Acclimation to extremely high ammonia levels in continuous biomethanation process and the associated microbial community dynamics

Acclimatized anaerobic communities to high ammonia levels can offer a solution to the ammonia toxicity problem in biogas reactors. In the current study, a stepwise acclimation strategy up to 10 g NH4+-N L−1, was performed in mesophilic (37 ± 1 °C) continuously stirred tank reactors. The reactors were co-digesting (20/80 based on volatile solid) cattle slurry and microalgae, a protein-rich, 3rd generation biomass. Throughout the acclimation period, methane production was stable with more than 95% of the uninhibited yield. Next generation 16S rRNA gene sequencing revealed a dramatic microbiome change throughout the ammonia acclimation process. Clostridium ultunense, a syntrophic acetate oxidizing bacteria, increased significantly alongside with hydrogenotrophic methanogen Methanoculleus spp., indicating strong hydrogenotrophic methanogenic activity at extreme ammonia levels (>7 g NH4+-N L−1). Overall, this study demonstrated for the first time that acclimation of methanogenic communities to extreme ammonia levels in continuous AD process is possible, by developing a specialised acclimation AD microbiome.
Biodiversity of soil bacteria exposed to sub-lethal concentrations of phosphonium-based ionic liquids: Effects of toxicity and biodegradation

Little is known about the effect of ionic liquids (ILs) on the structure of soil microbial communities and resulting biodiversity. Therefore, we studied the influence of six trihexyl(tetradecyl)phosphonium ILs (with either bromide or various organic anions) at sublethal concentrations on the structure of microbial community present in an urban park soil in 100-day microcosm experiments. The biodiversity decreased in all samples (Shannon's index decreased from 1.75 down to 0.74 and OTU's number decreased from 1399 down to 965) with the largest decrease observed in the microcosms spiked with ILs where biodegradation extent was higher than 80% (i.e. [P66614][Br] and [P66614][2,4,4]). Despite this general decrease in biodiversity, which can be explained by the toxic effect of the ILs, the microbial community in the microcosms was enriched with Gram-negative hydrocarbon-degrading genera e.g. Sphingomonas. It is hypothesized that, in addition to toxicity, the observed decrease in biodiversity and change in the microbial community structure may be explained by the primary biodegradation of the ILs or their metabolites by the mentioned genera, which outcompeted other microorganisms unable to degrade ILs or their metabolites. Thus, the introduction of phosphonium-based ILs into soils at sub-lethal concentrations may result not only in a decrease in biodiversity due to toxic effects, but also in enrichment with ILs-degrading bacteria.

General information
State: Published
Contact parameter identification for vibrational response variability prediction

Variability in the dynamic response of assembled structures can arise due to variations in the contact conditions between the parts that conform them. Contact conditions are difficult to model accurately due to randomness in physical properties such as contact surface, load distribution or geometric details. Those properties can vary for a given structure due to the assembly and disassembly process, and also across nominally equal items that are produced in series. This work focuses on modeling the contact between small light-weight plastic pieces such as those used in the hearing aid industry, where the vibrational behavior of the structures within the hearing frequency range is critical for the performance of the devices. A procedure to localize the most probable contact areas and determine the most sensitive contact points with respect to variations in the modes of vibration of the assembled plastic parts is presented. The procedure uses a gradient-based optimization strategy that updates the stiffness constants of a number of contact spring elements to match experimental data. By identifying the contact parameters for several sets of experimental data measured under varying contact conditions, the variability of the contact parameters can be characterized.

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Oticon A/S
Authors: Creixell Mediante, E. (Intern), Brunskog, J. (Intern), Jensen, J. S. (Intern), Larsen, M. (Ekstern)
Pages: 291–305
Publication date: 2018
Main Research Area: Technical/natural sciences

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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.33 SJR 0.89 SNIP 1.651
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.699 SNIP 1.757 CiteScore 1.85
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.686 SNIP 1.918 CiteScore 1.67
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 0.828 SNIP 2.356 CiteScore 1.64
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 0.8 SNIP 2.183 CiteScore 1.66
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.835 SNIP 1.807 CiteScore 1.38
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.702 SNIP 1.494
BFI (2009): BFI-level 1
Ecodesign Implementation and LCA

Ecodesign is a proactive product development approach that integrates environmental considerations into the early stages of the product development process so to improve the environmental performance of products. In this chapter, the ecodesign concept will be discussed, in terms of its implementation into manufacturing companies. Existing methods and tools for ecodesign implementation will be described, focusing on a multifaceted approach to environmental improvement through product development. Additionally, the use of LCA in an ecodesign implementation context will be further described in terms of the challenges and opportunities, together with the discussion of a selection of simplified LCA tools. Finally, a seven-step approach for ecodesign implementation which has been applied by several companies will be described.

General information

State: Published
Organisations: Department of Mechanical Engineering, Engineering Design and Product Development
Authors: McAloone, T. C. (Intern), Pigosso, D. C. A. (Intern)
Pages: 545-576
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Editors: Z. Hauschild, M., K. Rosenbaum, R., Irving Olsen , S.
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Main Research Area: Technical/natural sciences
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Source-ID: 2373522907
Publication: Research - peer-review › Book chapter – Annual report year: 2018

Editorial: Operational Research – Making an Impact

The origins of Operational Research are well known. OR developed – in particular in the UK - in the early 1940s as an area in which science was applied and new research inspired by real-world challenges, primarily in military analysis and in industrial production. As OR developed, a community of academic OR scholars became established alongside OR
practitioners and this has led quite naturally to the situation that, over time, much of the OR academic literature is inspired by theoretical development rather than by immediate application.

**General information**

State: Published  
Organisations: Department of Management Engineering, Management Science, Operations Research, University of Strathclyde  
Authors: Belton, V. (Ekstern), Bedford, T. (Ekstern), Pisinger, D. (Intern)  
Pages: 797-798  
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Main Research Area: Technical/natural sciences

**Publication information**

Journal: European Journal of Operational Research  
Volume: 264  
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ISSN (Print): 0377-2217  
Ratings:  
BFI (2017): BFI-level 1  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 1  
Scopus rating (2016): CiteScore 3.63 SJR 2.505 SNIP 2.339  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 1  
Scopus rating (2015): SJR 2.334 SNIP 2.412 CiteScore 3.59  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 1  
Scopus rating (2014): SJR 2.186 SNIP 2.485 CiteScore 3.21  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): SJR 2.346 SNIP 2.735 CiteScore 3.25  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 1  
Scopus rating (2012): SJR 2.418 SNIP 2.588 CiteScore 3.01  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): SJR 2.401 SNIP 2.441 CiteScore 3.02  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 2.477 SNIP 2.435  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 2.326 SNIP 2.577  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 1  
Scopus rating (2008): SJR 1.739 SNIP 1.984  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.679 SNIP 2.041  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 1.299 SNIP 2.023  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 1.194 SNIP 1.913  
Scopus rating (2004): SJR 1.24 SNIP 1.882  
Web of Science (2004): Indexed yes
Effect of ultrasound treatments on functional properties and structure of millet protein concentrate

In this study, the effect of high power ultrasound (US) probe in varying intensities and times (18.4, 29.58, and 73.95 W/cm² for 5, 12.5 and 20 min respectively) on functional properties of millet protein concentrate (MPC) was investigated, and also the structural properties of best modified treatment were evaluated by FTIR, DSC, Zeta potential and SDS-PAGE techniques. The results showed the solubility in all US treated MPC was significantly (p<.05) higher than those of the native MPC. Foaming capacity of native MPC (271.03 ± 4.51 ml) was reduced after US treatments at low intensities (82.37 ± 5.51 ml), but increased upon US treatments at high intensities (749.7 ± 2 ml). In addition, EAI and ES increased after US treatments. One of the best US treatments that can improve the functional properties of MPC was 73.95 W/cm² for 12.5 min that resulted in reduction of molecular weight and increase nearly 36% in the negative surface charge that was confirmed by SDS-page and Zeta potential results, respectively.

General information
State: Published
Organisations: National Food Institute, Research Group for Food Production Engineering, Shahid Beheshti University of Medical Sciences
Authors: Nazari, B. (Ekstern), Mohammadifar, M. A. (Intern), Shojaee-Aliabadi, S. (Ekstern), Feizollahi, E. (Ekstern), Mirmoghtadaie, L. (Ekstern)
Pages: 382-388
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): CiteScore 4.7 SJR 1.203 SNIP 1.766
Scopus rating (2015): SJR 1.465 SNIP 2.104 CiteScore 4.77
Scopus rating (2014): SJR 1.562 SNIP 2.129 CiteScore 4.59
Scopus rating (2013): SJR 1.434 SNIP 1.975 CiteScore 4.13
Scopus rating (2012): SJR 1.428 SNIP 1.902 CiteScore 3.63
Scopus rating (2011): SJR 1.631 SNIP 1.857 CiteScore 3.91
Scopus rating (2010): SJR 1.603 SNIP 1.65
Scopus rating (2009): SJR 1.443 SNIP 1.613
Scopus rating (2008): SJR 1.243 SNIP 1.752
Scopus rating (2007): SJR 1.105 SNIP 1.757
Scopus rating (2006): SJR 0.924 SNIP 1.799
Scopus rating (2005): SJR 0.968 SNIP 1.56
Scopus rating (2004): SJR 1.388 SNIP 1.772
Scopus rating (2003): SJR 0.902 SNIP 1.246
Scopus rating (2002): SJR 0.898 SNIP 1.082
Scopus rating (2001): SJR 0.78 SNIP 1.571
Scopus rating (2000): SJR 0.36 SNIP 1.087
Scopus rating (1999): SJR 1.584 SNIP 1.345
Original language: English
Hardening and strengthening behavior in rate-independent strain gradient crystal plasticity

Two rate-independent strain gradient crystal plasticity models, one new and one previously published, are compared and a numerical framework that encompasses both is developed. The model previously published is briefly outlined, while an in-depth description is given for the new, yet somewhat related, model. The difference between the two models is found in the definitions of the plastic work expended in the material and their relation to spatial gradients of plastic strains. The model predictions are highly relevant to the ongoing discussion in the literature, concerning 1) what governs the increase in the apparent yield stress due to strain gradients (also referred to as strengthening)? And 2), what is the implication of such strengthening in relation to crystalline material behavior at the micron scale? The present work characterizes material behavior, and the corresponding plastic slip evolution, by use of the finite element method. The pure shear problem of an infinite material slab is investigated, with the previously published model displaying strengthening, while the new model does not. In addition to the numerical approach an exact closed form solution, to the pure shear problem, is obtained for the new model, and it is demonstrated that the model predicts proportional straining in the entire plastic regime. Somewhat surprising it is found that the predictions for strain gradient hardening coincide for the two models.
Headwater streams in the EU Water Framework Directive: Evidence-based decision support to select streams for river basin management plans

Headwater streams are important contributors to aquatic biodiversity and may counteract negative impacts of anthropogenic stress on downstream reaches. In Denmark, the first river basin management plan (RBMP) included streams of all size categories, most being b2.5m wide (headwater streams). Currently, however, it is intensely debated whether the small size and low slopes, typical of Danish streams, in combination with degraded habitat conditions obstruct their ability to fulfill the ecological quality objectives required by the EU Water Framework Directive (WFD). The purpose of this study was to provide an analytically based framework for guiding the selection of headwater streams for RBMP. Specifically, the following hypotheses were addressed: i) stream slope, width, planform, and general physical habitat quality can act as criteria for selecting streams for the next generation of RBMPs, and ii) probability-based thresholds for reaching good ecological status can be established for some or all of these criteria, thus creating a sound, scientifically based, and clear selection process. The hypotheses were tested using monitoring data on Danish streams from the period 2004–2015. Significant linear relationships were obtained between the ecological quality ratio assessed by applying the Danish Stream Fauna Index (DSFIEQR) and stream slope, width, sinuosity, and DHI. The obtained models were used to produce pressure-response curves describing the probability of achieving good ecological status along gradients in these parameters. Next, threshold values for slope, width, sinuosity, and DHI were identified for selected probabilities of achieving minimum good ecological status. The obtained results can support managers and policy makers in prioritizing headwater streams for the 3rd RBMP. The approach applied is broadly applicable and can, for instance, help prioritization of restoration and conservation efforts in different types of ecosystems where the biota can be significantly linked to separate and quantifiable environmental characteristics.

General information
State: Accepted/In press
Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, Aarhus University, Aarhus Universitet
Authors: Baattrup-Pedersen, A. (Ekstern), Larsen, S. E. (Ekstern), Andersen, D. K. (Forskerdatabase), Jepsen, N. (Intern), Nielsen, J. (Intern), Rasmussen, J. (Ekstern)
Pages: 1048-1054
Publication date: 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Science of the Total Environment
Volume: 613-614
ISSN (Print): 0048-9697
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
High stability of benzotriazole and benzodithiophene containing medium band-gap polymer solar cell

The improvement of polymer solar cell stability is a challenge for the scientists and has significant implications commercially. In this study, we investigated the stability of a novel P-SBTBDT active material applied in an inverted type solar cell. Detailed stability experiments comprising shelf life, laboratory weathering and outdoor testing were carried out according to ISOS testing guidelines. Shelf life showed that P-SBTBDT solar cells were very stable after 840 h with...
encapsulation. Although accelerated weathering aging tests are a very harsh, the devices remained stable after the burn-in phase with $T_{50}$ from 700 to 840 h, with some P-SBTBDDT solar cells did not reach $T_{50}$ in the time span of the test. Degradation tests on the P-SBTBDDT solar cells which were carried out under natural solar light indicated that $T_{40}$ was reached after 840 h. The results of dark, light, damp and dry stability tests showed that most of the degradation was provoked by failure of the encapsulation. The experiments indicated that P-SBTBDDT solar cells are sensitive to light and oxygen but are strikingly stable under humid conditions. Further developments for minimizing the degradation effects using UV-filters and better encapsulation are some of the necessary improvements in further research.

General information
State: Published
Organisations: Department of Photonics Engineering, Diode Lasers and LED Systems, Organic Energy Materials, Department of Energy Conversion and Storage, Middle East Technical University, Yildiz Technical University, TUBITAK
Pages: 433-444
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Main Research Area: Technical/natural sciences

Publication information
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.97 SJR 1.587 SNIP 1.71
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.869 SNIP 1.896 CiteScore 5.16
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.204 SNIP 2.396 CiteScore 5.87
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.174 SNIP 2.582 CiteScore 5.58
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.435 SNIP 2.707 CiteScore 5.25
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.175 SNIP 2.638 CiteScore 5.16
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.524 SNIP 2.121
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.991 SNIP 1.977
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.654 SNIP 1.458
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.359 SNIP 1.488
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.447 SNIP 1.799
Investigation on acceptable reverberation time at various frequency bands in halls that present amplified music

Subjective ratings from 25 professional musicians and sound engineers were obtained to assess two Danish rock venues of similar size and similar low frequency reverberation times, but different high frequency reverberation times. The musicians judged one hall significantly better than the other, confirming a hypothesis that rock venues can have a longer reverberation time at mid to high frequencies at least in the empty condition. A fairly long reverberation time in the 63 Hz octave band is found to be acceptable, so the 125 Hz octave band is probably the single most important band to control for amplified music.

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Flex Acoustics, COWI AS
Authors: Adelman-Larsen, N. W. (Ekstern), Jeong, C. (Intern), Støfringsdal, B. (Ekstern)
Pages: 104–107
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.33 SJR 0.89 SNIP 1.651
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.699 SNIP 1.757 CiteScore 1.85
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.686 SNIP 1.918 CiteScore 1.67
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 0.828 SNIP 2.356 CiteScore 1.64
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 0.8 SNIP 2.183 CiteScore 1.66
ISI indexed (2012): ISI indexed yes
Amplified music, Reverberation time, Bass clarity, Concert hall rating, Reinforced music

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Publication: Research - peer-review › Journal article – Annual report year: 2017

**Life Cycle Costing: An Introduction**

The chapter gives an introduction to life cycle costing (LCC) and how it can be used to support decision-making. It can form the economic pillar in a full life cycle sustainability assessment, but often system delimitations differ depending on the goal and scope of the study. To provide a profound understanding this chapter describes several approaches and terms, fundamental principles and different types of costs. A brief introduction is given to conventional LCC and societal LCC but the main focus is on environmental Life Cycle Costing (eLCC) as the LCC approach that is compatible with environmental Life Cycle Assessment (LCA) in terms of system delimitation. Differences are explained and addressed, and an overview is given of the main cost categories to consider from different user perspectives. As inventory data is often sensitive in financial analyses, a list of relevant databases is provided as well as guidance on how to collect data to overcome this hurdle. In an illustrative case study on window frames, the eLCC theory is applied and demonstrated with each step along the eLCC procedure described in detail. A final section about advanced LCC introduces how to monetarise externalities and how to do discounting.

**General information**

State: Published
Organisations: Department of Management Engineering, Department of Mechanical Engineering, Engineering Design and Product Development
Authors: Rödger, J. (Intern), Kjær, L. L. (Intern), Pagoropoulos, A. (Intern)
Pages: 373-399
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Editors: Z. Hauschild, M., K. Rosenbaum, R., Irving Olsen, S.
ISBN (Print): 978-3-319-56474-6
Mechanical stability of roll-to-roll printed solar cells under cyclic bending and torsion

The ability of printed organic solar cells (OSCs) to survive repeated mechanical deformation is critical to large-scale implementation. This paper reports an investigation into the mechanical stability of OSCs through bending and torsion testing of whole printed modules. Two types of modules are used that differ slightly in thickness as well as on the basis of the electrode materials: silver nanowires or carbon-based inks. Each type of module is subjected to two different mechanical modes of deformation, bending and torsion, of several thousand cycles per module using a purpose-built robotic device. Analysis of the distribution of stress in the devices performed by finite-element modeling predicts the locations of failure. Failure upon bending originates at the laser-cut edges of the modules from shear at the clamp/module interface leading to crazing of the plastic barrier encapsulant foils. This crazing leads to eventual delamination due first to decohesion of the active layer at the edge of the modules and later to deadhesion between the PEDOT:PSS (electrode) and P3HT:PCBM (semiconductor) layers. The torsion mode imposes greater stresses than the bending mode and thus leads to failure at fewer strain cycles. Failure during torsion occurs through crack propagation initiated at stress concentrations on the edges of the module that were imposed by their rectangular geometry and ultimately leads to bifurcation of the entire module. Rather than the differences in electrode materials, the differences in survivability between the two types of modules are attributed mostly to the thickness of the substrate materials used, with the thinner substrate used in the carbon-based modules (~160 Åm) failing at fewer strain cycles than the substrate used in the silver-nanowire-based modules (~190 Åm). Taken together, the results suggest ways in which the lifetimes of devices can be extended by the layouts of modules and choices of materials.

General information

State: Published
Organisations: Department of Energy Conversion and Storage, Organic Energy Materials, University of California
Authors: Finn, M. (Ekstern), Martens, C. J. (Ekstern), Zaretski, A. V. (Ekstern), Roth, B. (Intern), Søndergaard, R. R. (Intern), Krebs, F. C. (Intern), Lipomi, D. J. (Ekstern)
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.97 SJR 1.587 SNIP 1.71
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.869 SNIP 1.896 CiteScore 5.16
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.204 SNIP 2.396 CiteScore 5.87
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.174 SNIP 2.582 CiteScore 5.58
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.435 SNIP 2.707 CiteScore 5.25
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.175 SNIP 2.638 CiteScore 5.16
Overnight glucose control in people with type 1 diabetes

This paper presents an individualized model predictive control (MPC) algorithm for overnight blood glucose stabilization in people with type 1 diabetes (T1D). The MPC formulation uses an asymmetric objective function that penalizes low glucose levels more heavily. We compute the model parameters in the MPC in a systematic way based on a priori available patient information. The model used by the MPC algorithm for filtering and prediction is an autoregressive integrated moving average with exogenous input (ARIMAX) model implemented as a linear state space model in innovation form. The control algorithm uses frequent glucose measurements from a continuous glucose monitor (CGM) and its decisions are...
implemented by a continuous subcutaneous insulin infusion (CSII) pump. We provide guidelines for tuning the control algorithm and computing the Kalman gain in the linear state space model in innovation form. We test the controller on a cohort of 100 randomly generated virtual patients with a representative inter-subject variability. We use the same control algorithm for a feasibility overnight study using 5 real patients. In this study, we compare the performance of this control algorithm with the patient’s usual pump setting. We discuss the results of the numerical simulations and the in vivo clinical study from a control engineering perspective. The results demonstrate that the proposed control strategy increases the time spent in euglycemia.

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**Process performance and modelling of anaerobic digestion using source-sorted organic household waste**

Three distinctive start-up strategies of biogas reactors fed with source-sorted organic fraction of municipal solid waste were investigated to reveal the most reliable procedure for rapid process stabilization. Moreover, the experimental results were compared with mathematical modeling outputs. The initial inoculations to start-up the reactors were 10, 50 and 100%.
of the final working volume. While a constant feeding rate of 7.8gVS/d was considered for the control reactor, the organic loading rate for fed-batch reactors with 10 and 50% inoculation was progressively increased during a period of 60 and 13 days, respectively. The results clearly demonstrated that an exponentially feeding strategy, considering 50% inoculation relative to final volume, can significantly decrease the alternatively prolonged period to reach steady conditions, as observed by high biogas and methane production rates. The combination of both experimental and modelling/simulation succeeded in optimizing the start-up process for anaerobic digestion of biopulp under mesophilic conditions.
Production and Application of Lysozyme-Gum Arabic Conjugate in Mayonnaise as a Natural Preservative and Emulsifier

Nowadays demand for food products made by natural sources is rising so fast. In this work Lysozyme (Lyz) was conjugated with gum Arabic (GA) in order to be applied in mayonnaise, at which the presence of both preservative and emulsifier is essential. Interestingly, the Lyz-GA conjugate exhibited improved functional properties and antibacterial activity. In order to approve the results of this study, the Lyz-GA conjugate was applied to mayonnaise as a natural preservative and emulsifier. Application of the Lyz-GA conjugate in mayonnaise expedited the death rate of both S. aureus and E. coli K-12. The observation proved that conjugations of Lyz with GA increased the spectrum of its application in food products with improved antibacterial activity. Surprisingly, investigation of emulsion stability and rheological properties confirmed the improved emulsification role of Lyz-GA conjugate with a higher elasticity in the mayonnaise. Mayonnaise including conjugates showed a linear rheological response and shear-thinning behavior. Sensory analysis of the mayonnaise with Lyz-GA conjugate was completely consistent with the commercial one. Taken together, our results suggest that conjugation of Lyz with GA made possible the application of a natural preservative and emulsifier in food and pharmaceutical industries, whereas Lyz alone does not have a broad-spectrum antibacterial activity or emulsifying properties.

General information
State: Accepted/In press
Organisations: National Food Institute, Research Group for Food Production Engineering, Brigham Young University, Shiraz University, University of Crete
Authors: Hashemi, M. M. (Ekstern), Aminlari, M. (Ekstern), Forouzan, M. M. (Ekstern), Moghimi, E. (Ekstern), Tavana, M. (Ekstern), Shekarforourush, S. (Ekstern), Mohammadifar, M. A. (Intern)
Number of pages: 12
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Main Research Area: Technical/natural sciences

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Volume: 68
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.56 SJR 0.397 SNIP 0.951
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.357 SNIP 0.581 CiteScore 0.83
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.344 SNIP 0.873 CiteScore 0.83
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.271 SNIP 0.599 CiteScore 0.71
Recent research trends in organic Rankine cycle technology: A bibliometric approach

This work describes the contribution of researchers around the world in the field of the organic Rankine cycle in the period 2000â€“2016. A bibliometric approach was applied to analyze the scientific publications in the field using the Scopus Elsevier database, together with Science Citation Index Expanded. Different aspects of the publications were analyzed, such as publication type, major research areas, journals, citations, authorship pattern, affiliations as well as the keyword occurrence frequency. The impact factor, h-index and number of citations were used to investigate the strength of active countries, institutes, authors, and journals in the organic Rankine cycle technology field. From 2000 to 2016, there were 2120 articles published by 3443 authors from 997 research institutes scattered over 71 countries. The total number of citations and impact factor are 36,739 and 4597, respectively, corresponding to 17 citations per paper and an impact factor of 2.168 per publication. The research articles originate primarily from China, the USA, and European countries. Results indicate that China, the United States, Italy, Greece, Belgium, Spain, Germany and the United Kingdom are the leading countries in organic Rankine cycle research and account for 64% of the total number of publications. The core research activities in the field are mainly focused on applications of the organic Rankine cycle technology, working fluids selection/performance, cycle architecture, and design/optimization. The most productive journal, author, institution, and country are Energy, Ibrahim Dincer, Tianjin University China and China, respectively.

General information

State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy, City University of Hong Kong, University of Science and Technology of China
Authors: Imran, M. (Intern), Haglind, F. (Intern), Asim, M. (Ekstern), Zeb Alvi, J. (Ekstern)
Pages: 552-562
Publication date: 2018
Main Research Area: Technical/natural sciences

Publication information

Journal: Renewable and Sustainable Energy Reviews
Volume: 81
ISSN (Print): 1364-0321
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 9.52 SJR 3.051 SNIP 3.454
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.999 SNIP 3.387 CiteScore 8.35
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 3.106 SNIP 3.761 CiteScore 7.79
Web of Science (2014): Indexed yes
Structure dependent antioxidant capacity of phlorotannins from Icelandic Fucus vesiculosus by UHPLC-DAD-ECD-QTOFMS

Brown algae are rich in polyphenolic compounds, phlorotannins, which have been found to possess high in vitro antioxidant capacity, especially DPPH radical scavenging activity, due to the high number of hydroxyl groups. Whereas, the overall antioxidant capacity of brown algae extracts has been widely studied, the antioxidant capacity of individual phlorotannins has been rarely explored. The aim of this study was to determine the structure dependant antioxidant capacity of phlorotannins from Icelandic brown algae, Fucus vesiculosus. The antioxidant capacity of individual phlorotannins was determined by an on-line method using liquid chromatography and an electrochemical detector followed by quadrupole Time of Flight mass spectrometry (UHPLC-DAD-ECD-QTOFMS). Tentative structural elucidation of 13 phlorotannin isomers from EAF was obtained by LC-DAD-QTOFMS, ranging from 374 to 870 Da. On-line determination of antioxidant capacity of the individual phlorotannins generally showed that low molecular phlorotannins exhibited higher antioxidant capacity and that the capacity decreased with polymerisation.

General information
State: Published
Organisations: National Food Institute, Research Group for Bioactives – Analysis and Application, Department of Biotechnology and Biomedicine, DTU Metabolomics Core, Lund University, Matís ltd.
Number of pages: 6
Pages: 904-909
Graphitic layer encapsulated iron based nanoparticles (G@FeNPs) have recently been disclosed as an interesting type of highly active electrocatalysts for the oxygen reduction reaction (ORR). However, the complex composition of the metal-containing components and their contributions in catalysis remain unclear. As a representative catalyst of the unique encapsulated structure, a series of G@FeNPs catalysts were prepared by a high-pressure pyrolytic process with uniform and essentially identical morphologies but varied compositions. The catalysts exhibited a high onset potential of 0.85 V at 0.1 mA cm⁻² in acidic media. By ⁵⁷Fe-Mössbauer spectroscopy the iron containing components were identified including α-Fe, γ-Fe, γ-Fe₂O₃, and Fe₃C as well as a minor doublet component due to Fe³⁺ in high spin and/or Fe²⁺ in low spin state. The ORR activities are evaluated in terms of the mass specific kinetic current density found to be positively correlated with the Fe₃C content in the range of study, indicating involvement of the encapsulated nanoparticles in the ORR catalysis. The recognition of the Fe compositions and active sites provides new insights to the confined Fe-based ORR electrocatalysts and therefore options for further development of non-precious metal materials.
Testing lagoonal sediments with early life stages of the copepod Acartia tonsa (Dana): An approach to assess sediment toxicity in the Venice Lagoon

The early-life stages of development of the calanoid copepod Acartia tonsa from egg to copepodite I is proposed as an endpoint for assessing sediment toxicity by exposing newly released eggs directly onto the sediment-water interface. A preliminary study of 5 sediment samples collected in the lagoon of Venice highlighted that the larval development rate (LDR) and the early-life stages (ELS) mortality endpoints with A. tonsa are more sensitive than the standard amphipod mortality test; moreover LDR resulted in a more reliable endpoint than ELS mortality, due to the interference of the sediment with the recovery of unhatched eggs and dead larvae. The LDR data collected in a definitive study of 48 sediment samples from the Venice Lagoon has been analysed together with the preliminary data to evaluate the statistical performances of the bioassay (among replicate variance and minimum significant difference between samples and control) and to investigate the possible correlation with sediment chemistry and physical properties. The results showed that statistical performances of the LDR test with A. tonsa correspond with the outcomes of other tests applied to the sediment-water interface (Strongylocentrotus purpuratus embryotoxicity test), sediments (Neanthes arenaceodentata survival and growth test) and porewater (S. purpuratus); the LDR endpoint did, however, show a slightly higher variance as compared with other tests used in the Lagoon of Venice, such as 10-d amphipod lethality test and larval development with sea urchin and bivalves embryos. Sediment toxicity data highlighted the high sensitivity and the clear ability of the larval development to discriminate among sediments characterized by different levels of contamination. The data of the definitive study evidenced that inhibition of the larval development was not affected by grain-size and the organic carbon content of the sediment; in contrast, a strong correlation between inhibition of the larval development and the sediment concentrations of some metals (Cu, Hg, Pb, Zn), acid-volatile sulphides (AVS), polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) was found. No correlation was found with DDTs, hexachlorobenzene and organotin compounds.

General information
State: Accepted/In press
Organisations: Department of Environmental Engineering, Ca’ Foscari University of Venice
Authors: Picone, M. (Ekstern), Bergamin, M. (Ekstern), Delaney, E. (Ekstern), Ghirardini, A. V. (Ekstern), Kusk, K. O. (Intern)
The evolution of facility management business models in supplier–client relationships

Purpose – The study improves the current understanding of business model innovation by outlining how business models unfold over time within supplier–client relationships in facilities management (FM) services.

Design/methodology/approach – This study of FM services in Denmark consists of an explorative case study and three case studies of facilities management clients. Both phases, related and overlapping, involved collection and analysis of in-depth, semi-structured interviews and archive data.

Findings – Findings shows that business model innovation entails interorganisational collaboration across different phases of the innovation process. The research demonstrates that external orientation within FM service ecosystems involves both a reaction to changes in the external environment and the proactive involvement of stakeholders throughout business model innovation.

Research limitations/implications – The selection of business model innovation processes was limited to the Danish context. The sample, although heterogeneous and representative, represented only a fraction of the total population, which may have excluded processes of business model innovation that contradict the research.

Practical implications – This paper suggests that by observing the business models of the value network over time, organisations could learn from the interdependencies between intra- and interorganisational stakeholders, thereby supporting the monitoring of risks and uncertainties as well as the anticipation of potential consequences of changes in the ecosystem.

Originality/value – This paper introduces new thinking on the subject of business model innovation to the context of FM. It presents the external orientation of FM business models as a way to combine planned and emergent business model innovation through interorganisational collaboration and value creation in FM ecosystems.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Management Science, Implementation and Performance Management, Copenhagen Business School
Authors: Nardelli, G. (Intern), Rajala, R. (Forskerdatabase)
Publication date: 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Facilities Management
Volume: 16
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
BFI (2015): BFI-level 2
BFI (2014): BFI-level 2
BFI (2013): BFI-level 2
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 2
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 2
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 2
BFI (2009): BFI-level 2
BFI (2008): BFI-level 1
Original language: English
Source: PublicationPreSubmission
Source-ID: 134614029
Publication: Research - peer-review Journal article – Annual report year: 2018
The Hi-Ring Architecture for Data Center Networks

Optical technologies have long been used for standard telecom applications ranging from long haul to metro and access networks. With the rapid expansion of traffic in data center networks, the deployment of optical technologies for computationally intensive short reach networking has attracted a lot of attention. The main interest in photonics comes from the fact that optical technologies are known for providing high bandwidth at low-cost and low power consumption. Unlike electrical switching, optical switching offers bit rate-independent operation; thus, the required processing capacity can greatly be reduced as there is no need to perform operations like electrical demultiplexing of high-speed data streams. Moreover, simultaneous switching of wavelength channels using an optical circuit switch yields energy-efficient operation, which is crucial to data centers.

General information
State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Nanophotonic Devices, Networks Technology and Service Platforms, Copenhagen Center for Health Technology
Authors: Kamchevska, V. (Intern), Ding, Y. (Intern), Berger, M. S. (Intern), Dittmann, L. (Intern), Oxenløwe, L. K. (Intern), Galili, M. (Intern)
Number of pages: 14
Pages: 93-106
Publication date: 2018

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Editors: Testa, F., Pavesi, L.
ISBN (Print): 978-3-319-61052-8
Main Research Area: Technical/natural sciences
Engineering, Communications Engineering, Networks, Microwaves, RF and Optical Engineering, Signal, Image and Speech Processing, Computer Communication Networks, Information Systems Applications (incl. Internet), Power Electronics, Electrical Machines and Networks, Time division multiplexing (TDM), Wavelength division multiplexing (WDM), Space division multiplexing (SDM), Multidimensional switching, Hi-Ring architecture
DOIs: 10.1007/978-3-319-61052-8_5
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Source-ID: 2373424764
Publication: Research - peer-review › Book chapter – Annual report year: 2017

Underground metabolism: network-level perspective and biotechnological potential
A key challenge in molecular systems biology is understanding how new pathways arise during evolution and how to exploit them for biotechnological applications. New pathways in metabolic networks often evolve by recruiting weak promiscuous activities of pre-existing enzymes. Here we describe recent systems biology advances to map such ‘underground’ activities and to predict and analyze their contribution to new metabolic functions. Underground activities are prevalent in cellular metabolism and can form novel pathways that either enable evolutionary adaptation to new environments or provide bypass to genetic lesions. We also illustrate the potential of integrating computational models of underground metabolism and experimental approaches to study the evolution of novel metabolic phenotypes and advance the field of biotechnology.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, ALE Technology & Software Development, Network Reconstruction in Silico Biology, Wageningen University, Hungarian Academy of Sciences
Authors: Notebaart, R. A. (Ekstern), Kintses, B. (Ekstern), Feist, A. (Intern), Papp, B. (Ekstern)
Pages: 108-114
Publication date: 2018
Main Research Area: Technical/natural sciences

Publication information
Journal: Current Opinion in Biotechnology
Volume: 49
ISSN (Print): 0958-1669
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Validation of a Robust Neural Real-Time Voltage Estimator for Active Distribution Grids on Field Data

The installation of measurements in distribution grids enables the development of data driven methods for the power system. However, these methods have to be validated in order to understand the limitations and capabilities for their use. This paper presents a systematic validation of a neural network approach for voltage estimation in active distribution grids by means of measured data from two feeders of a real low voltage distribution grid. The approach enables a real-time voltage estimation at locations in the distribution grid, where otherwise only non-real-time measurements are available. The method shows robust behavior in all analyzed aspects, which is vital for real world applications. A methodology to
select the most relevant input variables and find the best achievable performance for a particular number of inputs is presented. Moreover, the paper shows that the performance is not sensitive to the number of neurons in the hidden layer of the neural network as long as the model is not underdetermined. The paper examines the quantity of historical data needed to establish an adequately functioning model. To accommodate grid evolution and seasonal effects, the impact of different retraining intervals is investigated. Furthermore, the performance of the model during periods of high PV generation is evaluated. The validation shows that accurate voltage estimation models for distribution grids with high share of dispersed generation can be established with approximately one month of historical data. The model has to be retrained every 10 to 20 days to retain estimation mean squared errors below 0.35 V2. It was also found that the performance does not decline during times of high PV generation.

**General information**

State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy system operation and management, Danish Energy Association
Authors: Pertl, M. (Intern), Douglass, P. J. (Ekstern), Heussen, K. (Intern), Kok, K. (Intern)
Pages: 182–192
Publication date: 2018
Main Research Area: Technical/natural sciences

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Volume: 154
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- BFI (2017): BFI-level 2
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 3.32 SJR 1.167 SNIP 1.515
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 1.063 SNIP 1.663 CiteScore 2.74
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 1.129 SNIP 1.918 CiteScore 2.86
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 1.23 SNIP 1.941 CiteScore 2.92
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 1.211 SNIP 2.185 CiteScore 3.13
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 1
- Scopus rating (2011): SJR 0.942 SNIP 2.157 CiteScore 2.97
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 1
- Scopus rating (2010): SJR 1.004 SNIP 1.795
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 0.88 SNIP 1.561
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 1
- Scopus rating (2008): SJR 0.574 SNIP 1.302
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 0.529 SNIP 1.281
- Web of Science (2007): Indexed yes
Estimation of caffeine intake from analysis of caffeine metabolites in wastewater

Caffeine metabolites in wastewater were investigated as potential biomarkers for assessing caffeine intake in a population. The main human urinary metabolites of caffeine were measured in the urban wastewater of ten European cities and the metabolic profiles in wastewater were compared with the human urinary excretion profile. A good match was found for 1,7-dimethyluric acid, an exclusive caffeine metabolite, suggesting that might be a suitable biomarker in wastewater for assessing population-level caffeine consumption. A correction factor was developed considering the percentage of excretion of this metabolite in humans, according to published pharmacokinetic studies. Daily caffeine intake estimated from wastewater analysis was compared with the average daily intake calculated from the average amount of coffee consumed by country per capita. Good agreement was found in some cities but further information is needed to standardize this approach. Wastewater analysis proved useful to providing additional local information on caffeine use.

General information
State: Published
Organisations: Department of Environmental Engineering, Water Technologies, Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, University of South Australia, University of Oslo, University of Antwerp, Swiss Federal Institute of Aquatic Science and Technology (Eawag), Universidade do Porto, University of Queensland, University of Amsterdam, Universitat Jaume I, Istituto di Ricerche Farmacologiche Mario Negri, University of Bath, Chemical Water Quality and Health, Norwegian Institute for Water Research
Authors: Gracia-Lor, E. (Ekstern), Rousis, N. I. (Ekstern), Zuccato, E. (Ekstern), Bade, R. (Ekstern), Baz-Lomba, J. A. (Ekstern), Castrignanò, E. (Ekstern), Causanilles Llanes, A. (Ekstern), Hernández, F. (Ekstern), Kinyua, J. (Ekstern), Kasprzyk-Hordern, B. (Ekstern), van Nuijs, A. L. N. (Ekstern), Plósz, B. G. (Intern), Ramin, P. (Intern), Ryu, Y. (Ekstern), Santos, M. M. (Ekstern), Thomas, K. V. (Ekstern), de Voogt, P. (Ekstern), Yang, Z. (Ekstern), Castiglioni, S. (Ekstern)
Number of pages: 7
Pages: 1582-1588
Publication date: 31 Dec 2017
Main Research Area: Technical/natural sciences
A comparison of the survival and migration of wild and F1-hatchery-reared brown trout (Salmo trutta) smolts traversing an artificial lake

Supplementing salmonid populations by stocking is a widely-used method to improve catch or to rehabilitate populations. Though, most studies found that survival and fitness of hatchery-reared salmonids is inferior to wild fish. We compared survival, emigration patterns, migration speed and return rates from the sea of wild and 1-year old F1-hatchery-reared brown trout smolts in a Danish lowland stream that contains an artificial lake using passive integrated transponder telemetry in the years 2011–2013 and 2016. The majority of hatchery-reared smolts descended within 72 h after their release, whereas wild fish migration was mainly triggered by increased water discharge. Increased probability of a
successful lake passage was found at higher discharge. Within years, the groups differed in lake passage time, but without a significant overall difference. Overall, there was no difference in lake survival (wild: 30%, hatchery-reared: 32%) between the two groups, but survival differed between years. Only a single fish (0.9%) of the hatchery-reared smolts tagged in 2011–2013 returned from the sea compared to 11 (6.4%) wild smolts tagged in that period, which questions the value of supplementary stocking of smolts for conservation purposes.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Technical University of Denmark, Section for Freshwater Fisheries Ecology, Institute Management
Authors: Schwinn, M. (Intern), Baktoft, H. (Intern), Aarestrup, K. (Intern), Koed, A. (Intern)
Pages: 47-55
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Main Research Area: Technical/natural sciences

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Volume: 196
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.21 SJR 1.12 SNIP 1.136
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.067 SNIP 1.133 CiteScore 2.01
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.105 SNIP 1.312 CiteScore 2.17
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.037 SNIP 1.173 CiteScore 1.85
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.93 SNIP 1.177 CiteScore 1.78
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.154 SNIP 1.135 CiteScore 1.7
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.041 SNIP 1.1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.985 SNIP 1.065
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 0.938 SNIP 1.142
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.022 SNIP 1.075
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.025 SNIP 1.274
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.906 SNIP 1.134
Online short-term forecast of greenhouse heat load using a weather forecast service

In some district heating systems, greenhouses represent a significant share of the total load, and can lead to operational challenges. Short term load forecast of such consumers has a strong potential to contribute to the improvement of the overall system efficiency. This work investigates the performance of recursive least squares for predicting the heat load of individual greenhouses in an online manner. Predictor inputs (weekly curves terms and weather forecast inputs) are selected in an automated manner using a forward selection approach. Historical load measurements from 5 Danish greenhouses with different operational characteristics were used, together with weather measurements and a weather forecast service. It was found that these predictors of reduced complexity and computational load performed well at capturing recurring load profiles, but not fast frequency random changes. Overall, the root mean square error of the prediction was within 8–20% of the peak load for the set of consumers over the 8 months period considered.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science , Dynamical Systems, Aalborg University
Authors: Vogler-Finck, P. J. (Ekstern), Bacher, P. (Intern), Madsen, H. (Intern)
Pages: 1298-1310
Publication date: 1 Nov 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Applied Energy
Volume: 205
ISSN (Print): 0306-2619
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 7.78 SJR 3.058 SNIP 2.573
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.912 SNIP 2.61 CiteScore 6.4
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 3.254 SNIP 3.28 CiteScore 6.93
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 3.164 SNIP 3.377 CiteScore 6.59
Optimal pseudorandom sequence selection for online c-VEP based BCI control applications

Background: In a c-VEP BCI setting, test subjects can have highly varying performances when different pseudorandom sequences are applied as stimulus, and ideally, multiple codes should be supported. On the other hand, repeating the experiment with many different pseudorandom sequences is a laborious process. Aims: This study aimed to suggest an efficient method for choosing the optimal stimulus sequence based on a fast test and simple measures to increase the performance and minimize the time consumption for research trials. Methods: A total of 21 healthy subjects were included in an online wheelchair control task and completed the same task using stimuli based on the m-code, the gold-code, and the Barker-code. Correct/incorrect identification and time consumption were obtained for each identification. Subject-specific templates were characterized and used in a forward-step first-order model to predict the chance of completion and accuracy score. Results: No specific pseudorandom sequence showed superior accuracy on the group basis. When isolating the individual performances with the highest accuracy, time consumption per identification was not significantly increased. The Accuracy Score aids in predicting what pseudorandom sequence will lead to the best performance using only the templates. The Accuracy Score was higher when the template resembled a delta function the most and when repeated templates were consistent. For completion prediction, only the shape of the template was a significant predictor. Conclusions: The simple and fast method presented in this study as the Accuracy Score, allows c-VEP based BCI systems to support multiple pseudorandom sequences without increase in trial length. This allows for more personalized BCI systems with better performance to be tested without increased costs.
A bacterial cell factory for efficient production of ethanol from whey
The invention relates to a method for homo-ethanol production from lactose using a genetically modified lactic acid bacterium of the invention, where the cells are provided with a substrate comprising dairy waste supplemented with an amino nitrogen source (such as acid hydrolysed corn steep liquor). The invention further relates to genetically modified lactic acid bacterium and its use for homo-ethanol production from lactose in dairy waste. The lactic acid bacterium comprises both genes (lacABCD, LacEF, lacG) encoding enzymes catalysing the lactose catabolism pathway; and transgenes (pdc and adhB) encoding enzymes catalysing the conversion of pyruvate to ethanol. Additionally a number of genes (Idh, pta and adhE) are deleted in order to maximise homo-ethanol production as compared to production of lactate, acetoin and acetate production.

Evaluation of pharmacokinetic model designs for subcutaneous infusion of insulin aspart
Effective mathematical modelling of continuous subcutaneous infusion pharmacokinetics should aid understanding and control in insulin therapy. Thorough analysis of candidate model performance is important for selecting the appropriate models. Eight candidate models for insulin pharmacokinetics included a range of modelled behaviours, parameters and complexity. The models were compared using clinical data from subjects with type 1 diabetes with continuous subcutaneous insulin infusion. Performance of the models was compared through several analyses: $R^2$ for goodness of fit; the Akaike Information Criterion; a bootstrap analysis for practical identifiability; a simulation exercise for predictability. The simplest model fit poorly to the data ($R^2 = 0.53$), had the highest Akaike score, and worst prediction. Goodness of fit improved with increasing model complexity ($R^2 = 0.85–0.92$) but Akaike scores were similar for these models. Complexity increased practical non-identifiability, where small changes in the dataset caused large variation (CV > 10%) in identified parameters in the most complex models. Best prediction was achieved in a relatively simple model. Some model complexity was necessary to achieve good data fit but further complexity introduced practical non-identifiability and worsened prediction capability. The best model used two linear subcutaneous compartments, an interstitial and plasma compartment, and two identified variables for interstitial clearance and subcutaneous transfer rate. This model had optimal performance trade-off with reasonable fit ($R^2 = 0.86$) and parameterisation, and best prediction and practical identifiability (CV < 2%).
Continuous subcutaneous insulin infusion, Goodness of fit, Parameter identification, Pharmacokinetic modelling, Practical identifiability, Type 1 diabetes

Purpose: In order to improve and support decision-making for the selection of remedial techniques for contaminated sites, a multi-criteria assessment (MCA) method has been developed. The MCA framework is structured in a decision process actively involving stakeholders, and compares the sustainability of remediation alternatives by integrating environmental, societal, and economic criteria in the assessment. Materials and methods: The MCA includes five main decision criteria: remedial effect, remediation cost, remediation time, environmental impacts, and societal impacts. The main criteria are divided into a number of sub-criteria. The environmental impacts consider secondary impacts to the environment caused by remedial activities and are assessed by life-cycle assessment (LCA). The societal impacts mainly consider local impacts and are assessed in a more qualitative manner on a scale from 1 to 5. The performance on each main criterion is normalized to a score between 0 and 1, with 1 being the worst score. An overall score is obtained by calculating a weighted sum with criteria weights determined by stakeholders. The MCA method was applied to assess remediation
alternatives for the Groyne 42 site, one of the largest contaminated sites in Denmark. Results and discussion: The compared remediation alternatives for the site were: (1) excavation of the site followed by soil treatment; (2) in situ alkaline hydrolysis; (3) in situ thermal remediation; and (4) continued encapsulation of the site by sheet piling. Criteria weights were derived by a stakeholder panel. The stakeholders gave the highest weighting to the remedial effect of the methods and to the societal impacts. For the Groyne 42 case study, the excavation option obtained the lowest overall score in the MCA, and was therefore found to be the most sustainable option. This was especially due to the fact that this option obtained a high score in the main categories Effect and Social impacts, which were weighted highest by the stakeholders. Conclusions: The developed MCA method is structured with five main criteria. Effect and time are included in addition to the three pillars of sustainability (environment, society, and economy). The remedial effect of remediation is therefore assessed and weighted separately from the main criteria environment. This structure makes interpretation of criteria scores more transparent and emphasizes the importance of effect and time as decision parameters. This also facilitated an easier weighting procedure for the stakeholders in the case study, who expressed a wish to weigh the remedial effect independently from the secondary environmental impacts.

General information
State: Accepted/In press
Organisations: Department of Environmental Engineering, Water Resources Engineering, Central Denmark Region
Authors: Søndergaard, G. L. (Intern), Binning, P. J. (Intern), Bondgård, M. (Ekstern), Bjerg, P. L. (Intern)
Number of pages: 15
Publication date: 12 Aug 2017
Main Research Area: Technical/natural sciences

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Journal: Journal of Soils and Sediments
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.44 SJR 0.834 SNIP 0.988
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.873 SNIP 0.858 CiteScore 1.98
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.001 SNIP 1.299 CiteScore 2.49
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.965 SNIP 1.197 CiteScore 2.22
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.025 SNIP 0.971 CiteScore 2.01
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.932 SNIP 0.872 CiteScore 2.02
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.764 SNIP 1.005
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.934 SNIP 0.939
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.871 SNIP 1.015
Scopus rating (2007): SJR 0.65 SNIP 1.04
Scopus rating (2006): SJR 0.578 SNIP 0.743
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.582 SNIP 0.593
Scopus rating (2004): SJR 0.53 SNIP 0.493
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.613 SNIP 1.23
Web of Science (2003): Indexed yes
Mode conversion enables optical pulling force in photonic crystal waveguides

We propose a robust scheme to achieve optical pulling force using the guiding modes supported in a hollow core double-mode photonic crystal waveguide instead of the structured optical beams in free space investigated earlier. The waveguide under consideration supports both the 0th order mode with a larger forward momentum and the 1st order mode with a smaller forward momentum. When the 1st order mode is launched, the scattering by the object inside the waveguide results in the conversion from the 1st order mode to the 0th order mode, thus creating the optical pulling force according to the conservation of linear momentum. We present the quantitative agreement between the results derived from the mode conversion analysis and those from rigorous simulation using the finite-difference in the time-domain numerical method. Importantly, the optical pulling scheme presented here is robust and broadband with naturally occurred lateral equilibriums and has a long manipulation range. Flexibilities of the current configuration make it valuable for the optical force tailoring and optical manipulation operation, especially in microfluidic channel systems.

General information
State: Published
Organisations: Technical University of Denmark, Department of Photonics Engineering, Plasmonics and Metamaterials, Harbin Institute of Technology, North South University
Authors: Zhu, T. (Ekstern), Novitsky, A. (Intern), Cao, Y. (Ekstern), Mahdy, M. R. (Ekstern), Wang, Z. L. (Ekstern), Sun, F. (Ekstern), Jiang, Z. (Ekstern), Ding, W. (Ekstern)
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BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.085 SNIP 0.983 CiteScore 2.47
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.799 SNIP 1.462 CiteScore 3.25
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.149 SNIP 1.652 CiteScore 3.77
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.554 SNIP 1.754 CiteScore 3.76
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
»Oh-my-God-partiklen
Detekteret. Nogle partikler fra det ydre rum har så høj energi, at de egentlig ikke burde være her. De er kosmologiens svar på humlebien, der ikke kan flyve, og fysikerne leder stadig efter en god forklaring

General information
State: Published
Organisations: National Space Institute, Innovation and Research-based consultancy
Authors: Pedersen, J. O. P. (Intern)
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Publication Information
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Newspaper: Weekendavisen
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**Resonant power converter with dead-time control of synchronous rectification circuit**

The invention relates in a first aspect to a resonant power converter comprising a synchronous rectifier for supplying a DC output voltage. The synchronous rectifier is configured for alternatingly connecting a resonant output voltage to positive and negative DC output nodes via first and second semiconductor switches, respectively, separated by intervening dead-time periods in accordance with first and second rectification control signals. A dead-time controller is coupled to the resonant output voltage or the resonant input voltage and configured for adaptively adjusting lengths of the dead-time periods via the first and second rectification control signals.

**Characteristics of Xanthosoma sagittifolium roots during cooking, using physicochemical analysis, uniaxial compression, multispectral imaging and low field NMR spectroscopy**

To effectively promote the industrial utilization of cocoyam (Xanthosoma sagittifolium) roots for enhanced food sustainability and security, there is a need to study their molecular, mechanical and physicochemical properties in detail. The physicochemical and textural characteristics of the red and white varieties of cocoyam roots were thus analysed by low field nuclear magnetic resonance relaxometry, multispectral imaging, uniaxial compression testing, and relevant physicochemical analysis in the current study. Both varieties had similar dry matter content, as well as physical and mechanical properties. However, up to four fast-interacting water populations were observed in the roots, dependent on the root variety and their degree of gelatinization during cooking. Changes in the relaxation parameters indicated weak gelatinization of starch at approximately 80 °C in both varieties. However, shorter relaxation times and a higher proportion of restricted water in the white variety indicated that this variety was slightly more sensitive towards gelatinization. A strong negative correlation existed between dry matter and all multispectral wavelengths >800 nm, suggesting the potential use of that spectral region for rapid analysis of dry matter and water content of the roots. The small, but significant differences in the structural and gelatinization characteristics of the two varieties indicated that they may not be equally suited for further processing, e.g. to flours or starches. Processors thus need to choose their raw materials wisely dependent on the aimed product characteristics. However, the spectroscopic methods applied in the study were shown to be effective in assessing important quality attributes during cooking of the roots.
A new biostable glucose permeable polymer has been developed which is useful, for example, in implantable glucose sensors. This biostable glucose permeable polymer has a number of advantageous characteristics and, for example, does not undergo hydrolytic cleavage and degradation, thereby providing a composition that facilitates long term sensor stability in vivo. The versatile characteristics of this polymer allow it to be used in a variety of contexts, for example to form the body of an implantable glucose sensor. The invention includes the polymer composition, sensor systems formed from this polymer composition, and methods for making and using such sensor systems.
Scenarios for sustainable heat supply and heat savings in municipalities - the case of Helsingør, Denmark

Local climate action is not only a domain of large cities, but also smaller urban areas that increasingly address climate change mitigation in their policy. The Danish municipality of Helsingør can achieve a substantial CO2 emissions reduction by transforming its heat supply and deploying heat savings. In this paper, we model the heating system of Helsingør, assess it from a simple socio- and private-economic perspective, develop future scenarios, and conduct an iterative process to derive a cost-optimal mix between district heating, individual heating and heat savings. The results show that in 2030 it is cost-optimal to reduce the heating demand by 20–39% by implementing heat savings, to deploy 32%–41% of district heating and to reduce heating-related CO2 emissions by up to 95% in comparison to current emissions. In 2050, the cost-optimal share of district heating in Helsingør increases to between 38 and 44%. The resulting average heating costs and CO2 emissions are found to be sensitive to biomass and electricity price. Although the findings of the study are mainly applicable for Helsingør, the combined use of the Least Cost Tool and modelling with energyPRO is useful in planning of heating and/or cooling supply for different demand configurations, geographical region and scale.
A Quantitative Property-Property Relationship for the Internal Diffusion Coefficients of Organic Compounds in Solid Materials

Indoor releases of organic chemicals encapsulated in solid materials are major contributors to human exposures and are directly related to the internal diffusion coefficient in solid materials. Existing correlations to estimate the diffusion coefficient are only valid for a limited number of chemical-material combinations. This paper develops and evaluates a quantitative property-property relationship (QPPR) to predict diffusion coefficients for a wide range of organic chemicals and materials. We first compiled a training dataset of 1103 measured diffusion coefficients for 158 chemicals in 32 consolidated material types. Following a detailed analysis of the temperature influence, we developed a multiple linear regression model to predict diffusion coefficients as a function of chemical molecular weight (MW), temperature, and material type (adjusted R2 of 0.93). The internal validations showed the model to be robust, stable and not a result of chance correlation. The external validation against two separate prediction datasets demonstrated the model has good predicting ability within its applicability domain (R2ext > 0.8), namely MW between 30 and 1178 g/mol and temperature between 4 and 180 °C. By covering a much wider range of organic chemicals and materials, this QPPR facilitates high-throughput estimates of human exposures for chemicals encapsulated in solid materials.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, Transport DTU, University of Michigan
Authors: Huang, L. (Ekstern), Fantke, P. (Intern), Jolliet, O. (Ekstern)
Number of pages: 34
Could baseline establishment be counterproductive for emissions reduction? Insights from Vietnam's building sector

This article provides insights into the role of institutions involved in climate governance working towards a future low-carbon society at the national level, within the global climate change governance architecture. Specifically, it contributes to
understanding the fragmented governance of energy efficiency policy in developing countries by focussing on Vietnam's building sector, identifying key institutions related to underlying discourses, national and international power relations, resource distribution and coalitions. It uses the case of baseline setting in developing Nationally Appropriate Mitigation Actions (NAMAs) to illustrate institutional dynamics, nationally and transnationally, as well as to question whether demands for baseline setting achieve the ideal trade-off between actual GHG emissions reduction and institutionalized demands for accountability. The analysis reveals that, in addition to domestic efforts and challenges, the international agenda greatly influences the energy efficiency policy arena. The article presents lessons to be learnt about policy processes from the specific Vietnamese case, reflecting on the role of international actors and discourses in it. Finally, it argues for the abolition of baselines in favour of adequate monitoring and evaluation, from the perspective that requirement for deviation from fictitious baselines is unproductive and only serves an international techno-managerial discourse.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, UNEP DTU Partnership
Authors: Henrysson, M. (Intern), Lütken, S. (Intern), Puig, D. (Intern)
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.596 SNIP 1.268 CiteScore 2.42
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.215 SNIP 0.955 CiteScore 1.82
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.777 SNIP 0.827 CiteScore 1.36
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.95 SNIP 0.945 CiteScore 1.57
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.019 SNIP 0.873 CiteScore 1.35
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.808 SNIP 1.15
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.683 SNIP 1.241
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.885 SNIP 0.962
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.398 SNIP 0.719
Scopus rating (2006): SJR 0.701 SNIP 1.388
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.92 SNIP 1.256
Scopus rating (2004): SJR 0.983 SNIP 1.511
Scopus rating (2003): SJR 0.684 SNIP 1.051
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.878 SNIP 0.993
The reverse tragedy of the commons: an exploratory account of incentives for under-exploitation in an open innovation environment

This paper presents an empirical account of a phenomenon that we refer to as the ‘reverse tragedy of the commons’ in open innovation. The name signifies the ‘under-exploitation’ of intellectual property (IP) under weak appropriability. The name is this graphic because the tragedy is costly, and can also render IP effectively worthless and block innovation in the short to medium term. We propose that the tragedy is borne out of the interaction between enterprise characteristics, a competitive setting and the framework that is set by the policy intervention. This finding is pertinent to policy-makers with regard to the design of research, development and innovation instruments, as well as managers who must determine how to implement open practices in innovation.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Technology and Innovation Management, Gaia Consulting, Prime Minister's Office
Authors: Piirainen, K. A. (Intern), Raivio, T. (Ekstern), Lähteenmäki-smith, K. (Ektstern), Alkaeersig, L. (Intern), Li-Ying, J. (Intern)
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Scopus rating (2016): SJR 0.653 SNIP 0.88 CiteScore 1.56
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.651 SNIP 0.639 CiteScore 1.43
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.562 SNIP 0.834 CiteScore 1.22
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.548 SNIP 0.792 CiteScore 1.37
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.765 SNIP 0.992 CiteScore 1.48
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 0.622 SNIP 0.969 CiteScore 1.34
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 0.681 SNIP 0.987
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 0.581 SNIP 1.158
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.517 SNIP 0.719
Sensitivity-based research prioritization through stochastic characterization modeling

Product developers using life cycle toxicity characterization models to understand the potential impacts of chemical emissions face serious challenges related to large data demands and high input data uncertainty. This motivates greater focus on model sensitivity toward input parameter variability to guide research efforts in data refinement and design of experiments for existing and emerging chemicals alike. This study presents a sensitivity-based approach for estimating toxicity characterization factors given high input data uncertainty and using the results to prioritize data collection according to parameter influence on characterization factors (CFs). Proof of concept is illustrated with the UNEP-SETAC scientific consensus model USEtox.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, National Academies of Sciences, Leiden University, School of Sustainable Engineering and the Built Environment
Authors: Wender, B. A. (Ekstern), Prado-Lopez, V. (Ekstern), Fantke, P. (Intern), Ravikumar, D. (Ekstern), Seager, T. P. (Ekstern)
Number of pages: 9
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): CiteScore 3.43 SJR 1.328 SNIP 1.423
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.504 SNIP 1.554 CiteScore 3.49
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.736 SNIP 1.738 CiteScore 3.65
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.666 SNIP 1.979 CiteScore 3.35
ISI indexed (2013): ISI indexed yes
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Det varer ved

General information
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Organisations: National Space Institute, Innovation and Research-based consultancy
Authors: Pedersen, J. O. P. (Intern)
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Newspaper: Weekendavisen
Volume: 2017
No.: 17
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ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
Forskerhjerner på march gør ingen gavn
En gåtur i flok løser ikke videnskabens problemer - i morgen yder jeg mit bidrag ved at blive hjemme og forsk

General information
State: Published
Organisations: National Space Institute, Innovation and Research-based consultancy
Authors: Pedersen, J. O. P. (Intern)
Number of pages: 3
Publication date: 21 Apr 2017

High-level production of diacetyl in a metabolically engineered lactic acid bacterium
The present invention provides a genetically modified lactic acid bacterium capable of producing diacetyl under aerobic conditions. Additionally the invention provides a method for producing diacetyl using the genetically modified lactic acid bacterium under aerobic conditions in the presence of a source of iron-containing porphyrin and a metal ion selected from Fe3+, Fe2+ and Cu2+. The lactic acid bacterium is genetically modified by deletion of those genes in its genome that encode polypeptides having lactate dehydrogenase (E.C 1.1.1.27/E.C.1.1.1.28); α-acetolactate decarboxylase (E.C 4.1.1.5); water-forming NADH oxidase (E.C. 1.6.3.4); phosphotransacetylase (E.C.2.3.1.8) activity; and optionally devoid of or deleted for genes encoding polypeptides having diacetyl reductase ((R)-acetoin forming; EC: 1.1.1.303); D-acetoin reductase; butanediol dehydrogenase ((R,R)-butane-2,3-diol forming; E.C. 1.1.1.4/1.1.1.-) and alcohol dehydrogenase (E.C. 1.2.1.10) activity. The invention provides for use of the genetically modified lactic acid bacterium for the production of diacetyl and a food product.

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Biotechnology and Biorefining
Authors: Solem, C. (Intern), Jensen, P. R. (Intern), Liu, J. (Intern)
Publication date: 13 Apr 2017

Binding of hydrophobic antigens to surfaces
A first aspect of the present invention is a method of detecting antibodies comprising the steps of: i) providing a first group of beads comprising a surface modified with C1-C10 alkyl groups comprising amine, ammonium, ether and/or hydroxyl groups, ii) contacting said first group of beads with a first hydrophobic antigen to provide a first group of bead-antigen conjugates by adsorption of the first hydrophobic antigen on the first group of beads, iii) isolating said bead-antigen conjugates, iv) contacting said bead-antigen conjugates with a sample to bind antibodies therein to provide bead-antigen-antibody conjugates, and v) detecting said bead-antigen-antibody conjugates. Further aspects include an antibody
detection kit, a bead-antigen conjugate and a composition comprising at least two different groups of bead-antigen-conjugates.

**Modelling of electricity savings in the Danish households sector: from the energy system to the end-user**

In this paper, we examine the value of investing in energy-efficient household appliances from both an energy system and end-user perspectives. We consider a set of appliance categories constituting the majority of the electricity consumption in the private household sector, and focus on the stock of products which need to be replaced. First, we look at the energy system and investigate whether investing in improved energy efficiency can compete with the cost of electricity supply from existing or new power plants. To assess the analysis, Balmorel, a linear optimization model for the heat and power sectors, has been extended in order to endogenously determine the best possible investments in more efficient home appliances. Second, we propose a method to relate the optimal energy system solution to the end-user choices by incorporating consumer behaviour and electricity price addition due to taxes. The model is nonexclusively tested on the Danish energy system under different scenarios. Computational experiments show that several energy efficiency measures in the household sector should be regarded as valuable investments (e.g. an efficient lighting system) while others would require some form of support to become profitable. The analysis quantifies energy and economic savings from the consumer side and reveals the impacts on the Danish power system and surrounding countries. Compared to a business-as-usual energy scenario, the end-user attains net economic savings in the range of 30–40 EUR per year, and the system can benefit of an annual electricity demand reduction of 140–150 GWh. The paper enriches the existing literature about energy efficiency modelling in households, contributing with novel models, methods, and findings related to the Danish case.
Durable fuel electrode

The present invention relates to a composite for an electrode, a composite precursor, a method of manufacturing a composite, and the composite obtained by said method. The invention further relates to an electrode comprising the composite, as well as a solid state electrochemical cell comprising the composite. The invention also relates to the use of the composite as a fuel electrode, solid oxide fuel cell, and/or solid oxide electrolyser. The invention discloses a composite for an electrode, comprising a three-dimensional network of dispersed metal particles, stabilised zirconia particles and pores, wherein the size of the pores is smaller than the size of the metal particles, wherein the size of the metal particles is essentially equal to or smaller than the size of the stabilised zirconia particles, wherein the porosity is below 33, 30, or 29 vol%, more preferably below 26 or 24 vol%, and most preferably below 23, 22, 21, 18, 15, or 13 vol%, and/or wherein the pores are essentially exclusively generated from the volume created by reducing a corresponding metal oxide to the metal particles.

Klimaforskningen har et troværdighedsproblem

Videnskabelige procedurer, der får takten i den globale opvarming til at ændre sig efter behov, illustrerer med altydelighed, at der er brug for mere åbenhed i klimaforskningen
Learning from CDM SD tool experience for Article 6.4 in the Paris Agreement

The Paris Agreement (PA) emphasizes the intrinsic relationship between climate change and sustainable development (SD) and welcomes the 2030 agenda for the global Sustainable Development Goals (SDGs). Yet, there is a lack of assessment approaches to ensure that climate and development goals are achieved in an integrated fashion and trade-offs avoided. Article 6.4 of the PA introduces a new Sustainable Mitigation Mechanism (SMM) with the dual aim to contribute to the mitigation of greenhouse gas emissions and foster SD. The Kyoto Protocol’s Clean Development Mechanism (CDM) has a similar objective and in 2014, the CDM SD tool was launched by the Executive Board of the CDM to highlight the SD benefits of CDM activities. This article analyses the usefulness of the CDM SD tool for stakeholders and compares the SD tool’s SD reporting requirements against other flexible mechanisms and multilateral standards to provide recommendations for improvement. A key conclusion is that the Paris Agreement’s SMM has a stronger political mandate than the CDM to measure that SD impacts are ‘real, measurable and long-term’. Therefore, recommendations for an improved CDM SD tool are a relevant starting point to develop rules, modalities and procedures for SD assessment in Article 6.4 as well as for other cooperative mitigation approaches.

General information
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Organisations: Department of Management Engineering, UNEP DTU Partnership, Wuppertal Institute for Climate, Environment and Energy
Authors: Olsen, K. H. (Intern), Arens, C. (Ekstern), Mersmann, F. (Ekstern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.596 SNIP 1.268 CiteScore 2.42
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.215 SNIP 0.955 CiteScore 1.82
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.777 SNIP 0.827 CiteScore 1.36
ISI indexed (2013): ISI indexed yes
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Scopus rating (2012): SJR 0.95 SNIP 0.945 CiteScore 1.57
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.019 SNIP 0.873 CiteScore 1.35
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.808 SNIP 1.15
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.683 SNIP 1.241
Context-dependent individual behavioral consistency in Daphnia

The understanding of consistent individual differences in behavior, often termed "personality," for adapting and coping with threats and novel environmental conditions has advanced considerably during the last decade. However, advancements are almost exclusively associated with higher-order animals, whereas studies focusing on smaller aquatic organisms are still rare. Here, we show individual differences in the swimming behavior of Daphnia magna, a clonal freshwater invertebrate, before, during, and after being exposed to a lethal threat, ultraviolet radiation (UVR). We show consistency in swimming velocity among both mothers and daughters of D. magna in a neutral environment, whereas this pattern breaks down when exposed to UVR. Our study also, for the first time, illustrates how the ontogenetic development in swimming and refuge-seeking behavior of young individuals eventually approaches that of adults. Overall, we show that aquatic invertebrates are far from being identical robots, but instead they show considerable individual differences in behavior that can be attributed to both ontogenetic development and individual consistency. Our study also demonstrates, for the first time, that behavioral consistency and repeatability, that is, something resembling "personality," is context and state dependent in this zooplankter taxa.
In this paper, we propose a unified aggregation and relaxation approach for topology optimization with stress constraints. Following this approach, we first reformulate the original optimization problem with a design-dependent set of constraints into an equivalent optimization problem with a fixed design-independent set of constraints. The next step is to perform constraint aggregation over the reformulated local constraints using a lower bound aggregation function. We demonstrate that this approach concurrently aggregates the constraints and relaxes the feasible domain, thereby making singular optima accessible. The main advantage is that no separate constraint relaxation techniques are necessary, which reduces the parameter dependence of the problem. Furthermore, there is a clear relationship between the original feasible domain and the perturbed feasible domain via this aggregation parameter.
En jetstrøm i Jordens indre
Magnetfelt. 3000 kilometer under Jordens overflade bevæger en tung, varm strøm af metal sig rundt. Strømme i Jordens indre er med til at holde liv i det magnetfelt, som beskytter Jorden mod Solen.

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Source-ID: 128539050
Professor om kystsikring: København er vigtigere end Jylland

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Authors: Arnbjerg-Nielsen, K. (Intern)
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Stormvejr i rummet

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Main Research Area: Technical/natural sciences

A strain gauge
The invention relates to a strain gauge of a carrier layer and a meandering measurement grid (101) positioned on the carrier layer, wherein the measurement grid comprises a number of measurement grid sections placed side by side with gaps in between, and a number of end loops (106) interconnecting the measurement grid sections at their ends. The end loops at both ends of the measurement grid extend a length (L, 500) in the axial direction in millimetres of a factor times a ratio between a width of a grid section and the gap distance, wherein the factor is larger or equal to 1.5. The invention further relates to a method for manufacturing a strain gauge as mentioned above.

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Organisations: Department of Wind Energy, Composites and Materials Mechanics
Authors: Mikkelsen, L. P. (Intern), Gili, J. (Ekstern)
Publication date: 19 Jan 2017

Publication information
Ultrafine particle number flux over and in a deciduous forest

Ultrafine particles (UFP, particles with diameters (Dp) < 100 nm) play a key role in climate forcing; thus, there is interest in improved understanding of atmosphere-surface exchange of these particles. Long-term flux measurements from a deciduous forest in the Midwestern USA (taken during December 2012 to May 2014) show that although a substantial fraction of the data period indicates upward fluxes of UFP, on average, the forest is a net sink for UFP during both leaf-active and leaf-off periods. The overall mean above-canopy UFP number flux computed from this large data set is \(-4.90 \times 10^6 m^{-2} s^{-1}\) which re-emphasizes the importance of these ecosystems to UFP removal from the atmosphere. Although there remain major challenges to accurate estimation of the UFP number flux and in drawing inferences regarding the actual surface exchange from measurements taken above the canopy, the above the canopy mean flux is shown to be downward throughout the day (except at 23.00) with largest-magnitude fluxes during the middle of the day. On average, nearly three quarters of the total UFP capture by this ecosystem occurs at the canopy. This fraction increases to 78% during the leaf-active period, but the over-storey remains dominant over the subcanopy even during the leaf-off period.

General information
State: Published
Organisations: Department of Wind Energy, Cornell University, Aarhus University
Authors: Pryor, S. (Ekstern), Barthelmie, R. (Ekstern), Larsen, S. E. (Intern), Sørensen, L. (Ekstern)
Pages: 405-522
Publication date: 11 Jan 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Geophysical Research: Atmospheres
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.36 SJR 1.996 SNIP 1.313
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.288 SNIP 1.362 CiteScore 3.39
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.324 SNIP 1.349 CiteScore 3.27
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.357 SNIP 1.44 CiteScore 3.38
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.365 SNIP 1.35 CiteScore 2.93
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Resonant power converter comprising adaptive dead-time control.

The invention relates in a first aspect to a resonant power converter comprising: a first power supply rail for receipt of a positive DC supply voltage and a second power supply rail for receipt of a negative DC supply voltage. The resonant
power converter comprises a resonant network with an input terminal for receipt of a resonant input voltage from a driver circuit. The driver circuit is configured for alternatingly pulling the resonant input voltage towards the positive and negative DC supply voltages via first and second semiconductor switches, respectively, separated by intervening dead-time periods in accordance with one or more driver control signals. A dead-time controller is configured to adaptively adjusting the dead-time periods based on the resonant input voltage.

100-Gbps RZ Data Reception in 67-GHz Si-Contacted Germanium Waveguide p-i-n Photodetectors

We demonstrate 100-Gbps silicon-contacted germanium waveguide p-i-n photodetectors integrated on imec's silicon photonics platform. The performance of 14 and 20 μm long devices is compared. The responsivity of the devices is 0.74 and 0.92 A/W at 1550 nm, respectively.
Ratings:

- BFI (2017): BFI-level 2
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 3.87 SJR 1.233 SNIP 1.881
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 1.689 SNIP 1.955 CiteScore 4.15
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 1.801 SNIP 2.423 CiteScore 4.23
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 1.533 SNIP 2.341 CiteScore 4.03
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 1.711 SNIP 2.335 CiteScore 3.21
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 1.605 SNIP 2.758 CiteScore 3.2
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 2
- Scopus rating (2010): SJR 1.802 SNIP 2.411
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 2.312 SNIP 2.761
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 2.371 SNIP 2.423
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 2.467 SNIP 2.114
- Web of Science (2007): Indexed yes
- Scopus rating (2006): SJR 2.149 SNIP 2.603
- Web of Science (2006): Indexed yes
- Scopus rating (2005): SJR 2.939 SNIP 3.016
- Web of Science (2005): Indexed yes
- Scopus rating (2004): SJR 2.496 SNIP 2.741
- Web of Science (2004): Indexed yes
- Scopus rating (2003): SJR 2.947 SNIP 2.87
- Web of Science (2003): Indexed yes
- Scopus rating (2002): SJR 3.174 SNIP 2.605
- Web of Science (2002): Indexed yes
- Scopus rating (2001): SJR 3.056 SNIP 2.114
- Web of Science (2001): Indexed yes
- Scopus rating (2000): SJR 2.273 SNIP 1.832
- Web of Science (2000): Indexed yes
- Scopus rating (1999): SJR 2.232 SNIP 1.677

Original language: English

Optical waveguides, Bandwidth, Silicon, PIN photodiodes, Optical pulses, Radio frequency, photodetectors, Germanium, integrated optoelectronics, optical communications

DOIs:
100-Gb/s Transmission Over a 2520-km Integrated MCF System Using Cladding-Pumped Amplifiers

A 10.5-Tb/s optical transmission (15 x 100 Gb/s QPSK channels per core) over 2520 km of multicore fiber is achieved using an integrated multicore transmission link consisting of directly spliced multicore components, such as fan-in/fan-out fiber couplers, a 60-km trench-assisted seven-core hexagonal fiber and cladding-pumped erbium-ytterbium-doped fiber amplifiers.

General information
State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Christian-Albrechts-Universität zu Kiel, University of Southampton, Coriant R&D GmbH, Fujikura Ltd., NTT Corporation
Authors: Castro, C. (Ekstern), Jain, S. (Ekstern), De Man, E. (Ekstern), Jung, Y. (Ekstern), Hayes, J. (Ekstern), Calabro, S. (Ekstern), Pulverer, K. (Ekstern), Bohn, M. (Ekstern), Alam, S. (Ekstern), Richardson, D. J. (Ekstern), Takenaga, K. (Ekstern), Mizuno, T. (Ekstern), Miyamoto, Y. (Ekstern), Morioka, T. (Intern), Rosenkranz, W. (Ekstern)
Number of pages: 4
Pages: 1187-1190
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: IEEE Photonics Technology Letters
Volume: 29
Issue number: 14
ISSN (Print): 1041-1135
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.52 SJR 1.018 SNIP 1.279
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.263 SNIP 1.327 CiteScore 2.62
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.461 SNIP 1.614 CiteScore 2.78
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.487 SNIP 1.547 CiteScore 2.95
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.623 SNIP 1.706 CiteScore 2.46
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.51 SNIP 2.012 CiteScore 2.48
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.474 SNIP 1.623
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.775 SNIP 1.804
We report on a 116 Gb/s on-off keying (OOK), four pulse amplitude modulation (PAM) and 105-Gb/s 8-PAM optical transmitter using an InP-based integrated and packaged externally modulated laser for high-speed optical interconnects with up to 30 dB static extinction ratio and over 100-GHz 3-dB bandwidth with 2 dB ripple. In addition, we study the tradeoff between power penalty and equalizer length to foresee transmission distances with standard single mode fiber.

100 GHz Externally Modulated Laser for Optical Interconnects Applications

We report on a 116 Gb/s on-off keying (OOK), four pulse amplitude modulation (PAM) and 105-Gb/s 8-PAM optical transmitter using an InP-based integrated and packaged externally modulated laser for high-speed optical interconnects with up to 30 dB static extinction ratio and over 100-GHz 3-dB bandwidth with 2 dB ripple. In addition, we study the tradeoff between power penalty and equalizer length to foresee transmission distances with standard single mode fiber.
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.689 SNIP 1.955 CiteScore 4.15
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.801 SNIP 2.423 CiteScore 4.23
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.533 SNIP 2.341 CiteScore 4.03
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.711 SNIP 2.335 CiteScore 3.21
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.605 SNIP 2.758 CiteScore 3.2
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.802 SNIP 2.411
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.312 SNIP 2.761
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.371 SNIP 2.423
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.467 SNIP 2.114
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.149 SNIP 2.603
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.939 SNIP 3.016
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.496 SNIP 2.741
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 2.947 SNIP 2.87
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 3.174 SNIP 2.605
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 3.056 SNIP 2.114
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 2.273 SNIP 1.832
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 2.232 SNIP 1.677

Original language: English
Direct detection, Distributed feedback laser (DFB), Electroabsorption modulator, Optical interconnects

Electronic versions:
20170102_invited_v7.pdf
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Bibliographical note
Invited Paper.
Source: FindIt
1.142 μm GaAsBi/GaAs Quantum Well Lasers Grown by Molecular Beam Epitaxy
As a promising new class of near-infrared light emitters, GaAsBi laser diodes (LDs) are considered to have a high energy efficiency and an insensitive temperature dependence of the band gap. In this paper, we realize the longest ever reported lasing wavelength up to 1.142 μm at room temperature in GaAsBi0.058/GaAs quantum well LDs grown by molecular beam epitaxy. The output power is up to 127 mW at 300 K under pulsed mode. We also demonstrate continuous wave mode operation up to 273 K for the first time. The temperature coefficient of the GaAsBi/GaAs LD is 0.26 nm/K in the temperature range of 77-350 K, lower than that of both InGaAsP/InP and InGaAs/GaAs LDs. The characteristic temperature is extracted to be 139 K in the temperature range of 77-225 K and decreases to 79 K at 225-350 K.

General information
State: Published
Organisations: Department of Photonics Engineering, Diode Lasers and LED Systems, Centre of Excellence for Silicon Photonics for Optical Communications, CAS - Shanghai Institute of Microsystem and Information Technology
Authors: Wu, X. (Ekstern), Pan, W. (Ekstern), Zhang, Z. (Ekstern), Li, Y. (Ekstern), Cao, C. (Ekstern), Liu, J. (Ekstern), Zhang, L. (Ekstern), Song, Y. (Ekstern), Ou, H. (Intern), Wang, S. (Ekstern)
Pages: 1322-1326
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: A C S Photonics
Volume: 4
Issue number: 6
ISSN (Print): 2330-4022
Ratings:
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 6.48 SJR 3.516 SNIP 1.996
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 3.069 SNIP 1.616 CiteScore 5.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
Original language: English
GaAsBi, Molecular beam epitaxy, Laser diodes, Quantum well, Uncooled laser
DOIs:
10.1021/acsphotonics.7b00240
Source: FindIt
Source-ID: 2371146791
Publication: Research - peer-review › Journal article – Annual report year: 2017

120 Gb/s Multi-Channel THz Wireless Transmission and THz Receiver Performance Analysis
A photonic multi-channel terahertz (THz) wireless transmission system in the 350-475 GHz band is experimentally demonstrated. The employment of six THz carriers modulated with 10 Gbaud Nyquist quadrature phase-shift keying baseband signal per carrier results in an overall capacity of up to 120 Gb/s. The THz carriers with high-frequency stability and low phase noise are generated based on photonic photomixing of 25-GHz spaced six optical tones and a single optical local oscillator derived from a same optical frequency comb in an ultrabroadband uni-travelling carrier photodiode. The bit-error-rate performance below the hard decision forward error correction threshold of 3.8×10−3 for all the channels is successfully achieved after wireless delivery. Furthermore, we also investigate the influence of the harmonic spurs in a THz receiver on the performance of transmission system, and the experimental results suggest more than 30 dB spur suppression ratio in downconverted intermediate frequency signals for obtaining less than 1 dB interference.

General information
State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Center for Nanostructured Graphene, Ultrafast Infrared and Terahertz
We propose and experimentally demonstrate an on-chip pulse shaper for 125-GHz microwave waveform generation. The pulse shaper is implemented based on a silicon-on-insulator (SOI) platform that has a structure with eight-tap finite impulse response (FIR) and there is an amplitude modulator on each tap. By controlling the thermal heaters on the amplitude modulators, we obtain several signals centered at 125 GHz with typical envelopes, such as square envelope, triangular envelope, sawtooth envelope, Gaussian envelope, etc. Our scheme has some significant advantages, such as the central frequency of the generated microwave waveforms is larger than 100 GHz, and it has wide bandwidth when changing the time delay of the adjacent taps and compactness, capability for integration with electronics and small power consumption are also its merits.

General information
State: Published
Organisations: Department of Photonics Engineering, Nanophotonic Devices, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Huazhong University of Science and Technology
Authors: Liao, S. (Ekstern), Ding, Y. (Intern), Dong, J. (Ekstern), Wang, X. D. (Ekstern), Zhang, X. (Ekstern)
Pages: 2741-2745
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Journal of Lightwave Technology
Volume: 35
Issue number: 13
ISSN (Print): 0733-8724
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.87 SJR 1.233 SNIP 1.881
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.689 SNIP 1.955 CiteScore 4.15
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.801 SNIP 2.423 CiteScore 4.23
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
1,2-Fucosyllactose Does Not Improve Intestinal Function or Prevent Escherichia coli F18 Diarrhea in Newborn Pigs

Objectives: Infectious diarrhea, a leading cause of morbidity and deaths, is less prevalent in breastfed infants compared with infants fed infant formula. The dominant human milk oligosaccharide (HMO), α-1,2-fucosyllactose (2′-FL), has structural homology to bacterial adhesion sites in the intestine and may in part explain the protective effects of human milk. We hypothesized that 2′-FL prevents diarrhea via competitive inhibition of pathogen adhesion in a pig model for sensitive newborn infants. Methods: Intestinal cell studies were coupled with studies on cesarean-delivered newborn pigs (n=24) without (control) or with inoculation of enterotoxigenic Escherichia coli F18 (7.5×10¹⁰/day for 8 days) fed either no (F18) or 10 g/L 2′-FL (2FL-F18). Results: In vitro studies revealed reduced pathogen adhesion to intestinal epithelial cells with 2′-FL (5 g/L; P<0.001). F18 pigs showed more diarrhea than control pigs (P<0.01). Administration of 2′-FL to F18 pigs failed to prevent diarrhea, although the relative weight loss tended to be reduced (~19 vs ~124 g/kg, P=0.12), higher villi were observed in the distal small intestine (P<0.05), and a trend toward increased proportion of mucosa and activities of some brush border enzymes in the proximal small intestine. In situ abundance of α-1,2-fucose and E coli was...
similar between groups, whereas sequencing showed higher abundance of Enterobacteriaceae in F18, Enterococcus in control and Lachnospiraceae in 2FL-F18 pigs. Conclusions: 2′-FL inhibited in vitro adhesion of E coli F18 to epithelial cells, but had limited effects on diarrhea and mucosal health in newborn pigs challenged with E coli F18.

**General information**

**State:** Published

**Organisations:** National Veterinary Institute, University of Copenhagen, Arla Foods

**Authors:** Cilieborg, M. S. (Intern), Sangild, P. T. (Ekstern), Jensen, M. L. (Ekstern), Østergaard, M. V. (Ekstern), Christensen, L. (Ekstern), Rasmussen, S. O. (Ekstern), Mørbak, A. L. (Ekstern), Jrgensen, C. B. (Ekstern), Bering, S. B. (Ekstern)

**Pages:** 310-318

**Publication date:** 2017

**Main Research Area:** Technical/natural sciences

**Publication information**

**Journal:** Journal of Pediatric Gastroenterology and Nutrition

**Volume:** 64

**Issue number:** 2

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**Ratings:**

- BFI (2017): BFI-level 1
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 1
- Scopus rating (2016): SJR 1.24 SNIP 1.297 CiteScore 2.25
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 1
- Scopus rating (2015): SJR 1.261 SNIP 1.258 CiteScore 2.27
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 1
- Scopus rating (2014): SJR 1.242 SNIP 1.321 CiteScore 2.4
- BFI (2013): BFI-level 1
- Scopus rating (2013): SJR 1.297 SNIP 1.352 CiteScore 2.55
- ISI indexed (2013): ISI indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): SJR 0.93 SNIP 1.13 CiteScore 2.31
- ISI indexed (2012): Indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 1
- Scopus rating (2011): SJR 0.938 SNIP 1.194 CiteScore 2.37
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 1
- Scopus rating (2010): SJR 0.809 SNIP 1.02
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 0.826 SNIP 0.979
- BFI (2008): BFI-level 1
- Scopus rating (2008): SJR 0.812 SNIP 1.011
- Scopus rating (2007): SJR 0.738 SNIP 1.019
- Scopus rating (2006): SJR 0.762 SNIP 0.992
- Web of Science (2006): Indexed yes
- Scopus rating (2005): SJR 0.632 SNIP 1.143
- Scopus rating (2004): SJR 0.606 SNIP 0.88
- Scopus rating (2003): SJR 0.592 SNIP 1.057
- Scopus rating (2002): SJR 0.607 SNIP 1.047
- Scopus rating (2001): SJR 0.682 SNIP 1.136
- Scopus rating (2000): SJR 0.551 SNIP 1.039
- Scopus rating (1999): SJR 0.512 SNIP 1.007
12 Mode, MIMO-Free OAM Transmission
Simultaneous MIMO-free transmission of a record number (12) of orbital angular momentum modes over 1.2 km is demonstrated. WDM compatibility of the system is shown by using 60 WDM channels with 25 GHz spacing and 10 Gbaud QPSK.

General information
State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Fiber Optics, Devices and Non-linear Effects, Boston University, Technical University of Denmark, OFS Fitel Denmark ApS, University of Naples Federico II
Authors: Ingerslev, K. (Intern), Gregg, P. (Ekstern), Galili, M. (Intern), Da Ros, F. (Intern), Hu, H. (Intern), Bao, F. (Ekstern), Usuga Castaneda, M. A. (Intern), Kristensen, P. (Ekstern), Rubano, A. (Ekstern), Marrucci, L. (Ekstern), Ramachandran, S. (Ekstern), Rottwit, K. (Intern), Morioka, T. (Intern), Oxenløwe, L. K. (Intern)
Number of pages: 3
Publication date: 2017

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ISBN (Print): 978-1-943580-23-1
Series: 2017 Optical Fiber Communications Conference and Exhibition (ofc)
Main Research Area: Technical/natural sciences
Conference: Optical Fiber Communication Conference 2017, Los Angeles, United States, 19/03/2017 - 19/03/2017
DOIs: 10.1364/OFC.2017.M2D.1

Bibliographical note
From the session: SDM Transmission I (M2D)
Source: FindIt
Source-ID: 2371681549
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

17th International Conference on Petroleum Phase Behavior and Fouling
This special section of Energy & Fuels contains contributed papers from the 17th International Conference on Petroleum Phase Behavior and Fouling (Petrophase 2016). Petrophase 2016 was organized by the Technical University of Denmark and Schlumberger and took place in Elsinore (Helsingør) Denmark from June 19th to 23rd at the Beach Hotel Marienlyst. Petrophase is an international conference aimed at researchers in industry and academia dedicated to the study of the properties and chemistry of petroleum fluids and their effect on producing, processing, and refining in the upstream, midstream, and downstream industries. The conference started in 1999 as “The International Conference on Petroleum Phase Behavior & Fouling” and has since evolved into an annual event taking place in countries all around the world. Petrophase has been fortunate to have enjoyed financial and organizational support from many academic and industrial institutions through the years. Despite its growth over the years, Petrophase has always had the feel of an intimate conference where all participants are present in all of the activities.

General information
State: Published
Organisations: Center for Energy Resources Engineering, Department of Chemical and Biochemical Engineering, CERE – Center for Energy Resources Engineering, Department of Chemistry, Asphalt team
Authors: von Solms, N. (Intern), Yan, W. (Intern), Andersen, S. (Ekstern)
Pages: 3329-3329
Publication date: 2017
Main Research Area: Technical/natural sciences
Der er almindelige og sjældne og næsten usandsynlige stormfloder. Vandstandene i den vestlige Østersø nåede nærmest vanvittige højder under stormfloden den 12.-13. november 1872 og forårsagede oversvømmelser langs mange danske kyster. Selvom det er længe siden, og der gennem tiden er skrevet meget om netop denne stormflod, har den stadig stor betydning. For hvad vil en tilsvarende stormflod have af konsekvenser i dag, og hvor stor er sandsynligheden for, at den indtræffer? Hvis stormflodens sandsynlighed ganges med dens konsekvenser, kan vi tale om en oversvømmelsesrisiko; en risiko, der kan opgøres økonomisk ud fra de skader, den forvolder tillige med fx tab af menneskeliv, som vi ikke i Danmark

General information
State: Published
Organisations: National Space Institute, Geodesy, COWI A/S, COWI AS, Danish Coastal Authority
Authors: Sørensen, C. S. (Intern), Sørensen , P. (Ekstern), Jürgensen, C. (Ekstern), Jørgensen, N. (Ekstern), Jebens, M. (Ekstern), Knudsen, P. (Intern)
Number of pages: 1
Pages: 108
Publication date: 2017

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Title of host publication: 19. Danske Havforskermøde. Program & præsentationer
Main Research Area: Technical/natural sciences
Conference: 19. Danske Havforskermøde, Helsingør, Denmark, 25/01/2017 - 25/01/2017
Electronic versions:
PROGRAM_OG_ABSTRACT_BOG.PDF
Source: PublicationPreSubmission
Source-ID: 128573212
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

1967: Industri

General information
State: Published
Organisations: Department of Physics
Authors: Skyggebjerg, L. K. (Intern)
Publication date: 2017

Host publication information
Title of host publication: Danmark i Europa. 1950-2000
Publisher: Aarhus Universitetsforlag
Editor: Bejder, P.
ISBN (Print): 978 87 7184 251 7
Main Research Area: Technical/natural sciences
Source: PublicationPreSubmission
Source-ID: 128827065
Publication: Education - peer-review › Book chapter – Annual report year: 2017

1.9 W yellow, CW, high-brightness light from a high efficiency semiconductor laser-based system
Semiconductor lasers are ideal sources for efficient electrical-to-optical power conversion and for many applications where their small size and potential for low cost are required to meet market demands. Yellow lasers find use in a variety of bio-related applications, such as photocoagulation, imaging, flow cytometry, and cancer treatment. However, direct generation of yellow light from semiconductors with sufficient beam quality and power has so far eluded researchers. Meanwhile, tapered semiconductor lasers at near-infrared wavelengths have recently become able to provide near-diffraction-limited, single frequency operation with output powers up to 8 W near 1120 nm.

We present a 1.9 W single frequency laser system at 562 nm, based on single pass cascaded frequency doubling of such a tapered laser diode. The laser diode is a monolithic device consisting of two sections: a ridge waveguide with a distributed Bragg reflector, and a tapered amplifier. Using single-pass cascaded frequency doubling in two periodically poled lithium niobate crystals, 1.93 W of diffraction-limited light at 562 nm is generated from 5.8 W continuous-wave infrared light. When turned on from cold, the laser system reaches full power in just 60 seconds. An advantage of using a single pass configuration, rather than an external cavity configuration, is increased stability towards external perturbations. For example, stability to fluctuating case temperature over a 30 K temperature span has been demonstrated. The combination of high stability, compactness and watt-level power range means this technology is of great interest for a wide range of biological and biomedical applications. © (2017) COPYRIGHT Society of Photo-Optical Instrumentation Engineers (SPIE)
In this study an analysis strategy towards using the resonant inelastic X-ray scattering (RIXS) technique more effectively compared with X-ray absorption spectroscopy (XAS) is presented. In particular, the question of when RIXS brings extra information compared with XAS is addressed. To answer this question the RIXS plane is analysed using two models: (i) an exciton model and (ii) a continuum model. The continuum model describes the dipole pre-edge excitations while the exciton model describes the quadrupole excitations. Applying our approach to the experimental 1s2p RIXS planes of VO₂ and TiO₂, it is shown that only in the case of quadrupole excitations being present is additional information gained by RIXS compared with XAS. Combining this knowledge with methods to calculate the dipole contribution in XAS measurements gives scientists the opportunity to plan more effective experiments.
1-Pb/s (32 SDM/46 WDM/768 Gb/s) C-band Dense SDM Transmission over 205.6-km of Single-mode Heterogeneous Multi-core Fiber using 96-Gbaud PDM-16QAM Channels

We demonstrate the first 1-Pb/s unidirectional inline-amplified transmission over 205.6-km of single-mode 32-core fiber within C-band only. 96-Gbaud LDPC-coded PDM-16QAM channels with FEC redundancy of 12.75% realize high-aggregate spectral efficiency of 217.6 b/s/Hz
22q11.2 Deletion Syndrome Is Associated With Impaired Auditory Steady-State Gamma Response

The 22q11.2 deletion syndrome confers a markedly increased risk for schizophrenia. 22q11.2 deletion carriers without manifest psychotic disorder offer the possibility to identify functional abnormalities that precede clinical onset. Since schizophrenia is associated with a reduced cortical gamma response to auditory stimulation at 40 Hz, we hypothesized that the 40 Hz auditory steady-state response (ASSR) may be attenuated in nonpsychotic individuals with a 22q11.2 deletion. Eighteen young nonpsychotic 22q11.2 deletion carriers and a control group of 27 noncarriers with comparable age range (12-25 years) and sex ratio underwent 128-channel EEG. We recorded the cortical ASSR to a 40 Hz train of clicks, given either at a regular inter-stimulus interval of 25 ms or at irregular intervals jittered between 11 and 37 ms. Healthy noncarriers expressed a stable ASSR to regular but not in the irregular 40 Hz click stimulation. Both gamma power and inter-trial phase coherence of the ASSR were markedly reduced in the 22q11.2 deletion group. The ability to phase lock cortical gamma activity to regular auditory 40 Hz stimulation correlated with the individual expression of negative symptoms in deletion carriers (ρ = -0.487, P = .041). Nonpsychotic 22q11.2 deletion carriers lack efficient phase locking of evoked gamma activity to regular 40 Hz auditory stimulation. This abnormality indicates a dysfunction of fast intracortical oscillatory processing in the gamma-band. Since ASSR was attenuated in nonpsychotic deletion carriers, ASSR deficiency may constitute a premorbid risk marker of schizophrenia.
25-Gb/s Transmission Over 2.5-km SSMF by Silicon MRR Enhanced 1.55-μm III-V/SOI DML

The use of a micro-ring resonator (MRR) to enhance the modulation extinction ratio and dispersion tolerance of a directly modulated laser is experimentally investigated with a bit rate of 25 Gb/s as proposed for the next generation data center communications. The investigated system combines a 11-GHz 1.55-μm directly modulated hybrid III-V/SOI DFB laser realized by bonding III-V materials (InGaAlAs) on a silicon-on-insulator (SOI) wafer and a silicon MRR also fabricated on SOI. Such a transmitter enables error-free transmission (BER <10(-9)) at 25 Gb/s data rate over 2.5-km standard single mode fiber without dispersion compensation nor forward error correction. As both laser and MRR are fabricated on the SOI platform, they could be combined into a single device with enhanced performance, thus providing a cost-effective transmitter for short reach applications.

General information
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Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Nanophotonic Devices, Thales, Thales, Lab 3 5, F-91767 Palaiseau, France, Acreo Swedish ICT AB, FOTON Laboratory, III-V Lab, KTH - Royal Institute of Technology
Authors: Cristofori, V. (Intern), Da Ros, F. (Intern), Ozolins, O. (Ekstern), Chaibi, M. E. (Ekstern), Bramerie, L. (Ekstern), Ding, Y. (Intern), Pang, X. (Ekstern), Shen, A. (Ekstern), Gallet, A. (Ekstern), Duan, G. (Ekstern), Hassan, K. (Ekstern), Olivier, S. (Ekstern), Popov, S. (Ekstern), Jacobsen, G. (Ekstern), Oxenløwe, L. K. (Intern), Peucheret, C. (Ekstern)
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Publication date: 2017
Main Research Area: Technical/natural sciences
26-Gb/s DMT Transmission Using Full C-Band Tunable VCSEL for Converged PONs

Wavelength division multiplex (WDM) passive optical network (PON) is considered for converged fixed mobile broadband access networking. We propose to utilize low-cost tunable lasers at the remote sites, together with a centralized wavelength locker. Practical implementations require a transparently added downstream signaling channel and upstream per-channel pilot tones for channel tagging and remote wavelength control. We demonstrate, for the first time, 26-Gbps discrete multitone transmission modulated on a low-cost wide tunable vertical surface emitting laser over up to 40 km of standard single-mode fiber. The results confirm that converged fixed mobile WDM-PON systems based on low-cost lasers carrying discrete multitone modulation are a technically viable approach.
2D Numerical Modelling of the Resin Injection Pultrusion Process Including Experimental Resin Kinetics and Temperature Validation

In the present study, a two-dimensional (2D) transient Eulerian thermo-chemical analysis of a carbon fibre epoxy thermosetting Resin Injection Pultrusion (RIP) process is carried out. The numerical model is implemented using the well known unconditionally stable Alternating Direction Implicit (ADI) scheme. The total heat of reaction and the cure kinetics of the epoxy thermosetting are determined using Differential Scanning Calorimetry (DSC). A very good agreement is observed between the fitted cure kinetic model and the experimental measurements. The numerical steady state temperature predictions inside the composite profile are validated by comparison with experimental measurements and good agreement is found.

General information
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Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Fiberline Composites A/S
Authors: Rasmussen, F. S. (Intern), Sonne, M. R. (Intern), Larsen, M. (Ekstern), Spangenberg, J. (Intern), Lilleheden, L. T. (Ekstern), Hattel, J. H. (Intern)
Number of pages: 10
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2D of hexagonal plasmonic necklaces for enhanced second harmonic generation

Hexagonal plasmonic necklaces of silver nanoparticles organized in 2D superlattices on functional ferroelectric templates are fabricated in large-scale spatial regions by using a surfactant-free photo-deposition process. The plasmonic necklaces support broad radiative plasmonic resonances allowing the enhancement of second harmonic generation (SHG) at the ferroelectric domain boundaries. A 400-fold SHG enhancement is achieved at the near-UV spectral region with subsequent interest for technological applications.

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Organisations: Department of Photonics Engineering, Structured Electromagnetic Materials, Universidad Autónoma de Madrid, Universidad Autonoma de Madrid
Authors: Gómez-Tornero, A. (Ekstern), Tserkezis, C. (Intern), Mateos, L. (Ekstern), Bausá, L. E. (Ekstern), Ramírez, M. O. (Ekstern)
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Scopus rating (2015): CiteScore 18.5
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Web of Science (2014): Indexed yes
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Scopus rating (2013): CiteScore 15.78
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Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 14.41
ISI indexed (2012): ISI indexed yes
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BFI (2009): BFI-level 2
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Web of Science (2007): Indexed yes
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Web of Science (2004): Indexed yes
30-year mesoscale model simulations for the "Noise from wind turbines and risk of cardiovascular disease" project

**General information**
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Organisations: Department of Wind Energy, Meteorology & Remote Sensing, Resource Assessment Modelling
Authors: Pena Diaz, A. (Intern), Hahmann, A. N. (Intern)
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Volume: 0055
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Publication: Research - peer-review › Report – Annual report year: 2017

30 years of data reveal dramatic increase in abundance of brown trout following the removal of a small hydropower dam

Humans and freshwater ecosystems have a long history of cohabitation. Today, nearly all major rivers of the world have an in-stream structure which changes water flow, substrate composition, vegetation, and fish assemblage composition. The realization of these effects and their subsequent impacts on population sustainability and conservation has led to a collective effort aimed to find ways to mitigate these impacts. Barrier removal has recently received greater interest as a potential solution to restore river connectivity, and reestablish high quality habitats, suitable for feeding, refuge and spawning of fish. In the present study, we present thirty years of data from electrofishing surveys obtained at two sites, both prior to and following the removal of a small-scale hydropower dam in Central Jutland, Denmark. We demonstrate that the dam removal has led to a dramatic increase in trout density, especially in young of the year. Surprisingly, we found that this increase was not just upstream of the barrier, where the ponded zone previously was, but also downstream of the barrier, despite little changes in habitat in that area. These findings suggest that barrier removal may be the soundest conservation option to reinstate fish population productivity.
3.400 laks vandrede op i Skjern Å i 2016

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Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology
Authors: Jepsen, N. (Intern)
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http://www.fiskepleje.dk/nyheder/2017/01/laks-i-skjern-aa-2016?id=20643d3e-f9a9-462c-b350-
340nm UV LED excitation in time-resolved fluorescence system for europium-based immunoassays detection

In immunoassay analyzers for in-vitro diagnostics, Xenon flash lamps have been widely used as excitation light sources. Recent advancements in UV LED technology and its advantages over the flash lamps such as smaller footprint, better wall-plug efficiency, narrow emission spectrum, and no significant afterglow, have made them attractive light sources for gated detection systems. In this paper, we report on the implementation of a 340 nm UV LED based time-resolved fluorescence system based on europium chelate as a fluorescent marker. The system performance was tested with the immunoassay based on the cardiac marker, TnI. The same signal-to-noise ratio as for the flash lamp based system was obtained, operating the LED below specified maximum current. The background counts of the system and its main contributors were measured and analyzed. The background of the system of the LED based unit was improved by 39% compared to that of the Xenon flash lamp based unit, due to the LEDs narrower emission spectrum and longer pulse width. Key parameters of the LED system are discussed to further optimize the signal-to-noise ratio and signal-to-background, and hence the sensitivity of the instrument.

3.5 W of diffraction-limited green light at 515 nm from SHG of a single-frequency tapered diode laser

Multi-Watt efficient compact green laser sources are required for a number of applications e.g. within biophotonics, laser pumping and laser displays. We present generation of 3.5 W of diffraction-limited green light at 515 nm by second harmonic generation (SHG) of a tapered diode laser, itself yielding more than 9 W at 1030 nm. SHG is performed in single pass through a cascade of two nonlinear crystals with re-focusing and dispersion compensating optics between the two nonlinear crystals. The laser is single-frequency and the output power is stabilized to better than ±0.4%.
3D continuum phonon model for group-IV 2D materials

A general three-dimensional continuum model of phonons in two-dimensional materials is developed. Our first-principles derivation includes full consideration of the lattice anisotropy and flexural modes perpendicular to the layers and can thus be applied to any two-dimensional material. In this paper, we use the model to not only compare the phonon spectra among the group-IV materials but also to study whether these phonons differ from those of a compound material such as molybdenum disulfide. The origin of quadratic modes is clarified. Mode coupling for both graphene and silicene is obtained, contrary to previous works. Our model allows us to predict the existence of confined optical phonon modes for the group-IV materials but not for molybdenum disulfide. A comparison of the long-wavelength modes to density-functional results is included.
Drilling is an indispensable process for many manufacturing industries due to its importance for assembling components. This study presents a 3D finite element modeling (3D FEM) approach for drilling process of aluminum 2024-T3. The 3D model of drilling tools for two facet HSSCo and four facet HSS were generated including their geometries. The simulations were carried out for both drills under different cutting conditions. The numerically obtained thrust forces were compared against experimental results. The tool stress distribution, chip formation and temperature distribution in the chip area were determined numerically. The results confirm the ability and advantage of 3D FE modelling of the drilling process.
3D Finite Element Simulation of Micro End-Milling by Considering the Effect of Tool Run-Out

Understanding the micro milling phenomena involved in the process is critical and difficult through physical experiments. This study presents a 3D finite element modeling (3D FEM) approach for the micro end-milling process on Al6082-T6. The proposed model employs a Lagrangian explicit finite element formulation to perform coupled thermo-mechanical transient analyses. FE simulations were performed at different cutting conditions to obtain realistic numerical predictions of chip formation, temperature distribution, and cutting forces by considering the effect of tool run-out in the model. The radial run-out is a significant issue in micro milling processes and influences the cutting Stability due to chip load and force variations. The Johnson–Cook (JC) material constitutive model was applied and its constants were determined by an inverse method based on the experimental cutting forces acquired during the micro end-milling tests. The FE model prediction capability was validated by comparing the numerical model results with experimental tests. The maximum tool temperature was predicted in a different angular position of the cutter which is difficult or impossible to obtain in experiments. The predicted results of the model, involving the run-out influence, showed a good correlation with experimental chip formation and the signal shape of cutting forces.

3-D Imaging using Row–Column-Addressed 2-D Arrays with a Diverging Lens: Phantom Study

A double-curved diverging lens over a flat row–column-addressed (RCA) 2-D array can extend its inherent rectilinear 3-D imaging field-of-view (FOV) to a curvilinear volume region, which is necessary for applications such as abdominal and cardiac imaging. A concave lens with radius of 12.7 mm was manufactured using RTV664 silicone. The diverging properties of the lens were evaluated based on measurements on several phantoms. The measured 6 dB FOV in contact with a material similar to human soft tissue was less than 15% different from the theoretical predictions, i.e., a curvilinear FOV of 32°×32°. A synthetic aperture imaging sequence with single element transmissions was designed for imaging
down to 14 cm at a volume rate of 88 Hz. The performance was evaluated in terms of signal-to-noise ratio (SNR), FOV, and full-width-at-half-maximum (FWHM). The penetration depth in a tissue mimicking phantom with 0.5 dB/(cm MHz) attenuation was 13 cm. The results of this study confirm that the proposed lens approach is an effective method for increasing the FOV, when imaging with RCA 2-D arrays.

3D Printing of Bio-inspired surfaces
The ability of the gecko to scurry across smooth or rough surfaces, regardless of inclination (vertical or even upside down), has been traced to the multiscale hierarchical structures of the gecko toe [1 - 3]. Considering all the strategies to manufacture bio-inspired surfaces, the most common is polymer replica molding (REM) [4]. This project will further study the influence of pillar size, shape, aspect ratio, tilting angle and levels of hierarchies in terms of wettability and adhesion, using a cost effective rapid prototyping method with direct light processing (DLP). The aim of this project will be to seek the feasibility to rapid prototype gecko surface geometries. Furthermore, a micromanufacturing method is proposed using DLP and a mask.

3D protein-structure-oriented discovery of clinical relation across chronic lymphocytic leukemia patients
Chronic lymphocytic leukemia (CLL) is the most common adult leukemia with still unclear etiology. Indications of antigenic pressure have been hinted, using sequence and structure-based reasoning. The accuracy of such approaches, and in particular of the ones derived from 3D models obtained from the patient's antibody amino acid sequences, is intimately connected to both the reliability of the models and the quality of the methods used to compare and group them. The proposed work provides a sophisticated method for the classification of CLL patients based on clustering the amino acid sequences of the clonotypic B-cell receptor immunoglobulin, which is the ideal clone-specific marker, critical for clonal behavior and patient outcome. A novel CLL patient clustering method is hereby proposed, combining bioinformatics methods with the extraction of 3D object descriptors, used in machine learning applications. The proposed methodology achieved an efficient and highly informative grouping of CLL patients in accordance to their biological and clinical properties.
4D Study of Grain Growth in Armco Iron Using Laboratory X-ray Diffraction Contrast Tomography: Paper

Using a novel laboratory diffraction contrast tomography (LabDCT) technique, a non-destructive 4D study was conducted to investigate the evolution in 3D of the grain structure during grain growth in an Armco iron sample. The 3D grain morphology and the crystallographic orientations of more than 300 grains were determined at three temporal states during annealing. The correlation between growth of grains and grain orientation is explored. The results demonstrate the capability of the LabDCT technique to allow detailed studies of grain growth, and thereby provide the necessary 4D experimental evidence required for further understanding of grain growth.
**4-PAM Dispersion-Uncompensated Transmission with Micro-Ring Resonator Enhanced 1.55-µm DML**

Real-time transmission of 14-GBd 4-PAM signal is demonstrated by combining a commercial 1.55-µm DML with a silicon MRR. BER below the HD-FEC threshold is measured after 26-km SSMF transmission without offline digital signal processing.

**General information**

State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Acreo Swedish ICT AB, FOTON Laboratory, KTH - Royal Institute of Technology
Authors: Da Ros, F. (Intern), Cristofori, V. (Intern), Ozolins, O. (Ekstern), Chaibi, M. E. (Ekstern), Pang, X. (Ekstern), Jacobsen, G. (Ekstern), Popov, S. (Ekstern), Gallii, M. (Intern), Oxenløwe, L. K. (Intern), Peucheret, C. (Ekstern)
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**62 years of population dynamics of European perch (Perca fluviatilis) in a mesotrophic lake tracked using angler diaries: The role of commercial fishing, predation and temperature**

Standardised angler diaries could produce useful proxy data for assessing fish population density and size distribution, but few rigorous studies about their utility exist. We use 62 years of angling diary data (1949–2010), from a large mesotrophic lake, to investigate population structure (abundance, mean size and record size) of European perch (Perca fluviatilis L.) in relation to the impact of three commercial fishers with different fishing strategies, pike (Esox lucius L.) predation and temperature. We found that anglers' harvest rates of perch varied by a factor of 10 over time, indicating large variation in population abundance over decadal time scales. Our statistical analysis revealed that the anglers' harvest rates of perch were related to pike CPUE (proxy of pike predation), temperature and commercial fishing directly through the harvest of perch and indirectly through the harvest of pike, the top predator of the lake. The size distribution and growth rates of perch caught by anglers also changed substantially during the study period, most likely controlled by density-dependent mechanisms as well as size-selective commercial harvest. The effect of selective harvest on size-structure was stronger than ecological density dependence. We conclude that commercial harvesting may exert strong impacts on the quality of the angling experiences, at least in the studied case. Moreover, our work showcases the value of detailed angler diaries to study and monitor changes in freshwater fish populations, but it also underlines the need for supplementary data on biotic and abiotic factors to reach the full potential of angler diary data.

**General information**

State: Published
Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, Section for Oceans and Arctic, Humboldt-Universität zu Berlin
Authors: Skov, C. (Intern), Jansen, T. (Intern), Arlinghaus, R. (Ekstern)
Pages: 71-79
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Main Research Area: Technical/natural sciences
700 kg jern med de smukkeste krystaller

General information
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Organisations: National Space Institute, Innovation and Research-based consultancy
Authors: Pedersen, J. O. P. (Intern)
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ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: English
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700 kilo jern
Nedslag. Historien om krasnojarsk-meteoritten, der blev fundet for over 250 år siden i Sibirien, skal sandsynligvis skrives om. Det kan betyde, at der stadig er kostbare meteoritstykker at finde.

General information
State: Published
Organisations: National Space Institute, Innovation and Research-based consultancy
Authors: Pedersen, J. O. P. (Intern)
Number of pages: 1
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Main Research Area: Technical/natural sciences
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A 1D version of EllipSys
A one-dimensional version of EllipSys, labeled as EllipSys1D is presented. Three atmospheric boundary layer test cases are used to show that results of EllipSys1D are exactly the same or very similar as results of EllipSys3D, while EllipSys1D uses 3 to 4 orders of magnitude less CPU hours compared to EllipSys3D.

General information
State: Published
Organisations: Department of Wind Energy, Aerodynamic design
Authors: van der Laan, P. (Intern), Sørensen, N. N. (Intern)
A 3D human co-culture microtissue model for nanoparticle effect and uptake studies at the placental barrier

General information
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Organisations: National Food Institute, Research Group for Nano-Bio Science, Swiss Federal Laboratories for Materials Testing and Research, Swiss Federal Laboratories for Materials Science and Technology (Empa), University College Dublin, Karolinska Institutet, Cantonal Hospital St. Gallen
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BOOK_OF_ABSTRACTS
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

A 3-D numerical model of the influence of meanders on groundwater discharge to a gaining stream in an unconfined sandy aquifer

Groundwater discharge to streams depends on stream morphology and groundwater flow direction, but are not always well understood. Here a 3-D groundwater flow model is employed to investigate the impact of meandering stream geometries on groundwater discharge to streams in an unconfined and homogenous sandy aquifer at the reach scale (10–200 m). The effect of meander geometry was examined by considering three scenarios with varying stream sinuosity. The interaction with regional groundwater flow was examined for each scenario by considering three groundwater flow directions. The sensitivity of stream morphology and flow direction to other parameters was quantified by varying the stream width, the meander amplitude, the magnitude of the hydraulic gradient, the hydraulic conductivity, and the aquifer thickness. Implications for a real stream were then investigated by simulating groundwater flow to a stream at a field site located in Grindsted, Denmark. The simulation of multiple scenarios was made possible by the employment of a computationally efficient coordinate transform numerical method. Comparison of the scenarios showed that the geometry of meanders greatly affect the spatial distribution of groundwater flow to streams. The shallow part of the aquifer discharges to the outward pointing meanders, while deeper groundwater flows beneath the stream and enters from the opposite side. The balance between these two types of flow depends on the aquifer thickness and meander geometry. Regional groundwater flow can combine with the effect of stream meanders and can either enhance or smooth the effect of a meander bend, depending on the regional flow direction. Results from the Grindsted site model showed that real meander geometries had similar effects to those observed for the simpler sinuous streams, and showed that despite large temporal variations in stream discharge, the spatial pattern of flow is almost constant in time for a gaining stream.

General information
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Organisations: Department of Environmental Engineering, Water Resources Engineering, Office for Study Programmes and Student Affairs, Technical University of Denmark, University of Bergen
Authors: Balbarini, N. (Intern), Boon, W. M. (Ekstern), Nicolajsen, E. (Ekstern), Nordbotten, J. M. (Ekstern), Bjerg, P. L. (Intern), Binning, P. J. (Intern)
Abaqus2Matlab: A suitable tool for finite element post-processing

A suitable piece of software is presented to connect Abaqus, a sophisticated finite element package, with Matlab, the most comprehensive program for mathematical analysis. This interface between these well-known codes not only benefits from the image processing and the integrated graph-plotting features of Matlab but also opens up new opportunities in results post-processing, statistical analysis and mathematical optimization, among many other possibilities. The software architecture and usage are appropriately described and two problems of particular engineering significance are addressed to demonstrate its capabilities. Firstly, the software is employed to assess cleavage fracture through a novel 3-parameter Weibull probabilistic framework. Then, its potential to create and train neural networks is used to identify damage parameters through a hybrid experimental–numerical scheme, and model crack propagation in structural materials by means of a cohesive zone approach. The source code, detailed documentation and a large number of tutorials can be freely downloaded from www.abaqus2matlab.com.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics, National Technical University of Athens, Universidad de Oviedo
Authors: Papazafeiropoulos, G. (Ekstern), Muñiz-Calvente, M. (Ekstern), Martínez Pañeda, E. (Intern)
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Scopus rating (2015): SJR 0.771 SNIP 1.936 CiteScore 2.54
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.759 SNIP 1.858 CiteScore 2.13
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.818 SNIP 2.025 CiteScore 2.19
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.757 SNIP 2.074 CiteScore 1.92
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.745 SNIP 1.872 CiteScore 1.82
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.57 SNIP 1.466
A bayesian inference-based detection mechanism to defend medical smartphone networks against insider attacks

With the increasing digitization of the healthcare industry, a wide range of devices (including traditionally non-networked medical devices) are Internet- and inter-connected. Mobile devices (e.g. smartphones) are one common device used in the healthcare industry to improve the quality of service and experience for both patients and healthcare workers, and the underlying network architecture to support such devices is also referred to as medical smartphone networks (MSNs). MSNs, similar to other networks, are subject to a wide range of attacks (e.g. leakage of sensitive patient information by a malicious insider). In this work, we focus on MSNs and present a compact but efficient trust-based approach using Bayesian inference to identify malicious nodes in such an environment. We then demonstrate the effectiveness of our approach in detecting malicious nodes by evaluating the deployment of our proposed approach in a real-world environment with two healthcare organizations.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Cyber Security, City University of Hong Kong, Deakin University, University of Texas at San Antonio
Authors: Meng, W. (Intern), Li, W. (Ekstern), Xiang, Y. (Ekstern), Choo, K. K. R. (Ekstern)
Pages: 162-169
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Main Research Area: Technical/natural sciences

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Volume: 78
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BFI (2018): BFI-level 1
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.807 SNIP 2.509 CiteScore 4.42
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.831 SNIP 2.817 CiteScore 3.98
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.936 SNIP 3.08 CiteScore 3.82
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.757 SNIP 2.859 CiteScore 3.21
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.59 SNIP 2.14 CiteScore 2.48
A Bilevel Model for Participation of a Storage System in Energy and Reserve Markets

We develop a decision-making tool based on a bilevel complementarity model for a merchant price-maker energy storage system to determine the most beneficial trading actions in pool-based markets, including day-ahead (as joint energy and reserve markets) and balancing settlements. The uncertainty of net load deviation in real-time is incorporated into the model using a set of scenarios generated from the available forecast in the day-ahead. The objective of this energy storage system is to maximize its expected profit. The day-ahead products of energy storage system include energy as well as reserve commitment (as one of the ancillary services), whereas its balancing product is the energy deployed from the committed reserve. The proposed model captures the interactions of different markets and their impacts on the functioning of the storage system. It also provides an insight for storage system into clearing process of multiple markets and enables such a facility to possibly affect the outcomes of those markets to its own benefit through strategic price and quantity offers. The validity of the proposed approach is evaluated using a numerical study.
Ab Initio Assessment of the Bonding in Disulfonates Containing Divalent Nitrogen and Phosphorus Atoms

The iminodisulfonate, $[\text{N(SO}_3\text{)}_2]^{3-}$, and phosphinodisulfonate, $[\text{P(SO}_3\text{)}_2]^{3-}$, ions have been investigated by performing ab initio MP2/6-311+G** calculations. The nitrogen and phosphorus atoms as part of the ions are shown to be divalent with a negative charge and two lone pairs on the nitrogen and phosphorus atoms. The experimentally known calcium sodium iminodisulfonate trihydrate and the analogous unknown compound calcium sodium phosphinodisulfonate trihydrate have also been investigated using the MP2/6-311+G** calculations. For the nitrogen compound, only minor changes occur in the iminodisulfonate ion when it becomes part of the calcium sodium iminodisulfonate trihydrate. For the phosphorus compound, the geometry of the phosphinodisulfonate ion changes significantly as part of calcium sodium phosphinodisulfonate trihydrate. Furthermore, the charges associated with the atoms in calcium sodium phosphinodisulfonate trihydrate are quite different from those of the phosphinodisulfonate ion. For calcium sodium iminodisulfonate trihydrate, the Raman spectrum has been measured, and it compares well with the spectrum derived using HF/6-311+G** calculations.

General information
State: Published
Organisations: Physical and Biophysical Chemistry, Department of Chemistry
Authors: Andersen, V. B. (Intern), Berg, R. W. (Intern), Shim, I. (Intern)
Pages: 4447-4455
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Main Research Area: Technical/natural sciences

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Journal: A C S Omega
Volume: 2
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Original language: English
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Electronic versions:
acsomega.7b00266.pdf
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This is an open access article published under an ACS AuthorChoice License.
Abortion and mortality in farm mink (Neovison vison) associated with feed-born Clostridium limosum

Disease in mink clinically characterized by abortion and increased mortality among pregnant female mink on 28 Danish farms was observed during April and May 2015. Most of these farms suffered extensive disease problems, including a significant increase in the number of mated females without litters. Pathological, microbiological and molecular biological methods were applied to investigate the cause of disease. Necropsies of animals found dead revealed fragile and partially dissolved (liquefying) uterine tissue, with the presence of Gram positive rod-shaped bacteria. These slow growing bacteria were isolated by anaerobic culturing and identified as Clostridium limosum by both MALDI-TOF mass spectrometry analysis and 16S rRNA gene sequencing. All the performed tests for relevant differential diagnoses were negative. Foodborne disease was indicated because all the affected farms were served by the same feed factory. A specific PCR-based analysis was developed for positive identification of C. limosum and used to screen archived feed samples from the implicated feed factory. Both C. limosum 16S rRNA genes and C. limosum collagenase genes were identified in both mixed feed and more specifically in raw chicken carcass used as one of the components in the mixed feed, which was therefore identified as the most likely source of contamination. Based on the results of this investigation it is concluded that C. limosum can be associated with abortion and increased mortality in pregnant mink females and it is consequently recommended that raw materials contaminated with C. limosum should be avoided in mink feed, in particular during the whelping season.

General information

State: Published
Organisations: National Food Institute, Research Group for Gut Microbiology and Immunology, University of Copenhagen, Kopenhagen Consulting, Bindslev Animal Hospital
Authors: Hammer, A. S. (Ekstern), Andresen, L. (Ekstern), Aalbaek, B. (Ekstern), Damborg, P. (Ekstern), Weiss, V. (Ekstern), Christiansen, M. L. (Ekstern), Selsing, S. (Ekstern), Bahl, M. I. (Intern)
Number of pages: 5
Pages: 229-233
Publication date: 2017
Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.65 SJR 1.326 SNIP 1.208
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.393 SNIP 1.21 CiteScore 2.56
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.281 SNIP 1.262 CiteScore 2.54
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.438 SNIP 1.484 CiteScore 3
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.437 SNIP 1.579 CiteScore 3.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.562 SNIP 1.738 CiteScore 3.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
To reach the UN sustainable development goal, there is a need for comprehensive and robust tools to help decision-making identify the solutions that best support sustainable development. The decisions must have a system perspective, consider the life cycle, and all relevant impacts caused by the solution. Life Cycle Assessment (LCA) is a tool that has these characteristics and the ambition with this book is to offer a comprehensive and up-to-date introduction to the tool and its underlying methodological considerations and potential applications. The book consists of five parts. The first part introduces LCA. The second part is a text book aiming at university students from undergraduate to PhD level, and professionals from industry and within policy making. It follows ISO 14040/14044 structure, draws upon a variety of LCA methods published over the years, especially the ILCD, and offers prescriptions and recommendations for all the most important methodological choices that you meet when performing an LCA. The third part introduces applications of LCA and life cycle thinking by policy- and decision-makers in government and industry. The fourth part is a Cookbook guiding you through the concrete actions to undertake when performing an LCA. The fifth part contains some appendices. The book can be used as a text book, the chapter can be read as stand alone, and you can use the Cookbook as a manual on how to perform an LCA.
A Branch-and-Price algorithm for railway rolling stock rescheduling

How to best reschedule their fleet of rolling stock units during a disruption is an optimization problem regularly faced by railway operators. Despite the problem's high complexity, it is still usually solved manually. In this paper we propose a path based mathematical formulation and solve it using a Branch-and-Price algorithm. We demonstrate that, unlike flow based approaches, our formulation is more easily extended to handle certain families of constraints, such as train unit maintenance restrictions. The proposed algorithm is benchmarked on several real-life instances provided by the suburban railway operator in Copenhagen, DSB S-tog. When used in combination with a lower bound method taken from the literature we show that near-optimal solutions to this rescheduling problem can be found within a few seconds. Furthermore, we show that the proposed methodology can be used, with minor modification, on a tactical planning level, where it produces near-optimal rolling stock schedules in minutes of CPU time.
A Branch-and-Price Approach to the Feeder Network Design Problem

In this paper we consider the problem of designing a container liner shipping feeder network. The designer has to choose which port to serve during many rotations that start and end at a central hub. Many operational characteristics are considered, such as variable leg-by-leg speeds and cargo transit times. Realistic instances are generated from the LinerLib benchmark suite. The problem is solved with a branch-and-price algorithm, which can solve most instances to optimality within one hour. The results also provide insights on the cost structure and desirable features of optimal routes. These insights were obtained by means of an analysis where scenarios are generated varying internal and external conditions, such as fuel costs and port demands.

General information
State: Published
Organisations: Department of Management Engineering, Management Science, Operations Research, Transport DTU, RWTH Aachen University, Maersk Line
Authors: Santini, A. (Ekstern), Plum, C. E. M. (Ekstern), Røpke, S. (Intern)
Pages: 607–622
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Main Research Area: Technical/natural sciences

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Volume: 264
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Ratings:
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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 3.83 SJR 2.505 SNIP 2.339
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.334 SNIP 2.412 CiteScore 3.59
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
A brief comparison of Simon and Simeck

SIMECK is a new lightweight block cipher design based on combining the design principles of the SIMON and Speck block cipher. While the design allows a smaller and more efficient hardware implementation, its security margins are not well understood. The lack of design rationals of its predecessors further leaves some uncertainty on the security of SIMECK. In this work we give a short analysis of the impact of the design changes by comparing the upper bounds on the probability of differential and linear trails with SIMON. We also give a comparison of the effort of finding those bounds, which surprisingly is significantly lower for SIMECK while covering a larger number of rounds at the same time. Furthermore, we provide new differentials for SIMECK which can cover more rounds compared to previous results on SIMON and study how to choose good differentials for attacks and show that one can find better differentials by building them from a larger set of trail with initially lower probability. We also provide experimental results for the differentials for SIMON32 and SIMECK32 which show that there exist keys for which the probability of the differential is significantly higher than expected. Based on this we mount key recovery attacks on 19/26/33 rounds of SIMECK32/48/64, which also give insights on the reduced key guessing effort due to the different set of rotation constants.

General information
State: Published
A broad range quorum sensing inhibitor working through sRNA inhibition
For the last decade, chemical control of bacterial virulence has received considerable attention. Ajoene, a sulfur-rich molecule from garlic has been shown to reduce expression of key quorum sensing regulated virulence factors in the opportunistic pathogen Pseudomonas aeruginosa. Here we show that the repressing effect of ajoene on quorum sensing occurs by inhibition of small regulatory RNAs (sRNA) in P. aeruginosa as well as in Staphylococcus aureus, another important human pathogen that employs quorum sensing to control virulence gene expression. Using various reporter constructs, we found that ajoene lowered expression of the sRNAs RsmY and RsmZ in P. aeruginosa and the small dual-function regulatory RNA, RNAIII in S. aureus, that controls expression of key virulence factors. We confirmed the modulation of RNAIII by RNA sequencing and found that the expression of many QS regulated genes encoding virulence factors such as hemolysins and proteases were lowered in the presence of ajoene in S. aureus. Importantly, our findings show that sRNAs across bacterial species potentially may qualify as targets of anti-virulence therapy and that ajoene could be a lead structure in search of broad-spectrum compounds transcending the Gram negative-positive borderline.

General information
State: Published
Organisations: Department of Chemistry, Organic Chemistry, University of Copenhagen, Imperial College London, Statens Serum Institut
Authors: Jakobsen, T. H. (Ekstern), Warming, A. N. (Ekstern), Vejborg, R. M. (Ekstern), Moscoso, J. A. (Ekstern), Stegger, M. (Ekstern), Lorenzen, F. (Ekstern), Rybtke, M. T. (Ekstern), Andersen, J. B. (Ekstern), Petersen, R. (Intern), Andersen, P. S. (Ekstern), Nielsen, T. E. (Intern), Tolker-Nielsen, T. (Ekstern), Filloux, A. (Ekstern), Ingmer, H. (Ekstern), Givskov, M. (Ekstern)
Pages: 9857
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.63 SJR 1.625 SNIP 1.401
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.057 SNIP 1.684 CiteScore 5.3
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.103 SNIP 1.544 CiteScore 4.75
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.886 SNIP 1.51 CiteScore 4.06
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.458 SNIP 0.896 CiteScore 2.44
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
ISI indexed (2011): ISI indexed no
Original language: English
Microbiology, Pathogenesis
Electronic versions:
s41598_017_09886_8.pdf
A brute-force spectral approach for wave estimation using measured vessel responses

The article introduces a spectral procedure for sea state estimation based on measurements of motion responses of a ship in a short-crested seaway. The procedure relies fundamentally on the wave buoy analogy, but the wave spectrum estimate is obtained in a direct - brute-force - approach, and the procedure is simple in its mathematical formulation. The actual formulation is extending another recent work by including vessel advance speed and short-crested seas. Due to its simplicity, the procedure is computationally efficient, providing wave spectrum estimates in the order of a few seconds, and the estimation procedure will therefore be appealing to applications related to real-time, onboard control and decision support systems for safe and efficient marine operations. The procedure's performance is evaluated by use of numerical simulation of motion measurements, and it is shown that accurate wave spectrum estimates can be obtained for all wave directions in short-crested waves, taking the wave system to be composed by both wind generated sea and swell.
Absolute Quantification of Protein and mRNA Abundances Demonstrate Variability in Gene-Specific Translation Efficiency in Yeast

Protein synthesis is the most energy-consuming process in a proliferating cell, and understanding what controls protein abundances represents a key question in biology and biotechnology. We quantified absolute abundances of 5,354 mRNAs and 2,198 proteins in Saccharomyces cerevisiae under ten environmental conditions and protein turnover for 1,384 proteins under a reference condition. The overall correlation between mRNA and protein abundances across all conditions was low (0.46), but for differentially expressed proteins (n = 202), the median mRNA-protein correlation was 0.88. We used these data to model translation efficiencies and found that they vary more than 400-fold between genes. Non-linear regression analysis detected that mRNA abundance and translation elongation were the dominant factors controlling protein synthesis, explaining 61% and 15% of its variance. Metabolic flux balance analysis further showed that only mitochondrial fluxes were positively associated with changes at the transcript level. The present dataset represents a crucial expansion to the current resources for future studies on yeast physiology.

General information
State: Accepted/In press
Organisations: Novo Nordisk Foundation Center for Biosustainability, Yeast Cell Factories, Chalmers University of Technology, University of Tartu
Authors: Lahtvee, P. (Ekstern), Sanchez, B. J. (Ekstern), Smialowska, A. (Ekstern), Kasvandik, S. (Ekstern), Elseman, I. (Intern), Gatto, F. (Ekstern), Nielsen, J. (Intern)
Number of pages: 16
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Journal: Cell Systems
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Source: PublicationPreSubmission
Source-ID: 130946802
Absorbed dose, equivalent dose, measured dose rates, and implications for OSL age estimates: Introducing the Average Dose Model

Luminescence ages are calculated by dividing an absorbed dose by the dose rate to which the natural dosimeter has been exposed. In practice, one measures an equivalent dose, De; in the absence of an alpha dose contribution, this should be indistinguishable from the dose absorbed in nature. Here we first review the relationship between absorbed dose, equivalent dose and dose rate, and the measurements that lead to their estimation; we restate that, in contrast to recent suggestions, an equivalent dose is not a physically different quantity from a beta or gamma dose absorbed by quartz grains. Statistical analysis of OSL data is of great importance when dealing with single grain data, since such data commonly exhibit significant scatter. However, dose rate measurements provide an arithmetic mean of dose rates absorbed by individual grains; in this article, we propose a new model to estimate the average dose absorbed by the grains. We thus introduce a new model for OSL age estimates: the Average Dose Model (ADM). We argue that ADM ages should be more accurate than Central Age Model (CAM) based ages, and we provide experimental evidence supporting this expectation. We also argue that the use of the Finite Mixture Model should be avoided. Finally, we discuss the implications for multi-grain age estimates derived from well-bleached samples.

General information
State: Accepted/In press
Organisations: Center for Nuclear Technologies, Radiation Physics, Université Bordeaux Montaigne, Universite de Nantes, Aarhus University
Authors: Guerin, G. (Ekstern), Christophe, C. (Ekstern), Philippe, A. (Ekstern), Murray, A. S. (Ekstern), Thomsen, K. J. (Intern), Tribolo, C. (Ekstern), Urbanova, P. (Ekstern), Jain, M. (Intern), Guibert, P. (Ekstern), Mercier, N. (Ekstern), Kreutzer, S. (Ekstern), Lahaye, C. (Ekstern)
Number of pages: 11
Publication date: 2017
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Journal: Quaternary Geochronology
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.3 SJR 1.703 SNIP 0.949
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.067 SNIP 1.336 CiteScore 3.22
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.941 SNIP 1.227 CiteScore 2.86
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.439 SNIP 1.354 CiteScore 2.89
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.742 SNIP 1.865 CiteScore 3.77
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.493 SNIP 1.57 CiteScore 3.29
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.472 SNIP 1.651
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.939 SNIP 1.274
Absorption enhancement in graphene with an efficient resonator

Graphene can be utilized in designing tunable terahertz (THz) devices due to its tunability of sheet conductivity, suffering however with weak light-graphene interactions. In this paper, an absorption enhancement in graphene using a Fabry–Perot resonator is presented, and its performance has been numerically investigated using finite element method. The Fabry–Perot resonator consists of a continuous layer of graphene film sandwiched between the polymethyl methacrylate and silicon layers on an Au substrate which is covered by periodic gold ribbons. Numerical results show that the absorption performance is significantly enhanced by use of the Fabry–Perot resonator and a narrow band perfect absorption is achieved in THz regime. The influence of structural parameters on the absorption performance is further analyzed, and the absorption peak frequency can be flexibly controlled by adjusting the chemical potential of graphene which could be conveniently achieved by applying a bias voltage. The proposed structure here has a promising potential for developing advanced THz optics-electronics devices.

General information
State: Published
Organisations: Department of Photonics Engineering, Structured Electromagnetic Materials, China Jiliang University
Authors: Xiao, B. (Ekstern), Gu, M. (Ekstern), Qin, K. (Ekstern), Xiao, S. (Intern)
Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
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Scopus rating (2016): CiteScore 1.02 SJR 0.321 SNIP 0.629
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.392 SNIP 0.668 CiteScore 1.05
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.373 SNIP 0.591 CiteScore 0.98
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.547 SNIP 0.861 CiteScore 1.29
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.473 SNIP 0.787 CiteScore 0.95
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.463 SNIP 0.617 CiteScore 0.77
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Acanthoecid choanoflagellates from the Atlantic Arctic Region - a baseline study

The examination and statistical analysis of loricate choanoflagellate material collected from Greenland waters during the period 1988-1998 represents a de facto baseline study of heterotrophic nanoflagellates from the Atlantic Arctic Region. The geographic sites sampled are Disko Bay (West Greenland) and the high-arctic North-East Water (NEW) and North Water (NOW) polynya. The analyses encompass close to 50 taxa. Some of these are described as new species, i.e. Acanthocorbis glacialis, A. reticulata and Diaphanoeca dilatanda. Two distinct clusters of species that are separated in time and space occur at all three sampling sites. A PCA analysis of NEW and NOW data points to that one community is linked to e.g. an early season high nutrient and low phytoplankton biomass scenario, whereas the other is predominant when nutrient levels are exhausted and the phytoplankton biomass high or declining. The material additionally allows for a comprehensive examination of e.g. the Cosmoeca ventricosa morphological variability encountered, as well as puts on record bimodal size variability within a number of species.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Oceans and Arctic
Authors: Thomsen, H. A. (Intern), Østergaard, J. B. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

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Volume: 3
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ISSN (Print): 2405-8440
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Original language: English
Ecology, Microbiology
Electronic versions:
Publishers version
A Cas9-based toolkit to program gene expression in *Saccharomyces cerevisiae*

Despite the extensive use of *Saccharomyces cerevisiae* as a platform for synthetic biology, strain engineering remains slow and laborious. Here, we employ CRISPR/Cas9 technology to build a cloning-free toolkit that addresses commonly encountered obstacles in metabolic engineering, including chromosomal integration locus and promoter selection, as well as protein localization and solubility. The toolkit includes 23 Cas9-sgRNA plasmids, 37 promoters of various strengths and temporal expression profiles, and 10 protein-localization, degradation and solubility tags. We facilitated the use of these parts via a web-based tool, that automates the generation of DNA fragments for integration. Our system builds upon existing gene editing methods in the thoroughness with which the parts are standardized and characterized, the types and number of parts available and the ease with which our methodology can be used to perform genetic edits in yeast. We demonstrated the applicability of this toolkit by optimizing the expression of a challenging but industrially important enzyme, taxadiene synthase (TXS). This approach enabled us to diagnose an issue with TXS solubility, the resolution of which yielded a 25-fold improvement in taxadiene production.

**General information**

State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Synthetic Biology Tools for Yeast, Joint Bioenergy Institute, University of California at Berkeley
Authors: Apel, A. R. (Ekstern), d'Espaux, L. (Ekstern), Wehrs, M. (Ekstern), Sachs, D. (Ekstern), Li, R. A. (Ekstern), Tong, G. J. (Ekstern), Garber, M. (Ekstern), Nnadi, O. (Ekstern), Zhuang, W. (Ekstern), Hillson, N. J. (Ekstern), Keasling, J. D. (Intern), Mukhopadhyay, A. (Ekstern)
Pages: 496-508
Publication date: 2017
Main Research Area: Technical/natural sciences

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- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 9.28 SJR 7.397 SNIP 2.657
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 7.239 SNIP 2.639 CiteScore 9.48
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 6.576 SNIP 2.568 CiteScore 8.74
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 6.582 SNIP 2.266 CiteScore 8.46
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 6.13 SNIP 2.392 CiteScore 8.62
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 5.758 SNIP 2.172 CiteScore 7.86
Accelerated anaerobic hydrolysis rates under a combination of intermittent aeration and anaerobic conditions

Anaerobic hydrolysis in activated return sludge was investigated in laboratory scale experiments to find if intermittent aeration would accelerate anaerobic hydrolysis rates compared to anaerobic hydrolysis rates under strict anaerobic conditions. The intermittent reactors were set up in a 240 h experiment with intermittent aeration (3h:3h) in a period of 24 h followed by a subsequent anaerobic period of 24 h in a cycle of 48 hours which was repeated 5 times during the experiment. The anaerobic reactors were kept under strict anaerobic conditions in the same period (240 h). Two methods for calculating hydrolysis rates based on soluble COD were compared. Two-way ANOVA with the Bonferroni post-test was performed in order to register any significant difference between reactors with intermittent aeration and strictly anaerobic conditions respectively. The experiment demonstrated a statistically significant difference in favor of the reactors with intermittent aeration showing a tendency towards accelerated anaerobic hydrolysis rates due to application of intermittent aeration. The conclusion of the work is thus that intermittent aeration applied in the activated return sludge process (ARP) can improve the treatment capacity further in full scale applications.
Activated return sludge process (ARP), anaerobic hydrolysis, intermittent aeration, wastewater treatment
Accelerating time to benefit: Deconstructing innovative organizational practices in five projects

Despite the ubiquitous pressure for speed, our approaches to accelerate projects remain constrained to the old-fashioned understanding of the project as a vehicle to deliver products and services, not value. This article explores an attempt to accelerate time to benefit. We describe and deconstruct the implementation of a large intervention undertaken in five project-based organizations in Denmark – the Project Half Double where the same project methodology has been applied in five projects, each of them in five distinct organizations in Denmark, as a bold attempt to realize double the benefit in half of the time. Although all cases valued speed and speed to benefit, and implemented most practices proposed by the methodology, only three of the five projects were more successful in decreasing time to speed. Based on a multi-case study comparison between these five different projects and their respective organizations, we propose five complementary explanations for the different results.

General information
State: Published
Organisations: Department of Management Engineering, Engineering Systems, Center for Bachelor of Engineering Studies, Afdelingen for Produktionsudvikling, Aarhus Universitet
Authors: Svejvig, P. (Forskerdatabase), Geraldi, J. (Intern), Grex, S. (Intern)
Number of pages: 19
Publication date: 2017

Accuracy and Precision of Plane Wave Vector Flow Imaging for Laminar and Complex Flow In Vivo

In this study, a comparison between velocity fields for a plane wave 2-D vector flow imaging (VFI) method and a computational fluid dynamics (CFD) simulation is made. VFI estimates are obtained from the scan of a flow phantom, which mimics the complex flow conditions in the carotid artery. Furthermore, the precision of the VFI method is investigated under laminar and complex flow conditions in vivo. The carotid bifurcation of a healthy volunteer was scanned using both fast plane wave ultrasound and magnetic resonance imaging (MRI). The acquired MRI geometry of the bifurcation was used for fabricating an anthropomorphic flow phantom, which was also ultrasound scanned. The same geometry was used in a CFD simulation to calculate the velocity field. Results showed that similar flow patterns and vortices were estimated using CFD and VFI in the phantom. Velocity magnitudes were estimated with a mean difference within 15 %, however, it was 23 % in the external branch. For the in vivo scan, the precision in terms of mean standard deviation (SD) of estimates aligned to the cardiac cycle was highest in the center of the common carotid artery (SD 4.7◦ for angles) and lowest in the external branch and close to the vessel wall (SD 15.0◦ for angles).

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, MEMS-AppliedSensors, Department of Electrical Engineering, Biomedical Engineering, Center for Fast Ultrasound Imaging, Copenhagen University Hospital
Number of pages: 4
Publication date: 2017
Accuracy of dual-Doppler lidar retrievals of near-shore winds

Abstract: In this presentation the accuracy in retrieving horizontal wind speed and wind direction using a dual-Doppler lidar system will be described. First, the line of sight wind speed uncertainty is described followed by the detailed description of the various sources of errors in laser beam pointing with a particular focus on static errors. A methodology for assessing static pointing errors is presented accompanied with results from the method implementation. Afterwards, mathematical relations for the horizontal wind speed and wind direction uncertainties are derived. For the end, the derived mathematical relations are implemented for the uncertainty assessment of the dual-Doppler retrievals of near-shore winds that took place during the RUNE experiment.

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Organisations: Department of Wind Energy, Meteorology & Remote Sensing
Authors: Vasiljevic, N. (Intern), Courtney, M. (Intern)
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Electronic versions:
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Accuracy of food photographs for quantifying food servings in a lunch meal setting among Danish children and adults

Visual aids, such as food photographs, are widely used in estimating food quantities in dietary surveys. The present study aimed to assess how accurately Danish adults and children can estimate food portion sizes using 37 series of photographs illustrating four to six different portion sizes under real-life conditions; determine whether adults were more accurate than children; and estimate the error caused by using portion size photographs to estimate weights of foods consumed in macronutrient calculation. Six hundred and twenty-two adults and 109 children were recruited in three workplace canteens and in two schools, respectively, to estimate their lunchtime portions based on photographs. Participants were instructed to keep the foods separated on their plate when taking lunch. Participants thereafter estimated their own portions by looking at the relevant series of photographs. The actual food portions were then weighed. The proportion of correct estimations was 42% overall (range 19-77%). The mean difference (%) between estimated and actual weight was 17% (range 1-111%). Small portion size photographs were more often used correctly compared to larger portion photographs. Children had as many correct estimations as adults, although they overestimated portions more. Participants using fractions of (or more than) one photograph to estimate the portion of a food had significantly larger errors. When calculating the macronutrient content of a weekly menu using the estimated portion sizes, protein had the largest error (29%). When used in a real-life situation, the portion size photographs validated in the present study showed a certain inaccuracy compared to the actual weights.

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Ratings:
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Web of Science (2017): Indexed Yes
Accuracy of young male drivers’ self-assessments of driving skill

Accurate self-assessment of skill is important because it creates an appropriate level of confidence and hence behaviour. Inaccurate self-assessment of driving ability has been linked to reckless driving and accidents. Inaccurate self-assessment of driving skills may be a contributing factor to the over-representation of young male drivers in accident statistics. Most previous research on self-assessment of driving skills did not compare self-reported skills to objectively measured driving skills, so the aims of this study were: (1) to test the accuracy of young male drivers’ self-assessments of specific driving skills by comparing them with performance in a driving simulator; (2) to test whether self-assessment accuracy varied with driving skill, driving experience and sensation-seeking propensity. We found that young male drivers’ self-assessments were inconsistent with their driving performance, and that this inconsistency varied with driving skill, driving experience and sensation-seeking propensity. Groups with particularly inaccurate self-assessments are at high risk, because of their relative lack of skill, high mileage and sensation-seeking propensity. Self-assessments of hazard prediction and detection skills were particularly inaccurate. Understanding self-assessments of driving skill is crucial, but further studies are needed to allow preventive policies and interventions to take factors affecting self-assessments into account.

General information
State: Published
Accurate particle speed prediction by improved particle speed measurement and 3-dimensional particle size and shape characterization technique

Accurate particle mass and velocity measurement is needed for interpreting test results in erosion tests of materials and coatings. The impact and damage of a surface is influenced by the kinetic energy of a particle, i.e. particle mass and velocity. Particle mass is usually determined with optical methods, e.g. laser light scattering, and velocity by the double disk (DD) method. In this article we present two novel techniques, which allow a more accurate measurement of mass, velocity and shape, and we later compare the experimentally obtained flow velocities of particles with a simulation that also includes the particle's shape parameter, known as sphericity. Mass and sphericity are obtained from 3-dimensional data with an industrial X-ray computed tomography (CT) scanner. CT data can be used to accurately determine the volume-basis median of the particles (using the volume-equivalent particle diameter). Velocity is measured with a fast 2-dimensional particle imaging method using a pulsed LED. Good agreement of the measured and simulated particle velocity was found when including the sphericity from CT results. 2-dimensional optical particle size measurements in the jet of an erosion rig are compared with detailed 3-dimensional CT measurements and a low angle laser light scattering (LALLS) measurement system for six different samples of particles. It is shown that the particle volume or mass is usually overestimated by 16–22% when using 2-dimensional methods or LALLS. For CT allows additionally the surface-equivalent diameter to be calculated by using 2-dimensional projections of each particle, these results can be used to correct particle diameters measured with the particle imaging method using a pulsed LED.

General information
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Organisations: Department of Chemical and Biochemical Engineering, CHEC Research Centre, Department of Photonics Engineering, Physikalisch-Technische Bundesanstalt, Ricerca Sistema Energetico SpA
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Scopus rating (2016): CiteScore 3.16 SJR 0.983 SNIP 1.482
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.965 SNIP 1.598 CiteScore 2.99
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.89 SNIP 1.649 CiteScore 2.67
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.901 SNIP 1.875 CiteScore 2.64
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.854 SNIP 1.826 CiteScore 2.36
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.921 SNIP 1.86 CiteScore 2.45
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.94 SNIP 1.547
BFI (2009): BFI-level 1
A CFD Investigation on the Effect of the Air Entrainment in Breaking Wave Impacts on a Mono-Pile

In impacts of breaking waves on offshore structures, it is still not well-known how the air entrainment phenomenon affects the exerted loads. In this paper, a developed CFD solver capable of simulating the air entrainment process was employed to reproduce an experimental investigation on the impact of a spilling wave against a circular cylinder. The exerted in-line force was computed with and without the inclusion of dispersed bubbles. Results showed that the magnitude of the computed force was affected when the entrainment of bubbles was simulated.

Achieving low return temperature for domestic hot water preparation by ultra-low-temperature district heating

District heating (DH) is a cost-effective method of heat supply, especially to area with high heat density. Ultra-low-temperature district heating (ULTDH) is defined with supply temperature at 35-45 degrees C. It aims at making utmost use of the available low-temperature energy sources. In order to achieve high efficiency of the ULTDH system, the return temperature should be as low as possible. For the energy-efficient buildings in the future, it is feasible to use ULTDH to cover the space heating demand. However, considering the comfort and hygiene requirements of domestic hot water (DHW) preparation, supplementary heating devices should be combined, which can affect the return temperature in different extents. This study analysed the return temperatures of different types of substations for DHW preparation in ULTDH, and developed improvements in the substation for better energy efficiency. Both the instantaneous and storage-type electric heating methods were long-term measured as supplementary heating for ULTDH in the case substations in Denmark. We analysed the seasonal impacts of the return temperature from the DHW loop on the overall return temperature of district heating. To achieve lower return temperature and higher efficiency for DHW supply, an innovative...
substation was devised, which replaced the bypass with an instantaneous heat exchanger and a micro electric storage tank. The energy performance of the proposed substation and the resulting benefits for the DH system by the lower return temperature were investigated (C) 2017 The Authors. Published by Elsevier Ltd.

Achieving maximum sustainable yield in mixed fisheries: a management approach for the North Sea demersal fisheries

Achieving single species maximum sustainable yield (MSY) in complex and dynamic fisheries targeting multiple species (mixed fisheries) is challenging because achieving the objective for one species may mean missing the objective for another. The North Sea mixed fisheries are a representative example of an issue that is generic across most demersal fisheries worldwide, with the diversity of species and fisheries inducing numerous biological and technical interactions. Building on a rich knowledge base for the understanding and quantification of these interactions, new approaches have emerged. Recent paths towards operationalizing MSY at the regional scale have suggested the expansion of the concept into a desirable area of “pretty good yield”, implemented through a range around FMSY that would allow for more
flexibility in management
targets. This article investigates the potential of FMSY ranges to combine long-term single-stock targets with flexible,
short-term, mixed-fisheries management requirements applied to the main North Sea demersal stocks. It is shown that sustained
fishing at the upper
bound of the range may lead to unacceptable risks when technical interactions occur. An objective method is suggested
that provides an optimal
set of fishing mortality within the range, minimizing the risk of total allowable catch mismatches among stocks captured
within mixed
fisheries, and addressing explicitly the trade-offs between the most and least productive stocks.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, French
Research Institute for the Exploitation of the Sea, Cefas, Wageningen IMARES, European Commission - Joint Research
Center, Thünen Institute of Sea Fisheries
Authors: Ulrich, C. (Intern), Vermard, Y. (Ekstern), Dolder, P. J. (Ekstern), Brunel, T. (Ekstern), Jardim, E. (Ekstern),
Holmes, S. J. (Ekstern), Kempf, A. (Ekstern), Mortensen, L. O. (Intern), Poos, J. (Ekstern), Rindorf, A. (Intern)
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Main Research Area: Technical/natural sciences

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BFI (2016): BFI-level 1
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.35
ISI indexed (2012): ISI indexed yes
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BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 2.32
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
A choice function hyper-heuristic framework for the allocation of maintenance tasks in Danish railways

A new signalling system in Denmark aims at ensuring fast and reliable train operations, however imposes very strict time limits on recovery plans in the event of failure. As a result, it is necessary to develop a new approach to the entire maintenance scheduling process. In the largest region of Denmark, the Jutland peninsula, there is a decentralised structure for maintenance planning, whereby the crew start their duties from their home locations rather than starting from a single depot. In this paper, we allocate a set of maintenance tasks in Jutland to a set of maintenance crew members, defining the sub-region that each crew member is responsible for. Two key considerations must be made when allocating tasks to crew members. Firstly a fair balance of workload must exist between crew members and secondly, the distance between two tasks in the same sub-region must be minimised, in order to facilitate quick response in the case of unexpected failure. We propose a perturbative selection hyper-heuristic framework to improve initial solutions by reassigning outliers, those tasks that are far away, to another crew member at each iteration, using one of five low-level heuristics. Results of two hyper-heuristics, using a number of different initial solution construction methods are presented over a set of 12 benchmark problem instances.
Acid-base chemistry and proton conductivity of CsHSO₄, CsH₂PO₄ and their mixtures with N-heterocycles

Caesium hydrogen sulfate (CsHSO₄) and caesium dihydrogen phosphate (CsH₂PO₄) are solid acids that undergo superprotonic phase-transitions at about 140 and 230 °C, respectively. As a result, the proton conductivity is increased by several orders of magnitude. However, the practical operational temperature range is narrow due to decomposition of the high-conductivity phases. For CsHSO₄, it is known that this window can be extended to lower temperatures by addition of carefully selected N-heterocycles. The present work investigates if the same approach can be used to extend the practical operating temperature range of CsH₂PO₄ as well. Binary mixtures of CsH₂PO₄ with 1,2,4-triazole, benzimidazole or imidazole were prepared by means of mechanochemical synthesis. Mixtures based on CsHSO₄ were prepared as a basis for a comparative discussion. It was found that CsHSO₄ formed organic-inorganic salts, while CsH₂PO₄ formed heterogeneous mixtures with the N-heterocycles due to its weaker acidity. At a N-heterocycle content of 30 mol%, enhanced proton conductivity was observed for both solid acids at temperatures below their superprotonic phase transitions.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Proton conductors
Authors: Aili, D. (Intern), Gao, Y. (Intern), Han, J. (Intern), Li, Q. (Intern)
Pages: 13-19
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Main Research Area: Technical/natural sciences

Publication information
Journal: Solid State Ionics
Volume: 306
ISSN (Print): 0167-2738
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Acid-resistant organic coatings for the chemical industry: a review

Industries that work with acidic chemicals in their processes need to make choices on how to properly contain the substances and avoid rapid corrosion of equipment. Certain organic coatings and linings can be used in such
environments, either to protect vulnerable construction materials, or, in combination with fiber reinforcement, to replace them. However, degradation mechanisms of organic coatings in acid service are not thoroughly understood and relevant quantitative investigations are scarce. This review describes the uses and limitations of acid-resistant coatings in the chemical industry, with a comparison to alternative resistant materials based on metals or ceramics. In addition, coating degradation phenomena, caused by acid exposure, are mapped to the extent possible, and analysis methods for detecting coating degradation type and severity are listed and discussed. It is concluded that more knowledge on chemical and physical degradation mechanisms is required, and that improvements in resistance to elevated temperatures and abrasion would decrease the risk of use and increase the potential application areas of organic coatings exposed to acidic environments in the chemical industry.

**General information**

State: Published
Organisations: Department of Chemical and Biochemical Engineering, CHEC Research Centre, Hempel AS
Authors: Møller, V. B. (Intern), Dam-Johansen, K. (Intern), Frankær, S. M. G. (Ekstern), Kiil, S. (Intern)
Pages: 279-306
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**Publication information**

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Volume: 14
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.44 SJR 0.409 SNIP 0.614
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.45 SJR 0.421 SNIP 0.83
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.5 SJR 0.51 SNIP 1.062
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.46 SJR 0.534 SNIP 1.077
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.39 SJR 0.572 SNIP 1.364
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.24 SJR 0.517 SNIP 1.007
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.571 SNIP 0.968
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.396 SNIP 0.683
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.249 SNIP 0.502
Scopus rating (2007): SJR 0.432 SNIP 0.472
Scopus rating (2006): SJR 0.606 SNIP 1.016
Scopus rating (2005): SJR 0.219 SNIP 0.201
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Protective coating, Acid resistance, Chemical industry, Degradation mechanism, Coating analysis

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A cohesive zone framework for environmentally assisted fatigue
We present a compelling finite element framework to model hydrogen assisted fatigue by means of a hydrogen- and cycle-dep
endent cohesive zone formulation. The model builds upon: (i) appropriate environmental boundary conditions, (ii) a coupled mechanical and hydrogen diffusion response, driven by chemical potential gradients, (iii) a mechanical behavior characterized by finite deformation J2 plasticity, (iv) a phenomenological trapping model, (v) an irreversible cohesive zone formulation for fatigue, grounded on continuum damage mechanics, and (vi) a traction-separation law dependent on hydrogen coverage calculated from first principles. The computations show that the present scheme appropriately captures the main experimental trends; namely, the sensitivity of fatigue crack growth rates to the loading frequency and the environment. The role of yield strength, work hardening, and constraint conditions in enhancing crack growth rates as a function of the frequency is thoroughly investigated. The results reveal the need to incorporate additional sources of stress elevation, such as gradient-enhanced dislocation hardening, to attain a quantitative agreement with the experiments.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Solid Mechanics, Universidad de Oviedo
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Number of pages: 17
Publication date: 2017
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BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.39 SJR 1.247 SNIP 1.676
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.362 SNIP 1.945 CiteScore 2.44
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.619 SNIP 2.214 CiteScore 2.28
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.483 SNIP 2.047 CiteScore 2.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.367 SNIP 2.112 CiteScore 1.82
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.793 SNIP 2.237 CiteScore 1.92
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.482 SNIP 1.946
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.734 SNIP 1.899
Web of Science (2009): Indexed yes
A Colon Targeted Delivery System for Resveratrol Enriching in pH Responsive-Model

Background: Resveratrol effects on the prevention and treatment of colon cancer have been well documented recently, but low solubility, rapid absorption and metabolism of resveratrol limit its beneficial effects on colon cancer. Designing a formulation that enhances the solubility of resveratrol, protects resveratrol from oxidation and isomerization, and delivers it to the colon is a priority of food and drug industry. In this study, resveratrol-polyethylene glycol (PEG)-loaded pectin-chitosan polyelectrolyte complex was designed as a colon targeted delivery system. Methods: The effects of adding PEG, ultrasoundication time, pH, and pectin to chitosan ratio were investigated on particle size, polydispersity index (PDI), zeta potential by particle size analyzer, and scanning electron microscopy (SEM). Encapsulation efficiency (EE), release of resveratrol in simulated gastrointestinal fluid, and different pHs were analyzed via High Performance Liquid Chromatography (HPLC). Antioxidant activity was measured by (2, 2-diphenyl-1-picryl-hydrazyl-hydrate) DPPH free-radical method. Results: Results showed that colloidal stable micro-particles (725 ± 20 nm) with PDI < 0.3 and zeta potential +27 ± 2 mV was formed in the ratio of 5:1 of pectin to chitosan w/v % after a 10-min sonication. Encapsulation efficiency was 81 ± 7 %. The reduction of antioxidant activity of resveratrol loaded micro-particles after one month was less than 13%. Micro-particles released about 33% of resveratrol in the simulated gastric and intestinal fluids. Conclusion: Two-thirds of the loaded resveratrol in Pectin-Chitosan complex reached colon. The developed system had enough specification for enriching fruit based drinks due to remarkable colloidal stability in the pH range of 3.5 to 4.5.

General information
State: Published
Organisations: National Food Institute, Research Group for Food Production Engineering, Tabriz University of Medical Sciences
Authors: Andishmand, H. (Ekstern), Hamishehkar, H. (Ekstern), Mohammadifar, M. A. (Intern), Babazadeh, A. (Ekstern), Taghvimi, A. (Ekstern), Mohammadifar, M. A. (Intern), Mahnaz Tabibiazar (Ekstern)
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A Combination of Machine Learning and Cerebellar-like Neural Networks for the Motor Control and Learning of the Fable Modular Robot

We scaled up a bio-inspired control architecture for the motor control and motor learning of a real modular robot. In our approach, the Locally Weighted Projection Regression algorithm (LWPR) and a cerebellar microcircuit coexist, forming a Unit Learning Machine. The LWPR optimizes the input space and learns the internal model of a single robot module to command the robot to follow a desired trajectory with its end-effector. The cerebellar-like microcircuit refines the LWPR output delivering corrective commands. We contrasted distinct cerebellar-like circuits including analytical models and spiking models implemented on the SpiNNaker platform, showing promising performance and robustness results.

General information
State: Published
Organisations: Department of Electrical Engineering, Automation and Control, Centre for Playware, Copenhagen Center for Health Technology
Authors: Baira Ojeda, I. (Intern), Tolu, S. (Intern), Pacheco, M. (Intern), Christensen, D. J. (Intern), Lund, H. H. (Intern)
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Main Research Area: Technical/natural sciences

Publication Information
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Source: PublicationPreSubmission
Source-ID: 134007460
Publication: Research - peer-review › Journal article – Annual report year: 2017

A Combination of Machine Learning and Cerebellar Models for the Motor Control and Learning of a Modular Robot

We scaled up a bio-inspired control architecture for the motor control and motor learning of a real modular robot. In our approach, the Locally Weighted Projection Regression algorithm (LWPR) and a cerebellar microcircuit coexist, forming a Unit Learning Machine. The LWPR optimizes the input space and learns the internal model of a single robot module to command the robot to follow a desired trajectory with its end-effector. The cerebellar microcircuit refines the LWPR output delivering corrective commands. We contrasted distinct cerebellar circuits including analytical models and spiking models implemented on the SpiNNaker platform, showing promising performance and robustness results.

General information
State: Published
Organisations: Department of Electrical Engineering, Centre for Playware, Automation and Control, Copenhagen Center for Health Technology
Authors: Baira Ojeda, I. (Intern), Tolu, S. (Intern), Pacheco, M. (Intern), Christensen, D. J. (Intern), Lund, H. H. (Intern)
Number of pages: 4
Publication date: 2017
A combined aeroelastic-aeroacoustic model for wind turbine noise: Verification and analysis of field measurements

In this paper, semi-empirical engineering models for the three main wind turbine aerodynamic noise sources, namely, turbulent inflow, trailing edge and stall noise, are introduced. They are implemented into the in-house aeroelastic code HAWC2 commonly used for wind turbine load calculations and design. The results of the combined aeroelastic and aeroacoustic model are compared with field noise measurements of a 500kW wind turbine. Model and experimental data are in fairly good agreement in terms of noise levels and directivity. The combined model allows separating the various noise sources and highlights a number of mechanisms that are difficult to differentiate when only the overall noise from a wind turbine is measured.
A combined constraint handling framework: an empirical study

This paper presents a new combined constraint handling framework (CCHF) for solving constrained optimization problems (COPs). The framework combines promising aspects of different constraint handling techniques (CHTs) in different situations with consideration of problem characteristics. In order to realize the framework, the features of two popular used CHTs (i.e., Deb’s feasibility-based rule and multi-objective optimization technique) are firstly studied based on their relationship with penalty function method. And then, a general relationship between problem characteristics and CHTs in different situations (i.e., infeasible situation, semi-feasible situation, and feasible situation) is empirically obtained. Finally, CCHF is proposed based on the corresponding relationship. Also, for the first time, this paper demonstrates that multi-objective optimization technique essentially can be expressed in the form of penalty function method. As CCHF combines promising aspects of different CHTs, it shows good performance on the 22 well-known benchmark test functions. In general, it is comparable to the other four differential evolution-based approaches and five dynamic or ensemble state-of-the-art approaches for constrained optimization.
A Combined Reliability Model of VSC-HVDC Connected Offshore Wind Farms Considering Wind Speed Correlation

This paper proposes a combined reliability model of voltage source converter-based high voltage direct current (VSC-HVDC) connected offshore wind farms (WFs) using the frequency and duration technique. Firstly, a two-dimensional multi-state WF model is developed considering wind speed variations and WTGs outage. The wind speed correlation between different WFs is included in the two-dimensional multistate WF model by using an improved k-means clustering method. Then, the entire system with two WFs and a threeterminal VSC-HVDC system is modeled as a multi-state generation unit. The proposed model is applied to the Roy Billinton test system (RBTS) for adequacy studies. Both the probability and frequency indices are calculated. The effectiveness and accuracy of the combined model is validated by comparing results with the sequential Monte Carlo simulation (MCS) method. The effects of the outage of VSC-HVDC system and wind speed correlation on the system reliability were analyzed. Sensitivity analyses were conducted to investigate the impact of repair time of the offshore VSC-HVDC system on system reliability.

General information
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Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems, Shandong University, Shandong University
Authors: Guo, Y. (Ekstern), Gao, H. (Ekstern), Wu, Q. (Intern)
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Scopus rating (2015): SJR 3.031 SNIP 3.235 CiteScore 7.09
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Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.384 SNIP 3.777 CiteScore 7.03
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 1.355 SNIP 3.731 CiteScore 6.58
ISI indexed (2012): ISI indexed no
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A compact cyclic plasticity model with parameter evolution
The present paper presents a compact model for cyclic plasticity based on energy in terms of external and internal variables, and plastic yielding described by kinematic hardening and a flow potential with an additive term controlling the nonlinear cyclic hardening. The model is basically described by five parameters: external and internal stiffness, a yield stress and a limiting ultimate stress, and finally a parameter controlling the gradual development of plastic deformation. Calibration against numerous experimental results indicates that typically larger plastic strains develop than predicted by the Armstrong–Frederick model, contained as a special case of the present model for a particular choice of the shape parameter. In contrast to previous work, where shaping the stress-strain loops is derived from multiple internal stress states, this effect is here represented by a single parameter, and it is demonstrated that this simple formulation enables very accurate representation of experimental results. An extension of the theory to account for model parameter evolution effects, e.g. in the form of changing yield level, is included in the form of extended evolution equations for the model parameters. Finally, it is demonstrated that the model in combination with a simple parameter interpolation scheme enables representation of ratcheting effects.

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Organisations: Department of Mechanical Engineering, Solid Mechanics, Technical University of Denmark
Authors: Krenk, S. (Intern), Tidemann, L. (Ekstern)
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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.357 SNIP 1.838 CiteScore 2.56
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.204 SNIP 1.758 CiteScore 2.58
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ISI indexed (2012): ISI indexed yes
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ISI indexed (2011): ISI indexed yes
A comparative study of noise in supercontinuum light sources for ultra-high resolution optical coherence tomography

Supercontinuum (SC) light is a well-established technology, which finds applications in several domains ranging from chemistry to material science and imaging systems [1-2]. More specifically, its ultra-wide optical bandwidth and high average power make it an ideal tool for Optical Coherence Tomography (OCT). Over the last 5 years, numerous examples have demonstrated its high potential [3-4] in this context. However, SC light sources present pulse-to-pulse intensity variation that can limit the performance of any OCT system [5] by degrading their signal to noise ratio (SNR). To this goal, we have studied and compared the noise of several SC light sources and evaluated how their noise properties affect the performance of Ultra-High Resolution OCT (UHR-OCT) at 1300 nm. We have measured several SC light sources with different parameters (pulse length, energy, seed repetition rate, etc.). We illustrate the different noise measurements and their impact on a state of the art UHR-OCT system producing images of skin. The sensitivity of the system was higher than 95 dB, with an axial resolution below 4μm.
A comparative study on the activity of fungal lytic polysaccharide monooxygenases for the depolymerization of cellulose in soybean spent flakes
Lytic polysaccharide monooxygenases (LPMOs) are copper-dependent enzymes capable of the oxidative breakdown of polysaccharides. They are of industrial interest due to their ability to enhance the enzymatic depolymerization of recalcitrant substrates by glycoside hydrolases. In this paper, twenty-four lytic polysaccharide monooxygenases (LPMOs) expressed in Trichoderma reesei were evaluated for their ability to oxidize the complex polysaccharides in soybean spent flakes, an abundant and industrially relevant substrate. TrCel61A, a soy-polysaccharide-active AA9 LPMO from T. reesei, was used as a benchmark in this evaluation. In total, seven LPMOs demonstrated activity on pretreated soy spent flakes, with the products from enzymatic treatments evaluated using mass spectrometry and high performance anion exchange chromatography. The hydrolytic boosting effect of the top-performing enzymes was evaluated in combination with endoglucanase and beta-glucosidase. Two enzymes (TrCel61A and Aspte6) showed the ability to release more than 36% of the pretreated soy spent flake glucose - a greater than 75% increase over the same treatment without LPMO addition.
A comparison between tracer gas and aerosol particles distribution indoors: The impact of ventilation rate, interaction of airflows, and presence of objects

The study investigated the separate and combined effects of ventilation rate, free convection flow produced by a thermal manikin, and the presence of objects on the distribution of tracer gas and particles in indoor air. The concentration of aerosol particles and tracer gas was measured in a test room with mixing ventilation. Three layouts were arranged: an empty room, an office room with an occupant sitting in front of a table, and a single-bed hospital room. The room occupant was simulated by a thermal manikin. Monodisperse particles of three sizes (0.07, 0.7, and 3.5 μm) and nitrous oxide tracer gas were generated simultaneously at the same location in the room. The particles and gas concentrations were measured in the bulk room air, in the breathing zone of the manikin, and in the exhaust air. Within the breathing zone of the sitting occupant, the tracer gas emerged as reliable predictor for the exposure to all different-sized test particles. A change in the ventilation rate did not affect the difference in concentration distribution between tracer gas and larger particle sizes. Increasing the room surface area did not influence the similarity in the dispersion of the aerosol particles and the tracer gas.

General information
State: Accepted/In press
Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics, Institute of Chemical Process Fundamentals of the CAS
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Number of pages: 12
Publication date: 2017
Main Research Area: Technical/natural sciences
A comparison of extreme structural responses and fatigue damage of semi-submersible type floating horizontal and vertical axis wind turbines
A comprehensive comparison of floating HAWTs and VAWTs with different blade number. Extreme structural responses and fatigue damage are studied. Both operational and parked conditions are considered. The merits and disadvantages of floating HAWTs and VAWTs are revealed and highlighted.

General information
State: Published
Organisations: Department of Wind Energy, Aerodynamic design, Norwegian University of Science and Technology
Authors: Cheng, Z. (Ekstern), Aagaard Madsen, H. (Intern), Chai, W. (Ekstern), Gao, Z. (Ekstern), Moan, T. (Ekstern)
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.845 SNIP 2.118 CiteScore 4.51
Web of Science (2015): Indexed yes
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Scopus rating (2014): SJR 1.983 SNIP 2.687 CiteScore 4.51
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.066 SNIP 2.767 CiteScore 4.63
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.852 SNIP 2.745 CiteScore 3.97
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.688 SNIP 2.404 CiteScore 3.9
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.494 SNIP 2.215
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.305 SNIP 1.945
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.449 SNIP 1.867
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.214 SNIP 1.65
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.137 SNIP 1.486
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.215 SNIP 1.26
Scopus rating (2004): SJR 0.76 SNIP 1.154
Web of Science (2004): Indexed yes
A Comparison of Organic and Steam Rankine Cycle Power Systems for Waste Heat Recovery on Large Ships

This paper presents a comparison of the conventional dual pressure steam Rankine cycle process and the organic Rankine cycle process for marine engine waste heat recovery. The comparison was based on a container vessel, and results are presented for a high-sulfur (3 wt %) and low-sulfur (0.5 wt %) fuel case. The processes were compared based on their off-design performance for diesel engine loads in the range between 25% and 100%. The fluids considered in the organic Rankine cycle process were MM(hexamethyldisiloxane), toluene, n-pentane, i-pentane and c-pentane. The results of the comparison indicate that the net power output of the steam Rankine cycle process is higher at high engine loads, while the performance of the organic Rankine cycle units is higher at lower loads. Preliminary turbine design considerations suggest that higher turbine efficiencies can be obtained for the ORC unit turbines compared to the steam turbines. When the efficiency of the c-pentane turbine was allowed to be 10% points larger than the steam turbine efficiency, the organic Rankine cycle unit reaches higher net power outputs than the steam Rankine cycle unit at all engine loads for the low-sulfur fuel case. The net power production from the waste heat recovery units is generally higher for the low-sulfur fuel case. The steam Rankine cycle unit produces 18% more power at design compared to the high-sulfur fuel case, while the organic Rankine cycle unit using MM produces 33% more power.

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State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy
Authors: Andreasen, J. G. (Intern), Meroni, A. (Intern), Haglind, F. (Intern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.804 SNIP 1.416 CiteScore 2.87
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.87 SNIP 1.601 CiteScore 2.66
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.632 SNIP 1.345 CiteScore 2.29
ISI indexed (2013): ISI indexed yes
A comparison of reflectance properties on polymer micro-structured functional surface

In this study, a functional micro-structure surface [1] has been developed as a combination of arrays of micro ridges. The scope of the surface is to achieve specific directional optical properties: that is, under constrained lighting, maximizing the reflectance from a certain viewing direction, and minimizing it from the corresponding horizontally orthogonal position, i.e. maximize the contrast between two horizontally orthogonal view positions at the same inclination (Figure 1). The sample is composed of 12 different anisotropic surfaces, that are designed as a combination of ridges defined by their pitch distance and their angle in respect to the surface (Figure 2). The geometry was obtained by precision milling of a tool steel bar and replicated through silicone replica technology [2], and by hot embossing using Acrylonitrile Butadiene Styrene (ABS). A digital microscope has been used as a gonioreflectometer to determine the directional surface reflectance of each surface to varying light and camera positions. The presented results show that the replication processes and the polymeric material have a strong impact on the contrast under constrained lightening. More specifically, the reflectance properties are strongly influenced by the geometry of the structure and by the colour.

A comparison of the ground magnetic responses during the 2013 and 2015 St. Patrick's Day geomagnetic storms

The magnetosphere-ionosphere system response to extreme solar wind driving conditions depends on both the driving conditions and ionospheric conductivity. Since extreme driving conditions are rare, there are few opportunities to control for one parameter or another. The 17 March 2013 and 17 March 2015 geomagnetic storms driven by coronal mass ejections (CME) provide one such opportunity. The two events occur during the same solar illumination conditions; in particular, both occur near equinox on the same day of the year leading to similar ionospheric conductivity profiles. Moreover, both CMEs arrive at the same time of day leading to similar observing conditions (i.e., ground stations at similar magnetic local time in both events). We examine the ground magnetic response to each CME at a range of latitudes and in both the Northern and Southern Hemispheres, remote sensing several current systems. There are dramatic differences between the intensity, onset time and occurrence, duration, and spatial structure of the current systems in each case. For example, differing solar wind driving conditions lead to interhemispheric asymmetries in the high-latitude ground magnetic response during the 2015 storm; these asymmetries are not present in the 2013 storm.
A complete characterization of Galois subfields of the generalized Giulietti–Korchmaros function field

We give a complete characterization of all Galois subfields of the generalized Giulietti–Korchmaros function fields $\mathbb{C}_n/F_q$ for $n \geq 5$. Calculating the genera of the corresponding fixed fields, we find new additions to the list of known genera of maximal function fields.

General information
State: Accepted/In press
Organisations: Department of Applied Mathematics and Computer Science, Mathematics, Bogazici University
Authors: Anbar Meidl, N. (Intern), Bassa, A. (Ekstern), Beelen, P. (Intern)
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Scopus rating (2016): CiteScore 1.12 SJR 0.95 SNIP 1.31
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.003 SNIP 1.388 CiteScore 1.29
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.027 SNIP 1.579 CiteScore 1.17
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.869 SNIP 1.309 CiteScore 0.92
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.67 SNIP 1.679 CiteScore 0.81
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.091 SNIP 1.24 CiteScore 0.97
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.981 SNIP 1.141
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.015 SNIP 1.391
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Gaze stabilization is essential for clear vision; it is the combined effect of two reflexes relying on vestibular inputs: the vestibulocollic reflex (VCR), which stabilizes the head in space and the vestibulo-ocular reflex (VOR), which stabilizes the visual axis to minimize retinal image motion. The VOR works in conjunction with the opto-kinetic reflex (OKR), which is a visual feedback mechanism that allows to move the eye at the same speed as the observed scene. Together they keep the image stationary on the retina. In this work we implement on a humanoid robot a model of gaze stabilization based on the coordination of VCR and VOR and OKR. The model, inspired by neuroscientific cerebellar theories, is provided with learning and adaptation capabilities based on internal models. We present the results for the gaze stabilization model on three sets of experiments conducted on the SABIAN robot and on the iCub simulator, validating the robustness of the proposed control method. The first set of experiments focused on the controller response to a set of disturbance frequencies along the vertical plane. The second shows the performances of the system under three-dimensional disturbances. The last set of experiments was carried out to test the capability of the proposed model to stabilize the gaze in locomotion tasks. The results confirm that the proposed model is beneficial in all cases reducing the retinal slip (velocity of the image on the retina) and keeping the orientation of the head stable.
A computer-aided approach for achieving sustainable process design by process intensification

Process intensification can be applied to achieve sustainable process design. In this paper, a systematic, 3-stage synthesis-intensification framework is applied to achieve more sustainable design. In stage 1, the synthesis stage, an objective function and design constraints are defined and a base case is synthesized. In stage 2, the design and analysis stage, the base case is analyzed using economic and environmental analyses to identify process hot-spots that are translated into design targets. In stage 3, the innovation design stage, phenomena-based process intensification is performed to generate flowsheet alternatives that satisfy the design targets thereby, minimizing and/or eliminating the process hot-spots. The application of the framework is highlighted through the production of para-xylene via toluene methylation where more sustainable flowsheet alternatives that consist of hybrid/intensified unit operations are generated from the application of phenomena-based process intensification.

General information
State: Accepted/In press
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Chulalongkorn University
Authors: Anantasarn, N. (Ekstern), Suriyapraphadilok, U. (Ekstern), Babi, D. K. (Intern)
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Web of Science (2016): Indexed yes
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Scopus rating (2015): SJR 1.122 SNIP 1.724 CiteScore 3.04
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.184 SNIP 1.738 CiteScore 3.22
A computer-aided software-tool for sustainable process synthesis-intensification

Currently, the process industry is moving towards the design of innovative, more sustainable processes that show improvements in both economic and environmental factors. The design space of unit operations that can be combined to generate process flowsheet alternatives considering known unit operations as well as reported hybrid/intensified unit operations is large and can be difficult to manually navigate in order to determine the best process flowsheet for the production of a desired chemical product. Therefore, it is beneficial to utilize computer-aided methods and tools to enumerate, analyze and determine within the design space, the more sustainable processes. In this paper, an integrated computer-aided software-tool that searches the design space for hybrid/intensified more sustainable process options is presented. Embedded within the software architecture are process synthesis and intensification methods that operate at multiple scales, namely, unit operation, task and phenomena. First a base case process flowsheet (if it is not already available) is generated through process synthesis considering only known unit operations. The generated or supplied base case is then analyzed in order to identify process bottlenecks/limitations (hot-spots) that are translated into design
targets. Next, phenomena-based synthesis is performed to identify process flowsheets that match the design targets through the use of hybrid/intensified unit operations. As these process flowsheets satisfy all process constraints while also matching the design targets, they are therefore more sustainable than the base case. The application of the software-tool to the production of biodiesel is presented, highlighting the main features of the computer-aided, multi-stage, multi-scale methods that are able to determine more sustainable designs.

**General information**

State: Published
Organisations: Department of Chemical and Biochemical Engineering, KT Consortium, Novo Nordisk AS, Auburn University, Technical University of Denmark
Authors: Kumar Tula, A. (Intern), Babi, D. K. (Ekstern), Bottlaender, J. (Ekstern), Eden, M. R. (Ekstern), Gani, R. (Intern)
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  - Web of Science (2016): Indexed yes
  - BFI (2015): BFI-level 2
  - Scopus rating (2015): SJR 1.122 SNIP 1.724 CiteScore 3.04
  - Web of Science (2015): Indexed yes
  - BFI (2014): BFI-level 2
  - Scopus rating (2014): SJR 1.184 SNIP 1.738 CiteScore 3.22
  - Web of Science (2014): Indexed yes
  - BFI (2013): BFI-level 2
  - Scopus rating (2013): SJR 1.223 SNIP 1.776 CiteScore 3.06
  - ISI indexed (2013): ISI indexed yes
  - Web of Science (2013): Indexed yes
  - BFI (2012): BFI-level 2
  - Scopus rating (2012): SJR 1.161 SNIP 1.92 CiteScore 3.05
  - ISI indexed (2012): ISI indexed yes
  - Web of Science (2012): Indexed yes
  - BFI (2011): BFI-level 2
  - Scopus rating (2011): SJR 1.185 SNIP 1.736 CiteScore 2.8
  - ISI indexed (2011): ISI indexed yes
  - Web of Science (2011): Indexed yes
  - BFI (2010): BFI-level 2
  - Scopus rating (2010): SJR 1.176 SNIP 1.796
  - Web of Science (2010): Indexed yes
  - BFI (2009): BFI-level 2
  - Scopus rating (2009): SJR 1.154 SNIP 2.166
  - Web of Science (2009): Indexed yes
  - BFI (2008): BFI-level 2
  - Scopus rating (2008): SJR 1.293 SNIP 2.127
  - Web of Science (2008): Indexed yes
  - Scopus rating (2007): SJR 1.625 SNIP 1.959
  - Web of Science (2007): Indexed yes
  - Scopus rating (2006): SJR 1.304 SNIP 1.936
  - Scopus rating (2005): SJR 1.314 SNIP 1.953
  - Web of Science (2005): Indexed yes
A concise account of techniques available for shipboard sea state estimation

This article gives a review of techniques applied to make sea state estimation on the basis of measured responses on a ship. The general concept of the procedures is similar to that of a classical wave buoy, which exploits a linear assumption between waves and the associated motions. In the frequency domain, this assumption yields the mathematical relation between the measured motion spectra and the directional wave spectrum. The analogy between a buoy and a ship is clear, and the author has worked on this wave buoy analogy for about fifteen years. In the article, available techniques for shipboard sea state estimation are addressed, but with a focus on only the wave buoy analogy. Most of the existing work is based on methods established in the frequency domain but, to counteract disadvantages of the frequency-domain procedures, newer studies are working also on procedures formulated directly in the time domain. Sample results from several studies are included, and the main findings from these are mentioned.

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Authors: Nielsen, U. D. (Intern)
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Scopus rating (2016): CiteScore 2.46 SJR 1.315 SNIP 2.014
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.172 SNIP 1.989 CiteScore 2.19
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.252 SNIP 2.323 CiteScore 2.11
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.178 SNIP 2.773 CiteScore 2.2
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
A configurable FPGA FEC unit for Tb/s optical communication

Decoding of FEC (forward error correction) for optical communication beyond 1 Tb/s is investigated. A configurable single FPGA solution is presented having configurations supporting bit-rates in the range from 40 Gb/s to 1.6 Tb/s. The design allows for trade-offs of bit-rate, footprint, and latency within the resources of the FPGA. A proof-of-concept lab experiment at 40 Gb/s was conducted and pre-FEC — post-FEC performance validated with simulated results.

General information
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Organisations: Department of Photonics Engineering, Coding and Visual Communication, Centre of Excellence for Silicon Photonics for Optical Communications, High-Speed Optical Communication, Technical University of Denmark
Authors: Andersen, J. D. (Intern), Larsen, K. J. (Intern), Bering Bøgh, C. (Ekstern), Forchhammer, S. (Intern), Da Ros, F. (Intern), Dalgaard, K. (Intern), Iqbal, S. (Intern)
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A Consistent Methodology Based Parameter Estimation for a Lactic Acid Bacteria Fermentation Model

Lactic acid bacteria are used in many industrial applications, e.g. as starter cultures in the dairy industry or as probiotics, and research on their cell production is highly required. A first principles kinetic model was developed to describe and understand the biological, physical, and chemical mechanisms in a lactic acid bacteria fermentation. We present here a consistent approach for a methodology based parameter estimation for a lactic acid fermentation. In the beginning, just an initial knowledge based guess of parameters was available and an initial parameter estimation of the complete set of parameters was performed in order to get a good model fit to the data. However, not all parameters are identifiable with the given data set and model structure. Sensitivity, identifiability, and uncertainty analysis were completed and a relevant identifiable subset of parameters was determined for a new parameter estimation including an evaluation of the correlation and confidence intervals of those parameters to double-check identifiability issues. Such a consistent approach supports process modelling and understanding as i.e., one avoids questionable interpretations caused by estimates of actually unidentifiable parameters.

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Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, PILOT PLANT, Chr. Hansen AS
Authors: Spann, R. (Intern), Roca, C. (Ekstern), Kold, D. (Ekstern), Eliasson Lantz, A. (Intern), Gernaey, K. V. (Intern), Sin, G. (Intern)
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Lactic acid bacteria, Parameter estimation, Sensitivity analysis, Identifiability analysis, uncertainty analysis mathematical and computer techniques
DOIs: 10.1016/B978-0-444-63965-3.50372-X
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

A continuous hyperspatial monitoring system of evapotranspiration and gross primary productivity from Unmanned Aerial Systems

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, National Space Institute, Geodesy, Atmospheric Environment, European Commission - Joint Research Center, Technical University of Denmark
Authors: Wang, S. (Intern), Bandini, F. (Intern), Jakobsen, J. (Intern), Zarco Tejada, P. J. (Ekstern), Köppl, C. J. (Ekstern), Olesen, D. H. (Intern), Ibrom, A. (Intern), Bauer-Gottwein, P. (Intern), Garcia, M. (Intern)
Number of pages: 1
Publication date: 2017
Conference: EGU General Assembly 2017, Vienna, Austria, 24/04/2017 - 24/04/2017
Main Research Area: Technical/natural sciences

Publication information
A Continuous-Time Delta-Sigma ADC for Portable Ultrasound Scanners

A fully differential fourth-order 1-bit continuous-time delta-sigma ADC designed in a 65nm process for portable ultrasound scanners is presented in this paper. The circuit design, implementation and measurements on the fabricated die are shown. The loop filter consists of RC-integrators, programmable capacitor arrays, resistors and voltage feedback DACs. The quantizer contains a pulse generator, a high-speed clocked comparator and a pull-down clocked latch to ensure constant delay in the feedback loop. Using this implementation, a small and low-power solution required for portable ultrasound scanner applications is achieved. The converter has a supply voltage of 1.2V, a bandwidth of 10MHz and an oversampling ratio of 16 leading to an operating frequency of 320MHz. The design occupies a die area of 0.0175mm². Simulations with extracted parasitics show a SNR of 45.2dB and a current consumption of 489 µA. However, by adding a model of the measurement setup used, the performance degrades to 42.1dB. The measured SNR and current consumption are 41.6dB and 495 µA, which closely fit with the expected simulations. Several dies have been measured, and an estimation of the die spread distribution is given.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Electronics
Authors: Llimos Muntal, P. (Intern), Jørgensen, I. H. H. (Intern), Bruun, E. (Intern)
Number of pages: 16
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Analog Integrated Circuits and Signal Processing
ISSN (Print): 0925-1030
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Web of Science (2017): Indexed Yes
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Scopus rating (2016): CiteScore 0.74 SJR 0.233 SNIP 0.579
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.204 SNIP 0.405 CiteScore 0.58
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.228 SNIP 0.647 CiteScore 0.64
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.262 SNIP 0.632 CiteScore 0.72
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
A contribution to late Middle Paleolithic chronology of the Levant: New luminescence ages for the Atlit Railway Bridge site, Coastal Plain, Israel

The Atlit Railway Bridge (ARB) prehistoric site is located on the northern coastal plain of Israel, within natural caves which formed in calcareous aeolianites (kurkar), perhaps during a high sea-stand. Flint artifacts belonging to the Levantine later Mousterian tradition and faunal remains were found embedded in the kurkar infill of two caves. The aeolianites in which the caves had developed were previously constrained by IRSL50 dating of feldspars to be older than the last interglacial highest sea-stand (Frechen M. et al., 2004; Chronology of Pleistocene sedimentary cycles in the Carmel Coastal Plain of Israel. Quaternary International 121, 1e52), providing a maximum age for the artifacts.

Samples for luminescence dating were collected from the infill of the two caves (II and III), from the same deposits as the archaeological finds. Both quartz and alkali feldspars (KF) were extracted and measured using four different luminescence signals: optically stimulated luminescence (blue OSL) and violet stimulated luminescence (VSL) on quartz; and the infrared stimulated luminescence (IRSL) post-IR-IR290 signal and the IR50 signal corrected for anomalous fading on KF. The ages obtained from analyses of the different minerals and signals mostly agree within errors. The new luminescence ages date the sediment infill in Caves III and II to ~90 ka and ~70 ka, respectively, indicating that hominin occupation of this locality is coeval with the nearby Skhul Cave and Layer B in Tabun Cave.

General information
State: Accepted/In press
Organisations: Center for Nuclear Technologies, Radiation Physics, The Geological Survey of Israel, University of Haifa, The Hebrew University-Hadassah
Authors: Porat, N. (Ekstern), Jain, M. (Intern), Ronen, A. (Ekstern), Horwitz, L. (Ekstern)
Number of pages: 11
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
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A Contribution to the Understanding of the Combined Effect of Nitrogen and Boron in Grey Cast Iron

Inoculation practice has for decades been based on the addition of small amounts of elements with a strong affinity to O (and S) just before casting takes place. This method is proven—both in theory and in practice—to be effective in most cases. But it has the disadvantage that the nucleation effect fades away over time. In particular, in heavy castings (slow cooling) this effect may cause non-uniform and unacceptable material properties in some parts of the casting. Nitrogen is also known to influence grey iron microstructure. Both graphite flake formation and matrix formation are influenced. However, the obtained effects differ considerably between different reported investigations. This investigation deals with the combined effect of nitrogen and boron and how it is possible to utilize this effect to enhance material properties in heavy grey iron castings. It is shown that the controlled additions of nitrogen and boron can be used to control the microstructure of thick section grey iron castings. A plausible theory for the formation of boron nitride nuclei effective for graphite growth is presented.
A Controller for Dynamic Partial Reconfiguration in FPGA-Based Real-Time Systems

In real-time systems, the use of hardware accelerators can lead to a worst-case execution-time speed-up, to a simplification of its analysis, and to a reduction of its pessimism. When using FPGA technology, dynamic partial reconfiguration (DPR) can be used to minimize the area, by only loading those accelerators that are needed at any given point in time. The DPR controllers provided by the FPGA vendors satisfy a wide range of requirements and rely on software to manage the reconfiguration. This approach may lead to slow reconfiguration and unpredictable timing. This paper presents an open-source DPR controller specially developed for hard real-time systems and prototyped in connection with the open-source multi-core platform for real-time applications T-CREST. The controller enables a processor to perform reconfiguration in a time-predictable manner and supports different operating modes. The paper also presents a software tool for bitstream conversion, compression, and for reconfiguration time analysis. The DPR controller is evaluated in terms of hardware cost, operating frequency, speed, and bitstream compression ratio vs. reconfiguration time trade-off. A simple application example is also presented with the scope of showing the reconfiguration features of the controller.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Embedded Systems Engineering
Authors: Pezzarossa, L. (Intern), Schoebel, M. (Intern), Sparse, J. (Intern)
Pages: 92-100
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Publisher: IEEE
A Convex Reconstruction Model for X-ray Tomographic Imaging with Uncertain Flat-fields

Classical methods for X-ray computed tomography are based on the assumption that the X-ray source intensity is known, but in practice, the intensity is measured and hence uncertain. Under normal operating conditions, when the exposure time is sufficiently high, this kind of uncertainty typically has a negligible effect on the reconstruction quality. However, in time- or dose-limited applications such as dynamic CT, this uncertainty may cause severe and systematic artifacts known as ring artifacts. By carefully modeling the measurement process and by taking uncertainties into account, we derive a new convex model that leads to improved reconstructions despite poor quality measurements. We demonstrate the effectiveness of the methodology based on simulated and real data sets.

A coordination language for databases

We present a coordination language for the modeling of distributed database applications. The language, baptized Klaim-DB, borrows the concepts of localities and nets of the coordination language Klaim but re-incarnates the tuple spaces of Klaim as databases. It provides high-level abstractions and primitives for the access and manipulation of structured data, with integrity and atomicity considerations. We present the formal semantics of Klaim-DB and develop a type system that avoids potential runtime errors such as certain evaluation errors and mismatches of data format in tables, which are monitored in the semantics. The use of the language is illustrated in a scenario where the sales from different branches of a chain of department stores are aggregated from their local databases. Raising the abstraction level and encapsulating integrity checks in the language primitives have benefited the modeling task considerably.
Acoustic emission monitoring of the bending under tension test

Preliminary investigations have shown that acoustic emission has promising aspects as an online monitoring technique for assessment of tribological conditions during metal forming as regards to determination of the onset of galling. In the present study the acoustic emission measuring technique has been applied for online monitoring of the frictional conditions experienced during Bending Under Tension (BUT) testing. The BUT test emulates the forming conditions experienced when drawing sheet material over a die curvature as in deep drawing processes. Monitoring of the developed acoustic emission in BUT testing has been found to describe the frictional conditions during forming well and to allow for accurate assessment of the limits of lubrication.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Moghadam, M. (Intern), Sulaiman, M. H. B. (Intern), Christiansen, P. (Intern), Bay, N. O. (Intern)
Number of pages: 6
Publication date: 2017
Conference: International Conference on the Technology of Plasticity (ICTP 2017), Cambridge, United Kingdom, 17/09/2017 - 17/09/2017
Main Research Area: Technical/natural sciences
Acoustic Tweezing and Patterning of Concentration Fields in Microfluidics

We demonstrate theoretically that acoustic forces acting on inhomogeneous fluids can be used to pattern and manipulate solute concentration fields into spatiotemporally controllable configurations stabilized against gravity. A theoretical framework describing the dynamics of concentration fields that weakly perturb the fluid density and speed of sound is presented and applied to study manipulation of concentration fields in rectangular-channel acoustic eigenmodes and in Bessel-function acoustic vortices. In the first example, methods to obtain horizontal and vertical multilayer stratification of the concentration field at the end of a flow-through channel are presented. In the second example, we demonstrate acoustic tweezing and spatiotemporal manipulation of a local high-concentration region in a lower-concentration medium, thereby extending the realm of acoustic tweezing to include concentration fields.

General information
State: Published
Organisations: Department of Physics, Biophysics and Fluids
Authors: Karlsen, J. T. (Intern), Bruus, H. (Intern)
Number of pages: 10
Publication date: 2017
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Web of Science (2016): Indexed yes
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Publication: Research - peer-review › Journal article – Annual report year: 2017
Acousto-optical phonon excitation in cubic piezoelectric slabs and crystal growth orientation effects

In this paper we investigate theoretically the influence of piezoelectric coupling on phonon dispersion relations. Specifically we solve dispersion relations for a fully coupled zinc-blende freestanding quantum well for different orientations of the crystal unit cell. It is shown that the phonon mode density in GaAs can change by a factor of approximately 2–3 at $q_x a = 1$ for different crystal-growth directions relative to the slab thickness direction. In particular, it is found that optical and acoustic phonon modes are always piezoelectrically coupled, independent of the crystal-growth direction, and will be jointly excited by electrical stimulus. We demonstrate this for an electrically excited freestanding slab for two cases of high-symmetry crystal-growth directions and finally show the impact of the Drude model for permittivity on the phonon dispersion. In particular, it is verified that the piezoelectric effect leads to a drastically enhanced coupling of acoustic and optical phonon modes and increase in the local phonon density of states near the plasma frequency where the permittivity approaches zero.

General information
State: Published
Organisations: Department of Photonics Engineering, University of Southern Denmark
Authors: Willatzen, M. (Intern), Duggen, L. (Ekstern)
Number of pages: 9
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Volume: 95
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Article number: 035310
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Web of Science (2017): Indexed yes
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Web of Science (2016): Indexed yes
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Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
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ISI indexed (2012): ISI indexed no
Web of Science (2012): Indexed yes
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ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2001): Indexed yes
Acousto-optical phonon excitation in piezoelectric wurtzite slabs and crystal growth orientation effects

This paper presents a theoretical investigation of phonon dispersion in piezoelectric slabs of hexagonal crystal symmetry (wurtzite). Specifically, we solve the fully coupled dispersion relations in a GaN free standing quantum well by varying the crystal growth direction from the [001] axis to the [010] axis. Accounting for the Drude model in solving the fully-coupled dispersion relations, phonon modes will generate an additional phonon band, with a high local density of phonon states, close to the plasma frequency. As opposed to cubic crystals with isotropic permittivity, the location of this band varies with crystal orientation. We also find that the phonon mode dependence on the crystal orientation is more pronounced for small in-plane wavenumbers.

General information
State: Published
Organisations: Department of Photonics Engineering, University of Southern Denmark
Authors: Duggen, L. (Ekstern), Willatzen, M. (Intern)
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Main Research Area: Technical/natural sciences

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Article number: 064001
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Scopus rating (2016): SJR 0.632 SNIP 0.866 CiteScore 1.75
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.675 SNIP 0.977 CiteScore 1.73
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.991 SNIP 1.088 CiteScore 1.72
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.173 SNIP 1.133 CiteScore 1.53
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.051 SNIP 0.982 CiteScore 1.42
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.01 SNIP 1.08 CiteScore 1.66
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.82 SNIP 0.88
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.886 SNIP 0.914
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.298 SNIP 1.291
A Cow- and Herd-specific Bio-Economic Model of Intramammary Infections in Dairy Cows

General information
State: Published
Organisations: National Veterinary Institute, Epidemiology, University of Copenhagen
Authors: Kirkeby, C. T. (Intern), Gussmann, M. K. (Intern), Græsbøll, K. (Intern), Nielsen, S. S. (Ekstern), Toft, N. (Intern), Hisham Beshara Halasa, T. (Intern)
Number of pages: 1
Publication date: 2017
Main Research Area: Technical/natural sciences

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A Cow- and Herd-specific Bio-Economic Model of Intramammary Infections in Dairy Cows

Introduction. Mastitis, or intramammary infection (IMI), is one of the most significant diseases in dairy herds worldwide. It is caused by environmental and contagious bacteria. Simulation models have proven useful for evaluating the effect of different control strategies. However, previous published models are not cow-specific and therefore not so detailed in the simulation of host-pathogen interactions. If a simulation model is to be used by dairy farmers as a decision-making tool, it needs to be cow-specific because daily management decisions are made on cow level. Furthermore, as IMI is often caused by more than one pathogen in the same herd, such a simulation model should also be pathogen-specific to account for different transmission characteristics and treatment effects. Moreover, as different strains of pathogens can have different transmission routes (i.e. environmental, contagious or mixed), the model should be able to reflect this diversity. Our objective was thus to create a pathogen-, cow- and herd-specific bio-economic simulation model that could simulate multiple pathogens and strains at the same time within a dairy herd. This model should be able to simulate realistic scenarios for specific herds, thus being a tool for decision-making for individual farmers. Methods: We used an existing mechanistic, stochastic simulation model framework to create an IMI simulation model. This mechanistic model simulates a dairy herd in great detail: i.e. with individual lactation curves for all cows, continuous movement of cows between farm sections and continuous culling decisions made by the farmer. We expanded the model to simulate the individual quarters of cows. This procedure made it possible for cows to have up to four different infections at a time, one per quarter. We implemented two different transmission modes, namely environmental transmission based on a continuous reservoir of pathogens in the farm, and contagious IMI originating from other infected animals in the herd. Currently, the environmental pathogen included is Escherichia coli, and the contagious pathogens are Staphylococcus aureus, Streptococcus agalactiae and Streptococcus uberis. The contagious transmission is simulating transmission, e.g. via milk liners, and depends on the number of quarters with contagious pathogens in the herd. We chose to focus on these four pathogens because they are common in Danish dairy farms. We modelled the increase in somatic cell count (SCC) due to subclinical infection. The reduction in milk yield for individual cows is then based on their SSC. Thus we are able to estimate the economic consequences of each IMI pathogen in the herd, simulate different control scenarios and estimate their epidemiological and economic effects.
Acquired Immune Resistance Follows Complete Tumor Regression without Loss of Target Antigens or IFN gamma Signaling

Cancer immunotherapy can result in durable tumor regressions in some patients. However, patients who initially respond often experience tumor progression. Here, we report mechanistic evidence of tumoral immune escape in an exemplary clinical case: a patient with metastatic melanoma who developed disease recurrence following an initial, unequivocal radiologic complete regression after T-cell-based immunotherapy. Functional cytotoxic T-cell responses, including responses to one mutant neoantigen, were amplified effectively with therapy and generated durable immunologic memory. However, these immune responses, including apparently effective surveillance of the tumor mutanome, did not prevent recurrence. Alterations of the MHC class I antigen-processing and presentation machinery (APM) in resistant cancer cells, but not antigen loss or impaired IFN gamma signaling, led to impaired recognition by tumor-specific CD8(+) T cells. Our results suggest that future immunotherapy combinations should take into account targeting cancer cells with intact and impaired MHC class I-related APM. Loss of target antigens or impaired IFN gamma signaling does not appear to be mandatory for tumor relapse after a complete radiologic regression. Personalized studies to uncover mechanisms leading to disease recurrence within each individual patient are warranted.
A Critical Analysis of the Environmental Dossiers from the OECD Sponsorship Programme for the Testing of Manufactured Nanomaterials

In 2015, the OECD finally published the findings of its seven year testing programme for manufactured nanomaterials. Here, we present the first in-depth analysis of the published OECD dossiers with regards to data on physical and chemical properties, environmental fate and ecotoxicology. Each individual study in the dossiers was reviewed with regard to, among other, which OECD Test Guidelines (TG) were used, and the reliability assigned to the study. We furthermore analyzed in detail the suspension methods used, how media quality was quantified and physical and chemical characterization performed prior, during and/or at the end of the study. We find that the information in the dossiers present an incomplete portfolio of nanomaterial ecotoxicological evaluations that are difficult to draw substantive conclusions from and that most of the studies were not designed to investigate the validity of the OECD Test Guidelines. We acknowledge the effort of the OECD WPMN and recommend that a follow-on program is established with well-defined goals, end-points and direct funding to qualified research laboratories to ensure valid, rigorous, reproducible and efficient research.

General information
State: Published
Organisations: Department of Environmental Engineering, Environmental Chemistry
Authors: Hansen, S. F. (Intern), Hjorth, R. (Intern), Skjolding, L. M. (Intern), Bowman, D. M. (Ekstern), Maynard, A. (Ekstern), Baun, A. (Intern)
Pages: 282-291
Publication date: 2017
A critical period of corticospinal and EMG-EMG coherence detection in healthy infants aged 9-25 weeks: Corticospinal and EMG-EMG coherence during early development

The early postnatal development of functional corticospinal connections in human infants is not fully clarified. We used EEG and EMG to investigate the development of corticospinal and intramuscular coherence as indicators of functional corticospinal connectivity in healthy infants aged 1-66 weeks. EEG was recorded over leg and hand area of motor cortex. EMG recordings were made from right ankle dorsiflexor and right wrist extensor muscles. Quantification of the amount of corticomuscular coherence in the 20-40 Hz frequency band showed a significantly larger coherence for infants aged 9-25 weeks compared to younger and older infants. Coherence between paired EMG recordings from tibialis anterior muscle in the 20-40 Hz frequency band was also significantly larger for the 9-25 week age group. A low-amplitude, broad-duration (40-50 ms) central peak of EMG-EMG synchronization was observed for infants younger than 9 weeks, whereas a short-lasting (10-20 ms) central peak was observed for EMG-EMG synchronization in older infants. This peak was largest for infants aged 9-25 weeks. These data suggest that the corticospinal drive to lower and upper limb muscles shows significant developmental changes with an increase in functional coupling in infants aged 9-25 weeks, a period which coincides partly with the developmental period of normal fidgety movements. We propose that these neurophysiological findings may reflect the existence of a sensitive period where the functional connections between corticospinal tract fibres and spinal motoneurones undergo activity-dependent reorganization. This may be relevant for the timing of early therapy interventions in infants with pre-and perinatal brain injury.
A cross-sectional field study on potential associations between feed quality measures and usage of antimicrobials in commercial mink (Neovison vison)

Feed quality is generally assumed to affect health status in animal production. In previous studies, the feed producer has been found to affect the occurrence of gastrointestinal disease and antimicrobial use in Mink (Neovison vison). Mink are fed with moist, freshly produced feed, based on perishable ingredients. The objective of this study was to investigate the potential effect of specific feed parameters on antimicrobial use on herd level. The study was cross-sectional, including 1472 mink herds, responsible for 97% of oral antimicrobials prescribed for Danish mink during the study period, 2012-2014. Data were obtained from the national veterinary prescription database (VetStat), Kopenhagen Fur database, and the Voluntary Feed Control (Mink producers Organization). All feed batches subject to feed control were included. A multi-variable variance analysis was carried out analysing the effect of the feed parameters total volatile nitrogen, dry matter, crude protein and fat; total bacterial count (21 °C), and counts of sulphite producing bacteria (21 °C), Clostridium spp., faecal cocci (FC) (44 °C), yeast, and mould; presence of Salmonella spp. and Clostridium perfringens (dichotome). Three outcome variables were applied: prescription of oral antimicrobial on herd level within time slots of 3, 5 or 7 days after feeding. Two binomial models were developed, adjusting for significant effects (p < 0.0001) of Ps. aeruginosa infection, herd size, month (season) and year. Antimicrobial prescription was significantly (p < 0.0001) associated with FC (all time
A negative association ($p < 0.0001$) with crude protein on antimicrobial prescription within a 7 day slot suggested an association between low content of crude protein and antimicrobial use. The associations need to be confirmed in controlled studies, and ideally, potential causalities should be investigated. The perspective of such findings could be the development of tests for control of feed ingredients prior to use in the feed production.
A cross-sectional study of oral antibacterial treatment patterns in relation to specific diarrhoeal pathogens in weaner pigs

According to international guidelines, the use of antibacterials should be evidence based and prudent. This register-based, cross-sectional study investigates the potential effect of laboratory findings on the patterns of antibacterial oral (batch) medication of weaner pigs, and the level of compliance with national guidelines for antibacterial use. The study population includes 1,736 weaner herds (~65% of all Danish weaner pigs) that were subject to laboratory analysis from the National Veterinary Institute on Brachyspira pilosicoli, Lawsonia intracellularis, and E.coli (F4 and F18) in 2014. Antibacterial prescription data were obtained from the national database, VetStat. These showed that antibacterial prescriptions for use in weaner pigs was 8.6% lower in spring 2015 compared to spring 2014. The antibacterial use per pig tended (p = 0.08) to decrease more in herds with negative laboratory results compared to herds with a moderate or massive occurrence of either of the pathogens.Irrespective of the laboratory findings on diarrhoeal pathogens, tetracyclines were the most frequently used antibacterials by a substantial margin, both 3 months prior to and 2-5 months after laboratory analysis. According to the national guidelines, tetracyclines are the second or third-choice antibacterial for treatment of diarrhoeal pathogens, due to resistance and co-resistance patterns. Compliance with the guidelines increased in 14% of the herds, mostly following identification of B. pilosicoli within the herd. Between 10% and 20% of the herds did not use batch treatment, despite the presence of moderate–massive amounts of the pathogens.
Background/Aim: Staphylococcus aureus infection associated with orthopedic implants cannot always be controlled. We used a knee prosthesis model with implant-related osteomyelitis in rats to explore induction of an effective immune response with active and passive immunization. Materials and Methods: Fifty-two Sprague-Dawley rats were divided into active (N=28) and passive immunization groups (N=24). A bacterial inoculum of 10^3 S. aureus MN8 was injected into the tibia and the femur marrow before insertion of a non-constrained knee prosthesis in each rat. The active-immunization group received a synthetic oligosaccharide of polysaccharide poly-N-acetylglucosamine (PNAG), 9G1cNH(2) and the passive-immunization group received immunization with immunoglobulin from rabbits infected with S. aureus.

Results/Conclusion: Active immunization against PNAG significantly reduced the consequences of osteomyelitis infection from PNAG-producing intercellular adhesion (ica(+)) but not ica(-) S. aureus. Passive immunization resulted in better clinical assessments in animals challenged with either ica(+) or icaS. aureus, suggesting a lack of specificity in this antiserum.
Active and reactive power support of MV distribution systems using battery energy storage

Adoption of Battery Energy Storage Systems (BESSs) for provision of grid services is increasing. This paper investigates the applications of BESS for the grid upgrade deferral and voltage support of Medium Voltage (MV) distribution systems. A BESS is modelled in Matlab/Simulink to perform peak load shaving and voltage support service from the perspective of Distribution System Operators (DSOs). An active power support algorithm is implemented and the effects of various load profiles as well as different Photovoltaic (PV) penetration scenarios on the operation of BESS and the optimal BESS converter size for peak load shaving are investigated. The BESS annual lifetime degradation is also estimated using a rainflow counting algorithm. A reactive power support algorithm embedded with Q-U droop control is proposed in order to reduce the voltage drop in a part of 10 kV distribution network of Nordhavn in Copenhagen, and the effects of active and reactive power support by BESS on the grid voltage are investigated.

General information
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Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy resources, services and control, Energy system operation and management
Authors: Wang, J. (Intern), Hashemi Toghroljerdi, S. (Intern), You, S. (Intern), Træholt, C. (Intern)
Pages: 382-387
Publication date: 2017

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Voltage control, Load modeling, Reactive power, Reactive power control, Mathematical model, Energy storage, Power control, Battery energy storage system (BESS), peak load shaving, voltage support
DOIs: 10.1109/ICIT.2017.7913261

Relations
Projects:
Active and reactive power support of MV distribution systems using battery energy storage
Source: FindIt
Source-ID: 2351346659
Publication: Research - peer-review › Journal article – Annual report year: 2017

Active Distribution Grid Management based on Robust AC Optimal Power Flow

Further integration of distributed renewable energy sources in distribution systems requires a paradigm change in grid management by the distribution system operators (DSO). DSOs are currently moving to an operational planning approach based on activating flexibility from distributed energy resources in day/hour-ahead stages. This paper follows the DSO trends by proposing a methodology for active grid management by which robust optimization is applied to accommodate spatial-temporal uncertainty. The proposed method entails the use of a multi-period AC-OPF, ensuring a reliable solution for the DSO. Wind and PV uncertainty is modeled based on spatial-temporal trajectories, while a convex hull technique to define uncertainty sets for the model is used. A case study based on real generation data allows illustration and discussion of the properties of the model. An important conclusion is that the method allows the DSO to increase system reliability in the real-time operation. However, the computational effort grows with increases in system robustness.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electricity markets and energy analytics, INESC Porto, Electricite de France
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Number of pages: 12
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: IEEE Transactions on Smart Grid
Active integration of electric vehicles in the distribution network - theory, modelling and practice

Increasing environmental concerns are driving an evolution of the energy system, in which the electrification of the transport sector is considered to be a crucial element. Successful electric vehicle (EV) introduction potentially allows the reduction of CO2 emissions, but also represents a substantial challenge for the power system, especially at the distribution level where high EV concentrations cause various detrimental effects. More specifically, the low-voltage grid operation becomes challenging since uncontrolled EV charging typically coincides with the peak residential consumption, resulting in a considerable peak load and severe voltage deviations. However, EVs hold potential for providing services beyond transportation and, thus, should not be considered merely as passive loads. If managed properly, EVs become flexible resources which can enhance the grid operation, making them an attractive asset for the distribution system operator (DSO). This thesis investigates how EVs can mitigate the self-induced adverse effects and actively help the distribution grid operation, either autonomously or in coordination, e.g., with an EV aggregator. The general framework for EV integration is presented, including the contemporary technology, the relevant stakeholders and the most important challenges. EV flexibility provision to DSOs is studied both from the technical and the regulatory perspective in order to identify the barriers for active EV involvement, and provide a set of policy recommendations for overcoming them. The potential benefits and drawbacks of introducing EV reactive power capability for voltage support are analysed. A decentralised reactive power control is proposed which can, given the appropriate equipment sizing, support the distribution grid independent of the active power modulation. Such an autonomous controller relies only on the local voltage measurement and can be implemented in the short-term future by using the inherent functionality of the EV power electronics. The impact of the proposed control is investigated on a Danish low-voltage grid with the assessment of grid parameters in various conditions. A multi-objective framework is developed for the optimal EV day-ahead scheduling in unbalanced distribution grids. The framework assesses the trade-off between the DSO’s and the EV aggregator’s economic concerns, and uses a fuzzy-satisfying method to balance the interest of both parties. Moreover, the impact of the additional EV reactive power support is analysed when EVs are the only flexible resource, as well as when combined
with other demand response. Experimental activities were conducted to validate the technical feasibility of contemporary EVs to provide flexibility services, both in a laboratory environment and in a real distribution grid. The emphasis was put on assessing several EV parameters, such as EV responsiveness and EV accuracy, to provide basis for future theoretical work, as well as recommendations for improvement. Overall, it is shown that EVs can actively support the distribution grid operation, but there is a critical gap between the political sustainability plans, and the implemented standards and regulatory framework. Moreover, it is demonstrated that DSOs can benefit from the potential EV reactive power control without substantially influencing the losses or the EV aggregator’s cost. Finally, it is proven that series-produced EVs are capable of providing various flexibility services within several seconds, but their accuracy might arise as a topic of concern.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy resources, services and control
Authors: Knezovic, K. (Intern), Træholt, C. (Intern), Marinelli, M. (Intern), Andersen, P. B. (Intern)
Number of pages: 228
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Active Learning in Engineering Education: a (re)introduction
The informal network ‘Active Learning in Engineering Education’ (ALE) has been promoting Active Learning since 2001. ALE creates opportunity for practitioners and researchers of engineering education to collaboratively learn how to foster learning of engineering students. The activities in ALE are centred on the vision that learners construct their knowledge based on meaningful activities and knowledge. In 2014, the steering committee of the ALE network reinforced the need to discuss the meaning of Active Learning and that was the base for this proposal for a special issue. More than 40 submissions were reviewed by the European Journal of Engineering Education community and this theme issue ended up with eight contributions, which are different both in their research and Active Learning approaches. These different Active Learning approaches are aligned with the different approaches that can be increasingly found in indexed journals.

General information
State: Published
Organisations: Office for Study Programmes and Student Affairs, University of Minho, Chalmers University of Technology
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Number of pages: 4
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.01 SJR 0.501 SNIP 1.043
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.812 SNIP 1.456 CiteScore 1.34
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.84 SNIP 1.213 CiteScore 0.96
BFI (2013): BFI-level 2
Active tilting-pad journal bearings supporting flexible rotors: Part II–The model-based feedback-controlled lubrication

This is part II of a twofold paper series dealing with the design and implementation of model-based controllers meant for assisting the hybrid and developing the feedback-controlled lubrication regimes in active tilting pad journal bearings (active TPJBs). In both papers theoretical and experimental analyses are presented with focus on the reduction of rotor lateral vibration. This part is devoted to synthesising model-based LQG optimal controllers (LQR regulator + Kalman Filter) for the feedback-controlled lubrication and is based upon the mathematical model of the rotor-bearing system derived in part I. Results show further suppression of resonant vibrations when using the feedback-controlled or active lubrication, overweighting the reduction already achieved with hybrid lubrication, thus improving the whole machine dynamic performance.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: Salazar, J. A. G. (Intern), Santos, I. (Intern)
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Publication date: 2017
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ISSN (Print): 0301-679X
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.382 SNIP 2.094 CiteScore 3.16
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.437 SNIP 2.04 CiteScore 2.61
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.545 SNIP 2.5 CiteScore 2.44
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.473 SNIP 2.793 CiteScore 2.51
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Active tilting-pad journal bearings supporting flexible rotors: Part I – The hybrid lubrication

This is part I of a twofold paper series, of theoretical and experimental nature, presenting the design and implementation of model-based controllers meant for assisting the hybrid and developing the feedback-controlled lubrication regimes in active tilting-pad journal bearings (active TPJBs). In part I, the flexible rotor-active TPJB modelling is thoroughly covered by establishing the link between the mechanical and hydraulic systems for all regimes. The hybrid lubrication is herein covered in depth; from a control viewpoint, an integral controller to aid such a regime is designed using model-based standard tools. Results show slight improvement on the system dynamic performance by using the hybrid lubrication instead of the passive one. Further improvements are pursued with the active lubrication in part II.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: Salazar, J. A. G. (Intern), Santos, I. (Intern)
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Publication information
Journal: Tribology International
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Active tuned mass damper for damping of offshore wind turbine vibrations

An active tuned mass damper (ATMD) is employed for damping of tower vibrations of fixed offshore wind turbines, where the additional actuator force is controlled using feedback from the tower displacement and the relative velocity of the damper mass. An optimum tuning procedure equivalent to the tuning procedure of the passive tuned mass damper.
combined with a simple procedure for minimizing the control force is employed for determination of optimum damper parameters and feedback gain values. By time domain simulations conducted in an aeroelastic code, it is demonstrated that the ATMD can be used to further reduce the structural response of the wind turbine compared with the passive tuned mass damper and this without an increase in damper mass. A limiting factor of the design of the ATMD is the displacement of the damper mass, which for the ATMD, increases to compensate for the reduction in mass.

**General information**

State: Published  
Organisations: Department of Mechanical Engineering, Solid Mechanics, National Oilwell Varco Denmark I/S  
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Pages: 783–796  
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**Publication information**

Journal: Wind Energy  
Volume: 20  
Issue number: 5  
ISSN (Print): 1095-4244  
Ratings:  
BFI (2017): BFI-level 2  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 2  
Scopus rating (2016): CiteScore 3.37 SJR 1.104 SNIP 2.306  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 2  
Scopus rating (2015): SJR 1.196 SNIP 2.086 CiteScore 3.06  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 2  
Scopus rating (2014): SJR 1.272 SNIP 3.75 CiteScore 3.42  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 2  
Scopus rating (2013): SJR 1.275 SNIP 2.464 CiteScore 2.75  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 2  
Scopus rating (2012): SJR 1.126 SNIP 2.39 CiteScore 2.36  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 2  
Scopus rating (2011): SJR 1.024 SNIP 2.718 CiteScore 2.49  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 2  
Scopus rating (2010): SJR 1.487 SNIP 2.013  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 2  
Scopus rating (2009): SJR 1.124 SNIP 1.448  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 0.826 SNIP 1.559  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.053 SNIP 1.453  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 0.637 SNIP 1.689  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 0.287 SNIP 0.9
Active vibration-based structural health monitoring system for wind turbine blade: Demonstration on an operating Vestas V27 wind turbine

This study presents a structural health monitoring system that is able to detect structural defects of wind turbine blade such as cracks, leading/trailing-edge opening, or delamination. It is shown that even small defects of at least 15 cm size can be detected remotely without stopping the wind turbine. The structural health monitoring system presented is vibration-based: mechanical energy is artificially introduced by means of an electromechanical actuator, whose plunger periodically hits the blade. The induced vibrations propagate along the blade and are picked up by accelerometers mounted along the blade. The vibrations in mid-range frequencies are utilized: this range is above the frequencies excited by blade–wind interaction, ensuring a good signal-to-noise ratio. At the same time, the corresponding wavelength is short enough to deliver required damage detection resolution and long enough to be able to propagate the entire blade length. This article demonstrates the system on a Vestas V27 wind turbine. One blade of the wind turbine was equipped with the system, and a 3.5-month monitoring campaign was conducted while the turbine was operating normally. During the campaign, a defect—a trailing-edge opening—was artificially introduced into the blade and its size was gradually increased from the original 15 to 45 cm. Using a semi-supervised learning algorithm, the system was able to detect even the smallest amount of damage while the wind turbine was operating under different weather conditions. This article provides detailed information about the instrumentation and the measurement campaign and explains the damage detection algorithm.

General information
State: Published
Authors: Tcherniak, D. (Ekstern), Mølgaard, L. L. (Intern)
Pages: 536-550
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Scopus rating (2016): CiteScore 3.01 SJR 1.044 SNIP 1.641
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.17 SNIP 1.752 CiteScore 2.37
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.924 SNIP 3.364 CiteScore 3.43
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.312 SNIP 2.645 CiteScore 2.86
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.781 SNIP 1.996 CiteScore 1.58
Activity-Based Collaboration for Interactive Spaces

Activity-based computing (ABC) is a conceptual and technological framework for designing interactive systems that offers a better mapping between the activities people conduct and the digital entities they use. In ABC, rather than interacting directly with lower-level technical entities like files, folder, documents, etc., users are able to interact with ‘activities’ which encapsulate files and other low-level resources. In ABC an ‘activity’ can be shared between collaborating users and can be accessed on different devices. As such, ABC is a framework that suits the requirements of designing interactive spaces. This chapter provides an overview of ABC with a special focus on its support for collaboration (‘Activity Sharing’) and multiple devices (‘Activity Roaming’). These ABC concepts are illustrated as implemented in two different interactive spaces technologies; ReticularSpaces [1] and the eLabBench [2, 3]. The chapter discusses the benefits of activity-based collaboration support for these interactive spaces, while also discussing limitations and challenges to be addressed in further research.

General information

State: Published
Organisations: Copenhagen Center for Health Technology, Department of Applied Mathematics and Computer Science, Embedded Systems Engineering, Centre National de la Recherche Scientifique, IT University of Copenhagen
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Pages: 233-257
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Chapter: 11
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Activity of type I methanotrophs dominates under high methane concentration: Methanotrophic activity in slurry surface crusts as influenced by methane, oxygen, and inorganic nitrogen

Livestock slurry is a major source of atmospheric methane (CH4), but surface crusts harboring methane-oxidizing bacteria (MOB) could mediate against CH4 emissions. This study examined conditions for CH4 oxidation by in situ measurements of oxygen (O2) and nitrous oxide (N2O), as a proxy for inorganic N transformations, in intact crusts using microsensors. This was combined with laboratory incubations of crust material to investigate the effects of O2, CH4, and inorganic N on CH4 oxidation, using 13CH4 to trace C incorporation into lipids of MOB. Oxygen penetration into the crust was 2 to 14 mm, confining the potential for aerobic CH4 oxidation to a shallow layer. Nitrous oxide accumulated within or below the zone of O2 depletion. With 102 ppmv CH4 there was no O2 limitation on CH4 oxidation at O2 concentrations as low as...
2%, whereas CH₄ oxidation at 104 ppmv CH₄ was reduced at =5% O₂. As hypothesized, CH₄ oxidation was in general
inhibited by inorganic N, especially NO₂⁻, and there was an interaction between N inhibition and O₂ limitation at 102 ppmv
CH₄, as indicated by consistently stronger inhibition of CH₄ oxidation by NH₄⁺ and NO₃⁻ at 3% compared with 20% O₂.
Recovery of 13C in phospholipid fatty acids suggested that both Type I and Type II MOB were active, with Type I
dominating high-concentration CH₄ oxidation. Given the structural heterogeneity of crusts, CH₄ oxidation activity likely
varies spatially as constrained by the combined effects of CH₄, O₂, and inorganic N availability in microsites.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, Aarhus University
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Pages: 767-775
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Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.51 SJR 1.049 SNIP 1.15
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.255 SNIP 1.204 CiteScore 2.69
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.274 SNIP 1.271 CiteScore 2.66
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.318 SNIP 1.275 CiteScore 2.7
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.371 SNIP 1.22 CiteScore 2.51
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.47 SNIP 1.359 CiteScore 2.53
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.299 SNIP 1.314
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.425 SNIP 1.354
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.549 SNIP 1.478
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.706 SNIP 1.437
Scopus rating (2006): SJR 1.897 SNIP 1.689
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.676 SNIP 1.501
Scopus rating (2004): SJR 1.898 SNIP 1.665
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.738 SNIP 1.807
Web of Science (2003): Indexed yes
Acute dosing of vortioxetine strengthens event-related brain activity associated with engagement of attention and cognitive functioning in rats

Studies of the antidepressant vortioxetine have demonstrated beneficial effects on cognitive dysfunction associated with depression. To elucidate how vortioxetine modulates neuronal activity during cognitive processing we investigated the effects of vortioxetine (3 and 10 mg/kg) in rats performing an auditory oddball (deviant target) task. We investigated neuronal activity in target vs non-target tone responses in vehicle-treated animals using electroencephalographic (EEG) recordings. Furthermore, we characterized task performance and EEG changes in target tone responses of vortioxetine vs controls. Quantification of event-related potentials (ERPs) was supplemented by analyses of spectral power and inter-trial phase-locking. The assessed brain regions included prelimbic cortex, the hippocampus, and thalamus. As compared to correct rejection of non-target tones, correct target tone responses elicited increased EEG power in all regions. Additionally, neuronal synchronization was increased in vehicle-treated rats during both early and late ERP responses to target tones. This indicates a significant consistency of local phases across trials during high attentional load. During early sensory processing, vortioxetine increased both thalamic and frontal synchronized gamma band activity and EEG power in all brain regions measured. Finally, vortioxetine increased the amplitude of late hippocampal P3-like ERPs, the rodent correlate of the human P300 ERP. These findings suggest differential effects of vortioxetine during early sensory registration and late endogenous processing of auditory discrimination. Strengthened P3-like ERP response may relate to the pro-cognitive profile of vortioxetine in rodents. Further investigations are warranted to explore the mechanism by which vortioxetine increases network synchronization during attentive and cognitive processing.
Acute toxicity of copper oxide nanoparticles to Daphnia magna under different test conditions

The acute toxicity of monodispersed 6 nm and <100 nm poly-dispersed copper oxide nanoparticles toward *Daphnia magna* was assessed using 48 h immobilization tests. CuSO₄ was used as a reference. Four different exposure conditions were tested, to study whether the toxicity of the nanoparticle suspensions changed in a way similar to what is known for dissolved Cu: first in ISO standard test conditions (pH 7.8), second with slight acidity (pH 6.5), third in the presence of citric acid, and fourth in the presence of humic acid. For all four exposure conditions, the toxicity of Cu employed in the three forms followed the same sequence, i.e., CuSO₄ > monodispersed 6 nm CuO ≫ poly-dispersed CuO. The toxicity of all Cu forms decreased from pH 6.5, ≫ pH 7.8, ≫ pH 7.8 + citric acid, to ≫ pH 7.8 + humic acid. This pattern is in agreement with concentrations of Cu²⁺ calculated using the equilibrium model MINTEQ. These findings show that the acute toxicity of copper oxide nanoparticles is governed by test water composition and the chemical species Cu²⁺.

General information

State: Published
Organisations: Department of Environmental Engineering, Environmental Chemistry, Roskilde Universitet, Technical University of Denmark
Authors: Thit, A. (Ekstern), Huggins, K. (Ekstern), Selck, H. (Ekstern), Baun, A. (Intern)
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Journal: Toxicological and Environmental Chemistry
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Issue number: 4
ISSN (Print): 0277-2248
Ratings:
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Web of Science (2017): Indexed yes
Adaptation to flood risk: Results of international paired flood event studies

As flood impacts are increasing in large parts of the world, understanding the primary drivers of changes in risk is essential for effective adaptation. To gain more knowledge on the basis of empirical case studies, we analyze eight paired floods, that is, consecutive flood events that occurred in the same region, with the second flood causing significantly lower damage. These success stories of risk reduction were selected across different socioeconomic and hydro-climatic contexts. The potential of societies to adapt is uncovered by describing triggered societal changes, as well as formal measures and spontaneous processes that reduced flood risk. This novel approach has the potential to build the basis for an international data collection and analysis effort to better understand and attribute changes in risk due to hydrological extremes in the framework of the IAHSs Panta Rhei initiative. Across all case studies, we find that lower damage caused by the second event was mainly due to significant reductions in vulnerability, for example, via raised risk awareness, preparedness, and improvements of organizational emergency management. Thus, vulnerability reduction plays an essential role for successful adaptation. Our work shows that there is a high potential to adapt, but there remains the challenge to stimulate measures that reduce vulnerability and risk in periods in which extreme events do not occur.
Adapted wavelet transform improves time-frequency representations: a study of auditory elicited P300-like event-related potentials in rats.

Objective. Active auditory oddball paradigms are simple tone discrimination tasks used to study the P300 deflection of event-related potentials (ERPs). These ERPs may be quantified by time-frequency analysis. As auditory stimuli cause early high frequency and late low frequency ERP oscillations, the continuous wavelet transform (CWT) is often chosen for decomposition due to its multi-resolution properties. However, as the conventional CWT traditionally applies only one mother wavelet to represent the entire spectrum, the time-frequency resolution is not optimal across all scales. To account for this, we developed and validated a novel method specifically refined to analyse P300-like ERPs in rats. Approach. An adapted CWT (aCWT) was implemented to preserve high time-frequency resolution across all scales by commission of multiple wavelets operating at different scales. First, decomposition of simulated ERPs was illustrated using the classical CWT and the aCWT. Next, the two methods were applied to EEG recordings obtained from prefrontal cortex in rats performing a two-tone auditory discrimination task. Main results. While only early ERP frequency changes between responses to target and non-target tones were detected by the CWT, both early and late changes were successfully described with strong accuracy by the aCWT in rat ERPs. Increased frontal gamma power and phase synchrony was observed particularly within theta and gamma frequency bands during deviant tones. Significance. The study suggests superior performance of the aCWT over the CWT in terms of detailed quantification of time-frequency properties of ERPs. Our methodological investigation indicates that accurate and complete assessment of time-frequency components of short-time neural signals is feasible with the novel analysis approach which may be advantageous for characterisation of several types of evoked potentials in particularly rodents.
Adapting the Accreditation Procedures to a New Educational Technology

The FP7 PELARS project deals with the problem of developing a new educational technology for practical activities. As it is stated into the project proposal [1], the project produces and evaluates technology designs for analytic data generation for constructivist learning scenarios in Science, Technology, Engineering and Math (STEM) topics, including: technology solutions, infrastructure, activities, assessment, curricula, and classroom furniture and environment designs. The project addresses three different learning contexts (post-secondary design studios, post-secondary engineering sciences classrooms, and secondary-level high school STEM learning environments) across four national settings in the EU. In the upper defined context, this paper deals with the problem of adapting the accreditation of the engineering programs to the new educational technologies.

General information
State: Published
Organisations: Center for Bachelor of Engineering Studies, Afdelingen for El-teknologi, University of Craiova
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Main Research Area: Technical/natural sciences

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Adaptive control in an artificial pancreas for people with type 1 diabetes
In this paper, we discuss overnight blood glucose stabilization in patients with type 1 diabetes using a Model Predictive Controller (MPC). We compute the model parameters in the MPC using a simple and systematic method based on a priori available patient information. We describe and compare 3 different model structures. The first model structure is an
autoregressive integrated moving average with exogenous input (ARIMAX) structure. The second model structure is an autoregressive moving average with exogenous input (ARMAX) model, i.e. a model without an integrator. The third model structure is an adaptive ARMAX model in which we use a recursive extended least squares (RELS) method to estimate parameters of the stochastic part. In addition, we describe some safety layers in the control algorithm that improve the controller robustness and reduce the risk of hypoglycemia. We test and compare our control strategies using a virtual clinic of 100 randomly generated patients with a representative inter-subject variability. This virtual clinic is based on the Hovorka model. We consider the case where only half of the meal bolus is administered at mealtime, and the case where the insulin sensitivity increases during the night. The numerical results suggest that the use of an integrator leads to higher occurrence of hypoglycemia than for the controllers without the integrator. Compared to other control strategies, the adaptive MPC reduces both the time spent in hypoglycemia and the time spent in hyperglycemia.
Adaptive feedforward control of exhaust recirculation in large diesel engines

Environmental concern has led the International Maritime Organization to restrict NOₓ emissions from marine diesel engines. Exhaust gas recirculation (EGR) systems have been introduced in order to comply to the new standards. Traditional fixed-gain feedback methods are not able to control the EGR system adequately in engine loading transients so alternative methods are needed. This paper presents the design, convergence proofs and experimental validation of an adaptive feedforward controller that significantly improves the performance in loading transients. First the control concept is generalized to a class of first order Hammerstein systems with sensor delay and exponentially converging bounds of the control error are proven analytically. It is then shown how to apply the method to the EGR system of a two-stroke crosshead diesel engine. The controller is validated by closed loop simulation with a mean-value engine model, on an engine test bed and on a vessel operating at sea. A significant reduction of smoke formation during loading transients is observed both visually and with an opacity sensor.

General information
State: Published
Organisations: Department of Electrical Engineering, Automation and Control, Linköping University, MAN Diesel & Turbo
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Scopus rating (2016): CiteScore 3.42 SJR 1.287 SNIP 2.156
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.194 SNIP 2.091 CiteScore 3.05
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.323 SNIP 2.626 CiteScore 3.26
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.433 SNIP 3.278 CiteScore 3.5
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.267 SNIP 3.118 CiteScore 3.02
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.544 SNIP 2.911 CiteScore 2.96
Adaptive Laboratory Evolution of Antibiotic Resistance Using Different Selection Regimes Lead to Similar Phenotypes and Genotypes

Antibiotic resistance is a global threat to human health, wherefore it is crucial to study the mechanisms of antibiotic resistance as well as its emergence and dissemination. One way to analyze the acquisition of de novo mutations conferring antibiotic resistance is adaptive laboratory evolution. However, various evolution methods exist that utilize different population sizes, selection strengths, and bottlenecks. While evolution in increasing drug gradients guarantees high-level antibiotic resistance promising to identify the most potent resistance conferring mutations, other selection regimes are simpler to implement and therefore allow higher throughput. The specific regimen of adaptive evolution may have a profound impact on the adapted cell state. Indeed, substantial effects of the selection regime on the resulting geno- and phenotypes have been reported in the literature. In this study we compare the geno- and phenotypes of Escherichia coli after evolution to Amikacin, Piperacillin, and Tetracycline under four different selection regimes. Interestingly, key mutations that confer antibiotic resistance as well as phenotypic changes like collateral sensitivity and cross-resistance emerge independently of the selected regime. Yet, lineages that underwent evolution under mild selection displayed a growth advantage independently of the acquired level of antibiotic resistance compared to lineages adapted under maximal selection in a drug gradient. Our data suggests that even though different selection regimes result in subtle genotypic and phenotypic differences key adaptations appear independently of the selection regime.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Bacterial Synthetic Biology, Department of Applied Mathematics and Computer Science, Research Groups, Department of Biotechnology and Biomedicine
Authors: Jahn, L. J. (Intern), Munck, C. (Intern), Ellabaan, M. M. H. (Intern), Sommer, M. O. A. (Intern)
Number of pages: 14
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
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Volume: 8
Article number: 816
Adaptive management in the context of barriers in European freshwater ecosystems

Many natural habitats have been modified to accommodate for the presence of humans and their needs. Infrastructures such as hydroelectric dams, weirs, culverts and bridges are now a common occurrence in streams and rivers across the world. As a result, freshwater ecosystems have been altered extensively, affecting both biological and geomorphological components of the habitats. Many fish species rely on these freshwater ecosystems to complete their lifecycles, and the presence of barriers has been shown to reduce their ability to migrate and sustain healthy populations. In the long run, barriers may have severe repercussions on population densities and dynamics of aquatic animal species. There is currently an urgent need to address these issues with adequate conservation approaches. Adaptive management provides a relevant approach to managing barriers in freshwater ecosystems as it addresses the uncertainties of dealing with natural systems, and accommodates for future unexpected events, though this approach may not be suitable in all instances. A literature search on this subject yielded virtually no output. Hence, we propose a step-by-step guide for implementing adaptive management, which could be used to manage freshwater barriers.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, University of Durham, Durham University
Authors: Birnie-Gauvin, K. (Intern), Tummers, J. S. (Ekstern), Lucas, M. C. (Ekstern), Aarestrup, K. (Intern)
Pages: 436-441
Publication date: 2017
Main Research Area: Technical/natural sciences
Adaptive Observer for Nonlinearly Parameterised Hammerstein System with Sensor Delay – Applied to Ship Emissions Reduction

Taking offspring in a problem of ship emission reduction by exhaust gas recirculation control for large diesel engines, an underlying generic estimation challenge is formulated as a problem of joint state and parameter estimation for a class of multiple-input single-output Hammerstein systems with first order dynamics, sensor delay and a bounded time-varying parameter in the nonlinear part. The paper suggests a novel scheme for this estimation problem that guarantees exponential convergence to an interval that depends on the sensitivity of the system. The system is allowed to be nonlinear parameterized and time dependent, which are characteristics of the industrial problem we study. The approach requires the input nonlinearity to be a sector nonlinearity in the time-varying parameter. Salient features of the approach...
include simplicity of design and implementation. The efficacy of the adaptive observer is shown on simulated cases, on tests with a large diesel engine on test bed and on tests with a container vessel.

**General information**
State: E-pub ahead of print
Organisations: Department of Electrical Engineering, Automation and Control, MAN Diesel & Turbo, Linköping University
Authors: Nielsen, K. V. (Ekstern), Blanke, M. (Intern), Eriksson, L. (Ekstern)
Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
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Web of Science (2017): Indexed Yes
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Scopus rating (2016): SJR 2.017 SNIP 2.755 CiteScore 5.17
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.85 SNIP 2.757 CiteScore 4.72
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.958 SNIP 3.042 CiteScore 4.34
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.825 SNIP 3.498 CiteScore 4.41
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.62 SNIP 3.037 CiteScore 3.7
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.698 SNIP 3.013 CiteScore 3.26
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
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Scopus rating (2010): SJR 1.171 SNIP 2.483
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.737 SNIP 2.84
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.503 SNIP 2.787
Scopus rating (2007): SJR 1.147 SNIP 2.26
Scopus rating (2006): SJR 1.066 SNIP 2.409
Scopus rating (2005): SJR 1.12 SNIP 2.694
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Scopus rating (2003): SJR 1.722 SNIP 2.408
Scopus rating (2002): SJR 2.532 SNIP 2.721
Scopus rating (2001): SJR 2.182 SNIP 2.124
Scopus rating (2000): SJR 1.633 SNIP 2.099
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2016_OxygenObserver_kvn_mb_le.pdf
DOIs:
Adding Value to Bioethanol through a Purification Process Revamp

A comprehensive technical feasibility study was conducted of a bioethanol demonstration plant with the aim of converting parts of an existing fuel-grade bioethanol production into a more valuable solvent-grade ethanol. The study focuses on the separation unit, which consists of three consecutive distillation columns and a dehydration step using molecular sieves. This separation unit did not permit sufficient removal of crotonaldehyde and methanol for obtaining solvent-grade ethanol. Therefore, an additional distillation column after the dehydration step was investigated by simulation. It is operated at subatmospheric pressure and enables simultaneous removal of methanol, crotonaldehyde, and water in the distillate. The distillate meets the fuel-grade ethanol specifications, while the bottom product meets the solvent-grade specifications. It enables around 70% solvent-grade ethanol production and employs a vacuum pump that is already used in the considered plant. A stationary operating point is characterized by online operational data and experimental results of liquid samples. Particular emphasis during the characterization is put on trace compounds. Ethanol and the following 13 trace compounds were analyzed experimentally: Acetaldehyde, 1-propanal, 1-butanal, crotonaldehyde, benzaldehyde, ethyl acetate, methanol, 1-propanol, 1-butanol, 2-butanol, 2-methyl-l-propanol, 2-methyl-l-butanol, and 3-methyl-l-butanol. A simulation platform was established and evaluated with excellent agreement compared to the operational data. The beer composition (separation unit feed) and a complete stream summary for the separation unit is provided.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Inbicon A/S, University of Copenhagen
Authors: Bisgaard, T. (Intern), Mauricio Iglesias, M. (Intern), Huusom, J. K. (Intern), Gernaey, K. (Intern), Dohrup, J. (Ekstern), Petersen, M. A. (Ekstern), Abildskov, J. (Intern)
Pages: 5692-5704
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Main Research Area: Technical/natural sciences

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Scopus rating (2015): SJR 0.949 SNIP 1.146 CiteScore 2.87
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Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 0.982 SNIP 1.243 CiteScore 2.6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
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Additively manufactured metallic porous biomaterials based on minimal surfaces: A unique combination of topological, mechanical, and mass transport properties

Porous biomaterials that simultaneously mimic the topological, mechanical, and mass transport properties of bone are in great demand but are rarely found in the literature. In this study, we rationally designed and additively manufactured (AM) porous metallic biomaterials based on four different types of triply periodic minimal surfaces (TPMS) that mimic the properties of bone to an unprecedented level of multi-physics detail. Sixteen different types of porous biomaterials were rationally designed and fabricated using selective laser melting (SLM) from a titanium alloy (Ti-6Al-4V). The topology, quasi-static mechanical properties, fatigue resistance, and permeability of the developed biomaterials were then characterized. In terms of topology, the biomaterials resembled the morphological properties of trabecular bone including mean surface curvatures close to zero. The biomaterials showed a favorable but rare combination of relatively low elastic properties in the range of those observed for trabecular bone and high yield strengths exceeding those reported for cortical bone. This combination allows for simultaneously avoiding stress shielding, while providing ample mechanical support for bone tissue regeneration and osseointegration. Furthermore, as opposed to other AM porous biomaterials developed to date for which the fatigue endurance limit has been found to be of their yield (or plateau) stress, some of the biomaterials developed in the current study showed extremely high fatigue resistance with endurance limits up to 60% of their yield stress. It was also found that the permeability values measured for the developed biomaterials were in the range of values reported for trabecular bone. In summary, the developed porous metallic biomaterials based on TPMS mimic the topological, mechanical, and physical properties of trabecular bone to a great degree. These properties make them potential candidates to be applied as parts of orthopedic implants and/or as bone-substituting biomaterials. Statement of Significance Bone-substituting biomaterials aim to mimic bone properties. Although mimicking some of bone properties is feasible, biomaterials that could simultaneously mimic all or most of the relevant bone properties are rare. We used rational design and additive manufacturing to develop porous metallic biomaterials that exhibit an interesting combination
of topological, mechanical, and mass transport properties. The topology of the developed biomaterials resembles that of trabecular bone including a mean curvature close to zero. Moreover, the developed biomaterials show an unusual combination of low elastic modulus to avoid stress shielding and high strength to provide mechanical support. The fatigue resistance of the developed biomaterials is also exceptionally high, while their permeability is in the range of values reported for bone. (C) 2017 Acta Materialia Inc. Published by Elsevier Ltd. All rights reserved.

**General information**

State: Published

Organisations: Centre for oil and gas – DTU, Delft University of Technology, 3D Systems Leuven

Authors: Bobbert, F. S. L. (Ekstern), Lietaert, K. (Ekstern), Eftekhari, A. A. (Intern), Pouran, B. (Ekstern), Ahmadi, S. M. (Ekstern), Weinans, H. (Ekstern), Zadpoor, A. A. (Ekstern)

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Web of Science (2016): Indexed yes

BFI (2015): BFI-level 2

Scopus rating (2015): SJR 1.997 SNIP 1.99 CiteScore 6.58

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 2

Scopus rating (2014): SJR 1.814 SNIP 2.324 CiteScore 6.53

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 2

Scopus rating (2013): SJR 1.963 SNIP 2.269 CiteScore 6.41

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 2

Scopus rating (2012): SJR 1.904 SNIP 2.125 CiteScore 5.51

ISI indexed (2012): ISI indexed yes

Scopus rating (2011): SJR 1.808 SNIP 1.91 CiteScore 5.15

ISI indexed (2011): ISI indexed yes

Scopus rating (2010): SJR 1.794 SNIP 1.964

Web of Science (2010): Indexed yes

Scopus rating (2009): SJR 1.399 SNIP 1.662

Scopus rating (2008): SJR 1.404 SNIP 1.981

Scopus rating (2007): SJR 1.199 SNIP 1.493

Web of Science (2007): Indexed yes

Scopus rating (2006): SJR 0.837 SNIP 1.131

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**Addressing Energy System Modelling Challenges: The Contribution of the Open Energy Modelling Framework (oemof)**

The process of modelling energy systems is accompanied by challenges inherently connected with mathematical modelling. However, due to modern realities in the 21st century, existing challenges are gaining in magnitude and are supplemented with new ones. Modellers are confronted with a rising complexity of energy systems and high uncertainties...
on different levels. In addition, interdisciplinary modelling is necessary for getting insight in mechanisms of an integrated world. At the same time models need to meet scientific standards as public acceptance becomes increasingly important. In this intricate environment model application as well as result communication and interpretation is also getting more difficult.

In this paper we present the open energy modelling framework (oemof) as a novel approach for energy system modelling and derive its contribution to existing challenges. Therefore, based on literature review, we outline challenges for energy system modelling as well as existing and emerging approaches. Based on a description of the philosophy and elementary structural elements of oemof, a qualitative analysis of the framework with regard to the challenges is undertaken. Inherent features of oemof such as the open source, open data, non-proprietary and collaborative modelling approach are preconditions to meet modern realities of energy modelling. Additionally, a generic basis with an object-oriented implementation allows to tackle challenges related to complexity of highly integrated future energy systems and sets the foundation to address uncertainty in the future. Experiences from the collaborative modelling approach can enrich interdisciplinary modelling activities.

Our analysis concludes that there are remaining challenges that can neither be tackled by a model nor a modelling framework. Among these are problems connected to result communication and interpretation.

**General information**
State: Accepted/In press
Organisations: Department of Management Engineering, Systems Analysis
Authors: Hilpert, S. (Ekstern), Günther, S. (Ekstern), Kaldemeyer, C. (Ekstern), Krien, U. (Ekstern), Plessmann, G. (Ekstern), Wiese, F. (Intern), Wingenbach, C. (Ekstern)
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**Addressing the Conflict of Interest between Aggregators and DSOs in Deregulated Energy Markets**
This paper investigates potential conflicts of interest between distribution system operators (DSOs) and aggregators. We propose a method to quantify the allowed operating range of residential flexible loads in a local distribution network. The calculated bounds can be used to formulate DSO services, tradable on a potential DSO service market platform. Aggregators are considered, concentrating thermostatically controlled loads and electric vehicles with vehicle2grid technology in order to perform arbitrage on the power market and to offer ancillary services.

**General information**
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Main Research Area: Technical/natural sciences
Conference: 52nd International Universities' Power Engineering Conference, Greece, 29/08/2017 - 29/08/2017
Power distribution, Demand-side management, Load flow
Electronic versions: PID4921149_checked.pdf
Source: PublicationPreSubmission
Source-ID: 136744630
Addressing uncertainty in atomistic machine learning

Machine-learning regression has been demonstrated to precisely emulate the potential energy and forces that are output from more expensive electronic-structure calculations. However, to predict new regions of the potential energy surface, an assessment must be made of the credibility of the predictions. In this perspective, we address the types of errors that might arise in atomistic machine learning, the unique aspects of atomistic simulations that make machine-learning challenging, and highlight how uncertainty analysis can be used to assess the validity of machine-learning predictions. We suggest this will allow researchers to more fully use machine learning for the routine acceleration of large, high-accuracy, or extended-time simulations. In our demonstrations, we use a bootstrap ensemble of neural network-based calculators, and show that the width of the ensemble can provide an estimate of the uncertainty when the width is comparable to that in the training data. Intriguingly, we also show that the uncertainty can be localized to specific atoms in the simulation, which may offer hints for the generation of training data to strategically improve the machine-learned representation.
A Decade of Solid Oxide Electrolysis Improvements at DTU Energy

Solid oxide electrolysis cells (SOECs) can efficiently convert electrical energy (e.g. surplus wind power) to energy stored in fuels such as hydrogen or other synthetic fuels. Performance and durability of the SOEC has increased orders of magnitudes within the last decade. This paper presents a short review of the R&D work on SOEC single cells conducted at DTU Energy from 2005 to 2015. The SOEC improvements have involved increasing the of the oxygen electrode performance, elimination of impurities in the feed streams, optimization of processing routes, and fuel electrode structure optimization. All together, these improvements have led to a decrease in long-term degradation rate from ∼40 %/kh to ∼0.4 %/kh for steam electrolysis at -1 A/cm², while the initial area specific resistance has been decreased from 0.44 Ωcm² to 0.15 Ωcm² at -0.5 A/cm² and 750 °C.

General information
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Scopus rating (2015): SJR 0.214 SNIP 0.257 CiteScore 0.36
BFI (2014): BFI-level 1
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A Decision Support Tool for Transient Stability Preventive Control

The paper presents a decision support tool for transient stability preventive control contributing to increased situation awareness of control room operators by providing additional information about the state of the power system in terms of transient stability. A time-domain approach is used to assess the transient stability for potentially critical faults. Potential critical fault locations are identified by a critical bus screening through analysis of pre-disturbance steady-state conditions. The identified buses are subject to a fast critical contingency screening determining the actual critical contingencies/buses. These two screenings aim at reducing the computational burden of the assessment, since only contingencies considered as critical are taken into account. The critical clearing times for the critical contingencies are determined. A preventive re-dispatch of generators to ensure a predefined minimum critical clearing time for faults at all buses is proposed, while costs are minimized. The results of the assessment are presented to the control room operator, who decides to accept the suggested dispatch or to repeat the assessment considering additional user-specific constraints. The effectiveness of the proposed method is demonstrated on a standard nine-bus and the New England test system.
Control room operator, Decision support, Online assessment, Preventive control, Situation awareness, Transient stability

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Projects:
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Publication: Research - peer-review › Journal article – Annual report year: 2017
A density functional theory study of the carbon-coating effects on lithium iron borate battery electrodes

Lithium iron borate (LiFeBO3) is a promising cathode material due to its high theoretical specific capacity, inexpensive components and a small volume change during operation. Yet, challenges relating to severe air- and moisture-induced degradation necessitate the application of a protective coating on the electrode which also improves the electronic conductivity. However, not much is known about the preferential geometries of the coating as well as how these coating–electrode interfaces influence the lithium diffusion between the coating and the electrode. Here, we therefore present a density functional theory (DFT) study of the anchoring configurations of carbon coating on the LiFeBO3 electrode and its implications on the interfacial lithium diffusion. Due to large barriers associated with Li-ion diffusion through a parallel-oriented pristine graphene coating on the FeBO3 and LiFeBO3 electrode surfaces, large structural defects in the graphene coating are required for fast Li-ion diffusion. However, such defects are expected to exist only in small concentrations due to their high formation energies. Alternative coating geometries were therefore investigated, and the configuration in which the graphene coating layers were anchored normal to the electrode surface at B and O atoms were found to be most stable. Nudged elastic band (NEB) calculations of the lithium diffusion barriers across the interface between the optimally oriented coating layers and the electrode show no kinetic limitations for lithium extraction and insertion. Additionally, this graphite-coating configuration showed partial blocking of electrode-degrading species.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Atomic scale modelling and materials
Authors: Loftager, S. (Intern), Garcia Lastra, J. M. (Intern), Vegge, T. (Intern)
Pages: 2087-2094
Publication date: 2017
Main Research Area: Technical/natural sciences

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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.771 SNIP 1.244 CiteScore 4.45
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.772 SNIP 1.253 CiteScore 4.29
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.715 SNIP 1.216 CiteScore 4.05
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.916 SNIP 1.184 CiteScore 3.67
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.697 SNIP 1.203 CiteScore 3.6
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.802 SNIP 1.196
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.127 SNIP 1.369
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Adequacy of Frequency Reserves for High Wind Power Generation

In this article, a new methodology is developed to assess the adequacy of frequency reserves to handle power imbalances caused by wind power forecast errors. The goal of this methodology is to estimate the adequate volume and speed of activation of frequency reserves required to handle power imbalances caused due to high penetration of wind power. An algorithm is proposed and developed to estimate the power imbalances due to wind power forecast error following activation of different operating reserves. Frequency containment reserve requirements for mitigating these power imbalances are developed through this methodology. Furthermore, the probability of reducing this frequency containment reserve requirement is investigated through this methodology with activation of different volumes and speed of frequency restoration reserve. Wind power generation for 2020 and 2030 scenarios for Continental Europe network are investigated based on which recommendations are made for requirements of frequency reserves in these scenarios. It has been observed through simulations that frequency containment reserve requirements reduce exponentially with increase in volume of frequency restoration reserve and remains almost unaffected by increase activation speed of frequency restoration reserve.

General information
State: Published
Organisations: Department of Wind Energy, Integration & Planning, Energinet.dk
Authors: Das, K. (Intern), Litong-Palima, M. (Intern), Maule, P. (Intern), Altin, M. (Intern), Hansen, A. D. (Intern), Sørensen, P. E. (Intern), Abildgaard, H. (Ekstern)
Number of pages: 9
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Main Research Area: Technical/natural sciences

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A Dereplication and Bioguided Discovery Approach to Reveal New Compounds from a Marine-Derived Fungus Stilbella fimetaria

A marine-derived Stilbella fimetaria fungal strain was screened for new bioactive compounds based on two different approaches: (i) bio-guided approach using cytotoxicity and antimicrobial bioassays; and (ii) dereplication based approach using liquid chromatography with both diode array detection and high resolution mass spectrometry. This led to the discovery of several bioactive compound families with different biosynthetic origins, including pimarane-type diterpenoids and hybrid polyketide-non ribosomal peptide derived compounds. Prefractionation before bioassay screening proved to be a great aid in the dereplication process, since separate fractions displaying different bioactivities allowed a quick tentative identification of known antimicrobial compounds and of potential new analogues. A new pimarane-type diterpene, myrocin F, was discovered in trace amounts and displayed cytotoxicity towards various cancer cell lines. Further media optimization led to increased production followed by the purification and bioactivity screening of several new and known pimarane-type diterpenoids. A known broad-spectrum antifungal compound, ilicicolin H, was purified along with two new analogues, hydroxy-ilicicolin H and ilicicolin I, and their antifungal activity was evaluated.
Adhesion of Escherichia coli under flow conditions reveals potential novel effects of FimH mutations

FimH-mediated adhesion of Escherichia coli to bladder epithelium is a prerequisite for urinary tract infections. FimH is also essential for blood-borne bacterial dissemination, but the mechanisms are poorly understood. The purpose of this study was to assess the influence of different FimH mutations on bacterial adhesion using a novel adhesion assay, which models the physiological flow conditions bacteria are exposed to. We introduced 12 different point mutations in the mannose binding pocket of FimH in an E. coli strain expressing type 1 fimbriae only (MSC95-FimH). We compared the bacterial adhesion of each mutant across several commonly used adhesion assays, including agglutination of yeast, adhesion to mono- and tri-mannosylated substrates, and static adhesion to bladder epithelial and endothelial cells. We performed a comparison of these assays to a novel method that we developed to study bacterial adhesion to mammalian cells under flow conditions. We showed that E. coli MSC95-FimH adheres more efficiently to microvascular endothelium than to bladder epithelium, and that only endothelium supports adhesion at physiological shear stress. The results confirmed that mannose binding pocket mutations abrogated adhesion. We demonstrated that FimH residues E50 and T53 are crucial for adhesion under flow conditions. The coating of endothelial cells on biochips and modelling of
physiological flow conditions enabled us to identify FimH residues crucial for adhesion. These results provide novel insights into screening methods to determine the effect of FimH mutants and potentially FimH antagonists.

**General information**

**State:** Published

**Organisations:** Department of Systems Biology, Bacterial Ecophysiology and Biotechnology, National Food Institute, Research Group for Genomic Epidemiology, Medical University of Vienna, University of Bristol

**Authors:** Feenstra, T. (Ekstern), Schmidt Thøgersen, M. (Intern), Wieser, E. (Ekstern), Peschel, A. (Ekstern), Ball, M. J. (Ekstern), Brandes, R. (Ekstern), Satchell, S. C. (Ekstern), Stockner, T. (Ekstern), Aarestrup, F. M. (Intern), Rees, A. J. (Ekstern), Kain, R. (Ekstern)

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- ISI indexed (2013): ISI indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): SJR 1.136 SNIP 1.154 CiteScore 2.75
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- BFI (2011): BFI-level 1
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- Web of Science (2010): Indexed yes
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- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 1
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- Scopus rating (2001): SJR 0.723 SNIP 0.779
- Scopus rating (2000): SJR 0.654 SNIP 0.813
- Scopus rating (1999): SJR 0.755 SNIP 0.962
A Diagnostic and Predictive Framework for Wind Turbine Drive Train Monitoring

Vast amount of data are collected minute by minute from wind turbines around the world. This thesis represents a focused research effort into discovering new ways of processing these data streams in order to gain insights which can be used to lower the maintenance costs of wind turbines and increase the turbine availability.

First, it is demonstrated how simple sensor data streams can be leveraged based on a combination of non-linear predictive models and unsupervised fault detection to provide warnings of a critical bearing failure more than a month earlier compared to existing alarm systems. Second, early fault identification based on analysis of complex vibration patterns which is a domain previously reserved for human experts, is shown to be solved with high accuracy using deep learning architecture strained in a fully supervised sense from the data collected in a large scale wind turbine monitoring platform. The research shows a way towards a fully automatized data-driven wind turbine diagnostic processing system that is highly scalable and requires little or no feature engineering and system modeling.

A divergent heritage for complex organics in Isheyevo lithic clasts

Primitive meteorites are samples of asteroidal bodies that contain a high proportion of chemically complex organic matter (COM) including prebiotic molecules such as amino acids, which are thought to have been delivered to Earth via impacts during the early history of the Solar System. Thus, understanding the origin of COM, including their formation pathway(s) and environment(s), is critical to elucidate the origin of life on Earth as well as assessing the potential habitability of exoplanetary systems. The Isheyevo CH/CR carbonaceous chondrite contains chondritic lithic clasts with variable enrichments in $^{15}$N believed to be of outer Solar System origin. Using transmission electron microscopy (TEM-EELS) and in situ isotope analyses (SIMS and NanoSIMS), we report on the structure of the organic matter as well as the bulk H and N isotope composition of Isheyevo lithic clasts. These data are complemented by electron microprobe analyses of the clast mineral chemistry and bulk Mg and Cr isotopes obtained by inductively coupled plasma and thermal ionization mass spectrometry, respectively (MC-ICPMS and TIMS). Weakly hydrated (A) clasts largely consist of Mg-rich anhydrous silicates with local hydrated veins composed of phyllosilicates, magnetite and globular and diffuse organic matter. Extensively hydrated clasts (H) are thoroughly hydrated and contain Fe-sulfides, sometimes clustered with organic matter, as well as magnetite and carbonates embedded in a phyllosilicate matrix. The A-clasts are characterized by a more $^{15}$N-rich bulk nitrogen isotope composition ($\delta^{15}$N $= 200–650\%$) relative to H-clasts ($\delta^{15}$N $= 50–180\%$) and contain extremely $^{15}$N-rich domains with $\delta^{15}$N $< 5000\%$. The D/H ratios of the clasts are correlated with the degree of clast hydration and define two distinct populations, which we interpret as reflecting mixing between D-poor fluid(s) and distinct organic endmember components that are variably D-rich. High-resolution N isotope data of $^{15}$N-rich domains show that the lithic clast diffuse organic matter is typically more $^{15}$N-rich than globular organic matter. The correlated $\delta^{15}$N values and C/N ratios of nanoglobules require the existence of multiple organic components, in agreement with the H isotope data. The combined H and N isotope data suggest that the organic precursors of the lithic clasts are defined by an extremely $^{15}$N-poor (similar to solar) and D-rich component for H-clasts, and a moderately $^{15}$N-rich and D-rich component for A-clasts. In
contrast, the composition of the putative fluids is inferred to include D-poor but moderately to extremely $^{15}$N-rich H- and N-bearing components. The variable $^{15}$N enrichments in H- and A-clasts are associated with structural differences in the N bonding environments of their diffuse organic matter, which are dominated by amine groups in H-clasts and nitrile functional groups in A-clasts. We suggest that the isotopically divergent organic precursors in Isheyevo clasts may be similar to organic moieties in carbonaceous chondrites (CI, CM, CR) and thermally recalcitrant organic compounds in ordinary chondrites, respectively. The altering fluids, which are inferred to cause the $^{15}$N enrichments observed in the clasts, may be the result of accretion of variable abundances of NH$_3$ and HCN ices. Finally, using bulk Mg and Cr isotope composition of clasts, we speculate on the accretion regions of the various primitive chondrites and components and the origin of the Solar System’s N and H isotope variability.

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Administration of two probiotic strains during early childhood does not affect the endogenous gut microbiota composition despite probiotic proliferation

Probiotics are increasingly applied to prevent and treat a range of infectious, immune related and gastrointestinal diseases. Despite this, the mechanisms behind the putative effects of probiotics are poorly understood. One of the suggested modes of probiotic action is modulation of the endogenous gut microbiota, however probiotic intervention studies in adults have failed to show significant effects on gut microbiota composition. The gut microbiota of young children is known to be unstable and more responsive to external factors than that of adults. Therefore, potential effects of probiotic intervention on gut microbiota may be easier detectable in early life. We thus investigated the effects of a 6 month placebo-controlled probiotic intervention with Bifidobacterium animalis subsp. lactis (BB-12®) and Lactobacillus rhamnosus (LGG®) on gut microbiota composition and diversity in more than 200 Danish infants (N = 290 enrolled; N = 201 all samples analyzed), as assessed by 16S rRNA amplicon sequencing. Further, we evaluated probiotic presence and proliferation by use of specific quantitative polymerase chain reaction (qPCR). Probiotic administration did not significantly alter gut microbiota community structure or diversity as compared to placebo. The probiotic strains were detected in 91.3% of the fecal samples from children receiving probiotics and in 1% of the placebo treated children. Baseline gut microbiota was not found to predict the ability of probiotics to establish in the gut after the 6 month intervention. Within the probiotics group, proliferation of the strains LGG® and BB-12® in the gut was detected in 44.7% and 83.5% of the participants, respectively. A sub-analysis of the gut microbiota including only individuals with detected growth of the probiotics LGG® or BB-12® and comparing these to placebo revealed no differences in community structure or diversity. Six months of probiotic administration during early life did not change gut microbiota community structure or diversity, despite active proliferation of the administered probiotic strains. Therefore, alteration of the healthy infant gut microbiota is not likely to be a prominent mechanism by which these specific probiotics works to exert beneficial effects on host health. NCT02180581 . Registered 30 June 2014.
A DSM-based framework for integrated function modelling: concept, application and evaluation

Function modelling is proposed in the literature from different disciplines, in interdisciplinary approaches, and used in practice with the intention of facilitating system conceptualisation. However, function models across disciplines are largely diverse addressing different function modelling perspectives and using different structures and forms for representing the contained information. This hampers the exchange of information between the models and poses particular challenges to joint modelling and shared comprehension between designers from different disciplines. This article proposes an integrated function modelling framework, which specifically aims at relating between the different function modelling perspectives prominently addressed in different disciplines. It uses interlinked matrices based on the concept of DSM and MDM in order to facilitate cross-disciplinary modelling and analysis of the functionality of a system. The article further presents the application of the framework based on a product example. Finally, an empirical study in industry is presented. Therein, feedback on the potential of the proposed framework to support interdisciplinary design practice as well as on areas of further improvement has been obtained from participants working in industry.
General information
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Organisations: Department of Mechanical Engineering, Engineering Design and Product Development, Delft University of Technology, University of Luxembourg, Singapore University of Technology and Design
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Scopus rating (2009): SJR 0.752 SNIP 1.269
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.901 SNIP 1.09
Scopus rating (2007): SJR 0.671 SNIP 1.387
Scopus rating (2006): SJR 0.764 SNIP 1.579
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Scopus rating (2004): SJR 3.038 SNIP 4.009
Scopus rating (2003): SJR 1.513 SNIP 1.422
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.878 SNIP 1.542
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Function modelling, DSM, Interdisciplinary product development, Conceptual design, Empirical study
A principle concern for aquaculturists and aquarium hobbyists is the control and removal of dissolved organic matter. Granular activated carbon is a well-established medium for the adsorption of dissolved organic substances associated with these issues. The selection of activated carbon for aquaria and aquaculture is not well-established due to innate heterogeneity of these waters. The means to completely characterize adsorption between carbon sources are generally not available to end users provided their level of expertise and/or resources at their disposal. This study introduces a relatively simple method for characterizing activated carbon quality and filter performance utilizing readily available and relatively safe indicator compounds to test adsorptive capabilities between different sources of granular activated carbon. Methylene blue and a commercial mix of humic and tannic substances were used to comparatively test adsorptive performance between two filter groups (i.e. sources of granular activated carbon) by tracking spectral absorbance with non-linear regression statistics, and validating removal trends against mature aquaculture water. Greater adsorptive capacities were consistently observed in one filter group throughout the indicator testing battery. Similar findings were observed between the two indicator tests, thereby confirming the method. This method can be adopted by commercial aquaculture operations or aquarists to assist in comparatively screening particular types, particle sizes, and sources of granular activated carbon for specific water quality and engineering requirements.
Advanced 3-D Ultrasound Imaging: 3-D Synthetic Aperture Imaging using Fully Addressed and Row-Column Addressed 2-D Transducer Arrays.

Compared with conventional 2-D ultrasound imaging, real-time 3-D (or 4-D) ultrasound imaging has several advantages, resulting in a significant progress in the ultrasound imaging instrumentation over the past decade. Viewing the patient’s anatomy as a volume helps physicians to comprehend the important diagnostic information in a noninvasive manner. Diagnostic and therapeutic decisions often require accurate estimates of e.g., organ, cyst, or tumor volumes. 3-D ultrasound imaging can provide these measurements without relying on the geometrical assumptions and operator-dependent skills involved in such estimations using 2-D scans. Although the detail resolution of ultrasound can not compete with 3-D imaging modalities such as CT and MRI, the combination of patient safety by using nonionizing radiation, cost-effectiveness, portability, and real-time imaging ability makes ultrasound the preferred choice in many clinical applications. Real-time 3-D ultrasound imaging is still not as widespread in use in the clinics as 2-D ultrasound imaging. Two limiting factors have traditionally been the low image quality as well as low volume rate achievable with a 2-D transducer array using the conventional 3-D beamforming technique, Parallel Beamforming. The first part of the scientific contributions of this Ph.D. project demonstrate that 3-D synthetic aperture imaging achieves a better sensitivity and a higher volume rate than the parallel beamforming technique. Data were obtained using both Field II simulations and measurements with the ultrasound research scanner SARUS and a 3.8 MHz 1024 element 2-D transducer array. In all investigations, 3-D synthetic aperture imaging achieved a better resolution, lower side-lobes, higher contrast, and better signal to noise ratio than parallel beamforming. This is achieved partly because synthetic aperture imaging removes the limitation of a fixed transmit focal depth and instead enables dynamic transmit focusing. Particularly, synthetic aperture imaging could increase the achievable volume rate compared with parallel beamforming, to almost 50 times. Lately, the major ultrasound companies have produced ultrasound scanners using 2-D transducer arrays with enough transducer elements to produce high quality 3-D images. Because of the large matrix transducers with integrated custom electronics, these systems are extremely expensive. The relatively low price of ultrasound scanners is one of the factors for the widespread use of ultrasound imaging. The high price tag on the high quality 3-D scanners is limiting their market share. Row-column addressing of 2-D transducer arrays is a low cost alternative to fully addressed 2-D arrays, for 3-D ultrasound imaging. Using row-column addressing, the number of transducer elements is dramatically reduced. This reduces the interconnection cost and removes the need to integrate custom made electronics into the probe. Two downsides of row-column addressing 2-D arrays are its lower lateral resolution due to its one-way focusing compared with two-way focusing in fully addressed 2-D arrays and also the inherent forward-looking imaging field of view. In the second part of the scientific contributions of this Ph.D. project, row-column addressing of 2-D arrays was investigated to assess the possibilities and drawbacks associated with transducer arrays using this addressing scheme, when integrated into probe handles. For that reason, two in-house prototyped 62+62 row-column addressed 2-D array transducer probes were manufactured using capacitive micromachined ultrasonic transducer (CMUT) and piezoelectric transducer (PZT) technology. Based on a set of acoustical measurements the center frequency, bandwidth, surface pressure, sensitivity, and acoustical cross-talks were evaluated and discussed. The imaging quality assessments were carried out based on Field II simulations as well as phantom measurements. Moreover, an analysis on comparing the lateral resolution with a fully addressed array were presented. To improve the imaging sensitivity, spatial matched filter beamforming was used as well as delay-and-sum approach. An analysis on increasing the inherent forward-looking achievable field of view of a flat row-column addressed 2-D array by using a double curved row-column addressed 2-D array was presented. A delay-and-sum beamforming approach suitable for a double curved row-column addressed 2-D array was introduced. Due to challenges on manufacturing double curved 2-D arrays, using a diverging acoustical lens was proposed and its imaging abilities were evaluated based on Field II simulations and measurements. Thereby, the inherent imaging limitation with flat row-column addressed 2-D arrays was overcome by using a diverging lens. Overall, having a low channel count and a large field of view, offers the potential to fabricate arrays with large aperture sizes, which is important for abdominal scans. Thus by using a curved row-column addressed 2-D array, 3-D imaging with equipment in the price range of conventional 2-D imaging could be possible. The main part of the thesis consists of eight scientific papers submitted for international conferences and journals during the Ph.D. project.

General information
State: Published
Organisations: Department of Electrical Engineering, Biomedical Engineering, BK Medical Aps
Authors: Bouzari, H. (Intern), Jensen, J. A. (Intern), Nikolov, S. I. (Ekstern), Stuart, M. B. (Intern)
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Advancing from underground to above-ground model predictive control in urban drainage

**General information**
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- **Organisations:** Department of Environmental Engineering, Urban Water Systems
- **Authors:** Lund, N. S. V. (Intern), Borup, M. (Intern), Halvgaard, R. F. (Intern), Falk, A. K. V. (Intern), Mark, O. (Ekstern), Madsen, H. (Ekstern), Mikkelsen, P. S. (Intern)
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**Abstract**

Low-lying coastal communities face increasing challenges from rise in sea level, more extreme storm surge levels and floods. In addition, changing groundwater levels and precipitation patterns may further exacerbate the water-related impacts of climate change on society. Approximately 40,000 km² of Europe’s North Sea region is already flood prone. Storm surges pose a real and substantial risk to this area, especially the densely populated areas. Climate and sea level research seek to provide robust regional projections of change and to address uncertainties and errors inherent in climate models. It is a challenge for coastal communities to transform this information in order to provide for local impact assessments and to implement adaptive measures. To this end, information about potential subsidence, its magnitudes and causes is important: subsidence may adversely affect the probability, extent and depths of future floods, and knowledge about subsidence will serve to reduce the total uncertainty about the anticipated climate impacts. If included in an ‘impact integration system’, reliable subsidence mapping may serve to deal with possible future outcomes in local management and planning.

The paper presents subsidence mapping using Sentinel-1 (S-1) data over a case study area on the Danish North Sea coast, and it addresses challenges to validate and reference results to the national datum levelling network. For this, repeated precision levelling (2006-2015) and ERS2 (1995-2001) data are used. In addition, the Sentinel-1 time series for selected scatter points are compared to groundwater level data from 10 wells and sea level data from two tide gauges to analyse their effect in the S-1 data. Likewise, the variations in the ocean water level (from tidal excursion and positive/negative surges etc.) and in the groundwater table (from ocean level and gradient, wave run-up, precipitation etc.) may in an initial evaluation suggest time-dependent and water-related mechanisms for the inferred subsidence encountered. These variations may thus serve to detail our understanding of S-1 results, and they may be indicative of system responses to subsidence under climate change scenarios. Results are put into perspective in relation to additional S-1 studies carried out by the authors as well as to literature to outline perspectives of further work to relate and apply S-1 data to improve local coastal climate impact assessments and adaptation.

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- **Authors:** Sørensen, C. S. (Intern), Marinkovic, P. (Ekstern), Larsen, Y. (Ekstern), Knudsen, P. (Intern), Levinsen, J. (Ekstern), Broge, N. (Ekstern), Dehls, J. (Ekstern)
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- **Main Research Area:** Technical/natural sciences

**Advancing Sentinel-1 use in Coastal Climate Impact Assessments and Adaptation – A Case Study from the Danish North Sea**

Low-lying coastal communities face increasing challenges from rise in sea level, more extreme storm surge levels and floods. In addition, changing groundwater levels and precipitation patterns may further exacerbate the water-related impacts of climate change on society. Approximately 40,000 km² of Europe’s North Sea region is already flood prone. Storm surges pose a real and substantial risk to this area, especially the densely populated areas. Climate and sea level research seek to provide robust regional projections of change and to address uncertainties and errors inherent in climate models. It is a challenge for coastal communities to transform this information in order to provide for local impact assessments and to implement adaptive measures. To this end, information about potential subsidence, its magnitudes and causes is important: subsidence may adversely affect the probability, extent and depths of future floods, and knowledge about subsidence will serve to reduce the total uncertainty about the anticipated climate impacts. If included in an ‘impact integration system’, reliable subsidence mapping may serve to deal with possible future outcomes in local management and planning.

The paper presents subsidence mapping using Sentinel-1 (S-1) data over a case study area on the Danish North Sea coast, and it addresses challenges to validate and reference results to the national datum levelling network. For this, repeated precision levelling (2006-2015) and ERS2 (1995-2001) data are used. In addition, the Sentinel-1 time series for selected scatter points are compared to groundwater level data from 10 wells and sea level data from two tide gauges to analyse their effect in the S-1 data. Likewise, the variations in the ocean water level (from tidal excursion and positive/negative surges etc.) and in the groundwater table (from ocean level and gradient, wave run-up, precipitation etc.) may in an initial evaluation suggest time-dependent and water-related mechanisms for the inferred subsidence encountered. These variations may thus serve to detail our understanding of S-1 results, and they may be indicative of system responses to subsidence under climate change scenarios. Results are put into perspective in relation to additional S-1 studies carried out by the authors as well as to literature to outline perspectives of further work to relate and apply S-1 data to improve local coastal climate impact assessments and adaptation.
Advancing Sentinel-1 use in Coastal Climate Impact Assessments and Adaptation – A Case Study from the Danish North Sea

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Authors: Sørensen, C. S. (Intern), Marinkovic, P. (Ekstern), Larsen, Y. (Ekstern), Knudsen, P. (Intern), Levinsen, J. (Ekstern), Broge, N. (Ekstern), Dehls, J. (Ekstern)
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A dynamic approach to real-time performance measurement in design projects
Recent developments in engineering design management point to the need for more dynamic, fine-grain measurement approaches able to deal with multi-dimensional, cross-level process performance in product design. Thus, this paper proposes a new approach to the measurement and management of individual and teamwork performance in engineering design projects. This integrates multiple, previously disparate, aspects of design management and performance measurement theory in a single framework. Further, a fully realised performance measurement approach is developed, which complements existing management strategies. This framework is synthesised from an extensive review and illustrated via an in-depth case study. As such, this work contributes to performance measurement theory in engineering design and has significant implications for both engineering design research and industry.

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Organisations: Department of Management Engineering, Technology and Innovation Management, University of Zagreb
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Scopus rating (2014): SJR 1.172 SNIP 1.254 CiteScore 1.74
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A dynamic programming approach for quickly estimating large network-based MEV models

We propose a way to estimate a family of static Multivariate Extreme Value (MEV) models with large choice sets in short computational time. The resulting model is also straightforward and fast to use for prediction. Following Daly and Bierlaire (2006), the correlation structure is defined by a rooted, directed graph where each node without successor is an alternative. We formulate a family of MEV models as dynamic discrete choice models on graphs of correlation structures and show that the dynamic models are consistent with MEV theory and generalize the network MEV model (Daly and Bierlaire, 2006). Moreover, we show that these models can be estimated quickly using the concept of network flows and the nested fixed point algorithm (Rust, 1987). The main reason for the short computational time is that the new formulation allows to benefit from existing efficient solution algorithms for sparse linear systems of equations. We present numerical results based on simulated data with varying number of alternatives and nesting structures. We estimate large models, for example, a cross-nested model with 200 nests and 500,000 alternatives and 210 parameters that needs between 100–200 iterations to converge (4.3 h on an Intel(R) 3.2 GHz machine using a non-parallelized code). We also show that our approach allows to estimate a cross-nested logit model of 111 nests with a real data set of more than 100,000 observations in 14 h.

General information
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Authors: Mai, T. (Ekstern), Frejinger, E. (Ekstern), Fosgerau, M. (Intern), Bastin, F. (Ekstern)
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Aerelastic multidisciplinary design optimization of a swept wind turbine blade

Mitigating loads on a wind turbine rotor can reduce the cost of energy. Sweeping blades produces a structural coupling between flapwise bending and torsion, which can be used for load alleviation purposes. A multidisciplinary design optimization (MDO) problem is formulated including the blade sweep as a design variable. A multifidelity approach is used to confront the crucial effects of structural coupling on the estimation of the loads. During the MDO, ultimate and damage
equivalent loads are estimated using steady-state and frequency-domain–based models, respectively. The final designs are verified against time-domain full design load basis aeroelastic simulations to ensure that they comply with the constraints. A 10-MW wind turbine blade is optimized by minimizing a cost function that includes mass and blade root flapwise fatigue loading. The design space is subjected to constraints that represent all the necessary requirements for standard design of wind turbines. Simultaneous aerodynamic and structural optimization is performed with and without sweep as a design variable. When sweep is included in the MDO process, further minimization of the cost function can be obtained. To show this achievement, a set of optimized straight blade designs is compared to a set of optimized swept blade designs. Relative to the respective optimized straight designs, the blade mass of the swept blades is reduced of an extra 2% to 3% and the blade root flapwise fatigue damage equivalent load by a further 8%.

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Authors: Pavese, C. (Intern), Tibaldi, C. (Intern), Zahle, F. (Intern), Kim, T. (Intern)  
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Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 2  
Scopus rating (2016): CiteScore 3.37 SJR 1.104 SNIP 2.306  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 2  
Scopus rating (2015): SJR 1.196 SNIP 2.086 CiteScore 3.06  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 2  
Scopus rating (2014): SJR 1.272 SNIP 3.75 CiteScore 3.42  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 2  
Scopus rating (2013): SJR 1.275 SNIP 2.464 CiteScore 2.75  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 2  
Scopus rating (2012): SJR 1.126 SNIP 2.39 CiteScore 2.36  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 2  
Scopus rating (2011): SJR 1.024 SNIP 2.718 CiteScore 2.49  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 2  
Scopus rating (2010): SJR 1.487 SNIP 2.013  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 2  
Scopus rating (2009): SJR 1.124 SNIP 1.448  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 0.826 SNIP 1.559  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.053 SNIP 1.453  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 0.637 SNIP 1.689  
Web of Science (2006): Indexed yes
A facile approach to fabricate hierarchically structured poly(3-hexylthiophene-2,5-diyl) films

Microstructured surfaces have great potentials to improve the performances and efficiency of optoelectronic devices. In this work, a simple robust approach based on surface instabilities was presented to fabricate poly(3-hexylthiophene-2,5-diyl) (P3HT) films with ridge-like/wrinkled composite microstructures. Namely, the hierarchically patterned films were prepared by spin coating the P3HT/tetrahydrofuran (THF) solution on a polydimethylsiloxane (PDMS) substrate to form stable ridge-like structures, followed by solvent vapor swelling to create surface wrinkles with the orientation guided by the ridge-like structures. During spin coating of the P3HT/THF solution, the ridge-like structures were generated by the in-situ template of the THF swelling-induced creasing structures on the PDMS substrate. To our knowledge, it is the first report that the creasing structures are used as a recoverable template for patterning films. The crease-templated ridge-like structures were well modulated by the THF swelling time, the modulus of the PDMS substrate, the P3HT/THF solution concentration and the selective/blanket exposure of the PDMS substrate to O2 plasma. UV–vis and fluorescence spectrometry measurements indicated that the light absorption and fluorescent emission were improved on the hierarchically patterned P3HT films, which can be utilized to enhance the efficiencies of organic solar cells. Furthermore, this simple versatile method based on the solvent swelling-induced crease as the in-situ recoverable template has been extended to pattern other spin-coated films with different compositions.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Imaging and Structural Analysis, Tianjin University, Chinese Academy of Sciences
Pages: 928-939
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Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Polymer Science. Part B, Polymer Physics
Volume: 55
Issue number: 12
ISSN (Print): 0887-6266
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.12 SJR 1.051 SNIP 0.963
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.241 SNIP 1.119 CiteScore 3.4
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.498 SNIP 1.423 CiteScore 3.91
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.177 SNIP 1.313 CiteScore 3
A FEM based methodology to simulate multiple crack propagation in friction stir welds

In this work a numerical procedure, based on a finite element approach, is proposed to simulate multiple three-dimensional crack propagation in a welded structure. Cracks are introduced in a friction stir welded AA2024-T3 butt joint, affected by a process-induced residual stress scenario. The residual stress field was inferred by a thermo-mechanical FEM simulation of the process, considering temperature dependent elastic-plastic material properties, material softening and isotropic hardening. Afterwards, cracks introduced in the selected location of FEM computational domain allow stress redistribution and fatigue crack growth. The proposed approach has been validated by comparison with numerical outcomes provided by a consolidated FEM-DBEM procedure, available in literature. The discussed procedures are substantially equivalent in terms of SIFs evaluation along the crack front at the cracks insertion, as well as with respect to crack sizes measured in three different points for each propagation step. This FEM-based approach simulates the fatigue crack propagation by considering accurately the residual stress field generated by plastic deformations imposed on a structural component and has general validity.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, University of Salerno, Norwegian University of Science and Technology
Authors: Lepore, M. (Ekstern), Carlone, P. (Ekstern), Berto, F. (Ekstern), Sonne, M. R. (Intern)
Number of pages: 14
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Affibody scaffolds improve sesquiterpene production in *Saccharomyces cerevisiae*

Enzyme fusions have been widely used as a tool in metabolic engineering to increase pathway efficiency by reducing substrate loss and accumulation of toxic intermediates. Alternatively, enzymes can be co-localized through attachment to a synthetic scaffold via non-covalent interactions. Here we describe the use of affibodies for enzyme tagging and scaffolding. The scaffolding is based on the recognition of affibodies to their anti-idiotypic partners *in vivo*, and was first employed for co-localization of farnesyl diphosphate synthase and farnesene synthase in *S. cerevisiae*. Different parameters were modulated to improve the system, and the enzyme:scaffold ratio was most critical for its functionality. Ultimately, the yield of farnesene on glucose Ÿfar could be improved by 135 % in fed-batch cultivations using a 2-site affibody scaffold. The scaffolding strategy was then extended to a three-enzyme polyhydroxybutyrate (PHB) pathway, heterologously expressed in *E. coli*. Within a narrow range of enzyme and scaffold induction, the affibody tagging and scaffolding increased PHB production 7-fold. This work demonstrates how the versatile affibody can be used for metabolic engineering purposes.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Yeast Cell Factories, Chalmers University of Technology, Royal Institute of Technology
Authors: Tippmann, S. (Ekstern), Anfelt, J. (Ekstern), David, F. (Ekstern), Rand, J. M. (Ekstern), Siewers, V. (Ekstern), Uhlén, M. (Intern), Nielsen, J. (Intern), Hudson, E. P. (Ekstern)
Number of pages: 10
Pages: 19-28
Publication date: 2017
Main Research Area: Technical/natural sciences

**Affinity Electrophoresis for Analysis of Catalytic Module-Carbohydrate Interactions**

Affinity electrophoresis has long been used to study the interaction between proteins and large soluble ligands. The technique has been found to have great utility for the examination of polysaccharide binding by proteins, particularly carbohydrate binding modules (CBMs). In recent years, carbohydrate surface binding sites of proteins mostly enzymes have also been investigated by this method. Here, we describe a protocol for identifying binding interactions between enzyme catalytic modules and a variety of carbohydrate ligands.

General information
State: Published
A Flexible Web-Based Approach to Modeling Tandem Photocatalytic Devices

There have been several works modeling the optimal band gaps for tandem photocatalytic water splitting devices under different assumptions. Due to the many parameters involved, it is impossible for the authors to consider every conceivable situation. In this work, we have developed a web-based model (WBM) that allows users to input data such as photoabsorber diode parameters, catalytic losses, ionic losses, light concentration, etc. This program also adds a new parameter that allows one to balance the photon absorption distribution between both photoabsorbers in a tandem device (by thinning the top photoabsorber), thus allowing for a broader range of band gap combinations that can still provide highly efficient devices. While this does not change the overall maximum efficiency point, at certain band gap combinations balancing the photon absorption distribution between photoabsorbers can increase Solar to Hydrogen (STH) efficiency by up to 15% points. An additional feature of the WBM is that it allows users to upload data of a single photoelectrode, and then investigate the optimal matching photoabsorber band gap to maximize tandem device efficiency. This work analyzes some of the best previous experimental photoelectrodes, and quantitatively relates their performance...
to what would typically be expected via modeling programs.

**General information**
State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, Department of Micro- and Nanotechnology, Silicon Microtechnology
Authors: Seger, B. (Intern), Hansen, O. (Intern), Vesborg, P. C. K. (Intern)
Number of pages: 13
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Volume: 1
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Article number: 1600013
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Source: FindIt
Source-ID: 2350098109
Publication: Research - peer-review › Journal article – Annual report year: 2016

**A Framework for Determining Product Modularity Levels**
The application of modular products is seen as an important enabler for delivering customized products competitively. However, many companies struggle to find ways to implement modular products in a manner that suits their particular business. The literature includes examples of how modular products have been implemented in specific types of companies (mostly mass producers), but little guidance exists on how to identify the right level of modularity for other types of companies (such as engineer-to-order companies). In this article, we address this gap by suggesting a framework that categorizes the different types of modularity, where the categories fit different types of companies. More specifically, we introduce The Modularity Application Matrix – a conceptual tool that leads to a better understanding of partial modularization in relation to products. Through four case studies its application in practice is illustrated. This paper thereby contributes with new theoretical developments as well as a practical tool for practitioners in industries using partial modularization, such as, for example, the construction and building industry.

**General information**
State: Accepted/In press
Organisations: Department of Management Engineering, Management Science, Operations Management, Department of Mechanical Engineering, Engineering Design and Product Development, NCC Construction Danmark A/S, University of Southern Denmark
Authors: Hvam, L. (Intern), Herbert-Hansen, Z. N. L. (Intern), Haug, A. (Ekstern), Kudsk, A. (Ekstern), Mortensen, N. H. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Advances in Mechanical Engineering (New York)
ISSN (Print): 1687-8132
Ratings:
Web of Science (2017): Indexed Yes
Scopus rating (2016): CiteScore 0.76 SJR 0.277 SNIP 0.589
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 0.253 SNIP 0.531 CiteScore 0.64
Scopus rating (2014): SJR 0.238 SNIP 0.498 CiteScore 0.63
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 0.348 SNIP 0.858 CiteScore 1.11
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): SJR 0.378 SNIP 0.762 CiteScore 0.88
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.368 SNIP 1.183 CiteScore 1
ISI indexed (2011): ISI indexed no
A Framework for Operational Due Diligence in Mergers and Acquisitions

The number of mergers and acquisitions (M&As) has over the last five years increased greatly (Institute of Mergers, Acquisitions and Alliances, 2016). Furthermore, private equity professionals point to operational performance gains to drive an acquisition decision and attribute cost reductions as the most important lever for value creation, after a private equity firm acquires a company (PwC, 2016). However, the overall success rate of M&A activity remains low and the approach to understand an acquisition target’s operating model remains non-exhaustive and unstandardized. This paper investigates the pivotal determinants for assessing operational performance and identifying improvement potentials in an acquisition target. The research question is: “What are the fundamental operational determinants influencing the acquisition decision for private equity firms in the due diligence phase?” This paper presents an end-to-end framework which functions as a dynamic platform that simplifies the approach to conducting an operational due diligence (ODD). The framework focuses on identification and assessment of current operational performance and improvement drivers in the pre-acquisition phase.

A Framework for Organization-Aware Agents

Open systems are characterized by the presence of a diversity of heterogeneous and autonomous agents that act according to private goals. Organizations, such as those used in real-life to structure human activities such as task allocation, coordination and supervision, can regulate the agents’ behavior space and describe the expected behavior of the agents. Assuming an open environment, where agents are developed independently of the Organizational structures, agents need to be able to reason about the structure, so that they can deliberate about their actions and act within the expected boundaries and work towards the objectives of the organization. In this paper, we present the AORTA reasoning framework and show how it can be integrated into typical BDI-agents. We provide operational semantics that enables agents to make organizational decisions in order to coordinate and cooperate without explicit coordination mechanisms within the agents. The organizational model is independent of that of the agents, and the approach is not tied to a specific organizational model, but uses an organizational metamodel. We show how AORTA helps agents work together in a system with an organization for choosing the best tender for a building project.
A framework of knowledge creation processes in participatory simulation of hospital work systems

Participatory simulation (PS) is a method to involve workers in simulating and designing their own future work system. Existing PS studies have focused on analysing the outcome, and minimal attention has been devoted to the process of creating this outcome. In order to study this process, we suggest applying a knowledge creation perspective. The aim of this study was to develop a framework describing the process of how ergonomics knowledge is created in PS. Video recordings from three projects applying PS of hospital work systems constituted the foundation of process mining analysis. The analysis resulted in a framework revealing the sources of ergonomics knowledge creation as sequential relationships between the activities of simulation participants sharing work experiences; experimenting with scenarios; and reflecting on ergonomics consequences. We argue that this framework reveals the hidden steps of PS that are essential when planning and facilitating PS that aims at designing work systems.

General information

State: Published
Organisations: Department of Management Engineering, Engineering Systems, Copenhagen Center for Health Technology
Authors: Andersen, S. N. (Intern), Broberg, O. (Intern)
Number of pages: 40
Publication date: 2017
Main Research Area: Technical/natural sciences
A framework to estimate concentrations of potentially unknown substances by semi-quantification in liquid chromatography electrospray ionization mass spectrometry

Risk assessment of exposure to chemicals from food and other sources rely on quantitative information of the occurrence of these chemicals. As screening analysis is increasingly used, a strategy to semi-quantify unknown or untargeted analytes is required. A proof of concept strategy to semi-quantifying unknown substances in LC-MS was investigated by studying the responses of a chemically diverse marker set of 17 analytes using an experimental design study. Optimal conditions were established using two optimization parameters related to weak-responding compounds and to the overall response. All the 17 selected analytes were semi-quantified using a different analyte to assess the quantification performance under various conditions. It was found that source conditions had strong effects on the responses, with the range of low-response signals varying from ~80% to over +300% compared to centerpoints. Positive electrospray (ESI+)
was found to have more complex source interactions than negative electrospray (ESI-). Choice of quantification marker resulted in better quantification if the retention time difference was minimized (12 out of 12 cases error factor <4.0) rather than if the accurate mass difference was minimized (7 out of 12 cases error factor <4.0). Using optimal conditions and retention time selection, semi-quantification in ESI+ (70% quantified, average prediction error factor 2.08) and ESI- (100% quantified, average prediction error factor 1.74) yielded acceptable results for untargeted screening. The method was successfully applied to an extract of food contact material containing over 300 unknown substances. Without identification and authentic standards, the method was able to estimate the concentration of a virtually unlimited number of compounds thereby providing valuable data to prioritize compounds in risk assessment studies.

**General information**

State: Published  
Organisations: National Food Institute, Research Group for Analytical Food Chemistry  
Authors: Pieke, E. N. (Intern), Granby, K. (Intern), Trier, X. (Intern), Smedsgaard, J. (Intern)  
Number of pages: 12  
Pages: 30-41  
Publication date: 2017  
Main Research Area: Technical/natural sciences  

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Journal: Analytica Chimica Acta  
Volume: 975  
ISSN (Print): 0003-2670  
Ratings:  
BFI (2017): BFI-level 2  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 2  
Scopus rating (2016): CiteScore 5.01  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 2  
Scopus rating (2015): CiteScore 4.94  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 2  
Scopus rating (2014): CiteScore 4.64  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): CiteScore 4.74  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 1  
Scopus rating (2012): CiteScore 4.55  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 1  
Scopus rating (2011): CiteScore 4.62  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
BFI (2009): BFI-level 1  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 1  
Web of Science (2008): Indexed yes  
Web of Science (2007): Indexed yes  
Web of Science (2006): Indexed yes  
Web of Science (2005): Indexed yes  
Web of Science (2004): Indexed yes  
Web of Science (2003): Indexed yes  
Web of Science (2002): Indexed yes  
Web of Science (2001): Indexed yes
A Full-Size High-Temperature Superconducting Coil Employed in a Wind Turbine Generator Setup

A full-size stationary experimental setup, which is a pole pair segment of a 2 MW high-temperature superconducting (HTS) wind turbine generator, has been built and tested under the HTS-GEN project in Denmark. The performance of the HTS coil is crucial to the setup, and further to the development of the full generator. This paper deals with the HTS coil employed in the setup. The coil utilizing YBCO tapes is double-layered with 152 turns per layer and is wound on an FeNi9 iron core. Several sensors are installed to monitor the operating status of the coil, e.g., temperature, field, and voltage. The coil is tested in LN2 first, and then tested in the setup so that the magnetic environment in a real generator is reflected. The experimental results are reported, followed by a finite-element simulation and a discussion on the deviation of the results. The tested and estimated Ic in LN2 are 148 A and 143 A, respectively. When tested in the setup, the maximum temperature of the coil is controlled at 77 K and 40 K, and the I-V curves under both conditions are presented. It is found that the lower half coil that is closer to the stator has a smaller Ic due to a higher field level. The study is of significance to the development of HTS generators.

General information
State: Published
Authors: Song, X. (Intern), Mijatovic, N. (Intern), Kellers, J. (Ekstern), Bührer, C. (Ekstern), Rebsdorf, A. V. (Ekstern), Hansen, J. (Ekstern), Christensen, M. (Ekstern), Krause, J. (Ekstern), Wiezoreck, J. (Ekstern), Pütz, H. (Ekstern), Holbøll, J. (Intern)
Number of pages: 5
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: IEEE Transactions on Applied Superconductivity
Volume: 27
Issue number: 4
Article number: 5201105
ISSN (Print): 1051-8223
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.42 SJR 0.395 SNIP 1.031
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.35 SNIP 0.935 CiteScore 1.27
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.47 SNIP 1.113 CiteScore 0.83
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.431 SNIP 1.171 CiteScore 1.32
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.575 SNIP 1.27 CiteScore 1.11
A fully coupled air foil bearing model considering friction – Theory & experiment

The dynamics of air foil bearings (AFBs) are not yet fully captured by any model. The recent years have, however, seen promising results from nonlinear time domain models, and simultaneously coupled formulations are now available, avoiding the previous requirements for undesirably small time steps and temporal convergence studies.

In the present work, an alternative foil structure model is substituted for the simple elastic foundation model to avoid its inherent limitations. The new foil model is based on a truss representation from the literature, but incorporates the foil mass and a dynamic friction model. As a consequence of the friction model's velocity dependency, the foil mass is included to obtain a set of differential equations that can be coupled to the rotor and fluid domains while allowing a simultaneous solution.

Considerations leading to a practically applicable implementation are discussed and numerical results are compared with experimental data. The model predicts natural frequencies and mode shapes well, but it is not yet capturing the unbalance response when friction is considered. Possible causes for this discrepancy are discussed and it is suggested that sticking is a more prevalent state than previously assumed.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: von Osmanski, A. S. (Intern), Larsen, J. S. (Intern), Santos, I. (Intern)
Pages: 660-679
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Journal of Sound and Vibration
Volume: 400
ISSN (Print): 0022-460X
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 1.462 SNIP 2.162 CiteScore 3.09
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.391 SNIP 2.142 CiteScore 2.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.447 SNIP 2.38 CiteScore 2.54
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.391 SNIP 2.64 CiteScore 2.61
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.495 SNIP 2.992 CiteScore 2.3
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.441 SNIP 2.698 CiteScore 2.05
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.218 SNIP 2.069
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.384 SNIP 2.185
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.205 SNIP 1.96
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.173 SNIP 1.701
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.882 SNIP 1.632
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.087 SNIP 1.624
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.936 SNIP 1.463
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.243 SNIP 1.385
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.386 SNIP 1.27
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.836 SNIP 1.322
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.581 SNIP 1.192
A fully coupled method for numerical modeling and dynamic analysis of floating vertical axis wind turbines

- Aerodynamic modeling of floating VAWTs is established using the Actuator Cylinder (AC) flow method.
- A fully coupled aero-hydro-servo-elastic simulation tool, i.e. SIMO-RIFLEX-AC, is developed for floating VAWTs.
- The developed simulation tool is verified to be accurate by a series of code-to-code comparisons.
- This simulation tool can be used for design and response analysis of different floating VAWT concepts.

**General information**

- State: Published
- Organisations: Department of Wind Energy, Aerodynamic design, Norwegian University of Science and Technology
- Authors: Cheng, Z. (Ekstern), Aagaard Madsen, H. (Intern), Gao, Z. (Ekstern), Moan, T. (Ekstern)
- Pages: 604-619
- Publication date: 2017
- Main Research Area: Technical/natural sciences

**Publication information**

- Journal: Renewable Energy
- Volume: 107
- ISSN (Print): 0960-1481
- Ratings:
  - BFI (2017): BFI-level 1
  - Web of Science (2017): Indexed yes
  - BFI (2016): BFI-level 1
  - Scopus rating (2016): CiteScore 4.83 SJR 1.697 SNIP 2.044
  - Web of Science (2016): Indexed yes
  - BFI (2015): BFI-level 1
  - Scopus rating (2015): SJR 1.845 SNIP 2.118 CiteScore 4.51
  - Web of Science (2015): Indexed yes
  - BFI (2014): BFI-level 1
  - Scopus rating (2014): SJR 1.983 SNIP 2.687 CiteScore 4.51
  - Web of Science (2014): Indexed yes
  - BFI (2013): BFI-level 1
  - Scopus rating (2013): SJR 2.066 SNIP 2.767 CiteScore 4.63
  - ISI indexed (2013): ISI indexed yes
  - Web of Science (2013): Indexed yes
  - BFI (2012): BFI-level 1
  - Scopus rating (2012): SJR 1.852 SNIP 2.745 CiteScore 3.97
  - ISI indexed (2012): ISI indexed yes
  - Web of Science (2012): Indexed yes
  - BFI (2011): BFI-level 1
  - Scopus rating (2011): SJR 1.688 SNIP 2.404 CiteScore 3.9
  - ISI indexed (2011): ISI indexed yes
  - Web of Science (2011): Indexed yes
  - BFI (2010): BFI-level 1
  - Scopus rating (2010): SJR 1.494 SNIP 2.215
  - Web of Science (2010): Indexed yes
  - BFI (2009): BFI-level 1
  - Scopus rating (2009): SJR 1.305 SNIP 1.945
A Fully Developed Flow Thermofluid Model for Topology Optimization of 3D-Printed Air-Cooled Heat Exchangers

In this work, density-based topology optimization is applied to the design of the air-side surface of dry-cooled power plant condensers. A topology optimization model assuming a steady-state, thermally and fluid dynamically fully developed internal flow is developed and used for this application. The conductance of the heat exchanger is maximized for a prescribed pressure drop and prescribed air-side temperature change across the heat exchanger. Polymer with infilled thermally conducting metal filaments is considered as the heat exchanger material which allows cost effective additive manufacturing techniques to be used to fabricate the obtained designs. Parametric studies are presented that analyze the effect of the material thermal conductivity and the heat exchanger unit cell height on the system’s performance. The designs obtained from topology optimization are benchmarked against a simple optimized slot channel model in order to demonstrate the superior performance of the topology optimized designs. Thus, this work demonstrates the usefulness of topology optimization to fully exploit the design freedom afforded by additive manufacturing technologies.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Electrofunctional materials, University of Wisconsin-Madison
Authors: Haertel, J. H. K. (Intern), Nellis, G. F. (Ekstern)
Pages: 10-24
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Applied Thermal Engineering
Volume: 119
ISSN (Print): 1359-4311
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.78 SJR 1.462 SNIP 1.828
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.734 SNIP 1.898 CiteScore 3.32
**A gain-loss framework based on ensemble flow forecasts to switch the urban drainage-wastewater system management towards energy optimization during dry periods**

Precipitation is the cause of major perturbation to the flow in urban drainage and wastewater systems. Flow forecasts, generated by coupling rainfall predictions with a hydrologic runoff model, can potentially be used to optimize the operation of integrated urban drainage-wastewater systems (IUDWSs) during both wet and dry weather periods. Numerical weather prediction (NWP) models have significantly improved in recent years, having increased their spatial and temporal resolution. Finer resolution NWP are suitable for urban-catchment-scale applications, providing longer lead time than radar extrapolation. However, forecasts are inevitably uncertain, and fine resolution is especially challenging for NWP. This uncertainty is commonly addressed in meteorology with ensemble prediction systems (EPSs). Handling uncertainty is challenging for decision makers and hence tools are necessary to provide insight on ensemble forecast usage and to support the rationality of decisions (i.e. forecasts are uncertain and therefore errors will be made; decision makers need tools to justify their choices, demonstrating that these choices are beneficial in the long run).

This study presents an economic framework to support the decision-making process by providing information on when acting on the forecast is beneficial and how to handle the EPS. The relative economic value (REV) approach associates economic values with the potential outcomes and determines the preferential use of the EPS forecast. The envelope curve of the REV diagram combines the results from each probability forecast to provide the highest relative economic value for

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Original language: English

DOIs: 10.1016/j.applthermaleng.2017.03.030
Source: PublicationPreSubmission
Source-ID: 130504629
Publication: Research - peer-review › Journal article – Annual report year: 2017
a given gain-loss ratio. This approach is traditionally used at larger scales to assess mitigation measures for adverse events (i.e. the actions are taken when events are forecast). The specificity of this study is to optimize the energy consumption in IUDWS during low-flow periods by exploiting the electrical smart grid market (i.e. the actions are taken when no events are forecast). Furthermore, the results demonstrate the benefit of NWP neighbourhood post-processing methods to enhance the forecast skill and increase the range of beneficial uses.

**General information**

State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems, Krüger A/S
Authors: Courdent, V. (Ekstern), Grum, M. (Ekstern), Munk-Nielsen, T. (Ekstern), Mikkelsen, P. S. (Intern)
Number of pages: 14
Pages: 2531-2544
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Hydrology and Earth System Sciences
Volume: 21
Issue number: 5
ISSN (Print): 1027-5606
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.22 SJR 2.216 SNIP 1.624
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.225 SNIP 1.497 CiteScore 3.74
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.144 SNIP 1.635 CiteScore 3.71
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.859 SNIP 1.546 CiteScore 3.39
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.949 SNIP 1.567 CiteScore 3.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.493 SNIP 1.394 CiteScore 2.7
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.557 SNIP 1.334
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.658 SNIP 1.656
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.699 SNIP 1.431
Scopus rating (2007): SJR 1.108 SNIP 1.146
Scopus rating (2006): SJR 0.65 SNIP 0.79
Scopus rating (2005): SJR 0.777 SNIP 0.738
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.906 SNIP 0.922
Scopus rating (2003): SJR 1.09 SNIP 1.015
Scopus rating (2002): SJR 0.585 SNIP 0.703
A GBT-framework towards modal modelling of steel structures

In modern structural steel frame design, the modelling of joints between beams and columns are based on very simple assumptions. The joints are most often assumed to behave as a perfect hinge or as a rigid joint. This means that in the overall static analysis relative rotations and changes in the moment curves due to joint deformations are neglected. This simplification eases the modelling but it is at the cost of losing a detailed understanding of the behaviour of the joint. This happens even though the European code has introduced the so-called component method in order to determine the rotational stiffness of a connection. Based on a modelling of any beam-to-column joint using finite shell elements and springs for single components such as bolts, it is the primary hypothesis that it is possible to formulate a generalized connection model with few degrees of freedom related to a relevant set of deformation modes. This hypothesis is based on the idea of modal decomposition performed in generalized beam theories (GBT). The question is – is it possible to formulate an eigenvalue problem with a solution corresponding to mode shapes for the deformation of the joint by using the finite element model and some type of GBT beam elements? It is believed that this is possible. The paper will address our investigations and show the progress of our research.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Structural Engineering
Authors: Hansen, A. B. (Intern), Jönsson, J. (Intern)
Number of pages: 9
Pages: 1822-1830
Publication date: 2017
Conference: EUROSTEEL 2017, Copenhagen, Denmark, 13/09/2017 - 13/09/2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Ce/papers
Volume: 1
Issue number: 2-3
ISSN (Print): 2509-7075
Original language: English
Generalized beam theory, GBT, Connections, Thin-walled structures
DOIs:
10.1002/cepa.226
Source: FindIt
Source-ID: 2386059594
Publication: Research - peer-review › Conference article – Annual report year: 2017

A generic methodology for processing route synthesis and design based on superstructure optimization

In this paper, a systematic framework for novel and sustainable synthesis-design of processing routes is presented along with the associated computer-aided methods and tools. In Stage 1, superstructure optimization is used to determine the optimal processing route(s). In Stage 2, the design issues are resolved and targets for improvement are identified through the use of integrated tools. In Stage 3, new alternatives are generated using the selected route and the previously identified targets. In addition to the various computer-aided tools, two special tools are presented: (1) a database employing a specially developed knowledge representation system, and (2) Super-O, a software interface that guides users through the formulation and solution of synthesis problems. Super-O transfers data between the different tools, including a library of generic models, representing a wide range of processing options. Application of the synthesis and
design stages is highlighted through two case studies (biorefinery and carbon capture-utilization).

**General information**

State: Published

Organisations: Department of Chemical and Biochemical Engineering, KT Consortium, CAPEC-PROCESS, Technical University of Denmark

Authors: Bertran, M. (Intern), Frauzem, R. (Intern), Sanchez-Arcilla, A. S. (Ekstern), Zhang, L. (Intern), Woodley, J. (Intern), Gani, R. (Intern)

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Publication date: 2017

Main Research Area: Technical/natural sciences

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Journal: Computers and Chemical Engineering

Volume: 106

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Ratings:

BFI (2017): BFI-level 2

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BFI (2016): BFI-level 2

Scopus rating (2016): CiteScore 3.39 SJR 1.008 SNIP 1.607

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 2

Scopus rating (2015): SJR 1.122 SNIP 1.724 CiteScore 3.04

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 2

Scopus rating (2014): SJR 1.184 SNIP 1.738 CiteScore 3.22

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 2

Scopus rating (2013): SJR 1.223 SNIP 1.776 CiteScore 3.06

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 2

Scopus rating (2012): SJR 1.161 SNIP 1.92 CiteScore 3.05

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

BFI (2011): BFI-level 2

Scopus rating (2011): SJR 1.185 SNIP 1.736 CiteScore 2.8

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 2

Scopus rating (2010): SJR 1.176 SNIP 1.796

Web of Science (2010): Indexed yes

BFI (2009): BFI-level 2

Scopus rating (2009): SJR 1.154 SNIP 2.166

Web of Science (2009): Indexed yes

BFI (2008): BFI-level 2

Scopus rating (2008): SJR 1.293 SNIP 2.127

Web of Science (2008): Indexed yes

Scopus rating (2007): SJR 1.625 SNIP 1.959

Web of Science (2007): Indexed yes

Scopus rating (2006): SJR 1.304 SNIP 1.936

Scopus rating (2005): SJR 1.314 SNIP 1.953

Web of Science (2005): Indexed yes

Scopus rating (2004): SJR 1.125 SNIP 1.908

Web of Science (2004): Indexed yes
A genome-wide association study of thyroid stimulating hormone and free thyroxine in Danish children and adolescents

Background: Hypothyroidism is associated with obesity, and thyroid hormones are involved in the regulation of body composition, including fat mass. Genome-wide association studies (GWAS) in adults have identified 19 and 6 loci associated with plasma concentrations of thyroid stimulating hormone (TSH) and free thyroxine (fT4), respectively.

Objective: This study aimed to identify and characterize genetic variants associated with circulating TSH and fT4 in Danish children and adolescents and to examine whether these variants associate with obesity.

Methods: Genome-wide association analyses of imputed genotype data with fasting plasma concentrations of TSH and fT4 from a population-based sample of Danish children, adolescents, and young adults, and a group of children, adolescents, and young adults with overweight and obesity were performed (N = 1,764, mean age = 12.0 years [range 2.5-24.7]). Replication was performed in additional comparable samples (N = 2,097, mean age = 11.8 years [1.2-22.8]). Meta-analyses, using linear additive fixed-effect models, were performed on the results of the discovery and replication analyses.

Results: No novel loci associated with TSH or fT4 were identified. Four loci previously associated with TSH in adults were confirmed in this study population (PDE10A (rs2983511: beta = 0.112SD, p = 4.8·10(-16)), FOXE1 (rs7847663: beta = 0.223SD, p = 1.5·10(-20)), NR3C2 (rs9968300: beta = 0.194SD, p = 2.4·10(-11)), VEGFA (rs2396083: beta = 0.088SD, p = 2.2·10(-10))).

Effect sizes of variants known to associate with TSH or fT4 in adults showed a similar direction of effect in our cohort of children and adolescents, 11 of which were associated with TSH or fT4 in our study (p
A gentle introduction to epistemic planning: The DEL approach

Epistemic planning can be used for decision making in multi-agent situations with distributed knowledge and capabilities. Dynamic Epistemic Logic (DEL) has been shown to provide a very natural and expressive framework for epistemic planning. In this paper, we aim to give an accessible introduction to DEL-based epistemic planning. The paper starts with the most classical framework for planning, STRIPS, and then moves towards epistemic planning in a number of smaller steps, where each step is motivated by the need to be able to model more complex planning scenarios.

Bibliographical note

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Source-ID: 2355772515
Publication: Research - peer-review › Journal article – Annual report year: 2017

A gentle introduction to epistemic planning: The DEL approach

Epistemic planning can be used for decision making in multi-agent situations with distributed knowledge and capabilities. Dynamic Epistemic Logic (DEL) has been shown to provide a very natural and expressive framework for epistemic planning. In this paper, we aim to give an accessible introduction to DEL-based epistemic planning. The paper starts with the most classical framework for planning, STRIPS, and then moves towards epistemic planning in a number of smaller steps, where each step is motivated by the need to be able to model more complex planning scenarios.

General information

State: Published
Organisations: Department of Applied Mathematics and Computer Science , Algorithms and Logic
Authors: Bolander, T. (Intern)
Pages: 1-22
Publication date: 2017
Conference: 9th Workshop on Methods for Modalities, Kanpur, India, 08/01/2017 - 08/01/2017
Main Research Area: Technical/natural sciences

Publication information

Journal: Electronic Proceedings in Theoretical Computer Science
Volume: 243
ISSN (Print): 2075-2180
Ratings:
Web of Science (2017): Indexed yes
Aggregation of Single-phase Electric Vehicles for Frequency Control Provision Based on Unidirectional Charging

As the use of electric vehicles grows there is a greater possibility of using aggregated sets of electric vehicles as a large flexible unit to assist with the control of the power system. In this paper, the possibility of using electric vehicles as a flexible load for frequency control is investigated. The investigations are performed in a Pan-European interconnected grid with varying wind power penetration and different operational scenarios. Within this grid, the paper focuses on primary frequency control provision from electric vehicles and how the system behaves as the vehicles are being controlled within their respective areas. The investigations show that electric vehicles can be used for primary frequency control with different wind power penetration. By controlling the vehicles, the steady state frequency is improved and, since the vehicles react fast enough to the frequency changes, also frequency nadir and rate of change of frequency are positively affected.

A grid-independent EMMS/bubbling drag model for bubbling and turbulent fluidization

The EMMS/bubbling drag model takes the effects of meso-scale structures (i.e. bubbles) into modeling of drag coefficient and thus improves coarse-grid simulation of bubbling and turbulent fluidized beds. However, its dependence on grid size has not been fully investigated. In this article, we adopt a two-step scheme to extend the EMMS/bubbling model to the sub-grid level. Thus the heterogeneity index, HD, which accounts for the hydrodynamic disparity between homogeneous and heterogeneous fluidization, can be correlated as a function of both local voidage and slip velocity. Simulations over a periodic domain show the new drag model is less sensitive to grid size because of the additional dependence on local slip velocity. When applying the new drag model to simulations of realistic bubbling and turbulent fluidized beds, we find grid-independent results are easier to obtain for high-velocity turbulent fluidized bed cases. The simulation results indicate that the extended EMMS/bubbling drag model is a potential method for coarse-grid simulations of large-scale fluidized beds.
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Chemical Engineering Journal  
Volume: 326  
ISSN (Print): 1385-8947  

Ratings:  
- BFI (2017): BFI-level 2  
- Web of Science (2017): Indexed yes  
- BFI (2016): BFI-level 2  
- Scopus rating (2016): CiteScore 6.34  
- Web of Science (2016): Indexed yes  
- BFI (2015): BFI-level 2  
- Scopus rating (2015): CiteScore 5.68  
- Web of Science (2015): Indexed yes  
- BFI (2014): BFI-level 2  
- Scopus rating (2014): CiteScore 4.92  
- Web of Science (2014): Indexed yes  
- BFI (2013): BFI-level 1  
- Scopus rating (2013): CiteScore 4.59  
- ISI indexed (2013): ISI indexed yes  
- Web of Science (2013): Indexed yes  
- BFI (2012): BFI-level 1  
- Scopus rating (2012): CiteScore 3.92  
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- Web of Science (2012): Indexed yes  
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- Scopus rating (2011): CiteScore 3.96  
- ISI indexed (2011): ISI indexed yes  
- Web of Science (2011): Indexed yes  
- BFI (2010): BFI-level 1  
- Web of Science (2010): Indexed yes  
- BFI (2009): BFI-level 1  
- Web of Science (2009): Indexed yes  
- BFI (2008): BFI-level 2  
- Web of Science (2008): Indexed yes  
- Web of Science (2007): Indexed yes  
- Web of Science (2005): Indexed yes  
- Web of Science (2003): Indexed yes  
- Web of Science (2001): Indexed yes

Original language: English  

CFD, Drag coefficient, EMMS, Fluidized bed, Grid dependence, Simulation

**DOIs:**  

Source: Findit  
Source-ID: 2358780458

Publication: Research - peer-review › Journal article – Annual report year: 2017

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**A guide to Shared Spaces in Municipalities**

**General information**

State: Published  
Organisations: Department of Management Engineering, Systems Analysis  
Authors: Brinke, R. (Intern)

Number of pages: 24  
Publication date: 2017
A Hidden Markov Movement Model for rapidly identifying behavioral states from animal tracks

1. Electronic telemetry is frequently used to document animal movement through time. Methods that can identify underlying behaviors driving specific movement patterns can help us understand how and why animals use available space, thereby aiding conservation and management efforts. For aquatic animal tracking data with significant measurement error, a Bayesian state-space model called the first-Difference Correlated Random Walk with Switching (DCRWS) has often been used for this purpose. However, for aquatic animals, highly accurate tracking data of animal movement are now becoming more common.

2. We developed a new Hidden Markov Model (HMM) for identifying behavioral states from animal tracks with negligible error, which we called the Hidden Markov Movement Model (HMMM). We implemented as the basis for the HMMM the process equation of the DCRWS, but we used the method of maximum likelihood and the R package TMB for rapid model fitting. We compared the HMMM to a modified version of the DCRWS for highly accurate tracks, the DCRWSnme, and to a common HMM for animal tracks fitted with the R package moveHMM. We show that the HMMM is both accurate and suitable for multiple species by fitting it to real tracks from a grey seal, lake trout, and blue shark, as well as to simulated data. The HMMM is a fast and reliable tool for making meaningful inference from animal movement data that is ideally suited for ecologists who want to use the popular DCRWS implementation for highly accurate tracking data. It additionally provides a groundwork for development of more complex modelling of animal movement with TMB. To facilitate its uptake, we make it available through the R package swim.
A high-speed Schottky detector for ultra-wideband communications

This letter reviews the design procedure of a high-speed Schottky video detector for high-data-rate communications within the ultra-wideband (UWB) frequencies. The classic design approach for video detectors is extended with a mixer-like analysis, which results in a more detailed assessment of the detector performance. The designed circuit is reviewed and measurements are provided for a manufactured prototype. The detector can successfully demodulate 2.5 Gbps video signals around a 7 GHz carrier. The bitrate to carrier frequency ratio of 35.7% is the highest reported for detectors at UWB frequencies. Using 0 dBm carrier power, the lowest measured conversion loss is 10 dB for a video frequency of 1.1 GHz and better than 13 dB up to 1.8 GHz.

General information
State: Published
Organisations: Metro-Access and Short Range Systems, Department of Electrical Engineering, Electromagnetic Systems, Department of Photonics Engineering, Technical University of Denmark
Authors: Valdecasa, G. S. (Ekstern), Cimoli, B. (Intern), Blanco Granja, Á. (Ekstern), Jensen, J. B. (Intern), Tafur Monroy, I. (Intern), Johansen, T. K. (Intern), Vegas Olmos, J. J. (Intern)
Pages: 388-393
Publication date: 2017
Main Research Area: Technical/natural sciences
A homogenization method for ductile-brittle composite laminates at large deformations

This paper presents a high fidelity homogenization method for periodically layered composite structures that accounts for plasticity in the matrix material and quasi-brittle damage in the reinforcing layers, combined with strong geometrical nonlinearities. A set of deliberately chosen internal kinematic variables results in a rigorous representation of the kinematics of the two constituents, which in turn allows for complex constitutive laws per constituent to be employed directly in the formulation. The model accounts for hyper-elastoplastic behavior in the matrix phase and hyper-elastic behavior in the reinforcement as well as for the bending stiffness of the reinforcement layers. Additionally to previously proposed models, the present method includes Lemaitre type damage for the reinforcement, making it applicable to a wider range of engineering applications. The capability of the proposed method in representing the combined effect of plasticity, damage and buckling at microlevel within a homogenized setting is demonstrated by means of direct comparisons to a reference discrete model.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: Poulios, K. (Intern), Niordson, C. F. (Intern)
Number of pages: 36
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
ISSN (Print): 0029-5981
Ratings:
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.64 SJR 1.743 SNIP 1.566
Web of Science (2016): Indexed yes
A hybrid Constraint Programming/Mixed Integer Programming framework for the preventive signaling maintenance crew scheduling problem

A railway signaling system is a complex and interdependent system which should ensure the safe operation of trains. We introduce and address a mixed integer optimisation model for the preventive signal maintenance crew scheduling problem in the Danish railway system. The problem contains many practical constraints, such as temporal dependencies between crew schedules, the splitting of tasks across multiple days, crew competency requirements and several other managerial
constraints. We propose a novel hybrid framework using Constraint Programming (CP) to generate initial feasible solutions to feed as 'warm start' solutions to a Mixed Integer Programming (MIP) solver for further optimisation. We apply the CP/MIP framework to a section of the Danish rail network and benchmark our results against both direct application of a MIP solver and modelling the problem as a Constraint Optimisation Problem (COP). Whereas the current practice of using a general purpose MIP solver is only able to solve instances over a two-week planning horizon, the hybrid framework generates good results for problem instances over an eight-week period. In addition, the use of a MIP solver to improve the initial solutions generated by CP is shown to be vastly superior to solving the problem as a COP.

General information
State: Accepted/In press
Organisations: Management Science, Department of Management Engineering, Operations Research, Queen Mary University of London, Banedanmark
Authors: Pour, S. M. (Intern), Drake, J. H. (Ekstern), Ejlertsen, L. S. (Ekstern), Rasmussen, K. M. (Intern), Burke, E. K. (Ekstern)
Number of pages: 26
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: European Journal of Operational Research
ISSN (Print): 0377-2217
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.83 SJR 2.505 SNIP 2.339
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.334 SNIP 2.412 CiteScore 3.59
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.186 SNIP 2.485 CiteScore 3.21
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.346 SNIP 2.735 CiteScore 3.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.418 SNIP 2.588 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.401 SNIP 2.441 CiteScore 3.02
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.477 SNIP 2.435
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.326 SNIP 2.577
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.739 SNIP 1.984
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.679 SNIP 2.041
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.299 SNIP 2.023
A hybridizable discontinuous Galerkin method for solving nonlocal optical response models

We propose Hybridizable Discontinuous Galerkin (HDG) methods for solving the frequency-domain Maxwell’s equations coupled to the Nonlocal Hydrodynamic Drude (NHD) and Generalized Nonlocal Optical Response (GNOR) models, which are employed to describe the optical properties of nano-plasmonic scatterers and waveguides. Brief derivations for both the NHD model and the GNOR model are presented. The formulations of the HDG method for the 2D TM mode are given, in which we introduce two hybrid variables living only on the skeleton of the mesh. The local field solutions are expressed in terms of the hybrid variables in each element. Two conservativity conditions are globally enforced to make the problem solvable and to guarantee the continuity of the tangential component of the electric field and the normal component of the current density. Numerical results show that the proposed HDG methods converge at optimal rate. We benchmark our implementation and demonstrate that the HDG method has the potential to solve complex nanophotonic problems.

General information
State: Published
Organisations: Center for Nanostructured Graphene, Department of Photonics Engineering, Structured Electromagnetic Materials, University of Electronic Science and Technology of China, INRIA Sophia Antipolis
Authors: Li, L. (Ekstern), Lanteri, S. (Ekstern), Mortensen, N. A. (Intern), Wubs, M. (Intern)
Pages: 99-107
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Computer Physics Communications
Volume: 219
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Ratings:
BFI (2017): BFI-level 1
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Scopus rating (2016): CiteScore 4.04 SJR 2.136 SNIP 2.224
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.816 SNIP 2.185 CiteScore 3.79
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.35 SNIP 1.682 CiteScore 2.86
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.47 SNIP 1.729 CiteScore 3.17
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.122 SNIP 2.136 CiteScore 3.46
ISI indexed (2012): ISI indexed yes
Air Quality Monitoring System and Benchmarking

Air quality monitoring has become an integral part of smart city solutions. This paper presents an air quality monitoring system based on Internet of Things (IoT) technologies, and establishes a cloud-based platform to address the challenges related to IoT data management and processing capabilities, including data collection, storage, analysis, and visualization. In addition, this paper also benchmarks four state-of-the-art database systems to investigate the appropriate technologies for managing large-scale IoT datasets.

General information
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Organisations: Department of Management Engineering, Systems Analysis
Authors: Liu, X. (Intern), Nielsen, P. S. (Intern)
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Airway exposure to multi-walled carbon nanotubes disrupts the female reproductive cycle without affecting pregnancy outcomes in mice

Background: The use of multiwalled carbon nanotubes (MWCNT) is increasing due to a growing use in a variety of products across several industries. Thus, occupational exposure is also of increasing concern, particularly since airway exposure to MWCNTs can induce sustained pulmonary acute phase response and inflammation in experimental animals, which may affect female reproduction. This proof-of-principle study therefore aimed to investigate if lung exposure by intratracheal instillation of the MWCNT NM-400 would affect the estrous cycle and reproductive function in female mice.

Results: Estrous cycle regularity was investigated by comparing vaginal smears before and after exposure to 67 µg of NM-400, whereas reproductive function was analyzed by measuring time to delivery of litters after instillation of 2, 18 or 67 µg of NM-400. Compared to normal estrous cycling determined prior to exposure, exposure to MWCNT significantly prolonged the estrous cycle during which exposure took place, but significantly shortened the estrous cycle immediately after the exposed cycle. No consistent effects were seen on time to delivery of litter or other gestational or litter parameters, such as litter size, sex ratio, implantations and implantation loss.

Conclusion: Lung exposure to MWCNT interfered with estrous cycling. Effects caused by MWCNTs depended on the time of exposure: the estrous stage was particularly sensitive to exposure, as animals exposed during this stage showed a higher incidence of irregular cycling after exposure. Our data indicates that MWCNT exposure may interfere with events leading to ovulation.
A language-based approach to modelling and analysis of Twitter interactions

More than a personal microblogging site, Twitter has been transformed by common use to an information publishing venue, which public characters, media channels and common people daily rely on for, e.g., news reporting and consumption, marketing, and social messaging. The use of Twitter in a cooperative and interactive setting calls for the precise awareness of the dynamics regulating message spreading. In this paper, we describe Twitlang, a language for modelling the interactions among Twitter accounts. The associated operational semantics allows users to precisely determine the effects of their actions on Twitter, such as post, reply-to or delete tweets. The language is implemented in the form of a Maude interpreter, Twitlanger, which takes a language term as an input and explores the computations arising from the term. By combining the strength of Twitlanger and the Maude model checker, it is possible to automatically verify communication properties of Twitter accounts. We illustrate the benefits of our executable formalisation by means of an application scenario inspired from real life. While the scenario highlights the benefits of adopting Twitter for a cooperative use in the everyday life, our analysis shows that appropriate settings are essential for a proper usage of the platform, in respect of fulfilling those communication properties expected within collaborative and interactive contexts.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Embedded Systems Engineering, IMT Institute for Advanced Studies Lucca, CNR, Istituto di Informatica e Telematica, University of Camerino
Authors: Maggi, A. (Ekstern), Petrocchi, M. (Ekstern), Spognardi, A. (Intern), Tiezzi, F. (Ekstern)
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A layered shell containing patches of piezoelectric fibers and interdigitated electrodes: Finite element modeling and experimental validation

The work gives a theoretical and experimental contribution to the problem of smart materials connected to double curved flexible shells. In the theoretical part the finite element modeling of a double curved flexible shell with a piezoelectric fiber patch with interdigitated electrodes (IDEs) is presented. The developed element is based on a purely mechanical eight-node isoparametric layered element for a double curved shell, utilizing first-order shear deformation theory. The
electromechanical coupling of piezoelectric material is added to all elements, but can also be excluded by setting the piezoelectric material properties to zero. The electrical field applied via the IDEs is aligned with the piezoelectric fibers, and hence the direct d33 piezoelectric constant is utilized for the electromechanical coupling. The dynamic performance of a shell with a microfiber composite (MFC) patch is investigated using frequency response functions (FRFs) obtained via external impact test as well as internal random signal excitation using the MCF patch as an actuator. The experiments are used to validate the numerical results. Good agreement between theory and experiments is obtained in a large frequency range. Discrepancies and insights into optimal modeling frequency range and non-linear behavior are discussed.
A least squares approach for efficient and reliable short-term versus long-term optimization

The uncertainties related to long-term forecasts of oil prices impose significant financial risk on ventures of oil production. To minimize risk, oil companies are inclined to maximize profit over short-term horizons ranging from months to a few years. In contrast, conventional production optimization maximizes long-term profits over horizons that span more than a decade. To address this challenge, the oil literature has introduced short-term versus long-term optimization. Ideally, this problem is solved by a posteriori multi-objective optimization methods that generate an approximation to the Pareto front of optimal short-term and long-term trade-offs. However, such methods rely on a large number of reservoir simulations and scale poorly with the number of objectives subject to optimization. Consequently, the large-scale nature of production optimization severely limits applications to real-life scenarios. More practical alternatives include ad hoc hierarchical switching schemes. As a drawback, such methods lack robustness due to unclear convergence properties and do not naturally generalize to cases of more than two objectives. Also, as this paper shows, the hierarchical formulation may skew the balance between the objectives, leaving an unfulfilled potential to increase profits. To promote efficient and reliable short-term versus long-term optimization, this paper introduces a natural way to characterize desirable Pareto points and proposes a novel least squares (LS) method. Unlike hierarchical approaches, the method is guaranteed to converge to a Pareto optimal point. Also, the LS method is designed to properly balance multiple objectives, independently of Pareto front's shape. As such, the method poses a practical alternative to a posteriori methods in situations where the frontier is intractable to generate.
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Scopus rating (2014): SJR 1.232 SNIP 1.619 CiteScore 2.62
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.012 SNIP 1.393 CiteScore 2.09
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Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.856 SNIP 1.366 CiteScore 1.8
ISI indexed (2012): ISI indexed yes
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Scopus rating (2011): SJR 0.691 SNIP 1.01 CiteScore 1.92
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Scopus rating (2010): SJR 0.741 SNIP 1.266
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.122 SNIP 1.787
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Scopus rating (2008): SJR 0.664 SNIP 1.548
Scopus rating (2007): SJR 0.716 SNIP 1.489
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.92 SNIP 1.491
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Scopus rating (2002): SJR 0.466 SNIP 0.886
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Ålelarvernes vækstmuligheder i Sargassohavet

General information
Algal Biomass for Bioenergy and Bioproducts Production in Biorefinery Concepts

The fast population growth is increasing the demand for energy and resources. However, the reserves of oil are diminishing and greenhouse emissions associated to its combustion are affecting the global climate causing global warming. Therefore the need for alternative resources and processes is becoming imperative.

Macro- and microalgae have the ability to transform nutrients into valuable biomass. Being a good source of vitamins, minerals, lipids, proteins and pigments, they represent a promising source of various products. However these biomasses are still very little explored as biorefinery feedstocks.

Biorefinery represents an important tool towards the development of a sustainable economy. Within the biorefinery framework several bioproducts, such as food, feed and biofuels, can be produced from biomass. The specific composition of the biomass feedstock determines the potential final product that can be obtained.

In this thesis, micro- and macroalgae were investigated as biorefinery feedstocks. The main aim of this work was developing different biorefinery strategies for the production of high value products, such as proteins or pigments, to be employed in the pharmaceutical or nutraceutical industry. The macroalgae used in this work were Laminaria digitata and Saccharina latissima, while the microalgae were Chlorella sorokiniana, Chlorella vulgaris and Chlorella protothecoides. Moreover, an evaluation of the effect of the harvesting season and location on the composition of high value products such as total phenolics and on the biogas potential for L. digitata and S. latissima was done. Both these factors had a significant impact on the accumulation of total phenolics in the algal biomass and on the biogas production. In particular, samples harvested in summer, because of the high content of sugars, showed to be the most promising feedstock in the development of biorefinery processes, containing 0.5 mgTPC gDM-1 and having a biomethane potential of 343.7 NmLCH4 g VS-1.

Moreover, proteins being an interesting valuable product to be used as food and feed supplement, diverse industrial methods to produce amino acids and proteins were analyzed. Innovative techniques to increase the protein content in the final biomass, such as microalgae or microorganisms to be used as single cell proteins (SCP), were also investigated. The combination of phototropic growth of C. sorokiniana with Methyllococcus capsulatus led to an innovative solution where two products rich in proteins (up to 43 %DM) were obtained.

Another strategy developed in this thesis work was based on the combination of micro- and macroalgae to enhance protein production. Indeed, the microalgae C. protothecoides was grown heterotrophically in the macroalgae L. digitata hydrolyzed. The final composition of the microalgal biomass showed that the protein content was increased from 0.07 ± 0.01 gProtein gDM-1 to 0.44 ± 0.04 gProtein DM-1. The results obtained show that this solution may represent an interesting strategy to be applied in a biorefinery approach.

Finally, a microalgae biorefinery strategy was developed. Lutein represents a very important pigment present in the macular region of the human eye. It is crucial in the protection against light-induced retinal damages and responsible for maintaining human bone health and preventing some diseases. Lutein and proteins were extracted by developing innovative methods specifically designed for microalgae species. From the initial algal biomass were extracted 0.8 ± 0.1 mg Lutein gDM-1 with a purity of 92.5 ± 1.2% and a calculated yield of 95%. Moreover, the final protein content in the fraction was 82.7 ± 3.1% w w-1 with a protein yield of 55%. Finally, from the residues of this extraction processes, 372.7 ± 19.0 NmLCH4 g VS-1 of biogas were produced.

The results obtained in this thesis work show that macro- and microalgae are promising biomasses for the development of the future biorefineries.
Algal toxicity of the alternative disinfectants performic acid (PFA), peracetic acid (PAA), chlorine dioxide (ClO2) and their by-products hydrogen peroxide (H2O2) and chlorite (ClO2-)

Environmental effect evaluation of disinfection of combined sewer overflow events with alternative chemical disinfectants requires that the environmental toxicity of the disinfectants and the main by-products of their use are known. Many disinfectants degrade quickly in water which should be included in the evaluation of both their toxicity as determined in standardized tests and their possible negative effect in the water environment. Here we evaluated according to the standardized ISO 8692 test the toxicity towards the green microalgae, Pseudokirchneriella subcapitata, of three disinfectants: performic acid (PFA), peracetic acid (PAA) and chlorine dioxide (ClO2) as well as two by-products of their use: hydrogen peroxide (H2O2) and chlorite. All of the five chemicals investigated showed clear toxicity to the algae with well-defined dose response curves. The EC50 values ranged from 0.16 to 2.9 mg/L based on nominal concentrations leading to the labeling of the chemicals as either toxic or very toxic. The five investigated chemicals decreased in toxicity in the order chlorine dioxide, performic acid, peracetic acid, chlorite and hydrogen peroxide. The stability of the chemicals increased in the same order as the toxicity decrease. This indicates that even though ClO2 has the highest environmental hazard potential, it may still be suitable as an alternative disinfectant due to its rapid degradation in water.
A life cycle assessment of poly-hydroxybutyrate extraction from microbial biomass using dimethyl carbonate

Poly-hydroxyalkanoates are an example of biodegradable and biocompatible polymers, produced from renewable raw materials. With respect to other bioplastics the market share of poly-hydroxyalkanoates is still limited because of their commercial costs. To develop more cost-effective processes, a multilevel approach is usually undertaken combining innovative, cheaper and more effective microbial cultivation with safe and cheap extraction and purification methodologies. This study assesses the potential life cycle environmental impacts related to a novel protocol poly-hydroxyalkanoates extraction based on dimethyl carbonate in comparison to the use of halogenated hydrocarbons (in particular 1,2 dichloroethane). Four scenarios are analysed for the dimethyl carbonate protocol considering: extraction from microbial slurry or from dried biomass, and recovery by solvent evaporation or polymer precipitation. The life cycle assessment demonstrates that the environmental performances of dimethyl carbonate-based protocols are far better than those of the most comparative process using the halogenated hydrocarbons. The scenario that foresees the extraction of dried biomass and recovers solvent by evaporation appears to be the most promising in terms of environmental sustainability performance.

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Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, University of Bologna
Authors: Righi, S. (Ekstern), Baioli, F. (Ekstern), Samori , C. (Ekstern), Galletti, P. (Ekstern), Tagliavini, E. (Ekstern), Stramigioli, C. (Ekstern), Tugnoli, A. (Ekstern), Fantke, P. (Intern)
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Web of Science (2016): Indexed yes
We herein present broadly useful, readily available and nonintegral hydroxylamine linkers for the routine solid-phase synthesis of hydroxamic acids. The developed protocols enable the efficient synthesis and release of a wide range of hydroxamic acids from various resins, relying on high control and flexibility with respect to reagents and synthetic processes. A trityl-based hydroxylamine linker was used to synthesize a library of peptide hydroxamic acids. The inhibitory effects of the compounds were examined for seven HDAC enzyme subtypes using a chemiluminescence-based assay.
**Alkyl caffeates as antioxidants in O/W emulsions: Impact of emulsifier type and endogenous tocopherols**

Antioxidant addition can be one strategy to limit lipid oxidation in emulsions. Research has proven that an important factor regarding the efficacy of antioxidants is their localization in the emulsion; however, other factors such as interactions with other components can also have an impact. Thus, the aim was to evaluate the impact of emulsifiers (Citrem and Tween80) and presence of endogenous tocopherols on the efficacies of caffeic acid and caffeates (C1–C20) as antioxidants in emulsions. Lipid oxidation was evaluated during storage and partitioning of caffeic acid and caffeates was estimated by measuring their concentrations in the aqueous phase. Partitioning of caffeic acid and caffeates was influenced by emulsifier type and the presence of endogenous tocopherols. Caffeic acid was the most efficient antioxidant in Citrem and Tween stabilized emulsions in the presence of endogenous tocopherol. In contrast, for Tween stabilized emulsions, caffeic acid acted as a prooxidant and the evaluated caffeates acted as strong antioxidants in the absence of endogenous tocopherol. Thus, when endogenous tocopherol was present lipophilization of caffeic acid did not increase its efficacy as an antioxidant. It is suggested that the differences observed in antioxidant efficiency with different emulsifiers and with and without endogenous tocopherols is due to emulsifier–antioxidant interactions and antioxidant–antioxidant interactions in the emulsions.

**General information**

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*Authors:* Sørensen, A. M. (Intern), Villeneuve, P. (Ekstern), Jacobsen, C. (Intern)  
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BFI (2015): BFI-level 1  
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Web of Science (2015): Indexed yes  
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ISI indexed (2013): ISI indexed yes  
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BFI (2012): BFI-level 1  
Scopus rating (2012): SJR 0.873 SNIP 1.207 CiteScore 2.06  
ISI indexed (2012): ISI indexed yes  
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BFI (2011): BFI-level 1  
Scopus rating (2011): SJR 0.732 SNIP 0.945 CiteScore 1.75  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 0.791 SNIP 1.049  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 0.838 SNIP 1.077
In 2013, we raised suspicion that cobalt in leather could be responsible for hitherto unrecognized cases of allergic contact dermatitis. We saw a patient sensitized only to cobalt with clear long-term exposure to cobalt from a leather sofa, and observed resolution of dermatitis following avoidance [1]. In 2014, we performed a questionnaire study, which showed a positive and significant association between cobalt allergy and a history of dermatitis caused by non-occupational exposure to leather articles [2]. Recently, we published an article showing high amounts of cobalt in selected leather swatches from furniture [3]. Here, we report 2 additional cases of allergic cobalt dermatitis caused by consumer leather exposure, to increase awareness about this topic.

Allergic contact dermatitis caused by cobalt in leather – clinical cases

In 2013, we raised suspicion that cobalt in leather could be responsible for hitherto unrecognized cases of allergic contact dermatitis. We saw a patient sensitized only to cobalt with clear long-term exposure to cobalt from a leather sofa, and observed resolution of dermatitis following avoidance [1]. In 2014, we performed a questionnaire study, which showed a positive and significant association between cobalt allergy and a history of dermatitis caused by non-occupational exposure to leather articles [2]. Recently, we published an article showing high amounts of cobalt in selected leather swatches from furniture [3]. Here, we report 2 additional cases of allergic cobalt dermatitis caused by consumer leather exposure, to increase awareness about this topic.

General information

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Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Copenhagen University Hospital, University of Copenhagen
Authors: Bregnbak, D. (Ekstern), Opstrup, M. S. (Ekstern), Jellesen, M. S. (Intern), Johansen, J. D. (Ekstern), Thyssen, J. P. (Ekstern)
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Allergic Sensitization at School Age Is a Systemic Low-grade Inflammatory Disorder

Background
Systemic low-grade inflammation has been demonstrated in a range of the frequent noncommunicable diseases (NCDs) proposing a shared mechanism, but is largely unexplored in relation to allergic sensitization. We therefore aimed to investigate the possible association with childhood allergic sensitization.

Methods
High-sensitivity C-reactive protein (hs-CRP), interleukin-1β (IL-1β), IL-6, tumor necrosis factor-α (TNF-α), and chemokine (C-X-C motif) ligand 8 (CXCL8) were measured in plasma at age 6 months (N = 214) and 7 years (N = 277) in children from the Copenhagen Prospective Studies on Asthma in Childhood2000 (COPSAC2000) birth cohort. Allergic sensitization against common inhalant and food allergens was determined longitudinally at ages ½, 1½, 4 and 6 years by specific IgE assessments and skin prick tests. Associations between inflammatory biomarkers and sensitization phenotypes were tested with logistic regression and principal component analyses (PCAs).

Results
Adjusted for gender, recent infections, and a CRP genetic risk score, hs-CRP at 7 years was associated with concurrent...
elevated specific IgE against any allergen [adjusted OR (aOR) = 1.40; 95% CI, 1.14–1.72; P = 0.001], aeroallergens (aOR, 1.43; 1.15–1.77; P = 0.001), food allergens (aOR, 1.31; 95% CI, 1.02–1.67; P = 0.04), sensitization without any clinical allergy symptoms (aOR = 1.40; 1.06–1.85; P = 0.02), and with similar findings for skin prick tests. The other inflammatory markers were not univariately associated with sensitization, but multiparametric PCA suggested a specific inflammatory response among sensitized children. Inflammatory markers at age 6 months were not associated with subsequent development of sensitization phenotypes.

Conclusions
Elevated hs-CRP is associated with allergic sensitization in school-aged children suggesting systemic low-grade inflammation as a phenotypic characteristic of this early-onset NCD.

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Authors: Chawes, B. L. (Ekstern), Stokholm, J. (Ekstern), Schoos, A. M. (Ekstern), Fink, N. R. (Ekstern), Pedersen, S. B. (Intern), Bisgaard, H. (Ekstern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
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Scopus rating (2013): SJR 2.195 SNIP 1.902 CiteScore 4.91
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Scopus rating (2012): SJR 2.008 SNIP 1.818 CiteScore 4.81
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
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Scopus rating (2011): SJR 2.328 SNIP 1.781 CiteScore 4.89
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BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.826 SNIP 1.845
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.681 SNIP 0.958
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.433 SNIP 1.937
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Scopus rating (2007): SJR 1.374 SNIP 1.862
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.523 SNIP 2.691
All-fiber photon-pair source at telecom wavelengths

Single photon sources are a key element for quantum computing, quantum key distribution (QKD) and quantum communications. In particular, producing single photons at telecommunications wavelengths is valuable for QKD protocols and would enable realizing the quantum internet. The preferred method for their generation has long been spontaneous down conversion in bulk crystals, which suffers from connection loss to fiber networks. In-fiber spontaneous four-wave mixing provides a viable alternative as a photon pair source due to being compatible with existing fiber networks. We present an all-fiber photon pair source based on degenerate four-wave mixing in a 400 m Highly-Nonlinear fiber, with signal and idler wavelengths generated at 1552.5 nm and 1557 nm respectively. The source consists of CW pump laser operating at 1554.75 nm, which is slightly detuned from the zero group velocity dispersion wavelength into the normal dispersion regime. After pair generation in the highly-nonlinear fiber, three arrayed waveguide gratings are employed to spatially separate signal and idler, and provides a 120 dB pump power reduction. Firstly the source is modelled and experimentally characterized in the well known classical regime of stimulated four-wave mixing. The effect of fiber cooling on spontaneous Raman scattering is modelled and characterized, and a 30% reduction in spontaneous emission is found when cooling the fiber to −77 C◦. In the low power regime the coincidence to accidental count ratio is simulated and measured. An increase in the coincidence to accidental count ratio is observed when cooling the fiber.

General information

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Alloy design as an inverse problem of cluster expansion models

Central to a lattice model of an alloy system is the description of the energy of a given atomic configuration, which can be conveniently developed through a cluster expansion. Given a specific cluster expansion, the ground state of the lattice model at 0 K can be solved by finding the configuration of solutes that minimizes the energy of the system. In this paper, we develop a method for solving the inverse lattice problem, where, given a broad class of potential, we find the ground states for all possible values of the effective cluster interaction energies. To do so, we formulate the inverse problem in terms of energetically distinct configurations, using a constraint satisfaction model to identify constructible configurations, and show that a convex hull can be used to identify ground states. To demonstrate the approach, we solve for all ground states for a binary alloy in a 2D hexagonal lattice both with and without an interface, based on pairwise interactions.
**A local freshwater impact – proposing a groundwater indicator AGWaRe**

Currently there are several world maps showing the water stress in regions or nations. They give a good indication of water stress on a larger scale, but do not have information on a local scale that may assist a water utility in their prioritization of well fields to lower the overall pressure on the water resource. Furthermore a local water stress indicator is necessary for benchmarking regional water supplies against each other.

AWaRe is the freshwater impact recommended by the Lifecycle Initiative (developed by WULCA). It is defined as the inverse function of Availability Minus Demand (AMD) which is compared to the world average AMD. The AMD represents the water remaining after human consumption and environmental requirements. This is done for a grid of 50x50km worldwide, but it does not give sufficient information on a local scale. Therefore we modified the AWaRe indicator so that it can account for differences at the local scale and termed it AWaRe*. We have applied AWaRe* on four different demarcations for three public water supplies of the largest cities in Denmark.

The results of the local scales will be presented and compared with the results from the AWaRe found for non agricultural water use (found by WULCA). The AWaRe* differs between different demarcations. For the four locale scales water supply C ranks as the most water stressed. This fits well with the water stress experienced by the three water supplies. For two out of four demarcations, the ranking between the cases are the same. As expected for the local scales we see the highest impact factor for the smallest scale. For the water stress found by WULCA, the water stress is lowest for water supply C and case A and B have similar water stress, which is opposite of the ranking from the local scales. For the AWaRe scale, we obtain results that do not comply with the expected outcome from the water supply. Further work should be given to increase resolution of AWaRe data.

Not only is the applied method crucial to the outcome, but also the scale applied and the data used. The locale scale shows the highest water stress at water supply C, which is the city with most inhabitants and a water supply that experience water stress. AWaRe* on the locale scale represents the expected water stress for the water supplies.

**General information**

**State:** Published

**Organisations:** Department of Environmental Engineering, Urban Water Systems, Water Resources Engineering, HOFOR A/S

**Authors:** Gejl, R. N. (Intern), Bjerg, P. L. (Intern), Rasmussen, J. (Ekstern), Rygaard, M. (Intern)

**Number of pages:** 1

**Publication date:** 2017
A long look at MCG-5-23-16 with NuSTAR. I. relativistic reflection and coronal properties

MCG-5-23-16 was targeted in early 2015 with a half mega-second observing campaign using NuSTAR. Here we present the spectral analysis of these data sets along with an earlier observation and study the relativistic reflection and the primary coronal source. The data show strong reflection features in the form of both narrow and broad iron lines plus a Compton reflection hump. A cutoff energy is significantly detected in all exposures. The shape of the reflection spectrum does not change in the two years spanned by the observations, suggesting a stable geometry. A strong positive correlation is found between the cutoff energy and both the hard X-ray flux and spectral index. The measurements imply that the coronal plasma is not at the runaway electron-positron pair limit, and instead contains mostly electrons. The observed variability in the coronal properties is driven by a variable optical depth. A constant heating-to-cooling ratio is measured, implying that there is a feedback mechanism in which a significant fraction of the photons cooling the corona are due to reprocessed hard X-rays.
A low-spin Fe(III) complex with 100-ps ligand-to-metal charge transfer photoluminescence

Transition-metal complexes are used as photosensitizers(1), in light-emitting diodes, for biosensing and in photocatalysis(2). A key feature in these applications is excitation from the ground state to a charge-transfer state(3,4); the long charge-transfer-state lifetimes typical for complexes of ruthenium(5) and other precious metals are often essential to ensure high performance. There is much interest in replacing these scarce elements with Earth-abundant metals, with iron(6) and copper(7) being particularly attractive owing to their low cost and non-toxicity. But despite the exploration of innovative molecular designs(6,8-10), it remains a formidable scientific challenge(11) to access Earth-abundant transition-metal complexes with long-lived charge-transfer excited states. No known iron complexes are considered(12) photoluminescent at room temperature, and their rapid excited-state deactivation precludes their use as photosensitizers(13-15). Here we present the iron complex [Fe(btz)(3)][3+](where btz is 3,3'-dimethyl-1,1'-bis(p-tolyl)-4,4'-bis(1,2,3-triazol-5-ylidene)), and show that the superior sigma-donor and pi-acceptor electron properties of the ligand stabilize the excited state sufficiently to realize a long charge-transfer lifetime of 100 picoseconds (ps) and room-temperature photoluminescence. This species is a low-spin Fe(III) d(5) complex, and emission occurs from a long-lived doublet ligand-to-metal charge-transfer ((LMCT)-L-2) state that is rarely seen for transition-metal complexes(4,16,17). The absence of intersystem crossing, which often gives rise to large excited-state energy losses in transition-metal complexes, enables the observation of spin-allowed emission directly to the ground state and could be exploited as an increased driving force in photochemical reactions on surfaces. These findings suggest that appropriate design strategies can deliver new iron-based materials for use as light emitters and photosensitizers.

General information
State: Published
Organisations: Neutrons and X-rays for Materials Physics, Department of Physics, Lund University, Uppsala University, University of Copenhagen, National Institute of Standards and Technology
Number of pages: 19
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Nature
Volume: 543
Alterations in the brain's connectome during recovery from severe traumatic brain injury: Protocol for a longitudinal prospective study

Introduction Traumatic brain injury (TBI) is considered one of the most pervasive causes of disability in people under the age of 45. TBI often results in disorders of consciousness, and clinical assessment of the state of consciousness in these patients is challenging due to the lack of behavioural responsiveness. Functional neuroimaging offers a means to assess these patients without the need for behavioural signs, indicating that brain connectivity plays a major role in consciousness emergence and maintenance. However, little is known regarding how changes in connectivity during recovery from TBI accompany changes in the level of consciousness. Here, we aim to combine cutting-edge neuroimaging techniques to follow changes in brain connectivity in patients recovering from severe TBI. Methods and analysis A multimodal, longitudinal assessment of 30 patients in the subacute stage after severe TBI will be made comprising an MRI session.
combined with electroencephalography (EEG), a positron emission tomography session and a transcranial magnetic stimulation (TMS) combined with EEG (TMS/EEG) session. A group of 20 healthy participants will be included for comparison. Four sessions for patients and two sessions for healthy participants will be planned. Data analysis techniques will focus on whole-brain, both data-driven and hypothesis-driven, connectivity measures that will be specific to the imaging modality. Ethics and dissemination The project has received ethical approval by the local ethics committee of the Capital Region of Denmark and by the Danish Data Protection. Results will be published as original research articles in peer-reviewed journals and disseminated in international conferences. None of the measurements will have any direct clinical impact on the patients included in the study but may benefit future patients through a better understanding of the mechanisms underlying the recovery process after TBI. Trial registration number: NCT02424656; Pre-results.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Cognitive Systems, University of Copenhagen
Authors: Conde, V. (Ekstern), Andreasen, S. H. (Ekstern), Petersen, T. H. (Ekstern), Larsen, K. B. (Ekstern), Madsen, K. (Ekstern), Andersen, K. W. (Ekstern), Akopian, I. (Ekstern), Madsen, K. H. (Intern), Hansen, C. P. (Ekstern), Poulsen, I. (Ekstern), Kamersgaard, L. P. (Ekstern), Siebner, H. R. (Ekstern)
Number of pages: 10
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Open Journal of Ecology
Volume: 7
Issue number: 6
ISSN (Print): 2162-1985
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
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Journal Article, Medicine (all), Brain connectivity, Disorders of Consciousness, Longitudinal study, Multimodal study, Neuroimaging, Traumatic Brain Injury
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Source: FindIt
Source-ID: 2371512648
Publication: Research - peer-review › Journal article – Annual report year: 2017

Alternative prophylaxis/disinfection in aquaculture - Adaptable stress induced by peracetic acid at low concentration and its application strategy in RAS
• Stress was monitored by measuring cortisol in water instead of in blood. • Fish adapted to regular prophylaxis/disinfection with peracetic acid by showing reduced stress. • A mathematic model was established to improve understanding of substance distribution in RAS.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Aquaculture, Leibniz Institute of Freshwater Ecology and Inland Fisheries, Agricultural Research Service
Authors: Liu, D. (Ekstern), Pedersen, L. (Intern), Straus, D. L. (Ekstern), Kloas, W. (Ekstern), Meinelt, T. (Ekstern)
Pages: 82-85
Publication date: 2017
Main Research Area: Technical/natural sciences
Amalgams and χ-Boundedness

A class of graphs is hereditary if it is closed under isomorphism and induced subgraphs. A class G of graphs is χ-bounded if there exists a function f : N → N such that for all graphs G ∈ G, and all induced subgraphs H of G, we have that χ(H) ≤ f(ω(H)). We prove that proper homogeneous sets, clique-cutsets, and amalgams together preserve χ-boundedness. More precisely, we show that if G and G∗ are hereditary classes of graphs such that G is χ-bounded, and such that every graph in G∗ either belongs to G or admits a proper homogeneous set, a clique-cutset, or an amalgam, then the class G∗ is χ-bounded. This generalizes a result of [J Combin Theory Ser B 103(5) (2013), 567–586], which states that proper homogeneous sets and clique-cutsets together preserve χ-boundedness, as well as a result of [European J Combin 33(4) (2012), 679–683], which states that 1-joins preserve χ-boundedness. The house is the complement of the four-edge path. As an application of our result and of the decomposition theorem for “cap-free” graphs from [J Graph Theory 30(4) (1999), 289–308], we obtain that if G is a graph that does not contain any subdivision of the house as an induced subgraph, then χ(G) ≤ 3ω(G)−1.
A matheuristic for the Cargo Mix Problem with Block Stowage

The cargo-mix problem aims at selecting the amount of containers of a given type to load on a vessel. In this article we present an extended definition that includes the analysis of a circular route with draft restrictions, limitations on expected cargo and the use of a block stowage strategy. A compact formulation of the problem based on the state-of-the-art heuristic decomposition is shown not to be able to solve the extended problem, thus a matheuristic approach is presented that can achieve high quality results in a matter of seconds.
A Measure Based on Beamforming Power for Evaluation of Sound Field Reproduction Performance

This paper proposes a measure to evaluate sound field reproduction systems with an array of loudspeakers. The spatially-averaged squared error of the sound pressure between the desired and the reproduced field, namely the spatial error, has been widely used, which has considerable problems in two conditions. First, in non-anechoic conditions, room reflections substantially deteriorate the spatial error, although these room reflections affect human localization to a lesser degree. Second, for 2.5-dimensional reproduction of spherical waves, the spatial error increases consistently due to the difference in the amplitude decay rate, whereas the degradation of human localization performance is limited. The measure proposed in this study is based on the beamforming powers of the desired and the reproduced fields. Simulation and experimental results show that the proposed measure is less sensitive to room reflections and the amplitude decay than the spatial error, which is likely to agree better with the human perception of source localization.

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Korea Research Institute of Standards and Science
Authors: Chang, J. (Ekstern), Jeong, C. (Intern)
Number of pages: 15
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Applied Sciences
Volume: 7
Issue number: 3 - Special Issue 'Spatial Audio'
Article number: 249
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Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.03 SJR 0.26 SNIP 0.583
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.246 SNIP 0.371 CiteScore 0.34
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.115 SNIP 0.201 CiteScore 0.21
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.24 SNIP 0.912 CiteScore 0.42
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.345 SNIP 0.966 CiteScore 0.67
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.289 SNIP 0.744 CiteScore 0.51
Accurate wind speed simulation is an essential prerequisite to analyze the power systems with wind power. A wind speed model considering meteorological conditions and seasonal variations is proposed in this paper. Firstly, using the path analysis method, the influence weights of meteorological factors are calculated. Secondly, the meteorological data are classified into several states using an improved Fuzzy C-means (FCM) algorithm. Then the Markov chain is used to model the chronological characteristics of meteorological states and wind speed. The proposed model was proved to be more accurate in capturing the characteristics of probability distribution, auto-correlation and seasonal variations of wind speed compared with the traditional Markov chain Monte Carlo (MCMC) and autoregressive moving average (ARMA) model. Furthermore, the proposed model was applied to adequacy assessment of generation systems with wind power. The assessment results of the modified IEEE-RTS79 and IEEE-RTS96 demonstrated the effectiveness and accuracy of the proposed model.
A method for Effect Modifier Assessment in ergonomic intervention research – The EMA method

Purpose: Intervention research includes studies in which researchers arrange (or follow) changes in working conditions to determine the effects on risk factor, health and/or performance. Often this research takes place at workplaces and not in a controlled laboratory environment. Effects may thus be due to other factors in addition to the intervention – i.e. effect modifiers. These need to be identified and assessed in terms of potential impact on studied outcomes before proper inference can be drawn. We present a method to estimate potential effects of modifiers in intervention research.

Methodology: The EMA method is a type of group interview including 3-6 employees representing the occupational groups in the investigated organization. With reference to the investigated period they are asked to recall important
changes/events in and around the organization; 1) in general, 2) in work processes and equipment and 3) regarding their work environment. In each step the participants write their individual answers on post-it notes which are then discussed in plenum, one at a time, and placed on a timeline. All identified events are assessed as due to the investigated intervention(s) or other causes ("effect modifiers"). Their impact on the outcomes is estimated by triangulation. Following the workshop, events are entered into a database and analyzed. Results: Preliminary evaluations of the method suggest that it offers a relevant overview of potential effect modifiers. Limitations: Further validation is needed. Implications: Using the EMA-method seems to facilitate proper inference regarding the impact of a workplace intervention. Originality: The EMA-method is a novel and systematic approach to estimate potential effect modifiers.

General information
State: Published
Organisations: Department of Management Engineering, Management Science, Implementation and Performance Management, University of Gothenburg
Authors: Edwards, K. (Intern), Winkel, J. (Intern)
Publication date: 2017
Event: Abstract from European Association of Work and Organizational Psychology, Dublin, Ireland.
Main Research Area: Technical/natural sciences
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

A Method for Ship Collision Damage and Energy Absorption Analysis and Its Validation
For design evaluation, there is a need for a method which is fast, practical and yet accurate enough to determine the absorbed energy and collision damage extent in ship collision analysis. The most well-known simplified empirical approach to collision analysis was made probably by Minorsky, and its limitation is also well-recognised. The authors have previously developed simple expressions for the relation between the absorbed energy and the damaged material volume which take into account the structural arrangements, the material properties and the damage modes. The purpose of the present paper is to re-examine this method's validity and accuracy for ship collision damage analysis in ship design assessments by comprehensive validations with experimental results from the public domain. In total, 20 experimental tests have been selected, analysed and compared with the results calculated using the proposed method. It can be concluded that the proposed method has a good accuracy with the mean value of 0.988 and standard deviation of 0.042

General information
State: Published
Organisations: Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, Lloyd's Register EMEA
Authors: Zhang, S. (Ekstern), Pedersen, P. T. (Intern)
Pages: 783–796
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication information
Journal: Ships and Offshore Structures
Volume: 20
Issue number: 5
ISSN (Print): 1744-5302
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.025 SNIP 1.493 CiteScore 1.34
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.735 SNIP 1.011 CiteScore 0.89
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.52 SNIP 1.163 CiteScore 0.69
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.651 SNIP 1.14 CiteScore 0.91
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.299 SNIP 0.604 CiteScore 0.41
A Methodology for Anatomic Ultrasound Image Diagnostic Quality Assessment

This paper discusses methods for assessment of ultrasound image quality based on our experiences with evaluating new methods for anatomic imaging. It presents a methodology to ensure a fair assessment between competing imaging methods using clinically relevant evaluations. The methodology is valuable in the continuing process of method optimization and guided development of new imaging methods. It includes a three phased study plan covering from initial prototype development to clinical assessment. Recommendations to the clinical assessment protocol, software, and statistical analysis are presented. Earlier uses of the methodology has shown that it ensures validity of the assessment, as it separates the influences between developer, investigator, and assessor once a research protocol has been established. This separation reduces confounding influences on the result from the developer to properly reveal the clinical value. The paper exemplifies the methodology using recent studies of Synthetic Aperture Sequential Beamforming tissue harmonic imaging.

General information
State: Published
Organisations: Department of Electrical Engineering, Biomedical Engineering, Center for Fast Ultrasound Imaging, University of Copenhagen
Authors: Hemmsen, M. C. (Intern), Lange, T. (Ekstern), Brandt, A. H. (Ekstern), Nielsen, M. B. (Ekstern), Jensen, J. A. (Intern)
Number of pages: 12
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control
Volume: 64
Issue number: 1
ISSN (Print): 0885-3010
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.73 SJR 1.154 SNIP 1.473
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.82 SNIP 1.537 CiteScore 2.43
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.064 SNIP 1.624 CiteScore 2.18
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
A methodology for online visualization of the energy flow in a machine tool

The demand of energy efficient machine tools has increased recently due to the awareness for energy-efficient production in precision manufacturing. A portion of the energy supplied to machine tools is transferred to thermal losses which influence also the thermal behavior of the precision related machine tools components. Machine cooling and process cooling can prevent thermal machine tool errors. However, this further requires considerable amounts of energy. Hence there is a demand to monitor the electric, thermal, fluidic and mechanical energy flows in the machine tool in order to
optimize the machining process and by this increasing its energy efficiency. This study intents to propose a method which has the capability of real-time monitoring of the entire energetic flows in a CNC machine tool including motors, pumps and cooling fluid. The structure of this approach is based on categorizing the machine into subsystems and measurements of the consumers (pump, motors, . . . ) power, temperature at the inlet and outlet of the pumps and current as well as the speed of the motors. The visualization is carried out by a 2D Sankey diagram, which makes it easy to understand the energetic flows in the machine tool. The methodology is verified by the rule of energy conversion which confirms the capability of this method on real-time energy monitoring of a machine tool.

**General information**

*State*: Accepted/in press

*Organisations*: Department of Mechanical Engineering, Manufacturing Engineering, Swiss Federal Institute of Technology, inspire AG.

*Authors*: Mohammadi, A. (Intern), Züst, S. (Ekstern), Mayr, J. (Ekstern), Blaser, P. (Ekstern), Sonne, M. R. (Intern), Hattel, J. H. (Intern), Wegener, K. (Ekstern)

*Number of pages*: 9

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**Publication information**

*Journal*: CIRP Journal of Manufacturing Science and Technology

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*Ratings*:

- **BFI (2017)**: BFI-level 1
- **Web of Science (2017)**: Indexed yes
- **Scopus rating (2016)**: CiteScore 2.76 SJR 0.81 SNIP 1.991
- **Web of Science (2016)**: Indexed yes
- **Scopus rating (2015)**: SJR 0.953 SNIP 1.862 CiteScore 2.55
- **Web of Science (2015)**: Indexed yes
- **Scopus rating (2014)**: SJR 1.133 SNIP 1.777 CiteScore 2.46
- **Scopus rating (2013)**: SJR 0.95 SNIP 1.796 CiteScore 2.01
- **ISI indexed (2013)**: ISI indexed no
- **Scopus rating (2012)**: SJR 0.819 SNIP 1.822 CiteScore 1.69
- **ISI indexed (2012)**: ISI indexed no
- **Scopus rating (2011)**: SJR 0.946 SNIP 2.037 CiteScore 1.72
- **ISI indexed (2011)**: ISI indexed no
- **Scopus rating (2010)**: SJR 1.202 SNIP 2.299
- **Scopus rating (2009)**: SJR 0.837 SNIP 1.085

*Original language*: English

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A *method to characterize the roughness of 2-D line features: recrystallization boundaries*

A method is presented, which allows quantification of the roughness of nonplanar boundaries of objects for which the neutral plane is not known. The method provides quantitative descriptions of both the local and global characteristics. How the method can be used to estimate the sizes of rough features and local curvatures is also presented. The potential of the method is illustrated by quantification of the roughness of two recrystallization boundaries in a pure Al specimen characterized by scanning electron microscopy.

**General information**

*State*: Published

*Organisations*: Department of Wind Energy, Materials science and characterization, Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics


*Pages*: 313–321

*Publication date*: 2017

*Main Research Area*: Technical/natural sciences

**Publication information**
A method to investigate the biomechanical alterations in Perthes' disease by hip joint contact modeling

Perthes' disease is a destructive hip joint disorder characterized by malformation of the femoral head in young children. While the morphological changes have been widely studied, the biomechanical effects of these changes still need to be further elucidated. The objective of this study was to develop a method to investigate the biomechanical alterations in Perthes' disease by finite element (FE) contact modeling using MRI. The MRI data of a unilateral Perthes' case was obtained to develop the three-dimensional FE model of the hip joint. The stress and contact pressure patterns in the unaffected hip were well distributed. Elevated concentrations of stress and contact pressure were found in the Perthes' hip. The highest femoral cartilage von Mises stress 3.9 MPa and contact pressure 5.3 MPa were found in the Perthes’ hip, whereas 2.4 MPa and 4.9 MPa in the healthy hip, respectively. The healthy bone in the femoral head of the Perthes' hip carries additional loads as indicated by the increase of stress levels around the necrotic-healthy bone interface. Identifying the biomechanical changes, such as the location of stress and contact pressure concentrations, is a prerequisite for the preoperative planning to obtain stress relief for the highly stressed areas in the malformed hip. This single-patient study demonstrated that the biomechanical alterations in Perthes’ disease can be evaluated individually by patient-specific finite element contact modeling using MRI. A multi-patient study is required to test the strength of the proposed method as a pre-surgery planning tool.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Biomedical Engineering, Department of Wind Energy, Composites and Materials Mechanics, Hvidovre University Hospital
Authors: Salmingo, R. A. (Intern), Skytte, T. L. (Ekstern), Traberg, M. S. (Intern), Mikkelsen, L. P. (Intern), Henneberg, K. (Intern), Wong, C. (Ekstern)
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Main Research Area: Technical/natural sciences

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Ratings:
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 0.81 SJR 0.254 SNIP 0.415
Scopus rating (2015): CiteScore 0.99 SJR 0.334 SNIP 0.754
Scopus rating (2014): CiteScore 0.94 SJR 0.284 SNIP 0.486
Scopus rating (2013): CiteScore 0.98 SJR 0.349 SNIP 0.55
Scopus rating (2012): CiteScore 1.4 SJR 0.434 SNIP 0.73
Scopus rating (2011): CiteScore 1.31 SJR 0.424 SNIP 0.584
Scopus rating (2010): SJR 0.403 SNIP 0.328
Scopus rating (2009): SJR 0.367 SNIP 0.434
Scopus rating (2008): SJR 0.428 SNIP 0.543
Scopus rating (2007): SJR 0.544 SNIP 0.534
Scopus rating (2006): SJR 0.405 SNIP 0.581
Scopus rating (2005): SJR 0.295 SNIP 0.511
Scopus rating (2004): SJR 0.354 SNIP 0.831
Scopus rating (2003): SJR 0.392 SNIP 0.523
Scopus rating (2002): SJR 0.461 SNIP 0.69
Scopus rating (2001): SJR 0.373 SNIP 0.623
Scopus rating (2000): SJR 0.215 SNIP 0.32
Scopus rating (1999): SJR 0.426 SNIP 0.661
Original language: English
Perthes, Hip joint contact modeling, Orthopaedic biomechanics
DOIs: 10.3233/BME-171685
Source: PublicationPreSubmission
Source-ID: 133955964
Publication: Research - peer-review › Journal article – Annual report year: 2017
A microwave window for K band electromagnetic systems
This article proposes a solution for microwave window at K band. Properties of the window such as performance (transparency) at microwave frequencies, dimensions, and mounting place are discussed. The dimensions of the window were optimized in a full-wave simulator. To verify the design and simulation results the prototype of the window is realized by implementing into transition section and tested experimentally. The microwave window provides low return loss $|S_{11}|$ below $-30$ dB, low insertion loss $|S_{21}|$ below $-0.5$ dB and can be used for electromagnetic systems where vacuum sealing is required. © 2017 Wiley Periodicals, Inc.

General information
State: Published
Organisations: Center for Hyperpolarization in Magnetic Resonance, Department of Electrical Engineering, Center for Magnetic Resonance
Authors: Rybalko, O. (Intern)
Pages: 834-7
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication Information
Journal: Microwave and Optical Technology Letters
Volume: 59
Issue number: 4
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.299 SNIP 0.568 CiteScore 0.87
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.337 SNIP 0.52 CiteScore 0.72
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.362 SNIP 0.594 CiteScore 0.71
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.371 SNIP 0.639 CiteScore 0.75
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.365 SNIP 0.584 CiteScore 0.83
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.392 SNIP 0.61 CiteScore 0.83
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.409 SNIP 0.55
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.476 SNIP 0.614
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.424 SNIP 0.6
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.58 SNIP 0.828
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.595 SNIP 0.688
Web of Science (2006): Indexed yes
Amino acids production focusing on fermentation technologies – A review

Amino acids are attractive and promising biochemicals with market capacity requirements constantly increasing. Their applicability ranges from animal feed additives, flavour enhancers and ingredients in cosmetic to specialty nutrients in pharmaceutical and medical fields.

This review gives an overview of the processes applied for amino acids production and points out the main advantages and disadvantages of each.

Due to the advances made in the genetic engineering techniques, the biotechnological processes, and in particular the fermentation with the aid of strains such as Corynebacterium glutamicum or Escherichia coli, play a significant role in the industrial production of amino acids. Despite the numerous advantages of the fermentative amino acids production, the process still needs significant improvements leading to increased productivity and reduction of the production costs.

Although the production processes of amino acids have been extensively investigated in previous studies, a comprehensive overview of the developments in bioprocess technology has not been reported yet. This review states the importance of the fermentation process for industrial amino acids production, underlining the strengths and the weaknesses of the process. Moreover, the potential of innovative approaches utilizing macro and microalgae or bacteria are presented.
Ammonia synthesis from $N_2$ and $H_2O$ using a lithium cycling electrification strategy at atmospheric pressure

Ammonia production is imperative to providing food for a growing world population. However, the primary method of synthetic ammonia production, the Haber Bosch process, is resource demanding and unsustainable. Here we report a novel ammonia production strategy, exemplified in an electrochemical lithium cycling process, which provides a pathway to sustainable ammonia synthesis via the ability to directly couple to renewable sources of electricity and can facilitate localized production. Whereas traditional aqueous electrochemical approaches are typically dominated by the hydrogen evolution reaction (HER), we are able to circumvent the HER by using a stepwise approach which separates the reduction of $N_2$ from subsequent protonation to $NH_3$, thus our synthesis method is predominantly selective for ammonia production. Density functional theory calculations for thermodynamic and diffusion energy barrier insights suggest that Li-based materials are well suited to carry out this process, though other materials may also be useful. The three steps of the demonstrated process are LiOH electrolysis, direct nitridation of Li, and the exothermic release of ammonia from Li$_3$N, which reproduces the LiOH, completing the cycle. The process uses $N_2$ and $H_2O$ at atmospheric pressure and reasonable temperatures, and, while approaching industrial level electrolytic current densities, we report an initial current efficiency of 88.5% toward ammonia production.

General information
State: Published
Organizations: Department of Physics, Experimental Surface and Nanomaterials Physics, Stanford University
Authors: McEnaney, J. M. (Ekstern), Singh, A. R. (Ekstern), Schwalbe, J. A. (Ekstern), Kibsgaard, J. (Intern), Lin, J. C. (Ekstern), Cargnello, M. (Ekstern), Jaramillo, T. F. (Ekstern), Norskov, J. K. (Ekstern)
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Main Research Area: Technical/natural sciences
Ammonia tolerant inocula provide a good base for anaerobic digestion of microalgae in third generation biogas process

This study investigated the ability of an ammonia-acclimatized inoculum to digest efficiently protein-rich microalgae for continuous 3rd generation biogas production. Moreover, we investigated whether increased C/N ratio could alleviate ammonia toxicity. The biochemical methane potential (BMP) of five different algae (Chlorella vulgaris)/manure (cattle) mixtures showed that the mixture of 80/20 (on VS basis) resulted in the highest BMP value (431 mL CH₄ g VS⁻¹), while the BMP of microalgae alone (100/0) was 415 mL CH₄ g VS⁻¹. Subsequently, anaerobic digestion of those two substrates was tested in continuous stirred tank reactors (CSTR). Despite of the high ammonium levels (3.7-4.2 g NH₄⁺-N L⁻¹), CSTR reactors using ammonia tolerant inoculum resulted in relatively high methane yields (i.e. 77.5% and 84% of the maximum expected, respectively) These results demonstrated that ammonia tolerant inocula could be a promising approach to successfully digest protein-rich microalgae and achieve a 3rd generation biogas production.

General information
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Organisations: Department of Environmental Engineering, Residual Resource Engineering, Zagazig University, Technical University of Denmark, Environment and Technology (CIEMAT)
Authors: Mahdy, A. (Ekstern), Fotidis, I. (Intern), Mancini, E. (Ekstern), Ballesteros, M. (Ekstern)
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Main Research Area: Technical/natural sciences
A model-based approach to associate complexity and robustness in engineering systems

Ever increasing functionality and complexity of products and systems challenge development companies in achieving high and consistent quality. A model-based approach is used to investigate the relationship between system complexity and system robustness. The measure for complexity is based on the degree of functional coupling and the level of contradiction in the couplings. Whilst Suh’s independence axiom states that functional independence (uncoupled designs) produces more robust designs, this study proves this not to be the case for max-/min-is-best requirements, and only to be true in the general sense for nominal-is-best requirements. In specific cases, the independence axiom has exceptions as illustrated with a machining example, showing how a coupled solution is more robust than its uncoupled counterpart. This study also shows with statistical significance, that for max- and min-is-best requirements, the robustness is most affected by the level of contradiction between coupled functional requirements (p = 1.4e−36). In practice, the results imply that if the main influencing factors for each function in a system are known in the concept phase, an evaluation of the contradiction level can be used to evaluate concept robustness.

General information
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Organisations: Department of Mechanical Engineering, Engineering Design and Product Development, Massachusetts Institute of Technology
Authors: Göhler, S. M. (Intern), D. Frey, D. (Ekstern), Howard, T. J. (Intern)
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Main Research Area: Technical/natural sciences

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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.956 SNIP 1.827 CiteScore 1.61
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.259 SNIP 2.435 CiteScore 2.38
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.271 SNIP 2.588 CiteScore 2.48
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.825 SNIP 3.307 CiteScore 2.13
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.086 SNIP 2.739 CiteScore 2.37
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.222 SNIP 1.589
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
A Model for Designing Adaptive Laboratory Evolution Experiments

The occurrence of mutations is a cornerstone of the evolutionary theory of adaptation, capitalizing on the rare chance that a mutation confers a fitness benefit. Natural selection is increasingly being leveraged in laboratory settings for industrial and basic science applications. Despite increasing deployment, there are no standardized procedures available for designing and performing adaptive laboratory evolution (ALE) experiments. Thus, there is a need to optimize the experimental design, specifically for determining when to consider an experiment complete and for balancing outcomes with available resources (i.e., laboratory supplies, personnel, and time). To design and to better understand ALE experiments, a simulator, ALEsim, was developed, validated, and applied to the optimization of ALE experiments. The effects of various passage sizes were experimentally determined and subsequently evaluated with ALEsim, to explain differences in experimental outcomes. Furthermore, a beneficial mutation rate of $10^{-6.9}$ to $10^{-8.4}$ mutations per cell division was derived. A retrospective analysis of ALE experiments revealed that passage sizes typically employed in serial passage batch culture ALE experiments led to inefficient production and fixation of beneficial mutations. ALEsim and the results described here will aid in the design of ALE experiments to fit the exact needs of a project while taking into account the resources required and will lower the barriers to entry for this experimental technique. IMPORTANCE ALE is a widely used scientific technique to increase scientific understanding, as well as to create industrially relevant organisms. The manner in which ALE experiments are conducted is highly manual and uniform, with little optimization for efficiency. Such inefficiencies result in suboptimal experiments that can take multiple months to complete. With the availability of automation and computer simulations, we can now perform these experiments in an optimized fashion and can design experiments to generate greater fitness in an accelerated time frame, thereby pushing the limits of what adaptive laboratory evolution can achieve.
A model library for simulation and benchmarking of integrated urban wastewater systems
This paper presents a freely distributed, open-source toolbox to predict the behaviour of urban wastewater systems (UWS). The proposed library is used to develop a system-wide Benchmark Simulation Model (BSM-UWS) for evaluating (local/global) control strategies in urban wastewater systems (UWS). The set of models describe the dynamics of flow rates and major pollutants (COD, TSS, N and P) within the catchment (CT), sewer network (SN), wastewater treatment plant (WWTP) and river water system (RW) for a hypothetical, though realistic, UWS. Evaluation criteria are developed to allow for direct assessment of the river water quality instead of the traditional emission-based metrics (for sewer overflows and WWTP discharge). Three case studies are included to illustrate the applicability of the proposed toolbox and also demonstrate the potential benefits of implementing integrated control in the BSM-UWS platform. Simulation results show that the integrated control strategy developed to maximize the utilization of the WWTP’s capacity represents a balanced choice in comparison to other options. It also improves the river water quality criteria for unionized ammonia and dissolved oxygen by 62% and 6%, respectively.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Lund University, Aquafin NV
Authors: Saagi, R. (Ekstern), Flores Alsina, X. (Intern), Kroll, J. S. (Ekstern), Gernaey, K. (Intern), Jeppsson, U. (Ekstern)
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 1.936 SNIP 2.112 CiteScore 4.8
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.119 SNIP 2.172 CiteScore 4.67
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.065 SNIP 2.483 CiteScore 5.04
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.082 SNIP 2.458 CiteScore 4.8
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.829 SNIP 2.012 CiteScore 3.69
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.68 SNIP 2.096 CiteScore 3.52
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.684 SNIP 2.221
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.33 SNIP 1.965
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.131 SNIP 1.892
Scopus rating (2007): SJR 1.125 SNIP 1.907
A Model of Electrically Stimulated Auditory Nerve Fiber Responses with Peripheral and Central Sites of Spike Generation

A computational model of cat auditory nerve fiber (ANF) responses to electrical stimulation is presented. The model assumes that (1) there exist at least two sites of spike generation along the ANF and (2) both an anodic (positive) and a cathodic (negative) charge in isolation can evoke a spike. A single ANF is modeled as a network of two exponential integrate-and-fire point-neuron models, referred to as peripheral and central axons of the ANF. The peripheral axon is excited by the cathodic charge, inhibited by the anodic charge, and exhibits longer spike latencies than the central axon; the central axon is excited by the anodic charge, inhibited by the cathodic charge, and exhibits shorter spike latencies than the peripheral axon. The model also includes subthreshold and suprathreshold adaptive feedback loops which continuously modify the membrane potential and can account for effects of facilitation, accommodation, refractoriness, and spike-rate adaptation in ANF. Although the model is parameterized using data for either single or paired pulse stimulation with monophasic rectangular pulses, it correctly predicts effects of various stimulus pulse shapes, stimulation pulse rates, and level on the neural response statistics. The model may serve as a framework to explore the effects of different stimulus parameters on psychophysical performance measured in cochlear implant listeners.
A Modular High-Throughput In Vivo Screening Platform Based on Chimeric Bacterial Receptors

Multidrug resistance (MDR) is a globally relevant problem that requires novel approaches. Two-component systems are a promising, yet untapped target for novel antibacterials. They are prevalent in bacteria and absent in mammals, and their activity can be modulated upon perception of various stimuli. Screening pre-existing compound libraries could reveal small molecules that inhibit stimulus-perception by virulence-modulating receptors, reduce signal output from essential receptors or identify artificial stimulatory ligands for novel SHKs that are involved in virulence. Those small molecules could possess desirable therapeutic properties to combat MDR. We propose that a modular screening platform in which the periplasmic stimulus-perceiving domains are fused to an invariant cytoplasmic domain that governs transcription of a dynamic fluorescent reporter system. Furthermore, we show that aromatic tuning, or repositioning the aromatic residues at the end of the second transmembrane helix (TM2), modulates baseline signal output from the tested chimeras and even restores output from a nonfunctional NarX-EnvZ chimera. Finally, we observe an inverse correlation between baseline signal output and the degree of response to cognate stimuli. In summary, we propose that the platform described here, a fluorescent Escherichia coli reporter strain with plasmid-based expression of the aromatically tuned chimeric receptors, represents a synthetic biology approach to rapidly screen pre-existing compound libraries for receptor-modulating activities.

General information
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Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Microbial Evolution and Synthetic Biology, Institute of Molecular Biology, Goethe-University Frankfurt, University of Portsmouth
Authors: Lehning, C. E. (Intern), Heidelberger, J. B. (Ekstern), Reinhard, J. (Ekstern), Nørholm, M. H. H. (Intern), Draheim, R. R. (Ekstern)
Number of pages: 12
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Main Research Area: Technical/natural sciences

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A modular interpretation of various cubic towers

In this article we give a Drinfeld modular interpretation for various towers of function fields meeting Zink's bound.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Mathematics, Boğaziçi University
Authors: Anbar Meidl, N. (Intern), Bassa, A. (Ekstern), Beelen, P. (Intern)
Pages: 341-357
Publication date: 2017
Main Research Area: Technical/natural sciences
A modular metabolic engineering approach for the production of 1,2-propanediol from glycerol by Saccharomyces cerevisiae

Compared to sugars, a major advantage of using glycerol as a feedstock for industrial bioprocesses is the fact that this molecule is more reduced than sugars. A compound whose biotechnological production might greatly profit from the substrate's higher reducing power is 1,2-propanediol (1,2-PDO). Here we present a novel metabolic engineering approach to produce 1,2-PDO from glycerol in S. cerevisiae. Apart from implementing the heterologous methylglyoxal (MG) pathway for 1,2-PDO formation from dihydroxyacetone phosphate (DHAP) and expressing a heterologous glycerol facilitator, the employed genetic modifications included the replacement of the native FAD-dependent glycerol catabolic pathway by the ‘DHA pathway’ for delivery of cytosolic NADH and the reduction of triosephosphate isomerase (TPI) activity for increased precursor (DHAP) supply. The choice of the medium had a crucial impact on both the strength of the metabolic switch towards fermentation in general (as indicated by the production of ethanol and 1,2-PDO) and on the ratio at which these two fermentation products were formed. For example, virtually no 1,2-PDO but only ethanol was formed in synthetic glycerol medium with urea as the nitrogen source. When nutrient-limited complex YG medium was used, significant amounts of 1,2-PDO were formed and it became obvious that the concerted supply of NADH and DHAP are essential for boosting 1,2-PDO production. Additionally, optimizing the flux into the MG pathway improved 1,2-PDO formation at the expense of ethanol. Cultivation of the best-performing strain in YG medium and a controlled bioreactor set-up resulted in a maximum titer of > 4gL-1 1,2-PDO which, to the best of our knowledge, has been the highest titer of 1,2-PDO obtained in yeast so far. Surprisingly, significant 1,2-PDO production was also obtained in synthetic glycerol medium after changing the nitrogen source towards ammonium sulfate and adding a buffer.
A molecular genetic toolbox for Yarrowia lipolytica

Background: Yarrowia lipolytica is an ascomycete yeast used in biotechnological research for its abilities to secrete high concentrations of proteins and accumulate lipids. Genetic tools have been made in a variety of backgrounds with varying similarity to a comprehensively sequenced strain. Results: We have developed a set of genetic and molecular tools in order to expand capabilities of Y. lipolytica for both biological research and industrial bioengineering applications. In this work, we generated a set of isogenic auxotrophic strains with decreased non-homologous end joining for targeted DNA incorporation. Genome sequencing, assembly, and annotation of this genetic background uncovers previously unidentified genes in Y. lipolytica. To complement these strains, we constructed plasmids with Y. lipolytica-optimized superfolder GFP for targeted overexpression and fluorescent tagging. We used these tools to build the "Yarrowia lipolytica Cell Atlas," a collection of strains with endogenous fluorescently tagged organelles in the same genetic background, in order to define
organelle morphology in live cells. Conclusions: These molecular and isogenetic tools are useful for live assessment of organelle-specific protein expression, and for localization of lipid biosynthetic enzymes or other proteins in Y. lipolytica. This work provides the Yarrowia community with tools for cell biology and metabolism research in Y. lipolytica for further development of biofuels and natural products.

**General information**
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Yeast Cell Factories, U.S. Department of Energy, Pacific Northwest National Laboratory, Chalmers University of Technology
Authors: Bredeweg, E. L. (Ekstern), Pomraning, K. R. (Ekstern), Dai, Z. (Ekstern), Nielsen, J. (Intern), Kerkhoven, E. J. (Ekstern), Baker, S. E. (Ekstern)
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BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.89 SJR 1.969 SNIP 1.65
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.409 SNIP 1.89 CiteScore 6.79
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.414 SNIP 1.722 CiteScore 5.86
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.17 SNIP 1.815 CiteScore 6.21
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.15 SNIP 1.849 CiteScore 5.7
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.249 SNIP 2.168 CiteScore 6.1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.774 SNIP 1.745
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.317 SNIP 1.74
BFI (2008): BFI-level 2
Original language: English
Biotechnology, Applied Microbiology and Biotechnology, Renewable Energy, Sustainability and the Environment, Energy (all), Management, Monitoring, Policy and Law, Genome sequence, GFP localization, Hygromycin B, Isogenic, Organelle labeling, Overexpression plasmid, Protein tagging, Superfolder GFP, Tools, Yarrowia lipolytica, Cytology, Genes, Proteins, Genome sequences, Hygromycin, Over-expression, Industrial research, Yarrowia
Electronic versions:
A_molecular_genetic_toolbox.pdf
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Amplitude Noise Suppression and Orthogonal Multiplexing Using Injection-Locked Single-Mode VCSEL

We experimentally demonstrate BER reduction and orthogonal modulation using an injection locked single-mode VCSEL. It allows us suppressing an amplitude noise of optical signal and/or double the capacity of an information channel.

A multi-frequency fatigue testing method for wind turbine rotor blades

Rotor blades are among the most delicate components of modern wind turbines. Reliability is a crucial aspect, since blades shall ideally remain free of failure under ultra-high cycle loading conditions throughout their designated lifetime of 20–25 years. Full-scale blade tests are the most accurate means to experimentally simulate damage evolution under operating conditions, and are therefore used to demonstrate that a blade type fulfils the reliability requirements to an acceptable degree of confidence. The state-of-the-art testing method for rotor blades in industry is based on resonance excitation where typically a rotating mass excites the blade close to its first natural frequency. During operation the blade response due to external forcing is governed by a weighted combination of its eigenmodes. Current test methodologies which only utilise the lowest eigenfrequency induce a fictitious damage where additional tuning masses are required to recover the desired damage distribution. Even with the commonly adopted amplitude upscaling technique fatigue tests remain a time-consuming and costly endeavour. The application of tuning masses increases the complexity of the problem by lowering the natural frequency of the blade and therefore increasing the testing time. The novel method presented in this paper aims at shortening the duration of the state-of-the-art fatigue testing method by simultaneously exciting the blade with a combination of two or more eigenfrequencies. Taking advantage of the different shapes of the excited eigenmodes, the actual spatial damage distribution can be more realistically simulated in the tests by tuning the excitation force amplitudes rather than adding tuning masses. This implies that in portions of the blade the lowest mode is governing the damage whereas in others higher modes contribute more significantly due to their higher cycle count. A numerical feasibility study based on a publicly available large utility rotor blade is used to demonstrate the ability of the proposed approach to outperform the state-of-the-art testing method without compromising fatigue test requirements. It will be shown that the novel method shortens the testing time and renders the damage evolution with a higher degree of fidelity.
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 1.462 SNIP 2.162 CiteScore 3.09
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.391 SNIP 2.142 CiteScore 2.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.447 SNIP 2.38 CiteScore 2.54
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.391 SNIP 2.64 CiteScore 2.61
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.495 SNIP 2.992 CiteScore 2.3
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.441 SNIP 2.698 CiteScore 2.05
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.218 SNIP 2.069
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.384 SNIP 2.185
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.205 SNIP 1.96
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.173 SNIP 1.701
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.882 SNIP 1.632
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.087 SNIP 1.624
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.936 SNIP 1.463
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.243 SNIP 1.385
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.386 SNIP 1.27
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.836 SNIP 1.322
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.581 SNIP 1.192
Web of Science (2000): Indexed yes
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A multifunctional nanocomplex for enhanced cell uptake, endosomal escape and improved cancer therapeutic effect

Aim: To evaluate the chemotherapeutic potential of a novel multifunctional nanocomposite encapsulating both porous silicon (PSi) and gold (Au) nanoparticles in a polymeric nanocomplex. Materials & methods: The nanocomposite was physicochemically characterized and evaluated in vitro for biocompatibility, cellular internalization, endosomolytic properties, cytoplasmatic drug delivery and chemotherapeutic efficacy. Results: The nanocomposites were successfully produced and exhibited adequate physicochemical properties and superior in vitro cyto- and hemocompatibilities. The encapsulation of PSi nanoparticles in the nanocomplexes significantly enhanced their cellular internalization and enabled their endosomal escape, resulting in the efficient cytoplasmic delivery of these nanosystems. Sorafenib-loaded nanocomposites showed a potent in vitro antiproliferative effect on MDA-MB-231 breast cancer cells. Conclusion: The multifunctional nanocomposite herein presented exhibits great potential as a chemotherapeutic nanoplatform.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, BioLabChip, University of Helsinki, University of Turku
Authors: Almeida, P. V. (Ekstern), Shahbazi, M. (Intern), Correia, A. (Ekstern), Makila, E. (Ekstern), Kemell, M. (Ekstern), Salonen, J. (Ekstern), Hirvonen, J. (Ekstern), Santos, H. A. (Ekstern)
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BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.238 SNIP 0.888 CiteScore 4.08
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.393 SNIP 1.018 CiteScore 3.92
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.444 SNIP 1.118 CiteScore 4.04
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.715 SNIP 1.184 CiteScore 4.44
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.647 SNIP 1.135 CiteScore 4.21
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.691 SNIP 1.045 CiteScore 4.29
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.277 SNIP 1.463
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.87 SNIP 1.219
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.644 SNIP 1.098
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.751 SNIP 0.545
Web of Science (2007): Indexed yes
A multimedia streaming system for urban rail environments

Due to a large number of mostly stationary users inside a train and the availability of a radio connection to the outside world, urban rail environments serve as promising candidates for multimedia distribution systems deployment. This work proposes to offload the individual per-passenger cellular network connections by using the excessive Communications-Based Train Control (CBTC) radio link bandwidth to deliver multimedia streams to a train, where it is subsequently distributed to the passengers using peer-to-peer based data distribution. Connections among the train passengers are implemented using the Wi-Fi Direct connectivity and data exchange is coordinated by using the Peer-to-Peer Streaming Peer Protocol. This work presents the solution and evaluates it in the scope of urban rail deployment. Network emulation tests are used to analyze the factors impacting the number of concurrent users that can use the proposed system. This work also proposes future work lines that can be used to improve the system's design.

General information
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Organisations: Department of Photonics Engineering, Networks Technology and Service Platforms
Authors: Poderys, J. (Intern), Farooq, J. (Intern), Soler, J. (Intern)
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Wi-Fi Direct, Peer-to-Peer Streaming Peer Protocol, Train communication, Streaming multimedia, Peer-to-peer communication

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A multiple ship routing and speed optimization problem under time, cost and environmental objectives

The purpose of this paper is to investigate a multiple ship routing and speed optimization problem under time, cost and environmental objectives. A branch and price algorithm as well as a constraint programming model are developed that consider (a) fuel consumption as a function of payload, (b) fuel price as an explicit input, (c) freight rate as an input, and (d) in-transit cargo inventory costs. The alternative objective functions are minimum total trip duration, minimum total cost and minimum emissions. Computational experience with the algorithm is reported on a variety of scenarios.

General information
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Organisations: Department of Management Engineering, Management Science, Operations Research, Transport DTU, Xi'an Jiaotong–Liverpool University, Liverpool John Moores University
Authors: Wen, M. (Ekstern), Pacino, D. (Intern), Kontovas, C. (Ekstern)
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A multi-radio, multi-hop ad-hoc radio communication network for Communications-Based Train Control (CBTC)

Communications-Based Train Control (CBTC) is a modern signalling system that uses radio communication to transfer train control information between train and wayside. The trackside networks in these systems are mostly based on conventional infrastructure Wi-Fi (IEEE 802.11). It means a train has to continuously associate (i.e. perform handshake) with the trackside Wi-Fi Access Points (AP) as it moves, which incurs communication delays. Additionally, these APs are connected to the wayside infrastructure via optical fiber cables that incurs huge costs. This paper presents a novel design in which trackside nodes function in ad-hoc Wi-Fi mode, which means no association has to be performed with them prior to transmitting. A node upon receiving packets from a train forwards these packets to the next node, forming a chain of nodes. Following this chain, packets arrive at the destination. To make the design resilient against interference and failures, transmissions are separated on multiple frequencies and a node forwards packets to not only one but two of its neighbors. This paper investigates the resiliency, redundancy and scalability performance of this design and presents the results both from a field experiment involving prototype hardware and an extensive simulation study.
A multivariate dynamic linear model for early warnings of diarrhea and pen fouling in slaughter pigs

We present a method for providing early, but indiscriminant, predictions of diarrhea and pen fouling in grower/finisher pigs. We collected data on dispensed feed amount, water flow, drinking bouts frequency, temperature at two positions per pen, and section level humidity from 12 pens (6 double pens) over three full growth periods. The separate data series were co-modeled at pen level with time steps of one hour, using a multivariate dynamic linear model. The step-wise forecast errors of the model were unified using Cholesky decomposition. An alarm was raised if the unified error exceeded a set threshold a sufficient number of times, consecutively. Using this method with a 7 day prediction window, we achieved an area under the receiver operating characteristics curve of 0.84. Shorter prediction windows yielded lower performances, but longer prediction windows did not affect the performance.
An Acoustic Hypersingular Boundary Element Formulation Including Viscous and Thermal Losses

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Department of Mechanical Engineering, Solid Mechanics, Technical University of Munich
Authors: Andersen, P. R. (Intern), Cutanda Henriquez, V. (Intern), Aage, N. (Intern), Marburg, S. (Ekstern)
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Event: Abstract from 13th International Conference on Theoretical and Computational Acoustics, Vienna, Austria.
Main Research Area: Technical/natural sciences
Electronic versions: ICTCA2017_BookOfAbstracts_2.pdf
Source: PublicationPreSubmission
Source-ID: 134439800
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

An adaptive, data driven sound field control strategy for outdoor concerts
One challenge of outdoor concerts is to ensure adequate levels for the audience while avoiding disturbance of the surroundings. We outline the initial concept of a sound field control (SFC) system for tackling this issue using sound-zoning. The system uses Bayesian inference to update a sound propagation model. We present a simulation in which SFC and propagation model work together.

General information
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Organisations: Department of Electrical Engineering, Acoustic Technology
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Host publication information
Title of host publication: Proceedings of 2017 AES International Conference on Sound Reinforcement
An Adaptive Multialphabet Arithmetic Coding Based on Generalized Virtual Sliding Window

We propose a novel efficient multialphabet multiplication-free adaptive arithmetic coder. First, we generalize probability estimation via virtual sliding window for the multialphabet case and show that it does not require multiplications and provides a tradeoff between the probability adaptation speed and the precision of the probability estimation. Second, we show how the generalized virtual sliding window can be used to eliminate multiplications and divisions. Finally, we demonstrate that the proposed arithmetic coder provides better compression performance than existing implementations based on state-of-the-art multiplication-free binary arithmetic coders.

General information
State: Published
Organisations: Department of Photonics Engineering, Coding and Visual Communication, Centre of Excellence for Silicon Photonics for Optical Communications, Xidian University
Authors: Belyaev, E. (Intern), Forchhammer, S. (Intern), Liu, K. (Ekstern)
Pages: 1034-1038
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Main Research Area: Technical/natural sciences

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BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.54 SJR 0.942 SNIP 1.805
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.872 SNIP 1.887 CiteScore 3.13
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.902 SNIP 1.993 CiteScore 2.98
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.876 SNIP 2.111 CiteScore 2.84
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.97 SNIP 1.883 CiteScore 2.59
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 0.774 SNIP 1.604 CiteScore 2.06
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 0.981 SNIP 1.728
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 0.926 SNIP 1.75
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.048 SNIP 1.951
Scopus rating (2007): SJR 1 SNIP 2.006
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.84 SNIP 1.895
An Adaptive Nonlinear Basal-Bolus Calculator for Patients With Type 1 Diabetes

Background: Bolus calculators help patients with type 1 diabetes to mitigate the effect of meals on their blood glucose by administering a large amount of insulin at mealtime. Intraindividual changes in patients physiology and nonlinearity in insulin-glucose dynamics pose a challenge to the accuracy of such calculators.

Method: We propose a method based on a continuous-discrete unscented Kalman filter to continuously track the postprandial glucose dynamics and the insulin sensitivity. We augment the Medtronic Virtual Patient (MVP) model to simulate noise-corrupted data from a continuous glucose monitor (CGM). The basal rate is determined by calculating the steady state of the model and is adjusted once a day before breakfast. The bolus size is determined by optimizing the postprandial glucose values based on an estimate of the insulin sensitivity and states, as well as the announced meal size. Following meal announcements, the meal compartment and the meal time constant are estimated, otherwise insulin sensitivity is estimated.

Results: We compare the performance of a conventional linear bolus calculator with the proposed bolus calculator. The proposed basal-bolus calculator significantly improves the time spent in glucose target ($P < .01$) compared to the conventional bolus calculator.

Conclusion: An adaptive nonlinear basal-bolus calculator can efficiently compensate for physiological changes. Further clinical studies will be needed to validate the results.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Scientific Computing, Dynamical Systems, Copenhagen University Hospital
Authors: Boiroux, D. (Intern), Aradóttir, T. B. (Intern), Nørgaard, K. (Ekstern), Poulsen, N. K. (Intern), Madsen, H. (Intern), Jørgensen, J. B. (Intern)
Number of pages: 8
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 2.14 SJR 0.804 SNIP 1.124
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.855 SNIP 0.897 CiteScore 1.99
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.871 SNIP 0.971 CiteScore 1.84
An advanced structural trailing edge modelling method for wind turbine blades

This study demonstrates an advanced blade modelling approach based on a combination of shell and solid elements which can enhance the reliability of structural predictions for wind turbine blades. The advanced blade modelling approach is based on a shell element model where the adhesive bondline in the trailing edge region is discretised by means of solid brick elements which are connected via Multi-Point-Constraint to the shell elements. The new approach overcomes the drawbacks of pure shell element simulations and can reliably predict the response of wind turbine blade structures which are exposed to ultimate loads. The prediction accuracy of the numerical simulations was compared to a certification load case and a full-scale ultimate limit state test of a 34 m wind turbine rotor blade. The displacements, stresses and strains show reasonably good agreement and demonstrate the capabilities of the advanced blade modelling approach.

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State: Published
Organisations: Department of Wind Energy
Authors: Haselbach, P. U. (Intern)
Pages: 521-530
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Volume: 180
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.45 SJR 2.13 SNIP 2.033
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.247 SNIP 2.236 CiteScore 4.25
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.331 SNIP 2.524 CiteScore 4.03
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
CO is a main component of syngas, which can be produced from the gasification of organic wastes and biomass. CO can be converted to methane by anaerobic digestion (AD), however, it is still challenging due to its toxicity to microorganisms and limited knowledge about CO converting microorganisms. In the present study, anaerobic granular sludge (AGS) was used for the simultaneous biomethanation of wastewater and CO. Batch experiments showed that AGS tolerated CO partial pressure as high as 0.5 atm without affecting its ability for synthetic wastewater degradation, which had higher tolerance of CO compared to suspended sludge (less than 0.25 atm) as previously reported. Continuous experiments in upflow anaerobic sludge blanket (UASB) reactors showed AGS could efficiently convert synthetic wastewater and CO into methane by applying gas-recirculation. The addition of CO to UASB reactor enhanced the hydrogenotrophic CO-oxidizing pathway, resulted in the increase of extracellular polymeric substances, changed the morphology of AGS and significantly altered the microbial community compositions of AGS. The microbial species relating with CO conversion and their functions were revealed by metagenomic analysis. It showed that 23 of the 70 reconstructed genome bins (GBs), most of which were not previously characterized at genomic level, were enriched and contained genes involved in CO conversion upon CO addition. CO-converting microorganisms might be taxonomically more diverse than previously known and have multi-functions in the AD process. The reductive tricarboxylic acid (TCA) cycle in combination with the oxidation of the CO was probably crucial for CO utilization by the majority of the GBs in the present study.
Analyses of electron runaway in front of the negative streamer channel

X-and γ-ray emissions, observed in correlation with negative leaders of lightning and long sparks of high-voltage laboratory experiments, are conventionally connected with the bremsstrahlung of high-energy runaway electrons (REs). Here we extend a focusing mechanism, analyzed in our previous paper, which allows the electric field to reach magnitudes, required for a generation of significant RE fluxes and associated bremsstrahlung, when the ionization wave propagates in a narrow, ionized channel created by a previous streamer. Under such conditions we compute the production rate of REs per unit streamer length as a function of the streamer velocity and predict that, once a streamer is formed with the electric field capable of producing REs ahead of the streamer front, the ionization induced by the REs is capable of creating an ionized channel that allows for self-sustained propagation of the RE-emitting ionization wave independent of the initial electron concentration. Thus, the streamer coronas of the leaders are probable sources of REs producing the observed high-energy radiation. To prove these predictions, new simulations are planned, which would show explicitly that the pre-ionization in front of the channel via REs will lead to the ionization wave propagation self-consistent with REs generation.
Light rail transit and bus rapid transit have shown to be efficient and cost-effective in improving public transport systems in cities around the world. As these systems comprise various elements, which can be tailored to any given setting, e.g. pre-board fare-collection, holding strategies and other advanced public transport systems (APTS), the attractiveness of such systems depends heavily on their implementation. In the early planning stage it is advantageous to deploy simple and transparent models to evaluate possible ways of implementation. For this purpose, the present study develops a mesoscopic model which makes it possible to evaluate public transport operations in details, including dwell times, intelligent traffic signal timings and holding strategies while modelling impacts from other traffic using statistical distributional data thereby ensuring simplicity in use and fast computational times. This makes it appropriate for analysing the impacts of improvements to public transport operations, individually or in combination, in early planning stages. The
paper presents a joint measure of reliability for such evaluations based on passengers’ perceived travel time by considering headway time regularity and running time variability, i.e. taking into account waiting time and in-vehicle time. The approach was applied on a case study by assessing the effects of implementing segregated infrastructure and APTS elements, individually and in combination. The results showed that the reliability of on-street public transport operations mainly depends on APTS elements, and especially holding strategies, whereas pure infrastructure improvements induced travel time reductions. The results further suggested that synergy effects can be obtained by planning on-street public transport coherently in terms of reduced travel times and increased reliability.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Transport DTU, Transport Modelling, COWI A/S
Authors: Ingvardson, J. B. (Intern), Kornerup Jensen, J. (Ekstern), Nielsen, O. A. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Public Transport
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Scopus rating (2014): SJR 0.882 SNIP 0.939 CiteScore 1.26
Scopus rating (2013): SJR 0.757 SNIP 0.861 CiteScore 1.03
Scopus rating (2012): SJR 1.017 SNIP 1.001 CiteScore 0.96
Scopus rating (2011): SJR 1.214 SNIP 1.783 CiteScore 1.26
Scopus rating (2010): SJR 0.582 SNIP 0.759
Original language: English
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Publication: Research - peer-review › Journal article – Annual report year: 2017

Analysis and implementation of packet preemption for Time Sensitive Networks
A standard priority-queuing system is capable of arranging packets with different traffic classes to guarantee a relatively low latency for the high priority traffic. However, in practical cases, severe delay may be caused by starting a large, low-priority frame ahead of a time-critical frame. In this paper, interspersed express traffic is evaluated, which enables preemption of non-time-critical transmission, in particular, the preemptive queuing system allows the cut-through transmission for critical traffic and minimizes the jitter. We analyse the performance of packet preemption through a system level simulation in Riverbed Modeler. The simulation is complemented by numerical analysis which provides the average queuing delay for both types of traffic (preemptable and express). Furthermore, the paper describes an approach to implement the packet preemption solution on an FPGA in VHDL, which illustrates the complexity of hardware implementation.

General information
State: Published
Organisations: Department of Photonics Engineering, Networks Technology and Service Platforms, Technical University of Denmark
Authors: Zhou, Z. (Ekstern), Yan, Y. (Intern), Ruepp, S. R. (Intern), Berger, M. S. (Intern)
Number of pages: 6
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Conference: 2017 IEEE 18th International Conference on High Performance Switching and Routing, Campinas, Brazil, 18/06/2017 - 18/06/2017
Delays, Numerical models, Time factors, Analytical models, Hardware, Mathematical model, Simulation, Time-sensitive network (TSN), Packet preemption, Preemptive queuing, FPGA, VHDL, Riverbed modeler
Analysis and optimization of coupled windings in magnetic resonant wireless power transfer systems with orthogonal experiment method

The coupled magnetic resonant unit (CMRU) has great effect on the transmitting power capability and efficiency of magnetic resonant wireless power transfer system. The key objective i.e. the efficiency coefficient $k_Q$ is introduced in the design of CMRU or the coupled windings based on the mutual inductance model. Then the design method with orthogonal experiments and finite element method simulation is proposed to maximize the $k_Q$ due to low precise analytical model of AC resistance and inductance for PCB windings at high-frequency. The method can reduce the design iterations and thereby can get more optimal design results. The experiments verified the design objective of $k_Q$ as well as the design method effectively. In the optimal PCB windings prototype at operating frequency of 4 MHz, the $k_Q$ and the maximum efficiency are increased by about 12% and 4% respectively.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Electronics, Gutian River Hydropower Plant, Fuzhou University
Authors: Yudi, X. (Ekstern), Xingkui, M. (Ekstern), Mao, L. (Ekstern), Zhang, Z. (Intern), Andersen, M. A. E. (Intern)
Number of pages: 6
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Elektronika ir Elektrotechnika
ISSN (Print): 1392-1215
Ratings:
Web of Science (2017): Indexed Yes
Scopus rating (2016): SJR 0.321 SNIP 0.668 CiteScore 0.85
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 0.347 SNIP 0.599 CiteScore 0.71
Scopus rating (2014): SJR 0.292 SNIP 0.653 CiteScore 0.66
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 0.252 SNIP 0.634 CiteScore 0.53
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): SJR 0.226 SNIP 0.71 CiteScore 0.49
ISI indexed (2012): ISI indexed yes
Scopus rating (2011): SJR 0.203 SNIP 1.038 CiteScore 0.84
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.213 SNIP 0.3
Web of Science (2010): Indexed yes
Scopus rating (2009): SJR 0.19 SNIP 0.018
Web of Science (2004): Indexed yes
Original language: English
Wireless power transfer, Magnetic resonant, Orthogonal experiments, Magnetic coupling structure optimization
Electronic versions:
3._Analysis_and_Optimization_with_Orthogonal_Experiments_Method_Final.pdf
Source: PublicationPreSubmission
Source-ID: 133321466
Publication: Research - peer-review › Journal article – Annual report year: 2017

Analysis, Design, Modeling, and Control of an Interleaved-Boost Full-Bridge Three-Port Converter for Hybrid Renewable Energy Systems

This paper presents the design, modeling, and control of an isolated dc-dc three-port converter (TPC) based on an interleaved-boost full-bridge converter with pulsewidth modulation (PWM) and phase-shift control for hybrid renewable energy systems. In the proposed topology, the switches are driven by phase-shifted PWM signals, where both phase angle and duty cycle are the controlled variables. The power flow between the two inputs is controlled through the duty cycle, whereas the output voltage can be regulated effectively through the phase shift. The primary-side MOSFETs can
achieve zero-voltage-switching (ZVS) operation without additional circuitry. Additionally, due to the ac output inductor, the secondary-side diodes can operate under zero-current-switching (ZCS) conditions. In this study, the operation principles of the converter are analyzed and the critical design considerations are discussed. The dynamic behavior of the proposed ac-inductor-based TPC is investigated by performing state-space modeling. Moreover, the derived mathematical models are validated by simulation and measurements. In order to verify the validity of the theoretical analysis, design, and power decoupling control scheme, a prototype is constructed and tested under the various modes, depending on the availability of the renewable energy source and the load consumption. The experimental results show that the two decoupled control variables achieve effective regulation of the power flow among the three ports.
Scopus rating (2003): SJR 3.742 SNIP 3.056
Scopus rating (2002): SJR 3.953 SNIP 2.632
Scopus rating (2001): SJR 3.048 SNIP 1.904
Scopus rating (2000): SJR 0.664 SNIP 1.453
Scopus rating (1999): SJR 0.591 SNIP 2.399

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Inductors, Topology, Renewable energy sources, Load flow, Switches, Mathematical model, Zero voltage switching, three-port converter, Energy storage, phase-shift and duty cycle control, renewable energy, state-space modeling
Electronic versions:
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Analysis of 28 Arcobacter genomes belonging to different species

General information
State: Published
Organisations: National Food Institute, Research Group for Genomic Epidemiology, Rovira i Virgili University
Authors: Alba, P. (Ekstern), Leekitcharoenphon, P. (Intern), Hendriksen, R. S. (Intern), Aarestrup, F. M. (Intern), José, F. M. (Ekstern)
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Abstract p 302 in Abstract book, CHRO 2017 (poster presentation)
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Analysis of 62 hybrid assembled human Y chromosomes exposes rapid structural changes and high rates of gene conversion
The human Y-chromosome does not recombine across its male-specific part and is therefore an excellent marker of human migrations. It also plays an important role in male fertility. However, its evolution is difficult to fully understand because of repetitive sequences, inverted repeats and the potentially large role of gene conversion. Here we perform an evolutionary analysis of 62 Y-chromosomes of Danish descent sequenced using a wide range of library insert sizes and high coverage, thus allowing large regions of these chromosomes to be well assembled. These include 17 father-son pairs, which we use to validate variation calling. Using a recent method that can integrate variants based on both mapping and de novo assembly, we genotype 10898 SNVs and 2903 indels (max length of 27241 bp) in our sample and show by father-son concordance and experimental validation that the non-recurrent SNP and indel variation on the Y chromosome tree is called very accurately. This includes variation called in a 0.9 Mb centromeric heterochromatic region, which is by far the most variable in the Y chromosome. Among the variation is also longer sequence-stretches not present in the reference genome but shared with the chimpanzee Y chromosome. We analyzed 2.7 Mb of large inverted repeats (palindromes) for variation patterns among the two palindrome arms and identified 603 mutation and 416 gene conversions events. We find clear evidence for GC-biased gene conversion in the palindromes (and a balancing AT mutation bias), but irrespective of this, also a strong bias towards gene conversion towards the ancestral state, suggesting that palindromic gene conversion may alleviate Muller’s ratchet. Finally, we also find a large number of large-scale gene duplications and deletions in the palindromic regions (at least 24) and find that such events can consist of complex combinations of simultaneous insertions and deletions of long stretches of the Y chromosome.
Understanding energy consumption patterns of different types of consumers is essential in any planning of energy distribution. However, obtaining individual-level consumption information is often either not possible or too expensive. Therefore, we consider data from aggregations of energy use, that is, from sums of individuals’ energy use, where each individual falls into one of C consumer classes. Unfortunately, the exact number of individuals of each class may be unknown due to inaccuracies in consumer registration or irregularities in consumption patterns. We develop a methodology to estimate both the expected energy use of each class as a function of time and the true number of consumers in each class. To accomplish this, we use B-splines to model both the expected consumption and the individual-level random effects. We treat the reported numbers of consumers in each category as random variables with distribution depending on the true number of consumers in each class and on the probabilities of a consumer in one class reporting as another class. We obtain maximum likelihood estimates of all parameters via a maximization algorithm. We introduce a special numerical trick for calculating the maximum likelihood estimates of the true number of consumers in each class. We apply our method to a data set and study our method via simulation.
Analysis of Anholt offshore wind farm SCADA measurements

SCADA measurements from the Danish Anholt offshore wind farm (ANH) for a period of 2½ years have been qualified. ANH covers 12 km × 22 km and is located between Djursland and the island Anholt in Kattegat, Denmark. This qualification encompasses identification of curtailment and idling periods, start/stop events and a power curve control for each wind turbine in the wind farm. Data also include wind speed measurements from a nearby WindCube lidar and simulations from the WRF model for the same period as the SCADA. An equivalent wind speed (wsi) is derived from the combined power and pitch signals for each wind turbine. Furthermore, the local wind direction is derived for a number of wake-free turbine groups. By combining the wsi and wind direction, the undisturbed wind speed and direction inflow conditions of the wind farm (Upark and WDpark) are estimated for all 360 degrees.

The preliminary analysis reveals a significant wind gradient along the North-South direction for the western row of the wind farm – for westerly inflow, together with a distinct wind speed reduction caused by coastal effects. Figure 1 shows how the coast influences the wind speed gradient along the western row of turbines. Furthermore, a minor wind speed reduction is identified for easterly inflow, caused by the island Anholt. The internal wake effects are small, due to the large "variable" spacing based on the arch-based layout compared to other wind farms.

A comparison between simulated WRF and measured wind speeds shows good correlation. The power deficit along the rows of turbines demonstrates a significant difference between unstable and stable conditions.

General information

State: Published
Organisations: Department of Wind Energy, Fluid Mechanics, Resource Assessment Modelling, Resource Assessment Modelling, Resource Assessment Modelling, Resource Assessment Modelling, Meteorology & Remote Sensing, Aerodynamic design
Authors: Hansen, K. S. (Intern), Volker, P. (Intern), Pena Diaz, A. (Intern), van der Laan, P. (Intern), Ott, S. (Intern), Hasager, C. B. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Electronic versions:
WESC2017_Anholt_Hansen_et_al.pdf
Analysis of bearing steel exposed to rolling contact fatigue

The objective of this work is to characterize fatigue damage in roller bearings under conditions of high load and slippage. A test rig constructed for rolling contact fatigue tests of rings is described, and test results are presented for rings taken from two spherical roller bearings. The preparation of the rings and the loading situation are explained. Test conditions are chosen with the aim of achieving pitting formation at the contacting surfaces. During testing the contact pressure, torque and the rotational speed are monitored and recorded. After testing the tested rings have been characterized using X-ray tomography and scanning electron microscopy. The observations confirm that rolling contact fatigue testing at high loads leads to pitting failure at the contacting surfaces. The pitting mostly appears on one side of the contact, attributed to a non-uniform contact pressure in the axial direction.

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Organisations: Department of Wind Energy, Composites and Materials Mechanics, Materials science and characterization, Department of Mechanical Engineering, Solid Mechanics, Technical University of Denmark
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Scopus rating (2013): SJR 0.183 SNIP 0.256 CiteScore 0.16
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.161 SNIP 0.203 CiteScore 0.14
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.155 SNIP 0.149 CiteScore 0.1
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.151 SNIP 0.112
Original language: English
Electronic versions:
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Analysis of electrical and thermal stress effects on PCBM:P3HT solar cells by photocurrent and impedance spectroscopy modeling

We investigated the effects of electrical stress and thermal storage by means of photocurrent, Impedance Spectroscopy and Open Circuit Voltage Decay models. The electrical stress damages only the active layer, by reducing the generation rate, the polaron separation probability and the carrier lifetime. The thermal stress also degrades the anode interface. This reflects on the appearance of an inflection in the I-V photocurrent shape close to the operative region.
Analysis of free text in electronic health records for identification of cancer patient trajectories

With an aging patient population and increasing complexity in patient disease trajectories, physicians are often met with complex patient histories from which clinical decisions must be made. Due to the increasing rate of adverse events and hospitals facing financial penalties for readmission, there has never been a greater need to enforce evidence-led medical decision-making using available health care data. In the present work, we studied a cohort of 7,741 patients, of whom 4,080 were diagnosed with cancer, surgically treated at a University Hospital in the years 2004-2012. We have developed a methodology that allows disease trajectories of the cancer patients to be estimated from free text in electronic health records (EHRs). By using these disease trajectories, we predict 80% of patient events ahead in time. By control of confounders from 8326 quantified events, we identified 557 events that constitute high subsequent risks (risk > 20%), including six events for cancer and seven events for metastasis. We believe that the presented methodology and findings could be used to improve clinical decision support and personalize trajectories, thereby decreasing adverse events and optimizing cancer treatment.
Analysis of Gas Leakage and Current Loss of Solid Oxide Fuel Cells by Screen Printing

Two types of anode supported solid oxide fuel cell (SOFC) NiO-YSZ/YSZ/GDC/LSCF with the same structure and different manufacturing process were tested. Gas leakage was suspected for cells manufactured with screen printing technique. Effective leak current densities for both types of cells were calculated. Their performances of electrochemical impedance spectroscopy (EIS) were compared and distribution function of relaxation times (DRT) technique was also used to find the clue of gas leakage. Finally, thinning and penetrating holes were observed in electrolyte layer, which confirmed the occurrence of gas leakage.

General information
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Organisations: Department of Energy Conversion and Storage, Mixed Conductors, Tsinghua University
Authors: Jia, C. (Ekstern), Han, M. (Ekstern), Chen, M. (Intern)
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Analysis of Gas Leakage and Current Loss of Solid Oxide Fuel Cells by Screen Printing

One of the biggest advantages of SOFC (solid oxide fuel cell) is the probable use of methane as fuel. However, when the actual SOFC stack is operating with CH4 as fuel, due to the catalytic action of metal nickel, carbon will deposit on SOFC anode and nickel foam, which directly shorten the SOFC operating life and lead to performance degradation. The planar anode-supported Ni-YSZ|YSZ|LSCF SOFC was chosen as the research object, with the cell size of 12cm×12cm and the effective area of 100cm², and the holder is made of 99% purity of Al2O3 ceramic material, in order to eliminate the influence of Cr in stainless steel. The one-cell stack operated at 750°C, and the maximum power density was 0.35W/cm² when the fuel is 0.5slm/min pure hydrogen. The stability experiment was conducted first under pure H2 for 100h, then fuel was switched into pure methane, and another 100h of voltage stability was tested. In this work, the temperature distribution of the stack was monitored, whose relationship with the weight gain and the micro-structure of the nickel foam was established, and a possible explanation of the carbon deposition distribution and process on the nickel foam was put forward.

Analysis of surface insulation resistance related failures in electronics by circuit simulation

Purpose-The purpose of this study is to show that the humidity levels for surface insulation resistance (SIR)-related failures are dependent on the type of activators used in no-clean flux systems and to demonstrate the possibility of simulating the effects of humidity and contamination on printed circuit board components and sensitive parts if typical SIR data connected to a particular climatic condition are available. This is shown on representative components and typical circuits. Design/methodology/approach-A range of SIR values obtained on SIR patterns with 1,476 squares was used as input data for the circuit analysis. The SIR data were compared to the surface resistance values observable on a real device printed circuit board assembly. SIR issues at the component and circuit levels were analysed on the basis of parasitic circuit effects owing to the formation of a water layer as an electrical conduction medium. Findings-This paper provides a summary of the effects of contamination with various weak organic acids representing the active components in no-clean solder flux residue, and demonstrates the effect of humidity and contamination on the possible malfunctions and errors in electronic circuits. The effect of contamination and humidity is expressed as drift from the nominal resistance values of the resistors, self-discharge of the capacitors and the errors in the circuits due to parasitic leakage currents (reduction of SIR). Practical/implications-The methodology of the analysis of the circuits using a range of empirical leakage resistance values combined with the knowledge of the humidity and contamination profile of the electronics can be used for the robust design of a device, which is also important for electronic products relying on low current consumption for long battery lifetime. Originality/value-Examples provide a basic link between the combined effect of humidity and
contamination and the performance of electronic circuits. The methodology shown provides the possibility of addressing the climatic reliability of an electronic device at the early stage of device design by using typical SIR data representing the possible climate exposure.

**General information**
State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering
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**Analysis of the equivalent indenter concept used to extract Young’s modulus from a nano-indentation test: some new insights into the Oliver–Pharr method**

In this paper a thorough analysis of the equivalent indenter concept applied to nano-indentation is carried out, motivated by the fact that previous works in the field have not considered the requirement of a consistent relation between contact depth and projected contact area. Dimensional analysis is initially used to prove that the shape of the axisymmetric equivalent indenter can be regarded as a material property, provided that size-effects are negligible. Subsequently, it is shown that such shape can effectively be employed to describe the nano-indentation unloading stage by means of Sneddon's elastic solution which is formally valid only for indentation into a flat surface. This allows for formulating the problem of extracting Young's modulus from the unloading curve as an optimization problem. However, it is proved that the latter does not have a unique solution, due to the particular mathematical structure of the underlying equations; hence, additional constraints are needed to set restrictions on the admissible equivalent indenter shapes. An example of such constraint is hidden in some apparent inconsistencies of the well-known Oliver–Pharr method, which is demonstrated to be based on an equivalent conical indenter whose semi-apical angle depends on the ratio between residual and total penetration. Specifically, this angle tends to 90° when the material exhibits extensive inelastic deformation, whereas it reduces to the one characteristic of the real indenter for a perfectly elastic material. This provides a new physical explanation for the relatively good accuracy of the method even in presence of a non-negligible residual contact impression on the sample.
Analysis of the production of salmon fillet - Prediction of production yield

The aim was to investigate the influence of raw material variation in Atlantic salmon from aquaculture on filleting yield, and to develop a decision tool for choosing the appropriate raw material for optimized yield. This was achieved by tracking salmon on an individual level (n = 60) through a primary production site. The majority of the salmon exhibited a heavier right fillet compared to the left fillet after filleting. No explicit explanation was found for this observation although the heading procedure was shown to have a large impact. A Partial Least Square model was built to predict the yield after filleting. The model was based on six pre-processing variables and allowed an acceptable prediction of the filleting yield with a root mean square error cross validation of 0.68. The presented model can estimate the slaughter yield for a certain batch before ordering from the slaughterhouse. This may facilitate optimal planning of the production of salmon fillets by ordering and assigning the right batch to the right product category to obtain an optimal yield and quality.
Analysis of trait-based models in marine ecosystems.
The overarching theme for this thesis is spatial and temporal variations in ecosystems. The focus is on describing mechanisms that are responsible for generating the spatial and temporal patterns. The thesis contains two separate projects, each exploring a possible mechanism for pattern formation. In both projects, the model formulations result in partial integro-differential equations. The first project in the thesis considers temporal patterns in a size structured population. Size structure is relevant for species that go through significant changes through their lifetime. The population's response to regular temporal variations in the environment is investigated by introducing a periodic forcing in the system. This can for instance represent seasonal changes. The effect of an imposed forcing is explored both when the underlying unforced system has a stable equilibrium and when it has stable oscillatory dynamics. The numerical solutions show regular cycles where the period is equal to, or an integer multiple of, the forcing period and where the population can have one or more pulses of reproduction in each cycle. Additionally, the numerical results indicate quasi-periodic or chaotic solutions, period doubling bifurcations and coexisting attractors. The bifurcation structure is similar to results for comparable unstructured population models in the literature. This indicates that size structure does not affect the response to periodic forcing. The next project in the thesis considers spatio-temporal pattern formation in a predator–prey system where animals move towards higher fitness. Reaction-diffusion systems have been used extensively to describe spatio-temporal patterns in a variety of systems. However, animals rarely move completely at random, as expressed by diffusion. This has lead to models with taxis terms, describing individuals moving in the direction of an attractant. An example is chemotaxis models, where bacteria are attracted to a chemical substance. From an evolutionary perspective, it is expected that animals act as to optimize their fitness. Based on this principle, a predator–prey system with fitness taxis and diffusion is proposed. Here, fitness taxis refer to animals moving towards higher values of fitness, and the specific growth rates of the populations are used as a measure of the fitness values. To determine the conditions for pattern formation, a linear stability analysis is conducted. The analysis reveals that the fitness taxis leads to mechanisms for pattern formation, which are based on the prey gathering together. It turns out, that in some cases the problem is not well-posed and an ultraviolet catastrophe occurs, i.e., perturbations with infinitely short wavelength grow infinitely fast. To prevent this, the population dynamics are revised with a spatial feeding kernel, that defines a spatial range wherein a predator consumes prey. A linear stability analysis for the revised system reveals the ultraviolet catastrophe is avoided and the basic mechanisms for pattern formation are unchanged. Numerical solutions to the revised system are computed to visualize the patterns. The solutions encompass stationary spatial patterns in addition to traveling waves, standing waves and irregular solutions that might be spatio-temporal chaos. The modeling approach of fitness taxis presents a general way to express movement and it is concluded that the model provides a useful framework for describing generic mechanisms for pattern formation.

General information
State: Submitted
Organisations: Dynamical Systems, Department of Applied Mathematics and Computer Science, Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics, National Institute of Aquatic Resources, Centre for Ocean Life, University of Rostock
Analytical Comparison of Dual-Input Isolated dc-dc Converter with an ac or dc Inductor for Renewable Energy Systems

This paper presents two configurations of dual-input (DI) or three-port (TPC) isolated dc-dc converters for hybrid renewable energy systems such as photovoltaics and batteries. These two converters are derived by integrating an interleaved boost converter and a single-active bridge converter with an ac inductor as a power interfacing element or phase-shift softswitching converter with an output dc inductor. Both converters are controlled by a pulse-width modulation and phase-shift hybrid modulation scheme. The two converter topologies are, even though quite similar from the topological and control perspective, distinct in operation principles, voltage/power transfer functions, loss distributions, soft-switching constraints, and power efficiency under the same operating conditions. Moreover, the inductor design differs greatly between these two cases. In this paper, a comprehensive comparison is given for the first time and thereby the corresponding design tradeoffs are discussed. Finally, a laboratory 1 kW prototype is constructed and tested to verify the theoretical analysis.

Analytical gradients of wind turbine towers fatigue loads

This paper presents an analytical approach to calculate the fatigue loads on wind turbine towers. The approach is based on the analysis of the wind turbine's response to different wind conditions, taking into account the tower's geometry and the material properties. The results provide insights into the fatigue life of the tower and can be used to optimize the design and operation of wind turbines.

General information
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Organisations: Department of Wind Energy, Wind turbine loads & control
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Analytical Comparison of Dual-Input Isolated dc-dc Converter with an ac or dc Inductor for Renewable Energy Systems

This paper presents two configurations of dual-input (DI) or three-port (TPC) isolated dc-dc converters for hybrid renewable energy systems such as photovoltaics and batteries. These two converters are derived by integrating an interleaved boost converter and a single-active bridge converter with an ac inductor as a power interfacing element or phase-shift softswitching converter with an output dc inductor. Both converters are controlled by a pulse-width modulation and phase-shift hybrid modulation scheme. The two converter topologies are, even though quite similar from the topological and control perspective, distinct in operation principles, voltage/power transfer functions, loss distributions, soft-switching constraints, and power efficiency under the same operating conditions. Moreover, the inductor design differs greatly between these two cases. In this paper, a comprehensive comparison is given for the first time and thereby the corresponding design tradeoffs are discussed. Finally, a laboratory 1 kW prototype is constructed and tested to verify the theoretical analysis.

General information
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Organisations: Department of Electrical Engineering, Electronics
Authors: Zhang, Z. (Intern), Mira Albert, M. D. C. (Intern), Andersen, M. A. E. (Intern)
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Source-ID: 132851082
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Analytical gradients of wind turbine towers fatigue loads

This paper presents an analytical approach to calculate the fatigue loads on wind turbine towers. The approach is based on the analysis of the wind turbine's response to different wind conditions, taking into account the tower's geometry and the material properties. The results provide insights into the fatigue life of the tower and can be used to optimize the design and operation of wind turbines.

General information
State: Published
Organisations: Department of Wind Energy, Wind turbine loads & control
Authors: Tibaldi, C. (Intern), Hansen, M. H. (Intern), Stolpe, M. (Intern)
Number of pages: 28
Publication date: 2017

Publication information
Analytical Profiling of Airplane Wastewater - a New Matrix for Mapping Worldwide Patterns of Drug Use and Abuse

There is limited knowledge on the global prescription and consumption patterns of therapeutic (TD) and illicit drugs (ID). Pooled urine analysis and wastewater-based epidemiology (WBE) has been used for local-based drug screening. It is, however, difficult to study the global epidemiology due to difficulties in obtaining samples. The aims of the study were to test the detectability of TD and ID in airplane wastewater samples categorized according to their geographical origin. Wastewater samples (n= 17) were collected from long-distance flights and prepared with enzymatic conjugate cleaving followed by either precipitation or solid phase extraction. Aliquots were analysed on various liquid chromatography – mass spectrometers. TDs were grouped according to their Anatomical Therapeutic Chemical (ATC) codes. Identification confidence was assigned to three levels based on variables including detection on multiple instruments and number of targets per compound. A total of 424 compounds were identified across all samples, distributed on 87 unique TD and 2 ID. Two principal components in a principal component analysis separated three clusters of wastewater samples corresponding to geographical origin of the airplanes with therapeutic subgroup ATC codes as variables. Airplane wastewater analysis is useful for identifying targets for WBE and toxicological analysis and explore drug use and abuse patterns.

General information
State: Published
Organisations: National Food Institute, Research Group for Genomic Epidemiology, University of Copenhagen
Authors: Mardal, M. (Ekstern), Aarestrup, F. M. (Intern), Rasmussen, B. S. (Ekstern), Mollerup, C. B. (Ekstern), Dalsgaard, P. W. (Ekstern), Linnet, K. (Ekstern)
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Analytical solutions for waves in spherically- and cylindrically-symmetric inhomogeneous media

We present the operator approach of finding material parameters of inhomogeneous bianisotropic media, the Maxwell equations in which have closed-form solutions. It is applicable to spherically- and cylindrically-symmetric media. Scattering theory for the inhomogeneous objects in question is developed.

General information
State: Published
Organisations: Department of Photonics Engineering, Plasmonics and Metamaterials, ITMO University
Authors: Novitsky, A. (Intern), Shalin, A. S. (Ekstern), Lavrinenko, A. (Intern)
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Host publication Information
Analytic approximations for the elastic moduli of two-phase materials

Based on the models of series and parallel connections of the two phases in a composite, analytic approximations are derived for the elastic constants (Young's modulus, shear modulus, and Poisson's ratio) of elastically isotropic two-phase composites containing second phases of various volume fractions, shapes, and regular distributions. Comparison with a plentitude of finite element simulations and numerous previous experimental investigations shows a large consistency between the results and the analytic expressions derived, confirming the adequacy of the present approach. Compared with previous classical models, the present model has several advantages, including its simplicity, accuracy of prediction, and universal applicability.
Lytic polysaccharide monooxygenases perform oxidative cleavage of glycosidic bonds in various polysaccharides. The majority of LMPOs studied so far possess activity on either cellulose or chitin and analysis of these activities is therefore the main focus of this review. Notably, however, the number of LPMOs that are active on other polysaccharides is increasing. The products generated by LPMOs from cellulose are either oxidized in the downstream end (at C1) or upstream end (at C4), or at both ends. These modifications only result in small structural changes, which makes both chromatographic separation and product identification by mass spectrometry challenging. The changes in physicochemical properties that are associated with oxidation need to be considered when choosing analytical approaches. C1 oxidation leads to a sugar that is no longer reducing but instead has an acidic functionality, whereas C4 oxidation leads to products that are inherently labile at high and low pH and that exist in a keto-gemdiol equilibrium that is strongly shifted toward the gemdiol in aqueous solutions. Partial degradation of C4-oxidized products leads to the formation of native products, which could explain why some authors claim to have observed glycoside hydrolase activity for LPMOs. Notably, apparent glycoside hydrolase activity may also be due to small amounts of contaminating glycoside hydrolases since these normally have much higher catalytic rates than LPMOs. The low catalytic turnover rates of LPMOs necessitate the use of sensitive product detection methods, which limits the analytical possibilities considerably.

Modern liquid chromatography and mass spectrometry have become essential tools for evaluating LPMO activity, and this chapter provides an overview of available methods together with a few novel tools. The methods described constitute a suite of techniques for analyzing oxidized carbohydrate products, which can be applied to LPMOs as well as other carbohydrate-active redox enzymes.

**General information**

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**Organisations:** Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering, Norwegian University of Life Sciences

**Authors:** Westereng, B. (Ekstern), Arntzen, M. Ø. (Ekstern), Wittrup Agger, J. (Intern), Vaaje-Kolstad, G. (Ekstern), Eijsink, V. G. H. (Ekstern)

**Pages:** 71-92

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**Host publication information**

**Title of host publication:** Protein-Carbohydrate Interactions: Methods and Protocols
An analytical model of flagellate hydrodynamics

Flagellates are unicellular microswimmers that propel themselves using one or several beating flagella. We consider a hydrodynamic model of flagellates and explore the effect of flagellar arrangement and beat pattern on swimming kinematics and near-cell flow. The model is based on the analytical solution by Oseen for the low Reynolds number flow due to a point force outside a no-slip sphere. The no-slip sphere represents the cell and the point force a single flagellum. By superposition we are able to model a freely swimming flagellate with several flagella. For biflagellates with left–right symmetric flagellar arrangements we determine the swimming velocity, and we show that transversal forces due to the periodic movements of the flagella can promote swimming. For a model flagellate with both a longitudinal and a transversal flagellum we determine radius and pitch of the helical swimming trajectory. We find that the longitudinal flagellum is responsible for the average translational motion whereas the transversal flagellum governs the rotational motion. Finally, we show that the transversal flagellum can lead to strong feeding currents to localized capture sites on the cell surface.
An Approach for Hospital Planning with Multi-Agent Organizations

The background for this paper is a development that the Danish hospitals are undertaking which requires the establishment of a common emergency department. It is uncertain exactly what and how many resources the department needs and so resources are assigned dynamically as seen necessary by the staff. Such dynamic adjustments pose a challenge in predicting what consequences these adjustments may lead to. We propose an approach to deal with this challenge that applies simulation with intelligent agents and logics for organizational reasoning. We present some of the expected obstacles with this approach and potential ways to overcome them.

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Organisations: Department of Applied Mathematics and Computer Science, Algorithms and Logic
Authors: Larsen, J. B. (Intern), Villadsen, J. (Intern)
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An Assessment of State-of-the-Art Mean Sea Surface and Geoid Models of the Arctic Ocean: Implications for Sea Ice Freeboard Retrieval

State-of-the-art Arctic Ocean mean sea surface (MSS) models and global geoid models (GGMs) are used to support sea ice freeboard estimation from satellite altimeters, as well as in oceanographic studies such as mapping sea level anomalies and mean dynamic ocean topography. However, errors in a given model in the high frequency domain, primarily due to unresolved gravity features, can result in errors in the estimated along-track freeboard. These errors are
exacerbated in areas with a sparse lead distribution in consolidated ice pack conditions. Additionally model errors can impact ocean geostrophic currents, derived from satellite altimeter data, while remaining biases in these models may impact longer-term, multi-sensor oceanographic time-series of sea level change in the Arctic. This study focuses on an assessment of five state-of-the-art Arctic MSS models (UCL13/04, DTU15/13/10) and a commonly used GGM (EGM2008). We describe errors due to unresolved gravity features, inter-satellite biases, and remaining satellite orbit errors, and their impact on the derivation of sea ice freeboard. The latest MSS models, incorporating CryoSat-2 sea surface height measurements, show improved definition of gravity features, such as the Gakkel Ridge. The standard deviation between models ranges 0.03-0.25 m. The impact of remaining MSS/GGM errors on freeboard retrieval can reach several decimeters in parts of the Arctic. While the maximum observed freeboard difference found in the central Arctic was 0.59 m (UCL13 MSS minus EGM2008 GGM), the standard deviation in freeboard differences is 0.03-0.06 m.
An assessment of the importance of exposure routes to the uptake and internal localisation of fluorescent nanoparticles in zebrafish (Danio rerio), using light sheet microscopy

A major challenge in nanoecotoxicology is finding suitable methods to determine the uptake and localisation of nanoparticles on a whole-organism level. Some uptake methods have been associated with artefacts induced by sample preparation, including staining for electron microscopy. This study used light sheet microscopy (LSM) to define the uptake and localisation of fluorescently labelled nanoparticles in living organisms with minimal sample preparation. Zebrafish (Danio rerio) were exposed to fluorescent gold nanoparticles (Au NPs) and fluorescent polystyrene NPs via aqueous or dietary exposure. The in vivo uptake and localisation of NPs was investigated using LSM at different time points (1, 3 and 7 days). A time-dependent increase in fluorescence was observed in the gut after dietary exposure to both Au NPs and polystyrene NPs. No fluorescence was observed within gut epithelia regardless of the NP exposure route indicating no or limited uptake via intestinal villi. Fish exposed to polystyrene NPs through the aqueous phase emitted fluorescence signals from the gills and intestine. Fluorescence was also detected in the head region of the fish after aqueous exposure to polystyrene NPs. This was not observed for Au NPs. Aqueous exposure to Au NPs resulted in increased relative swimming distance, while no effect was observed for other exposures. This study supports that the route of exposure is essential for the uptake and subsequent localisation of nanoparticles in zebrafish. Furthermore, it demonstrates that the localisation of NPs in whole living organisms can be visualised in real-time, using LSM.

General information
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Organisations: Department of Environmental Engineering, Environmental Chemistry, Department of Micro- and Nanotechnology, Colloids and Biological Interfaces, University of Gothenburg, Roskilde Universitet
Authors: Skjolding, L. M. (Intern), Ašmonaitė, G. (Ekstern), Jølck, R. I. (Intern), Andresen, T. L. (Intern), Selck, H. (Ekstern), Baun, A. (Intern), Sturve, J. (Ekstern)
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Web of Science (2016): Indexed yes
A Natural Logic for Natural-language Knowledge Bases

We describe a natural logic for computational reasoning with a regimented fragment of natural language. The natural logic comes with intuitive inference rules enabling deductions and with an internal graph representation facilitating conceptual path finding between pairs of terms as an approach to semantic querying. Our core natural logic proposal covers formal ontologies and generative extensions thereof. It further provides means of expressing general relationships between classes in an application. We discuss extensions of the core natural logic with various conservative as well as non-conservative constructs in order to approach scientific use of natural language. Finally, we outline a prototype system addressing life science for the natural logic knowledge base setup being under continuous development.

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Source: FindIt
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Ancient genomes show social and reproductive behavior of early Upper Paleolithic foragers
Present-day hunter-gatherers (HG) live in multilevel social groups essential to sustain a population structure characterized by limited levels of within-band relatedness and inbreeding. When these wider social networks evolved among HGs is unknown. Here, we investigate whether the contemporary HG strategy was already present in the Upper Paleolithic (UP), using complete genome sequences from Sunghir, a site dated to ~34 thousand years BP (kya) containing multiple anatomically modern human (AMH) individuals. We demonstrate that individuals at Sunghir derive from a
population of small effective size, with limited kinship and levels of inbreeding similar to HG populations. Our findings suggest that UP social organization was similar to that of living HGs, with limited relatedness within residential groups embedded in a larger mating network.

**General information**

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**Organisations:** Department of Bio and Health Informatics, Metagenomics, University of Copenhagen, University of Bern, University of California at Berkeley, University of Cambridge, Russian Academy of Sciences, Lomonosov Moscow State University, University of Oxford

**Authors:** Sikora, M. (Ekstern), Seguin-Orlando, A. (Ekstern), Sousa, V. C. (Ekstern), Albrechtsen, A. (Ekstern), Korneliussen, T. (Ekstern), Ko, A. (Ekstern), Rasmussen, S. (Intern), Dupanloup, I. (Ekstern), Nigst, P. R. (Ekstern), Bosch, M. D. (Ekstern), Renaud, G. (Ekstern), Allentoft, M. E. (Ekstern), Margaryan, A. (Ekstern), Vasilyev, S. V. (Ekstern), Veselovskaya, E. V. (Ekstern), Borutskaya, S. B. (Ekstern), Deviese, T. (Ekstern), Comeskey, D. (Ekstern), Higham, T. (Ekstern), Manica, A. (Ekstern), Foley, R. (Ekstern), Meltzer, D. J. (Ekstern), Nielsen, R. (Ekstern), Excoffier, L. (Ekstern), Lahr, M. M. (Ekstern), Orlando, L. (Ekstern), Willerslev, E. (Ekstern)

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- Scopus rating (2013): SJR 12.305 SNIP 7.87 CiteScore 12.43
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 13.159 SNIP 8.124 CiteScore 12.39
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- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 14.049 SNIP 8.309 CiteScore 11.97
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 2
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- Scopus rating (2009): SJR 11.644 SNIP 7.033
- Web of Science (2009): Indexed yes
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- Web of Science (2008): Indexed yes
- Web of Science (2007): Indexed yes
An effect-directed strategy for characterizing emerging chemicals in food contact materials made from paper and board

Food contact materials (FCM) are any type of item intended to come into contact with foods and thus represent a potential source for human exposure to chemicals. Regarding FCMs made of paper and board, information pertaining to their chemical constituents and the potential impacts on human health remains scarce, which hampers safety evaluation. We describe an effect-directed strategy to identify and characterize emerging chemicals in paper and board FCMs. Twenty FCMs were tested in eight reporter gene assays, including assays for the AR, ER, AhR, PPARγ, Nrf2 and p53, as well as mutagenicity. All FCMs exhibited activities in at least one assay. As proof-of-principle, FCM samples obtained from a sandwich wrapper and a pizza box were carried through a complete step-by-step multi-tiered approach. The pizza box exhibited ER activity, likely caused by the presence of bisphenol A, dibutyl phthalate, and benzylbutyl phthalate. The sandwich wrapper exhibited AR antagonism, likely caused by abietic acid and dehydroabietic acid. Migration studies confirmed that the active chemicals can transfer from FCMs to food simulants. In conclusion, we report an effect-directed strategy that can identify hazards posed by FCMs made from paper and board, including the identification of the chemical(s) responsible for the observed activity.

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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.213 SNIP 1.426 CiteScore 3.44
An effective low Pd-loading catalyst for hydrogen generation from formic acid

As an interesting hydrogen carrier, formic acid is bio-renewable, non-toxic and available in the liquid state at room temperature. The development of active and low-cost catalyst is of significance for hydrogen generation from formic acid. In this study, both a relatively cheap metal (Ag) and a functional support (nitrogen modified reduced graphene oxide, N-rGO) were applied to prepare Pd catalyst. It was found that the Ag atoms facilitated the formation of Pd-rich surface in the preparation strategy, in which the reductive N-rGO and a two-step feeding process of metal precursors played important
roles. In addition, Ag additive was found to benefit catalyst stability. Most interestingly, the obtained low Pd-loading Pd1Ag6/N-rGO catalyst showed a specific Pd loading turnover frequency of 171 mol Pd−1 h−1 and a specific metal cost turnover frequency of 64.2 $−1 h−1, which were predominant among currently available Pd-based catalysts towards formic acid decomposition without any additive under room temperature.

**General information**

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Organisations: Department of Energy Conversion and Storage, Proton conductors, China University of Geosciences
Authors: Huang, Y. (Ekstern), Xu, J. (Ekstern), Ma, X. (Ekstern), Huang, Y. (Ekstern), Li, Q. (Intern), Qiu, H. (Ekstern)
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Web of Science (2013): Indexed yes
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Scopus rating (2012): SJR 1.515 SNIP 1.729 CiteScore 3.96
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.456 SNIP 1.837 CiteScore 4.42
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.589 SNIP 1.871
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.333 SNIP 1.885
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.401 SNIP 2.096
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.279 SNIP 2.201
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.073 SNIP 2.161
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.107 SNIP 1.787
Scopus rating (2004): SJR 1.225 SNIP 1.626
An efficient synthesis of linear β-(1→6)-galactan oligosaccharides related to plant cell wall glycans

Galactans are linear structures mainly found in arabinogalactan glycans and RG-I side chains. As a follow-up to our work on both β-(1→3)-linked and β-(1→4)-linked galactans, we herein report a convergent synthesis of β-(1→6)-galactan using our previously synthesized 4,6-benzylidene protected disaccharide as a key building block. However, the regioselective reductive opening of the 4,6-benzylidene protected disaccharide turned out to become more challenging as the length of the oligosaccharide increased and a second differential protected disaccharide building block carrying a chloroacetyl group on the 6-position was used to elongate the chain in a more efficient way.

An electron microscopy study of microstructural evolution during in-situ annealing of heavily deformed nickel

The microstructure of heavily deformed pure nickel processed by accumulative roll bonding to a von Mises strain of 6.4 has been investigated using both transmission electron microscopy and transmission Kikuchi diffraction in a scanning electron microscope. By monitoring the microstructure in one region during in-situ annealing in a transmission electron microscope, it is found that 9% of all triple junctions present in this region have migrated over more than 40 nm. Junctions formed by three high angle boundaries are observed to be more prone to motion during recovery than any other junctions. The extent of triple junction motion in the Ni sample is compared to that in heavily deformed aluminum.
Main Research Area: Technical/natural sciences

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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 0.757 SNIP 0.935
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.792 SNIP 1.021 CiteScore 2.5
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BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.895 SNIP 1.315 CiteScore 2.64
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BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.83 SNIP 1.237 CiteScore 2.41
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.924 SNIP 1.404 CiteScore 2.41
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.017 SNIP 1.568 CiteScore 2.54
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.059 SNIP 1.29
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.043 SNIP 1.276
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.979 SNIP 1.3
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.943 SNIP 1.31
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.846 SNIP 1.16
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.775 SNIP 1.167
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Scopus rating (2003): SJR 0.602 SNIP 0.828
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An Empirical Comparison of Algorithms to Find Communities in Directed Graphs and Their Application in Web Data Analytics

Detecting communities in graphs is a fundamental tool to understand the structure of Web-based systems and predict their evolution. Many community detection algorithms are designed to process undirected graphs (i.e., graphs with bidirectional edges) but many graphs on the Web—e.g., microblogging Web sites, trust networks or the Web graph itself—are often directed. Few community detection algorithms deal with directed graphs but we lack their experimental comparison. In this paper we evaluated some community detection algorithms across accuracy and scalability. A first group of algorithms (Label Propagation and Infomap) are explicitly designed to manage directed graphs while a second group (e.g., WalkTrap) simply ignores edge directionality; finally, a third group of algorithms (e.g., Eigenvector) maps input graphs onto undirected ones and extracts communities from the symmetrized version of the input graph. We ran our tests on both artificial and real graphs and, on artificial graphs, WalkTrap achieved the highest accuracy, closely followed by other algorithms; Label Propagation has outstanding performance in scalability on both artificial and real graphs. The Infomap algorithm showcased the best trade-off between accuracy and computational performance and, therefore, it has to be considered as a promising tool for Web Data Analytics purposes.

General information
State: Published
Organisations: Department of Management Engineering, Engineering Systems, University of Messina, Mediterranea University of Reggio Calabria, Lulea University of Technology
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An Empirical Model for Carbon Recovery in a Rotating Belt Filter and Its Application in the Frame of Plantwide Evaluation

The rotating belt filter (RBF) is an emerging and enabling technology for carbon recovery and also an alternative to the primary clarifier (PC), sludge thickening and dewatering. A recent study indicates that the RBF has the potential to reduce capital cost, footprint and improve energy and nutrient recovery in comparison to a conventional PC. Moreover, it is also believed that the RBF can fractionate carbon (enrichment of cellulose, namely toilet paper) based on particulate size, more efficiently than a PC. It is, therefore, necessary to understand and quantify the uniqueness of the RBF performance to maximize plant-wide benefits when retrofitted in existing wastewater treatment plants (WWTPs). Thus, a rigorous plant-wide study is required to interpret the deeper influence of an RBF on the major downstream units (such as activated sludge tanks, sludge digester, etc.). This study emphasizes the development of a simplified empirical model for describing carbon recovery in an RBF and the impact of the RBF implementation on plant-wide evaluation.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Trojan Technologies
Authors: Behera, C. R. (Intern), Daynouri-Pancino, F. (Ekstern), Santoro, D. (Ekstern), Gernaey, K. (Intern), Sin, G. (Intern)
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Volume: 4
An Error Analysis of Structured Light Scanning of Biological Tissue

This paper presents an error analysis and correction model for four structured light methods applied to three common types of biological tissue; skin, fat and muscle. Despite its many advantages, structured light is based on the assumption of direct reflection at the object surface only. This assumption is violated by most biological material e.g. human skin, which exhibits subsurface scattering. In this study, we find that in general, structured light scans of biological tissue deviate significantly from the ground truth. We show that a large portion of this error can be predicted with a simple, statistical linear model based on the scan geometry. As such, scans can be corrected without introducing any specially designed pattern strategy or hardware. We can effectively reduce the error in a structured light scanner applied to biological tissue by as much as factor of two or three.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Authors: Jensen, S. H. N. (Intern), Wilm, J. (Intern), Aanæs, H. (Intern)
Pages: 135-145
Publication date: 2017

A New Compton-thick AGN in Our Cosmic Backyard: Unveiling the Buried Nucleus in NGC 1448 with NuSTAR

NGC 1448 is one of the nearest luminous galaxies (L 8-1000μm >10^9 L⊙) to ours (z = 0.00390), and yet the active galactic nucleus (AGN) it hosts was only recently discovered, in 2009. In this paper, we present an analysis of the nuclear source across three wavebands: mid-infrared (MIR) continuum, optical, and X-rays. We observed the source with the Nuclear Spectroscopic Telescope Array (NuSTAR), and combined these data with archival Chandra data to perform broadband X-ray spectral fitting (=0.5-40 keV) of the AGN for the first time. Our X-ray spectral analysis reveals that the AGN is buried under a Compton-thick (CT) column of obscuring gas along our line of sight, with a column density of N_H ≥2.5 ×10^24 cm^-2. The best-fitting torus models measured an intrinsic 2-10 keV luminosity of L (3.5-7.6) ×10^{40} erg s^-1, making NGC 1448 one of the lowest luminosity CTAGNs known. In addition to the NuSTAR observation, we also performed optical spectroscopy for the nucleus in this edge-on galaxy using the European Southern Observatory New Technology Telescope. We reclassify the optical nuclear spectrum as a Seyfert on the basis of the Baldwin-Philips-Terlevich diagnostic diagrams, thus identifying the AGN at optical wavelengths for the first time. We also present high spatial resolution MIR observations of NGC 1448 with Gemini/T-ReCS, in which a compact nucleus is clearly detected. The absorption-corrected 2-10 keV luminosity measured from our X-ray spectral analysis agrees with that predicted from the optical [O iii]λ5007 Å emission line and the MIR 12 μm continuum, further supporting the CT nature of the AGN.

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Organisations: National Space Institute, Astrophysics and Atmospheric Physics, University of Durham, University of Southampton, European Southern Observatory, Georgia Institute of Technology, Pontificia Universidad Catolica de Chile, University of California at Berkeley, Pennsylvania State University, Virginia Polytechnic Institute and State University, Princeton University, Columbia University, Cahill Center for Astronomy and Astrophysics, ETH Zurich, NASA Goddard Space Flight Center, Harvard University, California Institute of Technology
A New Functional Classification of Glucuronoyl Esterases by Peptide Pattern Recognition

Glucuronoyl esterases are a novel type of enzymes believed to catalyze the hydrolysis of ester linkages between lignin and glucuronoxylan in lignocellulosic biomass, linkages known as lignin carbohydrate complexes. These complexes contribute to the recalcitrance of lignocellulose. Glucuronoyl esterases are a part of the microbial machinery for lignocellulose degradation and coupling their role to the occurrence of lignin carbohydrate complexes in biomass is a desired research goal. Glucuronoyl esterases have been assigned to CAZymes family 15 of carbohydrate esterases, but only few examples of characterized enzymes exist and the exact activity is still uncertain. Here peptide pattern recognition is used as a bioinformatic tool to identify and group new CE15 proteins that are likely to have glucuronoyl esterase activity. 1024 CE15-like sequences were drawn from GenBank and grouped into 24 groups. Phylogenetic analysis of these groups made it possible to pinpoint groups of putative fungal and bacterial glucuronoyl esterases and their sequence variation. Moreover, a number of groups included previously undescribed CE15-like sequences that are distinct from the glucuronoyl esterases and may possibly have different esterase activity. Hence, the CE15 family is likely to comprise other enzyme functions than glucuronoyl esterase alone. Gene annotation in a variety of fungal and bacterial microorganisms showed that coprophilic fungi are rich and diverse sources of CE15 proteins. Combined with the lifestyle and habitat of coprophilic fungi, they are predicted to be excellent candidates for finding new glucuronoyl esterase genes.

General information
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Organisations: Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering
Authors: Wittrup Agger, J. (Intern), Busk, P. K. (Intern), Pilgaard, B. (Intern), Meyer, A. S. (Intern), Lange, L. (Intern)
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Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.861 SNIP 1.16 CiteScore 3.76
Web of Science (2014): Indexed yes
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ISI indexed (2013): ISI indexed no
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Scopus rating (2012): SJR 1.415 SNIP 0.725 CiteScore 2.78
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A new k-epsilon model consistent with Monin-Obukhov similarity theory

A new k- epsilon model is introduced that is consistent with Monin–Obukhov similarity theory (MOST). The proposed k- epsilon model is compared with another k- epsilon model that was developed in an attempt to maintain inlet profiles compatible with MOST. It is shown that the previous k- epsilon model is not consistent with MOST for unstable conditions, while the proposed k- epsilon model can maintain MOST inlet profiles over distances of 50 km.

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Organisations: Department of Wind Energy, Aerodynamic design, Resource Assessment Modelling
Authors: van der Laan, P. (Intern), Kelly, M. C. (Intern), Sørensen, N. N. (Intern)
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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.272 SNIP 3.75 CiteScore 3.42
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.275 SNIP 2.464 CiteScore 2.75
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.126 SNIP 2.39 CiteScore 2.36
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.024 SNIP 2.718 CiteScore 2.49
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.487 SNIP 2.013
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
A new phase in the production of quality-controlled sea level data

Sea level is an essential climate variable (ECV) that has a direct effect on many people through inundations of coastal areas, and it is also a clear indicator of climate changes due to external forcing factors and internal climate variability. Regional patterns of sea level change inform us on ocean circulation variations in response to natural climate modes such as El Niño and the Pacific Decadal Oscillation, and anthropogenic forcing. Comparing numerical climate models to a consistent set of observations enables us to assess the performance of these models and help us to understand and predict these phenomena, and thereby alleviate some of the environmental conditions associated with them. All such studies rely on the existence of long-term consistent high-accuracy datasets of sea level. The Climate Change Initiative (CCI) of the European Space Agency was established in 2010 to provide improved time series of some ECVs, including sea level, with the purpose of providing such data openly to all to enable the widest possible utilisation of such data. Now in its second phase, the Sea Level CCI project (SL-cci) merges data from nine different altimeter missions in a clear, consistent and well-documented manner, selecting the most appropriate satellite orbits and geophysical corrections in order to further reduce the error budget. This paper summarises the corrections required, the provenance of corrections and the evaluation of options that have been adopted for the recently released v2.0 dataset (https://doi.org/10.5270/esa-sea-level-cci-1993-2015-v-2.0-201612). This information enables scientists and other users to clearly understand which corrections have been applied and their effects on the sea level dataset. The overall result of these changes is that the rate of rise of global mean sea level (GMSL) still equates to ~3.2mmyr⁻¹ during 1992-2015, but there is now greater confidence in this result as the errors associated with several of the corrections have been reduced. Compared with v1.1 of the SL-cci dataset, the new rate of Sea level is an essential climate variable (ECV) that has a direct effect on many people through inundations of coastal areas, and it is also a clear indicator of climate changes due to external forcing factors and internal climate variability. Regional patterns of sea level change inform us on ocean circulation variations in response to natural climate modes such as El Niño and the Pacific Decadal Oscillation, and anthropogenic forcing. Comparing numerical climate models to a consistent set of observations enables us to assess the performance of these models and help us to understand and predict these phenomena, and thereby alleviate some of the environmental conditions associated with them. All such studies rely on the existence of long-term consistent high-accuracy datasets of sea level. The Climate Change Initiative (CCI) of the European Space Agency was established in 2010 to provide improved time series of some ECVs, including sea level, with the purpose of providing such data openly to all to enable the widest possible utilisation of such data. Now in its second phase, the Sea Level CCI project (SL-cci) merges data from nine different altimeter missions in a clear, consistent and well-documented manner, selecting the most appropriate satellite orbits and geophysical corrections in order to further reduce the error budget. This paper summarises the
corrections required, the provenance of corrections and the evaluation of options that have been adopted for the recently released v2.0 dataset (https://doi.org/10.5270/esa-sea-level-cci-1993-2015-v-2.0-201612). This information enables scientists and other users to clearly understand which corrections have been applied and their effects on the sea level dataset. The overall result of these changes is that the rate of rise of global mean sea level (GMSL) still equates to ~3.2mm yr⁻¹ during 1992-2015, but there is now greater confidence in this result as the errors associated with several of the corrections have been reduced. Compared with v1.1 of the SL-cci dataset, the new rate of Sea level is an essential climate variable (ECV) that has a direct effect on many people through inundations of coastal areas, and it is also a clear indicator of climate changes due to external forcing factors and internal climate variability. Regional patterns of sea level change inform us on ocean circulation variations in response to natural climate modes such as El Niño and the Pacific Decadal Oscillation, and anthropogenic forcing. Comparing numerical climate models to a consistent set of observations enables us to assess the performance of these models and help us to understand and predict these phenomena, and thereby alleviate some of the environmental conditions associated with them. All such studies rely on the existence of long-term consistent high-accuracy datasets of sea level. The Climate Change Initiative (CCI) of the European Space Agency was established in 2010 to provide improved time series of some ECVs, including sea level, with the purpose of providing such data openly to all to enable the widest possible utilisation of such data. Now in its second phase, the Sea Level CCI project (SL-cci) merges data from nine different altimeter missions in a clear, consistent and well-documented manner, selecting the most appropriate satellite orbits and geophysical corrections in order to further reduce the error budget. This paper summarises the corrections required, the provenance of corrections and the evaluation of options that have been adopted for the recently released v2.0 dataset (https://doi.org/10.5270/esa-sea-level-cci-1993-2015-v-2.0-201612). This information enables scientists and other users to clearly understand which corrections have been applied and their effects on the sea level dataset. The overall result of these changes is that the rate of rise of global mean sea level (GMSL) still equates to ~3.2mm yr⁻¹ during 1992-2015, but there is now greater confidence in this result as the errors associated with several of the corrections have been reduced. Compared with v1.1 of the SL-cci dataset, the new rate of change is 0.2mm yr⁻¹ less during 1993 to 2001 and 0.2mm yr⁻¹ higher during 2002 to 2014. Application of new correction models brought a reduction of altimeter crossover variances for most corrections.

General information
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Organisations: National Space Institute, Geodesy, Plymouth Marine Laboratory, Universidade do Porto, Technische Universität Munchen, National Oceanography Centre, ISSI, European Space Agency - ESA, Collecte Localisation Satellites, isardSAT, CGI
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Volume: 9
Issue number: 2
ISSN (Print): 1866-3508
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Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 7.28 SJR 4.647 SNIP 2.504
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 5.282 SNIP 2.822 CiteScore 7.07
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 4.471 SNIP 2.559 CiteScore 6.19
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
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Publication: Research - peer-review » Journal article – Annual report year: 2017
A new player in the biorefineries field: phasin PhaP enhances tolerance to solvents and boosts ethanol and 1,3-propanediol synthesis in Escherichia coli

The microbial production of biofuels and other added-value chemicals is often limited by the intrinsic toxicity of these compounds. Phasin PhaP from the soil bacterium Azotobacter sp. strain FA8 is a polyhydroxyalkanoate granule-associated protein that protects recombinant Escherichia coli against several kinds of stress. PhaP enhances growth and poly(3-hydroxybutyrate) synthesis in polymer-producing recombinant strains and reduces the formation of inclusion bodies during overproduction of heterologous proteins. In this work, the heterologous expression of this phasin in E. coli was used as a strategy to increase tolerance to several biotechnologically relevant chemicals. PhaP was observed to enhance bacterial fitness in the presence of biofuels, such as ethanol and butanol, and to other chemicals, such as 1,3-propanediol. The effect of PhaP was also studied in a groELS mutant strain, in which both GroELS and PhaP were observed to exert a beneficial effect that varied depending on the chemical tested. Lastly, the potential of PhaP and GroEL to enhance the accumulation of ethanol or 1,3-propanediol was analyzed in recombinant E. coli Strains that overexpressed either groEL or phaP had increased growth, reflected in a higher final biomass and product titer compared to the control strain. Taken together, these results add a novel application to the already multifaceted phasin protein group, suggesting that expression of these proteins or other chaperones can be used to improve biofuels and chemicals production. Importance. This work has both basic and applied aspects. Our results demonstrate that a phasin with chaperone-like properties can increase bacterial tolerance to several biochemicals, providing further evidence of the diverse properties of these proteins. Additionally, both the PhaP phasin and the well-known chaperone GroEL were used to increase the biosynthesis of the biotechnologically-relevant compounds ethanol and 1,3-propanediol in recombinant E. coli. These findings open the road for the use of these proteins for the manipulation of bacterial strains to optimize the synthesis of diverse bioproducts from renewable carbon sources.

General information
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Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Systems Environmental Microbiology, Universidad de Buenos Aires
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BFI (2017): BFI-level 2
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BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.08
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.891 SNIP 1.308 CiteScore 4.14
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.857 SNIP 1.384 CiteScore 4.02
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.899 SNIP 1.414 CiteScore 4.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.975 SNIP 1.429 CiteScore 4.29
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.914 SNIP 1.455 CiteScore 4.12
ISI indexed (2011): ISI indexed yes
A new scenario-based approach to damage detection using operational modal parameter estimates

In this paper a vibration-based damage localization and quantification method, based on natural frequencies and mode shapes, is presented. The proposed technique is inspired by a damage assessment methodology based solely on the sensitivity of mass-normalized experimental determined mode shapes. The present method differs by being based on modal data extracted by means of Operational Modal Analysis (OMA) combined with a reasonable Finite Element (FE) representation of the test structure and implemented in a scenario-based framework. Besides a review of the basic methodology this paper addresses fundamental theoretical as well as practical considerations which are crucial to the applicability of a given vibration-based damage assessment configuration. Lastly, the technique is demonstrated on an experimental test case using automated OMA. Both the numerical study as well as the experimental test case presented in this paper are restricted to perturbations concerning mass change.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Structural Engineering, Aarhus University, Universidad de Oviedo
Authors: Hansen, J. (Ekstern), Brincker, R. (Intern), López-Aenlle, M. (Ekstern), Overgaard, C. (Ekstern), Kloborg, K. (Ekstern)
Pages: 359-373
Publication date: 2017
Main Research Area: Technical/natural sciences
A new tower with good p-rank meeting Zink's bound

In this article we investigate the asymptotic p-rank of a new tower of function fields defined over cubic finite fields. Its limit meets Zink's bound, but the new feature of this tower is that its asymptotic p-rank for small cubic finite fields is much smaller than that of other cubic towers for which the asymptotic p-rank is known. This is of independent interest, but also makes this new tower more interesting for theoretical applications in cryptography.

General information
State: Published
A New Wavelet-Based ECG Delineator for the Evaluation of the Ventricular Innervation

T-wave amplitude (TWA) has been proposed as a marker of the innervation of the myocardium. Until now, TWA has been calculated manually or with poor algorithms, thus making its use not efficient in a clinical environment. We introduce a new wavelet-based algorithm for the delineation QRS complexes and T-waves, and the automatic calculation of TWA. When
validated in the MIT/BIH Arrhythmia database, the QRS detector achieved sensitivity and positive predictive value of 99.84% and 99.87%, respectively. The algorithm was validated also on the QT database and it achieved sensitivity of 99.50% for T-peak detection. In addition, the algorithm achieved delineation accuracy that is similar to the differences in delineation between expert cardiologists. We applied the algorithm for the evaluation of the influence in TWA of anticholinergic and antiadrenergic drugs (i.e., atropine and metoprolol) for healthy subjects. We found that the TWA decreased significantly with atropine and that metoprolol caused a significant increase in TWA, thus confirming the clinical hypothesis that the TWA is a marker of the innervation of the myocardium. The results of this paper show that the proposed algorithm can be used as a useful and efficient tool in clinical practice for the automatic calculation of TWA and its interpretation as a non-invasive marker of the autonomic ventricular innervation.

**General information**

State: Published
Organisations: Department of Electrical Engineering, Biomedical Engineering, Copenhagen Center for Health Technology, Copenhagen University Hospital, University of Copenhagen
Authors: Cesari, M. (Intern), Mehlsen, J. (Ekstern), Mehlsen, A. (Ekstern), Sørensen, H. B. D. (Intern)
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Main Research Area: Technical/natural sciences

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Volume: 5
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Source: PublicationPreSubmission
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Publication: Research - peer-review › Journal article – Annual report year: 2017

**An experimental analysis of flow boiling and pressure drop in a brazed plate heat exchanger for organic Rankine cycle power systems**

Organic Rankine cycle power systems for low quality waste heat recovery applications can play a major role in achieving targets of increasing industrial processes efficiency and thus reducing the emissions of greenhouse gases. Low capacity organic Rankine cycle systems are equipped with brazed plate heat exchangers which allows for efficient heat transfer with a compact design. Accurate heat transfer correlations characterizing these devices are required from the design phase to the development of model-based control strategies. In this paper, the experimental heat transfer coefficient and pressure drop during vaporization at typical temperatures for low quality waste heat recovery organic Rankine cycle systems are presented for the working fluids HFC-245fa and HFO-1233zd. The experiments were carried out at saturation temperatures of 100°C, 115°C and 130°C and inlet and outlet qualities ranging between 0.1–0.4 and 0.5–1 respectively. The experimental heat transfer coefficients and frictional pressure drop were compared with well-known correlations and new ones are developed. The results indicated weak sensitivity of the heat transfer coefficients to the saturation temperature and were characterized by similar values for the two fluids. The frictional pressure drop showed a linear dependence with mean quality and increased as the saturation temperature decreased.

**General information**

State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy, University of Liege, Institute for Product Development
Authors: Desideri, A. (Ekstern), Zhang, J. (Intern), Kærn, M. R. (Intern), Ommen, T. S. (Intern), Wronski, J. (Ekstern), Lemort, V. (Ekstern), Haglind, F. (Intern)
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.75 SJR 1.623 SNIP 2.005
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.797 SNIP 1.941 CiteScore 3.09
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.624 SNIP 2.008 CiteScore 2.97
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.868 SNIP 2.164 CiteScore 3.38
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.688 SNIP 2.17 CiteScore 2.79
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.085 SNIP 1.978 CiteScore 3.04
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.647 SNIP 2.12
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.712 SNIP 2.123
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.579 SNIP 1.957
Scopus rating (2007): SJR 1.76 SNIP 1.949
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.809 SNIP 1.962
Scopus rating (2005): SJR 1.818 SNIP 1.885
Scopus rating (2004): SJR 1.266 SNIP 1.918
Scopus rating (2003): SJR 1.492 SNIP 1.781
Scopus rating (2002): SJR 1.105 SNIP 1.974
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.546 SNIP 1.777
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.319 SNIP 1.458
Scopus rating (1999): SJR 0.835 SNIP 1.381
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Two-phase heat transfer, Boiling, Pressure drop, Organic Rankine cycle, Experimental comparison

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Source: FindIt
Source-ID: 2370668399
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An experimental investigation of heat transfer enhancement in minichannel: Combination of nanofluid and micro fin structure techniques

This work experimentally studied the single-phase heat transfer and pressure drop characteristics by using two heat transfer enhancement techniques (micro fin structure and nanofluids) in multiport minichannel flat tube (MMFT). MMFT consisted of numerous parallel rectangular minichannels and is widely used in industry as the heat transfer unit of a heat exchanger. Firstly, the enhanced heat transfer performances by individually using one enhancement technique were investigated by testing Nusselt number, friction factor and performance evaluation criterion (PEC). In this section, five MMFTs with different micro fin numbers (N = 0, 1, 2, 3 and 4) and nanofluids with three volume concentrations (φ = 0.005%, 0.01% and 0.1%) were used as test sections and working fluids respectively. Secondly, the experiments using two combined enhancement technique were performed. By using conjunctively two enhancement techniques, Nusselt number increases by up to 158% at about Re = 3600 and the maximum PEC value can reach 2.0 at Re = 5150. Finally, an optimal heat transfer scheme was proposed based on test data.

General information
State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy, Beijing University of Technology
Authors: Zhang, J. (Intern), Diao, Y. (Ekstern), Zhao, Y. (Ekstern), Zhang, Y. (Ekstern)
Pages: 21-32
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Experimental Thermal and Fluid Science
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
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Scopus rating (2016): SJR 1.398 SNIP 1.922 CiteScore 3.14
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.427 SNIP 1.847 CiteScore 2.58
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.563 SNIP 2.04 CiteScore 2.57
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.321 SNIP 2.113 CiteScore 2.63
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.144 SNIP 1.916 CiteScore 2.09
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.969 SNIP 1.79 CiteScore 1.87
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1 SNIP 1.824
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.184 SNIP 1.571
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.753 SNIP 1.166
Scopus rating (2007): SJR 0.881 SNIP 1.335
Scopus rating (2006): SJR 1.126 SNIP 1.154
Scopus rating (2005): SJR 1.28 SNIP 1.309
Scopus rating (2004): SJR 0.936 SNIP 1.338
Scopus rating (2003): SJR 0.634 SNIP 0.798
Scopus rating (2002): SJR 0.741 SNIP 0.8
An experimentally validated simulation model for a four-stage spray dryer

In this paper, we develop a dynamic model of an industrial type medium size four-stage spray dryer. The purpose of the model is to enable simulations of the spray dryer at different operating points, such that the model facilitates development and comparison of control strategies. The dryer is divided into four consecutive stages: a primary spray drying stage, two heated fluid bed stages, and a cooling fluid bed stage. Each of these stages in the model is assumed ideally mixed and the dynamics are described by mass- and energy balances. These balance equations are coupled with constitutive equations such as a thermodynamic model, the water evaporation rate, the heat transfer rates, and an equation for the stickiness of the powder (glass transition temperature). Laboratory data is used to model the equilibrium moisture content and the glass transition temperature of the powder. The resulting mathematical model is an index-1 differential algebraic equation (DAE) model with 12 states, 9 inputs, 8 disturbances, and 30 parameters. The parameters in the model are identified from well-excited experimental data obtained from the industrial type spray dryer. The simulated outputs of the model are validated using independent well-excited experimental data from the same spray dryer. The simulated temperatures, humidities, and residual moistures in the spray dryer compare well to the validation data. The model also provides the profit of operation, the production rate, the energy consumption, and the energy efficiency. In addition, it computes stickiness of the powder in different stages of the spray dryer. These facilities make the model well suited as a simulation model for comparison of the process economics associated to different control strategies.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Department of Electrical Engineering, Automation and Control, Scientific Computing, GEA Process Engineering A/S
Authors: Petersen, L. N. (Intern), Poulsen, N. K. (Intern), Niemann, H. H. (Intern), Utzen, C. (Ekstern), Jørgensen, J. B. (Intern)
Pages: 50–65
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.41 SJR 1.21 SNIP 2.241
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.338 SNIP 2.028 CiteScore 3.35
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.521 SNIP 2.735 CiteScore 3.92
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.507 SNIP 2.607 CiteScore 3.47
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.563 SNIP 2.954 CiteScore 3.39
An exploration of the potential for re-distributed manufacturing to contribute to a sustainable, resilient city

Re-distributed manufacturing (RDM), broadly described as manufacturing done at a smaller-scale and locally, could be beneficial to business and urban society through creating jobs, reducing the environmental impacts of production, and improving resilience to future disturbances. Consideration of RDM within a city-region requires the consideration of a wide range of issues—societal, technical, economic and environmental. This paper presents the results of a study into the potential for RDM to contribute to a sustainable, resilient city in the face of a range of expected future disturbances on the city and on manufacturing sectors. The study took an integrated assessment approach which incorporated the development of a conceptual framework; a ‘strawman’ causal loop diagram which was reviewed by participants in a workshop; and a stock and flow system dynamics model that represents our understanding about the structure and behaviour of urban manufacturing. Several key themes emerged: similarities between RDM and traditional manufacturing, availability of physical space for RDM to be done, achieving urban resilience through RDM by enabling responsiveness to disturbances, changes in environmental impacts from production, additions or losses in jobs, the competitiveness of local manufacturing, and skills and innovation for RDM technologies. Further work is recommended.

General information
State: Published
Organisations: Department of Mechanical Engineering, Engineering Design and Product Development, University of Manchester, University of Bristol
Authors: Freeman, R. (Ekstern), McMahon, C. A. (Intern), Godfrey, P. (Ekstern)
Pages: 260-271
Publication date: 2017
Main Research Area: Technical/natural sciences

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Volume: 10
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An expression tag toolbox for microbial production of membrane bound plant cytochromes P450

Membrane-associated Cytochromes P450 (P450s) are one of the most important enzyme families for biosynthesis of plant-derived medicinal compounds. However, the hydrophobic nature of P450s makes their use in robust cell factories a challenge. Here we explore a small library of N-terminal expression tag chimeras of the model plant P450 CYP79A1 in different Escherichia coli strains. Using a high-throughput screening platform based on C-terminal GFP fusions, we identify several highly expressing and robustly performing chimeric designs. Analysis of long-term cultures by flow cytometry showed homogeneous populations for some of the conditions. Three chimeric designs were chosen for a more complex combinatorial assembly of a multigene pathway consisting of two P450s and a redox partner. Cells expressing these recombinant enzymes catalysed the conversion of the substrate to highly different ratios of the intermediate and the final product of the pathway. Finally, the effect of a robustly performing expression tag was explored with a library of 49 different P450s from medicinal plants and nearly half of these were improved in expression by more than 2-fold. The developed toolbox serves as platform to tune P450 performance in microbial cells, thereby facilitating recombinant production of complex plant P450-derived biochemicals.

General information
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Organisations: Novo Nordisk Foundation Center for Biosustainability, CHO Cell Line Engineering and Design, National Veterinary Institute, T-cells & Cancer, Research Groups, iLoop, Microbial Evolution and Synthetic Biology, University of Copenhagen
Authors: Vazquez Albacete, D. (Intern), Cavaleiro, M. (Intern), Christensen, U. (Intern), Seppala, S. (Intern), Møller, B. L. (Ekstern), Nørholm, M. (Intern)
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Journal: Biotechnology and Bioengineering
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.14 SJR 1.411 SNIP 1.163
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.613 SNIP 1.37 CiteScore 4.44
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.589 SNIP 1.401 CiteScore 4.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.621 SNIP 1.425 CiteScore 4.44
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.639 SNIP 1.366 CiteScore 4.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.668 SNIP 1.483 CiteScore 4.08
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.538 SNIP 1.357
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.491 SNIP 1.356
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.238 SNIP 1.288
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.368 SNIP 1.362
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.458 SNIP 1.43
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.123 SNIP 1.239
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.094 SNIP 1.249
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.041 SNIP 1.228
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.197 SNIP 1.278
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.07 SNIP 1.177
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.102 SNIP 1.541
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.511 SNIP 1.567
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Relations
Projects:
An expression tag toolbox for microbial production of membrane bound plant cytochromes P450
Source: FindIt
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Publication: Research - peer-review › Journal article – Annual report year: 2016
An extracellular cell-attached pullulanase confers branched α-glucan utilization in human gut Lactobacillus acidophilus

Of the few predicted extracellular glycan-active enzymes, glycoside hydrolase family 13 subfamily 14 (GH13_14) pullulanases are the most common in human gut lactobacilli. These enzymes share a unique modular organization, not observed in other bacteria, featuring a catalytic module, two starch binding modules, a domain of unknown function, and a C-terminal surface layer association protein (SLAP) domain. Here we explore the specificity of a representative of this group of pullulanases, LaPul13_14 and its role in branched α-glucans metabolism in the well characterized Lactobacillus acidophilus NCFM that is widely used as a probiotic. Growth experiments of L. acidophilus NCFM on starch-derived branched substrates revealed preference for α-glucans with short branches of about two to three glucosyl moieties over amylopectin with longer branches. Cell-attached debranching activity was measurable in the presence of α-glucans but was repressed by glucose. The debranching activity is conferred exclusively by LaPul13_14 and is abolished in a mutant strain lacking a functional LaPul13_14 gene. Hydrolysis kinetics of recombinant LaPul13_14 confirmed the preference for short branched α-glucan oligomers consistent with the growth data. Curiously, this enzyme displayed the highest catalytic efficiency and the lowest Km reported for a pullulanase. Inhibition kinetics revealed mixed inhibition by β-cyclodextrin suggesting the presence of additional glucan binding sites besides the active site of the enzyme, which may contribute to the unprecedented substrate affinity. The enzyme also displays high thermostability and higher activity in the acidic pH range reflecting adaptation to the physiologically challenging conditions in the human gut. IMPORTANCE Starch is one of the most abundant glycans in human diet. Branched α-1,6-glucans in dietary starch and glycogen are non-degradable by human enzymes and constitute a metabolic resource for the gut microbiota. The role of health-beneficial lactobacilli prevalent in the human small intestine in starch metabolism remains unexplored in contrast to colonic bacterial residents. This study highlights the pivotal role of debranching enzymes in the break-down of starch branched α-glucan oligomers (α-limit dextrins) by human gut lactobacilli exemplified by Lactobacillus acidophilus NCFM, which is one of the best characterized strains used as probiotics. Our data bring novel insight into the metabolic preference of L. acidophilus for α-glucans with short α-1,6-branches. The unprecedented affinity of the debranching enzyme that confers growth on these substrates reflects its adaptation to the nutrient-competitive gut ecological niche and constitutes a potential advantage in cross-feeding from human and bacterial dietary starch metabolism.

General information
State: Published
Organisations: Department of Biotechnology and Biomedicine, Enzyme and Protein Chemistry, Department of Systems Biology, Protein Glycoscience and Biotechnology, Technical University of Denmark, North Carolina State University
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.08
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.891 SNIP 1.308 CiteScore 4.14
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.857 SNIP 1.384 CiteScore 4.02
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.899 SNIP 1.414 CiteScore 4.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.975 SNIP 1.429 CiteScore 4.29
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Anger expression among Danish cyclists and drivers: A comparison based on mode specific anger expression inventories

Based on the short form of the driving anger expression inventory (DAX-short, 15-item), the present study developed an adapted version of the DAX for cyclists (CAX, 14 items). The data basis was an online survey of 2000 inhabitants of Denmark. A principle component analysis on the translated DAX-short confirmed the 4-factor solution of the original study differentiating between (1) personal physical aggressive expression, (2) use of a vehicle to express anger, (3) verbal aggressive expression and (4) adaptive/constructive expression. In case of cycling, the factor "use of a vehicle to express anger" only included one item and was left out. Based on the results, reliable subscales were developed. Drivers scored higher in verbal aggressive expression than cyclists, while there was no significant difference in constructive expression. The subscales for drivers and cyclists showed significant relations to age, gender, self-reported aggressive behaviours and traffic fines: Women scored for instance lower in physical expression, while older people scored higher in constructive expression. The effect of age and gender on anger expression among drivers and cyclists remained significant when controlling for exposure and other factors in linear regression analyses. These analyses also showed a relationship between a positive attitude towards driving and higher levels of anger expression among drivers, while this was not the case for cyclists.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Transport DTU
Authors: Møller, M. (Intern), Haustein, S. (Intern)
Angler apps as a source of recreational fisheries data: opportunities, challenges and proposed standards

Recreational fisheries surveys are limited in time and place in many countries. This lack of data limits scientific understanding and sustainable management. Smartphone applications (apps) allow anglers to record the details of their fishing trips and catches. In this study, we describe the opportunities and challenges associated with angler apps as a source of recreational fisheries data, and propose minimum standards for data collection via angler apps. Angler apps are a potentially valuable source of conventional and novel data that are both frequent and extensive, and an opportunity to engage anglers through data sharing and citizen science. Realizing this potential requires that we address significant challenges related to angler recruitment and retention, data quality and bias, and integration with existing fisheries programmes. We propose solutions to each of these challenges. Given that the angler app market is diverse, competitive and unpredictable, we emphasize minimum standards for data collection as a way to ensure large and reliable data sets that can be compared and integrated across apps. These standards relate to trips and catches, and angler demographics and behaviour, and should be supported through consultation and research. Angler apps have the potential to fundamentally change how anglers interact with the resource and with management.
Anholt offshore wind farm winds investigated from satellite images

The Anholt offshore wind farm in the Kattegat Strait has its centre position around 56.6°N and 11.2°E. The Sentinel-1 satellite carries a C-band Synthetic Aperture Radar (SAR). A SAR-based instantaneous wind speed map from May 5th, 2015 at 17:01 UTC is shown below. The wind speed is low at this particular moment and the backscatter from the wind turbines is much higher than that from the sea. Therefore the wind turbines are contrasted clearly as yellow/orange dots at the Anholt wind farm. Along the Swedish coast several ships (red dots) are visible. The SAR-based wind speeds can be trusted at around 1 km distance from any coastline except in grid cells with wind turbines, ships and other hard targets. The grid resolution is 1 km by 1 km. The wind direction is from the south west.

The satellite SAR analysis is based on ~1.000 SAR images from Envisat ASAR recorded from August 2002 to April 2012, i.e. before the wind farm was constructed. Based on these data the wind resource is estimated. Concurrent Sentinel-1 SAR data and available SCADA and lidar data, kindly provided by DONG Energy and partners, for the period January 2013 to June 2015 account for ~70 images, while ~300 images are available for Sentinel-1 from July 2015 to February 2017. The Sentinel-1 wind maps are investigated for wind farm wake effects. Furthermore the results on wind resources and wakes are compared to the SCADA and model results from WRF, Park, Fuga and RANS models.

General information
State: Published
Organisations: Department of Wind Energy, Meteorology & Remote Sensing, Resource Assessment Modelling , Fluid Mechanics, Aerodynamic design
Authors: Hasager, C. B. (Intern), Badger, M. (Intern), Volker, P. (Intern), Hansen, K. S. (Intern), Pena Diaz, A. (Intern), van der Laan, P. (Intern)
Publication date: 2017
Event: WESC2017_Hasager_et_al_Anholt.pdf
Publication: Research - peer-review Conference abstract for conference – Annual report year: 2017

An image-based method for objectively assessing injection moulded plastic quality

In high volume productions based on casting processes, like high-pressure die casting (HPDC) or injection moulding, there is a wide range of variables that affect the end quality of produced parts. These variables include production parameters (temperature, pressure, mixture), and external factors (humidity, temperature, etc.). With this many variables it is a challenge to maintain a stable output quality, wherefore massive amounts of resources are spent on quality assurance (QA) of produced parts. Currently, this QA is done manually through visual inspection. We demonstrate how a multispectral imaging system can be used to automatically rate the quality of a produced part using an autocorrelation and a Fourier-based method. These methods are compared with human rankings and achieve good correlations on a variety of samples.

General information
State: Published
An Improved Direction of Gradient-type Method for Large Scale Unconstrained Optimization

In this paper, a new modification of diagonal-gradient-type method for large scale unconstrained optimization is proposed. We utilize information from the proceeding iteration and consider some corrections for the difference of iterates to improve the current Hessian approximation in diagonal form. Also, the global convergence, under mild conditions is established. Finally, we report some numerical results to show the efficiency of our proposed method.

General information
State: Accepted/In press
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Islamic Azad University
Authors: Mahboubeh, F. (Intern), Malekmohammadi, N. (Ekstern)
Number of pages: 10
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Journal of Advanced Mathematics and Applications
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Web of Science (2017): Indexed yes
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Gradient-type methods, Diagonal updating, Quasi-Newton method, Large-scale unconstrained optimization
Electronic versions: JAMA_700216_FaridM.pdf
Publication: Research - peer-review › Journal article – Annual report year: 2017

An improved electrokinetic method to consolidate porous materials
Consolidation is considered one of the major restoration treatments applied on cultural heritage. This kind of treatment is focused on to preserve the external weathered layers of stone reducing their degradation caused by external alteration agents (mainly water and soluble salts). However the consolidation using commercial products have some limitations, such as: (1) low penetrability; (2) no chemical and mineralogical affinity with the material to treat and (3) release of toxic compounds (VOCs), during the solvent evaporation. In the last years, a new consolidation method based on electrokinetic techniques was developed. This method allows filling some pores by the precipitation of an inorganic compound. As a result the method allows increasing the penetration depth of current consolidation treatments. However, this method needs to be improved since: (1) no special care is taking in controlling the pH of the solutions in contact with the porous material, which can damage it and (2) it is difficult to determine in which area the consolidation takes place. In this study an electrokinetic consolidation method, which has two steps between which the current is reversed, is proposed to solve all of these problems. The results show that the proposed treatment achieves better results in terms of penetrability and durability of current consolidation treatments, and moreover prevent that the treated material to be exposed to extreme pH values.
An Improved On-line Contingency Screening for Power System Transient Stability Assessment

This paper presents a contingency screening method and a framework for its on-line implementation. The proposed method carries out contingency screening and on-line stability assessment with respect to first-swing transient stability. For that purpose, it utilizes the single machine equivalent method and aims at improving the prior developed contingency screening approaches. In order to determine vulnerability of the system with respect to a particular contingency, only one time-domain simulation needs to be performed. An early stop criteria is proposed so that in a majority of the cases the simulation can be terminated after a few hundred milliseconds of simulated system response. The method’s outcome is an assessment of the system's stability and a classification of each considered contingency. The contingencies are categorized by exploiting parameters of an equivalent one machine infinite bus system. A novel island detection approach, appropriate for an on-line application since it utilizes efficient algorithms from graph theory and enables stability assessment of individual islands, is also introduced. The New England and New York system as well as the large-scale model of the Continental-European interconnected system are used to test the proposed method with respect to assessment accuracy and computation time.
An incremental flow theory for crystal plasticity incorporating strain gradient effects

The present work investigates a new approach to formulating a rate-independent strain gradient theory for crystal plasticity. The approach takes as offset recent discussions published in the literature for isotropic plasticity, and a key ingredient of the present work is the manner in which a gradient enhanced effective slip measure governs hardening evolution. The effect of both plastic strains and plastic strain gradients are combined into this scalar effective slip quantity, the energy associated with plastic strain is dissipative (unrecoverable), while the energy from plastic strain gradients is recoverable (free). The framework developed forms the basis of a finite element implementation and is demonstrated on benchmark problems designed to bring out effects such as strengthening and hardening. Monotonic loading and plane strain deformation is assumed throughout, but despite this, non-proportional straining is predicted in the plastic regime even under pure shear conditions. Results of single slip and symmetric double slip reveal that strengthening and hardening are governed by the slip system orientation and the material length parameter only.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: Nellemann, C. (Intern), Niordson, C. F. (Intern), Nielsen, K. L. (Intern)
Pages: 239–250
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: International Journal of Solids and Structures
Volume: 110-111
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Ratings:
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.8 SJR 1.501 SNIP 1.713
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.502 SNIP 1.917 CiteScore 2.66
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.643 SNIP 2.048 CiteScore 2.72
An Influence of Parameters of Micro-Electrical Discharge Machining On Wear of Tool Electrode

To achieve better precision of features generated using the micro-electrical discharge machining (micro-EDM), there is a necessity to minimize the wear of the tool electrode, because a change in the dimensions of the electrode is reflected directly or indirectly on the feature. This paper presents a novel modeling and analysis approach of the tool wear in micro-EDM using a systematic statistical method exemplifying the influences of capacitance, feed rate and voltage on the tool wear ratio. The association between tool wear ratio and the input factors is comprehended by using main effect plots, interaction effects and regression analysis. A maximum variation of four-fold in the tool wear ratio have been observed which indicated that the tool wear ratio varies significantly over the trials. As the capacitance increases from 1 to 10 nF, the increase in tool wear ratio is by 33%. An increase in voltage as well as capacitance would lead to an increase in the number of charged particles, the number of collisions amongst them, which further enhances the transfer of the proportion of heat energy to the tool surface. Furthermore, to model the tool wear phenomenon, a regression relationship between tool wear...
An influence of the different incoming wake-like flows on the rotor vibrations: Paper

The aim of the current investigation is the rotor vibrations generated by the disturbances caused the different types of incoming wake-like flows. Those wakes arriving at the tested rotor were created by two ways: a passive wake generator (immobile disk) and an upstream rotating rotor as an active wake generator. The influence of both wakes on the tested rotor was studied in a water flume. A model of the tested three-bladed rotor designed using Glauert’s optimum theory at an optimal tip speed ratio $\lambda = 5$ was placed in both “passive” and “active” wakes to recognize dissimilarities on the vibrations of the tested rotor. The distance from the wake generators to the tested rotor was varied from 4 to 8 rotor diameters. Also, the shift between the rotor axis and axis of the incoming wakes was changed to 0, 0.5 and 1 rotor diameters. The flow condition before rotor was measured with high temporal accuracy using LDA. The turbulent intensity of the incoming wake flows changed from 3 to 16% due to the types of the wake generators. Power and thrust characteristics and their pulsations of the tested rotor were measured by strain gauges. The dependences of power coefficients from tip speed ratios and positions of the wake generators were documented. The present study showed a strong influence of the initial flow from the two different wake generators on the rotor vibrations.

An Integrated Framework for Life Cycle Engineering

Life Cycle Engineering (LCE) was introduced as a concept more than 24 years ago in order to address emerging concerns about environmental sustainability in engineering. A number of methods and tools have been introduced to operationalise...
the LCE concept, but since then, the scope of sustainability has broadened, and as a result, LCE has evolved in parallel with other disciplines with similar aims. Currently, in addition to LCE, there exist a number of concepts such as Industrial Ecology, Cleaner Production, Life Cycle Management (LCM), Industrial Symbiosis, and Circular Economy. As a result, orientation becomes challenging and a framework to integrate them is required. The paper aims to introduce an integrated framework for LCE defining the concept and its boundaries, and it argues for the need to reorientate LCE towards the environmental dimension of sustainability. Through an integrated top-down and bottom-up approach, the framework establishes a relationship between LCE and the other concepts and positions them relative to the planetary boundaries and the concept of absolute environmental sustainability. (C) 2017 The Authors. Published by Elsevier B.V.

General information
State: Published
Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, Technische Universität Braunschweig, University of New South Wales
Authors: Hauschild, M. Z. (Intern), Herrmann, C. (Ekstern), Kara, S. (Ekstern)
Number of pages: 8
Pages: 2-9
Publication date: 2017
Conference: 24th CIRP Conference on Life Cycle Engineering, Kamakura, Japan, 08/03/2017 - 08/03/2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Procedia CIRP
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Scopus rating (2015): SJR 0.572 SNIP 1.012
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ISI indexed (2013): ISI indexed no
Original language: English
Life Cycle Engineering, Absolute sustainability, Planetary boundaries, Integrated framework
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Source: FindIt
Source-ID: 2357820189
Publication: Research - peer-review › Journal article – Annual report year: 2017

An Integrated Research Infrastructure for Validating Cyber-Physical Energy Systems
Renewables are key enablers in the plight to reduce greenhouse gas emissions and cope with anthropogenic global warming. The intermittent nature and limited storage capabilities of renewables culminate in new challenges that power system operators have to deal with in order to regulate power quality and ensure security of supply. At the same time, the increased availability of advanced automation and communication technologies provides new opportunities for the derivation of intelligent solutions to tackle the challenges. Previous work has shown various new methods of operating highly interconnected power grids, and their corresponding components, in a more effective way. As a consequence of these developments, the traditional power system is being transformed into a cyber-physical energy system, a smart grid. Previous and ongoing research have tended to mainly focus on how specific aspects of smart grids can be validated, but until there exists no integrated approach for the analysis and evaluation of complex cyber-physical systems configurations. This paper introduces integrated research infrastructure that provides methods and tools for validating smart grid systems in a holistic, cyber-physical manner. The corresponding concepts are currently being developed further in the European project ERIGrid.

General information
State: Published
Organisations: Department of Electrical Engineering, Automation and Control, Center for Electric Power and Energy, Energy system operation and management, Austrian Institute of Technology, Ricerca sul Sistema Energetico, European Distributed Energy Resources Laboratories (DERlab) e.V, DNV-GL Oil & Gas, Hamburg University of Applied Sciences,
An integrated workflow for stress and flow modelling using outcrop-derived discrete fracture networks

Fluid flow in naturally fractured reservoirs is often controlled by subseismic-scale fracture networks. Although the fracture network can be partly sampled in the direct vicinity of wells, the inter-well scale network is poorly constrained in fractured reservoir models. Outcrop analogues can provide data for populating domains of the reservoir model where no direct measurements are available. However, extracting relevant statistics from large outcrops representative of inter-well scale fracture networks remains challenging. Recent advances in outcrop imaging provide high-resolution datasets that can cover areas of several hundred by several hundred meters, i.e. the domain between adjacent wells, but even then, data from the high-resolution models is often upscaled to reservoir flow grids, resulting in loss of accuracy. We present a workflow that uses photorealistic georeferenced outcrop models to construct geomechanical and fluid flow models containing thousands of discrete fractures covering sufficiently large areas, that does not require upscaling to model permeability. This workflow seamlessly integrates geomechanical Finite Element models with flow models that take into account stress-sensitive fracture permeability and matrix flow to determine the full permeability tensor. The applicability of this workflow is illustrated using an outcropping carbonate pavement in the Potiguar basin in Brazil, from which 1082 fractures are digitised. The permeability tensor for a range of matrix permeabilities shows that conventional upscaling to effective grid properties leads to potential underestimation of the true permeability and the orientation of principal permeabilities. The presented workflow yields the full permeability tensor model of discrete fracture networks with stress-induced apertures, instead of relying on effective properties as most conventional flow models do.

General information
State: Published
Organisations: Centre for oil and gas – DTU, Delft University of Technology
Authors: Bisdom, K. (Ekstern), Nick, H. (Intern), Bertotti, G. (Ekstern)
Number of pages: 15
Pages: 21-35
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Computers & Geosciences
Volume: 103
ISSN (Print): 0098-3004
Ratings:
BFI (2017): BFI-level 1
An Investigation of Methods for CT Synthesis in MR-only Radiotherapy

In recent years, the interest in using magnetic resonance (MR) imaging in radiotherapy (RT) has increased. This is because MR has a superior soft tissue contrast compared to computed tomography (CT), which makes it a better modality for delineating the target volume (tumor) and possible organs at risk (OARs). In an MR/CT work-flow, independent MR and CT scans are acquired. The target and possible OARs are delineated on the MR and then transferred to CT by aligning the data using a registration. This introduces the risk of systematic registration errors especially in non-rigid body structures, the consequence being a systematic miss of target or increased dose to healthy tissue.

Radiotherapy based on MR as the only modality removes this uncertainty and simplifies the clinical work-flow. However,
the information on electron density which is usually contained in the CT must now be derived from the MR. A way to achieve this is to computationally estimate a so-called synthetic CT (sCT) from the MR data, which can then act as a substitute for the CT. This is a challenging task, since no unique relationship between MR and electron density exists.

The goal of this thesis is to develop and investigate the right combination of MR acquisition protocols and computational models for accurate MR-based CT synthesis for use in RT. We investigate different categories of methods for CT synthesis and validate them using clinically relevant quality measures. Specifically, we implement a patch-based multi-atlas method in the brain, which compares favorably to state-of-the-art methods. In our next effort, we substantially improve the speed of the method and apply it in the pelvis, again with promising results. Our final contribution is a voxel-based method, which is developed to be registration-free and broadly applicable. In initial results, the performance of this method is close to the patch-based.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Authors: Andreasen, D. (Intern), Van Leemput, K. (Intern)
Number of pages: 72
Publication date: 2017

Publication information
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Electronic versions: phd428_Andreasen_D.pdf

Relations
Projects:
An Investigation of Methods for CT Synthesis in MR-only Radiotherapy
Publication: Research › Ph.D. thesis – Annual report year: 2017

Anionic Extraction for Efficient Recovery of Biobased 2,3-Butanediol-A Platform for Bulk and Fine Chemicals
2,3-Butanediol (BDO) presents a promising platform molecule for the synthesis of basic and fine chemicals. Biotechnological production of BDO from renewable resources with living microbes enables high concentrations in the fermentation broth. The recovery of high-boiling BDO from an aqueous fermentation broth presents a subsequent challenge. A method is proposed for BDO isolation based on reversible complexation with phenylboronate in an anionic complex. BDO can be recovered by back-extraction into an acidic solution. The composition of the extracted species was determined by NMR spectroscopy, MS, and GC-MS methods. The conditions of extraction and back-extraction were optimized by using commercial BDO and finally applied to different fermentation broths. Up to 72-93 % BDO can be extracted and up to 80-90 % can be back-extracted under the optimized conditions. Purified bio-BDO was used in the presence of sulfuric acid for the synthesis of methyl ethyl ketone, an established organic solvent and discussed tailor-made biofuel.

General information
State: Accepted/In press
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Applied Metabolic Engineering, RWTH Aachen University
Authors: Drabo, P. (Ekstern), Tiso, T. (Ekstern), Heyman, B. (Ekstern), Sarikaya, E. (Ekstern), Gaspar, P. (Intern), Förster, J. (Intern), Büchs, J. (Ekstern), Blank, L. M. (Ekstern), Delidovich, I. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: ChemSusChem (Print)
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Anisotropic enhancement of Yb3+ luminescence by disordered plasmonic networks self-assembled on RbTiOPO4 ferroelectric crystals

Increasing Yb3+ absorption efficiency is currently desired in a number of applications including bio-imaging, photovoltaics, near infrared driven photocatalysis or ultra-short pulsed solid-state lasers. In this work, silver nanoparticles, which are connected forming disordered networks, have been self-assembled on Yb3+ doped RbTiOPO4 crystals to produce a remarkable enhancement of Yb3+ absorption, and hence in the photoluminescence of this ion. The results are interpreted taking into account the near-field response of the plasmonic networks, which display strong amplification of the electric field at the maximum of Yb3+ excitation at around 900 nm, together with the anisotropic character of the Yb3+ transitions in RbTiOPO4. We show that in the near field regime, the scattering of the plasmonic networks produces additional polarization field components to those of the incident field, which allows access to the largest transition dipolar moment of Yb3+ ions in RbTiOPO4. As a result, a much more efficient route for Yb3+ excitation takes place at the immediacy of the plasmonic networks. This work provides fundamental insights for improving the optical properties of rare earth ions by the suitable design of metallic nanoparticle arrangements, and constitutes a promising step towards the development of new multifunctional solid-state lasers.

General information
State: E-pub ahead of print
Organisations: Department of Photonics Engineering, Structured Electromagnetic Materials, Universidad Autonoma de Madrid, Universitat Rovira i Virgili
Anisotropic Proton and Oxygen Ion Conductivity in Epitaxial Ba₂In₂O₅ Thin Films

Solid oxide oxygen ion and proton conductors are a highly important class of materials for renewable energy conversion devices like solid oxide fuel cells. Ba₂In₂O₅ (BIO) exhibits both oxygen ion and proton conduction, in a dry and humid environment, respectively. In a dry environment, the brownmillerite crystal structure of BIO exhibits an ordered oxygen ion sublattice, which has been speculated to result in anisotropic oxygen ion conduction. The hydrated structure of BIO, however, resembles a perovskite and the protons in it were predicted to be ordered in layers. To complement the significant theoretical and experimental efforts recently reported on the potentially anisotropic conductive properties in BIO, we measure here both the proton and oxygen ion conductivity along different crystallographic directions. Using epitaxial thin films with different crystallographic orientations, the charge transport for both charge carriers is shown to be anisotropic. The anisotropy of the oxygen ion conduction can indeed be explained by the layered structure of the oxygen sublattice of BIO. The anisotropic proton conduction, however, further supports the suggested ordering of the protonic defects in the material. The differences in proton conduction along different crystallographic directions attributed to proton ordering in BIO are of a similar extent as those observed along different crystallographic directions in materials where proton ordering is not present but where protons find preferential conduction pathways through chainlike or layered structures.
An MFA-based optimization model for increased resource efficiency: Phosphorus flows in Denmark

Phosphorus (P) is present in large amounts in agricultural residues and organic wastes from human consumption, from which it can be recovered as fertiliser, reducing dependence on primary P. Crucial for a secondary resource is its ability to fulfil the functions of the resource intended to be substituted. This quality of secondary resources is not captured well by material flow analysis (MFA). A static MFA of the Danish anthropogenic P cycle was adapted for optimization via linear programming to minimize primary P imports. The MFA system was adapted to reflect typical nutrient availability from various secondary-P fertilisers, to allow for exchange of secondary-P fertilisers between regions (sewage sludge incineration ash and composted organic household waste), and to reflect the system’s development over 3 annual time steps. Since P accumulating in agricultural soil gradually becomes available for plants over time, the outcome showed both a gradual decline of mineral P fertiliser inputs and net additions to soil P stocks stabilising at distinctly lower levels than evident from the static MFA. The optimization model's outcome, accounting for the dynamic aspects of transport and P availability to crops over time, suggests a substitution potential of over 80% (9.8 Gg primary P) by P recovered from sewage sludge and household biowaste, compared to 35% in the static MFA.

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, ETH Zürich
Authors: Klinglmair, M. (Intern), Vadenbo, C. (Ekstern), Astrup, T. F. (Intern), Scheutz, C. (Intern)
Number of pages: 10
Pages: 1-10
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Main Research Area: Technical/natural sciences
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Journal: Resources, Conservation and Recycling
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.16 SNIP 1.709 CiteScore 3.73
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.275 SNIP 1.915 CiteScore 3.98
Annual measured and simulated thermal performance analysis of a hybrid solar district heating plant with flat plate collectors and parabolic trough collectors in series

Flat plate collectors have relatively low efficiency at the typical supply temperatures of district heating networks (70–95 °C). Parabolic trough collectors retain their high efficiency at these temperatures. To maximize the advantages of flat plate collectors and parabolic trough collectors in large solar heating plants for a district heating network, a hybrid solar collector field with 5960 m² flat plate collectors and 4039 m² parabolic trough collectors in series was constructed in Taars, Denmark. The design principle is that the flat plate collectors preheat the return water from the district heating network to about 70 °C and then the parabolic trough collectors would heat the preheated water to the required supply temperature of the district heating network. Annual measured and simulated thermal performances of both the parabolic trough collector field and the flat plate collector field are presented in this paper. The thermal performance of both collector fields with weather data of a Design Reference Year was simulated to have a whole understanding of the application of both collectors under Danish climate conditions as well. These results not only can provide a design basis for this type of hybrid solar district heating plants with flat plate collectors and parabolic trough collectors in the Nordic region, but also introduce a novel design concept of solar district heating plants to other high solar radiation areas.
Annual Report on Zoonoses in Denmark 2016

General information
State: Published
Organisations: National Food Institute, Division of Risk Assessment and Nutrition, Statens Serum Institut
Authors: Helwigh, B. (Intern), Christensen, J. (Intern), Müller, L. (Ekstern)
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Annual Report on Zoonoses in Denmark (Journal)
Publication: Research › Report – Annual report year: 2017

Annual variations in GPS-measured vertical displacements near Upernavik Isstrøm (Greenland) and contributions from surface mass loading: Annual GPS Verticals in Greenland

In response to present-day ice mass loss on and near the Greenland Ice Sheet, steady crustal uplifts have been observed from the network of Global Positioning System (GPS) stations mounted on bedrock. In addition to the secular uplift trends, the GPS time series also show prominent annual variability. Here we examine the annual changes of the vertical displacements measured at two GPS stations (SRMP and UPVK) near Upernavik Isstrøm in western Greenland. We model elastic loading displacements due to various surface mass loading including three non-ice components: atmospheric pressure, ocean bottom pressure, continental water storage, and one ice component, i.e., surface mass balance (SMB). We find that the contribution from atmospheric pressure changes can explain 46% and 78% of the annual amplitude observed in the GPS verticals at SRMP and UPVK, respectively. We also show that removing the predicted loading displacements due to SMB adversely increases the annual variance of the GPS residuals. However, using the GPS data alone, we cannot identify the exact cause(s) of this discrepancy because the annual loading displacements are sensitive to the SMB changes from over 85% of the ice sheet area. Alternatively, by differencing vertical displacements between the two stations, we find a good agreement between the modeled differential SMB loading displacements and the GPS residuals after removing non-ice components. Our study highlights the necessity of correcting for non-ice loading contributions in the GPS measurements of crustal deformation to infer ice mass changes in Greenland at annual periods.

General information
State: Published
Organisations: National Space Institute, Geodesy, Chinese University of Hong Kong, University of Luxembourg, Ohio State University
Authors: Liu, L. (Ekstern), Khan, S. A. (Intern), van Dam, T. (Ekstern), Ma, J. H. Y. (Ekstern), Bevis, M. (Ekstern)
Pages: 677–691
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Main Research Area: Technical/natural sciences

Publication information
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Volume: 122
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<td>2017</td>
<td>BFI-level 2</td>
<td>SJR 2.288 SNIP 1.362 CiteScore 3.39</td>
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<td>SJR 2.324 SNIP 1.349 CiteScore 3.27</td>
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<td>BFI-level 2</td>
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<td>BFI-level 2</td>
<td>SJR 2.365 SNIP 1.35 CiteScore 2.93</td>
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<td>BFI-level 2</td>
<td>SJR 2.239 SNIP 1.301 CiteScore 3.03</td>
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<td>2012</td>
<td>BFI-level 2</td>
<td>SJR 2.449 SNIP 1.324</td>
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<td>BFI-level 2</td>
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<td>2000</td>
<td>BFI-level 2</td>
<td>SJR 2.229 SNIP 1.455</td>
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Original language: English

Electronic versions:

Annual_variations_in_GPS_measured_vertical_displacements_near_Upernavik_Isstr_m.pdf. Embargo ended: 27/01/2017
An optical flow-based state-space model of the vocal folds

High-speed movies of the vocal fold vibration are valuable data to reveal vocal fold features for voice pathology diagnosis. This work presents a suitable Bayesian model and a purely theoretical discussion for further development of a framework for continuum biomechanical features estimation. A linear and Gaussian nonstationary state-space model is proposed and thoroughly discussed. The evolution model is based on a self-sustained three-dimensional finite element model of the vocal folds, and the observation model involves a dense optical flow algorithm. The results show that the method is able to capture different deformation patterns between the computed optical flow and the finite element deformation, controlled by the choice of the model tissue parameters.
A note on circulatory systems: Old and new results: Circulatory systems

It is astonishing that after more than half a century intensive research in the area of non-conservative systems of second order differential equations still new interesting results appear, see [4]. In that paper an old stability criterion by Metelitsyn [8] and Frik [9] was reinvented. We shortly repeat this result in order to emphasize that the criterion is sufficient but not necessary for stability. Afterwards we concentrate on circulatory systems with purely imaginary eigenvalues and investigate the influence of indefinite damping. Finally the possibility of stabilizing circulatory systems by gyroscopic forces will be commented. Examples will demonstrate the developed theory.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science
Authors: Kliem, W. (Intern), Pommer, C. (Intern)
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.586 SNIP 1.147 CiteScore 1.06
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.597 SNIP 1.167 CiteScore 1.01
A note on identification in discrete choice models with partial observability

**General information**
State: Published
Organisations: Department of Management Engineering, Systems Analysis, Transport DTU
Authors: Ranjan, A. (Intern), Fosgerau, M. (Intern)
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**Publication information**
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Links:
https://www.researchgate.net/publication/313656112
Main Research Area: Technical/natural sciences
Source: PublicationPreSubmission
Source-ID: 130448874
Publication: Research › Working paper – Annual report year: 2017

Another paradigm lost? Autumn downstream migration of juvenile brown trout: Evidence for a presmolt migration
A novel 3D skin explant model to study anaerobic bacterial infection

Skin infection studies are often limited by financial and ethical constraints, and alternatives, such as monolayer cell culture, do not reflect many cellular processes limiting their application. For a more functional replacement, 3D skin culture models offer many advantages such as the maintenance of the tissue structure and the cell types present in the host environment. A 3D skin culture model can be set up using tissues acquired from surgical procedures or post slaughter, making it a cost effective and attractive alternative to animal experimentation. The majority of 3D culture models have been established for aerobic pathogens, but currently there are no models for anaerobic skin infections. Footrot is an anaerobic bacterial infection which affects the ovine interdigital skin causing a substantial animal welfare and financial impact worldwide. *Dichelobacter nodosus* is a Gram-negative anaerobic bacterium and the causative agent of footrot. The mechanism of infection and host immune response to *D. nodosus* is poorly understood. Here we present a novel 3D skin *ex vivo* model to study anaerobic bacterial infections using ovine skin explants infected with *D. nodosus*. Our results demonstrate that *D. nodosus* can invade the skin explant, and that altered expression of key inflammatory markers could be quantified in the culture media. The viability of explants was assessed by tissue integrity (histopathological features) and cell death (DNA fragmentation) over 76 h showing the model was stable for 28 h. *D. nodosus* was quantified in all infected skin explants by qPCR and the bacterium was visualized invading the epidermis by Fluorescent in situ Hybridization. Measurement of pro-inflammatory cytokines/chemokines in the culture media revealed that the explants released IL-1β in response to bacteria. In contrast, levels of CXCL8 production were no different to mock-infected explants. The 3D skin model realistically simulates the interdigital skin and has demonstrated that *D. nodosus* invades the skin and triggered an early cellular inflammatory response to this bacterium. This novel model is the first of its kind for investigating an anaerobic bacterial infection.
A novel archaeal species belonging to Methanoculleus genus identified via de-novo assembly and metagenomic binning process in biogas reactors

Recently, a first comprehensive catalogue of microbial genomes populating biogas reactors treating manure and agro-industrial residues was determined by sequencing samples collected from 22 biogas reactors including laboratory and full scale. Among the archaeal community, one of the most abundant methanogens belongs to Methanoculleus genus and for this reason it was provisionally named Methanoculleus sp. DTU006. Its full length 16S rRNA sequence is 97% similar to Methanoculleus marisnigri JR1 and to Methanoculleus palmoeli DSM 4273. Despite the high similarity of the 16S gene sequence, Average Nucleotide Identity calculation (ANI) calculated on all protein encoding genes indicated that the two most similar species, Methanoculleus bourgensis MS2T and Methanoculleus sp. MAB1, are divergent enough to define Methanoculleus sp. DTU006 as a new archaeal species. Its genome (2.15 Mbp) has an estimated completeness around 93%. Analysis of the metabolic pathways using KEGG confirmed that it is a hydrogenotrophic methanogen and therefore it is proposed the Candidatus status by naming it as "Candidatus Methanoculleus thermohydrogenotrophicum".
A novel biomarker of laminin turnover is associated with mortality and disease progression in chronic kidney disease

INTRODUCTION AND AIMS: Patients with chronic kidney disease (CKD) have increased risk of progressing to end-stage renal disease (ESRD) and a high mortality rate. One of the major underlying causes of progression of renal failure is renal fibrosis, which is caused by dysregulated extracellular matrix (ECM) remodeling. The laminin γ1 (LAMC1) chain is a constituent of the laminin types present in the glomerular basement membrane (GBM), and its turnover may be altered in CKD. Fragments of LAMC1 could quantify GBM turnover in human CKD and reflect pathological tissue changes. We developed an immunoassay targeting LG1M, a neo-epitope of LAMC1 generated by matrix metalloproteinases (MMPs). We then measured LG1M levels in serum and urine from a large prospective cohort of patients with high-risk CKD.
A novel Dual Amylin and Calcitonin Receptor Agonist (DACRA), KBP-089, induces weight loss through a reduction in fat, but not lean mass, while improving food preference

Background and Purpose
Obesity and associated co-morbidities, such as type 2 diabetes and non-alcoholic fatty liver disease, are major health challenges – hence, development of weight loss therapies with the ability to reduce the co-morbidities is key.

Experimental Approach
The effect of the dual amylin and calcitonin receptor agonist (DACRA), KBP-089, on bodyweight, glucose homeostasis, and fatty acid accumulation in liver and muscle tissue, food preference was investigated. Further, we elucidate weight-independent effects of KBP-089 using a weight-matched group.

Key Results
High fat diet fed rats were treated with KBP-089 s.c., at 0.625, 1.25, 2.5 µg·kg⁻¹ and vehicle resulting in a dose-dependent and sustained ~17% weight loss by the 2.5 µg·kg⁻¹ (p < 0.001). Moreover, KBP-089 reduced fat depot size and reduced lipid accumulation in muscle and liver.

In Zucker Diabetic Fatty rats, KBP-089 improved glucose homeostasis through improved insulin action.

To obtain a weight-matched group, significantly less food was offered (9% less than in the KBP-089 group). Weight-matching led to improved glucose homeostasis through lowered plasma insulin; however, these were inferior to the effect of KBP-089.

In the food preference test, normal diet rats obtained 74% of their calories from chocolate. KBP-089 administration reduced total caloric intake, and induced a relative increase in chow consumption while drastically lowering the chocolate compared to vehicle.

Conclusion
The novel DACRA, KBP-089 induces a sustained weight loss, leading to improved metabolic parameters including food preference, and these are beyond those observed simply by diet-induced weight loss.
A novel fuzzy-logic control strategy minimizing N2O emissions

A novel control strategy for achieving low N2O emissions and low effluent NH4+ concentration is here proposed. The control strategy uses the measurements of ammonium and nitrate concentrations in inlet and outlet of the aerobic zone of a wastewater treatment plant to calculate a ratio indicating the balance among the microbial groups. More specifically, the ratio will indicate if there is a complete nitrification. In case nitrification is not complete, the controller will adjust the aeration level of the plant in order to inhibit the production of N2O from AOB and HB denitrification. The controller was implemented using the fuzzy logic approach. It was comprehensively tested for different model structures and different sets of model parameters with regards to its ability of mitigating N2O emissions for future applications in real wastewater treatment plants. It is concluded that the control strategy is useful for those plants having AOB denitrification as the main N2O producing process. However, in treatment plants having incomplete NH2OH oxidation as the main N2O producing process, the strategy may not be as effective.
pathway, a cascade controller configuration adapting the oxygen supply to respect only the effluent ammonium concentration limits was found to be more effective to ensure low N₂O emissions.
A novel genetic tool for metabolic optimization of Corynebacterium glutamicum: efficient and repetitive chromosomal integration of synthetic promoter-driven expression libraries

Fine-tuning the expression level of multiple genes is usually pivotal for metabolic optimization. We have developed a tool for this purpose for the important industrial workhorse Corynebacterium glutamicum that allows for the introduction of synthetic promoter-driven expression libraries of arbitrary genes. We first devised a method for introducing genetic elements into the chromosome repeatedly, relying on site-specific recombinases and the vector pJS31 serving as the carrier. The pJS31 vector contains a synthetic cassette including a phage attachment site attP for integration, a bacterial attachment site attB for subsequent integration, a multiple cloning site, and two modified loxP sites to facilitate easy removal of undesirable vector elements. Meanwhile, we constructed a derivative of the wild-type strain ATCC 13032 carrying an attB site in its chromosome (JS34) and demonstrated that pJS31 readily could integrate into the attB site in this strain providing expression of the corresponding integrase. Subsequent expression of the Cre recombinase promoted recombination between the modified loxP sites, resulting in a strain only retaining the target insertions and an attB site. To simplify the procedure, non-replicating circular expression units for the phage integrase and the Cre recombinase were used. As a showcase, we used the tool to construct a battery of strains simultaneously expressing the two reporter genes, lacZ (encoding β-galactosidase) and gusA (encoding β-glucuronidase), to arbitrary levels. In principle, an unlimited number of genes, whether native, heterologous, or synthetic, can be introduced using the developed approach, and this should greatly facilitate metabolic optimization of this important platform organism.

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Biotechnology and Biorefining
Authors: Shen, J. (Intern), Chen, J. (Intern), Jensen, P. R. (Intern), Solem, C. (Intern)
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.57 SJR 1.177 SNIP 1.173
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
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Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.327 SNIP 1.458 CiteScore 3.71
Web of Science (2014): Indexed yes
A novel in situ measurement method of bubble sizes in bioreactors using a high speed camera

Mass transfer of oxygen from the gas phase to the liquid phase is the rate limiting phenomenon in many industrial aerobic fermentation processes. This phenomenon is often described by the rate constant \( k_{La} \), which remains a key performance indicator for scale up and general operation of fermentation processes. The attributing variables to the rate constant, the mass transfer resistance \( k_L \) and interfacial surface area \( a \), are however very rarely individually identifiable from standard experimental analysis. This co-dependency of the variables on the rate constant limits the understanding of how process conditions affect the mass transfer rate, and hence a tool for identifying them individually is required. Available correlations for these variables are predominantly system dependent and therefore not necessarily valid in the process of interest.

Currently available measurement techniques to identify bubble size require knowledge or assumptions regarding the gas flow direction to deduce the bubble size. An optical method for determining the interfacial surface area, based on bubble size identification has been developed.
using a high speed camera and an endoscope. This novel method has been applied to bioreactors at different conditions in terms of power input, gas flow rate and viscosity. This in situ measurement illustrates the effect of process conditions on the size of the bubbles. The information on bubble sizes at different conditions is a valuable input to mechanistic models regarding gas-liquid mass transfer, for example computational fluid dynamics (CFD) models, in which the bubble size is a key input parameter.

**General information**
State: Published
Organisations: Department of Chemical and Biochemical Engineering, PROSYS - Process and Systems Engineering Centre, Novozymes A/S
Authors: Bach, C. (Intern), Albæk, M. O. (Ekstern), Krühne, U. (Intern), Gernaey, K. V. (Intern)
Number of pages: 1
Publication date: 2017
Event: Abstract from International Symposium on Mixing in Industrial Processes IX, Birmingham, United Kingdom.
Main Research Area: Technical/natural sciences

Electronic versions:
ISMIP_Abstract_ChristianBach.pdf
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

**A Novel Method for Detecting and Computing Univolatility Curves in Ternary Mixtures**

**General information**
State: Accepted/In press
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Universite Toulouse III - Paul Sabatier, CNRS
Authors: Shcherbakov, N. (Ekstern), Rodriguez-Donis, I. (Intern), Abildskov, J. (Intern), Gerbaud, V. (Ekstern)
Number of pages: 34
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Chemical Engineering Science
ISSN (Print): 0009-2509
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.05 SJR 1.037 SNIP 1.442
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.038 SNIP 1.606 CiteScore 2.96
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.115 SNIP 1.642 CiteScore 2.81
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BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.157 SNIP 1.866 CiteScore 2.95
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Web of Science (2013): Indexed yes
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Scopus rating (2012): SJR 1.189 SNIP 1.847 CiteScore 2.77
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Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.205 SNIP 1.685 CiteScore 2.8
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Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.319 SNIP 1.708
A novel model-based control strategy for aerobic filamentous fungal fed-batch fermentation processes
A novel model-based control strategy has been developed for filamentous fungal fed-batch fermentation processes. The system of interest is a pilot scale (550L) filamentous fungus process operating at Novozymes A/S. In such processes, it is desirable to maximize the total product achieved in a batch in a defined process time. In order to achieve this goal, it is important to maximize both the product concentration, and also the total final mass in the fed-batch system. To this end, we describe the development of a control strategy which aims to achieve maximum tank fill, while avoiding oxygen limited conditions. This requires a two stage approach: (i) calculation of the tank start fill; and (ii) on-line control in order to maximize fill subject to oxygen transfer limitations. First, a mechanistic model was applied off-line in order to determine the appropriate start fill for processes with four different sets of process operating conditions for the stirrer speed, headspace pressure, and aeration rate. The start fills were tested with eight pilot scale experiments using a reference process operation. An on-line control strategy was then developed, utilizing the mechanistic model which is recursively updated using on-line measurements. The model was applied in order to predict the current system states, including the biomass concentration, and to simulate the expected future trajectory of the system until a specified end time. In this way, the desired feed rate is updated along the progress of the batch taking into account the oxygen mass transfer conditions and the expected future trajectory of the mass. The final results show that the target fill was achieved to within 5% under the maximum fill when tested using eight pilot scale batches, and over filling was avoided. The results were reproducible, unlike the reference experiments which show over 10% variation in the final tank fill, and this also includes over filling. The variance of the final tank fill is reduced by over 74%, meaning that it is possible to target the final maximum fill reproducibly. The product concentration achieved at a given set of process conditions was unaffected by the control strategy. Biotechnol. Bioeng. 2017;9999: 1–10. © 2017 Wiley Periodicals, Inc.
Journal: Biotechnology and Bioengineering (Print)
ISSN (Print): 0006-3592
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.14 SJR 1.411 SNIP 1.163
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.613 SNIP 1.37 CiteScore 4.44
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.589 SNIP 1.401 CiteScore 4.16
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.621 SNIP 1.425 CiteScore 4.44
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.639 SNIP 1.366 CiteScore 4.04
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.668 SNIP 1.483 CiteScore 4.08
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.538 SNIP 1.357
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.491 SNIP 1.356
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.238 SNIP 1.288
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.368 SNIP 1.362
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.458 SNIP 1.43
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.123 SNIP 1.239
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.094 SNIP 1.249
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.041 SNIP 1.228
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.197 SNIP 1.278
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.07 SNIP 1.177
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.102 SNIP 1.541
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.511 SNIP 1.567
Original language: English
Fermentation, Control, Modelling, Process optimization, Model-based control
A Novel Model on DST-Induced Transplantation Tolerance by the Transfer of Self-Specific Donor tTregs to a Haplotype-Matched Organ Recipient

Donor-specific blood transfusion (DST) can lead to significant prolongation of allograft survival in experimental animal models and sometimes human recipients of solid organs. The mechanisms responsible for the beneficial effect on graft survival have been a topic of research and debate for decades and are not yet fully elucidated. Once we discover how the details of the mechanisms involved are linked, we could be within reach of a procedure making it possible to establish donor-specific tolerance with minimal or no immunosuppressive medication. Today, it is well established that CD4+Foxp3+ regulatory T cells (Tregs) are indispensable for maintaining immunological self-tolerance. A large number of animal studies have also shown that Tregs are essential for establishing and maintaining transplantation tolerance. In this paper, we present a hypothesis of one H2-haplotype-matched DST-induced transplantation tolerance (in mice). The formulated hypothesis is based on a re-interpretation of data from an immunogenetic experiment published by Niimi and colleagues in 2000. It is of importance that the naive recipient mice in this study were never immunosuppressed and were therefore fully immune competent during the course of tolerance induction. Based on the immunological status of the recipients, we suggest that one H2-haplotype-matched self-specific Tregs derived from the transfusion blood can be activated and multiply in the host by binding to antigen-presenting cells presenting allopeptides in their major histocompatibility complex (MHC) class II (MHC-II). We also suggest that the endothelial and epithelial cells within the solid organ allograft upregulate the expression of MHC-II and attract the expanded Treg population to suppress inflammation within the graft. We further suggest that this biological process, here termed MHC-II recruitment, is a vital survival mechanism for organs (or the organism in general) when attacked by an immune system.

General information
State: Published
Organisations: Department of Chemistry, University of Copenhagen
Authors: Gregoriussen, A. M. M. (Ekstern), Bohr, H. G. (Intern)
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 5.37 SJR 2.963 SNIP 1.483
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Scopus rating (2015): SJR 2.818 SNIP 1.29 CiteScore 5.09
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 2.382 SNIP 1.056 CiteScore 4.24
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 1.842 SNIP 0.837 CiteScore 3.55
ISI indexed (2013): ISI indexed no
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ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.121
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Original language: English
Tregs, indirect alloantigen presentation, direct alloantigen presentation, MHC-II recruitment, DST, transplantation tolerance, haplotype-matched, self-tolerance

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Source: FindIt
Source-ID: 2355443822
Publication: Research - peer-review › Journal article – Annual report year: 2017
A novel porcine model of implant associated osteomyelitis: a comprehensive analysis of local, regional and systemic response

Pigs are favorable experimental animals for infectious diseases in humans. However, implant associated osteomyelitis (IAO) models in pigs have only been evaluated using high-inoculum infection (>10^8 CFU) models in 1975 and 1993. Therefore, the aim of this paper was to present a new low inoculum porcine model of human IAO based on 42 experimental pigs. The model was created by drilling an implant cavity in the tibial bone followed by insertion of a small steel implant and simultaneous inoculation of Staphylococcus aureus bacteria (n=32) or saline (n=10). The infected pigs were either inoculated with 10^4 CFU (n=26) or 10^2 and 10^3 CFU (n=6). All animals were euthanized five days after insertion of implants. Pigs receiving the high-inoculum infections showed a significantly higher volume of bone lesion, number of neutrophils around the implant, concentrations of acute phase proteins in serum and enlargement of regional lymph nodes. A positive correlation was present between a high number of surrounding neutrophils and high values of all other parameters. Furthermore, a threshold of 40 neutrophils per 10 high power fields for the histopathological diagnosis of high grade IAO was defined. In conclusion: this paper describes a novel low-inoculum S. aureus porcine model of IAO which was demonstrated to be reliable, reproducible and discriminative to human IAO, and represents a requested and valuable tool in orthopedic research. This article is protected by copyright. All rights reserved

General information
State: Accepted/In press
Organisations: National Veterinary Institute, Section for Immunology and Vaccinology, LEO Pharma A/S, University of Copenhagen, Copenhagen University Hospital, Aarhus University
Authors: Jensen, L. K. (Ekstern), Koch, J. (Ekstern), Dich-Jorgensen, K. (Ekstern), Aalbaek, B. (Ekstern), Petersen, A. (Ekstern), Fuursted, K. (Ekstern), Bjarnsholt, T. (Ekstern), Kragh, K. N. (Ekstern), Tøtterup, M. (Ekstern), Bue, M. (Ekstern), Hanberg, P. (Ekstern), Søballe, K. (Ekstern), Heegaard, P. M. H. (Intern), Jensen, H. E. (Ekstern)
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BFI (2016): BFI-level 2
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BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.509 SNIP 1.365 CiteScore 3.22
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.414 SNIP 1.416 CiteScore 3.14
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.491 SNIP 1.352 CiteScore 3.21
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.422 SNIP 1.401 CiteScore 3.31
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.426 SNIP 1.402 CiteScore 3.15
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.59 SNIP 1.529
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.446 SNIP 1.389
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.532 SNIP 1.388
Scopus rating (2007): SJR 1.532 SNIP 1.447
Scopus rating (2006): SJR 1.774 SNIP 1.812
Scopus rating (2005): SJR 1.74 SNIP 1.796
Scopus rating (2004): SJR 1.405 SNIP 1.497
Scopus rating (2003): SJR 1.373 SNIP 1.233
Scopus rating (2002): SJR 1.361 SNIP 1.024
A Novel Smart Meter Controlling System with Dynamic IP Addresses

Smart meters are the electronic devices for measuring energy consumption in real time. Usually, static public IP addresses are allocated to realize the point-to-point (P2P) communication and remote controlling for smart metering systems. This, however, restricts the wide deployment of smart meters, due to the deficiency of public IP resources. This paper proposes a novel subscription-based communication architecture for the support of dynamic IP addresses and group controlling of smart meters. The paper evaluates the proposed architecture by comparing the traditional P2P architecture, and validate its effectiveness to interact with smart meters.

General information
State: Published
Organisations: Department of Management Engineering, Systems Analysis, Sam Ratulangi University, De La Salle University-Manila
Authors: Manembu, P. (Ekstern), Welang, B. (Ekstern), Kalua Lapu, A. (Ekstern), Kewo, A. (Intern), Nielsen, P. S. (Intern), Liu, X. (Intern)
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A Novel SOFC/SOEC Sealing Glass with a Low SiO₂ Content and a High Thermal Expansion Coefficient

Solid oxide cells require seals that can function in harsh, elevated temperature environments. In addition, a low Si content can be advantageous, since Si impurities from the glass sealant can be transported to the active fuel electrode and poison the Ni-YSZ triple phase boundaries. To reduce the amount of Si emission, a low Si containing sealing glass (chemical composition: 50 mol% CaO, 20 mol% ZnO, 20 mol% B2O3 and 10 mol% SiO2) was developed at DTU. In this work, the results from thermal characterization, the crystallization behavior of the glass and the long-term stability and adhesion behavior of the glass were studied under SOFC and SOEC relevant conditions. The glass-ceramic sealant performed well over 400 h, and no cell degradation or leakage related to the seal was found, indicating that the developed glass system is applicable for the use in SOFC/SOEC stacks.

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A Novel SOFC/SOEC Sealing Glass with a Low SiO₂ Content and a High Thermal Expansion Coefficient

Solid oxide cells require seals that can function in harsh, elevated temperature environments. In the case of solid oxide electrolysis (SOEC), also a low Si content is desired, since Si impurities from the glass sealing can be transported to the active fuel electrode and poison the Ni-YSZ triple phase boundaries.

To reduce the amount of Si emission, a low Si containing sealing glass (chemical composition: 48 mol% CaO, 19 mol% ZnO, 21 mol% B₂O₃ and 12 mol% SiO₂) was developed at DTU. In this presentation, the results from thermal characterization, like thermal expansion coefficient, glass transition temperature, crystallization temperature, etc., of the glass will be presented. Additionally, the crystallization behavior of the glass was analyzed by in-situ X-ray diffraction, recording temperature resolved XRD spectra from 30 °C up to 900 °C.

Furthermore, the long-term stability and the adhesion behavior of the glass were studied under relevant SOFC and SOEC conditions. The stability of sealed Crofer/Glass/NiO-YSZ assemblies in reducing atmosphere and in air was investigated for over 500 h at temperatures between 750 °C and 850 °C. Additionally, a cell component test was performed to investigate the durability of the glass seal when exposed to dual atmosphere environments. The seals performed well over 400 h under fuel cell and electrolysis operation conditions, and no cell degradation or leakage related to the sealing was found, indicating that the developed glass system is applicable for the use in SOFC/SOEC stacks.

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Main Research Area: Technical/natural sciences
Publication information
A novel synthetic biology platform technology: PROMYS – Programming synthetic networks for bio-based production of value chemicals – FP7 project

Professor Morten Sommer from the Novo Nordisk Foundation Center for Biosustainability at the Technical University of Denmark discusses the latest work of the PROMYS (Programming synthetic networks for bio-based production of value chemicals) consortium developing a new technology platform that can be broadly applied to metabolic engineering.

A novel urinary biomarker of type VI collagen formation and endotrophin is associated with loss of kidney function in patients with diabetic nephropathy

INTRODUCTION AND AIMS: Diabetic nephropathy (DN) is the leading cause of CKD in the Western world. Around 50 percent of patients who have had diabetes for more than 20 years develop CKD. Glomerulosclerosis and tubulointerstitial fibrosis are histological features as DN progresses towards end-stage renal disease. Fibrosis is characterized by a dysregulated remodeling of the extracellular matrix (ECM). Collagen type VI (COL VI) is a crucial ECM molecule for the control of tissue organization. It is present at the interface of the glomerular basement membrane and interstitial matrix and its levels have been reported elevated in glomeruli of patients with glomerular diseases and in the mesangium of diabetic patients. During deposition of COL VI, a fragment is released, namely endotrophin (ETP). Endotrophin (ETP), has shown pro-fibrotic potential. We investigated the prognostic potential of COL VI formation and ETP for CKD prog
An overview of electron acceptors in microbial fuel cells

Microbial fuel cells (MFC) have recently received increasing attention due to their promising potential in sustainable wastewater treatment and contaminant removal. In general, contaminants can be removed either as an electron donor via microbial catalyzed oxidation at the anode or removed at the cathode as electron acceptors through reduction. Some contaminants can also function as electron mediators at the anode or cathode. While previous studies have done a thorough assessment of electron donors, cathodic electron acceptors and mediators have not been as well described. Oxygen is widely used as an electron acceptor due to its high oxidation potential and ready availability. Recent studies, however, have begun to assess the use of different electron acceptors because of the (1) diversity of redox potential, (2) needs of alternative and more efficient cathode reaction, and (3) expanding of MFC based technologies in different areas. The aim of this review was to evaluate the performance and applicability of various electron acceptors and mediators used in MFCs. This review also evaluated the corresponding performance, advantages and disadvantages, and future potential applications of select electron acceptors (e.g., nitrate, iron, copper, perchlorate) and mediators.
Antenna misalignment effects in 100 Gbit/s D-band wireless transmissions

We report an operational photonics-enabled 100 Gbit/s D-band antenna polarization multiplexing system (2 x 2 MIMO) with a carrier frequency of 141 GHz, and experimentally explores antenna misalignment effects on the signal performance in terms of bit error rate. Misalignments from 210 to 10 degrees were evaluated for both the E-and H-plane, highlighting the strict requirements needed to maintain a signal performance below forward-error correction codes thresholds. Our findings indicate tolerable misalignments are below 1 degree, hinting beam steering as a must for future D-band communication links. (C) 2017 Wiley Periodicals, Inc.
Anthelmintic effects of forage chicory (Cichorium intybus) against free-living and parasitic stages of Cooperia oncophora

Chicory shows great promise as an anthelmintic forage for grazing ruminants that can reduce reliance on anti-parasitic drugs. Recently, we reported potent anthelmintic effects of chicory-based diets in infected cattle with significant reductions in worm burdens of the abomasal nematode Ostertagia ostertagi, whilst no apparent activity was observed against the small intestinal parasite Cooperia oncophora. To explore this discrepancy, we investigated direct anthelmintic effects of forage chicory against C. oncophora in vitro. Chicory leaves (cultivar 'Spadona') were extracted with methanol in a Soxhlet apparatus and the resulting extract was purified by solid-phase extraction to concentrate bioactive phytochemicals such as sesquiterpene lactones. C. oncophora eggs and adult worms from mono-infected donor calves were exposed to decreasing concentrations of the chicory extract. In an egg hatch assay, the chicory extract induced a marked and dose-dependent inhibition of egg hatching, with 95% inhibition at 2500 μg extract/mL (EC50 = 619 [95% CI: 530–722] μg extract/mL). In the adult motility inhibition assays, the chicory extract induced a potent and dose-dependent worm paralysis. At 12 h of incubation, worms exposed to chicory showed a total paralysis at ≥500 μg extract/mL, while after 48 h of incubation a complete inhibition of worm motility was observed at ≥250 μg extract/mL (EC50 = 80 [95% CI: 67–95] μg extract/mL). We have demonstrated that forage chicory can induce potent inhibitory effects on the egg hatching and exert direct anthelmintic activity against parasitic stages of C. oncophora. These results suggest that the previously reported absence of in vivo effects of chicory towards C. oncophora in infected animals may be related with host-mediated factors and/or inhibitory digestive conditions, rather than an inherent inactivity of chicory and its bioactive phytochemicals.

General Information
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Organisations: National Veterinary Institute, Department of Biotechnology and Biomedicine, Photosynthetic Cell Factories, University of Copenhagen, Norwegian Veterinary Institute
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Anthropogenic $^{236}$U in Danish Seawater: Global Fallout versus Reprocessing Discharge

This work focuses on the occurrence of $^{236}$U in seawater along Danish coasts, which is the sole water-exchange region between the North Sea-Atlantic Ocean and the Baltic Sea. Seawater collected in 2013 and 2014 were analyzed for $^{236}$U (as well as $^{238}$U and $^{137}$Cs). Our results indicate that $^{236}$U concentrations in Danish seawater are distributed within a relatively narrow range of (3.6-8.2) × 10$^7$ atom/L and, to a certain extent, independent of salinity. $^{236}$U/$^{238}$U atomic ratios in Danish seawater are more than 4 times higher than the estimated global fallout value of 1 × 10$^{-9}$. The levels of $^{236}$U/$^{238}$U atomic ratios obtained are comparable to those reported for the open North Sea and much higher than several other open oceans worldwide. This indicates that besides the global fallout input, the discharges from the two major European nuclear reprocessing plants are dominating sources of $^{236}$U in Danish seawater. However, unexpectedly high $^{236}$U/$^{238}$U ratios as well as high $^{236}$U concentrations were observed at low-salinity locations of the Baltic Sea. While this feature might be interpreted as a clue for another significant $^{236}$U input in the Baltic Sea, it may also be caused by the complexity of water currents or slow turnover rate.
Anthropometry, DXA and leptin reflect subcutaneous but not visceral abdominal adipose tissue by MRI in 197 healthy adolescents

Abdominal fat distribution is associated with development of cardio-metabolic disease, independently of BMI. We assessed anthropometry, serum adipokines and DXA as markers of abdominal subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) by MRI.

METHODS: We performed a cross-sectional study including 197 healthy adolescents (114 boys) aged 10-15 years nested within a longitudinal population-based cohort. Clinical examination, blood sampling, DXA and abdominal MRI was performed. SAT% and VAT% was adjusted to total abdominal volume. Girls had a higher SAT% than boys in early and late puberty (16 vs. 13%, P
Anti-Bacterial Activity of Phenolic Compounds against Streptococcus pyogenes

Background: Worldwide, Streptococcus pyogenes is the leading cause of bacterial pharyngitis. To reduce the use of antibiotics, antimicrobial phytochemical-containing remedies, which have long been in use in traditional medicine, may provide new approaches for management of streptococcal pharyngitis. The objective of this study was to assess the inhibitory activities of 25 natural phenolic compounds against three strains of S. pyogenes. Methods: After an initial screening, the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of the nine most effective phenolic compounds were determined. The effect of four compounds with the lowest MIC and MBC on streptococcal growth and biofilm formation was also studied. Results: 1,2-Naphthoquinone and 5-hydroxy-1,4-naphthoquinone elicited the greatest anti-S. pyogenes activities with MICs ranging from 0.39 to 6.25 µg mL−1 and MBCs of 100 µg mL−1. Both naphthoquinones inhibited the biofilm formation at concentrations ranging from 12.5 to 50 µg mL−1. Biofilm reduction and altered bacterial cell structures were visible in scanning electron microscopy images of naphthoquinone-treated cells. Conclusion: In conclusion, 1,2-naphthoquinone and 5-hydroxy-1,4-naphthoquinone inhibit S. pyogenes and should be further investigated as candidates for the management of streptococcal pharyngitis.

General information
State: Published
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Antibiotic Resistance Genes and Correlations with Microbial Community and Metal Resistance Genes in Full-Scale Biogas Reactors As Revealed by Metagenomic Analysis

Digested residues from biogas plants are often used as biofertilizers for agricultural crops cultivation. The antibiotic resistance genes (ARGs) in digested residues pose a high risk to public health due to their potential spread to the disease-causing microorganisms and thus reduce the susceptibility of disease-causing microorganisms to antibiotics in medical treatment. A high-throughput sequencing (HTS)-based metagenomic approach was used in the present study to investigate the variations of ARGs in full-scale biogas reactors and the correlations of ARGs with microbial communities and metal resistance genes (MRGs). The total abundance of ARGs in all the samples varied from 7 × 10-3 to 1.08 × 10-1 copy of ARG/copy of 16S-rRNA gene, and the samples obtained from thermophilic biogas reactors had a lower total abundance of ARGs, indicating the superiority of thermophilic anaerobic digestion for ARGs removal. ARGs in all the samples were composed of 175 ARG subtypes; however, only 7 ARG subtypes were shared by all the samples. Principal component analysis and canonical correspondence analysis clustered the samples into three groups (samples from manure-based mesophilic reactors, manure-based thermophilic reactors, and sludge-based mesophilic reactors), and substrate, temperature, and hydraulic retention time (HRT) as well as volatile fatty acids (VFAs) were identified as crucial environmental variables affecting the ARGs compositions. Procrustes analysis revealed microbial community composition
was the determinant of ARGs composition in biogas reactors, and there was also a significant correlation between ARGs composition and MRGs composition. Network analysis further revealed the co-occurrence of ARGs with specific microorganisms and MRGs.

General information
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Organisations: Department of Environmental Engineering, Residual Resource Engineering, Tsinghua University, University of Hong Kong, Hong Kong Baptist University
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ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
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Scopus rating (2012): SJR 3.146 SNIP 2.056 CiteScore 5.17
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
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Scopus rating (2011): SJR 3.178 SNIP 1.953 CiteScore 5.16
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.964 SNIP 1.729
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BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.835 SNIP 1.803
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Web of Science (2006): Indexed yes
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Antibiotic resistance genes in municipal wastewater treatment systems and receiving waters in Arctic Canada

Domestic wastewater discharges may adversely impact arctic ecosystems and local indigenous people, who rely on being able to hunt and harvest food from their local environment. Therefore, there is a need to develop efficient wastewater treatment plants (WWTPs), which can be operated in remote communities under extreme climatic conditions. WWTPs have been identified as reservoirs of antibiotic resistance genes (ARGs). The objective of this work was to quantify the presence of nine different ARG markers (int1, sul1, sul2, tet(O), erm(B), mecA, blaCTX-M, blaTEM, and qnr(S)) in two passive systems (waste stabilization ponds [WSPs]) and one mechanical filtration plant operating in two smaller and one large community, respectively, in Nunavut, Canada. Measurement of water quality parameters (carbonaceous oxygen demand, ammonia, total suspended solids, Escherichia coli and total coliforms) showed that the WWTPs provided only primary treatment. Low levels of the ARGs (2 log copies/mL) were observed in the effluent, demonstrating that bacteria residing in three northern WWTPs harbour ARGs conferring resistance to multiple clinically-relevant classes of antibiotics. Our results indicate that long-term storage in WSPs benefitted removal of organic material and some ARGs. However, one WSP system showed evidence of the enrichment of sul1, sul2, mecA, tet(O) and qnr(S). Further research is needed to fully understand if these ARG releases pose a risk to human health, especially in the context of traditional hunting and fishing activities.
Antimicrobial peptide CAP18 and its effect on Yersinia ruckeri infections in rainbow trout Oncorhynchus mykiss (Walbaum): comparing administration by injection and oral routes

The antimicrobial peptide CAP18 has been demonstrated to have a strong in vitro bactericidal effect on Yersinia ruckeri, but its activity in vivo has not been described. In this work, we investigated whether CAP18 protects rainbow trout Oncorhynchus mykiss (Walbaum) against enteric red mouth disease caused by this pathogen either following i.p. injection or by oral administration (in feed). It was found that injection of CAP18 into juvenile rainbow trout before exposure to Y.
ruckeri was associated with lowered mortality compared to non-medicated fish although it was less effective than the conventional antibiotic oxolinic acid. Oral administration of CAP18 to trout did not prevent infection. The proteolytic effect of secretions on the peptide CAP18 in the fish gastrointestinal tract is suggested to account for the inferior effect of oral administration.

**General information**

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Organisations: National Food Institute, Research Group for Gut Microbiology and Immunology, Research Group for Genomic Epidemiology, National Veterinary Institute, Section for Bacteriology, Pathology and Parasitology, University of Copenhagen, Aalborg University, BioMar A/S
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Antimicrobial resistance among pathogenic bacteria from mink (Neovison vison) in Denmark

Background: For proper treatment of bacterial infections in mink, knowledge of the causative agents and their antimicrobial susceptibility patterns is crucial. The used antimicrobials are in general not registered for mink, i.e. most usage is “off-label”. In this study, we report the patterns of antimicrobial resistance among pathogenic bacteria isolated from Danish mink during the period 2014-2016. The aim of this investigation was to provide data on antimicrobial resistance and consumption, to serve as background knowledge for new veterinary guidelines for prudent and optimal antimicrobial usage in mink. Results: A total number of 308 Escherichia coli isolates, 41 Pseudomonas aeruginosa, 36 Streptococcus canis, 30 Streptococcus dysgalactiae, 55 Staphylococcus delphini, 9 Staphylococcus aureus, and 20 Staphylococcus schleiferi were included in this study. Among E. coli, resistance was observed more frequently among the hemolytic isolates than among the non-hemolytic ones. The highest frequency of resistance was found to ampicillin, 82.3% and 48.0% of the hemolytic of the non-hemolytic isolates, respectively. The majority of the P. aeruginosa isolates were only sensitive to ciprofloxacin and gentamicin. Among the Staphylococcus spp., the highest occurrence of resistance was found for tetracycline. Regarding the nine S. aureus, one isolate was resistant to cefoxitin indicating it was a methicillin-resistant Staphylococcus aureus. Both β-hemolytic Streptococcus species showed high levels of resistance to tetracycline and erythromycin. The antimicrobial consumption increased significantly during 2007-2012, and fluctuated at a high level during 2012-2016, except for a temporary drop in 2013-2014. The majority of the prescribed antimicrobials were aminopenicillins followed by tetracyclines and macrolides. Conclusions: The study showed that antimicrobial resistance was common in most pathogenic bacteria from mink, in particular hemolytic E. coli. There is a need of guidelines for prudent use of antimicrobials for mink.
Antioxidant effect of water and acetone extracts of Fucus vesiculosus on oxidative stability of skin care emulsions

A water and an acetone extract of the Icelandic brown algae Fucus vesiculosus were evaluated as potential natural sources of antioxidant compounds in skin care emulsions. To assess their efficacy in inhibiting lipid oxidation caused by photo- or thermoxidation, they were stored in darkness and room temperature as control conditions, and compared to samples stored under accelerated conditions (light and room temperature, or darkness and 40°C). The presence of extracts in the skin care emulsions induced remarkable colour changes when the emulsions were exposed to light, and more extensively under high temperature. High temperature also caused greater increments in the droplet size of the emulsions. The analysis of the tocopherol content, peroxide value and volatile compounds during the storage revealed that, whereas both water and acetone extracts showed (at 2mg/g of emulsion) protective effect against thermooxidation, only the water extract showed antioxidant activity against photooxidation.

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BFI (2014): BFI-level 1
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ISI indexed (2012): ISI indexed yes
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Antioxidant Efficacies of Rutin and Rutin Esters in Bulk Oil and Oil-in-Water Emulsion

The use of flavonoids as antioxidants in food formulations is limited due to their solubility and thereby their localization in the food products. However, enzymatic alkylation of flavonoids with lipophilic moieties alters their lipophilicity and thereby partitioning within different phases in a food product. This study aimed to evaluate the antioxidative efficiency of two derivatives of rutin, namely rutin laurate (C12:0) and rutin palmitate (C16:0) compared with their parent compound rutin and with butylated hydroxytoluene (BHT). Their efficiency as antioxidants at two different concentrations (25 and 200 µM) was assessed in bulk oil and in an o/w emulsion system without and with iron addition. All evaluated compounds revealed antioxidant effects. However, rutin and BHT were the most efficient antioxidants in bulk oil followed by rutin palmitate, whereas rutin laurate acted as either an antioxidant or a prooxidant at low and high concentrations (25 and 200 µM), respectively. In emulsions, rutin and BHT in high concentration (200 µM) were more efficient than rutin esters. Thus, acylation of rutin with medium chain fatty acids did not improve the antioxidant ability, neither in bulk oil nor in o/w emulsion. Interestingly, rutin had stronger antioxidative effect than BHT upon iron addition to the emulsion.

Practical application: According to the antioxidant hypothesis the polar paradox more amphiphilic antioxidants should perform as better antioxidants in emulsions than more polar antioxidants. The finding in this study revealed that lipophilization of rutin did not improve its antioxidant capacity in emulsions compared to untreated rutin. This stresses the importance of evaluating the antioxidant in each emulsion systems before selecting appropriate antioxidants for optimal protection against lipid oxidation.

General information
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Organisations: National Food Institute, Research Group for Bioactives – Analysis and Application, Aarhus University
Authors: Lue, B. (Ekstern), Sørensen, A. M. (Intern), Jacobsen, C. (Intern), Guo, Z. (Ekstern), Xu, X. (Ekstern)
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Antioxidant treatment attenuates lactate production in diabetic nephropathy

The early progression of diabetic nephropathy is notoriously difficult to detect and quantify before the occurrence of substantial histological damage. Recently, hyperpolarized [1-13C]pyruvate has demonstrated increased lactate production in the kidney early after the onset of diabetes, implying increased lactate dehydrogenase activity as a consequence of increased nicotinamide adenine dinucleotide substrate availability due to upregulation of the polyol pathway, i.e., pseudohypoxia. In this study, we investigated the role of oxidative stress in mediating these metabolic alterations using state-of-the-art hyperpolarized magnetic resonance (MR) imaging. Ten-week-old female Wistar rats were randomly divided into three groups: healthy controls, untreated diabetic (streptozotocin treatment to induce insulinopenic diabetes), and diabetic, receiving chronic antioxidant treatment with TEMPOL (4-hydroxy-2,2,6,6-tetramethylpiperidin-1-oxyl) via the drinking water. Examinations were performed 2, 3, and 4 wk after the induction of diabetes by using a 3T Clinical MR system equipped with a dual tuned13C/1H-volume rat coil. The rats received intravenous hyperpolarized [1-13C]pyruvate and were imaged using a slice-selective13C-IDEAL spiral sequence. Untreated diabetic rats showed increased renal lactate production compared with that shown by the controls. However, chronic TEMPOL treatment significantly attenuated diabetes-induced lactate production. No significant effects of diabetes or TEMPOL were observed on [13C]alanine levels, indicating an intact glucose-alanine cycle, or [13C]bicarbonate, indicating normal flux through the Krebs cycle. In conclusion, this study demonstrates that diabetes-induced pseudohypoxia, as indicated by an increased lactate-to-pyruvate ratio, is significantly attenuated by antioxidant treatment. This demonstrates a pivotal role of oxidative stress in renal metabolic alterations occurring in early diabetes.
antiSMASH 4.0: Improvements in chemistry prediction and gene cluster boundary identification

Many antibiotics, chemotherapeutics, crop protection agents and food preservatives originate from molecules produced by bacteria, fungi or plants. In recent years, genome mining methodologies have been widely adopted to identify and characterize the biosynthetic gene clusters encoding the production of such compounds. Since 2011, the ‘antibiotics and secondary metabolite analysis shell-antiSMASH’ has assisted researchers in efficiently performing this, both as a web server and a standalone tool. Here, we present the thoroughly updated antiSMASH version 4, which adds several novel features, including prediction of gene cluster boundaries using the ClusterFinder method or the newly integrated CASSIS algorithm, improved substrate specificity prediction for non-ribosomal peptide synthetase adenylation domains based on the new SANDPUMA algorithm, improved predictions for terpene and ribosomally synthesized and post-translationally modified peptides cluster products, reporting of sequence similarity to proteins encoded in experimentally characterized gene clusters on a per-protein basis and a domain-level alignment tool for comparative analysis of trans-AT polyketide synthase assembly line architectures. Additionally, several usability features have been updated and improved. Together, these improvements make antiSMASH up-to-date with the latest developments in natural product research and will further facilitate computational genome mining for the discovery of novel bioactive molecules.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, New Bioactive Compounds, Hans Knöll Institute, University of Wisconsin-Madison, Wageningen University, University of Illinois at Urbana-Champaign, University of Warwick, University of Lisbon, University of Bonn, University of Manchester
Pages: W36-W41
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication information
A Numerical Approach for Hybrid Simulation of Power System Dynamics Considering Extreme Icing Events

The global climate change leads to more extreme meteorological conditions such as icing weather, which have caused great losses to power systems. Comprehensive simulation tools are required to enhance the capability of power system risk assessment under extreme weather conditions. A hybrid numerical simulation scheme integrating icing weather events with power system dynamics is proposed to extend power system numerical simulation. A technique is developed to efficiently simulate the interaction of slow dynamics of weather events and fast dynamics of power systems. An extended package for PSS/E enabling hybrid simulation of icing event and power system disturbance is developed, based on which a hybrid simulation platform is established. Numerical studies show that the functionality of power system simulation is greatly extended by taking into account the icing weather events.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems, Shandong University, Shandong University
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Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences
A numerical model to evaluate the flow distribution in a large solar collector field

This study presents a numerical model to evaluate the flow distribution in a large solar collector field, with solar collectors connected both in series and in parallel. The boundary conditions of the systems, such as flow rate, temperature, fluid type and layout of the collector field can be easily changed in the model. The model was developed in Matlab and the calculated pressure drop and flow distribution were compared with measurements from a solar collector field. A good agreement between model and measurements was found. The model was then used to study the flow distribution in different conditions. Balancing valves proved to be an effective way to achieve uniform flow distribution also in conditions different from those for which the valves were regulated. For small solar collector fields with limited number of collector rows connected in parallel, balancing valves are not strictly necessary if the pressure drop across the collector rows is much higher than the pressure drop along the longest distribution pipe.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Building Energy
Authors: Bava, F. (Intern), Dragsted, J. (Intern), Furbo, S. (Intern)
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.52 SJR 1.547 SNIP 1.748
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.974 SNIP 2.143 CiteScore 4.61
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.014 SNIP 2.704 CiteScore 4.77
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.058 SNIP 2.92 CiteScore 4.44
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.655 SNIP 2.55 CiteScore 3.65
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.326 SNIP 2.223 CiteScore 3.19
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.419 SNIP 2.161
Web of Science (2010): Indexed yes
An X-band Schottky diode mixer in SiGe technology with tunable Marchand balun

In this paper, we propose a double balanced mixer with a tunable Marchand balun. The circuit is designed in a SiGe BiCMOS process using Schottky diodes. The tunability of the Marchand balun is used to enhance critical parameters for double balanced mixers. The local oscillator-IF isolation can be changed from –51 to –60.5 dB by tuning. Similarly, the IIP2 can be improved from 41.3 to 48.7 dBm at 11 GHz, while the input referred 1-dB compression point is kept constant at 8 dBm. The tuning have no influence on conversion loss, which remains at 8.8 dB at a LO power level of 11 dBm at the center frequency of 11 GHz. The mixer has a 3 dB bandwidth from 8 to 13 GHz, covering the entire X-band. The full mixer has a size of 2050 μm × 1000 μm.

General information
State: Published
Organisations: Department of Electrical Engineering, Electromagnetic Systems, Department of Electromagnetic Systems, Center for Magnetic Resonance, Weibel Scientific A/S
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Pages: 965-976
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): SJR 0.234 SNIP 0.481 CiteScore 0.65
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 0.209 SNIP 0.472 CiteScore 0.53
Scopus rating (2014): SJR 0.216 SNIP 0.37 CiteScore 0.55
Aortic Valve Stenosis Increases Helical Flow and Flow Complexity: A Study of Intra-operative Cardiac Vector Flow Imaging

Aortic valve stenosis alters blood flow in the ascending aorta. Using intra-operative vector flow imaging on the ascending aorta, secondary helical flow during peak systole and diastole, as well as flow complexity of primary flow during systole, were investigated in patients with normal, stenotic and replaced aortic valves. Peak systolic helical flow, diastolic helical flow and flow complexity during systole differed between the groups (p < 0.0001), and correlated to peak systolic velocity (R^2 = 0.94, 0.87 and 0.88, respectively). The study indicates that aortic valve stenosis increases helical flow and flow complexity, which are measurable with vector flow imaging. For assessment of aortic stenosis and optimization of valve surgery, vector flow imaging may be useful.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Biomedical Engineering, Center for Fast Ultrasound Imaging, Copenhagen University Hospital
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Publication date: 2017
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.927 SNIP 1.184 CiteScore 2.53
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.027 SNIP 1.416 CiteScore 2.65
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.891 SNIP 1.245 CiteScore 2.71
ISI indexed (2013): ISI indexed yes
A Padawan Programmer's Guide to Developing Software Libraries

With the rapid adoption of computational tools in the life sciences, scientists are taking on the challenge of developing their own software libraries and releasing them for public use. This trend is being accelerated by popular technologies and platforms, such as GitHub, Jupyter, R/Shiny, that make it easier to develop scientific software and by open-source licenses that make it easier to release software. But how do you build a software library that people will use? And what characteristics do the best libraries have that make them enduringly popular? Here, we provide a reference guide, based on our own experiences, for developing software libraries along with real-world examples to help provide context for scientists who are learning about these concepts for the first time. While we can only scratch the surface of these topics, we hope that this article will act as a guide for scientists who want to write great software that is built to last.

General information

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Organisations: Novo Nordisk Foundation Center for Biosustainability, Big Data 2 Knowledge, Network Reconstruction in Silico Biology, University of California at San Diego, The Ohio State University, University of Tubingen
Authors: Yurkovich, J. T. (Ekstern), Yurkovich, B. J. (Ekstern), Dräger, A. (Ekstern), Palsson, B. O. (Intern), King, Z. A. (Ekstern)
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Main Research Area: Technical/natural sciences

Publication information

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A pathology atlas of the human cancer transcriptome

Cancer is one of the leading causes of death, and there is great interest in understanding the underlying molecular mechanisms involved in the pathogenesis and progression of individual tumors. We used systems-level approaches to analyze the genome-wide transcriptome of the protein-coding genes of 17 major cancer types with respect to clinical outcome. A general pattern emerged: Shorter patient survival was associated with up-regulation of genes involved in cell growth and with down-regulation of genes involved in cellular differentiation. Using genome-scale metabolic models, we show that cancer patients have widespread metabolic heterogeneity, highlighting the need for precise and personalized medicine for cancer treatment. All data are presented in an interactive open-access database (www.proteinatlas.org/pathology) to allow genome-wide exploration of the impact of individual proteins on clinical outcomes.
A Pd-Catalyzed in situ domino process for mild and quantitative production of 2,5-dimethylfuran directly from carbohydrates

An in situ domino process has been developed to be highly efficient for direct and mild conversion of various hexose sugars to the biofuel 2,5-dimethylfuran in almost quantitative yields, without separation of unstable intermediates at 120 °C in n-butanol, by using polymethylhydrosiloxane and hydrophobic Pd/C as a H-donor and a bifunctional catalyst, respectively. Among the cascade reactions, the hydrosilylation process was confirmed by deuterium-labeling and kinetic studies to be favorable for sugar dehydration and exclusively acts on deoxygenation of in situ formed intermediates including furanic alcohols and aldehydes to DMF via a hydride transfer process that was facilitated by an alcoholic solvent. The catalytic system is more selective than the H2-participated counterpart, and could be scaled up with only 0.04 mol% catalyst loading, giving DMF in a comparable yield of 85%. Moreover, Pd(0) was demonstrated to be the active species for deoxygenation, and the heterogeneous catalyst exhibited good recyclability with little elemental leaching.
A Physically-Based Equivalent Circuit Model for the Impedance of a LiFePO$_4$/Graphite 26650 Cylindrical Cell

In this work an Equivalent Circuit Model (ECM) is developed and used to model impedance spectra measured on a commercial 26650 LiFePO$_4$/Graphite cylindrical cell. The ECM is based on measurements and modeling of impedance spectra recorded separately on cathode (LiFePO$_4$) and anode (Graphite) samples, harvested from the commercial cell. Modeling of the single-electrode impedance spectra provided information about the electronic and ionic resistance in the porous composite electrodes, as well as the solid state diffusion. Focused Ion Beam (FIB)/Scanning Electron Microscopy (SEM) of anode and cathode samples was used to make 3-D maps of the electrode microstructures and to obtain microstructural data for the ECM. The complementary analysis was crucial for the resolution of the single electrode impedance parameters and the proposal and validation of a new equivalent circuit used to model the full commercial battery impedance.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Applied Electrochemistry, Imaging and Structural Analysis
Authors: Scipioni, R. (Intern), Jørgensen, P. S. (Intern), Graves, C. R. (Intern), Hjelm, J. (Intern), Jensen, S. H. (Intern)
Pages: A2017-A2030
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Main Research Area: Technical/natural sciences

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Journal: Electrochemical Society. Journal
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.97 SJR 1.134 SNIP 0.867
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.037 SNIP 1 CiteScore 3.17
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.147 SNIP 1.206 CiteScore 3.36
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.151 SNIP 1.299 CiteScore 2.92
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.329 SNIP 1.296 CiteScore 2.61
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.33 SNIP 1.345 CiteScore 2.74
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.417 SNIP 1.312
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.45 SNIP 1.267
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.608 SNIP 1.416
A Pilot Study of Multiple Password Interference Between Text and Map-Based Passwords

Today’s computer users have to remember several passwords for each of their accounts. It is easily noticed that people may have difficulty in remembering multiple passwords, which result in a weak password selection. Previous studies have shown that recall success rates are not statistically dissimilar between textual passwords and graphical passwords. With the advent of map-based graphical passwords, this paper focuses on multiple password interference and presents a pilot study consisting of 60 participants to study the recall of multiple passwords between text passwords and map-based passwords under various account scenarios. Each participant has to create six distinct passwords for different account scenarios. It is found that participants in the map-based graphical password scheme could perform better than the textual password scheme in both short-term (one-hour session) and long term (after two weeks) password memorability tests (i.e., they made higher success rates). Our effort attempts to complement existing studies and stimulate more research on this issue.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Cyber Security, Singapore University of Technology and Design, City University of Hong Kong, Institute for Infocomm Research
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Main Research Area: Technical/natural sciences
A Pole Pair Segment of a 2-MW High-Temperature Superconducting Wind Turbine Generator

A 2-MW high-temperature superconducting (HTS) generator with 24 pole pairs has been designed for the wind turbine application. In order to identify potential challenges and obtain practical knowledge prior to production, a full-size stationary experimental setup, which is one pole pair segment of the full generator, has been built and tested. The experimental setup comprises a consequent-pole HTS rotor and a conventional three-phase copper stator. This paper first presents the electromagnetic designs of the full generator and the setup, then it goes to compare the performance of the full generator and the setup in terms of the flux density, the operating condition of the HTS winding, and the force-generation capability. Finite element (FE) software MagNet is used to carry out numerical simulations. The findings show that the HTS winding in the setup is a good surrogate for those that would be used in the full generator. The FE simulations also tell that the maximum tangential force generated in the setup is 3.77% lower than that in the full generator. Good agreement between the values of interest in the setup and those projected in the full generator has revealed a cost-effective prototyping methodology for developing HTS machines.
Application of aluminum diffusion coatings to mitigate the KCl-induced high-temperature corrosion

Pack cementation was used to produce Fe$_{1-x}$Al and Fe$_2$Al$_5$ diffusion coatings on ferritic-martensitic steel P91 and a Ni$_2$Al$_3$ diffusion coating on pure nickel. The performance of diffusion coatings against high-temperature corrosion induced by potassium chloride (KCl) was evaluated by exposing the samples at 600 °C for 168 h in static lab air under KCl deposit. In addition, a salt-free experiment was performed for comparison. Microstructure, chemical and phase composition of the samples were analyzed with scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS) and X-ray diffractometry (XRD) before and after the exposures. It was found that all the diffusion coatings formed protective oxides under salt-free exposure in air. Under the salt deposit, Fe$_{1-x}$Al showed local failure while on large parts of the sample a protective layer had formed. Fe$_2$Al$_5$ was attacked over the entire surface and the dominant mode of attack was selective aluminum removal. Ni$_2$Al$_3$ showed excellent performance and no sign of attack was observed anywhere on the sample.

General information

State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, FORCE Technology
Authors: Kiamehr, S. (Intern), Lomholt, T. N. (Ekstern), Dahl, K. V. (Intern), Christiansen, T. L. (Intern), Somers, M. A. J. (Intern)
Number of pages: 13
Pages: 82–94
Publication date: 2017
Main Research Area: Technical/natural sciences
Application of a Mechanistic Model as a Tool for On-line Monitoring of Pilot Scale Filamentous Fungal Fermentation Processes - The Importance of Evaporation Effects: Mechanistic model for pilot scale monitoring

A mechanistic model-based soft sensor is developed and validated for 550L filamentous fungus fermentations operated at Novozymes A/S. The soft sensor is comprised of a parameter estimation block based on a stoichiometric balance, coupled to a dynamic process model. The on-line parameter estimation block models the changing rates of formation of product, biomass, and water, and the rate of consumption of feed using standard, available on-line measurements. This parameter estimation block is coupled to a mechanistic process model, which solves the current states of biomass, product, substrate, dissolved oxygen and mass, as well as other process parameters including kLa, viscosity and partial pressure of CO2. State estimation at this scale requires a robust mass model including evaporation, which is a factor not often considered at smaller scales of operation. The model is developed using a historical dataset of eleven batches from the fermentation pilot plant (550L) at Novozymes A/S. The model is then implemented on-line in 550L fermentation processes operated at Novozymes A/S in order to validate the state estimator model on fourteen new batches utilizing a new strain. The product concentration in the validation batches was predicted with an average root mean sum of squared error (RMSSE) of 16.6%. In addition, calculation of the Janus coefficient for the validation batches shows a suitably calibrated model. The robustness of the model prediction is assessed with respect to the accuracy of the input data. Parameter estimation uncertainty is also carried out. The application of this on-line state estimator allows for on-line monitoring of pilot scale batches, including real-time estimates of multiple parameters which are not able to be monitored on-line. With successful application of a soft sensor at this scale, this allows for improved process monitoring, as well as opening up further possibilities for on-line control algorithms, utilizing these on-line model outputs. This article is protected by copyright. All rights reserved

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Department of Environmental Engineering, Novozymes A/S
Authors: Mears, L. (Intern), Stocks, S. M. (Ekstern), Albæk, M. O. (Ekstern), Sin, G. (Intern), Gernaey, K. V. (Intern)
Pages: 589–599
Publication date: 2017
Main Research Area: Technical/natural sciences
ε-Caprolactam and δ-valerolactam are important commodity chemicals used in the manufacture of nylons, with millions of tons produced annually. Biological production of these highly valued chemicals has been limited due to a lack of enzymes that cyclize ω-amino fatty acid precursors to corresponding lactams under ambient conditions. In this study, we demonstrated production of these chemicals using ORF26, an acyl-CoA ligase involved in the biosynthesis of ECO-02301 in *Streptomyces aizunensis*. This enzyme has a broad substrate spectrum and can cyclize 4-aminobutyric acid into γ-valerolactam, 5-aminovaleric acid into δ-valerolactam, and 6-aminocaproic acid into ε-caprolactam. Recombinant *E. coli* expressing ORF26 produced valerolactam and caprolactam when 5-aminovaleric acid and 6-aminocaproic acid were added to the culture medium. Upon coexpressing ORF26 with a metabolic pathway that produced 5-aminovaleric acid from lysine, we were able to demonstrate production of δ-valerolactam from lysine.
Application of CRISPR/Cas9 Genome Editing to Improve Recombinant Protein Production in CHO Cells

Genome editing has become an increasingly important aspect of Chinese Hamster Ovary (CHO) cell line engineering for improving production of recombinant protein therapeutics. Currently, the focus is directed toward expanding the product diversity, controlling and improving product quality and yields. In this chapter, we present our protocol on how to use the genome editing tool Clustered Regularly Interspaced Short Palindromic Repeat (CRISPR)/CRISPR-associated protein 9 (Cas9) to knockout engineering target genes in CHO cells. As an example, we refer to the glutamine synthetase (GS)-encoding gene as the knockout target gene, a knockout that increases the selection efficiency of the GS-mediated gene amplification system.

General information
State: Published
Organizations: Novo Nordisk Foundation Center for Biosustainability, CHO Cell Line Engineering and Design
Authors: Grav, L. M. (Intern), Julie la Cour Karottki, K. (Intern), Lee, J. S. (Intern), Kildegaard, H. F. (Intern)
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Source: FindIt
Source-ID: 2358570176
Application of CryoSat-2 altimetry data for river analysis and modelling

Availability of in situ river monitoring data, especially of data shared across boundaries, is decreasing, despite growing challenges for water resource management across the entire globe. This is especially valid for the case study of this work, the Brahmaputra Basin in South Asia. Commonly, satellite altimeters are used in various ways to provide information about such river basins. Most missions provide virtual station time series of water levels at locations where their repeat orbits cross rivers. CryoSat-2 is equipped with a new type of altimeter, providing estimates of the actual ground location seen in the reflected signal. It also uses a drifting orbit, challenging conventional ways of processing altimetry data to river water levels and their incorporation in hydrologic–hydrodynamic models. However, CryoSat-2 altimetry data provides an unprecedentedly high spatial resolution. This paper suggests a procedure to (i) filter CryoSat-2 observations over rivers to extract water-level profiles along the river, and (ii) use this information in combination with a hydrologic–hydrodynamic model to fit the simulated water levels with an accuracy that cannot be reached using information from globally available digital elevation models (DEMs) such as from the Shuttle Radar Topography Mission (SRTM) only. The filtering was done based on dynamic river masks extracted from Landsat imagery, providing spatial and temporal resolutions high enough to map the braided river channels and their dynamic morphology. This allowed extraction of river water levels over previously unmonitored narrow stretches of the river. In the Assam Valley section of the Brahmaputra River, CryoSat-2 data and Envisat virtual station data were combined to calibrate cross sections in a 1-D hydrodynamic model of the river. The hydrologic–hydrodynamic model setup and calibration are almost exclusively based on openly available remote sensing data and other global data sources, ensuring transferability of the developed methods. They provide an opportunity to achieve forecasts of both discharge and water levels in a poorly gauged river system.

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, National Space Institute, Geodesy, DHI Denmark
Authors: Schneider, R. (Intern), Godiksen, P. N. (Ekstern), Villadsen, H. (Intern), Madsen, H. (Ekstern), Bauer-Gottwein, P. (Intern)
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Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 4.22 SJR 2.216 SNIP 1.624
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.225 SNIP 1.497 CiteScore 3.74
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.144 SNIP 1.635 CiteScore 3.71
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.859 SNIP 1.546 CiteScore 3.39
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.949 SNIP 1.567 CiteScore 3.18
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.493 SNIP 1.394 CiteScore 2.7
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Application of integrative genomics and systems biology to conventional and in vitro reproductive traits in cattle

Assisted reproductive technologies (ARTs) have a strong impact on breeding especially when coupled with genomic selection (GS). The routine implementation of in vitro production (IVP) and GS of embryos before embryo transfer (ET) in breeding companies is not yet possible. Improvement of oocyte donor and embryo recipient quality is needed to make realistic a commercialization of these procedures in the near future. A better understanding of both biological mechanisms and molecular markers associated to IVPET related traits is necessary to improve the prediction of donor and recipient cow quality for IVP procedures. The huge amount of data generated from high throughput technologies has a tremendous impact in the search for biomarkers of complex traits. This paper reviews integrative genomics and systems biology approaches as applied to both Bos indicus and Bos taurus cattle reproduction by both conventional and ARTs such as OPU-IVP. The integration of systems biology information across different biological layers generates a complete view of the different molecular networks that control complex traits and can provide a strong contribution to the understanding of traits related to ARTs.

General information

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Organisations: Department of Bio and Health Informatics, Administration, University of Copenhagen, Aarhus University, University of São Paulo, Sao Paulo State University
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Application of Iterative Robust Model-based Optimal Experimental Design for the Calibration of Biocatalytic Models

The aim of model calibration is to estimate unique parameter values from available experimental data, here applied to a biocatalytic process. The traditional approach of first gathering data followed by performing a model calibration is inefficient, since the information gathered during experimentation is not actively used to optimise the experimental design. By applying an iterative robust model-based optimal experimental design, the limited amount of data collected is used to design additional informative experiments. The algorithm is used here to calibrate the initial reaction rate of an ω-transaminase catalysed reaction in a more accurate way. The parameter confidence region estimated from the Fisher Information Matrix is compared with the likelihood confidence region, which is a more accurate, but also a computationally more expensive method. As a result, an important deviation between both approaches is found, confirming that linearisation methods should be applied with care for nonlinear models. This article is protected by copyright. All rights reserved.

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Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Department of Chemistry, Ghent University, Lund University
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.727 SNIP 0.825 CiteScore 2.07
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.808 SNIP 0.931 CiteScore 2.2
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.764 SNIP 0.847 CiteScore 2.16
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.84 SNIP 0.868 CiteScore 2.35
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.918 SNIP 0.956 CiteScore 2.4
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.988 SNIP 0.947
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.965 SNIP 1.047
Web of Science (2009): Indexed yes
Application of Photocurrent Model on Polymer Solar Cells Under Forward Bias Stress

We performed a constant current stress at forward bias on organic heterojunction solar cells. We measured current voltage curves in both dark and light at each stress step to calculate the photocurrent. An existing model applied to photocurrent experimental data allows the estimation of several parameters such as generation, recombination, dissociation rate, and nearly zero field voltage within the active layer as a function of the stress time. The analysis of extrapolated parameters shows that the stress mainly affects the recombination rate of the polaron charge transfer states.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Organic Energy Materials, University of Padova, University of Padova
Authors: Rizzo, A. (Ekstern), Torto, L. (Ekstern), Wrachien, N. (Ekstern), Corazza, M. (Intern), Krebs, F. C. (Intern), Gevorgyan, S. (Intern), Cester, A. (Ekstern)
Pages: 1542-1548
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: IEEE Journal of Photovoltaics
Volume: 6
Issue number: 6
ISSN (Print): 2156-3381
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.512 SNIP 1.268 CiteScore 4.14
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.909 SNIP 1.966 CiteScore 4.42
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Application of Probabilistic Modeling to Quantify the Reduction Levels of Hepatocellular Carcinoma Risk Attributable to Chronic Aflatoxins Exposure

Epidemiological studies show a definite connection between areas of high aflatoxin content and a high occurrence of human hepatocellular carcinoma (HCC). Hepatitis B virus in individuals further increases the risk of HCC. The two risk factors are prevalent in rural Kenya and continuously predispose the rural populations to HCC. A quantitative cancer risk assessment therefore quantified the levels at which potential pre- and postharvest interventions reduce the HCC risk attributable to consumption of contaminated maize and groundnuts. The assessment applied a probabilistic model to derive probability distributions of HCC cases and percentage reductions levels of the risk from secondary data. Contaminated maize and groundnuts contributed to 1,847 +/- 514 and 158 +/- 52 HCC cases per annum, respectively. The total contribution of both foods to the risk was additive as it resulted in 2,000 +/- 518 cases per annum. Consumption and contamination levels contributed significantly to the risk whereby lower age groups were most affected. Nonetheless, pre- and postharvest interventions might reduce the risk by 23.0-83.4% and 4.8-95.1%, respectively. Therefore, chronic exposure to aflatoxins increases the HCC risk in rural Kenya, but a significant reduction of the risk can be achieved by applying specific pre- and postharvest interventions.

General information
State: Published
Organisations: National Food Institute, Research Group for Genomic Epidemiology, University of Nairobi, Kenya Nutritionists and Dieticians Institute
Authors: Wambui, J. M. (Ekstern), Karuri, E. G. (Ekstern), Ojiambo, J. A. (Ekstern), Njage, P. M. K. (Intern)
Number of pages: 13
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Nutrition and Cancer-an International Journal
Volume: 69
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BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.895 SNIP 0.841 CiteScore 2.5
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.967 SNIP 0.823 CiteScore 2.36
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.915 SNIP 0.809 CiteScore 2.5
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.057 SNIP 0.841 CiteScore 3.07
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.1 SNIP 0.94 CiteScore 3.2
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.901 SNIP 0.891 CiteScore 2.83
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Application of silicone based elastomers for manufacturing of Green Fiber Bottle

Due to ever-increasing demand of sustainable products, eco-friendly packaging solutions are finding their importance in the paper packaging industry [1]. Green Fiber Bottle (GFB) is an alternative to plastic, glass and metal based packaging for beverages. The manufacturing of paper bottle is a two-stage process, where the wood fibers are first thermoformed in the desired shape followed by drying of the formed geometry [2]. To ensure the robustness of the bottle and to avoid shrinkage of cellulose fibers, the wet-formed bottle is pressurized using a silicone core. The core is inserted inside the drying tool and inflated. This keeps the wet bottle under pressure thereby enhancing formation of good hydrogen bonds, and hence providing good strength. The feasibility of the tool design concept is supported with Finite Element Model. The hyperelastic behaviour of silicone is defined by the deformation energy function (W). To simulate the inflation action of the core, Yeoh’s model is used for modelling of W. The strength of the GFB is correlated with the pressure the bottle can hold and the cut off burst pressure from experiments is also reported in this work.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Saxena, P. (Intern), Bissacco, G. (Intern)
Number of pages: 1
Pages: 62
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Main Research Area: Technical/natural sciences
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Electronic versions:
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Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017
Application of silicone based elastomers for manufacturing of Green Fiber Bottle

Due to ever-increasing demand of sustainable products, eco-friendly packaging solutions are finding their importance in the paper packaging industry. Green Fiber Bottle (GFB) is an alternative to plastic, glass and metal based packaging for beverages. The tool concept for manufacturing of paper bottle uses a silicone based elastomer as the core. The expansion of core in the tool resists shrinkage of paper during drying as well as helps in obtaining good fiber compaction. The feasibility of the tool concept in the production of GFB is discussed in this work.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Saxena, P. (Intern), Bissacco, G. (Intern)
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Main Research Area: Technical/natural sciences
Electronic versions: Poster_Saxena_and_Bissacco.pdf
Publication: Research - peer-review › Poster – Annual report year: 2017

Application of simulated lidar scanning patterns to constrained Gaussian turbulence fields

We demonstrate a method for incorporating wind velocity measurements from multiple-point scanning lidars into threedimensional wind turbulence time series serving as input to wind turbine load simulations. Simulated lidar scanning patterns are implemented by imposing constraints on randomly generated Gaussian turbulence fields in compliance with the Mann model for neutral stability. The expected efficiency of various scanning patterns is estimated by means of the explained variance associated with the constrained field. A numerical study is made using the HAWC2 aerelastic software, whereby the constrained turbulence wind time series serves as input to load simulations on a 10 MW wind turbine model using scanning patterns simulating different lidar technologies—pulsed lidar with one or multiple beams—and continuous wave lidar scanning in three different revolving patterns. Based on the results of this study, we assess the influence of the proposed method on the statistical uncertainty in wind turbine extreme and fatigue loads. The main conclusion is that introducing lidar measurements as turbulence constraints in load simulations may bring significant reduction in load and energy production uncertainty, not accounting for any additional uncertainty from real measurements. The constrained turbulence method is most efficient for prediction of energy production and loads governed by the turbulence intensity and the thrust force, while for other load components such as tower base side-to-side moment, the achieved reduction in uncertainty is minimal.

General information
State: Published
Organisations: Department of Wind Energy, Wind Turbine Structures and Component Design
Authors: Dimitrov, N. K. (Intern), Natarajan, A. (Intern)
Number of pages: 17
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Journal: Wind Energy
Volume: 20
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.37 SJR 1.104 SNIP 2.306
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.196 SNIP 2.086 CiteScore 3.06
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.272 SNIP 3.75 CiteScore 3.42
Application of the thermostable β-galactosidase, BgaB, from Geobacillus stearothermophilus as a versatile reporter under anaerobic and aerobic conditions

Use of thermophilic organisms has a range of advantages, but the significant lack of engineering tools limits their applications. Here we show that β-galactosidase from Geobacillus stearothermophilus (BgaB) can be applicable in a range of conditions, including different temperatures and oxygen concentrations. This protein functions both as a marker, promoting colony color development in the presence of a lactose analogue S-gal, and as a reporter enabling quantitative measurement by a simple colorimetric assay. Optimal performance was observed at 70 °C and pH 6.4. The gene was introduced into G. thermoglucosidans. The combination of BgaB expressed from promoters of varying strength with S-gal produced distinct black colonies in aerobic and anaerobic conditions at temperatures ranging from 37 to 60 °C. It showed an important advantage over the conventional β-galactosidase (LacZ) and substrate X-gal, which were inactive at high temperature and under anaerobic conditions. To demonstrate the versatility of the reporter, a promoter library was constructed by randomizing sequences around −35 and −10 regions in a wild type groES promoter from Geobacillus sp. GHH01. The library contained 28 promoter variants and encompassed fivefold variation. The experimental pipeline allowed construction and measurement of expression levels of the library in just 4 days. This β-galactosidase provides a promising tool for engineering of aerobic, anaerobic, and thermophilic production organisms such as Geobacillus species.
Applications of automatic differentiation in topology optimization

The goal of this article is to demonstrate the applicability and to discuss the advantages and disadvantages of automatic differentiation in topology optimization. The technique makes it possible to wholly or partially automate the evaluation of derivatives for optimization problems and is demonstrated on two separate, previously published types of problems in topology optimization. Two separate software packages for automatic differentiation, CoDiPack and Tapenade are considered, and their performance and usability trade-offs are discussed and compared to a hand coded adjoint gradient evaluation process. Finally, the resulting optimization framework is verified by applying it to a non-trivial unsteady flow topology optimization problem.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics, Technische Universität Kaiserslautern
Authors: Nørgaard, S. A. (Intern), Sagebaum, M. (Ekstern), Gauger, N. R. (Ekstern), Lazarov, B. S. (Intern)
Pages: 1135-1146
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Structural and Multidisciplinary Optimization
Volume: 56
Applications of Fiber-Reinforced Polymers in Additive Manufacturing

Additive manufacturing technologies are these years entering the market of functional final parts. Initial research has been performed targeting the integration of fibers into additive manufactured plastic composites. Major advantages, among others, are for example increased tensile strength and Young's modulus. Key challenges in the field, as of now, are proper fiber placement, fiber seizing, an increased knowledge in the used materials and how they are applied into engineering solutions through proper control of the additive manufacturing process. The aim of this research is the improved understanding of fiber-reinforcement in additive manufacturing in terms of production and application. Vat polymerization and material extrusion techniques for composite additive manufacturing were investigated with respect of increasing adhesion between the matrix material and the fibers. Process optimization was performed in order to avoid matrix cracks.
and delamination.

**General information**

State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Hofstätter, T. (Intern), Pedersen, D. B. (Intern), Tosello, G. (Intern), Hansen, H. N. (Intern)
Pages: 312-316
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Scopus rating (2014): SJR 0.736 SNIP 1.419
Scopus rating (2013): SJR 0.515 SNIP 1.163
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**Applied Genomics of Foodborne Pathogens**

This book provides a timely and thorough snapshot into the emerging and fast evolving area of applied genomics of foodborne pathogens. Driven by the drastic advance of whole genome shot gun sequencing (WGS) technologies, genomics applications are becoming increasingly valuable and even essential in studying, surveying and controlling foodborne microbial pathogens. The vast opportunities brought by this trend are often at odds with the lack of bioinformatics know-how among food safety and public health professionals, since such expertise is not part of a typical food microbiology curriculum and skill set. Further complicating the challenge is the large and ever evolving body of bioinformatics tools that can obfuscate newcomers to this area. Although reviews, tutorials and books are not in short supply in the fields of bioinformatics and genomics, until now there has not been a comprehensive and customized source of information designed for and accessible to microbiologists interested in applying cutting-edge genomics in food safety and public health research. This book fills this void with a well-selected collection of topics, case studies, and bioinformatics tools contributed by experts at the forefront of foodborne pathogen genomics research.

**General information**

State: Published
Organisations: National Food Institute, Research Group for Genomic Epidemiology
Authors: Deng, X. (ed.) (Ekstern), C. den Bakker, H. (ed.) (Ekstern), Hendriksen, R. S. (ed.) (Intern)
Number of pages: 205
Publication date: 2017

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Applying a new ensemble approach to estimating stock status of marine fisheries around the world: Estimating global fisheries status

The exploitation status of marine fisheries stocks worldwide is of critical importance for food security, ecosystem conservation, and fishery sustainability. Applying a suite of data-limited methods to global catch data, combined through an ensemble modeling approach, we provide quantitative estimates of exploitation status for 785 fish stocks. Fifty-six percent (439 stocks) are below BMSY and of these, 261 are estimated to be below 80% of the BMSY level. While the 178 stocks above 80% of BMSY are conventionally considered "fully exploited" stocks staying at this level for many years, forego substantial yield. Our results enable managers to consider more detailed information than simply a categorization of stocks as "fully" or "over" exploited. Our approach is reproducible, allows consistent application to a broad range of stocks, and can be easily updated as new data become available. Applied on an ongoing basis, this approach can provide critical, more detailed information for resource management for more exploited fish stocks than currently available.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Center for Science and Democracy, Union of Concerned Scientists, Environmental Defense Fund, University of California, Santa Barbara , University of Washington, International Council for the Exploration of the Sea, Simon Fraser University, NOAA, CSIRO, FAO, European Commission - Joint Research Center, Rutgers University, Institute of Marine Research, Marine Stewardship Council, University of Sao Paolo, Galway - Mayo Institute of Technology, University of California, Conservation International
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 5.14 SJR 2.936 SNIP 1.818
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 3.513 SNIP 2.009 CiteScore 5.62
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 3.183 SNIP 1.893 CiteScore 4.99
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.756 SNIP 1.671 CiteScore 4.47
ISI indexed (2013): ISI indexed yes
Scopus rating (2012): SJR 2.716 SNIP 1.611 CiteScore 4.24
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scopus rating (2011): SJR 2.817 SNIP 1.424 CiteScore 3.46
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 2.513 SNIP 2.611
Scopus rating (2009): SJR 1.332 SNIP 2.087
Web of Science (2009): Indexed yes
Original language: English
Electronic versions:
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Applying boundary objects to create coherence between management decisions regarding prevention of Musculoskeletal Disorders and implemented changes

Purpose. This study aims to support social healthcare workplaces with methods to establish coherence between management decisions regarding prevention of Musculoskeletal Disorders (MSD) and the work related preventive changes implemented in the organization. The study builds on the known risk factors for developing MSD in combination with the theory of explication of tacit knowledge by the use of boundary objects (Carlile, 2002). Design/Methodology. Searching the literature of visual knowledge generating methods, we selected those who focus on the work process and relate to one or more of the risk factors of MSD. The search resulted in the following methods: Workbooks, Photo-Safari, Layout Games, Employee Exchange, Videos and the Fishbone workshop. Three Occupational Health and Safety Departments in municipalities and one hospital tested the methods, which several public workplaces will apply starting January 2017. Results. The identified visualization methods each addresses specific risk factors of MSD but when combined, they provide a holistic insight in to the work-related causes to MSD at the workplace. The new knowledge forms the basis for focused work-related preventive changes. The test participants found the methods applicable in relation to create coherence between strategy and practice. Research implications: Our preliminary results imply that visualization methods can generate new knowledge about work-related causes to MSD, identification of new preventive changes and how they link to the preventive MSD strategy. Originality/Value. The study investigates the application of boundary objects in the identification of causes and implementation of a preventive MSD strategy and work-related changes.

General information
State: Published
Organisations: Department of Management Engineering, Management Science, Implementation and Performance Management
Authors: Ipsen, C. (Intern), Edwards, K. (Intern), Poulsen, S. (Intern), Seim, R. (Intern)
Publication date: 2017
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Main Research Area: Technical/natural sciences
Electronic versions:
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Source: PublicationPreSubmission
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Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Applying fluorescence correlation spectroscopy to investigate peptide-induced membrane disruption

There is considerable interest in understanding the interactions of antimicrobial peptides with phospholipid membranes. Fluorescence correlation spectroscopy (FCS) is a powerful experimental technique that can be used to gain insight into these interactions. Specifically, FCS can be used to quantify leakage of fluorescent molecules of different sizes from large unilamellar lipid vesicles, thereby providing a tool for estimating the size of peptide-induced membrane disruptions. If fluorescently labeled lipids are incorporated into the membranes of the vesicles, FCS can also be used to obtain information about whether leakage occurs due to localized membrane perturbations or global membrane destabilization. Here, we outline a detailed step-by-step protocol on how to optimally implement an FCS-based leakage assay. To make the protocol easily accessible to other researchers, it has been supplemented with a number of practical tips and tricks.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, Colloids and Biological Interfaces, Center for Nanomedicine and Theranostics, Department of Chemistry
Authors: Kristensen, K. (Intern), Henriksen, J. R. (Intern), Andresen, T. L. (Intern)
Number of pages: 22
Pages: 159-180
Publication date: 2017

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ISBN (Electronic): 978-1-4939-6737-7
Series: Methods in Molecular Biology
Volume: 1548
Applying lean thinking to risk management in product development
This paper re-conceptualizes risk management (RM) in product development (PD) through a lean thinking perspective. Arguably, risk management in PD projects became a victim of its own success. It is often implemented as a highly formalized, compliance driven activity, ending up disconnected from the actual value creation of the engineering task. Cost overrun, delay and low quality decision making is common in product development processes even if RM processes are in place. Product development is about reaching project objectives by gradually reducing uncertainty, but often fail to do so without delay or cost overrun. This paper explores the relationship between product development and risk management and proposes to make RM an integrated value adding part of PD. Through a literature review we identify the potential of re-conceptualizing RM through lean thinking. We then conceptualize an outline of how one could apply lean thinking to RM to create a simple, value focused and consensus forming perspective on how to make RM a meaningful part of PD.

Applying Multi-Class Support Vector Machines for performance assessment of shipping operations: The case of tanker vessels
Energy efficient operations are a key competitive advantage for modern shipping companies. During the operation of the vessel, improvements in energy use can be achieved by not only by technical upgrades, but also through behavioural changes in the way the crew on board is operating the vessels. Identifying the potential of behavioural savings can be challenging, due to the inherent difficulty in analysing the data and operationalizing energy efficiency within the dynamic operating environment of the vessels. This article proposes a supervised learning model for identifying the presence of energy efficient operations. Positive and negative patterns of energy efficient operations were identified and verified through discussions with senior officers and technical superintendents. Based on this data, the high dimensional parameter space that describes vessel operations was first reduced by means of feature selection algorithms. Afterwards, a model based on Multi-Class Support Vector Machines (SVM) was constructed and the efficacy of the approach is shown through the application of a test set. The results demonstrate the importance and benefits of machine learning algorithms in driving energy efficiency on board, as well as the impact of power management on energy costs throughout the life cycle of the ships.
Approaching target: A service for nationwide deformation monitoring in Denmark using Sentinel-1
Approaching target: A service for nationwide deformation monitoring in Denmark using Sentinel-1

Building upon decades of experience with deformation monitoring from repeated precision leveling and GNSS measurements as well as more recent time series analyses of ERS, Envisat, and Sentinel-1 imagery, we are now working towards a nationwide mapping using Sentinel-1 Interferometric Wide Swath (IWS) mode data. The mission’s high spatio-temporal resolution yields multiple new potentials, one of which is the focus of this work: The establishment of an operational service for a nationwide monitoring of vertical land deformations in Denmark.

We present deformation rates over selected test sites, obtained by applying Persistent Scatterer Interferometry to nearly two years of Sentinel-1 IWS data. They clearly demonstrate the potential in using such observations to identify areas undergoing rapid changes, so-called hotspots. Close collaborations with end-users show that the high-resolution information is relevant for, e.g., climate change adaptation and for optimizing renovation works of subsurface pipelines. Other relevant end-users represent road authorities, insurance companies, local authorities, etc. A nationwide mapping therefore is associated with great potentials for optimizing processes in both the public and private sectors. This will inevitably lead to significant economic savings.

The test study makes up part of the foundation for establishing a nationwide service. As such, the results over the test sites will be presented to a broad range of end-users to identify their needs for the full-scale, technical solution.

Furthermore, we investigate how to optimally exploit our network of in-situ measurements as well as a national uplift model to generate absolute deformation rates with a mm-accuracy. Combined with the close involvement of end-users, we focus on developing a service tailored to specific needs, which increases the probability of its implementation in both the public and private sectors.

Presenting the results obtained on the road to setting up a nationwide deformation monitoring will clearly demonstrate the potentials arising with the continuous stream of Sentinel-1 IWS data.

A predation cost to bold fish in the wild

Studies of predator-mediated selection on behaviour are critical for our understanding of the evolution and maintenance of behavioural diversity in natural populations. Consistent individual differences in prey behaviour, especially in the propensity to take risks (“boldness”), are widespread in the animal kingdom. Theory predicts that individual behavioural types differ in a cost-benefit trade-off where bolder individuals benefit from greater access to resources while paying higher predation-risk costs. However, explicitly linking predation events to individual behaviour under natural conditions is challenging and there is currently little data from the wild. We assayed individual behaviour and electronically tagged hundreds of fish (roach, Rutilus rutilus) before releasing them into their lake of origin, thereby exposing them to predation risk from avian apex predators (cormorants, Phalacrocorax carbo). Scanning for regurgitated tags at the cormorant roosting site provided data on individual predation events. We found that fish with higher boldness have a greater susceptibility to cormorant predation compared to relatively shy, risk-averse individuals. Our findings hereby provide unique and direct evidence of behavioural type-dependent predation vulnerability in the wild, i.e. that there is a predation cost to boldness, which is critical for our understanding of the evolution and maintenance of behavioural diversity in natural populations.
A predator-2 prey fast-slow dynamical system for rapid predator evolution

We consider adaptive change of diet of a predator population that switches its feeding between two prey populations. We develop a novel 1 fast-3 slow dynamical system to describe the dynamics of the three populations amidst continuous but rapid evolution of the predator's diet choice. The two extremes at which the predator's diet is composed solely of one prey correspond to two branches of the three-branch critical manifold of the fast slow system. By calculating the points at which there is a fast transition between these two feeding choices (i.e., branches of the critical manifold), we prove that the system has a two-parameter family of periodic orbits for sufficiently large separation of the time scales between the evolutionary and ecological dynamics. Using numerical simulations, we show that these periodic orbits exist, and that their phase difference and oscillation patterns persist, when ecological and evolutionary interactions occur on comparable time scales. Our model also exhibits periodic orbits that agree qualitatively with oscillation patterns observed in experimental studies of the coupling between rapid evolution and ecological interactions.
MATHEMATICS, PHYSICS, SINGULAR PERTURBATION-THEORY, ECOLOGICAL DYNAMICS, CONTEMPORARY EVOLUTION, FUNCTIONAL-RESPONSE, AUTONOMOUS SYSTEMS, VIBRIO-CHOLERAE, POPULATION, COEVOLUTION, BACTERIOPHAGE, TRAITS, Lotka-Volterra interaction, fast-slow dynamical systems, geometric singular perturbation theory, planktonic protozoa-algae dynamics, 37N25 34A26 37C27 92B05, math.DS, nlin.AO, q-bio.PE, Systems theory applications in natural resources and ecology, Systems theory applications in biology and medicine, ecology, evolution (biological), predator-prey systems, predator-2 prey fast–slow dynamical system, rapid predator evolution, predator population, prey populations, three-branch critical manifold, periodic orbits, ecological dynamics, evolutionary dynamics, phase difference, oscillation patterns, ecological interactions, evolutionary interactions

DOI: 10.1137/16M1068426
A prism based magnifying hyperlens with broad-band imaging

Magnification in metamaterial hyperlenses has been demonstrated using curved geometries or tapered devices, at frequencies ranging from the microwave to the ultraviolet spectrum. One of the main issues of such hyperlenses is the difficulty in manufacturing. In this letter, we numerically and experimentally study a wire medium prism as an imaging device at THz frequencies. We characterize the transmission of the image of two sub-wavelength apertures, observing that our device is capable of resolving the apertures and producing a two-fold magnified image at the output. The hyperlens shows strong frequency dependent artefacts, a priori limiting the use of the device for broad-band imaging. We identify the main source of image aberration as the reflections supported by the wire medium and also show that even the weaker reflections severely affect the imaging quality. In order to correct for the reflections, we devise a filtering technique equivalent to spatially variable time gating so that ultra-broad band imaging is achieved.

General information
State: Published
Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation, University of Sydney
Authors: Habib, M. S. (Ekstern), Stefani, A. (Intern), Atakaramians, S. (Ekstern), Fleming, S. C. (Ekstern), Argyros, A. (Ekstern), Kuhlmey, B. T. (Ekstern)
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Scopus rating (2016): CiteScore 2.67 SJR 1.132 SNIP 0.996
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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.799 SNIP 1.462 CiteScore 3.25
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BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.149 SNIP 1.652 CiteScore 3.77
ISI indexed (2013): ISI indexed yes
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Scopus rating (2012): SJR 2.554 SNIP 1.754 CiteScore 3.76
ISI indexed (2012): ISI indexed yes
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BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.805 SNIP 1.94 CiteScore 4.04
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.926 SNIP 1.789
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
A Probabilistic Framework for Curve Evolution

In this work, we propose a nonparametric probabilistic framework for image segmentation using deformable models. We estimate an underlying probability distributions of image features from regions defined by a deformable curve. We then evolve the curve such that the distance between the distributions is increasing. The resulting active contour resembles a well studied piecewise constant Mumford-Shah model, but in a probabilistic setting. An important property of our framework is that it does not require a particular type of distributions in different image regions. Additional advantages of our approach include ability to handle textured images, simple generalization to multiple regions, and efficiency in computation. We test our probabilistic framework in combination with parametric (snakes) and geometric (level-sets) curves. The experimental results on composed and natural images demonstrate excellent properties of our framework.
A procedure for grouping food consumption data for use in food allergen risk assessment

Food allergic subjects need to avoid the allergenic food that triggers their allergy. However, foods can also contain unintended allergens. Food manufacturers or authorities need to perform a risk assessment to be able to decide if unintended allergen presence constitutes a risk to food allergic consumers. One of the input parameters in risk assessment is the amount of a given food consumed in a meal. There has been little emphasis on how food consumption data can be used in food allergen risk assessment. The aim of the study was to organize the complex datasets from National Food Consumption Surveys from different countries (France, Netherlands and Denmark) to be manageable in food allergen risk assessment. To do this, a two-step method was developed. First, based on initial groups of similar food items, the homogeneity of consumption was evaluated using a customized clustering method. Then, the risk was calculated for each initial food group and its subgroups to verify if it also represents a relevant difference in risk. Forty-eight food groups were designated in Denmark (53 in the Netherlands, 54 in France). Finally, summary statistics and names for each food group for the Danish data illustrate the results when applying the procedure.
A proof of the Barát-Thomassen conjecture

The Barát-Thomassen conjecture asserts that for every tree $T$ on $m$ edges, there exists a constant $k_T$ such that every $k_T$-edge-connected graph with size divisible by $m$ can be edge-decomposed into copies of $T$. So far this conjecture has only been verified when $T$ is a path or when $T$ has diameter at most 4. Here we prove the full statement of the conjecture.

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Organisations: Department of Applied Mathematics and Computer Science, Algorithms and Logic, Université Toulouse III - Paul Sabatier, Ecole Normale Superieure de Lyon
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Web of Science (2015): Indexed yes
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Scopus rating (2014): SJR 2.211 SNIP 2.018 CiteScore 1.1
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BFI (2013): BFI-level 2
A prospective observational longitudinal study of new-onset seizures and newly diagnosed epilepsy in dogs

Seizures are common in dogs and can be caused by non-epileptic conditions or epilepsy. The clinical course of newly diagnosed epilepsy is sparsely documented. The objective of this study was to prospectively investigate causes for seizures (epileptic and non-epileptic) in a cohort of dogs with new-onset untreated seizures, and for those dogs with newly diagnosed epilepsy to investigate epilepsy type, seizure type and the course of disease over time, including the risk of seizure recurrence. Untreated client-owned dogs experiencing new-onset seizures were prospectively enrolled in a longitudinal observational study including clinical investigations and long-term monitoring at the Copenhagen University Hospital for Companion Animals. A baseline clinical assessment was followed by investigator/owner contact every eight weeks from inclusion to death or end of study. Inclusion of dogs was conducted from November 2010 to September 2012, and the study terminated in June 2014. One hundred and six dogs were included in the study. Seventy-nine dogs (74.5%) were diagnosed with idiopathic epilepsy, 13 dogs (16.5%) with structural epilepsy and five dogs (6.3%) with suspected structural epilepsy. A non-epileptic cause for seizures was identified in 13 dogs and suspected in 10 dogs. Four dogs in which no cause for seizures was identified experienced only one seizure during the study. In dogs with idiopathic epilepsy 60% had their second epileptic seizure within three months of seizure onset. Twenty-six dogs with idiopathic epilepsy (43%) completed the study without receiving antiepileptic treatment. The natural course of idiopathic epilepsy (uninfluenced by drugs) was illustrated by highly individual and fluctuating seizure patterns,
including long periods of remission. Cluster seizures motivated early treatment. In a few dogs with a high seizure frequency owners declined treatment against the investigators advice. Epilepsy is the most likely diagnosis in dogs presenting with new-onset seizures. The course of idiopathic epilepsy is highly individual and might not necessarily require long-term treatment. This must be considered when advising owners about what to expect with regard to treatment and prognosis.
A pseudo-Voigt component model for high-resolution recovery of constituent spectra in Raman spectroscopy

Raman spectroscopy is a well-known analytical technique for identifying and analyzing chemical species. Since Raman scattering is a weak effect, surface-enhanced Raman spectroscopy (SERS) is often employed to amplify the signal. SERS signal surface mapping is a common method for detecting trace amounts of target molecules. Since the method produces large amounts of data and, in the case of very low concentrations, low signal-to-noise (SNR) ratio, ability to extract relevant spectral features is crucial. We propose a pseudo-Voigt model as a constrained source separation model, that is able to directly and reliably identify the Raman modes, with overall performance similar to the state of the art non-negative matrix factorization approach. However, the model provides better interpretation and is a step towards enabling the use of SERS in detection of trace amounts of molecules in real-life settings.

Aqualase, a yeast-based in-feed probiotic, modulates intestinal microbiota, immunity and growth of rainbow trout Oncorhynchus mykiss

Yeast probiotics have great promise, yet they received little attention in fish. This study investigated the influence of Aqualase, a yeast-based commercial probiotic composed of Saccharomyces cerevisiae and Saccharomyces ellipsoideas, on health and performance of rainbow trout (Oncorhynchus mykiss). Probiotics were incorporated in the diets at three different inclusion levels (1%, 1.5% and 2%) and administered to the fish for a period of 8 weeks. After the feeding trial, intestinal total viable aerobic bacterial count was significantly higher in fish group that received 2% in-feed probiotics.

In addition, a significant increase in at least 11% in intestinal lactic acid bacteria population was observed in all probiotic-fed groups. Total protein level and lysozyme activity in skin mucus were significantly elevated following probiotic feeding. Inhibitory potential of skin mucus against fish pathogens was significantly enhanced by at least 50% in probiotic-fed groups. Humoral and cellular immune parameters were influenced by probiotic feeding and the effects were dependent on inclusion level. Digestive physiology was affected by infeed probiotics through improvement of intestinal enzyme activities. All growth performance parameters were significantly improved following probiotic administration specifically at inclusion rate 1.5% and above. Taken together, the results revealed that Aqualase is a promising yeast-based probiotic for rainbow trout with the capability of modulating the intestinal microbiota, immunity and growth.
Aquaporin based biomimetic membrane in forward osmosis: Chemical cleaning resistance and practical operation

Aquaporin plays a promising role in fabricating high performance biomimetic forward osmosis (FO) membranes. However, aquaporin as a protein also has a risk of denaturation caused by various chemicals, resulting in a possible decay of membrane performance. The present study tested a novel aquaporin based biomimetic membrane in simulated membrane cleaning processes. The effects of cleaning agents on water flux and salt rejection were evaluated. The membrane showed a good resistance to the chemical agents. The water flux after chemical cleaning showed significant increases, particularly after cleaning with NaOCl and Alconox. Changes in the membrane structure and increased hydrophilicity in the surrounding areas of the aquaporin may be accountable for the increase in water permeability. The membrane shows stable salt rejection up to 99% after all cleaning agents were tested. A 15-day experiment with secondary wastewater effluent as the feed solution and seawater as the draw solution showed a stable flux and high salt rejection. The average rejection of the dissolved organic carbon from wastewater after the 15-day test was 90%. The results demonstrated that the aquaporin based biomimetic FO membrane exhibits chemical resistance for most agents used in membrane cleaning procedures, maintaining a stable flux and high salt rejection.

General information
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Organisations: Department of Environmental Engineering, Water Technologies, Northwest Agriculture and Forestry University, King Abdullah University of Science and Technology, Clemson University
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Scopus rating (2014): SJR 1.86 SNIP 2.257 CiteScore 4.65
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Scopus rating (2013): SJR 1.733 SNIP 2.17 CiteScore 4.28
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ISI indexed (2012): ISI indexed yes
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ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
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Aquatic conservation

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Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology
Authors: Brownscombe, J. W. (Ekstern), Reid, A. J. (Ekstern), Dolgova, L. (Ekstern), Pusiak, R. (Ekstern), Laurich, B. (Ekstern), Turenne, E. D. (Ekstern), Zolderdo, A. (Ekstern), Moraga, A. (Ekstern), Birnie-Gauvin, K. (Intern), Brooks, J. (Ekstern), Sullivan, B. (Ekstern), Ford, M. (Ekstern), Bower, S. D. (Ekstern), Bennett, J. R. (Ekstern), Cooke, S. J. (Ekstern)
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Aquatic toxicity testing of liquid hydrophobic chemicals – Passive dosing exactly at the saturation limit
The aims of the present study were (1) to develop a passive dosing approach for aquatic toxicity testing of liquid substances with very high Kow values and (2) to apply this approach to the model substance dodecylbenzene (DDB, Log Kow = 8.65). The first step was to design a new passive dosing format for testing DDB exactly at its saturation limit. Silicone O-rings were saturated by direct immersion in pure liquid DDB, which resulted in swelling of >14%. These saturated O-rings were used to establish and maintain DDB exposure exactly at the saturation limit throughout 72-h algal growth inhibition tests with green algae Raphidocelis subcapitata. Growth rate inhibition at DDB solubility was 13 ± 5% (95% CI) in a first and 8 ± 3% (95% CI) in a repeated test, which demonstrated that improved exposure control can lead to good precision and repeatability of toxicity tests. This moderate toxicity at chemical activity of unity was higher than expected relative to a reported hydrophobicity cut-off in toxicity, but lower than expected relative to a reported chemical activity range for baseline toxicity. The present study introduces a new effective approach for toxicity testing of an important group of challenging chemicals, while providing a basis for investigating toxicity cut-off theories.

General information
State: Published
Organisations: Department of Environmental Engineering, Environmental Chemistry, RWTH Aachen University, Technical University of Denmark
Aqueous metal–organic solutions for YSZ thin film inkjet deposition

Inkjet printing of 8% Y2O3-stabilized ZrO2 (YSZ) thin films is achieved by designing a novel water-based reactive ink for Drop-on-Demand (DoD) inkjet printing. The ink formulation is based on a novel chemical strategy that consists of a combination of metal oxide precursors (zirconium alkoxide and yttrium salt), water and a nucleophilic agent, i.e. n-methyldiethanolamine (MDEA). This chemistry leads to metal–organic complexes with long term ink stability and high precision printability. Ink rheology and chemical reactivity are analyzed and controlled in terms of metal–organic interactions in the solutions. Thin dense nanocrystalline YSZ films below 150 nm are obtained by low temperature calcination treatments (400–500 °C), making the deposition suitable for a large variety of substrates, including silicon, glass and metals. Thin films and printed patterns achieve full densification with no lateral shrinkage and high ionic conductivity.

General information

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Organisations: Department of Energy Conversion and Storage, Ceramic Engineering & Science, Applied Electrochemistry, Technical University of Denmark, EPFL
Authors: Gadea, C. (Intern), Hanniet, Q. (Ekstern), Lesch, A. (Ekstern), Marani, D. (Intern), Jensen, S. H. (Intern), Esposito, V. (Intern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.751 SNIP 1.577 CiteScore 5.32
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.505 SNIP 1.36 CiteScore 4.64
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
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Architecturally Significant Requirements Identification, Classification and Change Management for Multi-tenant Cloud-Based Systems

Involvement of numerous stakeholders in cloud-based systems' design and usage with varying degrees of nonfunctional requirements makes Architecturally Significant Requirements (ASRs) identification and management a challenge undertaking. The aim of the research presented in this chapter is to identify different types of design-time and run-time ASRs of the cloud-based systems, provide an ASRs classification scheme and present a framework to manage the requirements' variability during life cycle of the cloud-based systems. We have used a multifaceted research approach to address the ASRs identification, classification, and change management challenges. We have explored findings from systematic as well as structured reviews of the literature on quality requirements of the cloud-based systems including but not limited to security, availability, scalability, privacy, and multi-tenancy. We have presented a framework for requirements classification and change management focusing on distributed Platform as a Service (PaaS) and Software as a Service (SaaS) systems as well as complex software ecosystems that are built using PaaS and SaaS, such as Tools as a Service (TaaS). We have demonstrated applicability of the framework on a selected set of the requirements for the cloud-based systems. The results of the research presented in this chapter show that key quality requirements of the cloud-based systems, for example, multi-tenancy and security, have a significant impact on how other quality requirements (such as scalability, reliability, and interoperability) are handled in the overall architecture design of a cloud-based system. It is important to distinguish tenant-specific run-time architecturally significant quality requirements and corresponding cloud-based systems' components so that run-time status of the tenant-specific architecture quality requirements can be monitored and system configurations can be adjusted accordingly. For the systems that can be used by multiple tenants, the requirements change management framework should consider if the addition or modification (triggered by a specific tenant) of a quality requirement can impact quality requirements of other tenants, and whether or not a trade-off point should be introduced in the architecture (corresponding to the requirements). The trade-off point can also be referred as a variability point, that is, a compromise has to be made among the number of quality requirements and only some of the requirements can be satisfied. System analysts and software architects can use the proposed taxonomy and the management framework for identifying relevant quality requirements for multi-tenant cloud-based systems, for analyzing impact of changes in the requirements on the overall system architecture, and for managing variability of the architecturally significant requirements.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Cyber Security
Authors: Chauhan, M. A. (Intern), Probst, C. W. (Intern)
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Arctic Sea Level During the Satellite Altimetry Era

Results of the sea-level budget in the high latitudes (up to 80°N) and the Arctic Ocean during the satellite altimetry era. We investigate the closure of the sea-level budget since 2002 using two altimetry sea-level datasets based on the Envisat waveform retracking: temperature and salinity data from the ORAP5 reanalysis, and Gravity Recovery And Climate Experiment (GRACE) space gravimetry data to estimate the steric and mass components. Regional sea-level trends seen in the altimetry map, in particular over the Beaufort Gyre and along the eastern coast of Greenland, are of halosteric origin. However, in terms of regional average over the region ranging from 66°N to 80°N, the steric component contributes little to the observed sea-level trend, suggesting a dominant mass contribution in the Arctic region. This is confirmed by GRACE-based ocean mass time series that agree well with the altimetry-based sea-level time series. Direct estimate of the mass component is not possible prior to GRACE. Thus, we estimated the mass contribution from the difference between the altimetry-based sea level and the steric component. We also investigate the coastal sea level with tide gauge records. Twenty coupled climate models from the CMIP5 project are also used. The models lead us to the same conclusions concerning the halosteric origin of the trend patterns.
A Reaction Database for Small Molecule Pharmaceutical Processes Integrated with Process Information

This article describes the development of a reaction database with the objective to collect data for multiphase reactions involved in small molecule pharmaceutical processes with a search engine to retrieve necessary data in investigations of reaction-separation schemes, such as the role of organic solvents in reaction performance improvement. The focus of this reaction database is to provide a data rich environment with process information available to assist during the early stage synthesis of pharmaceutical products. The database is structured in terms of reaction classification of reaction types; compounds participating in the reaction; use of organic solvents and their function; information for single step and multistep reactions; target products; reaction conditions and reaction data. Information for reactor scale-up together with information for the separation and other relevant information for each reaction and reference are also available in the database. Additionally, the retrieved information obtained from the database can be evaluated in terms of sustainability using well-known “green” metrics published in the scientific literature. The application of the database is illustrated through the synthesis of ibuprofen, for which data on different reaction pathways have been retrieved from the database and compared using “green” chemistry metrics.

General information
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Organisations: Department of Chemical and Biochemical Engineering, KT Consortium, PROSYS - Process and Systems Engineering Centre, King Mongkut's Institute of Technology Ladkrabang
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Are building users prepared for energy flexible buildings—A large-scale survey in the Netherlands

Building energy flexibility might play a crucial role in demand side management for integrating intermittent renewables into smart grids. The potential of building energy flexibility depends not only on the physical characteristics of a building but also on occupant behaviour in the building. Building users will have to adopt smart technologies and to change their daily energy use behaviours or routines, if energy flexibility is to be achieved. The willingness of users to make changes will determine how much demand flexibility can be achieved in buildings and whether energy flexible buildings can be realized. This will have a considerable impact on the transition to smart grids. This study is thus to assess the perception of smart grids and energy flexible buildings by building users, and their readiness for them on a large scale. We attempted to identify the key characteristics of the ideal user of flexible buildings. A questionnaire was designed and administered as an online survey in the Netherlands. The questionnaire consisted of questions about the sociodemographic characteristics of the current users, house type, household composition, current energy use behaviour, willingness to use smart technologies, and willingness to change energy use behaviour. The survey was completed by 835 respondents, of which 785 (94%) were considered to have provided a genuine response. Our analysis showed that the concept of smart grids is an unfamiliar one, as more than 60% of the respondents had never heard of smart grids. However, unfamiliarity with smart grids increased with age, and half of the respondents aged 20–29 years old were aware of the concept. Monetary incentives were identified as the biggest motivating factor for adoption of smart grid technologies. It was also found that people would be most in favour of acquiring smart dishwashers (65% of the respondents) and refrigerator/freezers (60%). Statistical analysis shows that people who are willing to use smart technologies are also willing to change their behaviour,
and can thus be categorised as potentially flexible building users. Given certain assumptions, 11% of the respondents were found to be potentially flexible building users. To encourage people to be prepared for energy flexible buildings, awareness of smart grids will have to be increased, and the adoption of smart technologies may have to be promoted by providing incentives such as financial rewards.

**General information**

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Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics, Eindhoven University of Technology
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BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.473 SNIP 2.84 CiteScore 5.5
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.516 SNIP 2.25
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.003 SNIP 1.781
Web of Science (2009): Indexed yes
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Scopus rating (2008): SJR 0.974 SNIP 1.215
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.179 SNIP 1.709
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.979 SNIP 1.293
Scopus rating (2005): SJR 1.043 SNIP 0.996
Web of Science (2005): Indexed yes
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Elastocaloric cooling and heating is an alternative cooling technology that has potential to be highly efficient and environmentally friendly. Experimental results are reported for two elastocaloric regenerators made of NiTi alloys in the form of parallel plates in two plate thicknesses. For the regenerator made of 0.2 mm plates, a maximum no-load temperature span of 17.6 K was achieved for an applied strain of 4.3 \%. For the regenerator with 0.35 mm plates, a maximum temperature span of 19.9 K was reached for a strain of 3.5 \%. The 0.2 mm regenerator failed after approximately 5200 cycles and the 0.35 mm regenerator failed after approximately 5500 cycles.
A regional and nonstationary model for partial duration series of extreme rainfall

Regional extreme value models for estimation of extreme rainfall intensities are widely applied, but their underlying assumption of stationarity is challenged. Many recent studies show that the rainfall extremes worldwide exhibit a nonstationary behavior. This paper presents a spatiotemporal model of extreme rainfall. The framework is built on a partial duration series approach with a nonstationary, regional threshold value. The model is based on generalized linear regression solved by generalized estimation equations. It allows a spatial correlation between the stations in the network and accounts furthermore for variable observation periods at each station and in each year. Marginal regional and temporal regression models solved by generalized least squares are used to validate and discuss the results of the full spatiotemporal model. The model is applied on data from a large Danish rain gauge network for four durations ranging from 10 min to 24 h. The observation period differs between stations, and the number of stations with more than 10 years of observations has increased over the years. A spatiotemporal model for the threshold is suggested, applying the mean annual precipitation and time as the explanatory variables in the regional and temporal domain, respectively. Further analysis of partial duration series with nonstationary and regional thresholds shows that the mean exceedances also exhibit a significant variation in space and time for some rainfall durations, while the shape parameter is found to be constant.
**General information**
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, Urban Water Systems, DHI Denmark
Authors: Gregersen, I. B. (Intern), Madsen, H. (Ekstern), Rosbjerg, D. (Intern), Arnbjerg-Nielsen, K. (Intern)
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- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 2.58 SNIP 1.617 CiteScore 4.06
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 2.44 SNIP 1.643 CiteScore 3.75
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 2.205 SNIP 1.748 CiteScore 3.65
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 2.123 SNIP 1.567 CiteScore 3.12
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 1.946 SNIP 1.481 CiteScore 2.92
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 2
- Scopus rating (2010): SJR 2.051 SNIP 1.433
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 2
- Scopus rating (2009): SJR 2.132 SNIP 1.524
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 1.753 SNIP 1.522
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 1.619 SNIP 1.401
- Web of Science (2007): Indexed yes
- Scopus rating (2006): SJR 1.663 SNIP 1.589
- Web of Science (2006): Indexed yes
- Scopus rating (2005): SJR 1.596 SNIP 1.327
- Web of Science (2005): Indexed yes
- Scopus rating (2004): SJR 1.597 SNIP 1.427
- Web of Science (2004): Indexed yes
- Scopus rating (2003): SJR 1.904 SNIP 1.762
- Scopus rating (2002): SJR 1.805 SNIP 1.979
A research agenda for a people-centred approach to energy access in the urbanizing global south

Energy access is typically viewed as a problem for rural areas, but people living in urban settings also face energy challenges that have not received sufficient attention. A revised agenda in research and practice that puts the user and local planning complexities centre stage is needed to change the way we look at energy access in urban areas, to understand the implications of the concentration of vulnerable people in slums and to identify opportunities for planned management and innovation that can deliver urban energy transitions while leaving no one behind. Here, we propose a research agenda focused on three key issues: understanding the needs of urban energy users; enabling the use of context-specific, disaggregated data; and engaging with effective modes of energy and urban governance. This agenda requires interdisciplinary scholarship across the social and physical sciences to support local action and deliver large-scale, inclusive transformations.

A resource-efficient network interface supporting low latency reconfiguration of virtual circuits in time-division multiplexing networks-on-chip

This paper presents a resource-efficient time-division multiplexing network interface of a network-on-chip intended for use in a multicore platform for hard real-time systems. The network-on-chip provides virtual circuits to move data between core-local on-chip memories. In such a platform, a change of the application’s operating mode may require reconfiguration of virtual circuits that are setup by the network-on-chip. A unique feature of our network interface is the instantaneous reconfiguration between different time-division multiplexing schedules, containing sets of virtual circuits, without affecting virtual circuits that persist across the reconfiguration. The results show that the worst-case latency from triggering a reconfiguration until the new schedule is executing, is in the range of 300 clock cycles. Experiments show that new schedules can be transmitted from a single master to all slave nodes for a 16-core platform in between 500 and 3500 clock cycles. The results also show that the hardware cost for an FPGA implementation of our architecture is considerably smaller than other network-on-chips with similar reconfiguration functionalities, and that the worst-case time for a
reconfiguration is smaller than that seen in functionally equivalent architectures.

**General information**

State: Published

Organisations: Department of Applied Mathematics and Computer Science, Embedded Systems Engineering

Authors: Sørensen, R. B. (Intern), Pezzarossa, L. (Intern), Schoeberl, M. (Intern), Sparse, J. (Intern)

Pages: 1–13

Publication date: 2017

Main Research Area: Technical/natural sciences

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Journal: Journal of Systems Architecture

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- BFI (2017): BFI-level 2
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): SJR 0.341 SNIP 1.192 CiteScore 1.66
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 0.301 SNIP 1.046 CiteScore 1.39
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 0.294 SNIP 1.24 CiteScore 1.14
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 0.317 SNIP 1.432 CiteScore 1.32
- ISI indexed (2013): ISI indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 0.325 SNIP 1.182 CiteScore 1.51
- ISI indexed (2012): ISI indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 0.278 SNIP 1.221 CiteScore 1.23
- ISI indexed (2011): ISI indexed yes
- BFI (2010): BFI-level 2
- Scopus rating (2010): SJR 0.37 SNIP 1.188
- BFI (2009): BFI-level 2
- Scopus rating (2009): SJR 0.354 SNIP 1.045
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 0.302 SNIP 0.813
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 0.351 SNIP 0.92
- Web of Science (2007): Indexed yes
- Scopus rating (2006): SJR 0.291 SNIP 0.824
- Scopus rating (2005): SJR 0.258 SNIP 0.707
- Scopus rating (2004): SJR 0.263 SNIP 0.709
- Scopus rating (2003): SJR 0.229 SNIP 0.676
- Scopus rating (2002): SJR 0.239 SNIP 0.378
- Scopus rating (2001): SJR 0.194 SNIP 0.35
- Scopus rating (2000): SJR 0.176 SNIP 0.431
- Scopus rating (1999): SJR 0.159 SNIP 0.363

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Network-on-chip, Real-time systems, Reconfiguration, Time-division multiplexing

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10.1016/j.sysarc.2017.02.001

Publication: Research - peer-review › Journal article – Annual report year: 2017
A review of control strategies for manipulating the feed rate in fed-batch fermentation processes

A majority of industrial fermentation processes are operated in fed-batch mode. In this case, the rate of feed addition to the system is a focus for optimising the process operation, as it directly impacts metabolic activity, as well as directly affecting the volume dynamics in the system. This review covers a range of strategies which have been employed to use the feed rate as a manipulated variable in a control strategy. The feed rate is chosen as the focus for this review, as it is seen that this variable may be used towards many different objectives depending on the process of interest, the characteristics of the strain, or the product being produced, which leads to different drivers for process optimisation. This review summarises the methods, as well as focusing on the different objectives for the controllers, and the choice of...
measured variables involved in the strategy. The discussion includes a summary of considerations for control strategy development.

**General information**

State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Novozymes A/S
Authors: Mears, L. (Intern), Stocks, S. M. (Ekstern), Sin, G. (Intern), Gernaey, K. (Intern)
Pages: 34-46
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication Information**

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Ratings:

BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.88 SJR 0.978 SNIP 0.937
Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.068 SNIP 0.987 CiteScore 2.87
Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.113 SNIP 1.144 CiteScore 2.95
Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.173 SNIP 1.188 CiteScore 3.22
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes

BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.255 SNIP 1.312 CiteScore 3.4
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes

BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.157 SNIP 1.064 CiteScore 2.87
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes

BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.126 SNIP 1.18
Web of Science (2010): Indexed yes

BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.216 SNIP 1.235
Web of Science (2009): Indexed yes

BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.136 SNIP 1.265
Web of Science (2008): Indexed yes

Scopus rating (2007): SJR 1.132 SNIP 1.273
Web of Science (2007): Indexed yes

Scopus rating (2006): SJR 1.091 SNIP 1.383
Web of Science (2006): Indexed yes

Scopus rating (2005): SJR 1.162 SNIP 1.369
Web of Science (2005): Indexed yes

Scopus rating (2004): SJR 1.009 SNIP 1.43
Web of Science (2004): Indexed yes

Scopus rating (2003): SJR 0.932 SNIP 1.235
A Review of Cyber-Physical Energy System Security Assessment

Increasing penetration of renewable energy resources (RES) and electrification of services by implementing distributed energy resources (DER) has caused a paradigm shift in the operation of the power system. The controllability of the power system is predicted to be shifted from the generation side to the consumption side. This transition entails that the future power system evolves into a complex cyber-physical energy system (CPES) with strong interactions between the power, communication and neighboring energy systems. Current power system security assessment methods are based on centralized computation and N-1 contingencies, while these risks should still be considered in the future CPES, additional factors are affecting the system security. This paper serves as a review of the challenges entailed by transforming the power system into a CPES from a security assessment perspective. It gives an indication of theoretical solutions to CPES challenges and proposes a new framework for security assessment in CPES.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems, University of Sydney
Authors: Rasmussen, T. B. (Intern), Yang, G. (Intern), Nielsen, A. H. (Intern), Dong, Z. (Ekstern)
Number of pages: 6
Publication date: 2017

Host publication information
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Publisher: IEEE
Main Research Area: Technical/natural sciences
Conference: 12th IEEE Power and Energy Society PowerTech Conference, Manchester, United Kingdom, 18/06/2017 - 18/06/2017
Communication system, Cyber-Physical Systems, Distributed power generation, Power System Security, Security Assessment
Electronic versions:
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Activities:
12th IEEE Power and Energy Society PowerTech Conference
Source: PublicationPreSubmission
Source-ID: 131666484
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

A review of measured bioaccumulation data in terrestrial plants for organic chemicals: Metrics, variability and the need for standardized measurement protocols: Review of bioaccumulation data in terrestrial plants

Quantifying the transfer of organic chemicals from the environment into terrestrial plants is essential for assessing human and ecological risks, using plants as environmental contamination biomonitors, and predicting phytoremediation effectiveness. Experimental data describing chemical uptake by plants are often expressed as ratios of chemical concentrations in the plant compartments of interest (e.g., leaves, shoots, roots, xylem sap) to that in the exposure medium (e.g., soil, soil pore water, hydroponic solution, air). These ratios are generally referred to as bioconcentration factors (BCFs) but have also been named for the specific plant compartment sampled, such as root concentration factors (RCFs), leaf concentration factors (LCFs), or transpiration stream (xylem sap) concentrations factors (TSCFs). We reviewed over 350 papers to develop a database with 7,049 entries of measured bioaccumulation data for 310 organic
chemicals and 112 terrestrial plant species. Various experimental approaches have been used; therefore, inter-study comparisons and data quality evaluations are difficult. Key exposure and plant growth conditions were often missing, and units were often unclear or not reported. The lack of comparable high confidence data also limits model evaluation and development. Standard test protocols, or at a minimum, standard reporting guidelines, for the measurement of plant uptake data are recommended to generate comparable, high-quality data that will improve mechanistic understanding of organic chemical uptake by plants. This article is protected by copyright. All rights reserved.

**General information**
State: Accepted/In press
Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, Transport DTU, Utah State University, Environment and Climate Change Canada, Hill Air Force Base, ExxonMobil Biomedical Sciences, University of Toronto
Authors: Doucette, W. J. (Ekstern), Shunthirasingham, C. (Ekstern), Dettenmaier, E. M. (Ekstern), Zaleski, R. T. (Ekstern) , Fantke, P. (Intern), Arnot, J. A. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Environmental Toxicology and Chemistry
ISSN (Print): 0730-7268
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.74 SJR 1.19 SNIP 1.031
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.446 SNIP 1.055 CiteScore 3
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.506 SNIP 1.129 CiteScore 2.89
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.653 SNIP 1.092 CiteScore 2.88
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.642 SNIP 1.107 CiteScore 2.81
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.937 SNIP 1.168 CiteScore 3.05
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.708 SNIP 0.997
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.613 SNIP 1.047
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.48 SNIP 1.049
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.691 SNIP 1.144
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.604 SNIP 1.144
Web of Science (2006): Indexed yes
A review of models for near-field exposure pathways of chemicals in consumer products

Exposure to chemicals in consumer products has been gaining increasing attention, with multiple studies showing that near-field exposures from products is high compared to far-field exposures. Regarding the numerous chemical-product combinations, there is a need for an overarching review of models able to quantify the multiple transfers of chemicals from products used near-field to humans. The present review therefore aims at an in-depth overview of modeling approaches for near-field chemical release and human exposure pathways associated with consumer products. It focuses on lower-tier, mechanistic models suitable for life cycle assessments (LCA), chemical alternative assessment (CAA) and high-throughput screening risk assessment (HTS). Chemicals in a product enter the near-field via a defined “compartment of entry”, are transformed or transferred to adjacent compartments, and eventually end in a “human receptor compartment”. We first focus on models of physical mass transfers from the product to ‘near-field’ compartments. For transfers of chemicals from article interior, adequate modeling of in-article diffusion and of partitioning between article surface and air/skin/food is key. Modeling volatilization and subsequent transfer to the outdoor is crucial for transfers of chemicals used in the inner space of appliances, on object surfaces or directly emitted to indoor air. For transfers from skin surface, models need to reflect the competition between dermal permeation, volatilization and fraction washed-off. We then focus on transfers from the ‘near-field’ to ‘human’ compartments, defined as respiratory tract, gastrointestinal tract and epidermis, for which good estimates of air concentrations, non-dietary ingestion parameters and skin permeation are essential, respectively. We critically characterize for each exposure pathway the ability of models to estimate near-field transfers and to best inform LCA, CAA and HTS, summarizing the main characteristics of the potentially best-suited models. This review identifies large knowledge gaps for several near-field pathways and suggests research needs and future directions.

General information
State: Published
Organisations: Department of Management Engineering, Quantitative Sustainability Assessment, University of Michigan, National Risk Management Research Laboratory
Authors: Huang, L. (Ekstern), Ernstoff, A. (Intern), Fantke, P. (Intern), Csiszar, S. A. (Ekstern), Jolliet, O. (Ekstern)
Pages: 1182-1208
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Science of the Total Environment
Volume: 574
ISSN (Print): 0048-9697
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.09 SJR 1.621 SNIP 1.849
Web of Science (2016): Indexed yes
A review of recent research on the use of zeotropic mixtures in power generation systems

The use of zeotropic fluid mixtures in refrigeration cycles and heat pumps has been widely studied in the last three decades or so. However it is only in the past few years that the use of zeotropic mixtures in power generation applications has been analysed in a large number of studies, mostly with low grade heat as the energy source. This paper presents a
review of the recent research on power cycles with zeotropic mixtures as the working fluid. The available literature primarily discusses the thermodynamic performance of the mixture power cycles through energy and exergy analyses but there are some studies which also consider the economic aspects through the investigation of capital investment costs or through a thermoeconomic analysis. The reviewed literature in this paper is divided based on the various applications such as solar energy based power systems, geothermal heat based power systems, waste heat recovery power systems, or generic studies. The fluid mixtures used in the various studies are listed along with the key operation parameters and the scale of the power plant. In order to limit the scope of the review, only the studies with system level analysis of various power cycles are considered. An overview of the key trends and general conclusions from the various studies and some possible directions for future research are also presented.

General information
State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy, Indian Institute of Technology, Bombay
Authors: Modi, A. (Ekstern), Haglind, F. (Intern)
Pages: 603–626
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Energy Conversion and Management
Volume: 138
ISSN (Print): 0196-8904
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 6.04 SJR 2.287 SNIP 2.065
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.09 SNIP 2.092 CiteScore 5.24
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.854 SNIP 2.835 CiteScore 5.35
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.669 SNIP 2.558 CiteScore 4.49
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.732 SNIP 2.277 CiteScore 3.72
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.292 SNIP 1.846 CiteScore 3.03
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.372 SNIP 1.75
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.339 SNIP 1.797
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.508 SNIP 1.905
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.196 SNIP 1.811
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.327 SNIP 1.816
Web of Science (2006): Indexed yes
A review of solar energy based heat and power generation systems

The utilization of solar energy based technologies has attracted increased interest in recent times in order to satisfy the various energy demands of our society. This paper presents a thorough review of the open literature on solar energy based heat and power plants. In order to limit the scope of the review, only fully renewable plants with at least the production of electricity and heat/hot water for end use are considered. These include solar photovoltaic and solar thermal based plants with both concentrating and non-concentrating collectors in both solar-only and solar-hybrid configurations.

The paper also presents a selection of case studies for the evaluation of solar energy based combined heat and power generation possibility in Denmark. The considered technologies for the case studies are (1) solar photovoltaic modules, (2) solar flat plate collectors, (3) a ground source heat pump, (4) a biomass burner, and (5) an organic Rankine cycle. The various cases are compared on the basis of economic profitability and environmental performance. The results from the case studies indicate that it is economically and environmentally beneficial to invest in both small and large capacity solar-biomass hybrid plants for combined heat and power production in the Nordic climatic conditions. The results also suggest that the configuration with an organic Rankine cycle with solar thermal collectors and a biomass burner is particularly attractive for large capacity plants.

General information
State: Published
Organisations: Department of Mechanical Engineering, Thermal Energy
Authors: Modi, A. (Intern), Bühler, F. (Intern), Andreasen, J. G. (Intern), Haglind, F. (Intern)
Pages: 1047-1064
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Renewable & Sustainable Energy Reviews
Volume: 67
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Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 9.52 SJR 3.051 SNIP 3.454
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.999 SNIP 3.387 CiteScore 8.35
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 3.106 SNIP 3.761 CiteScore 7.79
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 3.072 SNIP 3.889 CiteScore 7.88
ISI indexed (2013): ISI indexed yes
A Review on Grid-connected Converter Control for Short Circuit Power Provision under Grid Unbalanced Faults

As an increasing amount of converter-based generation on power electronics is connected to power systems, transmission system operators (TSOs) are revising the grid connection requirements to streamline the connectivity of the devices to maintain security of supply. Converter-based generation can behave significantly different from the traditional alternators under grid faults. In order to evaluate the potential impact of future converter-based power systems on protective relays, it is necessary to consider diverse current control strategies of voltage source converters (VSC) under unbalanced faults as the performance of converters primarily depends on their control objectives. In this paper, current control strategies of VSC under unbalanced faults for short circuit power provision are reviewed in two groups, namely power-characteristic-oriented and voltage-support-oriented control strategy respectively. As the fault current provided by converters should be restricted within secure operation limits considering semiconductor capabilities, converter current limit issue is also discussed.

General information
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Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems
Authors: Jia, J. (Intern), Yang, G. (Intern), Nielsen, A. H. (Intern)
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Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.791 SNIP 2.408 CiteScore 4.46
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.967 SNIP 2.66 CiteScore 3.96
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.726 SNIP 2.693 CiteScore 3.4
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.64 SNIP 2.845 CiteScore 3.51
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.386 SNIP 2.688 CiteScore 3.28
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.117 SNIP 2.257 CiteScore 2.89
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.172 SNIP 2.068
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.985 SNIP 2.053
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.12 SNIP 2.157
Scopus rating (2007): SJR 0.926 SNIP 1.978
Scopus rating (2006): SJR 0.944 SNIP 1.821
Scopus rating (2005): SJR 0.973 SNIP 1.925
Scopus rating (2004): SJR 0.807 SNIP 1.946
Scopus rating (2003): SJR 1.727 SNIP 1.876
Scopus rating (2001): SJR 1.234 SNIP 1.169
Scopus rating (2000): SJR 0.945 SNIP 1.783
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.425 SNIP 1.31

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Publication: Research - peer-review › Journal article – Annual report year: 2017
A risk modelling approach for setting microbiological limits using enterococci as indicator for growth potential of Salmonella in pork

Microbiological limits are widely used in food processing as an aid to reduce the exposure to hazardous microorganisms for the consumers. However, in pork, the prevalence and concentrations of Salmonella are generally low and microbiological limits are not considered an efficient tool to support hygiene interventions. The objective of the present study was to develop an approach which could make it possible to define potential risk-based microbiological limits for an indicator, enterococci, in order to evaluate the risk from potential growth of Salmonella. A positive correlation between the concentration of enterococci and the prevalence and concentration of Salmonella was shown for 6640 pork samples taken at Danish cutting plants and retail butchers. The samples were collected in five different studies in 2001, 2002, 2010, 2011 and 2013. The observations that both Salmonella and enterococci are carried in the intestinal tract, contaminate pork by the same mechanisms and share similar growth characteristics (lag phase and maximum specific growth rate) at temperatures around 5-10 °C, suggest a potential of enterococci to be used as an indicator of potential growth of Salmonella in pork. Elevated temperatures during processing will lead to growth of both enterococci and, if present, also Salmonella. By combining the correlation between enterococci and Salmonella with risk modelling, it is possible to predict the risk of salmonellosis based on the level of enterococci. The risk model used for this purpose includes the dose-response relationship for Salmonella and a reduction factor to account for preparation of the fresh pork. By use of the risk model, it was estimated that the majority of salmonellosis cases, caused by the consumption of pork in Denmark, is caused by the small fraction of pork products that has enterococci concentrations above 5 log. CFU/g. This illustrates that our approach can be used to evaluate the potential effect of different microbiological limits and therefore, the perspective of this novel approach is that it can be used for definition of a risk-based microbiological limit for enterococci. The limit for enterococci can then be used for development of a process hygiene criterion in cutting plants and retail butcher shops, with the purpose of reducing the risk of Salmonella for the consumer.
A Robust Statistical Model to Predict the Future Value of the Milk Production of Dairy Cows Using Herd Recording Data

The future value of an individual dairy cow depends greatly on its projected milk yield. In developed countries with developed dairy industry infrastructures, facilities exist to record individual cow production and reproduction outcomes consistently and accurately. Accurate prediction of the future value of a dairy cow requires further detailed knowledge of the costs associated with feed, management practices, production systems, and disease. Here, we present a method to predict the future value of the milk production of a dairy cow based on herd recording data only. The method consists of several steps to evaluate lifetime milk production and individual cow somatic cell counts and to finally predict the average production for each day that the cow is alive. Herd recording data from 610 Danish Holstein herds were used to train and test a model predicting milk production (including factors associated with milk yield, somatic cell count, and the survival of individual cows). All estimated parameters were either herd- or cow-specific. The model prediction deviated, on average, less than 0.5 kg from the future average milk production of dairy cows in multiple herds after adjusting for the effect of somatic cell count. We conclude that estimates of future average production can be used on a day-to-day basis to rank cows for culling, or can be implemented in simulation models of within-herd disease spread to make operational decisions, such as culling versus treatment. An advantage of the approach presented in this paper is that it requires no specific knowledge of disease status or any other information beyond herd recorded milk yields, somatic cell counts, and reproductive status.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, National Veterinary Institute, Epidemiology, Dynamical Systems, Københavns Universitet
Authors: Græsbøll, K. (Intern), Kirkeby, C. T. (Intern), Nielsen, S. S. (Ekstern), Hisham Beshara Halasa, T. (Intern), Toft, N. (Intern), Christiansen, L. E. (Intern)
Number of pages: 9
Publication date: 2017
Identification of epitopes targeted by antibodies (B cell epitopes) is of critical importance for the development of many diagnostic and therapeutic tools. For clinical usage, such epitopes must be extensively characterized in order to validate specificity and to document potential cross-reactivity. B cell epitopes are typically classified as either linear epitopes, i.e. short consecutive segments from the protein sequence or conformational epitopes adapted through native protein folding. Recent advances in high-density peptide microarrays enable high-throughput, high-resolution identification and characterization of linear B cell epitopes. Using exhaustive amino acid substitution analysis of peptides originating from target antigens, these microarrays can be used to address the specificity of polyclonal antibodies raised against such antigens containing hundreds of epitopes. However, the interpretation of the data provided in such large-scale screenings is far from trivial and in most cases it requires advanced computational and statistical skills. Here, we present an online application for automated identification of linear B cell epitopes, allowing the non-expert user to analyse peptide microarray data. The application takes as input quantitative peptide data of fully or partially substituted overlapping peptides from a given antigen sequence and identifies epitope residues (residues that are significantly affected by substitutions) and visualize the selectivity towards each residue by sequence logo plots. Demonstrating utility, the application was used to identify and address the antibody specificity of 18 linear epitope regions in Human Serum Albumin (HSA), using peptide microarray data consisting of fully substituted peptides spanning the entire sequence of HSA and incubated with polyclonal rabbit anti-HSA (and mouse anti-rabbit-Cy3). The application is made available at: www.cbs.dtu.dk/services/ArrayPitope.
Artifacts and Visible Singularities in Limited Data X-Ray Tomography

We describe a principle to determine which features of an object will be easy to reconstruct from limited X-ray CT data and which will be difficult. The principle depends on the geometry of the data set, and it applies to any limited data set. We also describe a characterization of Frikel and the author explaining artifacts that can be added to limited angle reconstructions, and we provide an easy-to-implement method to decrease them. These ideas are justified using microlocal analysis, deep mathematics that involves Fourier theory. Reconstructions from simulated and real limited data are given to illustrate our ideas.

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Authors: Quinto, T. (Intern)
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Artsspecifik sporing og kvantificering af eDNA fra marine fisk i Østersøen

General information
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A Runtime Analysis of Parallel Evolutionary Algorithms in Dynamic Optimization

A simple island model with $K$ islands and migration occurring after every $k$ iterations is studied on the dynamic fitness function Maze. This model is equivalent to a $(K, k)$ EA if migration occurs during every iteration. It is proved that even for an increased offspring population size up to $(K, k+1)$, the $(K, k)$ EA is still not able to track the optimum of Maze. If the migration interval is chosen carefully, the algorithm is able to track the optimum even for logarithmic $(K, k)$. The relationship of $(K, k)$ and the ability of the island model to track the optimum is then investigated more closely. Finally, experiments are performed to supplement the asymptotic results, and investigate the impact of the migration topology.
A safflower oil-based high fat/high-sucrose diet modulates the gut microbiota and liver phospholipid profiles associated with early glucose intolerance in the absence of tissue inflammation

n-6 PUFA-rich diets are generally considered obesogenic in rodents. Here we examined how long-term intake of a high fat/high sucrose (HF/HS) diet based on safflower oil affected metabolism, inflammation and gut microbiota composition. We fed male C57BL/6J mice a HF/HS diet based on safflower oil - rich in n-6 PUFAs - or low-fat/low-sucrose (LF/LS) diet for 40 weeks. Compared to the LF/LS diet, intake of the safflower-based HF/HS diet only led to moderate weight gain, while glucose intolerance developed at week 5 prior to signs of inflammation, but concurrent with increased levels of linoleic acid and arachidonic acid in hepatic phospholipids. Intake of the HF/HS diet resulted in early changes in the gut microbiota, including an increased abundance of Blautia, while late changes coincided with altered inflammatory profiles and increased fasting plasma insulin. Analysis of immune cells in visceral fat and liver revealed no differences between diets before week 40, where the number of immune cells decreased in the liver of HF/HS-fed mice. We suggest that a diet-dependent increase in the n-6 to n-3 PUFA ratio in hepatic phospholipids together with gut microbiota changes contributed to early development of glucose intolerance without signs of inflammation. This article is protected by copyright. All rights reserved.
A Scalable Neuro-inspired Robot Controller Integrating a Machine Learning Algorithm and a Spiking Cerebellar-like Network

Combining Fable robot, a modular robot, with a neuroinspired controller, we present the proof of principle of a system that can scale to several neurally controlled compliant modules. The motor control and learning of a robot module are carried out by a Unit Learning Machine (ULM) that embeds the Locally Weighted Projection Regression algorithm (LWPR) and a spiking cerebellar-like microcircuit. The LWPR guarantees both an optimized representation of the input space and the learning of the dynamic internal model (IM) of the robot. However, the cerebellar-like sub-circuit integrates LWPR input-driven contributions to deliver accurate corrective commands to the global IM. This article extends the earlier work by including the Deep Cerebellar Nuclei (DCN) and by reproducing the Purkinje and the DCN layers using a spiking neural network (SNN) implemented on the neuromorphic SpiNNaker platform. The performance and robustness outcomes from the real robot tests are promising for neural control scalability.
A Science Cloud for Smart Cities Research

Cities are densely populated and heavily equipped areas with a high level of service provision. Smart cities can use these conditions to achieve the goals of a smart society for their citizens. To facilitate such developments, the necessary IT-infrastructure has to be in place for supporting, amongst many other things, the whole lifecycle of big data management and analytics for research activities. At the Centre for IT-Intelligent Smart Energy for Cities, we have therefore been developing a flexible infrastructure, based on open source technologies. This paper presents this solution and its application in a city and building research.
A scored human protein-protein interaction network to catalyze genomic interpretation

Genome-scale human protein-protein interaction networks are critical to understanding cell biology and interpreting genomic data, but challenging to produce experimentally. Through data integration and quality control, we provide a scored human protein-protein interaction network (InWeb_InBioMap, or InWeb_IM) with severalfold more interactions (>500,000) and better functional biological relevance than comparable resources. We illustrate that InWeb_InBioMap enables functional interpretation of >4,700 cancer genomes and genes involved in autism.
A semi-empirical airfoil stall noise model based on surface pressure measurements

This work is concerned with the experimental study of airfoil stall and the modelling of stall noise. Using pressure taps and high-frequency surface pressure microphones flush-mounted on airfoils measured in wind tunnels and on an operating wind turbine blade, the characteristics of stall are analyzed. This study shows that the main quantities of interest, namely convection velocity, spatial correlation and surface pressure spectra, can be scaled highlighting the universal nature of stall independently of airfoil shapes and flow conditions, although within a certain range of experimental conditions. Two main regimes for the scaling of the correlation lengths and the surface pressure spectra, depending on the Reynolds number of the flow, can be distinguished. These results are used to develop a model for the surface pressure spectra within the detached flow region valid for Reynolds numbers ranging from $1 \times 10^6$ to $6 \times 10^6$. Subsequently, this model is used to derive a model for stall noise. Modelled noise spectra are compared with experimental data measured in anechoic wind tunnels with reasonably satisfactory agreement.
A serum biomarker reflecting collagen type I degradation (C1M) is an independent risk factor for acute myocardial infarction in postmenopausal women: results from the PERF study

Cardiovascular disease (CVD) is the leading cause of death in postmenopausal women, and symptoms of ischemic heart disease (IHD) and acute myocardial infarction (AMI) are often overlooked. With the loss of estrogen production collagen stability is affected with potential of an increased risk of unstable plaques in coronary vessels. Collagen type I, a major component of the cardiac extracellular matrix (ECM), is cleaved by matrix metalloproteinases (MMPs) and known to be active remodeled in CVD.

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Organisations: Department of Biotechnology and Biomedicine, Disease Systems Immunology, University of Copenhagen, Nordic Bioscience A/S, ProScion A/S
Authors: Bertelsen, D. (Ekstern), Nielsen, S. H. (Intern), Neergaard, J. (Ekstern), Karsdal, M. A. (Ekstern), Nielsen, H. (Ekstern)
Pages: 722
A short numerical study on the optimization methods influence on topology optimization

Structural topology optimization problems are commonly defined using continuous design variables combined with material interpolation schemes. One of the challenges for density based topology optimization observed in the review article (Sigmund and Maute Struct Multidiscip Optim 48(6):1031-1055 2013) is the slow convergence that is often encountered in practice, when an almost solid-and-void design is found. The purpose of this forum article is to present some preliminary observations on how designs evolves during the optimization process for different choices of optimization methods. Additionally, the authors want to open a discussion on how to properly define and identify the boundary translation that is often observed in practice. The authors hope that these preliminary observations can open for fruitful discussions and stimulate further investigations concerning slowly moving boundaries. Although the discussion is centered on density based methods it may be equally relevant to level-set and phase-field approaches.

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Organisations: Department of Wind Energy, Department of Mechanical Engineering, Solid Mechanics
Authors: Rojas Labanda, S. (Intern), Sigmund, O. (Intern), Stolpe, M. (Intern)
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Web of Science (2007): Indexed yes
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Web of Science (2005): Indexed yes
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A simple method for preparing superconducting FeSe pellets without sealing in evacuated silica tubes

Superconducting tetragonal FeSe pellets were made by reacting mixtures of elemental Fe and Se powders in argon atmosphere without sealing in evacuated silica tubes. A simple tube furnace has been used. Although the tube's material consisted of quartz, an alumina tube could be used as well. X-ray pure samples with onset of superconducting transition between 8.0K and 8.5K were obtained under specific heat treatment conditions. Residual, unreacted Fe particles could be virtually eliminated through prolonged annealing. A key factor for the synthesis of good samples consists in using processing parameters that minimize Se losses.
A simple model for fatigue crack growth in concrete applied to a hinge beam model

In concrete structures, fatigue is one of the major causes of material deterioration. Repeated loads result in formation of cracks. Propagation of these cracks cause internal progressive damage within the concrete material which ultimately leads to failure. This paper presents a simplified general concept for non-linear analysis of concrete subjected to cyclic loading. The model is based on the fracture mechanics concepts of the fictitious crack model, considering a fiber of concrete material, and a simple energy based approach for estimating the bridging stress under cyclic loading. Further, the uni-axial fiber response is incorporated in a numerical hinge model for beam analysis. Finally, the hinge model is implemented into a finite element beam element on a constitutive level. The proposed model is compared to experimental results on both fiber-and beam level. The proposed model shows good performance and seems well suited for the description of fatigue crack growth in concrete. (C) 2017 Elsevier Ltd. All rights reserved.
A simple model of the wind turbine induction zone derived from numerical simulations

The induction zone in front of different wind turbine rotors is studied by means of steady-state Navier-Stokes simulations combined with an actuator disk approach. It is shown that, for distances beyond 1 rotor radius upstream of the rotors, the induced velocity is self-similar and independent of the rotor geometry. On the basis of these findings, a simple analytical model of the induction zone of wind turbines is proposed.

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Organisations: Department of Wind Energy, Aerodynamic design
Authors: Troldborg, N. (Intern), Meyer Forsting, A. R. (Intern)
Number of pages: 10
A simplified kinetic and mass transfer modelling of the thermal hydrolysis of vegetable oils

This work presents a combined modelling approach to investigate the kinetics and mass transfer effects on the hydrolysis of vegetable oils under subcritical conditions. The primary purpose of this simplified model is to interpret experimental data collected from typical batch tests and to estimate parameters for the proposed model. Due to its heterogeneous nature, the hydrolysis reaction is affected not only by the chemical kinetics but also by the rate of mass transfer between the oil and water as well as their specific contact area in this two phase emulsion. Considering these properties, a model was developed and evaluated by comparing the results with experimental data from literature. The model included among others the mass transfer coefficient as a function of operation and process variables, e.g. agitation speed, temperature, pressure, density and viscosity. Thereafter, uncertainty analysis was performed to assess the accuracy of estimated parameters and model predictions. The parameter estimation results showed that while the parameter estimates were accurate, however the pairwise correlation between estimates were significant. This indicates that the available experimental data is not fit to uniquely identify the mass and kinetic parameters requiring further and better design optimal experiment. The uncertainty analysis showed that model prediction uncertainty due to parameter estimation errors were rather negligible. Therefore it is recommended that the model be used for process analysis and improvement accompanied by Monte Carlo uncertainty analysis. Since the lack of experimental data is a crucial issue in the hydrolysis of vegetable oils, this model-based analysis of data is of substantial value to provide necessary information for detailed modeling and characterization of the process.

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A simulation study to evaluate the performance of five statistical monitoring methods when applied to different time-series components in the context of control programs for endemic diseases

Disease monitoring and surveillance play a crucial role in control and eradication programs, as it is important to track implemented strategies in order to reduce and/or eliminate a specific disease. The objectives of this study were to assess the performance of different statistical monitoring methods for endemic disease control program scenarios, and to explore what impact of variation (noise) in the data had on the performance of these monitoring methods. We simulated 16 different scenarios of changes in weekly sero-prevalence. The changes included different combinations of increases, decreases and constant sero-prevalence levels (referred as events). Two space-state models were used to model the time series, and different statistical monitoring methods (such as univariate process control algorithms–Shewart Control Chart, Tabular Cumulative Sums, and the V-mask- and monitoring of the trend component–based on 99% confidence intervals and the trend sign) were tested. Performance was evaluated based on the number of iterations in which an alarm was raised for a given week after the changes were introduced. Results revealed that the Shewhart Control Chart was better at detecting increases over decreases in sero-prevalence, whereas the opposite was observed for the Tabular Cumulative Sums. The trend-based methods detected the first event well, but performance was poorer when adapting to several consecutive events. The V-Mask method seemed to perform most consistently, and the impact of noise in the baseline was greater for the Shewhart Control Chart and Tabular Cumulative Sums than for the V-Mask and trend-based methods. The performance of the different statistical monitoring methods varied when monitoring increases and decreases in disease sero-prevalence. Combining two of more methods might improve the potential scope of surveillance systems, allowing them to fulfill different objectives due to their complementary advantages.
A Soft Tooling process chain employing Additive Manufacturing for injection molding of a 3D component with micro pillars

The purpose of the research presented in this paper is to investigate the capability of a soft tooling process chain employing Additive Manufacturing (AM) for preproduction of an insert with micro features by injection molding. The Soft Tooling insert was manufactured in a high temperature photopolymer by Digital Light Processing (vat photopolymerization). The mold cavity was formed by two insert halves, by design; both inserts have four angled tines, with micro holes (Ø200 μm, 200 μm deep) on the surface. Injection molding with polyethylene was used with the soft tool inserts to manufacture the final production components. The diameter and height of the pillars that were replicated on the molded components were characterized by means of a 3D profilometer. The influence of the injection molding parameters on the replication was evaluated using a 2-levels DOE of three factors. The uniformity of the pillars are also evaluated regarding the diameter and height.

General information
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Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Technical University of Denmark
Authors: Zhang, Y. (Intern), Pedersen, D. B. (Intern), Segebrecht Gøtje, A. (Ekstern), Mischkot, M. (Intern)
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A sparse equivalent source method for near-field acoustic holography

This study examines a near-field acoustic holography method consisting of a sparse formulation of the equivalent source method, based on the compressive sensing (CS) framework. The method, denoted Compressive-Equivalent Source Method (C-ESM), encourages spatially sparse solutions (based on the superposition of few waves) that are accurate when the acoustic sources are spatially localized. The importance of obtaining a non-redundant representation, i.e., a sensing matrix with low column coherence, and the inherent ill-conditioning of near-field reconstruction problems is addressed. Numerical and experimental results on a classical guitar and on a highly reactive dipoledike source are presented. C-ESM is valid beyond the conventional sampling limits, making wideband reconstruction possible. Spatially extended sources can also be addressed with C-ESM, although in this case the obtained solution does not recover the spatial extent of the source.
A spatiotemporal model for snow crab (Chionoecetes opilio) stock size in the southern Gulf of St. Lawrence

We develop a high-resolution spatiotemporal model of stock size and harvest rates for snow crab (Chionoecetes opilio) in the southern Gulf of St. Lawrence, which supports an economically important fishery off the east coast of Canada. It is a spatial and weekly model during 1997–2014 that utilizes within-season depletion based on catch per unit of effort (CPUE; kg·pot−1) and also biomass values from a survey designed specifically for this stock. The model is formulated in a state-space framework. The main contribution of the model is to provide a better understanding of fishery-dependent factors that affect CPUE. There is strong evidence of density dependence in the relationship with CPUE and stock biomass, in addition to a general increase in CPUE catchability over time that may be related to changes in gear soak time and spatial variation in catchability. We also find that a natural mortality rate of 0.4 provides a better fit to survey results. Model results suggest that there is no evidence of effort saturation in the fishery.
Aspergillus hancockii sp. Nov., a biosynthetically talented fungus endemic to southeastern Australian soils

Aspergillus hancockii sp. nov., classified in Aspergillus subgenus Circumdati section Flavi, was originally isolated from soil in peanut fields near Kumbia, in the South Burnett region of southeast Queensland, Australia, and has since been found occasionally from other substrates and locations in southeast Australia. It is phylogenetically and phenotypically related most closely to A. leporis States and M. Chr., but differs in conidial colour, other minor features and particularly in metabolite profile. When cultivated on rice as an optimal substrate, A. hancockii produced an extensive array of 69 secondary metabolites. Eleven of the 15 most abundant secondary metabolites, constituting 90% of the total area under the curve of the HPLC trace of the crude extract, were novel. The genome of A. hancockii, approximately 40 Mbp, was sequenced and mined for genes encoding carbohydrate degrading enzymes identified the presence of more than 370 genes in 114 gene clusters, demonstrating that A. hancockii has the capacity to degrade cellulose, hemicellulose, lignin, pectin, starch, chitin, cutin and fructan as nutrient sources. Like most Aspergillus species, A. hancockii exhibited a diverse secondary metabolite gene profile, encoding 26 polyketide synthase, 16 nonribosomal peptide synthase and 15 nonribosomal peptide synthase-like enzymes.

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Organisations: Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering, Macquarie University, Commonwealth Scientific and Industrial Research Organisation, Microbial Screening Technologies, University of Western Australia
Authors: Pitt, J. I. (Ekstern), Lange, L. (Intern), Lacey, A. E. (Ekstern), Vuong, D. (Ekstern), Midgley, D. J. (Ekstern), Greenfield, P. (Ekstern), Bradbury, M. I. (Ekstern), Lacey, E. (Ekstern), Busk, P. K. (Intern), Pilgaard, B. (Intern), Chooi, Y. H. (Ekstern), Piggott, A. M. (Ekstern)
Assessing and managing multiple risks in a changing world — The Roskilde recommendations

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Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Department of Civil Engineering, Section for Structural Engineering, Roskilde University, Stockholm University, University of Michigan, DHI Denmark, Simon Fraser University, Delft University of Technology, Enviresearch, Newcastle-upon-Tyne, Halmstad University, Aarhus University, Norwegian Institute for Water Research, University of Aveiro, U.S. Environmental Protection Agency, Norwegian Geotechnical Institute, Polish Academy of Sciences, Chapema Environmental Strategies, University of Gothenburg, Roskilde University, Roskilde Universitetscenter
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BFI (2014): BFI-level 2
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Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 1.653 SNIP 1.092 CiteScore 2.88
ISI indexed (2013): ISI indexed yes
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ISI indexed (2012): ISI indexed yes
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Scopus rating (2010): SJR 1.708 SNIP 0.997
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Scopus rating (2009): SJR 1.613 SNIP 1.047
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Assessing climate impact on reinforced concrete durability with a multi-physics model

A framework for performance-based durability engineering can incorporate climate impacts in its assessment of the lifetime sustainability of built infrastructure. Most performance-based durability and climate impact assessments have used simplified deterioration models, which are insensitive to shorter-term fluctuations in boundary conditions and therefore may underestimate climate change impacts. A highly sensitive fully-coupled, validated, multi-physics model for heat, moisture and ion transport and corrosion was used to assess a reinforced concrete structure located in coastal Norfolk, Virginia. Deterioration was predicted using tidal exposure conditions obtained from statistically downscaled global climate model output under two emissions scenarios. Deterioration, repair, and decision metrics under the emissions scenarios were compared using the performance-based framework to assess the influence of climate change.

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Authors: Michel, A. (Intern), Flint, M. M. (Ekstern)
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Assessing glycolytic flux alterations resulting from genetic perturbations in E. coli using a biosensor

We describe the development of an optimized glycolytic flux biosensor and its application in detecting altered flux in a production strain and in a mutant library. The glycolytic flux biosensor is based on the Cra-regulated ppsA promoter of E. coli controlling fluorescent protein synthesis. We validated the glycolytic flux dependency of the biosensor in a range of different carbon sources in six different E. coli strains and during mevalonate production. Furthermore, we studied the flux-altering effects of genome-wide single gene knock-outs in E. coli in a multiplex FlowSeq experiment. From a library consisting of 2126 knock-out mutants, we identified 3 mutants with high-flux and 95 mutants with low-flux phenotypes that did not have severe growth defects. This approach can improve our understanding of glycolytic flux regulation improving metabolic models and engineering efforts.

General information
Assessing pre- and post-zygotic barriers between North Atlantic eels (Anguilla anguilla and A. rostrata)

Eliciting barriers to gene flow is important for understanding the dynamics of speciation. Here we investigate pre- and post-zygotic mechanisms acting between the two hybridizing species of Atlantic eels: Anguilla anguilla and A. rostrata. Temporally varying hybridization was examined by analyzing 85 species-diagnostic single-nucleotide polymorphisms (SNPs; FST 0.95) in eel larvae sampled in the spawning region in the Sargasso Sea in 2007 (N=92) and 2014 (N=460). We further investigated whether genotypes at these SNPs were nonrandomly distributed in post-F1 hybrids, indicating selection. Finally, we sequenced the mitochondrial ATP6 and nuclear ATP5c1 genes in 19 hybrids, identified using SNP and restriction site associated DNA (RAD) sequencing data, to test a previously proposed hypothesis of cytonuclear incompatibility leading to adenosine triphosphate (ATP) synthase dysfunction and selection against hybrids. No F1 hybrids but only later backcrosses were observed in the Sargasso Sea in 2007 and 2014. This suggests that interbreeding between the two species only occurs in some years, possibly controlled by environmental conditions at the spawning grounds, or that interbreeding has diminished through time as a result of a declining number of spawners. Moreover, potential selection was found at the nuclear and the cytonuclear levels. Nonetheless, one glass eel individual showed a mismatch, involving an American ATP6 haplotype and European ATP5c1 alleles. This contradicted the presence of cytonuclear incompatibility but may be explained by that (1) cytonuclear incompatibility is incomplete, (2) selection acts at a later life stage or (3) other genes are important for protein function. In total, the study demonstrates the utility of genomic data when examining pre- and post-zygotic barriers in natural hybrids.

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General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Ecology and Oceanography, Aarhus University, Northwest Iceland Nature Research Centre, University of the Faroe Islands
Authors: Jacobsen, M. W. (Ekstern), Smedegaard, L. (Ekstern), Sørensen, S. R. (Intern), Pujolar, .. M. (Ekstern), Munk, P. (Intern), Jónsson, B. (Ekstern), Magnussen, E. (Ekstern), Hansen, M. M. (Ekstern)
Pages: 266-275
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BFI (2014): BFI-level 2
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ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Assessing the Added Value of information systems supporting facilities management business processes.

Purpose: To present a method for assessing the added value of Information Systems (IS), which are implemented to support the business processes in Facilities Management (FM). Theory: The method is based on a supply chain management model of FM, general value dimensions such as efficiency and effectiveness and the concepts of Value Adding Management (VAM) and Functional Affordances of IS. Design/methodology/approach: From case studies of IS implementation processes in FM in different countries, a general picture of the expressed added value of IS in FM was established. Based on this insight a method for assessing the added value of IS in FM was developed. The proposed method is applied to one of the cases. Findings: The paper analyses how a specific IS supports the management of a specific operational process – cleaning in an airport. The assessment shows that the IS definitely adds value to the cleaning process and because the resulting increase in user experience of the cleaning level is aligned with the strategy of the corporation, the IS also adds value to the primary process of the organisation. The analysis reveals that a well organised management setup is required to gain value from IS. It also illustrates that implementing IS includes both organisational and technological changes and demonstrates that the proposed assessment method is applicable to practice. Originality/value: This is the first paper using a supply chain management model of FM, general value dimensions, VAM and Functional Affordances to access the added value of IS in FM.

General information

State: Published
Organisations: Department of Management Engineering, Management Science, Implementation and Performance Management, Rambøll Management Consulting
Authors: Ebbesen, P. (Ekstern), Jensen, P. A. (Intern)
Number of pages: 11
Publication date: 2017
Assessing the chemical contamination dynamics in a mixed land use stream system

Traditionally, the monitoring of streams for chemical and ecological status has been limited to surface water concentrations, where the dominant focus has been on general water quality and the risk for eutrophication. Mixed land use stream systems, comprising urban areas and agricultural production, are challenging to assess with multiple chemical stressors impacting stream corridors. New approaches are urgently needed for identifying relevant sources, pathways and potential impacts for implementation of suitable source management and remedial measures. We developed a method for risk assessing chemical stressors in these systems and applied the approach to a 16-km groundwater-fed stream corridor (Grindsted, Denmark). Three methods were combined: (i) in-stream contaminant mass discharge for source quantification, (ii) Toxic Units and (iii) environmental standards. An evaluation of the chemical quality of all three stream compartments – stream water, hyporheic zone, streambed sediment – made it possible to link chemical stressors to their respective sources and obtain new knowledge about source composition and origin. Moreover, toxic unit estimation and comparison to environmental standards revealed the stream water quality was substantially impaired by both geogenic and diffuse anthropogenic sources of metals along the entire corridor, while the streambed was less impacted. Quantification of the contaminant mass discharge originating from a former pharmaceutical factory revealed that several 100 kgs of chlorinated ethenes and pharmaceutical compounds discharge into the stream every year. The strongly reduced redox conditions in the plume result in high concentrations of dissolved iron and additionally release arsenic, generating the complex contaminant mixture found in the narrow discharge zone. The fingerprint of the plume was observed in the stream several km downgradient, while nutrients, inorganics and pesticides played a minor role for the stream health. The results emphasize future investigations should include multiple compounds and stream compartments, and highlight the need for holistic approaches when risk assessing these dynamic systems.
Assessing the edible city: Environmental implications of urban agriculture in the Northeast United States

One of the pivotal environmental challenges in the coming decades will be feeding an increasingly wealthy and populated planet in a sustainable manner. As industrialization and concomitant urbanization acts hitherto peripheral economies, much of this challenge will depend on the ability to support the nutritional demands of a global urban population in a fashion aligned with the biophysical capacity of the planet. Amongst the myriad of solutions proposed to guide humanity towards more environmentally sustainable food system, co-locating food production and consumption in cities is an area that has seen significant action in research, design and practice. In the Northeast United States, where per capita diets are amongst the most environmentally intensive globally, there is a growing interest in local food production as a way to reduce the ecological burdens of food demand. Urban farms and pro-urban agriculture planning agendas are proliferating throughout many of the region’s cities, typically with urban agriculture's environmental sustainability evoked to varying
degrees in support of these initiatives. However, environmental appraisals comparing urban and rural food production are scarce in existing literature, leaving a number of lingering questions surrounding urban agriculture's environmental performance. In a Northern context, it remains to be seen whether the benefits of reducing distance from farm to fork are outweighed by the energy demanded by year-round growing systems. Even if urban agriculture does provide leaner resource intensities at the farm scale, do these add up to meaningful shifts in a city's environmental footprint at the urban scale? The aim of this project was to begin removing these uncertainties using the Northeast United States as a case study, since cities within that region have some of the most vibrant and well-supported urban farming communities in the Global North. This report is comprised of six chapters that probe and add to our current understanding of urban food systems.

**General information**

State: Published
Organisations: Quantitative Sustainability Assessment, Department of Management Engineering, Massachusetts Institute of Technology
Authors: Goldstein, B. P. (Intern), Birkved, M. (Intern), Fernández, J. (Ekstern), Hauschild, M. Z. (Intern)
Number of pages: 473
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Projects:
Assessing the edible city: Environmental implications of urban agriculture in the Northeast United States
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Assessing the efficacy of hearing-aid amplification using a phoneme test
Consonant-vowel (CV) perception experiments provide valuable insights into how humans process speech. Here, two CV identification experiments were conducted in a group of hearing-impaired (HI) listeners, using 14 consonants followed by the vowel /ɑ/. The CVs were presented in quiet and with added speech-shaped noise at signal-to-noise ratios of 0, 6, and 12 dB. The HI listeners were provided with two different amplification schemes for the CVs. In the first experiment, a frequency-independent amplification (flat-gain) was provided and the CVs were presented at the most-comfortable loudness level. In the second experiment, a frequency-dependent prescriptive gain was provided. The CV identification results showed that, while the average recognition error score obtained with the frequency-dependent amplification was lower than that obtained with the flat-gain, the main confusions made by the listeners on a token basis remained the same in a majority of the cases. An entropy measure and an angular distance measure were proposed to assess the highly individual effects of the frequency-dependent gain on the consonant confusions in the HI listeners. The results suggest that the proposed measures, in combination with a well-controlled phoneme speech test, may be used to assess the impact of hearing-aid signal processing on speech intelligibility.

**General information**

State: Published
Organisations: Department of Electrical Engineering, Hearing Systems, University of Illinois at Urbana-Champaign
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Scopus rating (2016): CiteScore 1.83 SJR 0.749 SNIP 1.27
Web of Science (2016): Indexed yes
Assessing the Energy Content of System Frequency and Electric Vehicle Charging Efficiency for Ancillary Service Provision

The purpose of this paper is to quantify the effect of biased system frequency deviations and charger losses in order for an aggregation of electric vehicles (EVs) to provide reliable primary frequency control (PFC). A data set consisting of one year of frequency measurements of the Nordic synchronous zone is used for the analysis. The average system frequency can be biased over the hour, which can lead storage units, performing PFC, to become fully charged or depleted. This paper presents statistical bounds on how variable the average system frequency can be on different time scales. Additionally, a method for calculating the expected energy loss caused by continuous charging and discharging is presented together with efficiency measurements of a commercial bidirectional EV charger. It is found that during a year, the energy balance of the service provider, relative to the grid, is within the calculated bounds. The efficiency losses are calculated and validated to have a linear relationship with the reserve capacity and the provision time.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy resources, services and control, Energy system operation and management
Authors: Thingvad, A. (Intern), Ziras, C. (Intern), Hu, J. (Intern), Marinelli, M. (Intern)
Number of pages: 6
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Assessing the importance of spatio-temporal RCM resolution when estimating sub-daily extreme precipitation under current and future climate conditions

The increase in extreme precipitation is likely to be one of the most significant impacts of climate change in cities due to increased pluvial flood risk. Hence, reliable information on changes in sub-daily extreme precipitation is needed for robust adaptation strategies. This study explores extreme precipitation over Denmark generated by the regional climate model (RCM) HIRHAM-ECEARTH at different spatial resolutions (8, 12, 25 and 50km), three RCM from the RiskChange project at 8km resolution and three RCMs from ENSEMBLES at 25km resolution at temporal aggregations from 1 to 48h. The performance of the RCM simulations in current climate as well as projected changes for 2081-2100 is evaluated for non-central moments of order 1-3 and for the 2- and 10-year events. The comparison of the RCM simulations and observations shows that the higher spatial resolution simulations (8 and 12km) are more consistent across all temporal aggregations in the representation of high-order moments and extreme precipitation. The biases in the spatial pattern of extreme precipitation change across temporal and spatial resolution. The hourly extreme value distributions of the HIRHAM-ECEARTH simulations are more skewed than the observational dataset, which leads to an overestimation by the higher spatial resolution simulations. Nevertheless, in general, under current conditions RCM simulations at high spatial resolution represent extreme events and high-order moments better. The changes projected by the RCM simulations depend on the global climate model (GCM)-RCM combination, spatial resolution and temporal aggregation. The simulations disagree on the magnitude and spatial pattern of the changes. However, there is an agreement on higher changes for lower temporal aggregation and higher spatial resolution. Overall, the results from this study show the influence of the spatial resolution on the precipitation outputs from RCMs. The biases of the RCM simulations increase, and the projected changes decrease for decreasing spatial resolution of the simulations. This points towards the need for high spatial and temporal resolution RCMs to obtain reliable information on changes in sub-daily extreme precipitation.

General information
State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems, DHI Hørsholm, Imperial College London
Authors: Sunyer Pinya, M. A. (Intern), Luchner, J. (Ekstern), Onof, C. (Ekstern), Madsen, H. (Ekstern), Arnbjerg-Nielsen, K. (Intern)
Number of pages: 18
Pages: 688-705
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: International Journal of Climatology
Volume: 37
Assessing the need for better forecasting and observability of PV.

In its review of the challenges and opportunities associated with massive deployment of solar PV generation, the Grid integration working group of the ETIP PV identified forecasting and observability as critical technologies for the planning and operation of the power system with large PV penetration. In this white paper ETIP PV set out to spell out in more details what features are needed from these technologies and what is the state of the art.
Assessing the performance of the random phase approximation for exchange and superexchange coupling constants in magnetic crystalline solids

The random phase approximation (RPA) for total energies has previously been shown to provide a qualitatively correct description of static correlation in molecular systems, where density functional theory (DFT) with local functionals are bound to fail. This immediately poses the question of whether the RPA is also able to capture the correct physics of strongly correlated solids such as Mott insulators. Due to strong electron localization, magnetic interactions in such systems are dominated by superexchange, which in the simplest picture can be regarded as the analog of static correlation for molecules. In this paper, we investigate the performance of the RPA for evaluating both superexchange and direct exchange interactions in the magnetic solids NiO, MnO, Na$_2$Cu$_2$SbO$_5$, Sr$_2$CuO$_3$, Sr$_2$CuTeO$_6$, and a monolayer of CrI$_3$, which were chosen to represent a broad variety of magnetic interactions. It is found that the RPA can accurately correct the large errors introduced by Hartree-Fock, independent of the input orbitals used for the perturbative expansion. However, in most cases, accuracies similar to RPA can be obtained with DFT + U, which is significantly simpler from a computational point of view.
Assessing transformational change from institutionalising digital capabilities on implementation and development of Product-Service Systems: Learnings from the maritime industry

Digitization is rapidly reshaping industries and economic sectors. It enables novel Product-Service Systems (PSS) that transform customer/supplier relationships and introduces new value propositions. However, while opportunities for novel types of PSS arise, it is not clear how digitization and the institutionalisation of digital capabilities, particularly within the customer organisations, may affect implementation of PSS, potentially leading to transformational changes in the customer organisation. This paper examines one such potential transformational change from three complementary viewpoints – the resource based, the dynamic, and the relational viewpoint. It does so through action research study in the context of the maritime industry, which is particularly attractive for PSS offerings. The research methodology comprised a two-step action research process, focusing on both digitization and PSS development and implementation. The main findings are that rather than facilitating procurement to co-development of PSS, institutionalisation of digital capabilities facilitated development of PSS by stakeholders internal to the company, and strategic co-development with external stakeholders. The new digital capabilities circumvented cost barriers associated with the procurement of services from external stakeholders, supported process standardization - to the expense of process innovation-, and transformed the network that delivered PSS by closing opportunity gaps for externally procured services. Furthermore, the uptake of digital capabilities highlighted the importance of cost estimation in making the customer more responsive to threats and opportunities.
Assessment and recruitment status of Baltic Sea trout populations

General information
State: Accepted/In press
Assessment of a combined dry anaerobic digestion and post-composting treatment facility for source-separated organic household waste, using material and substance flow analysis and life cycle inventory

The fate of total solids, volatile solids, total organic carbon, fossil carbon, biogenic carbon and 17 substances (As, Ca, CaCO3, Cd, Cl, Cr, Cu, H, Hg, K, Mg, N, Ni, O, P, Pb, S, Zn) in a combined dry anaerobic digestion and post-composting facility were assessed. Mass balances showed good results with low uncertainties for non-volatile substances, while balances for nitrogen, carbon, volatile solids and total organic carbon showed larger but reasonable uncertainties, due to volatilisation and emissions into the air. Material and substance flow analyses were performed in order to obtain transfer coefficients for a combined dry anaerobic digestion and post-composting facility. All metals passed through the facility and ended up in compost or residues, but all concentrations of metals in the compost complied with legislation. About 23% of the carbon content of the organic waste was transferred to the biogas, 24% to the compost, 13% to residues and 40% into the atmosphere. For nitrogen, 69% was transferred to the compost, 10% volatilised to the biofilter, 11% directly into the atmosphere and 10% to residues. Finally, a full life cycle inventory was conducted for the combined dry anaerobic digestion and post-composting facility, including waste received, fuel consumption, energy use, gaseous emissions, products, energy production and chemical composition of the compost produced.
Assessment of airborne bacteria and noroviruses in air emission from a new highly-advanced hospital wastewater treatment plant

Exposure to bioaerosols can pose a health risk to workers at wastewater treatment plants (WWTPs) and to habitants of their surroundings. The main objective of this study was to examine the presence of harmful microorganisms in the air emission from a new type of hospital WWTP employing advanced wastewater treatment technologies. Air particle measurements and sampling of inhalable bacteria, endotoxin and noroviruses (NoVs) were performed indoor at the WWTP and outside at the WWTP ventilation air exhaust, downwind of the air exhaust, and upwind of the WWTP. No significant differences were seen in particle and endotoxin concentrations between locations. Bacterial concentrations were comparable or significantly lower in the exhaust air than inside the WWTP and in the upwind reference. Bacterial isolates were identified using matrix-assisted laser desorption-ionization time-of-flight mass spectrometry. In total, 35 different bacterial genera and 64 bacterial species were identified in the air samples. Significantly higher genus and species richness was found with an Andersen Cascade Impactor compared with filter-based sampling. No pathogenic bacteria were found in the exhaust air. Streptomyces was the only bacterium found in the air both inside the WWTP and at the air emission, but not in the upwind reference. NoV genomes were detected in the air inside the WWTP and at the air exhaust, albeit in low concentrations. As only traces of NoV genomes could be detected in the exhaust air they are unlikely to pose a health risk to surroundings. Hence, we assess the risk of airborne exposure to pathogenic bacteria and NoVs from the WWTP air emission to surroundings to be negligible. However, as a slightly higher NoV concentration was detected inside the WWTP, we cannot exclude the possibility that exposure to airborne NoVs can pose a health risk to susceptible to workers inside the WWTP, although the risk may be low.

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, National Research Center for Working Environment, DHI Denmark
Authors: Uhrbrand, K. (Intern), Schultz, A. C. (Intern), Koivisto, A. J. (Ekstern), Nielsen, U. (Ekstern), Madsen, A. M. (Ekstern)
Assessment of broadband snr estimation for hearing aid applications

An accurate estimation of the broadband input signal-to-noise ratio (SNR) is a prerequisite for many hearing-aid algorithms. An extensive comparison of three SNR estimation algorithms was performed. Moreover, the influence of the duration of the analysis window on the SNR estimation performance was systematically investigated. The most accurate approach utilized an estimation of the clean speech power spectral density (PSD) and the noisy speech power across a sliding window of 1280 ms and achieved an total SNR estimation error below 3 dB across a wide variety of background noises and input SNRs.

Assessment of drinking water quality at the tap using fluorescence spectroscopy

Treated drinking water may become contaminated while travelling in the distribution system on the way to consumers. Elevated dissolved organic matter (DOM) at the tap relative to the water leaving the treatment plant is a potential indicator of contamination, and can be measured sensitively, inexpensively and potentially on-line via fluorescence and absorbance spectroscopy. Detecting elevated DOM requires potential contamination events to be distinguished from natural fluctuations in the system, but how much natural variation to expect in a stable distribution system is unknown. In this study, relationships between DOM optical properties, microbial indicator organisms and trace elements were investigated for households connected to a biologically-stable drinking water distribution system. Across the network, humic-like fluorescence intensities showed limited variation (RSD = 3.5-4.4%), with half of measured variation explained by interactions with copper. After accounting for quenching by copper, fluorescence provided a very stable background signal (RSD).
Assessment of groundwater contamination impacting stream ecosystems

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, Bielefeld University, Aarhus University
Authors: Bjerg, P. L. (Intern), Sonne, A. T. (Intern), Rasmussen, J. J. (Ekstern), Höss, S. (Ekstern), Rønde, V. (Intern), Traunspurger, W. (Ekstern), McKnight, U. S. (Intern)
Pages: 98-98
Publication date: 2017

Assessment of methane production from shredder waste in landfills: The influence of temperature, moisture and metals

In this study, methane (CH4) production rates from shredder waste (SW) were determined by incubation of waste samples over a period of 230 days under different operating conditions, and first-order decay kinetic constants (k-values) were calculated. SW and sterilized SW were incubated under different temperatures (20-25°C, 37°C, and 55°C), moisture contents (35% and 75% w/w) and amounts of inoculum (5% and 30% of the samples wet weight). The biochemical methane potential (BMP) from different types of SW (fresh, old and sieved) was determined and compared. The ability of metals (iron, aluminum, zinc, and copper) contained in SW to provide electrons for methanogens resulting in gas compositions with high CH4 contents and very low CO2 contents was investigated. The BMP of SW was 1.5-6.2 kg CH4/ton waste. The highest BMP was observed in fresh SW samples, while the lowest was observed in sieved samples (fine fraction of SW). Abiotic production of CH4 was not observed in laboratory incubations. The biotic experiments showed that when the moisture content was 35% w/w and the temperature was 20-25°C, CH4 production was extremely low. Increasing the temperature from 20-25°C to 37°C resulted in significantly higher CH4 production while increasing the temperature from 37°C to 55°C resulted in higher CH4 production, but to a lower extent. Increasing the moisture and inoculum content also increased CH4 production. The k-values were 0.033-0.075 yr(-1) at room temperature, 0.220-0.429 yr(-1) at 37°C and 0.235-0.488 yr(-1) at 55°C, indicating that higher temperatures resulted in higher k-values. It was observed that H2 can be produced by biocorrosion of iron, aluminum, and zinc and it was shown that produced H2 can be utilized by hydrogenotrophic methanogens to convert CO2 to CH4. Addition of iron and copper to SW resulted in inhibition of CH4 production, while addition of aluminum and zinc resulted in higher CH4 production. This suggested that aluminum and zinc contribute to high CH4 production from SW by providing H2 for hydrogenotrophic methanogens. Gas compositions with higher CH4 and lower CO2 observed in landfilled SW are thus most likely due to the consumption of existing CO2 in the produced biogas and the produced H2 by biocorrosion of aluminum and zinc by methanogens.

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering
Authors: Fathi Aghdam, E. (Intern), Schuetz, C. (Intern), Kjeldsen, P. (Intern)
Pages: 226-237
Publication date: 2017

Assessment of methane production from shredder waste in landfills: The influence of temperature, moisture and metals

In this study, methane (CH4) production rates from shredder waste (SW) were determined by incubation of waste samples over a period of 230 days under different operating conditions, and first-order decay kinetic constants (k-values) were calculated. SW and sterilized SW were incubated under different temperatures (20-25°C, 37°C, and 55°C), moisture contents (35% and 75% w/w) and amounts of inoculum (5% and 30% of the samples wet weight). The biochemical methane potential (BMP) from different types of SW (fresh, old and sieved) was determined and compared. The ability of metals (iron, aluminum, zinc, and copper) contained in SW to provide electrons for methanogens resulting in gas compositions with high CH4 contents and very low CO2 contents was investigated. The BMP of SW was 1.5-6.2 kg CH4/ton waste. The highest BMP was observed in fresh SW samples, while the lowest was observed in sieved samples (fine fraction of SW). Abiotic production of CH4 was not observed in laboratory incubations. The biotic experiments showed that when the moisture content was 35% w/w and the temperature was 20-25°C, CH4 production was extremely low. Increasing the temperature from 20-25°C to 37°C resulted in significantly higher CH4 production while increasing the temperature from 37°C to 55°C resulted in higher CH4 production, but to a lower extent. Increasing the moisture and inoculum content also increased CH4 production. The k-values were 0.033-0.075 yr(-1) at room temperature, 0.220-0.429 yr(-1) at 37°C and 0.235-0.488 yr(-1) at 55°C, indicating that higher temperatures resulted in higher k-values. It was observed that H2 can be produced by biocorrosion of iron, aluminum, and zinc and it was shown that produced H2 can be utilized by hydrogenotrophic methanogens to convert CO2 to CH4. Addition of iron and copper to SW resulted in inhibition of CH4 production, while addition of aluminum and zinc resulted in higher CH4 production. This suggested that aluminum and zinc contribute to high CH4 production from SW by providing H2 for hydrogenotrophic methanogens. Gas compositions with higher CH4 and lower CO2 observed in landfilled SW are thus most likely due to the consumption of existing CO2 in the produced biogas and the produced H2 by biocorrosion of aluminum and zinc by methanogens.
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ISI indexed (2013): ISI indexed yes
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Scopus rating (2012): SJR 1.611 SNIP 2.184 CiteScore 2.91
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Scopus rating (2010): SJR 1.555 SNIP 1.78
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Scopus rating (2009): SJR 1.502 SNIP 1.899
Web of Science (2009): Indexed yes
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Scopus rating (2008): SJR 1.378 SNIP 2.13
Web of Science (2008): Indexed yes
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Scopus rating (2006): SJR 1.046 SNIP 1.749
Web of Science (2006): Indexed yes
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Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.847 SNIP 1.269
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.561 SNIP 0.874
Scopus rating (2001): SJR 0.456 SNIP 0.696
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Source-ID: 2349358359
Publication: Research - peer-review › Journal article – Annual report year: 2017
Assessment of perceptual diffuseness in the time domain

This study proposes a numerical and experimental framework for evaluating the perceptual aspect of the diffuse field condition with intended final use in music auditoria. Multiple Impulse Responses are simulated based on the time domain Poisson process with increasing reflection density. Different diffuseness conditions are realized by altering the directions of arrival of the reflected waves. This model also considers room characteristics such as the volume, absorption of surfaces, air absorption and geometrical divergence. Listening tests are performed in an anechoic 64-loudspeaker based virtual acoustic environment to examine how sensitive the human auditory system is to changes in the diffuseness condition, which factors are most crucial and which conditions are most favourable in music halls. Two types of stimuli, a music signal and an impulse response, are tested under the same diffuseness conditions. The study shows that subjective diffuseness is highly correlated to the parameters of Surround, Source Width, and Timbre, and is modelled with relevant acoustic parameters such as LG, LF and uniformity of the incident sound.

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Organisations: Department of Electrical Engineering, Acoustic Technology, Soundzipper LLP
Authors: Garcia, J. M. (Ekstern), Jeong, C. (Intern), Brunskog, J. (Intern), Nolan, M. (Intern)
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Antibiotic consumption in pigs can be optimized by developing treatment guidelines, which encourage veterinarians to use effective drugs with low probability of developing resistance of importance for human health. In Denmark, treatment guidelines for use in swine production are currently under review at the Danish Veterinary and Food Administration. Use of pleuromutilins in swine has previously been associated with a very low risk for human health. However, recent international data and sporadic findings of novel resistance genes suggest a change of risk. Consequently, a reassessment was undertaken inspired by a risk assessment framework developed by the European Medicines Agency. Livestock-associated methicillin-resistant Staphylococcus aureus of clonal complex 398 (MRSA CC398) and enterococci were identified as relevant hazards. The release assessment showed that the probability of development of pleuromutilin resistance was high in MRSA CC398 (medium uncertainty) and low in enterococci (high uncertainty). A relatively small proportion of Danes has an occupational exposure to pigs, and foodborne transmission was only considered of relevance.
for enterococci, resulting in an altogether low exposure risk. The human consequences of infection with pleuromutilin-resistant MRSA CC398 or enterococci were assessed as low for the public in general but high for vulnerable groups such as hospitalized and immunocompromised persons. For MRSA CC398, the total risk was estimated as low (low uncertainty), among other due to the current guidelines on prevention of MRSA in place at Danish hospitals, which include screening of patients with daily contact to pigs on admittance. Moreover, MRSA CC398 has a medium human–human transmission potential. For enterococci, the total risk was estimated as low due to low prevalence of resistance, low probability of spread to humans, low virulence, but no screening of hospitalized patients, high ability of acquiring resistance genes, and a limited number of alternative antimicrobials (high uncertainty). This assessment reflects the current situation and should be repeated if pleuromutilin consumption increases substantially, resulting in increased prevalence of mobile, easily transmissible resistance mechanisms. Continuous monitoring of pleuromutilin resistance in selected human pathogens should therefore be considered. This also includes monitoring of linezolid resistance, since resistance mechanisms for pleuromutins and oxazolidones are often coupled.

General information
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Organisations: National Food Institute, Division of Risk Assessment and Nutrition, Danish Agriculture and Food Council, Danish Association of the Veterinary Pharmaceutical Industry, Statens SerumInstitute
Authors: Alban, L. (Ekstern), Ellis-Iversen, J. (Intern), Andreasen, M. (Ekstern), Dahl, J. (Ekstern), Wolff Sönksen, U. (Ekstern)
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Assessment of Urban Pluvial Flood Risk and Efficiency of Adaptation Options Through Simulations – A New Generation of Urban Planning Tools
We present a new framework for flexible testing of flood risk adaptation strategies in a variety of urban development and climate scenarios. This framework couples the 1D-2D hydrodynamic simulation package MIKE FLOOD with the agent-based urban development model DAnCE4Water and provides the possibility to systematically test various flood risk adaptation measures ranging from large infrastructure changes over decentralised water management to urban planning policies. We have tested the framework in a case study in Melbourne, Australia considering 9 scenarios for urban development and climate and 32 potential combinations of flood adaptation measures. We found that the performance of adaptation measures strongly depended on the considered climate and urban development scenario and the other implementation measures implemented, suggesting that adaptive strategies are preferable over one-off investments. Urban planning policies proved to be an efficient means for the reduction of flood risk, while implementing property buyback and pipe increases in a guideline-oriented manner was too costly. Random variations in location and time point of urban development could have significant impact on flood risk and would in some cases outweigh the benefits of less efficient adaptation strategies. The results of our setup can serve as an input for robust decision making frameworks and thus support the identification of flood risk adaptation measures that are economically efficient and robust to variations of climate and urban layout.

General information
State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems, Monash University, DHI Denmark
Authors: Löwe, R. (Intern), Urich, C. (Ekstern), Sto. Domingo, N. D. F. (Ekstern), Mark, O. (Ekstern), Deletic, A. (Ekstern), Arnberg-Nielsen, K. (Intern)
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Journal: Journal of Hydrology
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Assisted crack tip flipping under Mode I thin sheet tearing

Crack tip flipping, where the fracture surface alternates from side to side in roughly 45° shear bands, seems to be an overlooked propagation mode in Mode I thin sheet tearing. In fact, observations of crack tip flipping is rarely found in the literature. Unlike the already established modes such as slanting, cup-cone (rooftop), or cup-cup (bathtub) the flipping crack never settles in a steady-state as the near tip stress/strain field continuously change when the flip successively initiates and develops shear-lips. A recent experimental investigation has revealed new insight by exploiting 3D X-ray tomography scanning of a developing crack tip flip. But, it remains to be understood what makes the crack flip systematically, what sets the flipping frequency, and under which material conditions this mode occurs. The present study aims at investigating the idea that a slight out-of-plane action (Mode III type loading) on the tip of a slant Mode I crack can provoke it to flip to the opposite side. Both experiments and micro-mechanics based modeling support this hypothesis.

General information

State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics
Authors: Felter, C. L. (Intern), Nielsen, K. L. (Intern)
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BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.7 SJR 1.462 SNIP 1.466
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.442 SNIP 1.492 CiteScore 2.56
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.317 SNIP 1.627 CiteScore 2.14
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.647 SNIP 2.129 CiteScore 2.6
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.379 SNIP 1.828 CiteScore 1.92
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.271 SNIP 1.742 CiteScore 1.92
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.251 SNIP 1.696
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.644 SNIP 1.634
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.688 SNIP 1.675
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.407 SNIP 1.58
Web of Science (2007): Indexed yes
Associating ground magnetometer observations with current or voltage generators

A circuit analogy for magnetosphere-ionosphere current systems has two extremes for drivers of ionospheric currents: ionospheric electric fields/voltages constant while current/conductivity vary—the "voltage generator"—and current constant while electric field/conductivity vary—the "current generator." Statistical studies of ground magnetometer observations associated with dayside Transient High Latitude Current Systems (THLCS) driven by similar mechanisms find contradictory results using this paradigm: some studies associate THLCS with voltage generators, others with current generators. We argue that most of this contradiction arises from two assumptions used to interpret ground magnetometer observations: (1) measurements made at fixed position relative to the THLCS field-aligned current and (2) negligible auroral precipitation contributions to ionospheric conductivity. We use observations and simulations to illustrate how these two assumptions substantially alter expectations for magnetic perturbations associated with either a current or a voltage generator. Our results demonstrate that before interpreting ground magnetometer observations of THLCS in the context of current/voltage generators, the location of a ground magnetometer station relative to the THLCS field-aligned current and the location of any auroral zone conductivity enhancements need to be taken into account.
Association between selected antimicrobial resistance genes and antimicrobial exposure in Danish pig farms

Bacterial antimicrobial resistance (AMR) in pigs is an important public health concern due to its possible transfer to humans. We aimed at quantifying the relationship between the lifetime exposure of antimicrobials and seven antimicrobial resistance genes in Danish slaughter pig farms. AMR gene levels were quantified by qPCR of total-community DNA in faecal samples obtained from 681 batches of slaughter pigs. The lifetime exposure to antimicrobials was estimated at batch level for the piglet, weaner, and finisher periods individually for the sampled batches. We showed that the effect of antimicrobial exposure on the levels of AMR genes was complex and unique for each individual gene. Several antimicrobial classes had both negative and positive correlations with the AMR genes. From 10-42% of the variation in AMR gene levels could be explained in the final regression models, indicating that antimicrobial exposure is not the only important determinant of the AMR gene levels.

General information
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Organisations: National Veterinary Institute, Epidemiology, Section for Epidemiology, Section for Bacteriology, Pathology and Parasitology, Bacteriology & Parasitology
Association between single nucleotide polymorphisms in the antioxidant genes CAT, GR and SOD1, erythrocyte enzyme activities, dietary and life style factors and breast cancer risk in a Danish, prospective cohort study

Exposure to estrogens and alcohol consumption - the two only well-established risk factors for breast cancer - are capable of causing oxidative stress, which has been linked to progression of breast cancer. Here, five functional polymorphisms in the antioxidant genes SOD1, CAT and GSR were investigated in 703 breast cancer case-control pairs in the Danish, prospective "Diet, Cancer and Health" cohort together with gene-environment interactions between the polymorphisms, enzyme activities and intake of fruits and vegetables, alcohol and smoking in relation to breast cancer risk. Our results showed that genetically determined variations in the antioxidant enzyme activities of SOD1, CAT and GSR were not associated with risk of breast cancer per se. However, intake of alcohol, fruit and vegetables, and smoking status interacted with some of the polymorphisms in relation to breast cancer risk. Four polymorphisms were strongly associated with enzyme activity, but there was no interaction between any of the studied environmental factors and the polymorphisms in relation to enzyme activity. Additionally, single measurement of enzyme activity at entry to the cohort was not associated with risk of breast cancer. Our results therefore suggest that the antioxidant enzyme activities studied here are not major determinants of breast cancer risk.

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Organisations: National Food Institute, Research Group for Risk-Benefit, National Research Center for Working Environment, University of Copenhagen, Danish Cancer Society
A Statistical Model for Hourly Large-Scale Wind and Photovoltaic Generation in New Locations

The analysis of large-scale wind and photovoltaic (PV) energy generation is of vital importance in power systems where their penetration is high. This paper presents a modular methodology to assess the power generation and volatility of a system consisting of both PV plants (PVPs) and wind power plants (WPPs) in new locations. The methodology is based on statistical modelling of PV and WPP locations with a vector autoregressive model, which takes into account both the temporal correlations in individual plants and the spatial correlations between the plants. The spatial correlations are linked through distances between the locations, which allows the methodology to be used to assess scenarios with PVPs and WPPs in multiple locations without actual measurement data. The methodology can be applied by the transmission and distribution system operators when analysing the effects and feasibility of new PVPs and WPPs in system planning. The model is verified against hourly measured wind speed and solar irradiance data from Finland. A case study assessing the impact of the geographical distribution of the PVPs and WPPs on aggregate power generation and its variability is presented.
A statistical strategy to assess cleaning level of surfaces using fluorescence spectroscopy and Wilks' ratio

A statistical strategy combining fluorescence spectroscopy, multivariate analysis and Wilks' ratio is proposed. The method was tested both off-line and on-line having riboflavin as a (controlled) contaminant. Wilks’ ratio signals unusual recordings based on shifts in variance and covariance structure described in in-control data.
A Stochastic Model to Assess the Effect of Meat Inspection Practices on the Contamination of the Pig Carcasses

The objective of meat inspection is to promote animal and public health by preventing, detecting, and controlling hazards originating from animals. With the improvements of sanitary level in pig herds, the hazards profile has shifted and the inspection procedures no longer target major foodborne pathogens (i.e., not risk based). Additionally, carcass manipulations performed when searching for macroscopic lesions can lead to cross-contamination. We therefore developed a stochastic model to quantitatively describe cross-contamination when consecutive carcasses are submitted to...
classic inspection procedures. The microbial hazard used to illustrate the model was Salmonella, the data set was obtained from Brazilian slaughterhouses, and some simplifying assumptions were made. The model predicted that due to cross-contamination during inspection, the prevalence of contaminated carcass surfaces increased from 1.2% to 95.7%, whereas the mean contamination on contaminated surfaces decreased from 1 logCFU/cm² to −0.87 logCFU/cm², and the standard deviations decreased from 0.65 to 0.19. These results are explained by the fact that, due to carcass manipulations with hands, knives, and hooks, including the cutting of contaminated lymph nodes, Salmonella is transferred to previously uncontaminated carcasses, but in small quantities. These small quantities can easily go undetected during sampling. Sensitivity analyses gave insight into the model performance and showed that the touching and cutting of lymph nodes during inspection can be an important source of carcass contamination. The model can serve as a tool to support discussions on the modernization of pig carcass inspection.

General information
State: Published
Organisations: National Food Institute, Research Group for Risk-Benefit, Federal University of Rio Grande do Sul
Authors: de Freitas Costa, E. (Ekstern), Corbellini, L. G. (Ekstern), da Silva, A. P. S. P. (Ekstern), Nauta, M. (Intern)
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Scopus rating (2015): SJR 1.305 SNIP 1.521 CiteScore 2.51
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.352 SNIP 1.61 CiteScore 2.2
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.067 SNIP 1.563 CiteScore 2.1
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.763 SNIP 1.612 CiteScore 2.12
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.725 SNIP 1.707 CiteScore 2.15
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.741 SNIP 1.526
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.64 SNIP 1.39
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.673 SNIP 1.461
Scopus rating (2007): SJR 0.78 SNIP 1.441
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.818 SNIP 1.458
Scopus rating (2005): SJR 0.717 SNIP 1.42
Web of Science (2005): Indexed yes
A stochastic surplus production model in continuous time

Surplus production modelling has a long history as a method for managing data-limited fish stocks. Recent advancements have cast surplus production models as state-space models that separate random variability of stock dynamics from error in observed indices of biomass. We present a stochastic surplus production model in continuous time (SPiCT), which in addition to stock dynamics also models the dynamics of the fisheries. This enables error in the catch process to be reflected in the uncertainty of estimated model parameters and management quantities. Benefits of the continuous-time state-space model formulation include the ability to provide estimates of exploitable biomass and fishing mortality at any point in time from data sampled at arbitrary and possibly irregular intervals. We show in a simulation that the ability to analyse subannual data can increase the effective sample size and improve estimation of reference points relative to discrete-time analysis of aggregated annual data. Finally, subannual data from five North Sea stocks are analysed with particular focus on using residual analysis to diagnose model insufficiencies and identify necessary model extensions such as robust estimation and incorporation of seasonality. We argue that including all known sources of uncertainty, propagation of that uncertainty to reference points and checking of model assumptions using residuals are critical prerequisites to rigorous fish stock management based on surplus production models.
A straightforward approach to electrodeposit tungsten disulfide/poly(3,4-ethylenedioxythiophene) composites onto nanoporous gold for the hydrogen evolution reaction

1.1 nm tungsten disulfide/poly(3,4-ethylenedioxythiophene) (PEDOT) was successfully electrodeposited on the surface of dealloyed nanoporous gold (NPG) surface to form uniform nanocomposites and offers an excellent electrocatalysis for the electrochemical dihydrogen evolution reaction (HER) in acidic media. The approach is straightforward and does not require any expensive equipment or intensive energy. The morphology and composition of the nanocomposites were structurally mapped by high-resolution transmission electron microscopy (HRTEM), X-ray photoelectron spectroscopy (XPS) and Fourier transform infrared spectrometry (FTIR). The roles of both the NPG substrate and PEDOT in the observed enhanced HER activity compared to planar Au-electrode surfaces and pure single-component WS₂ have been deconvoluted experimentally. PEDOT itself is inert for the HER, but was found to improve significantly the conductivity and operating stability of the WS₂ catalyst. The prepared nanocomposites reach the best in 2D WS₂ catalyst family, exhibiting excellent electrochemical catalystic activity for the HER. The optimal electrode showed an onset potential of -164 mV vs. reversible hydrogen electrode (RHE), an apparent exchange current density as high as 0.04 mAcm⁻², and a very low Tafel slope of 53 mV dec⁻¹. These catalysts are promising electrocatalysts for generation a large amount of H₂ from water.

General information
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Organisations: Department of Chemistry, NanoChemistry, Organic Chemistry, Shandong University, Aarhus University
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BFI (2016): BFI-level 1
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.914 SNIP 1.3 CiteScore 3.13
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.958 SNIP 1.477 CiteScore 2.96
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.965 SNIP 1.488 CiteScore 2.78
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.918 SNIP 1.373 CiteScore 2.26
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.908 SNIP 1.402 CiteScore 2.27
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.924 SNIP 1.141
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.842 SNIP 1.023
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.899 SNIP 1.087
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.795 SNIP 0.945
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.852 SNIP 1.052
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.679 SNIP 0.946
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.964 SNIP 1.126
Scopus rating (2003): SJR 0.988 SNIP 1.027
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.921 SNIP 0.954
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.841 SNIP 0.796
Scopus rating (2000): SJR 0.866 SNIP 0.772
Scopus rating (1999): SJR 1.064 SNIP 0.907

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A Strategic View of University Timetabling

University Timetabling has traditionally been studied as an operational problem where the goal is to assign lectures to rooms and timeslots and create timetables of high quality for students and teachers. Two other important decision problems arise before this can be solved: what rooms are necessary, and in which teaching periods? These decisions may have a large impact on the resulting timetables and are rarely changed or even discussed. This paper focuses on solving these two strategic problems and investigates the impact of these decisions on the quality of the resulting timetables.

The relationship and differences between operational, tactical and strategic timetabling problems are reviewed. Based on the formulation of curriculum-based course timetabling and data from the Second International Timetabling Competition (ITC 2007), three new bi-objective mixed-integer models are formulated. We propose an algorithm based on the constraint method to solve them. The algorithm can be used to analyze the impact of having different resources available on most timetabling problems. Finally, we report results on how the three objectives - rooms, teaching periods and quality - influence one another.

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Organisations: Department of Management Engineering, Management Science, Operations Research, University of Auckland
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Web of Science (2016): Indexed yes
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Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.186 SNIP 2.485 CiteScore 3.21
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.346 SNIP 2.735 CiteScore 3.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.418 SNIP 2.588 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.401 SNIP 2.441 CiteScore 3.02
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.477 SNIP 2.435
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.326 SNIP 2.577
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
A Strategy to Suppress Phonon Transport in Molecular Junctions Using pi-Stacked Systems

Molecular junctions are promising candidates for thermoelectric devices due to the potential to tune the electronic and thermal transport properties. However, a high figure of merit is hard to achieve, without reducing the phononic contribution to thermal conductance. Here, we propose a strategy to suppress phonon transport in graphene-based molecular junctions preserving high electronic power factor, using nonbonded pi-stackal systems. Using first-principles calculations, we find that the thermal conductance of pi-stacked systems can be reduced by about 95%, compared with that of a covalently bonded molecular junction. Phonon transmission of pi-stacked systems is largely attenuated in the whole frequency range, and the remaining transmission occurs mainly below 5 THz, where out-of-plane channels dominate. The figure of merit (ZT) of the pi-stacked molecular junction is dramatically enhanced because of the very low phononic thermal conductance, leaving room for further optimization of the electronic properties.
A study of associations between early DHA status and fatty acid desaturase (FADS) SNP and developmental outcomes in children of obese mothers

DHA from diet or endogenous synthesis has been proposed to affect infant development, however, results are inconclusive. In this study, we aim to verify previously observed fatty acid desaturase gene cluster (FADS) SNP-specific associations with erythrocyte DHA status in 9-month-old children and sex-specific association with developmental outcomes. The study was performed in 166 children (55 % boys) of obese mothers. Erythrocyte fatty acid composition was analysed in blood-samples obtained at 9 months of age, and developmental outcomes assessed by the Ages and Stages Questionnaire at 3 years. Erythrocyte DHA level ranged from 4·4 to 9·9 % of fatty acids, but did not show any association with FADS SNP or other potential determinants. Regression analysis showed associations between erythrocyte DHA and scores for personal-social skills (β 1·8 (95 % CI 0·3, 3·3), P=0·019) and problem solving (β 3·4 (95 % CI 1·2, 5·6), P=0·003). A tendency was observed for an association in opposite direction between minor alleles (G-variant) of rs1535 and rs174575 and personal-social skills (P=0·062 and 0·068, respectively), which became significant when the SNP were combined based on their previously observed effect on erythrocyte DHA at 9 months of age (β 2·6 (95 % CI 0·01, 5·1), P=0·011). Sex-SNP interaction was indicated for rs174575 genotype on fine motor scores (P=0·016), due to higher scores among minor allele carrying girls (P=0·043), whereas no effect was seen among boys. In conclusion, DHA-increasing FADS SNP and erythrocyte DHA status were consistently associated with improved personal-social skills in this small cohort of children of obese mothers irrespective of sex, but the sample was too small to verify potential sex-specific effects.

General information
A Study of Deactivating Carbon Species during Methanation on a Ni/Al₂O₃ Catalyst

This Ph.D. thesis describes the research and findings from experimental testing of a methanation catalyst and the characterisation of said catalyst. Methanation is the conversion of syngas (CO and H₂) typically from coal or biomass to methane and water. Methane is the biggest constituent of natural gas and as the infrastructure is already in place for natural gas, it is an attractive alternative to depleting oil resources. Catalysts based on nickel are the most common choice within industry due to the relatively low price of nickel and its acceptable performance. However, nickel catalysts are prone to deactivate due to sintering and carbon deposition. The latter process is not well understood and thus, this work attempted to further the research in low temperature carbon formation. In order to obtain fundamental knowledge, the experimental setup had to be free of impurities and great care was taken to eliminate potential sources. Experiments designed for that purpose established that the influence of sulfur was negligible. Through a series of experiments of temperature programmed hydrogenation (TPH) - methanation - TPH, the carbon build-up during the methanation was studied by the second TPH. Four types of carbon were identified and especially one was found to be the main cause of deactivation. Through x-ray diffraction (XRD) it was established that part of the carbon dissolved into the nickel particles expanding the crystal structure. No carbon was observed during transmission electron microscopy (TEM). Yet by scanning transmission electron microscopy (STEM) energy dispersive spectroscopy (EDS) carbon was discovered in proximity to the nickel particles. However, this was not as well-defined shells and thus, it was deduced that the particles were not encapsulated by carbon. Instead, the carbon was likely very inhomogeneously distributed across the nickel surface, which was supported by remaining activity observed during the methanation tests. Preliminary results on the effect of particle size, temperature and total pressure of methanation showed that especially temperature greatly affected the types of carbon deposited.

General information
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Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics
Authors: Olesen, S. E. (Intern), Chorkendorff, I. (Intern), Andersson, K. J. (Intern)
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A Study of Deactivating Carbon Species during Methanation on a Ni/Al₂O₃ Catalyst
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A study of DLC coatings for ironing of stainless steel

Stamping of sheet metal components without lubrication or using minimum amount of hazard free lubricant is a possible solution to diminish health hazards to personnel and environmental impact and to reduce production costs. This paper studies the application of diamond-like coating (DLC) under severe lubrication conditions by adopting strip reduction testing to replicate industrial ironing production of deep drawn, stainless steel cans. Three DLC coatings are investigated; multi-layer, double layer and single layer. Experiments revealed that the double layer coating worked successful, i.e. with no sign of galling using no lubrication even at elevated tool temperature, while the other two coatings peeled off and resulted in severe galling unless lubrication was applied.

General information
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Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Sulaiman, M. H. B. (Intern), Christiansen, P. (Intern), Bay, N. O. (Intern)
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Scopus rating (2015): SJR 0.172 SNIP 0.281 CiteScore 0.22
Scopus rating (2014): SJR 0.186 SNIP 0.306 CiteScore 0.18
Scopus rating (2013): SJR 0.183 SNIP 0.256 CiteScore 0.16
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.161 SNIP 0.203 CiteScore 0.14
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.155 SNIP 0.149 CiteScore 0.1
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.151 SNIP 0.112
Original language: English
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A survey of modelling methods for high-fidelity wind farm simulations using large eddy simulation

Large eddy simulations (LES) of wind farms have the capability to provide valuable and detailed information about the dynamics of wind turbine wakes. For this reason, their use within the wind energy research community is on the rise, spurring the development of new models and methods. This review surveys the most common schemes available to model the rotor, atmospheric conditions and terrain effects within current state-of-the-art LES codes, of which an overview is provided. A summary of the experimental research data available for validation of LES codes within the context of single and multiple wake situations is also supplied. Some typical results for wind turbine and wind farm flows are presented to illustrate best practices for carrying out high-fidelity LES of wind farms under various atmospheric and terrain conditions. This article is part of the themed issue 'Wind energy in complex terrains'.
A Survey of Scholarly Data: From Big Data Perspective
Recently, there has been a shifting focus of organizations and governments towards digitization of academic and technical documents, adding a new facet to the concept of digital libraries. The volume, variety and velocity of this generated data, satisfies the big data definition, as a result of which, this scholarly reserve is popularly referred to as big scholarly data. In order to facilitate data analytics for big scholarly data, architectures and services for the same need to be developed. The evolving nature of research problems has made them essentially interdisciplinary. As a result, there is a growing demand for scholarly applications like collaborator discovery, expert finding and research recommendation systems, in addition to several others. This research paper investigates the current trends and identifies the existing challenges in development of a big scholarly data platform, with specific focus on directions for future research and maps them to the different phases of the big data lifecycle.
A survey of xerophilic Aspergillus from indoor environment, including descriptions of two new section Aspergillus species producing eurotium-like sexual states

Xerophilic fungi grow at low water activity or low equilibrium relative humidity and are an important part of the indoor fungal community, of which Aspergillus is one of the dominant genera. A survey of xerophilic fungi isolated from Canadian and Hawaiian house dust resulted in the isolation of 1039 strains; 296 strains belong to Aspergillus and represented 37 species. Reference sequences were generated for all species and deposited in GenBank. Aspergillus sect. Aspergillus (formerly called Eurotium) was one of the most predominant groups from house dust with nine species identified. Additional cultures deposited as Eurotium were received from the Canadian Collection of Fungal Cultures and were also re-identified during this study. Among all strains, two species were found to be new and are introduced here as A. mallochii and A. megasporus. Phylogenetic comparisons with other species of section Aspergillus were made using sequences of ITS, beta-tubulin, calmodulin and RNA polymerase II second largest subunit. Morphological observations were made from cultures grown under standardized conditions. Aspergillus mallochii does not grow at 37 degrees C and produces roughened ascospores with incomplete equatorial furrows. Aspergillus megasporus produces large conidia (up to 12 μm diam) and roughened ascospores with equatorial furrows. Echinulin, quinolactacin A(1) & A(2), preechinulin and neoechinulin A & B were detected as major extrolites of A. megasporus, while neoechinulin A & B and isoechinulin A, B & C were the major extrolites from A. mallochii.

General information
State: Published
Organisations: Department of Biotechnology and Biomedicine, Fungal Chemodiversity, University of Ottawa, Agriculture and Agri-Food Canada, Charles University, CBS-KNAW Fungal Biodiversity Centre
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Journal: MycoKeys
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Scopus rating (2016): SJR 1.148 SNIP 0.893 CiteScore 3.6
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MC_article_11161.pdf
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Publication: Research - peer-review › Journal article – Annual report year: 2017
Planning problems in passenger railway range from long term strategic decision making to the detailed planning of operations. Operations research methods have played an increasing role in this planning process. However, recently more attention has been given to considerations of robustness in the quality of solutions to individual planning problems, and of operations in general. Robustness in general is the capacity for some system to absorb or resist changes. In the context of railway robustness it is often taken to be the capacity for operations to continue at some level when faced with a disruption such as delay or failure. This has resulted in more attention given to the inclusion of robustness measures and objectives in individual planning problems, and to the providing of tools to ensure operations continue under disrupted situations. In this paper we survey the literature on robustness in railway planning problems, considering how robustness is conceptualized and modelled for the individual problems of railway, the degree to which an overall railway robustness concept is present, and consider the future directions of robustness in railway planning.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Management Science, Operations Research, Transport DTU
Authors: Lusby, R. M. (Intern), Larsen, J. (Intern), Bull, S. H. (Intern)
Number of pages: 42
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: European Journal of Operational Research
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Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.83 SJR 2.505 SNIP 2.339
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.334 SNIP 2.412 CiteScore 3.59
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.186 SNIP 2.485 CiteScore 3.21
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.346 SNIP 2.735 CiteScore 3.25
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.418 SNIP 2.588 CiteScore 3.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.401 SNIP 2.441 CiteScore 3.02
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.477 SNIP 2.435
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.326 SNIP 2.577
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.739 SNIP 1.984
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.679 SNIP 2.041
Web of Science (2007): Indexed yes
Asymmetric Total Syntheses of (-)-α-Lycorane, (-)-Zephyranthine and Formal Synthesis of (+)-Clivonine
We report the successful achievement of an asymmetric route to (-)-α-lycorane and (-)-zephyranthine as well as a formal total synthesis of (+)-clivonine. A pivotal intermediate, which serves as a potent precursor for the divergent syntheses of these natural products, was accessed by a diastereoselective Pd-catalyzed cinnamylation of an N-tert-butanesulfinyl imine.

General information
State: Published
Organisations: Department of Chemistry, Centre for Catalysis and Sustainable Chemistry, Organic Chemistry, Fudan University
Authors: Chen, Y. (Ekstern), Cai, S. (Ekstern), Wang, C. (Ekstern), Cheng, J. (Ekstern), Kramer, S. (Intern), Sun, X. (Ekstern)
Number of pages: 6
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Chemistry - An Asian Journal
ISSN (Print): 1861-4728
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.584 SNIP 0.773 CiteScore 3.92
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.766 SNIP 0.911 CiteScore 4.41
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.762 SNIP 0.974 CiteScore 4.38
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.767 SNIP 0.872 CiteScore 4.12
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.267 SNIP 1.026 CiteScore 4.36
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.31 SNIP 1.017 CiteScore 4.43
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.259 SNIP 1.014
Asymptotically Matched Layer (AML) for transient wave propagation in a moving frame of reference

The paper presents an Asymptotically Matched Layer (AML) formulation in a moving frame of reference for transient dynamic response of a multi-layer 2D half-space. A displacement based finite element formulation of the convected domain problem is presented together with the AML formulation in which the original convolution integrals are represented via two auxiliary displacement-like state-space variables. A parametric study of the AML parameters is conducted for optimizing the absorbing properties. The performance is demonstrated on a single- and a two-layered half-space for various velocities of an impulse Ricker load. Excellent absorbing properties are demonstrated in both half spaces.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Geotechnics and Geology, Department of Mechanical Engineering, Solid Mechanics
Authors: Madsen, S. S. (Intern), Krenk, S. (Intern)
Pages: 124-133
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Computers and Geotechnics
Volume: 82
ISSN (Print): 0266-352X
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 2.012 SNIP 2.371 CiteScore 3.11
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.959 SNIP 2.157 CiteScore 2.65
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.025 SNIP 2.649 CiteScore 2.83
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.158 SNIP 2.959 CiteScore 2.51
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.149 SNIP 2.974 CiteScore 1.99
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.751 SNIP 3.384 CiteScore 2.2
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.691 SNIP 2.522
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.167 SNIP 2.07
A systematic methodology to extend the applicability of a bioconversion model for the simulation of various co-digestion scenarios

Detailed simulation of anaerobic digestion (AD) requires complex mathematical models and the optimization of numerous model parameters. By performing a systematic methodology and identifying parameters with the highest impact on process variables in a well-established AD model, its applicability was extended to various co-digestion scenarios. More specifically, the application of the step-by-step methodology led to the estimation of a general and reduced set of parameters, for the simulation of scenarios where either manure or wastewater were co-digested with different organic substrates. Validation of the general parameter set involved the simulation of laboratory-scale data from three continuous co-digestion experiments, treating mixtures of different organic residues either at thermophilic or mesophilic conditions. Evaluation of the results showed that simulations using the general parameter set fitted experimental data quite well, indicating that it offers a reliable reference point for future simulations of anaerobic co-digestion scenarios.

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering
Authors: Kovalovszki, A. (Intern), Alvarado-Morales, M. (Intern), Fotidis, I. (Intern), Angelidaki, I. (Intern)
Pages: 157-166
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Bioresource Technology
Volume: 235
ISSN (Print): 0960-8524
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.94 SJR 2.191 SNIP 1.91
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.255 SNIP 1.908 CiteScore 5.47
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.41 SNIP 2.104 CiteScore 5.3
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.412 SNIP 2.503 CiteScore 5.97
ISI indexed (2013): ISI indexed yes
A systematic model identification method for chemical transformation pathways – the case of heroin biomarkers in wastewater

This study presents a novel statistical approach for identifying sequenced chemical transformation pathways in combination with reaction kinetics models. The proposed method relies on sound uncertainty propagation by considering parameter ranges and associated probability distribution obtained at any given transformation pathway levels as priors for parameter estimation at any subsequent transformation levels. The method was applied to calibrate a model predicting the transformation in untreated wastewater of six biomarkers, excreted following human metabolism of heroin and codeine. The method developed was compared to parameter estimation methods commonly encountered in literature (i.e., estimation of all parameters at the same time and parameter estimation with fix values for upstream parameters) by assessing the model prediction accuracy, parameter identifiability and uncertainty analysis. Results obtained suggest that the method developed has the potential to outperform conventional approaches in terms of prediction accuracy, transformation pathway identification and parameter identifiability. This method can be used in conjunction with optimal experimental designs to effectively identify model structures and parameters. This method can also offer a platform to promote a closer interaction between analytical chemists and modellers to identify models for biochemical transformation pathways, being a prominent example for the emerging field of wastewater-based epidemiology.
A taste of plastic - quantifying micro- and nanoplastic ingestion and interactions with feeding in daphnia magna (E)

Aquatic ecosystems worldwide are polluted by microplastics and they are ingested by a broad range of organisms. Although research so far mainly focused on marine ecosystems, freshwater organisms are just as affected. Approaches to study microplastic ingestion are predominantly qualitative since quantitative measures are analytically challenging. The aim of this study was to develop and apply a quantitative approach to measure particle body burden to study uptake and depuration of micro- and nanoplastics in the freshwater flea Daphnia magna, using fluorescent polystyrene beads. The animals were first exposed to a particle concentration of 1 mg/l for 24 h (uptake) and thereafter transferred to clean medium for another 24 h (depuration). During both phases animals were sampled and particle body burdens were determined by measuring particle fluorescence in the dissolved tissue. To analyze the influence of particle size, the study was done with beads of 2 µm and 100 nm. It was furthermore analyzed how the processes are affected by food availability and how the particles in turn affect the feeding rate of D. magna. Both particle sizes were readily taken up and body burdens increased with exposure time. The 2 µm beads were taken up in a higher quantity. Likewise, depuration was more efficient for the bigger particles. Smaller particles remain in the organism for a longer time, potentially increasing their hazard. Food availability strongly influenced particle body burdens, with lower levels in the presence of food. In turn, the particles can potentially alter the animals’ feeding rate, which could lead to impairments of physiology and fitness.
A third order accurate Lagrangian finite element scheme for the computation of generalized molecular stress function fluids

A third order accurate, in time and space, finite element scheme for the numerical simulation of three-dimensional time-dependent flow of the molecular stress function type of fluids in a generalized formulation is presented. The scheme is an extension of the K-BKZ Lagrangian finite element method presented by Marín and Rasmussen (2009).

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Fasano, A. (Intern), Rasmussen, H. K. (Intern)
Pages: 10-20
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Non-Newtonian Fluid Mechanics
Volume: 246
ISSN (Print): 0377-0257
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 1.079 SNIP 1.555 CiteScore 2.43
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.158 SNIP 1.496 CiteScore 2.23
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.986 SNIP 1.342 CiteScore 1.96
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.023 SNIP 1.618 CiteScore 2.09
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.112 SNIP 1.544 CiteScore 1.93
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.116 SNIP 1.405 CiteScore 1.93
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.237 SNIP 1.728
Web of Science (2010): Indexed yes
Atmospheric deposition, CO2, and change in the land carbon sink

Concentrations of atmospheric carbon dioxide (CO2) have continued to increase whereas atmospheric deposition of sulphur and nitrogen has declined in Europe and the USA during recent decades. Using time series of flux observations from 23 forests distributed throughout Europe and the USA, and generalised mixed models, we found that forest-level net ecosystem production and gross primary production have increased by 1% annually from 1995 to 2011. Statistical models indicated that increasing atmospheric CO2 was the most important factor driving the increasing strength of carbon sinks in these forests. We also found that the reduction of sulphur deposition in Europe and the USA lead to higher recovery in ecosystem respiration than in gross primary production, thus limiting the increase of carbon sequestration. By contrast, trends in climate and nitrogen deposition did not significantly contribute to changing carbon fluxes during the studied period. Our findings support the hypothesis of a general CO2-fertilization effect on vegetation growth and suggest that, so far unknown, sulphur deposition plays a significant role in the carbon balance of forests in industrialized regions. Our results show the need to include the effects of changing atmospheric composition, beyond CO2, to assess future dynamics of carbon-climate feedbacks not currently considered in earth system/climate modelling.

General information

State: Published
Organisations: Department of Environmental Engineering, Atmospheric Environment
Number of pages: 13
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication Information

Journal: Scientific Reports
Volume: 7
Issue number: 1
Article number: 9632
ISSN (Print): 2045-2322
Ratings:
Atomistic Galois insertions for flow sensitive integrity

Several program verification techniques assist in showing that software adheres to the required security policies. Such policies may be sensitive to the flow of execution and the verification may be supported by combinations of type systems and Hoare logics. However, this requires user assistance and to obtain full automation we shall explore the over-approximating nature of static analysis. We demonstrate that the use of atomistic Galois insertions constitutes a stable framework in which to obtain sound and fully automatic enforcement of flow sensitive integrity. The framework is illustrated on a concurrent language with local storage and polyadic synchronous communication.
A Top-down Approach to Genetic Circuit Synthesis and Optimized Technology Mapping

Genetic logic circuits are becoming popular as an emerging field of technology. They are composed of genetic parts of DNA and work inside a living cell to perform a dedicated boolean function triggered by the presence or absence of certain proteins or other species.

General information

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Embedded Systems Engineering
Authors: Baig, H. (Intern), Madsen, J. (Intern)
Number of pages: 2
Publication date: 2017

Host publication information

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Main Research Area: Technical/natural sciences
Conference: 9th International Workshop on Bio-Design Automation, Pittsburgh, United States, 08/08/2017 - 08/08/2017
Electronic versions:
IWBDA_HB_JM.pdf
Source: PublicationPreSubmission
Source-ID: 134658523
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017
A total generalized variation approach for near-field acoustic holography

Near-field methods based on microphone array measurements are useful to understand how a source radiates sound. Due to discretization errors, these methods are typically restricted to low frequencies. Sparse approaches have gained considerable attention, as they can potentially recover a seemingly under-sampled signal with remarkable accuracy, extending the valid frequency range. However, near-field problems are generally not spatially sparse, and it is more appropriate to promote block-sparse solutions (i.e., spatially extended) rather than direct spatial sparsity. In this paper, a method is examined that promotes solutions with sparse spatial derivatives. The method seeks spatially extended solutions, valid over a wide frequency range, and suitable to near-fields and extended sources. The methodology is based on a Total Variation approach using higher order derivatives. The frequency range of validity is examined, as well as the robustness to noise. The performance of different finite difference stencils is investigated. Numerical and experimental results are presented, with particular focus on the estimated power radiated by the source. The method is benchmarked against conventional approaches.
A trait-based approach to understanding marine communities composition, assembly and diversity

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Section for Oceans and Arctic
Authors: Pécuchet, L. (Intern), Lindegren, M. (Intern), Payne, M. (Intern)
Number of pages: 126
Publication date: 2017

Publication information
Publisher: DTU Aqua. National Institute of Aquatic Resources
Original language: English
Main Research Area: Technical/natural sciences
Publication: Research › Ph.D. thesis – Annual report year: 2017

A trait database for marine copepods
The trait-based approach is gaining increasing popularity in marine plankton ecology but the field urgently needs more and easier accessible trait data to advance. We compiled trait information on marine pelagic copepods, a major group of zooplankton, from the published literature and from experts and organized the data into a structured database. We collected 9306 records for 14 functional traits. Particular attention was given to body size, feeding mode, egg size, spawning strategy, respiration rate, and myelination (presence of nerve sheathing). Most records were reported at the species level, but some phylogenetically conserved traits, such as myelination, were reported at higher taxonomic levels, allowing the entire diversity of around 10 800 recognized marine copepod species to be covered with a few records. Aside from myelination, data coverage was highest for spawning strategy and body size, while information was more limited for quantitative traits related to reproduction and physiology. The database may be used to investigate relationships between traits, to produce trait biogeographies, or to inform and validate trait-based marine ecosystem models. The data can be downloaded from PANGAEA, doi:10.1594/PANGAEA.862968
Attribution mechanisms for ancillary service costs induced by variability in power delivery

The increased penetration of renewable energy sources in existing power systems has led to necessary developments in electricity market mechanisms. Most importantly, renewable energy generation is increasingly made accountable for deviations between scheduled and actual energy generation. However, there is no mechanism to enforce accountability for the additional costs induced by power fluctuations. These costs are socialized and eventually supported by electricity customers. We propose some metrics for assessing the contribution of all market participants to power regulation needs, as well as an attribution mechanism for fairly redistributing related power regulation costs. We discuss the effect of various metrics used by the attribution mechanisms, and we illustrate, in a game-theoretical framework, their consequences on the strategic behavior of market participants. We also illustrate, by using the case of Western Denmark, how these mechanisms may affect revenues and the various market participants.
A two-dimensional Dirac fermion microscope

The electron microscope has been a powerful, highly versatile workhorse in the fields of material and surface science, micro and nanotechnology, biology and geology, for nearly 80 years. The advent of two-dimensional materials opens new possibilities for realizing an analogy to electron microscopy in the solid state. Here we provide a perspective view on how a two-dimensional (2D) Dirac fermion-based microscope can be realistically implemented and operated, using graphene as a vacuum chamber for ballistic electrons. We use semiclassical simulations to propose concrete architectures and design rules of 2D electron guns, deflectors, tunable lenses and various detectors. The simulations show how simple objects can be imaged with well-controlled and collimated in-plane beams consisting of relativistic charge carriers. Finally, we discuss the potential of such microscopes for investigating edges, terminations and defects, as well as interfaces, including external nanoscale structures such as adsorbed molecules, nanoparticles or quantum dots.

General information
State: Published
Organisations: Center for Nanostructured Graphene, Department of Micro- and Nanotechnology, Nanocarbon, Theoretical Nanoelectronics, RWTH Aachen University
Authors: Bøggild, P. (Intern), Caridad, J. (Intern), Stampfer, C. (Ekstern), Calogero, G. (Intern), Papior, N. R. (Intern), Brandbyge, M. (Intern)
Number of pages: 1
Pages: 15783
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 11.8 SJR 6.399 SNIP 2.995
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 6.364 SNIP 3.053 CiteScore 11.23
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 6.331 SNIP 3.091 CiteScore 10.77
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 5.967 SNIP 2.776 CiteScore 9.85
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 5.586 SNIP 2.724 CiteScore 8.32
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scopus rating (2011): SJR 3.122 SNIP 1.544 CiteScore 4.44
ISI indexed (2011): ISI indexed no
Web of Science (2010): Indexed yes
Original language: English
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ncomms15783.pdf
DOIs:
10.1038/ncomms15783
Source: FindIt
Source-ID: 2371310799
Publication: Research - peer-review › Journal article – Annual report year: 2017
Auditory brainstem response latency in forward masking, a marker of sensory deficits in listeners with normal hearing thresholds

In rodent models, acoustic exposure too modest to elevate hearing thresholds can nonetheless cause auditory nerve fiber deafferentation, interfering with the coding of supra-threshold sound. Low-spontaneous rate nerve fibers, important for encoding acoustic information at supra-threshold levels and in noise, are more susceptible to degeneration than high-spontaneous rate fibers. The change in auditory brainstem response (ABR) wave-V latency with noise level has been shown to be associated with auditory nerve deafferentation. Here, we measured ABR in a forward masking paradigm and evaluated wave-V latency changes with increasing masker-to-probe intervals. In the same listeners, behavioral forward masking detection thresholds were measured. We hypothesized that 1) auditory nerve fiber deafferentation increases forward masking thresholds and increases wave-V latency and 2) a preferential loss of low-spontaneous rate fibers results in a faster recovery of wave-V latency as the slow contribution of these fibers is reduced. Results showed that in young audiometrically normal listeners, a larger change in wave-V latency with increasing masker-to-probe interval was related to a greater effect of a preceding masker behaviorally. Further, the amount of wave-V latency change with masker-to-probe interval was positively correlated with the rate of change in forward masking detection thresholds. Although we cannot rule out central contributions, these findings are consistent with the hypothesis that auditory nerve fiber deafferentation occurs in humans and may predict how well individuals can hear in noisy environments. (C) 2017 Elsevier B.V. All rights reserved.
Augmented Reality Interfaces for Additive Manufacturing
This paper explores potential use cases for using augmented reality (AR) as a tool to operate industrial machines. As a baseline we use an additive manufacturing system, more commonly known as a 3D printer. We implement novel augmented interfaces and controls using readily available open source frameworks and low cost hardware. Our results show that the technology enables richer and more intuitive printer control and performance monitoring than currently available on the market. Therefore, there is a great deal of potential for these types of technologies in future digital factories.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, Department of Mechanical Engineering, Manufacturing Engineering, Technical University of Denmark, MIT Media Lab
Authors: Eiríksson, E. R. (Intern), Pedersen, D. B. (Intern), Frisvad, J. R. (Intern), Skovmand, L. (Ekstern), Heun, V. (Ekstern), Maes, P. (Ekstern), Aanæs, H. (Intern)
Pages: 515-525
Publication date: 2017

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Main Research Area: Technical/natural sciences
Conference: 20th Scandinavian Conference on Image Analysis, Tromsø, Norway, 12/06/2017 - 12/06/2017
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A Unified Trading Model Based on Robust Optimization for Day-Ahead and Real-Time Markets with Wind Power Integration
In a conventional electricity market, trading is conducted based on power forecasts in the day-ahead market, while the power imbalance is regulated in the real-time market, which is a separate trading scheme. With large-scale wind power connected into the power grid, power forecast errors increase in the day-ahead market which lowers the economic efficiency of the separate trading scheme.
This paper proposes a robust unified trading model that includes the forecasts of real-time prices and imbalance power into the day-ahead trading scheme. The model is developed based on robust optimization in view of the undefined probability distribution of clearing prices of the real-time market. For the model to be used efficiently, an improved quantum-behaved particle swarm algorithm (IQPSO) is presented in the paper based on an in-depth analysis of the limitations of the static character of quantum-behaved particle swarm algorithm (QPSO). Finally, the impacts of associated parameters on the separate trading and unified trading model are analyzed to verify the superiority of the proposed model and algorithm.

**General information**
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy system operation and management, Fuzhou University
Authors: Jiang, Y. (Ekstern), Chen, M. (Ekstern), You, S. (Intern)
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- Web of Science (2016): Indexed yes
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- Web of Science (2014): Indexed yes
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- ISI indexed (2013): ISI indexed yes
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- BFI (2012): BFI-level 1
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Auralisations with loudspeaker arrays from a phased combination of the image source method and acoustical radiosity

In order to create a simulation tool that is well-suited for small rooms with low diffusion and highly absorbing ceilings, a new room acoustic simulation tool has been developed that combines a phased version of the image source with acoustical radiosity and that considers the angle dependence of the surface properties. The new tool is denoted PARISM, and here PARISM is used to create loudspeaker array-based auralisations. Different auralisation techniques with PARISM are described and compared to implementations of auralisations with another geometrical acoustic simulation tool, i.e. ODEON and the LoRA toolbox that applies Ambisonics to ODEON simulations. In opposition to the LoRA toolbox, higher order Ambisonics are also applied to the late part of the PARISM impulse response, because more directional information is available with acoustical radiosity. Small rooms with absorbing surfaces are tested, because this is the room type that PARISM is particularly useful for.

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Authors: Marbjerg, G. H. (Intern)
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Auralizations with loudspeaker arrays from a phased combination of the image source method and acoustical radiosity

In order to create a simulation tool that is well-suited for small rooms with low diffusion and highly absorbing ceilings, a new room acoustic simulation tool has been developed that combines a phased version of the image source with acoustical radiosity and that considers the angle dependence of the surface properties. The new tool is denoted PARISM, and here PARISM is used to create loudspeaker array-based auralizations. Different auralization techniques are compared, such as Ambisonics, vector-based panning, and the method of nearest loudspeaker. The implementations of the auralization techniques with PARISM are described and compared to implementations of auralizations with another geometrical acoustic simulation tool, i.e., ODEON and the LoRA toolbox that applies Ambisonics to ODEON simulations. In opposition to the LoRA toolbox, higher order Ambisonics are also applied to the late part of the PARISM impulse response, because more directional information is available with acoustical radiosity. Small rooms with absorbing surfaces are tested, because this is the room type that PARISM is particularly useful for.

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Interacoustics A/S
Authors: Marbjerg, G. H. (Intern), Brunskog, J. (Intern), Jeong, C. (Intern), Zapata-Rodriguez, V. (Ekstern)
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Main Research Area: Technical/natural sciences

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Scopus rating (2010): SJR 0.754 SNIP 1.528
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Web of Science (2007): Indexed yes
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Web of Science (2006): Indexed yes
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Web of Science (2004): Indexed yes
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Web of Science (2003): Indexed yes
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Web of Science (2002): Indexed yes
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Authentication for E-Government in Developing Countries - With special focus on the North Africa Countries

Recently, many countries include both developed countries as well as developing countries have transformed paper based systems into electronic systems using ICT technologies in order to improve service delivery and reduce cost. Several researches and International Organizations in the field of e-Government reports that many countries over the world have not achieved transaction stages of government e-services and most of those countries are from developing countries. One of the main issues challenge government e-service inclusion is digital divide which barriers achieving principle of equal access and benefit of government e-service. Therefore, This thesis aims to investigate digital divide and IDM issues challenge government e-service in developing countries such as North Africa Countries (NAC) from achieving the pricula of equal access in a secure manner. To achieve this aim we, developed a framework that consists of two components include digital divide variables and a simple IDM model in order to assess the current state of government e-service in NAC. Moreover, we analyzed the existing IDM protocol's concept to understand whether those concepts consider disadvantaged user's needs. Based on the identified challenges in NAC using the developed framework and the analysis of IDM protocol's concept we identify the requirements to be satisfied in order to allow large portion of citizens access and benefit of government e-service in equal and secure manner. One possible solution to improve e-Government inclusion is to consider vulnerable group needs such as the case in which users (citizens) do not have the ability either to read or write and as a result are excluded from e-services. Thus, a solution should enable such users to benefit from e-services. Introducing vulnerable group such as illiterate individuals might introduce new risks which have not existed in citizens-government face to face interaction. Thus, considering security property include confidentiality, integrity, non-repudiation and accountability for a proposed solution is needed. User authentication based on social relationship protocol is proposed in order to bridge digital divide. We formalized the proposed protocol as well as IDM protocol's concept using Open Source Fixed Point Model Checker tool (OFMC) To verify security properties include secrecy of exchanged information and authenticity of communication parties of the target protocols. OFMC is an automatic protocol security verification tool to identify the strengths of the verified protocol. Based on the verification result of OFMC tool, an attack is found against the existing IDM protocol's concept when considering vulnerable users while the proposed protocol has achieved the specified goals without ant attack at least in one session. We also, performed a simple usability comparison between the proposed protocol and public kiosk service delivery channel and the proposed protocol shows its effectiveness as well as efficient.

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Authors: Elaswad, O. (Intern), Jensen, C. D. (Intern)
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Automated Analysis of Flow Cytometry Data to Reduce Inter-Lab Variation in the Detection of Major Histocompatibility Complex Multimer-Binding T Cells

Manual analysis of flow cytometry data and subjective gate-border decisions taken by individuals continue to be a source of variation in the assessment of antigen-specific T cells when comparing data across laboratories, and also over time in individual labs. Therefore, strategies to provide automated analysis of major histocompatibility complex (MHC) multimer-binding T cells represent an attractive solution to decrease subjectivity and technical variation. The challenge of using an automated analysis approach is that MHC multimer-binding T cell populations are often rare and therefore difficult to detect. We used a highly heterogeneous dataset from a recent MHC multimer proficiency panel to assess if MHC multimer-binding CD8(+) T cells could be analyzed with computational solutions currently available, and if such analyses would reduce the technical variation across different laboratories. We used three different methods, FLOW Clustering without K (FLOCK), Scalable Weighted Iterative Flow-clustering Technique (SWIFT), and ReFlow to analyze flow cytometry data files from 28 laboratories. Each laboratory screened for antigen-responsive T cell populations with frequency ranging from 0.01 to 1.5% of lymphocytes within samples from two donors. Experience from this analysis shows that all three programs can be used for the identification of high to intermediate frequency of MHC multimer-binding T cell populations, with results very similar to that of manual gating. For the less frequent populations (
Automated angular and translational tomographic alignment and application to phase-contrast imaging

X-ray computerized tomography (CT) is a 3D imaging technique that makes use of x-ray illumination and image reconstruction techniques to reproduce the internal cross-sections of a sample. Tomographic projection data usually require an initial relative alignment or knowledge of the exact object position and orientation with respect to the detector. As tomographic imaging reaches increasingly better resolution, thermal drifts, mechanical instabilities, and equipment limitations are becoming the main dominant factors contributing to sample positioning uncertainties that will further introduce reconstruction artifacts and limit the attained resolution in the final tomographic reconstruction. Alignment algorithms that require manual interaction impede data analysis with ever-increasing data acquisition rates, supplied by more brilliant sources. We present in this paper an iterative reconstruction algorithm for wrapped phase projection data and an alignment algorithm that automatically takes 5 degrees of freedom, including the possible linear and angular motion errors, into consideration. The presented concepts are applied to simulated and real measured phase-contrast data, exhibiting a possible improvement in the reconstruction resolution. A MATLAB implementation is made publicly available and will allow robust analysis of large volumes of phase-contrast tomography data.
Automated Determination of Oxygen-Dependent Enzyme Kinetics in a Tube-in-Tube Flow Reactor

Enzyme-mediated oxidation is of particular interest to synthetic organic chemists. However, the implementation of such systems demands knowledge of enzyme kinetics. Conventionally collecting kinetic data for biocatalytic oxidations is fraught with difficulties such as low oxygen solubility in water and limited oxygen supply. Here, we present a novel method for the collection of such kinetic data using a pressurized tube-in-tube reactor, operated in the low-dispersed flow regime to generate time-series data, with minimal material consumption. Experimental development and validation of the instrument revealed not only the high degree of accuracy of the kinetic data obtained, but also the necessity of making measurements in this way to enable the accurate evaluation of high $K_{MO}$ enzyme systems. For the first time, this paves the way to integrate kinetic data into the protein engineering cycle.

General information

State: Published
Organisations: Department of Chemical and Biochemical Engineering, PROSYS - Process and Systems Engineering Centre, KT Consortium
Authors: Ringborg, R. H. (Intern), Pedersen, A. T. (Intern), Woodley, J. (Intern)
Pages: 3285 – 3288
Automated four-dimensional Monte Carlo workflow using log files and real-time motion monitoring

With emerging techniques for tracking and gating methods in radiotherapy of lung cancer patients, there is an increasing need for efficient four-dimensional Monte Carlo (4DMC) based quality assurance (QA). An automated and flexible workflow for 4DMC QA, based on the 4DdefDOSXYZnrc user code, has been developed in python. The workflow has been tested and verified using an in-house developed dosimetry system comprised of a dynamic thorax phantom constructed for plastic scintillator dosimetry. The workflow is directly compatible with any treatment planning system and can also be triggered by the appearance of linac log files. It has minimum user interaction and, with the use of linac log files, it provides a method for verification of the actually delivered dose in the patient geometry.
Automated specification and verification of Web-based applications

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Authors: ter Beek, M. H. (Ekstern), Lluch Lafuente, A. (Intern)
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ISI indexed (2013): ISI indexed no
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Scopus rating (2010): SJR 0.288 SNIP 0.344
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Web of Science (2007): Indexed yes
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Automatic Atrial Fibrillation Detection: A Novel Approach Using Discrete Wavelet Transform and Heart Rate Variability

Early detection of Atrial Fibrillation (AF) is crucial in order to prevent acute and chronic cardiac rhythm disorders. In this study, a novel method for robust automatic AF detection (AAFD) is proposed by combining atrial activity (AA) and heart rate variability (HRV), which could potentially be used as a screening tool for patients suspected to have AF. The method includes an automatic peak detection prior to the feature extraction, as well as a noise cancellation technique followed by a bagged tree classification. Simulation studies on the MIT-BIH Atrial Fibrillation database was performed to evaluate the performance of the proposed method. Results from these extensive studies showed very promising results, with an average sensitivity of 96.51%, a specificity of 99.19%, and an overall accuracy of 98.22%.

Automatic minimization of ocular artifacts from electroencephalogram: A novel approach by combining Complete EEMD with Adaptive Noise and Renyi's Entropy

Ocular artifacts (OAs) are one of the major interferences that obscure electroencephalogram (EEG) signals. In this paper, a novel, completely automatic, adaptive and fast method that combines the Complete Empirical Mode Decomposition with Adaptive Noise (CEEMDAN) and Renyi's Entropy (RE) is proposed for minimizing the OAs from corrupted EEG signals. The RE criterion is suggested to automatically select the Intrinsic Mode Functions (IMFs) to reconstruct the artifact minimized EEG signals. The scheme requires only a single channel OAs corrupted EEG recording and a reasonable computation time. The method first evaluated on simulated OAs (one, two, and several blinks as well as saccadic eye movements) corrupted EEG signals and then extended to real EEG signals. The signal-to-noise ratio improvement (SNRimp) along with time and power spectral density (PSD) plots are used for evaluating the performance of the scheme. The method is compared to one based on the CEEMDAN and manual choice of IMFs for OAs minimization from EEG. Results from extensive simulation studies clearly indicate the efficacy of the proposed scheme in automatically minimizing the OAs from the corrupted EEG signals.
Automatic Segmentation of Abdominal Fat in MRI-Scans, Using Graph-Cuts and Image Derived Energies

For many clinical studies changes in the abdominal distribution of fat is an important measure. However, the segmentation of abdominal fat in MRI scans is both difficult and time consuming using manual methods. We present here an automatic and flexible software package, that performs both bias field correction and segmentation of the fat into superficial and deep subcutaneous fat as well as visceral fat with the spinal compartment removed. Assessment when comparing to the gold standard - CT-scans - shows a correlation and bias comparable to manual segmentation. The method is flexible by tuning the image-derived energies used for the segmentation, allowing the method to be applied to other body parts, such as the thighs.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, Rector's office, Statistics and Data Analysis, University of Copenhagen
Authors: Christensen, A. N. (Intern), Larsen, C. T. (Intern), Mandrup Jensen, C. M. (Ekstern), Petersen, M. B. (Ekstern), Larsen, R. (Intern), Conradsen, K. (Intern), Dahl, V. A. (Intern)
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Automatic Segmentation of Vessels in In-Vivo Ultrasound Scans

Ultrasound has become highly popular to monitor atherosclerosis, by scanning the carotid artery. The screening involves measuring the thickness of the vessel wall and diameter of the lumen. An automatic segmentation of the vessel lumen, can enable the determination of lumen diameter. This paper presents a fully automatic segmentation algorithm, for robustly segmenting the vessel lumen in longitudinal B-mode ultrasound images. The automatic segmentation is performed using a combination of B-mode and power Doppler images. The proposed algorithm includes a series of preprocessing steps, and performs a vessel segmentation by use of the marker-controlled watershed transform. The ultrasound images used in the study were acquired using the bk3000 ultrasound scanner (BK Ultrasound, Herlev, Denmark) with two transducers “8L2 Linear” and “10L2w Wide Linear” (BK Ultrasound, Herlev, Denmark). The algorithm was evaluated empirically and applied to a dataset of in-vivo 1770 images recorded from 8 healthy subjects. The segmentation results were compared to manual delineation performed by two experienced users. The results showed a sensitivity and specificity of 90.41 ± 11.2 % and 97.93 ± 5.7 % (mean ± standard deviation), respectively. The amount of overlap of segmentation and manual segmentation, was measured by the Dice similarity coefficient, which was 91.25 ± 11.6 %. The empirical results demonstrated the feasibility of segmenting the vessel lumen in ultrasound scans using a fully automatic algorithm.

General information
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Organisations: Department of Electrical Engineering, Biomedical Engineering, Center for Fast Ultrasound Imaging, Technical University of Denmark
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Automatiseret simplificering af 1D hydraulisk model – med hensyn til 1D-2D oversvømmelsesberegninger

General information
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Organisations: Department of Environmental Engineering, Urban Water Systems
Autoresonant control of drift waves

The control of nonlinear drift waves in a magnetized plasmas column has been investigated. The studies are based on the Hasegawa–Mima model, which is solved on a disk domain with radial inhomogeneity of the plasma density. The system is forced by a rotating potential with varying frequency defined on the boundary. To excite and control the waves we apply the autoresonant effect, taking place when the amplitude of the forcing exceeds a threshold value and the waves are phase-locked with the forcing. We demonstrate that the autoresonant approach is applicable for excitation of a range of steady nonlinear waves of the lowest azimuthal mode numbers and for controlling their amplitudes and phases. We also demonstrate the excitation of zonal flows (m = 0 modes), which are controlled via the forced modes.
A valence force field-Monte Carlo algorithm for quantum dot growth modeling

We present a novel kinetic Monte Carlo version for the atomistic valence force fields algorithm in order to model a self-assembled quantum dot growth process. We show our atomistic model is both computationally favorable and capture more details compared to traditional kinetic Monte Carlo models based on continuum elastic models. We anticipate the model will be useful to experimentalists in understanding better the growth dynamics of quantum dot systems.

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Organisations: Department of Photonics Engineering, Center for Electron Nanoscopy, Nanophotonic Devices, Centre of Excellence for Silicon Photonics for Optical Communications, University of Rome Tor Vergata, National Research Council of Italy
Authors: Barettin, D. (Ekstern), Willatzen, M. (ed.) (Intern), Kadkhodazadeh, S. (Intern), Pecchia, A. (Ekstern), Auf der Maur, M. (Ekstern), Semenova, E. (Intern)
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A versatile one-step CRISPR-Cas9 based approach to plasmid-curing

Background
Plasmids are widely used and essential tools in molecular biology. However, plasmids often impose a metabolic burden and are only temporarily useful for genetic engineering, bio-sensing and characterization purposes. While numerous techniques for genetic manipulation exist, a universal tool enabling rapid removal of plasmids from bacterial cells is lacking.
Results
Based on replicon abundance and sequence conservation analysis, we show that the vast majority of bacterial cloning and expression vectors share sequence similarities that allow for broad CRISPR-Cas9 targeting. We have constructed a universal plasmid-curing system (pFREE) and developed a one-step protocol and PCR procedure that allow for identification of plasmid-free clones within 24 h. While the context of the targeted replicons affects efficiency, we obtained curing efficiencies between 40 and 100% for the plasmids most widely used for expression and engineering purposes. By virtue of the CRISPR-Cas9 targeting, our platform is highly expandable and can be applied in a broad host context. We exemplify the wide applicability of our system in Gram-negative bacteria by demonstrating the successful application in both Escherichia coli and the promising cell factory chassis Pseudomonas putida.

Conclusion
As a fast and freely available plasmid-curing system, targeting virtually all vectors used for cloning and expression purposes, we believe that pFREE has the potential to eliminate the need for individualized vector suicide solutions in molecular biology. We envision the application of pFREE to be especially useful in methodologies involving multiple plasmids, used sequentially or simultaneously, which are becoming increasingly popular for genome editing or combinatorial pathway engineering.
A vertical ball mill as a new reactor design for biomass hydrolysis and fermentation process

A vertical ball mill (VBM) reactor was evaluated for use in biomass conversion processes. The effects of agitation speed (100–200 rpm), number of glass spheres (0–30 units) and temperature (40–46 °C) on enzymatic hydrolysis of rice straw and on glucose fermentation by a thermotolerant Kluyveromyces marxianus strain were separately studied. The results revealed an important role of the spheres during biomass' fiber liquefaction and yeast's fermentative performance. For hydrolysis, the spheres were the only variable with significant positive impact on cellulose conversion, while for fermentation all the variables have influenced the ethanol volumetric productivity (QP). For QP, the spheres showed an interactive effect with temperature, being obtained a maximum of 2.16 g/L·h when both variables were used in the lowest level. By applying the needed adjustments on the levels of the variables for each process (hydrolysis and fermentation), the VBM reactor could be efficiently used for biomass conversion into ethanol.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Biomass Conversion and Bioprocess Technology, Universidade de Sao Paulo
Authors: de Assis Castro, R. C. (Ekstern), Mussatto, S. I. (Intern), Conceicao Roberto, I. (Ekstern)
Pages: 775-780
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Renewable Energy
Volume: 114
Issue number: Part B
ISSN (Print): 0960-1481
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.83 SJR 1.697 SNIP 2.044
Web of Science (2016): Indexed yes

In order to compensate multiple time scales power fluctuation resulted from distributed energy resources and loads, hybrid energy storage systems are employed as the buffer unit in DC microgrid. In this paper, a wireless hierarchical control strategy is proposed to realize power sharing between energy density storage unit and power density storage unit in reasonable fashion. Primary control introduces change rate of voltage as virtual information carrier, and urges supercapacitor unit to pick up major dynamic power immediately in the load switching moment, by setting sensitivity of different storage interface converters. The steady state error produced in primary control is eliminated by secondary control, in which voltage magnitude is maintained and zero steady state current in supercapacitor is guaranteed. In this framework, autonomous and coordinated control is achieved using only local information of each unit, therefore economic

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Publication: Research - peer-review › Journal article – Annual report year: 2017
and reliability issues born along communication network can be avoided. The feasibility and effectiveness of the proposed control strategy are validated by experimental results.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power components, Beijing Jiaotong University, Collaborative Innovation Center of Electric Vehicles in Beijing
Authors: Yang, J. (Ekstern), Jin, X. (Ekstern), Wu, X. (Ekstern), Chen, M. (Ekstern), Agelidis, V. (Intern)
Pages: 135-144
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Diangong Jishu Xuebao/transactions of China Electrotechnical Society
Volume: 32
Issue number: 10
ISSN (Print): 1000-6753
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Scopus rating (2016): CiteScore 1.77 SJR 0.666 SNIP 0.944
Scopus rating (2015): CiteScore 1.5 SJR 0.633 SNIP 1.104
Scopus rating (2014): CiteScore 1.41 SJR 0.746 SNIP 1.253
Scopus rating (2013): CiteScore 1.04 SJR 0.565 SNIP 1.067
Scopus rating (2012): CiteScore 0.85 SJR 0.539 SNIP 0.95
Scopus rating (2011): CiteScore 0.81 SJR 0.453 SNIP 0.802
Scopus rating (2010): SJR 0.406 SNIP 0.621
Scopus rating (2009): SJR 0.352 SNIP 0.546
Scopus rating (2008): SJR 0.276 SNIP 0.281
Scopus rating (2007): SJR 0.271 SNIP 0.114
Scopus rating (2006): SJR 0.205
Scopus rating (2005): SJR 0.18
Scopus rating (2004): SJR 0.15
Scopus rating (2003): SJR 0.144
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Original language: English
Electrical and Electronic Engineering, DC microgrid, Hierarchical control, Hybrid energy storage systems (HESS), Power sharing, Energy resources, Energy storage, Hierarchical systems, Supercapacitor, Dc micro-grid, Distributed Energy Resources, Energy-density storage, Hybrid energy storage systems, Interface converters, Buffer storage
Source: Findit
Source-ID: 2373093387
Publication: Research - peer-review › Journal article – Annual report year: 2017

BacHBerry:: BACterial Hosts for production of Bioactive phenolics from bERRY fruits
BACterial Hosts for production of Bioactive phenolics from bERRY fruits (BacHBerry) was a 3-year project funded by the Seventh Framework Programme (FP7) of the European Union that ran between November 2013 and October 2016. The overall aim of the project was to establish a sustainable and economically-feasible strategy for the production of novel high-value phenolic compounds isolated from berry fruits using bacterial platforms. The project aimed at covering all stages of the discovery and pre-commercialization process, including berry collection, screening and characterization of their bioactive components, identification and functional characterization of the corresponding biosynthetic pathways, and construction of Gram-positive bacterial cell factories producing phenolic compounds. Further activities included optimization of polyphenol extraction methods from bacterial cultures, scale-up of production by fermentation up to pilot scale, as well as societal and economic analyses of the processes. This review article summarizes some of the key findings obtained throughout the duration of the project.

General information
State: Accepted/In press
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Microbial Evolution and Synthetic Biology, Applied Metabolic Engineering, Instituto de Biologia Experimental e Tecnológica, Universidade Nova de Lisboa, INRIA Institut National de Recherche en Informatique et en Automatique, Pontificia Universidad Catolica de Chile, Evolva, University of Copenhagen, Research Centre Julich (FZJ), Biotempo, University of Minho, John Innes Centre, The James
Bacillus cereus in fresh ricotta: Comparison of growth and Haemolysin BL production after artificial contamination during production or post processing

Bacillus cereus is of particular concern for the production of fresh ricotta, due to the ability of spores to survive to the thermal treatment, leading to a potential germination, growth and toxin production in the product. This study aimed to evaluate the effect of a B.\textit{c}ereus contamination occurring in the whey used for the production of ricotta, or in the final product as post-production event. Four B.\textit{c}ereus strains (ATCC 14579 and three clinical isolates, GGu1, GPe2 and RCe1) were first evaluated for their ability to grow at different temperatures (from 5 to 55\textdegree\textnormal{C}) and spore survival rate to different thermal treatments (65, 70, 80 and 90\textdegree\textnormal{C} for 30, 15, 10 and 3\textnormal{min}, respectively). None of the strains showed to be psychrotrophic, as no growth below 10\textdegree\textnormal{C} was observed. Strains ATCC 14579 and GPe2 were the most resistant to thermal stresses and were selected for the inoculation tests. In the first trial, two aliquots of whey were inoculated with ATCC 14579 or GPe2 strain and used for the production of fresh ricotta samples, that were stored at 10\textdegree\textnormal{C} for 7 days (only GPe2) or 15\textdegree\textnormal{C} for 5 days (both the strains). In the second trial, the inoculation was made on fresh ricotta just after production. Samples were stored in the same conditions and analysed daily for the quantification of B.\textit{c}ereus vegetative cells and spores; the L2 component of Haemolysin BL was also quantified in the product. At 15\textdegree\textnormal{C}, a very fast germination of spores, followed by an active growth, was constantly observed in the two trials for both B.\textit{c}ereus strains. An earlier growth was detected in the whey-inoculated samples, suggesting the potential activation of spore germination caused by high temperatures reached during ricotta production. A slightly faster growth was observed for ATCC 14579 strain. At 10\textdegree\textnormal{C}, GPe2 strain showed a slow growth, with similar rates between whey- or product-inoculated ricotta samples. The production of HBL toxin was significant only in samples kept at 15\textdegree\textnormal{C}, starting from the 4th day of storage. In order to ensure the consumers\texttrademark protection, these results suggest the suitability of fresh ricotta as a substrate for the growth and metabolic activity of B.\textit{c}ereus, highlighting the need to prevent the contamination of the product and, above all, to apply a correct refrigeration during its storage.

General information
State: Published
Organisations: National Food Institute, Università degli Studi di Milano, University of Pisa, Azienda Agricola Casati s. a.
Authors: Tirloni, E. (Ekstern), Ghelardi, E. (Ekstern), Celandroni, F. (Ekstern), Bernardi, C. (Ekstern), Casati, R. (Ekstern), Rosshaug, P. S. (Intern), Stella, S. (Ekstern)
Number of pages: 7
Pages: 272-278
Publication date: 2017
Main Research Area: Technical/natural sciences

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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.86 SJR 1.462 SNIP 1.719
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.509 SNIP 1.72 CiteScore 3.65
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.389 SNIP 1.718 CiteScore 3.27
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.273 SNIP 1.745 CiteScore 3.14
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.264 SNIP 1.916 CiteScore 3.1
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Backlash Estimation for Industrial Drive-Train Systems

Backlash in gearing and other transmission components is a common positioning-degrading phenomenon that develops over time in industrial machines. High-performance machine tool controls use backlash compensation algorithms to maintain accurate positioning of the tool to cope with such deadzone phenomena. As such, estimation of the magnitude of deadzones is essential. This paper addresses the generic problem of accurately estimating the width of the deadzone in a single-axis mechanical drive train. The paper suggests a scheme to estimate backlash between motor and load, employing a sliding mode observer and a nonlinear adaptive estimator. The efficacy of the approach is illustrated via simulations.

General information
State: Published
Organisations: Department of Electrical Engineering, Automation and Control, Siemens
Authors: Papageorgiou, D. (Intern), Blanke, M. (Intern), Niemann, H. H. (Intern), Richter, J. H. (Ekstern)
Pages: 3336-3341
Publication date: 2017

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Title of host publication: Preprints of the 20th World Congress
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Main Research Area: Technical/natural sciences
Conference: The 20th World Congress of the International Federation of Automatic Control, Toulouse, France, 09/07/2017 - 09/07/2017
Parameter estimation based methods for FDI, FDI for nonlinear Systems, Condition Monitoring
Electronic versions:
Backlash_Estimation_for_Industrial Drive_Train_Systems.pdf

Bibliographical note
Bacteria from Wheat and Cucurbit Plant Roots Metabolize PAHs and Aromatic Root Exudates: Implications for Rhizodegradation

The chemical interaction between plants and bacteria in the root zone can lead to soil decontamination. Bacteria which degrade PAHs have been isolated from the rhizospheres of plant species with varied biological traits, however, it is not known what phytochemicals promote contaminant degradation. One monocot and two dicotyledon plants were grown in PAH-contaminated soil from a manufactured gas plant (MGP) site. A phytotoxicity assay confirmed greater soil decontamination in rhizospheres when compared to bulk soil controls. Bacteria were isolated from plant roots (rhizobacteria) and selected for growth on anthracene and chrysene on PAH-amended plates. Rhizosphere isolates metabolized 3- and 4-ring PAHs and PAH catabolic intermediates in liquid incubations. Aromatic root exudate compounds, namely flavonoids and simple phenols, were also substrates for isolated rhizobacteria. In particular, the phenolic compounds - morin, caffeic acid, and protocatechuic acid - appear to be linked to bacterial degradation of 3- and 4- ring PAHs in the rhizosphere.
Bacterial activity dynamics in the water phase during start-up of recirculating aquaculture systems

Microbial water quality in recirculating aquaculture systems (RAS) is important for successful RAS operation but difficult to assess and control. There is a need to identify factors affecting changes in the bacterial dynamics – in terms of abundance and activity – to get the information needed to manage microbial stability in RAS. This study aimed to quantify bacterial activity in the water phase in six identical, pilot scale freshwater RAS stocked with rainbow trout (Oncorhynchus mykiss) during a three months period from start-up. Bacterial activity and dynamics were investigated by the use of a patented method, BactiQuant®. The method relies on the hydrolysis of a fluorescent enzyme-substrate and is a rapid technique for quantifying bacterial enzyme activity in a water sample. The results showed a forty-fold increase in bacterial activity within the first 24 days from start-up. Average BactiQuant® values (BQV) were below 1000 at Day 0 and stabilized around 40,000 BQV after four weeks from start. The study revealed considerable variation in initial BQV levels between identically operated and designed RAS; over time these differences diminished. Total ammonia nitrogen, nitrite and nitrate levels were very similar in all six RAS and were neither related to nor affected by BQV. Chemical oxygen demand (COD) and biological oxygen demand (BOD5) were highly reproducible parameters between RAS with a stable equilibrium dynamic over time. This study showed that bacterial activity was not a straightforward predictable parameter in the waterphase as e.g. nitrate-N would be in identical RAS, and showed unexpected sudden changes/fluctuations within specific RAS. However, a bacterial activity stabilization phase was observed as systems matured and reached equilibrium, suggesting a successive transition from fragile to robust microbial community compositions.

**General information**

State: Published
Organisations: National Institute of Aquatic Resources, Section for Aquaculture
Authors: Rojas-Tirado, P. A. (Intern), Pedersen, P. B. (Intern), Pedersen, L. (Intern)
Pages: 24-31
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Main Research Area: Technical/natural sciences

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Volume: 78 A
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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 2.09 SJR 0.798 SNIP 1.525
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.723 SNIP 1.148 CiteScore 1.63
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.72 SNIP 1.437 CiteScore 1.61
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.666 SNIP 1.511 CiteScore 1.8
ISI indexed (2013): ISI indexed yes
Bacterial community composition and potential driving factors in different reef habitats of the Spermonde Archipelago, Indonesia

Coastal eutrophication is a key driver of shifts in bacterial communities on coral reefs. With fringing and patch reefs at varying distances from the coast the Spermonde Archipelago in southern Sulawesi, Indonesia offers ideal conditions to study the effects of coastal eutrophication along a spatially defined gradient. The present study investigated bacterial community composition of three coral reef habitats: the water column, sediments, and mucus of the hard coral genus Fungia, along that cross shelf environmental and water quality gradient. The main research questions were: (1) How do water quality and bacterial community composition change along a coastal shelf gradient? (2) Which water quality parameters influence bacterial community composition? (3) Is there a difference in bacterial community composition among the investigated habitats? For this purpose, a range of key water parameters were measured at eight stations in distances from 2 to 55 km from urban Makassar. This was supplemented by sampling of bacterial communities of important microbial habitats using 454 pyrosequencing. Findings revealed that the population center Makassar had a strong effect on the concentrations of Chlorophyll a, suspended particulate matter (SPM), and transparent exopolymer particles (TEP), which were all significantly elevated at the inshore compared the other seven sites. Shifts in the bacterial communities were specific to each sampled habitat. Two OTUs, belonging to the genera Escherichia/Shigella (Gammaproteobacteria) and Raistonia (Betaproteobacteria), respectively, both dominated the bacterial community composition of the both size fractions of the water column and coral mucus. The sampled reef sediments were more diverse, and no single OTUs was dominant. There was no gradual shift in bacterial classes or OTUs within the sampled habitats. In addition, we observed very distinct communities between the investigated habitats. Our data show strong changes in the bacterial community composition at the inshore site for water column and sediment samples. Alarmingly, there was generally a high prevalence of potentially pathogenic bacteria across the entire gradient.
Bacterial Electrocalyisis of $K_4[Fe(CN)_6]$ Oxidation

*Shewanella oneidensis* MR-1 (MR-1), a model strain of electrochemically active bacteria, can transfer electrons from cell to extracellular electron acceptors including Fe(III) (hydro)oxides. It has been reported that several redox species such as cytochromes in membranes and flavins assist in the electron transport (ET) processes. However, the oxidization of metal compounds was barely described. Here we report electrocalysis of $K_4[Fe(CN)_6]$ oxidation by MR-1. $K_4[Fe(CN)_6]$ is a redox inorganic compound and shows a reversible redox process on bare glassy carbon (GCE). This is reflected by a pair of symmetric peaks on cyclic voltammetry (CV) (Fig. 1). Interestingly, unsymmetric peaks with a strong anodic peak and a very weak cathodic peak are found on CVs of 1.0 mM $K_4[Fe(CN)_6]$ when the GCE was coated with MR-1, distinguished from the reversible CV on bare electrodes (Fig. 1). A similar electrochemical pattern has been observed using $K_3[Fe(CN)_6]$. These results suggested an electrocalysis process of $[Fe(CN)_6]^{4-}$ to $[Fe(CN)_6]^{3-}$ by MR-1. The ratio of anodic peak current vs cathodic peak current depends on scan rate, suggesting both diffusion of redox molecules and interfacial ET rate are key factors of the electrocalysis. Moreover, Selectivity of MR-1 is another interesting issue: MR-1 does not catalyze other redox compounds such as Ru([NH$_3$]$_6$)Cl$_3$ and Resorufin. In our recent work, extracellular polymeric substances (EPS) showed redox properties and electron hopping through EPS. Here we notice that neither the glassy carbon electrode (GCE) coating EPS extracted from MR-1 nor MR-1 removed EPS (MR-1ΔEPS) exhibited asymmetric redox feature (Fig.1), but caused the decrease of current and the broadening of the difference of anodic and cathodic peak potential, indicating the hindrance of reaction. More work to disclose the origin of the electrocalysis phenomenon is in
progress, aiming at the identification of related compositions in MR-1.

### General information

**State:** Published

**Organisations:** Department of Chemistry, NanoChemistry, Metalloprotein Chemistry and Engineering, Organic Chemistry, Chinese Academy of Sciences

**Authors:** Zheng, Z. (Intern), Xiao, Y. (Intern), Wu, R. (Intern), Christensen, H. E. M. (Intern), Zhao, F. (Ekstern), Zhang, J. (Intern)

**Publication date:** 2017

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**Main Research Area:** Technical/natural sciences

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**Source:** PublicationPreSubmission

**Source-ID:** 136749263

**Publication:** Research - peer-review › Conference abstract for conference – Annual report year: 2017

### Bacterial invasion of the uterus and oviducts in bovine pyometra

Pyometra is a common disease of cattle that causes infertility and thereby financial losses to the cattle industry. Bacteria involved in the development and progression of pyometra have been investigated by microbial culture but their tissue invading abilities, which is an important aspect of bacterial pathogenicity and development of lesions, have not been investigated. Bacterial invasion of the uterus and oviducts was studied in 21 cows diagnosed with pyometra at the time of slaughter by applying fluorescence in situ hybridization using probes targeting 16S ribosomal RNA of *Fusobacterium necrophorum*, *Porphyromonas levii*, *Trueperella pyogenes* and the overall bacterial domain Bacteria. *Fusobacterium necrophorum* and *P. levii* were found to invade the endometrium, especially if the endometrium was ulcerated, and penetrated deep into the lamina propria. These species co-localized within the tissue thus indicating a synergism. *Trueperella pyogenes* did not invade the uterine tissue. In addition to endometrial lesions, most cows with pyometra also had salpingitis but without significant bacterial invasion of the oviductal wall.

### General information

**State:** Published

**Organisations:** National Veterinary Institute, Pathology, University of Copenhagen

**Authors:** Karstrup, C. C. (Ekstern), Pedersen, H. G. (Ekstern), Jensen, T. K. (Intern), Agerholm, J. S. (Ekstern)

**Number of pages:** 6

**Pages:** 93-98

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**Main Research Area:** Technical/natural sciences

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**Journal:** Theriogenology

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**Web of Science (2016):** Indexed yes

**BFI (2015):** BFI-level 2

**Scopus rating (2015):** SJR 0.864 SNIP 1.254 CiteScore 1.86

**BFI (2014):** BFI-level 2

**Scopus rating (2014):** SJR 0.955 SNIP 1.349 CiteScore 2.12

**BFI (2013):** BFI-level 2

**Scopus rating (2013):** SJR 1.08 SNIP 1.356 CiteScore 2.07

**ISI indexed (2013):** ISI indexed yes

**BFI (2012):** BFI-level 2

**Scopus rating (2012):** SJR 0.955 SNIP 1.486 CiteScore 2.29

**ISI indexed (2012):** ISI indexed yes

**Web of Science (2012):** Indexed yes

**BFI (2011):** BFI-level 2

**Scopus rating (2011):** SJR 1.087 SNIP 1.376 CiteScore 2.11
Bacterial whole genome-based phylogeny: construction of a new benchmarking dataset and assessment of some existing methods

Background
Whole genome sequencing (WGS) is increasingly used in diagnostics and surveillance of infectious diseases. A major application for WGS is to use the data for identifying outbreak clusters, and there is therefore a need for methods that can accurately and efficiently infer phylogenies from sequencing reads. In the present study we describe a new dataset that we have created for the purpose of benchmarking such WGS-based methods for epidemiological data, and also present an analysis where we use the data to compare the performance of some current methods.

Results
Our aim was to create a benchmark data set that mimics sequencing data of the sort that might be collected during an outbreak of an infectious disease. This was achieved by letting an E. coli hypermutator strain grow in the lab for 8 consecutive days, each day splitting the culture in two while also collecting samples for sequencing. The result is a data set consisting of 101 whole genome sequences with known phylogenetic relationship. Among the sequenced samples 51 correspond to internal nodes in the phylogeny because they are ancestral, while the remaining 50 correspond to leaves. We also used the newly created data set to compare three different online available methods that infer phylogenies from whole-genome sequencing reads: NTtree, CSI Phylogeny and REALPHY. One complication when comparing the output of these methods with the known phylogeny is that phylogenetic methods typically build trees where all observed sequences are placed as leafs, even though some of them are in fact ancestral. We therefore devised a method for post processing the inferred trees by collapsing short branches (thus relocating some leafs to internal nodes), and also present two new measures of tree similarity that takes into account the identity of both internal and leaf nodes.

Conclusions
Based on this analysis we find that, among the investigated methods, CSI Phylogeny had the best performance, correctly identifying 73% of all branches in the tree and 71% of all clades. We have made all data from this experiment (raw sequencing reads, consensus whole-genome sequences, as well as descriptions of the known phylogeny in a variety of formats) publicly available, with the hope that other groups may find this data useful for benchmarking and exploring the performance of epidemiological methods. All data is freely available at: https://cge.cbs.dtu.dk/services/evolution_data.php.

General information
State: Published
Organisations: Department of Bio and Health Informatics, Genomic Epidemiology, Disease Intelligence and Molecular Evolution, National Food Institute, Research Group for Genomic Epidemiology, University of Copenhagen
Authors: Ahrenfeldt, J. (Intern), Skaarup, C. (Intern), Hasman, H. (Ekstern), Pedersen, A. G. (Intern), Aarestrup, F. M. (Intern), Lund, O. (Intern)
Number of pages: 13
Bag om Måltidsmærket: Udvikling og afprøvning af mærkets principper for sund kantinemad

General information
State: Published
Organisations: National Food Institute, Division of Risk Assessment and Nutrition
Authors: Lassen, A. D. (Intern), Christensen, L. M. (Intern), Trolle, E. (Intern)
Number of pages: 10
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Publication date: 2017
Main Research Area: Technical/natural sciences

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Bandpass transmission filters based on phase shifted fiber Bragg gratings in microstructured polymer optical fibers
In this contribution we report on the fabrication of novel bandpass transmission filters based on PS-FBGs in microstructured polymer fibers at telecom wavelengths. The phase mask technique is employed to fabricate several superimposed gratings with slight different periods in order to form Moiré structures with a single or various π phase shifts along the device. Simulations and experimental results are included in order to demonstrate very narrowband transmission filters. Experimental characterization under strain and temperature variations is provided in a non-annealed fiber and time stability of the fabricated devices has been also measured under different pre-strain conditions.

General information
State: Published
Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation, Universidad Politecnica de Valencia
Authors: Ortega, B. (Ekstern), Min, R. (Ekstern), Sáez-Rodríguez, D. (Ekstern), Mi, Y. (Ekstern), Nielsen, K. (Intern), Bang, O. (Intern)
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Volume: 10232
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Main Research Area: Technical/natural sciences
Band structure engineered layered metals for low-loss plasmonics

Plasmonics currently faces the problem of seemingly inevitable optical losses occurring in the metallic components that challenges the implementation of essentially any application. In this work, we show that Ohmic losses are reduced in certain layered metals, such as the transition metal dichalcogenide TaS2, due to an extraordinarily small density of states for scattering in the near-IR originating from their special electronic band structure. On the basis of this observation, we propose a new class of band structure engineered van der Waals layered metals composed of hexagonal transition metal chalcogenide-halide layers with greatly suppressed intrinsic losses. Using first-principles calculations, we show that the suppression of optical losses lead to improved performance for thin-film waveguiding and transformation optics.
Band structure engineering in van der Waals heterostructures via dielectric screening: the GΔW method

The idea of combining different two-dimensional (2D) crystals in van der Waals heterostructures (vdWHs) has led to a new paradigm for band structure engineering with atomic precision. Due to the weak interlayer couplings, the band structures of the individual 2D crystals are largely preserved upon formation of the heterostructure. However, regardless of the details of the interlayer hybridisation, the size of the 2D crystal band gaps are always reduced due to the enhanced dielectric screening provided by the surrounding layers. The effect can be significant (on the order of electron volts) but its precise magnitude is non-trivial to predict because of the non-local nature of the screening in quasi-2D crystals. Moreover, the effect is not captured by effective single-particle methods such as density functional theory. Here we present an efficient and general method for calculating the band gap renormalization of a 2D material embedded in an arbitrary vdWH. The method evaluates the change in the GW self-energy of the 2D material from the change in the screened Coulomb interaction. The latter is obtained using the quantum-electrostatic heterostructure (QEH) model. We benchmark the GΔW method against full first-principles GW calculations and use it to unravel the importance of screening-induced band structure renormalisation in various vdWHs. A main result is the observation that the size of the band gap reduction of a given 2D material when inserted into a heterostructure scales inversely with the polarisability of the 2D material. Our work demonstrates that dielectric engineering via van der Waals heterostructuring represents a promising strategy for tailoring the band structure of 2D materials.

Bandwidth-adaptable silicon photonic differentiator employing a slow light effect

A photonic differentiator (DIFF) plays a crucial role in photonic circuits. Despite the fact that a DIFF having a tera-hertz bandwidth has been reported, the practical bandwidth is limited to being a bandpass response. In this Letter, we propose the concept of a bandwidth-adaptable DIFF, which exploits the slow light effect in a photonic crystal waveguide (PhCW) to overcome the inherent bandwidth limitation of current photonic DIFFs. We fabricated a PhCW Mach-Zehnder interferometer (PhCW-MZI) on the silicon-on-isolator material platform to validate our concept. Input Gaussian pulses with full width to half-maximums (FWHMs) ranging from 2.7 to 81.4 ps are accurately differentiated using our PhCW-MZI. Our
all-passive scheme circumvents the bandwidth bottlenecks of previously reported photonic DIFFs and can greatly broaden the application area of photonic DIFFs. (C) 2017 Optical Society of America
Barley genotypic β-glucan variation combined with enzymatic modifications direct its potential as a natural ingredient in a high fiber extract

β-Glucan was extracted from eight different barley genotypes varying in β-glucan content and molecular structure using Termamyl® SC (T), Attenuzyme® (A) and Attenuzyme® Flex (AF) amylolytic enzymes in combinations. Extracts from barley lines Lys5f, KVL408, KVL1104 and CDC Fibar exceeded 4 g β-glucan/l, providing European Food Safety Authority (EFSA) and U.S. Food and Drug Administration (FDA) recommended amounts (3 g β-glucan/day) from three portions. TAF extracts of Lys5f and KVL408 grains reached extraordinary high concentrations of 8-9 g β-glucan/l. The β-glucan molecular mass decreased with enzyme treatment T < TA < TAF due to minor lichenase side activity. Extractability was generally higher and molecular mass lower for barley lines low in triosyl/tetraosyl (DP3/DP4) ratios than for those high in DP3/DP4 ratios (Lys5f, KVL408 and KVL1104). Overall, the higher β-glucan content and structural robustness in Lys5f and KVL408 raw materials favor these in a β-glucan rich extract with potential for EFSA and FDA health and Nutrition claims.
Barriers for district heating as a source of flexibility for the electricity system

The Scandinavian countries Denmark, Norway and Sweden currently deploy large amounts of variable renewable energy (VRE) sources, especially wind power. This calls for additional flexibility in the power market. The right coupling to the underlying national and local district heating (DH) markets can generate large amounts of flexibility. However, regulatory barriers and different energy market designs may hinder the potential benefits from system integration, and lower the potential that can be realized. The Scandinavian countries have a large extension of DH with a good potential for providing flexibility services to the electricity market. We survey and discuss regulatory barriers and drivers for exploiting this potential for flexibility. Combined heat and power (CHP) is widely integrated in the power market, but it is threatened by low electricity prices due to the increasing amounts of wind power. Power-to-heat technologies, electric boilers and heat pumps are blocked by high tariffs and taxes. A calculation of the heat costs of different DH technologies demonstrates that, under the present price and tax conditions in Denmark and Sweden, CHP and power-to-heat are unable to compete with heat-only boilers that use tax-free biomass.

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Base-Catalyzed Depolymerization of Solid Lignin-Rich Streams Enables Microbial Conversion

Lignin valorization offers significant potential to enhance the economic viability of lignocellulosic biorefineries. However, because of its heterogeneous and recalcitrant nature, conversion of lignin to value-added coproducts remains a considerable technical challenge. In this study, we employ base-catalyzed depolymerization (BCD) using a process-relevant solid lignin stream produced via deacetylation, mechanical refining, and enzymatic hydrolysis to enable biological lignin conversion. BCD was conducted with the solid lignin substrate over a range of temperatures at two NaOH concentrations, and the results demonstrate that the lignin can be partially extracted and saponified at temperatures as low as 60°C. At 120°C and 2% NaOH, the high extent of lignin solubility was accompanied by a considerable decrease in the lignin average molecular weight and the release of lignin-derived monomers including hydroxycinnamic acids. BCD liquors were tested for microbial growth using seven aromatic-catabolizing bacteria and two yeasts. Three organisms (Pseudomonas putida KT2440, Rhodotorula mucilaginosa, and Corynebacterium glutamicum) tolerate high BCD liquor concentrations (up to 90% v/v) and rapidly consume the main lignin-derived monomers, resulting in lignin conversion of up to 15%. Furthermore, as a proof of concept, muconic acid production from a representative lignin BCD liquor was demonstrated with an engineered P. putida KT2440 strain. These results highlight the potential for a mild lignin depolymerization process to enhance the microbial conversion of solid lignin-rich biorefinery streams.
Basic and practical aspects of pregnancy establishment in cattle

Bovine embryos are increasingly produced using reproductive technologies, e.g. ovum pick-up (OPU), in vitro embryo production (IVP) and embryo transfer (ET). Such in vitro manipulated embryos are known to deviate in several aspects compared to in vivo derived embryos. Pregnancy establishment in cattle involves timed biological events including fine-tuned communication, initiated and carried out by both the embryo and the endometrium. This stimulates research to increase the understanding of events and interactions taking place in the uterus after embryo transfer, both from a biological and systems biology point of view. This review will focus on the biological events taking place during early embryonic development, implantation and beginning of placentation, with focus on transfer of in vitro produced embryos, including a systems biology approach for selection of superior embryo recipients.

Batch medication of intestinal infections in nursery pigs—A randomised clinical trial on the efficacy of treatment strategy, type of antibiotic and bacterial load on average daily weight gain

Introduction
Previous research projects have demonstrated the need for better diagnostic tools to support decisions on medication strategies for infections caused by Escherichia coli F4 (F4) and F18 (F18), Lawsonia intracellularis (LI) and Brachyspira pilosicoli (PILQ). This study was carried out as a randomised clinical trial in three Danish pig herds and included 1047 nursery pigs, distributed over 10 batches and 78 pens. The objectives of this study were: (1) to assess the effect of four 5-day treatment strategies (initiated at clinical outbreak of diarrhoea or at fixed time points 14, 21, or 28 days after weaning) on average daily weight gain (ADG); (2) to compare the effect of treatment with doxycycline or tylosine on diarrhoea prevalence, pathogenic bacterial load, and ADG; (3) to evaluate PCR testing of faecal pen floor samples as a diagnostic tool for determining the optimal time of treatment. Results (1) The four treatment strategies had a significant overall effect on ADG (p = 0.01). Pigs starting treatment 14 days after weaning had a significantly higher ADG (42 g) compared to pigs treated on day 28 (p = 0.01). (2) When measured 2 days after treatment, doxycycline treatment resulted in fewer LI-positive pens (p = 0.004), lower excretion levels of LI (p = 0.013), and fewer pens with a high level of LI (p = 0.031) compared to pens treated with tylosine. There was no significant difference in F4, F18 and PILQ levels after treatment with the two antibiotic compounds. There was a significant difference (p = 0.04) of mean diarrhoea prevalence on day 21 of the study between pens treated with tylosine (0.254, 95% CI: 0.184–0.324), and doxycycline (0.167, 95% CI: 0.124–0.210). The type of antibiotic compound was not found to have a significant effect on ADG (p = 0.209). (3) Pigs
starting treatment on day 14 in pens where F4, F18, LI or PILO were detected by qPCR on the pen floor had a statistically significant increase in ADG (66 g) compared to pigs treated on day 14 in pens where no enteric pathogens were detected (p = 0.04). Conclusions The results of this study showed that the highest ADG was achieved when treatment was initiated 14 days after weaning in pens where intestinal pathogens were detected. Doxycycline was more effective in reducing diarrhoea and LI excretion levels than treatment with tylosine.

**General information**

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Organisations: National Veterinary Institute, Virology, University of Copenhagen
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Bayesian inference of the flow resistivity of a sound absorber and the room's influence on the Sabine absorption coefficients

A Bayesian analysis is applied to determine the flow resistivity of a porous sample and the influence of the test chamber based on measured Sabine absorption coefficient data. The Sabine absorption coefficient measured in a reverberation chamber according to ISO 354 is influenced by the test chamber significantly, whereas the flow resistivity is a rather reproducible material property, from which the absorptive characteristics can be calculated through reliable models. Using Sabine absorption coefficients measured in 13 European reverberation chambers, the maximum a posteriori and the uncertainty of the flow resistivity and the test chamber's influence are estimated. Inclusion of more than one chamber's absorption data helps the flow resistivity converge towards a reliable value with a standard deviation below 17%.
Bayesian Modelling of Functional Whole Brain Connectivity

This thesis deals with parcellation of whole-brain functional magnetic resonance imaging (fMRI) using Bayesian inference with mixture models tailored to the fMRI data. In the three included papers and manuscripts, we analyze two different approaches to modeling fMRI signal; either we accept the prevalent strategy of standardizing fMRI time series and model data using directional statistics or we model the variability in the signal across the brain and across multiple subjects. In either case, we use Bayesian nonparametric modeling to automatically learn from the fMRI data the number of functional units, i.e. parcels. We benchmark the proposed mixture models against state of the art methods of brain parcellation, both probabilistic and non-probabilistic.

The time series of each voxel are most often standardized using z-scoring which projects the time series data onto a hypersphere. This underlying manifold is often ignored and the data is modeled using Gaussian distributions. In one
contribution, we show that using a mixture model based on the directional distribution, the von Mises-Fisher distribution, increase the reliability of inferred parcellations.

We develop a mixture model for modeling time-series using a Gaussian Process as a prior that is informed of the temporal dynamics of the data expected from the blood oxygenation level dependent (BOLD) signal. In two contributions, we explore the potential of this modeling framework. In the first, we show that this mixture model can delineate regions of task activation that can then be identified unsupervised. This forms a promising framework for unsupervised identification of task activated when the task design is unknown. In the final contribution, we evaluate the performance of the mixture model on the problem of clustering whole-brain fMRI. Based on both simulations on synthetic data and analysis of two fMRI datasets, we show that the model provides improved reliability of clustering compared to traditional clustering methods. Furthermore, the inferred parcellations provide the foundation for a method for increasing the reliability and sensitivity in analyses of task activation and for determining the networks of functionally connectivity in fMRI.

The proposed mixture models form promising tools for brain parcellation and we hope the methods can provide a nudge towards using probabilistic models for fMRI parcellation.
Bayesian estimation of $P(X > x)$ from a small sample of Gaussian data

The classical statistical uncertainty problem of estimation of upper tail probabilities on the basis of a small sample of observations of a Gaussian random variable is considered. Predictive posterior estimation is discussed, adopting the standard statistical model with diffuse priors of the two normal distribution parameters. Rarely the uncertainty of the predictive estimate itself is quantified in practice. By considering the exceedance probability as a random variable over the posterior probability distribution of the parameters, an explicit expression for the distribution of this random variable is obtained. It is shown that the usual elementary estimate based on the normal distribution is very close to the median of this distribution. For increasing exceedance level the distribution skewness increases so that the predictive estimate, which is equal to the mean of the distribution, comes further and further out in the upper tail of the distribution. The dual frequentist's confidence interval approach is shown to have difficulties not present for the Bayesian approach. (C) 2017 Elsevier Ltd. All rights reserved.

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Scopus rating (2008): SJR 1.414 SNIP 2.507
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Scopus rating (2007): SJR 1.261 SNIP 2.743
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Web of Science (2005): Indexed yes
This paper presents an inexpensive, low temperature and rapid fabrication method for capacitive micromachined ultrasonic transducers (CMUT). The fabrication utilizes the bonding and dielectric properties of the photosensitive polymer Benzocyclobutene (BCB). A BCB based row-column addressed CMUT with integrated apodization has been fabricated and characterized with initial impedance measurement. Furthermore, two linear BCB CMUT arrays have been fabricated with different bottom electrode designs and characterized acoustically. All the fabricated arrays have a center frequency of 2.5 MHz when immersed into water and a pull-in voltage of 75 V. Stability tests have showed a stable coupling coefficient of approximately 0.1 during 10 hours of biased operation. Acoustic measurements, with a hydrophone positioned 1 cm from the CMUTs, have showed a peak-to-peak pressure of 14 kPa.

**General information**
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An endlessly single-mode doped microstructured poly(methyl methacrylate) (PMMA) optical fiber is produced for effective fiber Bragg grating (FBG) photo-inscription by means of a 400 nm femtosecond pulsed laser and the phase mask technique. The fiber presents a uniform benzyl dimethyl ketal (BDK) distribution in its core without drastic loss increase. It was produced using the selected center hole doping technique, and the BDK dopant acts as a photoinitiator. In this Letter, we report a rapidly growing process of the grating reflection band. For an 11 mW mean laser power, the FBG reflectivity reaches 83% in only 40 s.

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Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation, University of Mons
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Beam steering application for W-band data links with moving targets in 5G wireless networks

Ubiquitous broadband Internet access is one of the major goals of the next generation of wireless communications. However, there are still some locations where this is difficult to achieve. This is the case on moving vehicles and, particularly, on trains. Among the possible solutions to this problem, RoF (Radio-over-Fiber) architectures have been proposed as low-latency, cost-effective candidates. Two elements are introduced to extend the RoF approach. First, the carrier frequency is raised into the W-band (75–110 GHz) to increase the available capacity. Second, a mechanical beam-steering solution based on a Stewart platform is adopted for the transmitter antenna to allow it to follow a moving receiver along a known path, thereby enhancing the coverage area. The performance of a system transmitting a 2.5 Gbit/s non-return-to-zero signal generated by photonic up-conversion over a wireless link is evaluated in terms of real-time BER (Bit Error Rate) measurements. The receiver is situated in different positions, and the orientation of the transmitter is changed accordingly. Values below the forward error correction limit for 7% overhead are obtained over a range of 60 cm around a center point situated 2 m away from the transmitter.

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Beamstop-based low-background ptychography to image weakly scattering objects

In recent years, X-ray ptychography has been established as a valuable tool for high-resolution imaging. Nevertheless, the spatial resolution and sensitivity in coherent diffraction imaging are limited by the signal that is detected over noise and over background scattering. Especially, coherent imaging of weakly scattering specimens suffers from incoherent background that is generated by the interaction of the central beam with matter along its propagation path in particular close to and inside of the detector. Common countermeasures entail evacuated flight tubes or detector-side beamstops, which improve the experimental setup in terms of background reduction or better coverage of high dynamic range in the diffraction patterns. Here, we discuss an alternative approach: we combine two ptychographic scans with and without beamstop and reconstruct them simultaneously taking advantage of the complementary information contained in the two scans. We experimentally demonstrate the potential of this scheme for hard X-ray ptychography by imaging a weakly scattering object composed of catalytic nanoparticles and provide the analysis of the signal-to-background ratio in the diffraction patterns.

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Behavior is a major determinant of predation risk in zooplankton

Zooplankton exhibit different small-scale motile behaviors related to feeding and mating activities. These different motile behaviors may result in different levels of predation risk, which may partially determine the structure of planktonic communities. Here, we experimentally determined predation mortality associated with (1) feeding activity (ambush feeders vs. feeding-current vs. cruising feeders) and (2) mate-finding behavior (males vs. females). The copepods Oithona nana, O. davisiæ (ambush feeders), Temora longicornis (feeding-current feeder), and Centropages hamatus (cruising feeder) were used as prey for different predatory copepods. Copepods with “active” feeding behaviors (feeding-current and cruising feeders) showed significantly higher mortality from predation (~2–8 times) than similarly sized copepods with low motility feeding behavior (ambush feeders). Copepod males, which have a more active motile behavior than females (mate-seeking behavior), suffered a higher predation mortality than females in most of the experiments. However, the predation risk for mate-searching behavior in copepods varied depending on feeding behavior with ambush feeders consistently having the greatest difference in predation mortality between genders (~4 times higher for males than for females). This gender-specific predation pressure may partially explain field observations of female-biased sex ratios in ambush feeding copepods (e.g., Oithonidae). Overall, our results demonstrate that small-scale motile behavior is a key trait in zooplankton that significantly affects predation risk and therefore is a main determinant of distribution and composition of zooplankton communities in the ocean.
study area after restoration (94%) than before (53%). Moreover, throughout the study period, cod spent significantly more hours per day and prolonged their residence time in the study area after the restoration. The study indicates that marine reefs subjected to boulder extraction can be restored and function as favourable cod habitats. Temperate marine boulder reef restoration represents a valuable management tool to improve habitats for temperate fish species.
Behavioural design: A process for integrating behaviour change and design

Nudge, persuasion, and the influencing of human behaviour through design are increasingly important topics in design research and in the wider public consciousness. However, current theoretical approaches to behaviour change have yet to be operationalized in design process support. Specifically, there are few empirically grounded processes supporting designers in realising behaviour change projects. In response to this, 20 design projects from a case company are analysed in order to distil a core process for behavioural design. Results show a number of process stages and activities associated with project success, pointing to a new perspective on the traditional design process, and allowing designers to integrate key insights from behaviour change theory. Using this foundation we propose the Behavioural Design process.

General information
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Being, doing and leading in the project society
The last decades have seen a proliferation of projects across different contexts, from the building of an iconic venue to the planning of a family vacation. Building on Jensen (2009) work on the project society and Jensen et al (2016) articulation of projects as human conditions, this article explores strategies for living in the project society. Guided by the philosophical concepts of activity, time, space and relations, we explore the project society as an ideal type, in opposition to the disciplinary society. We discuss implications of being, doing and leading in a project society. Taken together this analysis describes some of the key challenges emerging from the project society and suggests some ideas and advices to fellow project man and woman, navigating in project society.

The work extends our understanding of projects beyond organizational settings – to a societal and individual level. We argue that, first, our growing and insightful body of literature on project organizing can become useful for each one of us as individuals navigating in project society. Second, it opens up to a more extensive empirical context – studying behaviour of people in projects, outside classic organizational settings. In this respect, the article serves as a basis for future research on living in the project society where nothing lasts forever but our projects define who we are and what we can become.

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Benchmarking Density Functionals for Chemical Bonds of Gold

Gold plays a major role in nanochemistry, catalysis, and electrochemistry. Accordingly, hundreds of studies apply density functionals to study chemical bonding with gold, yet there is no systematic attempt to assess the accuracy of these methods applied to gold. This paper reports a benchmark against 51 experimental bond enthalpies of AuX systems and seven additional polyatomic and cationic molecules. Twelve density functionals were tested, covering meta functionals, hybrids with variable HF exchange, double-hybrid, dispersion-corrected, and nonhybrid GGA functionals. The defined benchmark data set probes all types of bonding to gold from very electronegative halides that force Au+ electronic structure, via covalently bonded systems, hard and soft Lewis acids and bases that either work against or complement the softness of gold, the Au2 molecule probing gold's bond with itself, and weak bonds between gold and noble gases. Zero-point vibrational corrections are relatively small for Au-X bonds, ∼11-12 kJ/mol except for Au-H bonds. Dispersion typically provides ∼5 kJ/mol of the total bond enthalpy but grows with system size and is 10 kJ/mol for AuXe and AuKr. HF exchange and LYP correlation produce weaker bonds to gold. Most functionals provide similar trend accuracy, though somewhat lower for M06 and M06L, but very different numerical accuracy. Notably, PBE and TPSS functionals with dispersion display the smallest numerical errors and very small mean signed errors (0-6 kJ/mol), i.e. no bias toward over- or under-binding. Errors are evenly distributed versus atomic number, suggesting that relativistic effects are treated fairly; the mean absolute error is almost halved from B3LYP (45 kJ/mol) to TPSS and PBE (23 kJ/mol, including difficult cases); 23 kJ/mol is quite respectable considering the diverse bonds to gold and the complication of relativistic effects. Thus, studies that use DFT with effective core potentials for gold chemistry, with no alternative due to computational cost, are on solid ground using TPSS-D3 or PBE-D3.

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Benchmarking five computational methods for analyzing large photonic crystal membrane cavities

We benchmark five state-of-the-art computational methods by computing quality factors and resonance wavelengths in photonic crystal membrane L5 and L9 line defect cavities. The convergence of the methods with respect to resolution, degrees of freedom and number of modes is investigated. Convergence is not obtained for some of the methods, indicating that some are more suitable than others for analyzing line defect cavities.

Benchmarking healthcare logistics processes: a comparative case study of Danish and US hospitals

Logistics processes in hospitals are vital in the provision of patient care. Improving healthcare logistics processes provides an opportunity for reduced healthcare costs and better support of clinical processes. Hospitals are faced with increasing healthcare costs around the world and improvement initiatives prevalent in manufacturing industries such as lean, business process reengineering and benchmarking have seen an increase in use in healthcare. This study investigates how logistics processes in a hospital can be benchmarked to improve process performance. A comparative case study of the bed logistics process and the pharmaceutical distribution process was conducted at a Danish and a US hospital. The case study results identified decision criteria for designing efficient and effective healthcare logistics processes. The most important decision criteria were related to quality, security of supply and employee engagement. Based on these decision criteria, performance indicators were developed to enable benchmarking of logistics processes in healthcare. The study contributes to the limited literature on healthcare logistics benchmarking. Furthermore, managers in healthcare logistics are provided with a list of decision parameters relevant for designing and benchmarking processes.
Benchmarking Pt and Pt-lanthanide sputtered thin films for oxygen electroreduction: fabrication and rotating disk electrode measurements
Platinum-lanthanide alloys are very promising as active and stable catalysts for the oxygen reduction reaction (ORR) in low-temperature fuel cells. We have fabricated Pt and Pt$_5$Gd metallic thin films via (co-)sputtering deposition in an ultra-high vacuum (UHV) chamber. The electrochemical ORR activity, stability, as-well as chemical composition and crystallographic structure of Pt$_5$Gd thin film catalysts have been investigated using a combination of electrochemical measurements, X-ray photoemission spectroscopy (XPS) and X-ray diffraction (XRD) techniques. We describe the measurement procedures, with the aim of benchmarking electrochemical characterization of Pt-based thin film catalysts for ORR. Pt$_5$Gd thin films present an activity enhancement by a factor of 4.5 and 2.5 over polycrystalline Pt and Pt thin films, respectively.

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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.391 SNIP 1.482 CiteScore 4.59
Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 1.435 SNIP 1.607 CiteScore 4.44
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.651 SNIP 1.592 CiteScore 3.99
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Scopus rating (2010): SJR 1.691 SNIP 1.725
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
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Scopus rating (2007): SJR 1.563 SNIP 1.595
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.534 SNIP 1.736
Bent and bent(4) spectra of Boolean functions over finite fields

For $c \in \mathbb{F}_2^n$, a $c$-bent4 function $f$ from the finite field $\mathbb{F}_2^n$ to $\mathbb{F}_2$ is a function with a flat spectrum with respect to the unitary transform $V-f(c)$, which is designed to describe the component functions of modified planar functions. For $c = 0$ the transform $V-f(c)$ reduces to the conventional Walsh transform, and hence a 0-bent4 function is bent. In this article we generalize the concept of partially bent functions to the transforms $V-f(c)$. We show that every quadratic function is partially bent, and hence it is plateaued with respect to any of the transforms $V-f(c)$. In detail we analyse two quadratic monomials. The first has values as small as possible in its spectra with respect to all transforms $V-f(c)$, and the second has a flat spectrum for a large number of $c$. Moreover, we show that every quadratic function is $c$-bent4 for at least three distinct $c$. In the last part we analyse a cubic monomial. We show that it is $c$-bent(4) only for $c = 1$, the function is then called negabent, which shows that non-quadratic functions exhibit a different behaviour. (C) 2017 Elsevier Inc. All rights reserved.

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Organisations: Department of Applied Mathematics and Computer Science, Mathematics, Otto-von-Guericke Universität Magdeburg
Authors: Anbar Meidl, N. (Intern), Meidl, W. (Ekstern)
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Scopus rating (2015): SJR 1.003 SNIP 1.388 CiteScore 1.29
BFI (2014): BFI-level 1
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Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.869 SNIP 1.309 CiteScore 0.92
ISI indexed (2013): ISI indexed yes
Antibodies have become an indispensable tool for many biotechnological and clinical applications. They bind their molecular target (antigen) by recognizing a portion of its structure (epitope) in a highly specific manner. The ability to predict epitopes from antigen sequences alone is a complex task. Despite substantial effort, limited advancement has been achieved over the last decade in the accuracy of epitope prediction methods, especially for those that rely on the sequence of the antigen only. Here, we present BepiPred-2.0 (http://www.cbs.dtu.dk/services/BepiPred/), a web server for predicting B-cell epitopes from antigen sequences. BepiPred-2.0 is based on a random forest algorithm trained on epitopes annotated from antibody-antigen protein structures. This new method was found to outperform other available tools for sequence-based epitope prediction both on epitope data derived from solved 3D structures, and on a large collection of linear epitopes downloaded from the IEDB database. The method displays results in a user-friendly and informative way, both for computer-savvy and non-expert users. We believe that BepiPred-2.0 will be a valuable tool for the bioinformatics and immunology community.
Beskedent overtryk gav spektakulære følger
For at undertrykke generende opskumning blev en tank sat under et såkaldt "meget beskedent overtryk". Pludselig svigtede samlingen i bunden. Tanken nåede en højde på 30 m og faldt ned og knuste en varevogn. Uheldet viser, at et stort volumen af gas under lavt tryk indeholder en ikke uvæsentlig mængde energi.

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Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Statistics and Data Analysis
Authors: Hedlund, F. H. (Intern)
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Between Indoor and Outdoor. Norwegian Perceptions of Well-Being in Energy Efficient Housing
An increased societal focus on energy efficiency has led to the development of new building concepts and standards in many countries, such as the passive house standard in Norway which implies a dense building envelope with restrictions on the use of glass and natural ventilation. Generally low-energy building concepts are based on a rational approach to comfort in housing limited to mainly measurable aspects. This, however, hardly reflects what makes residents feel comfortable at home, since it lacks a holistic understanding of residential well-being. Well-being is a complex and multi-faceted concept that includes atmosphere and feeling at home. In a qualitative study of four Norwegian low-energy housing projects, we investigate and discuss the impact of visual and sensory qualities, like view, daylight and access to fresh air, on residential well-being. The study reveals that it is possible to achieve well-being in energy-efficient housing, but some practices jeopardize the energy-design concept and influence energy use. Residents find strategies to achieve well-being by opening windows and doors, despite restrictions on airing naturally. Access to daylight and view and the ability to open windows or balcony doors to let in air, smells and sounds from the outside are crucial for residents' well-being and thus important factors to consider when designing and building energy-efficient housing where people feel at home.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Norwegian University of Science and Technology
Authors: Wågø, S. (Ekstern), Hauge, B. (Intern), Støa, E. (Ekstern)
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Journal: Journal of Architectural and Planning Research
Volume: 33
Beyond Water Splitting: Efficiencies of Photo-Electrochemical Devices Producing Hydrogen and Valuable Oxidation Products

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Authors: Mei, B. (Ekstern), Mul, G. (Ekstern), Seger, B. (Intern)
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Big Data er en meningsskabelsesproces, der tager afsæt i dit mindset

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Organisations: Center for Bachelor of Engineering Studies, Afdelingen for Forretningsudvikling
Authors: Rydén, P. (Intern)
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Big Data hvor N=1
Forsknings vedrørende anvendelsen af 'big data' indenfor sundhed er kun lige begyndt, og kan på sigt blive en stor hjælp i forhold til at tilrettelægge en mere personlig og helhedsorienteret sundhedsindsats for multisyge. Personlig sundhedssteknologi, som kort præsenteres i dette kapital, rummer et stor potentiale for at gennemføre 'big data' analyser for den enkelte person, det vil sige hvor N=1. Der er store teknologiske udfordringer i at få lavet teknologier og metoder til at indsamle og håndtere personlige data, som kan deles, på tværs på en standardiseret, forsvarlig, robust, sikker og ikke mindst anonym facon.

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Organisations: Copenhagen Center for Health Technology, Department of Applied Mathematics and Computer Science , Embedded Systems Engineering
Authors: Bardram, J. E. (Intern)
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Title of host publication: Hvidbog om MULTISYGDOM : Dokumentation af multisygdom i det danske samfund – fra silotænkning til sammenhæng
Editors: Frølich, A., Olesen, F., Kristensen, I.
Chapter: 13
Main Research Area: Technical/natural sciences
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Publication: Research › Book chapter – Annual report year: 2017

Big data - modelling of midges in Europa using machine learning techniques and satellite imagery
Biting midges (Diptera, Ceratopogonidae) of the genus Culicoides are important vectors of pathogens causing diseases in free living and production animals and can lead to large economic losses in many European countries. In Europe, Culicoides imicola and the Obsoletus group are considered to be the main vectors of bluetongue virus that mostly affects ruminants such as cattle and sheep. Spatio-temporal modelling of vector distribution and abundance allows us to identify high risk areas for virus transmission and can aid in applying effective surveillance and control measures.

We used presence-absence and monthly abundance data of Culicoides from 1005 sites across 9 countries (Spain, France, Denmark, Poland, Switzerland, Austria, Poland, Sweden, Norway) collected between the years 2007 and 2013. The dataset included information on the vector species abundance (number of specimens caught per night), GPS
coordinates of each trap, start and end dates of trapping. We used 120 environmental predictor variables together with Random Forest machine learning algorithms to predict the overall species distribution (probability of occurrence) and monthly abundance in Europe. We generated maps for every month of the year, to visualize the abundance of C. imicola and Obsoletus group in Europe as well as distribution maps showing the probability of occurrence.

We were able to create predictive maps of both Culicoides sp. occurrence and abundance using Random Forest models, and although the variance was large, the predicted abundance values for each site had a positive correlation with the observed abundance. We found relatively large spatial variations in probability of occurrence and abundance for both C. imicola and the Obsoletus group. For C. imicola probability of occurrence and abundance was higher in southern Spain, where as the Obsoletus group had higher probability of occurrence and abundance in central and northern Europe such as France and Germany. Temporal variation was also observed with higher abundance occurring during summer months and low or no abundance during winter months for both C. imicola and the Obsoletus group, although abundance was generally higher for a longer period of time for C. imicula than for the Obsoletus group.

Using machine learning techniques, we were able to model the spatial distribution in Europe for C. imicula and the Obsoletus group in terms of abundance and suitability (probability of occurrence). Our maps corresponded well with the previously reported distribution for C. imicula and the Obsoletus group. The observed seasonal variation was also consistent with reported population dynamics for Culicoides, as it depends on environmental factors such as temperature and rainfall. Longer seasonal abundance for C. imicula compared to the Obsoletus group can be explained by the species distribution, as C. imicula is limited to the southern parts of Europe where the warm season lasts longer, whereas the Obsoletus group is found further north. The outputs obtained here will be used as input for epidemiological models and can be helpful for determining high risk areas for disease transmission.

**General information**

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**Organisations:** National Veterinary Institute, Epidemiology, Department of Applied Mathematics and Computer Science, Statistics and Data Analysis, Universidad de Zaragoza, University of the Balearic Islands, Avia-GIS, Aarhus University, Roskilde University, National Veterinary Institute, Bernhard Nocht Institute for Tropical Medicine, National Veterinary Research Institute, Norwegian Veterinary Institute, Institute for Veterinary Public Health, Centre de cooperation Internationale en Recherche Agronomique pour le Développement, Universite de Strasbourg, EID Méditerranée, University of Zurich


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**Bigger is not better: cortisol-induced cardiac growth and dysfunction in salmonids**

Stress and elevated cortisol levels are associated with pathological heart growth and cardiovascular disease in humans and other mammals. We recently established a link between heritable variation in post-stress cortisol production and cardiac growth in salmonid fish too. A conserved stimulatory effect of the otherwise catabolic steroid hormone cortisol is probably implied, but has to date not been established experimentally. Furthermore, whereas cardiac growth is associated with failure of the mammalian heart, pathological cardiac hypertrophy has not previously been described in fish. Here, we show that rainbow trout (Oncorhynchus mykiss) treated with cortisol in the diet for 45 days have enlarged hearts with lower maximum stroke volume and cardiac output. In accordance with impaired cardiac performance, overall circulatory oxygen-transporting capacity was diminished as indicated by reduced aerobic swimming performance. In contrast to the well-known adaptive/physiological heart growth observed in fish, cortisol-induced growth is maladaptive. Furthermore, the observed heart growth was associated with up-regulated signature genes of mammalian cardiac pathology, suggesting that signalling pathways mediating cortisol-induced cardiac remodelling in fish are conserved from fish to mammals. Altogether, we show that excessive cortisol can induce pathological cardiac remodelling. This is the first study to report and integrate the etiology, physiology and molecular biology of cortisol-induced pathological remodelling in fish.
Binding of Plasmodium falciparum to CD36 can be shielded by the glycocalyx

Background: Plasmodium falciparum-infected erythrocytes sequester in the microcirculation due to interaction between surface-expressed parasite proteins and endothelial receptors. Endothelial cells are covered in a carbohydrate-rich glycocalyx that shields against undesired leukocyte adhesion. It was investigated if the cellular glycocalyx affects the binding of P. falciparum-infected erythrocytes to CD36 in vitro.

Methods: Glycocalyx growth was followed in vitro by using azido sugars and cationized ferritin detecting O-glycoproteins and negatively charged proteoglycans, respectively. P. falciparum (clone FCR3/IT) was selected on Chinese hamster ovary (CHO) cells transfected with human CD36. Cytoadhesion to CHO CD36 at 1-4 days after seeding was quantified by using a static binding assay.

Results: The glycocalyx thickness of CHO cells increased during 4 days in culture as assessed by metabolic labelling of glycans with azido sugars and with electron microscopy studying the binding of cationized ferritin to cell surfaces. The functional importance of this process was addressed in binding assays by using CHO cells transfected with CD36. In parallel with the maturation of the glycocalyx, antibody-binding to CD36 was inhibited, despite stable expression of CD36. P. falciparum selected for CD36-binding recognized CD36 on CHO cells on the first day in culture, but the binding was lost after 2-4 days.

Conclusion: The endothelial glycocalyx affects parasite cytoadhesion in vitro, an effect that has previously been ignored. The previously reported loss of glycocalyx during experimental malaria may play an important role in the pathogenesis of malaria complications by allowing the close interaction between infected erythrocytes and endothelial receptors.
Bioaccessibility of contaminants of emerging concern in raw and cooked commercial seafood species: insights for food safety risk assessment

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Place of publication: Brussels, Belgium
Publisher: Royal Flemish Academy of Science and the Arts (KVAB)
Bioactivity of Cod and Chicken Protein Hydrolysates before and after in vitro Gastrointestinal Digestion

Bioactivity of cod (Gadus morhua) and chicken (Gallus domesticus) protein hydrolysates before and after in vitro gastrointestinal (GI) digestion was investigated using yeast Saccharomyces cerevisiae as a model organism. Both hydrolysates were exposed to in vitro GI digestion prior to cellular exposure to simulate digestion conditions in the human body and therefore investigate the role of modulations in the GI tract on the cell response. The effect of digested and undigested hydrolysates on intracellular oxidation, cellular metabolic energy and proteome level was investigated. No difference in the effect on intracellular oxidation activity was obtained between cod and chicken hydrolysates, while higher effect on intracellular oxidation was provided by digested hydrolysates, with relative values of intracellular oxidation of cod of (70.2±0.8) and chicken of (74.5±1.4) % than by undigested ones, where values of cod and chicken were (95.5±1.2) and (90.5±0.7) %, respectively. Neither species nor digestion had any effect on cellular metabolic energy. At proteome level, digested hydrolysates gave again significantly stronger responses than undigested counterparts; cod peptides here also gave somewhat stronger response than chicken peptides. The knowledge of the action of food protein hydrolysates and their digests within live cells, also at proteome level, is important for further validation of their activity in higher eukaryotes to develop new products, such as in this case chicken and cod muscle-derived peptides as functional ingredients.
Bioaugmentation with hydrolytic microbes to improve the anaerobic biodegradability of lignocellulosic agricultural residues

Bioaugmentation with hydrolytic microbes was applied to improve the methane yield of bioreactors fed with agricultural wastes. The efficiency of Clostridium thermocellum and Melioribacter roseus to degrade lignocellulosic matter was evaluated in batch and continuously stirred tank reactors (CSTRs). Results from batch assays showed that C. thermocellum enhanced the methane yield by 34%. A similar increase was recorded in CSTR during the bioaugmentation period; however, at steady-state the effect was noticeably lower (7.5%). In contrast, the bioaugmentation with M. roseus did not promote markedly the anaerobic biodegradability, as the methane yield was increased up to 10% in batch and no effect was shown in CSTR. High-throughput 16S rRNA amplicon sequencing was used to assess the effect of bioaugmentation strategies on bacterial and archaeal populations. The microbial analysis revealed that both strains were not markedly resided into biogas microbiome. Additionally, the applied strategies did not alter significantly the microbial communities.
Bioavailability and bioaccessibility of polycyclic aromatic hydrocarbons from (post-pyrolytically treated) biochars

Bioaccessibility data of PAHs from biochar produced under real world conditions is scarce and the influence of feedstock and various post-pyrolysis treatments common in agriculture, such as co-composting or lactic fermentation to produce silage fodder, on their bioavailability and bioaccessibility has hardly been studied. The total (Ctotal), and freely dissolved (i.e., bioavailable) concentrations (Cfree) of the sum of 16 US EPA PAHs of 43 biochar samples produced and treated in such ways ranged from 0.4 to almost 2000 mg/kg, and from 12 to 81 ng/L, respectively, which resulted in very high biochar-water partition coefficients (4.2 ≤ log KD ≤ 8.8 L/kg) for individual PAHs. Thirty three samples were incubated in contaminant traps that combined a diffusive carrier and a sorptive sink. Incubations yielded samples only containing desorption-resistant PAHs (Cres). The desorption resistant PAH fraction was dominant, since only eight out of 33 biochar samples showed statistically significant bioaccessible fractions (fbioaccessible = 1 - Cres/Ctotal). Bioavailability correlated positively with Ctotal/surface area. Other relationships of bioavailability and -accessibility with the investigated post-
pyrolysis processes or elemental composition could not be found. PAH exposure was very limited (low C_free, high C_res) for all samples with low to moderate C_total, whereas higher exposure was determined in some biochars with C_total > 10 mg/kg.

**General information**

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Organisations: Department of Environmental Engineering, Environmental Chemistry, Agroscope, Aarhus University, Norwegian Geotechnical Institute, Ithaka Institute for Carbon Strategies

Authors: Hilber, I. (Ekstern), Mayer, P. (Intern), Gouliarmou, V. (Ekstern), Hale, S. E. (Ekstern), Cornelissen, G. (Ekstern), Schmidt, H. P. (Ekstern), Bucheli, T. D. (Ekstern)

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Scopus rating (2013): SJR 1.724 SNIP 1.767 CiteScore 3.92

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Scopus rating (2011): SJR 1.961 SNIP 1.515 CiteScore 3.61

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Bioavailability of emerging contaminants in seafood

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Biobased production of alkanes and alkenes through metabolic engineering of microorganisms

Advancement in metabolic engineering of microorganisms has enabled bio-based production of a range of chemicals, and such engineered microorganisms can be used for sustainable production leading to reduced carbon dioxide emission there. One area that has attained much interest is microbial hydrocarbon biosynthesis, and in particular, alkanes and alkenes are important high-value chemicals as they can be utilized for a broad range of industrial purposes as well as 'drop-in' biofuels. Some microorganisms have the ability to biosynthesize alkanes and alkenes naturally, but their production level is extremely low. Therefore, there have been various attempts to recruit other microbial cell factories for production of alkanes and alkenes by applying metabolic engineering strategies. Here we review different pathways and involved enzymes for alkane and alkene production and discuss bottlenecks and possible solutions to accomplish industrial level production of these chemicals by microbial fermentation.

General information
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Authors: Kang, M. K. (Ekstern), Nielsen, J. (Intern)
Pages: 613-622
Publication date: 2017
Main Research Area: Technical/natural sciences
Bio-based production of fuels and industrial chemicals by repurposing antibiotic-producing type I modular polyketide synthases: opportunities and challenges

Complex polyketides comprise a large number of natural products that have broad application in medicine and agriculture. They are produced in bacteria and fungi from large enzyme complexes named type I modular polyketide synthases (PKSs) that are composed of multifunctional polypeptides containing discrete enzymatic domains organized into modules. The modular nature of PKSs has enabled a multitude of efforts to engineer the PKS genes to produce novel polyketides of predicted structure. We have repurposed PKSs to produce a number of short-chain mono- and di-carboxylic acids and ketones that could have applications as fuels or industrial chemicals.
Biodegradation of hydrocarbon mixtures in surface waters at environmentally relevant levels - Effect of inoculum origin on kinetics and sequence of degradation

Biodegradation is a dominant removal process for many organic pollutants, and biodegradation tests serve as tools for assessing their environmental fate within regulatory risk assessment. In simulation tests, the inoculum is not standardized, varying in microbial quantity and quality, thereby potentially impacting the observed biodegradation kinetics. In this study we investigated the effect of inoculum origin on the biodegradation kinetics of hydrocarbons for five inocula from surface waters varying in urbanization and thus expected pre-exposure to petroleum hydrocarbons. A new biodegradation method for testing mixtures of hydrophobic chemicals at trace concentrations was demonstrated: Aqueous solutions containing 9 hydrocarbons were generated by passive dosing and diluted with surface water resulting in test systems containing native microorganisms exposed to test substances at ng-μg/L levels. Automated Headspace Solid Phase Microextraction coupled to GC-MS was applied directly to these test systems to determine substrate depletion relative to abiotic controls. Lag phases were generally less than 8 days. First order rate constants were within one order of magnitude for each hydrocarbon in four of the five waters but lower in water from a rural lake. The sequence of degradation between the 9 hydrocarbons showed similar patterns in the five waters indicating the potential for using selected hydrocarbons for benchmarking between biodegradation tests. Degradation half-times were shorter than or within one order of magnitude of BioHCwin predictions for 8 of 9 hydrocarbons. These results showed that location choice is important for biodegradation kinetics and can provide a relevant input to aquatic exposure and fate models.

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Authors: Birch, H. (Intern), Hammershøj, R. H. (Intern), Comber, M. (Ekstern), Mayer, P. (Intern)
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Web of Science (2014): Indexed yes
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Biodegradation testing of chemicals with high Henry's constants – separating mass and effective concentration reveals higher rate constants

During simulation-type biodegradation tests, volatile chemicals will continuously partition between water phase and headspace. This study addressed how (1) this partitioning affects biodegradation test results and (2) it can be accounted for by combining mass balance and dynamic biodegradation models. An aqueous mixture of 9 (semi)volatile chemicals was first prepared using passive dosing and then diluted with environmental surface water to produce test systems containing concentrations in the ng/L to µg/L range. After incubation for 2 hours to 4 weeks, automated Headspace Solid Phase Microextraction (HS-SPME) was applied directly on the test systems to measure substrate depletion by biodegradation relative to abiotic controls. HS-SPME was also applied to determine air to water partitioning ratios. Water phase biodegradation rate constants, kwater, were up to 72 times higher than test system biodegradation rate constants, ksystem. True water phase degradation rate constants facilitate extrapolation to other air-water systems and are more suitable input parameters for aquatic exposure and fate models. As such, they should be considered more appropriate for
risk assessments than test system rate constants.

**General information**
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Organisations: Department of Environmental Engineering, Environmental Chemistry, Water Technologies, Mike Comber Consulting
Authors: Birch, H. (Intern), Andersen, H. R. (Intern), Comber, M. (Ekstern), Mayer, P. (Intern)
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Biodegradation testing of chemicals with high Henry's constants – Separating mass and effective concentration reveals higher rate constants

**General information**
State: Published
Organisations: Department of Environmental Engineering, Environmental Chemistry, Water Technologies, Mike Comber Consulting
Authors: Birch, H. (Intern), Andersen, H. R. (Intern), Comber, M. (Ekstern), Mayer, P. (Intern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.51 SNIP 1.57 CiteScore 4.04
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.593 SNIP 1.651 CiteScore 3.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.724 SNIP 1.767 CiteScore 3.92
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.818 SNIP 1.623 CiteScore 3.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.961 SNIP 1.515 CiteScore 3.61
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Biodegradation testing of hydrophobic chemicals in mixtures at low concentrations – covering the chemical space of petroleum hydrocarbons

Petroleum products are complex mixtures of varying composition containing thousands of hydrocarbons each with their own physicochemical properties and degradation kinetics. One approach for risk assessment of these products is therefore to group the hydrocarbons by carbon number and chemical class i.e. hydrocarbon blocks. However, the biodegradation kinetic data varies in quantity and quality for the different hydrocarbon blocks, hampering the characterization of their fate properties. In this study, biodegradation kinetics of a large number of hydrocarbons aiming to cover the chemical space of petroleum hydrocarbons, were therefore determined at ng/L to µg/L concentrations in surface water, seawater and activated sludge filtrate. Two hydrocarbon mixtures were prepared, comprising a total of 53 chemicals including paraffins, naphthenics and aromatic hydrocarbons from C8 to C20. Passive dosing from silicone rod loaded with the mixtures was used to prepare stock solutions. Test systems were then prepared using stock solution diluted with the surface water, seawater or activated sludge filtrate. Test systems were incubated at 20 °C on a roller for up to 98 days and analyzed using GC-MS and fully automated Solid Phase Micro Extraction. Results were normalized to parallel measurements of abiotic controls prior to evaluation of biodegradation kinetics. Degradation was generally faster in the activated sludge filtrate than in the seawater and lakewater. In the activated sludge filtrate lag phases were < 9 days for the 49 hydrocarbons that were degraded within test duration. Degradation rate constants and corresponding half-lives were determined for 44 of the hydrocarbons. In lakewater and seawater, less test chemicals were degraded within the test duration compared to the activated sludge filtrate.

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Organisations: Department of Environmental Engineering, Environmental Chemistry
Authors: Birch, H. (Intern), Hammershøj, R. H. (Intern), Mayer, P. (Intern)
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Main Research Area: Technical/natural sciences
Biodistribution of Carbon Nanotubes in Animal Models

The many interesting physical and chemical properties of carbon nanotubes (CNT) make it one of the most commercially attractive materials in the era of nanotechnology. Here, we review the recent publications on in vivo biodistribution of pristine and functionalized forms of single-walled and multi-walled CNT. Pristine CNT remain in the lung for months or even years after pulmonary deposition. If cleared, the majority of CNT move to the gastrointestinal (GI) tract via the mucociliary escalator. However, there appears to be no uptake of CNT from the GI tract, with a possible exception of the smallest functionalized SWCNT. Importantly, a significant fraction of CNT translocate from the alveolar space to the near pulmonary region including lymph nodes, subpleura and pleura (<7% of the pulmonary deposited dose) and to distal organs including liver, spleen and bone marrow (~1%). These results clearly demonstrate the main sites of long-term CNT accumulation, which also includes pleura, a major site for fibre-induced pulmonary diseases. Studies on intravenous injection show that CNT in blood circulation are cleared relatively fast with a half-life of minutes or hours. The major target organs were the same as identified after pulmonary exposure with the exception of urine excretion of especially functionalized SWCNT and accumulation in lung tissue. Overall, there is evidence that CNT will primarily be distributed to the liver where they appear to be present at least one year after exposure.
Biodiversity of mycobiota throughout the Brazil nut supply chain: From rainforest to consumer

A total of 172 Brazil nut samples (114 in shell and 58 shelled) from the Amazon rainforest region and São Paulo state, Brazil was collected at different stages of the Brazil nut production chain: rainforest, street markets, processing plants and supermarkets. The mycobiota of the Brazil nut samples were evaluated and also compared in relation to water activity. A huge diversity of Aspergillus and Penicillium species were found, besides Eurotium spp., Zygomycetes and dematiaceous fungi. A polyphasic approach using morphological and physiological characteristics, as well as molecular and extrolite profiles, were studied to distinguish species among the more important toxigenic ones in Aspergillus section Flavi and A. section Nigri. Several metabolites and toxins were found in these two sections. Ochratoxin A (OTA) was found in 3% of A. niger and 100% of A. carbonarius. Production of aflatoxins B and G were found in all isolates of A. arachidicola, A. bombycis, A. nomius, A. pseudoaeanatus and A. pseudonomius, while aflatoxin B was found in 38% of A. flavus and all isolates of A. pseudotamarii. Cyclopiazonic acid (CPA) was found in A. bertholletius (94%), A. tamarii (100%), A. caelatus (54%) and A. flavus (41%). Tenuazionic acid, a toxin commonly found in Alternaria species was produced by A. bertholletius (47%), A. caelatus (77%), A. nomius (55%), A. pseudonomius (75%), A. arachidicola (50%) and A. bombycis (100%). This work shows the changes of Brazil nut mycobiota and the potential of mycotoxin production from rainforest to consumer, considering the different environments which exist until the nuts are consumed.

General information
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Organisations: Department of Systems Biology, Instituto de Tecnologia de Alimentos, Universidade Estadual de Londrina
Authors: Taniwaki, M. H. (Ekstern), Frisvad, J. C. (Intern), Ferranti, L. S. (Ekstern), de Souza Lopes, A. (Ekstern), Larsen, T. O. (Intern), Fungaro, M. H. P. (Ekstern), Iamanaka, B. T. (Ekstern)
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BFI (2014): BFI-level 1
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BFI (2013): BFI-level 1
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ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.618 SNIP 1.647 CiteScore 3.54
Bio-electrolytic sensor for rapid monitoring of volatile fatty acids in anaerobic digestion process

This study presents an innovative biosensor that was developed on the basis of a microbial electrolysis cell for fast and reliable measurement of volatile fatty acids (VFA) during anaerobic digestion (AD) process. The bio-electrolytic sensor was first tested with synthetic wastewater containing varying concentrations of VFA. A linear correlation (R² = 0.99) between current densities (0.03 ± 0.01 to 2.43 ± 0.12 A/m²) and VFA concentrations (5–100 mM) was found. The sensor performance was then investigated under different affecting parameters such as the external voltage, VFA composition ratio, and ionic strength. Linear relationship between the current density and VFA concentrations was always observed. Furthermore, the bio-electrolytic sensor proved ability to handle interruptions such as the presence of complex organic matter, anode exposure to oxygen and low pH. Finally, the sensor was applied to monitor VFA concentrations in a lab-scale AD reactor for a month. The VFA measurements from the sensor correlated well with those from GC analysis which proved the accuracy of the system. Since hydrogen was produced in the cathode as byproduct during monitoring, the system could be energy self-sufficient. Considering the high accuracy, short response time, long-term stability and additional benefit of H₂ production, this bio-electrolytic sensor could be a simple and cost-effective method for VFA monitoring during AD and other anaerobic processes.
Bioenergy production and sustainable development: science base for policy-making remains limited

The possibility of using bioenergy as a climate change mitigation measure has sparked a discussion of whether and how bioenergy production contributes to sustainable development. We undertook a systematic review of the scientific literature to illuminate this relationship and found a limited scientific basis for policy-making. Our results indicate that knowledge on the sustainable development impacts of bioenergy production is concentrated in a few well-studied countries, focuses on environmental and economic impacts, and mostly relates to dedicated agricultural biomass plantations. The scope and methodological approaches in studies differ widely and only a small share of the studies sufficiently reports on context and/or baseline conditions, which makes it difficult to get a general understanding of the attribution of impacts. Nevertheless we identified regional patterns of positive or negative impacts for all categories – environmental, economic, institutional, social and technological. In general, economic and technological impacts were more frequently reported as positive, while social and environmental impacts were more frequently reported as negative (with the exception of impacts on direct substitution of GHG emission from fossil fuel). More focused and transparent research is needed to validate these patterns and develop a strong science underpinning for establishing policies and governance agreements that prevent/mitigate negative and promote positive impacts from bioenergy production.

General information

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Organisations: Department of Management Engineering, Systems Analysis, DTU Climate Centre, ETH Zurich, Foundation for Global Sustainability, Chalmers University of Technology, Universidad Autónoma de Barcelona, Technical University of Berlin, University of Klagenfurt, Murdoch University, University of Western Ontario, Stockholm Environment Institute, Potsdam Institute for Climate Impact Research, climate-babel.org, Universidade Federal do Rio de Janeiro, Swiss Federal Laboratories for Materials Testing and Research, University of Aberdeen, KU Leuven, University of Gothenburg


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Scopus rating (2015): SJR 1.962 SNIP 1.61 CiteScore 5.14
Web of Science (2015): Indexed yes
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Scopus rating (2012): SJR 1.056 SNIP 1.316 CiteScore 3.93
ISI indexed (2012): ISI indexed yes
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Scopus rating (2011): SJR 0.782 SNIP 0.456
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Bioinspired, biomimetic, double-enzymatic mineralization of hydrogels for bone regeneration with calcium carbonate

Hydrogels are popular materials for tissue regeneration. Incorporation of biologically active substances, e.g. enzymes, is straightforward. Hydrogel mineralization is desirable for bone regeneration. Here, hydrogels of Gellan Gum (GG), a biocompatible polysaccharide, were mineralized biomimetically with CaCO3 using a double enzymatic approach. The enzymes urease (U) and carbonic anhydrase (CA) were incorporated in GG hydrogels. Hydrogels were incubated in a mineralization solution containing U substrate (urea) and calcium ions. U converts urea to ammonia (which raises pH) and CO2. CA catalyses the reaction of CO2 with water to form HCO3 −, which undergoes deprotonation to form CO3 2−, which react with Ca2+ to form insoluble CaCO3. All hydrogels containing U+CA were mineralized more with calcite and stiffer than hydrogels containing U. Mineralization with calcite promoted proliferation and spreading of osteoblast-like cells.

General information
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Organisations: National Food Institute, Research Group for Nano-Bio Science, Université de Lille, AGH University of Science and Technology, Ghent University
Authors: Lopez-Heredia, M. A. (Ekstern), Łapa, A. (Ekstern), Mendes, A. C. L. (Intern), Balcaen, L. (Ekstern), Samal, S. K. (Ekstern), Chai, F. (Ekstern), Van der Voort, P. (Ekstern), Stevens, C. V. (Ekstern), Parakhonskiy, B. V. (Ekstern), Chronakis, I. S. (Intern), Vanhaecke, F. (Ekstern), Blanchemain, N. (Ekstern), Pamula, E. (Ekstern), Skirtach, A. G. (Ekstern), Douglas, T. E. L. (Ekstern)
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.51 SJR 0.757 SNIP 0.935
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.792 SNIP 1.021 CiteScore 2.5
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.895 SNIP 1.315 CiteScore 2.64
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.83 SNIP 1.237 CiteScore 2.41
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.924 SNIP 1.404 CiteScore 2.41
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.017 SNIP 1.568 CiteScore 2.54
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.059 SNIP 1.29
Biological caproate production by Clostridium kluyveri from ethanol and acetate as carbon sources

Caproate is a valuable industrial product and chemical precursor. In this study, batch tests were conducted to investigate the fermentative caproate production through chain elongation from acetate and ethanol. The effect of acetate/ethanol ratio and initial ethanol concentration on caproate production was examined. When substrate concentration was controlled at 100 mM total carbon, hydrogen was used as an additional electron donor. The highest caproate concentration of 3.11 g/L was obtained at an ethanol/acetate ratio of 7:3. No additional electron donor was needed upon an ethanol/acetate ratio ≥7:3. Caproate production increased with the increase of carbon source until ethanol concentration over 700 mM, which inhibited the fermentation process. The highest caproate concentration of 8.42 g/L was achieved from high ethanol strength wastewater with an ethanol/acetate ratio of 10:1 (550 mM total carbon). Results obtained in this study can pave the way towards efficient chain elongation from ethanol-rich wastewater.

General information
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Organisations: Department of Environmental Engineering, Residual Resource Engineering, Tsinghua University
Authors: Yin, Y. (Ekstern), Zhang, Y. (Intern), Karakashev, D. B. (Intern), Wang, J. (Ekstern), Angelidaki, I. (Intern)
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- Scopus rating (2016): CiteScore 5.94 SJR 2.191 SNIP 1.91
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- Scopus rating (2015): SJR 2.255 SNIP 1.908 CiteScore 5.47
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
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Chain elongation, n-caproate, Clostridium kluyveri, Fermentation, Ethanol/acetate ratio

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Biologiske undersøgelser i Karrebæk fjord i 2017

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Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management
Authors: Christoffersen, M. (Intern)
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Publication information
Biomass accident investigations – missed opportunities for learning and accident prevention
The past decade has seen a major increase in the production of energy from biomass. The growth has been mirrored in an increase of serious biomass related accidents involving fires, gas explosions, combustible dust explosions and the release of toxic gasses. There are indications that the number of bioenergy related accidents is growing faster than the energy production. This paper argues that biomass accidents, if properly investigated and lessons shared widely, provide ample opportunities for improving general hazard awareness and safety performance of the biomass industry. The paper examines selected serious accidents involving biogas and wood pellets in Denmark and argues that such opportunities for learning were missed because accident investigations were superficial, follow-up incomplete and information sharing absent. In one particularly distressing case, a facility saw a repeat accident, this time with fatal outcome, still without any learning taking place. The paper presents some information on other biomass accidents in Denmark, mostly involving biogas from anaerobic digestion. Details are lacking however, precisely because the accidents were insufficiently investigated and results not communicated. The biomass industry needs to pay more attention to safety. Utmost care should be taken to avoid so-called mediashifting i.e. that the resolution of a problem within one domain, the environmental, creates a new problem in another, the workplace safety domain.
aspects of 3D bioprinting technique and discuss how the development of bioprinted tissue models have propelled our understanding of diseases' characteristics (i.e. initiation and progression). The future perspectives on the use of bioprinted 3D tissue models for drug discovery application are also highlighted.

**General information**

**State:** Published

**Organisations:** Department of Micro- and Nanotechnology, Colloids and Biological Interfaces, King Abdulaziz University, Arizona State University, University of Victoria BC

**Authors:** Memic, A. (Ekstern), Navaei, A. (Ekstern), Mirani, B. (Ekstern), Cordova, J. A. V. (Intern), Aldhahri, M. (Ekstern), Dolatshahi-Pirouz, A. (Intern), Akbari, M. (Ekstern), Nikkhah, M. (Ekstern)

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- Web of Science (2017): Indexed yes
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- BFI (2015): BFI-level 1
- Scopus rating (2015): SJR 0.591 SNIP 0.673 CiteScore 1.66
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 1
- Scopus rating (2014): SJR 0.627 SNIP 0.809 CiteScore 1.75
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 1
- Scopus rating (2013): SJR 0.713 SNIP 0.941 CiteScore 2.03
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 1
- Scopus rating (2012): SJR 0.758 SNIP 0.949 CiteScore 2.03
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 1
- Scopus rating (2011): SJR 0.722 SNIP 0.912 CiteScore 1.97
- ISI indexed (2011): ISI indexed yes
- BFI (2010): BFI-level 1
- Scopus rating (2010): SJR 0.698 SNIP 0.894
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 0.707 SNIP 0.816
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 1
- Scopus rating (2008): SJR 0.628 SNIP 0.778
- Web of Science (2008): Indexed yes
- Scopus rating (2007): SJR 0.533 SNIP 0.725
- Web of Science (2007): Indexed yes
- Scopus rating (2006): SJR 0.543 SNIP 0.718
- Web of Science (2006): Indexed yes
- Scopus rating (2005): SJR 0.462 SNIP 0.68
- Web of Science (2005): Indexed yes
- Scopus rating (2004): SJR 0.455 SNIP 0.602
- Scopus rating (2003): SJR 0.44 SNIP 0.635
- Scopus rating (2002): SJR 0.477 SNIP 0.658
Bioprocess intensification for the effective production of chemical products

The further implementation of new bioprocesses, using biocatalysts in various formats, for the synthesis of chemicals is highly dependent upon effective process intensification. The need for process intensification reflects the fact that the conditions under which a biocatalyst carries out a reaction in nature are far from those which are optimal for industrial processes. In this paper the rationale for intensification will be discussed, as well as the four complementary approaches used today to achieve bioprocess intensification. Two of these four approaches are based on alteration of the biocatalyst (either by protein engineering or metabolic engineering), resulting in an extra degree of freedom in the process design. To date, biocatalyst engineering has been developed independently from the conventional process engineering methodology to intensification. Although the integration of these two methodologies has now started, in the future synergistic integration should enable many new opportunities for bioprocesses for the production of chemicals.

Bioprocess intensification for the effective production of chemical products

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Biorefinery Sustainability Analysis

This chapter deals with sustainability analysis of biorefinery systems in terms of environmental and socio-economic indicators. Life cycle analysis has methodological issues related to the functional unit (FU), allocation, land use and biogenic carbon neutrality of the reference system and of the biorefinery-based system. Socio-economic criteria and indicators used in sustainability frameworks assessment are presented and discussed. There is not one single methodology that can aptly cover the synergies of environmental, economic, social and governance issues required to assess the sustainable production and use of bioenergy systems. The perfect metric for environmental issues is not yet established and some researchers prefer to avoid high levels of uncertainty in life cycle assessment (LCA) methodology and adopt more physically quantifying methods like the annual basis carbon (ABC) method presented here. In addition to establishing the perfect metric, there are three types of uncertainty when building scenarios with biorefinery-based systems that must be regarded to have a more holistic point of view. This uncertainty is at the level of the concept, of the configuration and of the operation.

General information

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Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Imperial College London, Universidade de Sao Paulo
Authors: J. S. M. Silva, C. (Ekstern), Prunescu, R. M. (Intern), Gernaey, K. (Intern), Sin, G. (Intern), Diaz-Chavez, R. A. (Ekstern)
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Bioremediation 3.0: Engineering pollutant-removing bacteria in the times of systemic biology
Elimination or mitigation of the toxic effects of chemical waste released to the environment by industrial and urban activities relies largely on the catalytic activities of microorganisms—specifically bacteria. Given their capacity to evolve rapidly, they have the biochemical power to tackle a large number of molecules mobilized from their geological repositories through human action (e.g., hydrocarbons, heavy metals) or generated through chemical synthesis (e.g., xenobiotic compounds). Whereas naturally occurring microbes already have considerable ability to remove many environmental pollutants with no external intervention, the onset of genetic engineering in the 1980s allowed the possibility of rational design of bacteria to catabolize specific compounds, which could eventually be released into the environment as bioremediation agents. The complexity of this endeavour and the lack of fundamental knowledge nonetheless led to the virtual abandonment of such a recombinant DNA-based bioremediation only a decade later. In a twist of events, the last few years have witnessed the emergence of new systemic fields (including systems and synthetic biology, and metabolic engineering) that allow revisiting the same environmental pollution challenges through fresh and far more powerful approaches. The focus on contaminated sites and chemicals has been broadened by the phenomenal problems of anthropogenic emissions of greenhouse gases and the accumulation of plastic waste on a global scale. In this article, we analyze how contemporary systemic biology is helping to take the design of bioremediation agents back to the core of environmental biotechnology. We inspect a number of recent strategies for catabolic pathway construction and optimization and we bring them together by proposing an engineering workflow.

General information
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Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Systems Environmental Microbiology, Centro Nacional de Biotecnología, Masaryk University
Authors: Dvořák, P. (Ekstern), Nikel, P. I. (Intern), Damborskýc, J. (Ekstern), de Lorenzo, V. (Ekstern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.919 SNIP 3.432 CiteScore 10.56
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.922 SNIP 3.757 CiteScore 10.24
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.936 SNIP 4.028 CiteScore 10.71
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.552 SNIP 5.178 CiteScore 11.65
Biosecurity Conditions in Small Commercial Chicken Farms, Bangladesh 2011-2012

In Bangladesh, highly pathogenic avian influenza H5N1 is endemic in poultry. This study aimed to understand the biosecurity conditions and farmers' perception of avian influenza biosecurity in Bangladeshi small commercial chicken farms. During 2011-2012, we conducted observations, in-depth interviews and group discussions with poultry farmers in 16 farms and in-depth interviews with seven local feed vendors from two districts. None of the farms were completely segregated from people, backyard poultry, other animals, households, other poultry farms or large trees. Wild birds and rodents accessed the farms for poultry feed. Farmers usually did not allow the buyers to bring egg trays inside their sheds. Spraying disinfectant in the shed and removing feces were the only regular cleaning and disinfection activities observed. All farmers sold or used untreated feces as fish feed or fertilizer. Farmers were more concerned about Newcastle disease and infectious bursal disease than about avian influenza. Farmers' understanding about biosecurity and avian influenza was influenced by local vendors. While we seldom observed flock segregation, some farmers used measures that involved additional cost or effort to protect their flocks. These farmers could be motivated by interventions to protect their investment from diseases they consider harmful. Future interventions could explore the feasibility and effectiveness of low-cost alternative biosecurity measures.

General information
State: Published
Organisations: National Veterinary Institute, Epidemiology
Authors: Rimi, N. A. (Ekstern), Sultana, R. (Ekstern), Muhsina, M. (Ekstern), Uddin, B. (Ekstern), Haider, N. (Intern), Nahar, N. (Ekstern), Zeidner, N. (Ekstern), Sturm-Ramirez, K. (Ekstern), Luby, S. P. (Ekstern)
Pages: 244-258
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: EcoHealth
Volume: 14
Issue number: 2
ISSN (Print): 1612-9202
Biosynthesis of the antimicrobial cyclic lipopeptides nunamycin and nunapeptin by Pseudomonas fluorescens strain In5 is regulated by the LuxR-type transcriptional regulator NunF

Nunamycin and nunapeptin are two antimicrobial cyclic lipopeptides (CLPs) produced by Pseudomonas fluorescens In5 and synthesized by nonribosomal synthetases (NRPS) located on two gene clusters designated the nun-nup regulon. Organization of the regulon is similar to clusters found in other CLP-producing pseudomonads except for the border regions where putative LuxR-type regulators are located. This study focuses on understanding the regulatory role of the LuxR-type-encoding gene nunF in CLP production of P. fluorescens In5. Functional analysis of nunF coupled with liquid chromatography-high-resolution mass spectrometry (LC-HRMS) showed that CLP biosynthesis is regulated by nunF. Quantitative real-time PCR analysis indicated that transcription of the NRPS genes catalyzing CLP production is strongly reduced when nunF is mutated indicating that nunF is part of the nun-nup regulon. Swarming and biofilm formation was reduced in a nunF knockout mutant suggesting that these CLPs may also play a role in these phenomena as observed in other pseudomonads. Fusion of the nunF promoter region to mCherry showed that nunF is strongly upregulated in response to carbon sources indicating the presence of a fungus suggesting that environmental elicitors may also influence nunF expression which upon activation regulates nunamycin and nunapeptin production required for the growth inhibition of phytopathogens.

General information
State: Accepted/In press
Organisations: Department of Biotechnology and Biomedicine, DTU Metabolomics Core, Natural Product Discovery, University of Copenhagen, Fujian Agriculture and Forestry University
Authors: Hennessy, R. C. (Ekstern), Phippen, C. (Intern), Nielsen, K. F. (Intern), Olsson, S. (Ekstern), Stougaard, P. (Ekstern)
Number of pages: 14
Publication date: 2017
Biotechnological Applications of the Roseobacter Clade

The multitude of distinct niches that prevail in the marine environment has facilitated the development of very diverse marine microbiomes. This diversity is, naturally, reflected in their biochemistry and secondary metabolites and, hence, marine microbes represent a virtually untapped source of new bioactive compounds. The Roseobacter clade of marine α-proteobacteria represents some of the most abundant organisms in the marine environment and they may constitute as much as 20–30 % of the prokaryotic community during algal blooms. Often, they exhibit traits suggestive of a lifestyle in close association with phytoplankton; including traits related to surface colonization, iron scavenging, and the production of bioactive secondary metabolites. Despite the fact that relatively few bioactive compounds have been identified in the α-proteobacteria, the roseobacters are known to produce compounds capable of stimulating algae growth, i.e. auxins, and algaecidal compounds, i.e. the roseobacticides. In addition, the roseobacters can produce a range of antibacterial products, such as the small tropolone compound tropodithietic acid (TDA) and the nonribosomal peptide indigoidine. TDA targets a broad spectrum of Gram-positive and Gram-negative bacteria in which resistance towards the compound does not arise easily. Mining the genomes of roseobacters also reveal that they are likely capable of producing other compounds than hitherto discovered by classical bio-assay guided fractionation, since the genomes contain genes/gene clusters probably encoding unknown bioactive secondary metabolites. Therefore, bacteria of the Roseobacter clade may serve as potential sources of novel bioactive compounds, including novel antibiotics, which is of paramount importance in the battle against antibiotic resistant pathogenic bacteria.

The discovery of new antibiotic compounds is not the only means by which we can counter the spread of antibiotic resistance. Development of sustainable alternatives to the application of antibiotics in agri- and aquaculture may be equally important. Attributable to their inherent properties, the roseobacters may be such an alternative in the aquaculture industry. Especially at the younger stages in larviculture, disease outbreaks caused by fish pathogenic microorganisms may lead to mortality rates of 100 % when antibiotic treatment is not initiated. Adding roseobacters as probiotics is promising as fish larvae challenged with fish pathogens of the genus Vibrio exhibit survival rates similar to, or better than, unchallenged larvae when roseobacter probionts are added. Thus, the Roseobacter clade is a promising source of new bioactive compounds and a possible sustainable alternative to the prophylactic administration of antibiotics in fish rearing.
Bismuth phosphates as intermediate temperature proton conductors: From polycrystalline powders to amorphous glasses

Proton conducting electrolyte materials operational in the intermediate temperature range of 200-400 °C are of special interest for applications in fuel cells and water electrolyzers. Bismuth phosphates in forms of polycrystalline powders and amorphous glasses are synthesized and investigated by scanning electron microscopy, X-ray diffraction, FT-IR, thermogravimetric analysis and AC impedance. Under dry atmosphere the pure crystalline and amorphous phosphates exhibit an intrinsic conductivity of up to $10^{-3}$ S cm$^{-1}$ at 250 °C. In the presence of atmospheric humidity the conductivity of both types of phosphates is significantly enhanced, reaching about $10^{-2}$ S cm$^{-1}$ at a water vapor partial pressure above 0.5 atm. During a period of more than 100 h with four humidity cycles from zero to 0.58 atm of the water vapor partial pressure, the phosphates show good stability, suggesting the potential as an intermediate temperature electrolyte.
Bit-rate-transparent optical RZ-to-NRZ format conversion based on linear spectral phase filtering

We propose a novel and strikingly simple design for all-optical bit-rate-transparent RZ-to-NRZ conversion based on optical phase filtering. The proposed concept is experimentally validated through format conversion of a 640 Gbit/s coherent RZ signal to NRZ signal.

General information

State: Published
Organisations: High-Speed Optical Communication, Department of Photonics Engineering, Centre of Excellence for Silicon Photonics for Optical Communications, Institut National de la Recherche Scientifique
Authors: Maram, R. (Ekstern), Da Ros, F. (Intern), Guan, P. (Intern), Røge, K. M. (Intern), Galili, M. (Intern), Oxenløwe, L. K. (Intern), Azana, J. (Ekstern)
Number of pages: 3
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DOI: 10.1364/OFC.2017.Th4I.1

Bibliographical note

From the session: Coherent Optical Signal Processing (Th4I)

Blåfinnet tuns færden skal undersøges i danske farvande
Blockchain technology promises a sizable potential for executing inter-organizational business processes without requiring a central party serving as a single point of trust (and failure). This paper analyzes its impact on business process management (BPM). We structure the discussion using two BPM frameworks, namely the six BPM core capabilities and the BPM lifecycle. This paper provides research directions for investigating the application of blockchain technology to BPM.
Blood O2 affinity of a large polar elasmobranch, the Greenland shark Somniosus microcephalus

The Greenland shark (Somniosus microcephalus, Bloch & Schneider 1801) is a polar elasmobranch that is hypothesised to possess a unique metabolic physiology due to its extreme large size, the cold waters it inhabits and its slow swimming lifestyle. Our results therefore provide the first insight into the metabolic physiology of this unique shark, with a focus on blood O2 affinity. An evaluation of blood O2 affinity at 2 °C using tonometry revealed a P50 of 11.7 mmHg at a PCO2 of 2.25 mmHg and a Bohr effect (binding sensitivity of blood to pH, $\phi = \Delta \log P50/\Delta pH$) of $-0.26$. A comparative evaluation of blood O2 affinity across elasmobranch fishes suggests that S. microcephalus has a high blood O2 affinity (i.e., low P50) and a small Bohr effect but these are common traits in sluggish elasmobranch fishes, with little evidence for any relationship of blood O2 affinity to the low metabolic rates, low environmental temperatures, or large body mass of S. microcephalus. After gathering this physiology data, a subsidiary aim attempted to understand whether a warming scenario would impose a negative effect on blood O2 binding. Incubating blood to a slightly elevated temperature of 7 °C resulted in a small but significant reduction of blood O2 affinity, but no significant change in the Bohr effect. The Hill’s cooperativity coefficient ($nH$) was also small (1.6–2.2) and unaffected by either PCO2 or temperature. The moderate sensitivity of Greenland shark blood O2 affinity to warming potentially implies little vulnerability of functional O2 supply to the temperature changes associated with the regular vertical movements of this species or warming of polar seas resulting from directional climate change.
In this paper, we present a way of extending the blowup method, in the formulation of Krupa and Szmolyan, to flat slow manifolds that lose hyperbolicity beyond any algebraic order. Although these manifolds have infinite co-dimensions, they do appear naturally in certain settings; for example, in (a) the regularization of piecewise smooth systems by tanh, (b) a particular aircraft landing dynamics model, and finally (c) in a model of earthquake faulting. We demonstrate the approach using a simple model system and the examples (a) and (b).

**Blowup for flat slow manifolds:** Paper

**General information**

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Mathematics
Authors: Kristiansen, K. U. (Intern)
Pages: 2138-2184
Degradable biopolymers are used as carrier materials in drug delivery devices. A complete understanding of their degradation behaviour is thus crucial in the design of new delivery systems. Here we combine a reliable method, based on spray coated micromechanical resonators and a disposable microfluidic chip, to characterize biopolymer degradation under the action of enzymes in controlled flow condition. The sensing platform is based on the mechanics and optics from
a Blu-Ray player, which automatically localize individual sensors within the array, and sequentially measure and record the resonance frequency of up to twelve resonators within 4 min. Such fast and automated measuring technology, combined with the use of thin polymers layers in the degradation experiments, allows to reduce the experimental time needed for degradation studies from 6 weeks to 8 h. We first present a full characterization of sensor properties and then perform degradation studies of poly(lactic-co-glycolic acid) (PLGA) in steady flow for three different enzyme concentrations. The degradation has been performed in liquid environment. Before each resonator measurement, the measuring chamber has been automatically dried, since the resonator characteristics are much approved when measuring in air compared to liquid. The obtained degradation profiles are comparable to profiles obtained by conventional approaches, which have shown to require up to 6 weeks of experimental time frame.
Blygsamt övertryck fick spektakulära följder

För att minska besvärande skumning sattes en tank under "mycket blygsamt" övertryck. Plötsligt brast botten. Tanken for 30 meter upp i luften, föll ned och krossade en varubil. Olyckan visar att en stor gasvolym under lågt tryck innehåller en väsentlig mängd energi

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Dynamical Systems, Statistics and Data Analysis
Authors: Hedlund, F. H. (Intern)
Pages: 21-23
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Main Research Area: Technical/natural sciences

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Issue number: 2
ISSN (Print): 1650-0725
Original language: English
Source: PublicationPreSubmission
Source-ID: 131336878
Publication: Research - peer-review › Journal article – Annual report year: 2017

Boosting the Open Circuit Voltage of Cu$_2$ZnSnS$_4$ Solar Cells by a Lattice-Matched CeO$_2$ Layer and Theoretical Understanding of Interface Defects

General information
State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, Silicon Microtechnology, Department of Micro- and Nanotechnology, Theoretical Nanoelectronics, Department of Photonics Engineering, Optical Microsensors and Micromaterials, University of New South Wales, QuantumWise A/S
Authors: Crovetto, A. (Intern), Yan, C. (Ekstern), Palsgaard, M. L. N. (Intern), Iandolo, B. (Intern), Zhou, F. (Ekstern), Gunst, T. (Intern), Markussen, T. (Ekstern), Stride, J. (Ekstern), Schou, J. (Intern), Stokbro, K. (Ekstern), Brandbyge, M. (Intern), Hao, X. (Ekstern), Hansen, O. (Intern)
Publication date: 2017
Event: Abstract from 2017 MRS Spring Meeting & Exhibit, Phoenix, United States.
Main Research Area: Technical/natural sciences
Electronic versions:
Bottom-Up Design of a Copper-Ruthenium Nanoparticulate Catalyst for Low-Temperature Ammonia Oxidation

A novel nanoparticulate catalyst of copper (Cu) and ruthenium (Ru) was designed for low-temperature ammonia oxidation at near-stoichiometric mixtures using a bottom-up approach. A synergistic effect of the two metals was found. An optimum CuRu catalyst presents a reaction rate threefold higher than that for Ru and forty-fold higher than that for Cu. X-ray absorption spectroscopy suggests that in the most active catalyst Cu forms one or two monolayer thick patches on Ru and the catalysts are less active once 3D Cu islands form. The good performance of the tuned CuRu catalyst is attributed to changes in the electronic structure, and thus the altered adsorption properties of the surface Cu sites.

General information

State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, Center for Electron Nanoscopy, Department of Chemical and Biochemical Engineering, Atomic scale modelling and materials, Universidade de Sao Paulo, Karlsruhe Institute of Technology KIT
Number of pages: 6
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BFI (2017): BFI-level 2
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BFI (2016): BFI-level 2
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 5.958 SNIP 2.235 CiteScore 11.13
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 5.805 SNIP 2.309 CiteScore 10.84
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 5.681 SNIP 2.204 CiteScore 10.7
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 6.362 SNIP 2.338 CiteScore 10.55
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 6.062 SNIP 2.387 CiteScore 10.75
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 5.858 SNIP 2.31
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 5.52 SNIP 2.218
Web of Science (2009): Indexed yes
Boundary Element Method with Viscous and Thermal Losses: A Calibration Microphone Test Case

General information
State: Published
Organisations: Department of Electrical Engineering, Acoustic Technology, Danish Fundamental Metrology
Authors: Cutanda Henriquez, V. (Intern), Barrera Figueroa, S. (Ekstern), Andersen, P. R. (Intern)
Number of pages: 1
Publication date: 2017
Event: Abstract from 13th International Conference on Theoretical and Computational Acoustics, Vienna, Austria.
Main Research Area: Technical/natural sciences
Electronic versions:
ICTCA2017_BookOfAbstracts_1.pdf
Source: PublicationPreSubmission
Source-ID: 134439792
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Boundary migration in a 3D deformed microstructure inside an opaque sample
How boundaries surrounding recrystallization grains migrate through the 3D network of dislocation boundaries in deformed crystalline materials is unknown and critical for the resulting recrystallized crystalline materials. Using X-ray Laue diffraction microscopy, we show for the first time the migration pattern of a typical recrystallization boundary through a well-characterized deformation matrix. The data provide a unique possibility to investigate effects of both boundary misorientation and plane normal on the migration, information which cannot be accessed with any other techniques. The results show that neither of these two parameters can explain the observed migration behavior. Instead we suggest that the subdivision of the deformed microstructure ahead of the boundary plays the dominant role. The present experimental observations challenge the assumptions of existing recrystallization theories, and set the stage for determination of mobilities of recrystallization boundaries.

General information
State: Published
Organisations: Department of Wind Energy, Materials science and characterization, Risø National Laboratory for Sustainable Energy, Oak Ridge National Laboratory, Argonne National Laboratory, Brigham Young University
Number of pages: 8
Brazil’s Soft-Power Strategy: The Political Aspirations of South–South Development Cooperation

By trading upon the principles of South-South cooperation, Brazil is widely viewed as having gained a positive image worldwide. Brazil’s South-South development cooperation was one of the foreign policy instruments it used to raise this profile. However, studies of the generation of soft power are still lacking in the international relations literature, and where empirical research exists it focuses more on the results of soft power strategies than on how soft power is created. Therefore, this article explores how Brazil’s soft power strategy is conceptualized in Brazil’s development cooperation discourse and how it is operationalized through South-South development activities. This research uses a triangulation method combining the analysis of official documents, academic studies and interviews to conclude that the Brazilian government under President Lula (2003-2011) influenced the organization of its cooperation agency and guided it towards sectors and targets that contribute to the creation of positive outcomes. This article contributes to the debate on the state’s behavior in soft power, that is, the ‘behavior’ of the Brazilian government in the design of its cooperation agency’s activities, thus also contributing to knowledge about the relationship between an agent’s behavior and the outcomes of a country’s policy of ‘soft empowerment’.
Breadth of T cell responses after immunization with adenovirus vectors encoding ancestral antigens or polyvalent papillomavirus antigens

Oncogenic human papillomaviruses (HPVs) are in most cases eliminated by intervention of T cells. As many other pathogens, these oncogenic HPVs belong to an ancient and diverse virus family. Therefore, we found it relevant to investigate the potential and limitations of inducing a broad response - either by inducing cross-reactive T cells or by administering a polyvalent vaccine. To test these strategies, we designed 3 ancestral and 2 circulating sequences based on the two domains of the E1 and E2 proteins of papillomaviruses (PVs) that exhibit the highest degree of conservation in comparison to the other PV proteins. The PV sequences were fused to a T cell adjuvant, the murine invariant chain and encoded in a recombinant adenoviral vector which was administered to naïve outbred mice. By measuring T cell responses induced by these different vaccines and towards peptide pools representing 3 circulating strains and a putative ancestor of oncogenic HPVs, we showed that the ancestral vaccine antigen has to be approximately 90% identical to the circulating PVs before a marked drop of ~90% mean CD8+ T cell responses ensues. Interestingly, the combination of two or three type-specific PV vaccines did not induce a significant decrease of the CD8+ T cell response to the individual targeted PV types. Polyvalent HPV vaccine based on the E1 and E2 proteins seem to be capable of triggering responses towards more than one type of PV while the cross-reactivity of ancestral vaccine seems insufficient in consideration of the sequence diversity between HPV types.
Breaking confinement: unconventional peptide presentation by major histocompatibility (MHC) class I allele HLA-A*02:01

Peptide antigen-presentation by Major Histocompatibility Class (MHC) I proteins initiates CD8+ T cell mediated immunity against pathogens and cancers. MHC I molecules typically bind peptides with nine amino acids in length with both ends tucked inside the major A and F binding pocket. It has been known for a while that longer peptides can also bind by either bulging out of the groove in the middle of the peptide or by binding in a zig-zag fashion inside the groove. In a recent study, we identified an alternative binding conformation of naturally occurring peptides from Toxoplasma gondii bound by HLA-A*02:01. These peptides were extended at the C-terminus (PΩ) and contained charged amino acids not more than 3 residues after the anchor amino acid at PΩ, which enabled them to open the F pocket and expose their C-terminal extension into the solvent. Here, we show that the mechanism of F pocket opening is dictated by the charge of the first charged amino acid found within the extension. While positively charged amino acid result in the Tyr84 swing, amino acids that are negatively charged induce a not previously described Lys146 lift. Further, we demonstrate that the peptides with alternative binding modes have properties that fit very poorly to the conventional MHC class I pathway, and suggest they are presented via alternative means, potentially including cross-presentation via the MHC class II pathway.

**General information**

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Organisations: Department of Systems Biology, Department of Biotechnology and Biomedicine, Department of Bio and Health Informatics
Number of pages: 21
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Main Research Area: Technical/natural sciences
T-cell receptor (TCR), Toxoplasma gondii, antigen presentation, major histocompatibility complex (MHC), natural killer cells (NK cells), peptide interaction, protein crystallization, protein structure

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**Breaking resilience for a sustainable future: Thoughts for the anthropocene**

**General information**
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Organisations: National Institute of Aquatic Resources, Centre for Ocean Life
Publication date: 2017
Main Research Area: Technical/natural sciences

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Scopus rating (2016): CiteScore 0.53 SJR 0.173 SNIP 0.109
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.145 SNIP 0.05
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
Original language: English
Publication: Research - peer-review › Journal article – Annual report year: 2017

**Breakthrough In Current In Plane Metrology For Monitoring Large Scale MRAM Production**
The current-in-plane tunneling technique (CIPT) has been a crucial tool in the development of magnetic tunnel junction stacks suitable for Magnetic Random Access Memories (MRAM) for more than a decade. The MRAM development has now reached the maturity to make the transition from R&D to large-scale production. This will require a metrology to precisely monitor the properties of the MTJ stacks over 300 mm wafers with high performance in terms of reproducibility and repeatability. Here, we present a major breakthrough in the CIPT metrology that can deliver a substantial improvement on the precision of the Resistance Area product (RA) and the Tunnel Magnetoresistance (TMR) measurements, compared to state of the art CIPT metrology tools dedicated to R&D. On two test wafers, the repeatability of RA and MR was improved up to 350% and the measurement reproducibility up to 1700%. We believe that CIPT metrology now constitutes a very strong candidate for monitoring MRAM production, since it can guarantee the high metrology performance needed for the advent of the MRAM era.

**General information**
State: Published
Organisations: Department of Micro- and Nanotechnology, Silicon Microtechnology, Capres A/S
Authors: Cagliani, A. (Intern), Østerberg, F. W. (Intern), Hansen, O. (Intern), Petersen, D. H. (Intern), Shiv, L. (Ekstern), Nielsen, P. F. (Ekstern)
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Conference: 2017 IEEE International Memory Workshop (IMW), Monterey, United States, 14/05/2017 - 14/05/2017
DOIs:
10.1109/IMW.2017.7939073
Breakthrough in current-in-plane tunneling measurement precision by application of multi-variable fitting algorithm

We present a breakthrough in micro-four-point probe (M4PP) metrology to substantially improve precision of transmission line (transfer length) type measurements by application of advanced electrode position correction. In particular, we demonstrate this methodology for the M4PP current-in-plane tunneling (CIPT) technique. The CIPT method has been a crucial tool in the development of magnetic tunnel junction (MTJ) stacks suitable for magnetic random-access memories for more than a decade. On two MTJ stacks, the measurement precision of resistance-area product and tunneling magneto-resistance was improved by up to a factor of 3.5 and the measurement reproducibility by up to a factor of 17, thanks to our improved position correction technique.

General information
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Organisations: Department of Micro- and Nanotechnology, Silicon Microtechnology, Capres A/S, Kongens Lyngby, Denmark., Capres A/S
Authors: Cagliani, A. (Intern), Østerberg, F. W. (Intern), Hansen, O. (Intern), Shiv, L. (Ekstern), Nielsen, P. F. (Ekstern), Petersen, D. H. (Intern)
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Main Research Area: Technical/natural sciences

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BFI (2016): BFI-level 1
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.562 SNIP 0.824 CiteScore 1.11
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.922 SNIP 1.211 CiteScore 1.45
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.898 SNIP 1.117 CiteScore 1.28
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.012 SNIP 1.267 CiteScore 1.45
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.861 SNIP 1.105 CiteScore 1.43
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.214 SNIP 1.415
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.001 SNIP 1.065
Brewer’s Spent Grain Valorization Using Phosphoric Acid Pretreatment for Second Generation Bioethanol Production

Brewer’s spent grain constitutes a byproduct of beer making process yearly generated in big amounts and lacking of economic feasible applications. This lignocellulosic residue was characterized and pretreated by dilute phosphoric acid according to a rotatable central composite design to evaluate the effect of phosphoric acid concentration (2-6\% w/v) and pretreatment temperature (140-180\(^\circ\)C). The influence of these factors on the hemicellulosic sugar solubilisation and the subsequent enzymatic hydrolysis was evaluated. Optimal pretreatment conditions were determined by maximizing both hemicellulosic sugar recovery in liquids and enzymatic hydrolysis yield.

General information
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Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Biomass Conversion and Bioprocess Technology, University of Jaén, Universidad de Jaén
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Publication date: 2017
Main Research Area: Technical/natural sciences
Source: PublicationPreSubmission
Source-ID: 133203289
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Brewing with 100 % unmalted grains: barley, wheat, oat and rye

Whilst beers have been produced using various levels of unmalted grains as adjuncts along with malt, brewing with 100 \% unmalted grains in combination with added mashing enzymes remains mostly unknown. The aim of this study was to investigate the brewing potential of 100 \% unmalted barley, wheat, oat and rye in comparison with 100 \% malt. To address this, identical brewing methods were adopted at 10-L scale for each grain type by applying a commercial mashing enzyme blend (Ondea\® Pro), and selected quality attributes were assessed for respective worts and beers. Different compositions of fermentable wort carbohydrates were observed in the worts (all at ca. 12\(^\circ\)P), and in particular oat wort had lower
concentration of maltose compared to the others, resulting in the lowest concentration of alcohol in final beer. Moreover, wort made from unmalted grains also showed lower free amino nitrogen and higher viscosity than malt wort. Furthermore, the use of 100 % unmalted grains resulted in a decrease in the levels of colour and brightness, as well as higher alcohols and esters in the final beers. Consequently, the study provides valuable information for exploring beer brewing with 100 % unmalted barley, oat, rye or wheat using exogenously added enzymes. It also helps to understand the process ability by revealing specific needs when manufacturing different type of beers from unmalted grains, potentially paving the way to process optimisation and development of future products.

**General information**
State: Published
Organisations: National Food Institute, Research Group for Microbial Biotechnology and Biorefining, Research Group for Analytical Food Chemistry, Technical University of Denmark
Authors: Zhuang, S. (Intern), Shetty, R. (Intern), Hansen, M. (Ekstern), Fromberg, A. (Intern), Hansen, P. B. (Intern), Hobley, T. J. (Intern)
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Publication date: 2017
Main Research Area: Technical/natural sciences

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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.742 SNIP 0.882
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.732 SNIP 0.822
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.828 SNIP 0.908
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.791 SNIP 0.901
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.872 SNIP 1.038
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
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Scopus rating (2011): SJR 1.009 SNIP 1.097
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.931 SNIP 0.901
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.917 SNIP 0.845
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.852 SNIP 0.849
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.707 SNIP 0.842
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.749 SNIP 0.824
Web of Science (2006): Indexed yes
Bridging food webs, ecosystem metabolism, and biogeochemistry using ecological stoichiometry theory

Although aquatic ecologists and biogeochemists are well aware of the crucial importance of ecosystem functions, i.e., how biota drive biogeochemical processes and vice-versa, linking these fields in conceptual models is still uncommon. Attempts to explain the variability in elemental cycling consequently miss an important biological component and thereby impede a comprehensive understanding of the underlying processes governing energy and matter flow and transformation. The fate of multiple chemical elements in ecosystems is strongly linked by biotic demand and uptake; thus, considering elemental stoichiometry is important for both biogeochemical and ecological research. Nonetheless, assessments of ecological stoichiometry (ES) often focus on the elemental content of biota rather than taking a more holistic view by examining both elemental pools and fluxes (e.g., organismal stoichiometry and ecosystem process rates). ES theory holds the promise to be a unifying concept to link across hierarchical scales of patterns and processes in ecology, but this has not been fully achieved. Therefore, we propose connecting the expertise of aquatic ecologists and biogeochemists with ES theory as a common currency to connect food webs, ecosystem metabolism, and biogeochemistry, as they are inherently concatenated by the transfer of carbon, nitrogen, and phosphorous through biotic and abiotic nutrient transformation and fluxes. Several new studies exist that demonstrate the connections between food web ecology, biogeochemistry, and ecosystem metabolism. In addition to a general introduction into the topic, this paper presents examples of how these fields can be combined with a focus on ES. In this review, a series of concepts have guided the discussion: (1) changing biogeochemistry affects trophic interactions and ecosystem processes by altering the elemental ratios of key species and assemblages; (2) changing trophic dynamics influences the transformation and fluxes of matter across environmental boundaries; (3) changing ecosystem metabolism will alter the chemical diversity of the non-living environment. Finally, we propose that using ES to link nutrient cycling, trophic dynamics, and ecosystem metabolism would allow for a more holistic understanding of ecosystem functions in a changing environment.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, University of Eastern Finland, University of Oldenburg, École Polytechnique Fédérale de Lausanne, Montana State University, University of Maryland, University of Wisconsin-Milwaukee, Queen Mary University of London, Ohio State University, Florida International University, Cornell University, University of California, St. Catherine University
Authors: Welti, N. (Ekstern), Striebel, M. (Ekstern), Ulseth, A. J. (Ekstern), Cross, W. F. (Ekstern), DeVilbiss, S. (Ekstern), Glibert, P. M. (Ekstern), Guo, L. (Ekstern), Hirst, A. G. (Intern), Hood, J. (Ekstern), Kominoski, J. S. (Ekstern), MacNeill, K. L. (Ekstern), Mehring, A. S. (Ekstern), Welter, J. R. (Ekstern), Hillebrand, H. (Ekstern)
Publication date: 2017
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Bridging the gap between morphological species and molecular barcodes - Exemplified by loricate choanoflagellates

Translating the vast amounts of molecular barcodes from global surveys of microbial eukaryotes into ecological insight depends critically on a well-curated reference database with adequate taxonomic coverage. In this respect, the choanoflagellates resemble other eukaryotic lineages: reasonable coverage at higher taxonomic levels, but missing diversity at the species level. The acanthocoid (loricate) choanoflagellates are well-characterized morphologically, with over 115 species described, but less than 10% with any sequence data. Because lorica shape is species-specific, the acanthocoids represent an opportunity to link morphological with molecular data within a lineage of eukaryotes. To match morphospecies to sequences, we sampled the Kattegat and the Isefjord in Denmark in September 2014 and February 2015. We identified 45 morphospecies and sequenced ribosomal DNA of nine previously unsequenced species, roughly doubling the number of acanthocid species with sequence data, including the first data representing five genera: Bicosta, Calliacantha, Cosmoeca, Crinolina and Pleurasiga. Our phylogenetic analysis is mainly congruent with morphology-based systematics. Five of the newly sequenced species match a previously unidentified barcode from Tara Oceans, providing access to the global distribution of species isolated from Danish waters. One species, Calliacantha natans, is the second most globally abundant choanoflagellate present in Tara Oceans. Our project translating new ribosomal DNA sequences to distributions of described species on a global scale supports the approach linking morphology to molecular barcodes for microbial eukaryote ecology.

General information
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Organisations: National Institute of Aquatic Resources, Institute Management, University of Cologne, Sorbonne Universités, CNRS
Authors: Frank, N. (Ekstern), Thomsen, H. A. (Intern), Daniel J, R. (Ekstern)
Pages: 26-37
Publication date: 2017
Broadband infrared absorption enhancement by electroless-deposited silver nanoparticles

Decorating semiconductor surfaces with plasmonic nanoparticles (NPs) is considered a viable solution for enhancing the absorptive properties of photovoltaic and photodetecting devices. We propose to deposit silver NPs on top of a semiconductor wafer by a cheap and fast electroless plating technique. Optical characterization confirms that the random array of electroless-deposited NPs improves absorption by up to 20% in a broadband of nearinfrared frequencies from the bandgap edge to 2000 nm. Due to the small filling fraction of particles, the reflection in the visible range is practically unchanged, which points to the possible applications of such deposition method for harvesting photons in nanophotonics and photovoltaics. The broadband absorption is a consequence of the resonant behavior of particles with different shapes and sizes, which strongly localize the incident light at the interface of a high-index semiconductor substrate. Our hypothesis is substantiated by examining the plasmonic response of the electroless-deposited NPs using both electron energy loss spectroscopy and numerical calculations.
Broadband, wide-angle and tunable terahertz absorber based on cross-shaped graphene arrays

Tunable terahertz absorbers composed of periodically cross-shaped graphene arrays with the ability to achieve nearunity absorbance are proposed and studied. Our results demonstrate that the bandwidth of absorption rate above 90% can reach up to 1.13 terahertz by use of a single layer of cross-shaped graphene arrays. By simply stacking the double layer cross-shaped graphene with careful design, the working bandwidth can be broadened compared with the single-layer graphene-based absorber. The proposed absorbers have the properties of being polarization insensitive and having large angle tolerance, and the tunability of the Fermi level in graphene allows us to realize tunable terahertz absorbers with potential interest in integrated terahertz optoelectronic devices.
**Buen og gnisten**
Anmeldelse af Lise Bock "Buen og gnisten. Pionerne fra radioens barndom"

**General information**
State: Published
Organisations: Department of Physics
Authors: Skyggebjerg, L. K. (Intern)
Publication date: 2017

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Publication: Communication › Internet publication – Annual report year: 2017

**Building a bio-based industry in the Middle East through harnessing the potential of the Red Sea biodiversity**
The incentive for developing microbial cell factories for production of fuels and chemicals comes from the ability of microbes to deliver these valuable compounds at a reduced cost and with a smaller environmental impact compared to the analogous chemical synthesis. Another crucial advantage of microbes is their great biological diversity, which offers a much larger “catalog” of molecules than the one obtainable by chemical synthesis. Adaptation to different environments is one of the important drives behind microbial diversity. We argue that the Red Sea, which is a rather unique marine niche, represents a remarkable source of biodiversity that can be geared towards economical and sustainable bioproduction processes in the local area and can be competitive in the international bio-based economy. Recent bioprospecting studies, conducted by the King Abdullah University of Science and Technology, have established important leads on the Red Sea biological potential, with newly isolated strains of Bacilli and Cyanobacteria. We argue that these two groups of local organisms are currently most promising in terms of developing cell factories, due to their ability to operate in saline conditions, thus reducing the cost of desalination and sterilization. The ability of Cyanobacteria to perform photosynthesis can be fully exploited in this particular environment with one of the highest levels of irradiation on the planet. We highlight the importance of new experimental and in silico methodologies needed to overcome the hurdles of developing efficient cell factories from the Red Sea isolates.

**General information**
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Bacterial Signal Transduction, Chalmers University of Technology, King Abdullah University of Science and Technology
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Web of Science (2016): Indexed yes
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Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.327 SNIP 1.458 CiteScore 3.71
Web of Science (2014): Indexed yes
Several potential business benefits obtained from ecodesign are consistently reported by academic studies and companies. These benefits comprise increased innovation potential, development of new markets and business models, reduction in risks and costs, improvement of organizational brand, among others. However, there are still significant challenges for adopting ecodesign, specially concerning the capture and measurement of the expected business benefits. To address such gap, this paper proposes an exploratory concept of a simulation-based business case for ecodesign implementation, grounded on a System Dynamics approach. The study builds upon the Ecodesign Maturity Model (EcoM2) and the related capabilities of ecodesign managements practices, offering an integrative outlook into how ecodesign capability building can potentially affect corporate performance outcomes over time. Preliminary results point towards the potential for managers and key organizational decision-makers to use the business case simulator to assessing ecodesign benefits and testing multiple implementation scenarios (e.g. what-if questions).
Building a fructan LC–MS2 library and its application to reveal the fine structure of cereal grain fructans

A liquid chromatography-mass spectrometry (LC–MS) library is presented containing the relative retention times of 28 fructan oligomers and MS2 spectra of 18 of them. It includes the main representatives of all fructan classes occurring in nature and with a degree of polymerization between three and five. This library enables a rapid and unambiguous detection of these 18 fructan structures in any type of sample without the need for fructan purification or the synthesis of fructan standards. Its wide applicability is demonstrated by the analysis of fructans in a set of cereal flour samples. Marked differences were observed in the types of fructans present in oat, barley, rye, spelt and wheat flour. A putative link between the accumulation of certain fructan types and cereal phylogeny is described.
Building and breaking a Large Igneous Province: An example from the High Arctic

The genesis of the Amerasia Basin in the Arctic Ocean has been difficult to discern due to overprint of the Cretaceous High-Arctic Large Igneous Province (HALIP). Based on detailed analysis of bathymetry data, new Arctic magnetic and gravity compilations, and recently published radiometric and seismic data, we present a revised plate kinematic model of the northernmost Amerasia Basin. We show that the smaller Makarov Basin is formed by rifting and seafloor spreading during the latest Cretaceous (to middle Paleocene). The opening progressively migrated into the Alpha Ridge structure, which was the focus of Early-to-Middle Cretaceous HALIP formation, causing breakup of the proto-Alpha Ridge into the present-day Alpha Ridge and Alpha Ridge West Plateau. We propose that breakup of the Makarov Basin was triggered by extension between the North America and Eurasian plates and possibly North Pacific plate rollback.
Butanol fermentation of the brown seaweed Laminaria digitata by Clostridium beijerinckii DSM-6422

Seaweed represents an abundant, renewable, and fast-growing biomass resource for 3rd generation biofuel production. This study reports an efficient butanol fermentation process carried out by Clostridium beijerinckii DSM-6422 using enzymatic hydrolysate of the sugar-rich brown seaweed Laminaria digitata harvested from the coast of the Danish North Sea as substrate. The highest butanol yield (0.42g/g-consumed-substrates) compared to literature was achieved, with a significantly higher butanol:acetone-butanol-ethanol (ABE) molar ratio (0.85) than typical (0.6). This demonstrates the possibility of using the seaweed L. digitata as a potential biomass for butanol production. For the first time, consumption of alginate components was observed by C. beijerinckii DSM-6422. The efficient utilization of sugars and lactic acid further highlighted the potential of using this strain for future development of large-scale cost-effective butanol production based on (ensiled) seaweed.

General information
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Organisations: Department of Environmental Engineering, Residual Resource Engineering, Danish Technological Institute, Technical University of Denmark, Energy research Centre of the Netherlands - ECN
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Web of Science (2016): Indexed yes
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Scopus rating (2015): SJR 2.255 SNIP 1.908 CiteScore 5.47
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.41 SNIP 2.104 CiteScore 5.3
Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 2.412 SNIP 2.503 CiteScore 5.97
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.389 SNIP 2.465 CiteScore 5.25
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.314 SNIP 2.508 CiteScore 5.56
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.086 SNIP 2.355
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.912 SNIP 2.231
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.734 SNIP 2.732
Web of Science (2008): Indexed yes
Butanol production, Clostridium beijerinckii, Enzymatic hydrolysate, Laminaria digitata, Wide-spectrum-substrate utilization

Butanol is cytotoxic to Lactococcus lactis while ethanol and hexanol are cytostatic

Lactic acid bacteria currently used extensively by the dairy industry have a superior tolerance towards small chain alcohols, which makes them interesting targets for use in future bio-refineries. The mechanism underlying the alcohol tolerance of lactic acid bacteria has so far received little attention. In the present study the physiological alcohol stress response of Lactococcus lactis subsp. cremoris MG1363 towards the primary, even-chain alcohols; ethanol, butanol, and hexanol was characterized. The alcohol tolerance of L. lactis was found comparable to those reported for highly alcohol resistant lactic acid bacteria. Combined results from alcohol survival rate, live/dead staining, and a novel usage of the beta-galactosidase assay, revealed that while high concentrations of ethanol and hexanol were cytostatic to L. lactis, high concentrations of butanol were cytotoxic, causing irreparable damages to the cell membrane.

General information
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Organisations: Department of Biotechnology and Biomedicine, Metabolic Signaling and Regulation, National Food Institute, Research Group for Microbial Biotechnology and Biorefining
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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 1.56 SJR 0.805 SNIP 0.648
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.136 SNIP 0.834 CiteScore 2.05
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.448 SNIP 0.978 CiteScore 2.69
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.652 SNIP 1.031 CiteScore 3.34
Cache timing attacks on recent microarchitectures

Cache timing attacks have been known for a long time, however since the rise of cloud computing and shared hardware resources, such attacks found new potentially devastating applications. One prominent example is SSA (presented by Irazoqui et al at S&P 2015) which is a cache timing attack against AES or similar algorithms in virtualized environments. This paper applies variants of this cache timing attack to Intel's latest generation of microprocessors. It enables a spy-process to recover cryptographic keys, interacting with the victim processes only over TCP. The threat model is a logically separated but CPU co-located attacker with root privileges. We report successful and practically verified applications of this attack against a wide range of microarchitectures, from a two-core Nehalem processor (i5-650) to two-core Haswell (i7-4600M) and four-core Skylake processors (i7-6700). The attack results in full key recovery. Compared to earlier processor generations, the attacks are more involved, but still of practical complexity, requiring between $2^{19}$ and $2^{21}$ encryptions. For the last two processors, the cache slice selection algorithm (CSSA) was not known before and had to be reverse engineered as part of this work. This is the first time CSSAs for the Skylake architecture are reported. Our attacks demonstrate that cryptographic applications in cloud computing environments using key-dependent tables for acceleration are still vulnerable even on recent architectures, including Skylake. Our reverse engineering of the CSSAs of these
processors will also be beneficial for developers in many other contexts, for instance for implementing page colouring in modern operating systems.

**Calanus hyperboreus and the lipid pump**

Lipid-fuelled overwintering by copepods can be a regionally important contribution to carbon sequestration in the deep oceans. Here, we estimate the contribution for Calanus hyperboreus, found in abundance in the northern reaches of the North Atlantic and Arctic Ocean. Estimates for regions with high overwintering populations, Fram Strait, Greenland Sea and Iceland Sea lie between 3.5 gC m⁻² yr⁻¹ and 6.0 gC m⁻² yr⁻¹ at depths of 1000–3000 m, comparable to the flux of detrital organic carbon at commensurate depths. Apart from the variation in the abundance of overwintering populations, these estimates are most sensitive to mortality rates. We present a general model based on metabolic theory and isomorphism that can be used to constrain estimates for data poor species in other parts of the global ocean.
Calculating excitons, plasmons, and quasiparticles in 2D materials and van der Waals heterostructures: Topical Review

Atomically thin two-dimensional (2D) materials host a rich set of electronic states that differ substantially from those of their bulk counterparts due to quantum confinement and enhanced many-body effects. This Topical Review focuses on the theory and computation of excitons, plasmons and quasiparticle band structures in 2D materials and their heterostructures. The general theory is illustrated by applications to various types of 2D materials including transition metal dichalcogenides, graphene, phosphorene, and hexagonal boron nitride. The weak and highly non-local dielectric function of atomically thin crystals is shown to be responsible for many of the unique properties exhibited by the 2D materials such as the formation of strongly bound, non-Hydrogenic excitons, large band gap renormalization effects, and the different signatures of excitons and plasmons in electron energy loss spectroscopy (EELS). Among other topics covered are spin-orbit coupling, trions, interlayer excitons, exciton dissociation, and environmental screening. Technical issues associated with the application of the many-body GW method and the Bethe-Salpeter equation (BSE) to 2D materials are also discussed. A combined quantum/classical method is introduced and used throughout to account for dielectric screening and self-energy effects from substrates and van der Waals heterostructures including the difficult case of non-matching lattices.
Calculation of Multiphase Chemical Equilibrium by the Modified RAND Method

A robust and efficient algorithm for simultaneous chemical and phase equilibrium calculations is proposed. It combines two individual nonstoichiometric solving procedures: a nested-loop method with successive substitution for the first steps and final convergence with the second-order modified RAND method. The modified RAND extends the classical RAND method from single-phase chemical reaction equilibrium of ideal systems to multiphase chemical equilibrium of nonideal systems. All components in all phases are treated in the same manner and the system Gibbs energy can be used to monitor convergence. This is the first time that modified RAND was applied to multiphase chemical equilibrium systems. The combined algorithm was tested using nine examples covering vapor–liquid (VLE) and vapor–liquid–liquid equilibria (VLLE) of ideal and nonideal reaction systems. Successive substitution provided good initial estimates for the accelerated computation with modified RAND, to ultimately converge to the equilibrium solution without failure.
Calculation of simultaneous chemical and phase equilibrium by the method of Lagrange multipliers

The purpose of this work is to develop a general, reliable and efficient algorithm, which is able to deal with multiple reactions in multiphase systems. We selected the method of Lagrange multipliers to minimize the Gibbs energy of the system, under material balance constraints. Lagrange multipliers and phase amounts are the independent variables, whose initialization is performed by solving a subset of the working equations. This initialization is the unconstrained minimization of a convex function and it is bound to converge. The whole solution procedure employs a nested loop with Newton iteration in the inner loop and non-ideality updated in the outer loop, thus giving an overall linear convergence rate. Stability analysis is used to introduce additional phases sequentially so as to obtain the final multiphase solution. The procedure was successfully tested on vapor-liquid equilibrium (VLE) and vapor-liquid-liquid equilibrium (VLLE) of reaction systems.

General information

State: Published
Organisations: Center for Energy Resources Engineering, Department of Chemistry, Centre for oil and gas – DTU, Department of Chemical and Biochemical Engineering, CERE – Center for Energy Resources Engineering, Technical University of Denmark
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Scopus rating (2016): CiteScore 3.05 SJR 1.037 SNIP 1.442
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.038 SNIP 1.606 CiteScore 2.96
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.115 SNIP 1.642 CiteScore 2.81
Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 1.157 SNIP 1.866 CiteScore 2.95
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.189 SNIP 1.847 CiteScore 2.77
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.205 SNIP 1.685 CiteScore 2.8
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.319 SNIP 1.708
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.293 SNIP 1.759
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.299 SNIP 1.6
Calibration of the comprehensive NDHA-N\textsubscript{2}O dynamics model for nitrifier-enriched biomass using targeted respirometric assays

The NDHA model comprehensively describes nitrous oxide (N\textsubscript{2}O) producing pathways by both autotrophic ammonium oxidizing and heterotrophic bacteria. The model was calibrated via a set of targeted extant respirometric assays using enriched nitrifying biomass from a lab-scale reactor. Biomass response to ammonium, hydroxylamine, nitrite and N\textsubscript{2}O additions under aerobic and anaerobic conditions were tracked with continuous measurement of dissolved oxygen (DO) and N\textsubscript{2}O. The sequential addition of substrate pulses allowed the isolation of oxygen-consuming processes. The parameters to be estimated were determined by the information content of the datasets using identifiability analysis. Dynamic DO profiles were used to calibrate five parameters corresponding to endogenous, nitrite oxidation and ammonium oxidation processes. The subsequent N\textsubscript{2}O calibration was not significantly affected by the uncertainty propagated from the DO calibration because of the high accuracy of the estimates. Five parameters describing the individual contribution of three biological N\textsubscript{2}O pathways were estimated accurately (variance/mean < 10\% for all estimated parameters). The NDHA model response was evaluated with statistical metrics (F-test, autocorrelation function). The 95\% confidence intervals of DO and N\textsubscript{2}O predictions based on the uncertainty obtained during calibration are studied for the first time. The measured data fall within the 95\% confidence interval of the predictions, indicating a good model description. Overall, accurate parameter estimation and identifiability analysis of ammonium removal significantly decreases the uncertainty propagated to N\textsubscript{2}O production, which is expected to benefit N\textsubscript{2}O model discrimination studies and reliable full scale applications.

General information
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Organisations: Department of Environmental Engineering, Water Technologies, Department of Chemical and Biochemical Engineering, PROSYS - Process and Systems Engineering Centre, Technical University of Denmark
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Can carbon footprint serve as proxy of the environmental burden from urban consumption patterns?

Carbon footprint (CFP) is widely applied as an indicator when assessing environmental sustainability of products and services. The objective of the present study is to evaluate the validity of CFP as overall environmental indicator for representing the environmental burden of residents from urbanized areas. Applying four different Life Cycle Impact Assessment (LCIA) methods environmental impact profiles were determined for the consumption patterns of 1281 Danish urban residents. Six main consumption components were distinguished including road transport, air travel, food, accommodation (covering consumption of materials for the construction of dwellings) and use of energy in terms of thermal energy, and electricity. The results for the individual consumption components showed a strong correlation between CFP and nearly all other impact indicators for all the applied LCIA methods. However, upon aggregation of the indicator results across consumption components, the impact indicators for the total consumption showed no significant correlation between CFP and the other impact scores for any of the four impact assessment methods. These findings suggest that while CFP can be a good indicator of the environmental burden associated with specific activities, this is not the case for more complex activities (such as consumption patterns related to urban life styles). This conclusion discourages the use of CFP as sustainability measure in relation to regulation of private or public consumption.

General information
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Organisations: Quantitative Sustainability Assessment, Department of Management Engineering, Indian Institute of Technology, Bombay, Aarhus University
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.481 SNIP 1.726 CiteScore 3.99
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.463 SNIP 1.996 CiteScore 3.76
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.353 SNIP 1.837 CiteScore 3.63
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.257 SNIP 1.858 CiteScore 3.42
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.21 SNIP 1.732 CiteScore 3.05
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.239 SNIP 1.603
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.047 SNIP 1.769
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.907 SNIP 1.474
Scopus rating (2007): SJR 0.774 SNIP 1.395
**Canonical analysis of sentinel-1 radar and sentinel-2 optical data**

This paper gives results from joint analyses of dual polarimetry synthetic aperture radar data from the Sentinel-1 mission and optical data from the Sentinel-2 mission. The analyses are carried out by means of traditional canonical correlation analysis (CCA) and canonical information analysis (CIA). Where CCA is based on maximising correlation between linear combinations of the two data sets, CIA maximises mutual information between the two. CIA is a conceptually more pleasing method for the analysis of data with very different modalities such as radar and optical data. Although a little inconclusive as far as the change detection aspect is concerned, results show that CIA analysis gives conspicuously less noisy appearing images of canonical variates (CVs) than CCA. Also, the 2D histogram of the mutual information based leading CVs clearly reveals much more structure than the correlation based one. This gives promise for potentially better change detection results with CIA than can be obtained by means of CCA.

**General information**

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Authors: Nielsen, A. A. (Intern), Larsen, R. (Intern)
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**Can seafood safety be compromised in the ocean of tomorrow?**

**General information**

State: Published
Organisations: National Food Institute, Research Group for Nano-Bio Science
Authors: Maulvault, A. L. (Ekstern), Camacho, C. (Ekstern), Sampaio, E. (Ekstern), Barbosa, V. (Ekstern), Alves, R. N. (Ekstern), Fogaça, F. (Ekstern), Kwdijk, C. (Ekstern), Kotterman, M. (Ekstern), Sloth, J. J. (Intern), Rasmussen, R. R. (Intern), Eljarrat, E. (Ekstern), Aznar-Alemany, O. (Ekstern), Cunha, S. (Ekstern)
Pages: 24-24
Publication date: 2017
Can stochastic consumer phase models in QMRA be simplified to a single factor?

In quantitative microbiological risk assessment (QMRA), the consumer phase covers the part of the food chain following production and retail, where the consumer transports, stores, prepares and consumes the food products considered. These consumer practices have a crucial impact on exposure, and a consumer phase model (CPM) needs to be included in a QMRA to allow an evaluation of the effectiveness of intervention measures in food production and processing in terms of human health risk. However, the development of a CPM is complex because consumer practices can be highly variable and data are scarce. So far, it is unclear to which extent CPMs need to include data on variability and detailed descriptions of the stochastic processes that may result in exposure. We therefore compared the performance of published stochastic CPMs with a simple surrogate CPM that assumes a proportional linear relation between concentration at retail and ingested dose, described by a constant factor. A comparative study was performed for different pathogens and different food products: Campylobacter in broiler meat, Salmonella in minced pork and pork cuts and Listeria in smoked salmon. Published stochastic CPMs were re-implemented and their equivalent surrogate models were derived, basing the value of the constant surrogate model factor on the absolute risk estimate from the stochastic model. The performances of the models were evaluated by comparing the effects of hypothetical intervention measures that reduce the mean or the standard deviation of the distribution of concentrations at retail. These effects were expressed in terms of relative risk estimates, as estimated in the risk assessments using the simplified and the stochastic CPMs. Results showed that after interventions that result in a reduction of the mean or standard deviation of the distribution of concentrations at retail, the relative risk estimates obtained for the simple surrogate models are always lower than those of the stochastic CPMs, which means that simplified models tend to overestimate the effects of interventions. The difference was largest in the Listeria model, where growth during storage is expected to be the dominant process. It was found that for interventions affecting the prevalence only, a simplified surrogate CPM performs similarly to a stochastic CPM. We concluded that the use of a simple surrogate CPM, which does not include the variability inherent to consumer practices, may lead to an overestimation of the effect of intervention measures in a QMRA, especially if these interventions affect the concentrations. For adequate risk assessment, it may therefore be necessary to include the variation in consumer practices (e.g. variation in storage time and temperature, cooking time and temperature and cross-contamination), as described in more realistic and more complex CPMs, definitely if this variation is expected to be large.

Can you design for Fidelity? How your intervention framework describes intended actions, participation and behavior

In recent years the term fidelity has been introduced within the field of organizational level interventions. Fidelity describes the extent to which the intervention has been implemented as it was originally intended, and is regarded critical for determining the validity of the research results. The reason for introducing this term has been for researchers to be able to conclude whether an intervention has worked as intended. In this paper we discuss the term fidelity in relation to the concept of script analysis (Akrich 1994). We do this to question whether it is even relevant to discuss fidelity in organizational level interventions. The concept of fidelity stems from clinical interventions although the concept has
developed over time (Bellg et al. 2004). Organizational level interventions differ from clinical interventions, as they are more complex regarding both the “dose” given and the number and levels of participants involved at the same time. Steering organizational level interventions in every detail and secure full fidelity or treatment integrity can thus seem difficult. Organizational level intervention frameworks are often built on the designer’s experiences with previous interventions as well as what have been reported as best practice. The designer thus has a large role in making the intervention work – he or she can design intended actions, participation and behavior into the framework. The notion script can help explain the designer’s role. A script is the designer’s presumptions, visions and predictions about how the framework will interact with the intervention participants. As derived concepts Akrich (1994) introduces ‘in-scription’ and ‘de-scription’. Where ‘in-scription’ is the limitations and constraint that the intervention designer in-scribe in the framework, and ‘de-scription’ is how the intervention participants interpret the framework and adjust the framework to the organization.

**General information**
State: Published
Organisations: Department of Management Engineering, Management Science, Implementation and Performance Management, Center for Bachelor of Engineering Studies
Authors: Poulsen, S. (Intern), Gish, L. (Intern), Ipsen, C. (Intern)
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Main Research Area: Technical/natural sciences
Electronic versions:
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**Capability Database of Injection Molding Process— Requirements Study for Wider Suitability and Higher Accuracy**
Generally, there is little disagreement that an early consideration of dimensional accuracies achieved in production is conducive to the success of development of injection molding products. While different process capability databases (PCDBs) provide guidance for a meaningful estimation of the expected part variation, the adoption of corresponding guidelines and (proprietary) software tools seems to be, however, limited in industrial practice so far. This research paper addresses the gap between the available PCDBs and the requirement of designers in practice and investigates the key drivers for an improved applicability of corresponding database solutions in an industrial context. A survey of database users at all phases of product value chain in the plastic industry revealed that 59% of the participating companies use their own, internally created databases, although reported to be not fully adequate in most cases. Essential influences are the suitability of the provided data, defined by the content such as material, tolerance types, etc. covered, as well as its accuracy, largely influenced by the updating frequency. Forming a consortium with stakeholders, linking database update to technology changes and connecting dimensioning standards to database offerings are proposed solutions.

**General information**
State: Published
Organisations: Department of Mechanical Engineering, Engineering Design and Product Development, Technical University of Denmark
Authors: Boorla, S. M. (Intern), Eifler, T. (Intern), Jepsen, J. D. O. (Ekstern), Howard, T. J. (Intern)
Pages: 18-28
Publication date: 2017
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**Capacitor Voltages Measurement and Balancing in Flying Capacitor Multilevel Converters Utilizing a Single Voltage Sensor**
This paper proposes a new method for measuring capacitor voltages in multilevel flying capacitor (FC) converters that requires only one voltage sensor per phase leg. Multiple dc voltage sensors traditionally used to measure the capacitor voltages are replaced with a single voltage sensor at the ac side of the phase leg. The proposed method is subsequently
used to balance the capacitor voltages using only the measured ac voltage. The operation of the proposed measurement and balancing method is independent of the number of the converter levels. Experimental results presented for a five-level FC converter verify effective operation of the proposed method.

**General information**

**State:** Published

**Organisations:** Department of Electrical Engineering, Center for Electric Power and Energy, Electric power components, Nanyang Technological University, University of New South Wales, University of Sharjah

**Authors:** Farivar, G. (Ekstern), Ghias, A. M. Y. M. (Ekstern), Hredzak, B. (Ekstern), Pou, J. (Ekstern), Agelidis, V. (Intern)

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**Main Research Area:** Technical/natural sciences

**Publication information**

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- BFI (2016): BFI-level 2
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- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 2.498 SNIP 3.819 CiteScore 9.2
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 2.299 SNIP 4.318 CiteScore 8.78
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 2.396 SNIP 4.427 CiteScore 8.41
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 1.945 SNIP 3.803 CiteScore 6.98
- ISI indexed (2012): ISI indexed yes
- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): SJR 1.993 SNIP 3.359 CiteScore 7.12
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 2
- Scopus rating (2010): SJR 1.796 SNIP 2.89
- BFI (2009): BFI-level 2
- Scopus rating (2009): SJR 1.786 SNIP 2.726
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 2.538 SNIP 3.073
- Web of Science (2008): Indexed yes
- Scopus rating (2005): SJR 3.761 SNIP 3.411
- Scopus rating (2004): SJR 2.931 SNIP 3.653
- Scopus rating (2003): SJR 3.742 SNIP 3.056
- Scopus rating (2001): SJR 3.048 SNIP 1.904
Capacity Enhancement for Hybrid Fiber-Wireless Channels with 46.8Gbit/s Wireless Multi-CAP Transmission over 50m at W-Band

Transmission of a 46.8 Gbit/s multi-band CAP signal is experimentally demonstrated over a 50 m W-band radio-over-fiber link. Bit error rates below 3.8×10^-3 are achieved, employing nine CAP bands with bit and power loading.

General information
State: Published
Organisations: Department of Photonics Engineering, Metro-Access and Short Range Systems, Networks Technology and Service Platforms
Authors: Rommel, S. (Intern), Puerta Ramírez, R. (Intern), Vegas Olmos, J. J. (Intern), Tafur Monroy, I. (Intern)
Number of pages: 3
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Conference: Optical Fiber Communication Conference 2017, Los Angeles, United States, 19/03/2017 - 19/03/2017
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A reduced attractiveness of investments in reliable fossil power plants in liberalized markets on the background of a transition towards renewable energies has brought a discussion on capacity policies to Europe. I develop a partial equilibrium model to compare effects of three polar capacity remuneration mechanisms (CRMs) based on the assumption that a CRM is indicated. A strategic reserve (SR) policy with administratively set capacity targets, a capacity market (CM) based on public procurement, and a decentralized reserve market with the obligation of generators to finance reserves in relation to their peak supply (RM). Substantial differences of policies arise across countries and regarding consumers and producers due to power plant structures. By 2023, we find the decentralized RM to induce least pronounced distributional effects and only modest welfare reductions, while SR and CM induce higher losses. In the longer term until 2033, welfare results differ less pronounced, although the RM is most friendly to consumers. A robust policy conclusion has to pay attention to further aspects concerning the environment and technological developments.

General information
State: Published
Organisations: Department of Management Engineering, Systems Analysis
Authors: Traber, T. (Intern)
Pages: 1-14
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Carbazole-based copolymers via direct arylation polymerization (DArP) for Suzuki-convergent polymer solar cell performance

Although direct arylation polymerization (DArP) has recently emerged as an alternative to traditional cross-coupling methods like Suzuki polymerization, the evaluation of DArP polymers in practical applications like polymer solar cells (PSCs) is limited. Because even the presence of minute quantities of defects can dramatically influence the solar cell performance of DArP polymers offers critical insight alongside other structural and optoelectronic comparisons. Even via traditional methods, carbazole-based donors are frequently prone to homocoupling defects, which has been shown to - along with β-defects - compromise performance. Through defect minimization with the bulky and affordable neodecanoic acid (NDA) mixture, we report the synthesis of DArP poly[[9-(heptadecan-9-yl)-9H-carbazole]-alt-(4,7-di(thiophen-2-yl)benzo[c][1,2,5]thiadiazole)] (PCDTBT) that outperforms Suzuki PCDTBT with similar molecular weights. Expanding beyond this model system, carbazole-based polymers featuring 2,5-diethylhexyl-thieno[2',3':5,6]pyrido[3,4-g]thieno[3,2-c]isoquinoline-5,11-dione (TPTI), 5-octyl-1,3-di(thiophen-2-yl)-4H-thieno[3,4-c]pyrrole-4,6(5H)-dione (DT-TPD), and 2,5-bis(2,3-
Dihydrothieno[3,4-b][1,4]dioxin-5-yl)pyridine (EDOT-Pyr) are generated. Polymers are characterized by $^1$H NMR, cyclic voltammetry, UV-Vis, GIXRD, SCLC hole mobilities, and are implemented into polymer solar cells fabricated in air under ambient humidity. We demonstrate that DArP polymers perform comparably to Suzuki in practical applications.

**General information**
- **State:** Published
- **Organisations:** Department of Energy Conversion and Storage, Organic Energy Materials, University of Southern California
- **Authors:** Gobalasingham, N. S. (Ekstern), Ekiz, S. (Ekstern), Pankow, R. M. (Ekstern), Livi, F. (Intern), Bundgaard, E. (Intern), Thompson, B. C. (Ekstern)
- **Pages:** 4393-4402
- **Publication date:** 2017
- **Main Research Area:** Technical/natural sciences

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  - Scopus rating (2015): SJR 1.946 SNIP 1.157 CiteScore 5.61
  - Web of Science (2015): Indexed yes
  - BFI (2014): BFI-level 1
  - Scopus rating (2014): SJR 2.03 SNIP 1.235 CiteScore 5.51
  - Web of Science (2014): Indexed yes
  - BFI (2013): BFI-level 1
  - Scopus rating (2013): SJR 1.983 SNIP 1.326 CiteScore 5.81
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  - Web of Science (2013): Indexed yes
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  - ISI indexed (2012): ISI indexed yes
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  - ISI indexed (2011): ISI indexed no
  - Web of Science (2010): Indexed yes
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**Carbon bioavailability in a high Arctic fjord influenced by glacial meltwater, NE Greenland**

The land-to-ocean flux of organic carbon is increasing in glacierized regions in response to increasing temperatures in the Arctic (Hood et al., 2015). In order to understand the response of the coastal ecosystem metabolism to the organic carbon input it is essential to determine the bioavailability of the different carbon sources in the system. We quantified the bacterial turnover of organic carbon in a high Arctic fjord system (Young Sound, NE Greenland) during the ice-free period (July-October 2014) and assessed the quality and quantity of the 3 major organic carbon sources: (1) local phytoplankton production (2) runoff from land-terminating glaciers and a lowland river and (3) inflow from the ocean shelf. We found that despite relatively low concentrations of DOC in the rivers, the bioavailability of the river–DOC was significantly higher than in the fjord, and characterized by high cell-specific bacterial production and low C:N ratios. In contrast, the DOC source entering via inflow of coastal shelf waters had high DOC concentrations with high C:N and low specific bacterial production. The phytoplankton production in the fjord could not sustain the bacterial carbon demand, but was still the major source of organic carbon for bacterial growth. We assessed the bacterial community composition and found that communities were specific for the different water types i.e., the bacterial community of the coastal inflow water could be traced mainly in the subsurface water, while the glacial river community strongly dominated the surface water in the fjord.
Carbon Nanotubes as Thermally Induced Water Pumps

Thermal Brownian motors (TBMs) are nanoscale machines that exploit thermal fluctuations to provide useful work. We introduce a TBM-based nanopump which enables continuous water flow through a carbon nanotube (CNT) by imposing an axial thermal gradient along its surface. We study the performance of this molecular motor using molecular dynamics (MD) simulations. From the MD trajectories, we compute the net water flow and the induced velocity profiles for various imposed thermal gradients. We find that spatial asymmetry modifies the vibrational modes of the CNT induced by the thermal gradient, resulting in a net water flow against the thermal gradient. Moreover, the kinetic energy associated with the thermal oscillations rectifies the Brownian motion of the water molecules, driving the flow in a preferred direction. For imposed thermal gradients of 0.5-3.3 K/nm, we observe continuous net flow with average velocities up to 5 m/s inside CNTs with diameters of 0.94, 1.4, and 2.0 nm. The results indicate that the CNT-based asymmetric thermal motor can provide a controllable and robust system for delivery of continuous water flow with potential applications in integrated nanofluidic devices.
Carbon Sequestration by Urban Trees

Carbon dioxide (CO2) is the most prominent component of anthropogenic greenhouse gas emissions, resulting mainly from fuel combustion in the built environment – for activities such as heating of buildings, urban mobility and cooking. The concentration of near-surface CO2 in cities is affected by a range of factors, including traffic density and atmospheric stability. Plants have the capacity to sequester CO2 through photosynthesis, and can therefore store carbon in plant biomass and in the soil. Green areas in the city may significantly affect local concentrations of atmospheric CO2, as observed in urban-to-rural comparisons showing lower CO2 concentration in the presence of vegetation. CO2 sequestration over the 'urban forest' displays diurnal variation during the growing period, with uptake during daytime when plants are photosynthetically active, and nocturnal emissions in response to respiration. High atmospheric CO2 concentrations represent a fertilizer for plants, promoting more efficient photosynthesis. However, urban plants often experience environmental stresses which compromise the photosynthetic apparatus, and in extreme cases may turn plants from carbon sinks into carbon sources. In this chapter, we review the most recent studies and highlight emerging research needs for a better understanding of present and future roles of urban trees in removing CO2 from the atmosphere.

General information

State: Published
Organisations: Department of Environmental Engineering, Atmospheric Environment, Council for Agricultural Research and Economics, National Research Council of Italy, Université de Lorraine, University of Antwerp
Authors: Fares, S. (Ekstern), Paoletti, E. (Ekstern), Calfapietra, C. (Ekstern), Mikkelsen, T. N. (Intern), Samson, R. (Ekstern), Thiec, D. L. (Ekstern)
Carrier-selective p- and n-contacts for efficient and stable photocatalytic water reduction

The successful realization of carrier-selective contacts for crystalline silicon (c-Si) based device for photocatalytic hydrogen production has been demonstrated. The proposed TiO$_2$-protected carrier-selective contacts resemble a metal-oxide-semiconductor configuration, including a highly-doped nanocrystallinesilicon (nc-Si) and a tunnel oxide, thereby form a heterostructure with the c-Si substrate. By substituting conventional pn$^+$-junction Si by c-Si/SiO$_x$/nc-Si structure for both front and back contacts we demonstrate a 16% increase in photovoltage (an open circuit voltage of 584 mV under AM 1.5G conditions). TiO$_2$ protected carrier-selective photoelectrodes showed excellent long-term durability in acidic aqueous solution having stable photocurrent output for more than 40 days, implying that the proposed carrier-selective contact is a promising configuration to substitute for the conventional pn-junction based c-Si photocathodes.
Carryover of CH$_3$Hg from feed to sea bass and salmon

Contamination of food generally has a negative impact on the quality and may imply a risk to human health. Mercury (Hg) is one of the most hazardous compounds in our environment and is released from the earth’s crust by both natural and anthropogenic processes. The mercury species ‘methylmercury’ is highly toxic, because affects the function of enzymes, easily crosses the blood-brain and the placenta barriers and is toxic to the nervous system (especially the developing brain). It bioaccumulates and biomagnifies through the aquatic food chain. Methylmercury is the most common mercury species in fish and humans are also mainly exposed to methylmercury from consumption of fish and other seafood. The aims of the present controlled fish feeding trials were to study the carryover from feed to fish fillets (at low spike levels 1x background level of methylmercury) and to determine toxicokinetic parameters. The study included Atlantic salmon (Salmo salar), which is one of the main farmed seafood product consumed in Europe and with production in Northern Europe as well as European seabass (Dicentrarchus labrax) produced in Southern Europe, where it is a highly consumed seafood. The weight gain of the fish, their feed intake, feed and fish fillet contaminant level were determined to model the uptake and elimination of methylmercury. The toxicokinetics for feed with low levels of methylmercury (41-75 ng/g) showed high assimilation and low elimination. The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under the ECsafeSEAFOOD project (grant agreement n° 311820).

General information
State: Published
CASCADE, a platform for controlled gene amplification for high, tunable and selection-free gene expression in yeast

Over-expression of a gene by increasing its copy number is often desirable in the model yeast Saccharomyces cerevisiae. It may facilitate elucidation of enzyme functions, and in cell factory design it is used to increase production of proteins and metabolites. Current methods are typically exploiting expression from the multicopy 2μ-derived plasmid or by targeting genes repeatedly into sequences like Ty or rDNA; in both cases, high gene expression levels are often reached. However, with 2μ-based plasmid expression, the population of cells is very heterogeneous with respect to protein production; and for integration into repeated sequences it is difficult to determine the genetic setup of the resulting strains and to achieve specific gene doses. For both types of systems, the strains often suffer from genetic instability if proper selection pressure is not applied. Here we present a gene amplification system, CASCADE, which enables construction of strains with defined gene copy numbers. One or more genes can be amplified simultaneously and the resulting strains can be stably propagated on selection-free medium. As proof-of-concept, we have successfully used CASCADE to increase heterologous production of two fluorescent proteins, the enzyme β-galactosidase the fungal polyketide 6-methyl salicylic acid and the plant metabolite vanillin glucoside.

General information
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Organisations: Department of Systems Biology, Department of Biotechnology and Biomedicine, Eukaryotic Molecular Cell Biology, University of Copenhagen
Number of pages: 12
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Main Research Area: Technical/natural sciences

Publication information
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BFI (2017): BFI-level 1
Cascades of alternating pitchfork and flip bifurcations in H-bridge inverters

Power electronic DC/AC converters (inverters) play an important role in modern power engineering. These systems are also of considerable theoretical interest because their dynamics is influenced by the presence of two vastly different forcing frequencies. As a consequence, inverter systems may be modeled in terms of piecewise smooth maps with an extremely high number of switching manifolds. We have recently shown that models of this type can demonstrate a complicated bifurcation structure associated with the occurrence of border collisions. Considering the example of a PWM H-bridge single-phase inverter, the present paper discusses a number of unusual phenomena that can occur in piecewise smooth maps with a very large number of switching manifolds. We show in particular how smooth (pitchfork and flip) bifurcations may form a macroscopic pattern that stretches across the overall bifurcation structure. We explain the observed bifurcation phenomena, show under which conditions they occur, and describe them quantitatively by means of an analytic approximation.
Catalysing low cost green technologies for sustainable water service delivery in Kenya: Feasibility Study Report
Since 1974, the government of Kenya has recognised water supplies as critical for poverty reduction and development. Kenya’s economic and social development Vision 2030 emphasises the need for adequate and sustainable provision of water supply and sanitation services, with a target to achieve universal access by 2030. However, thus far most water development targets have not been achieved. Improvement has been much slower in rural and low income urban areas, and the current funding level is inadequate to achieve universal access by 2030. Over the years, official effort have been
complemented through non-programmatic community and self-help action, but many projects quickly deteriorate after implementation and are rarely functioning 5 years after implementation. Consequently, water services available for the poor in Kenya are often inadequate, unsafe and unsustainable. Weak attention to planning, standards and operations and maintenance, including source and cost of energy in rural and peri-urban water supplies is a key challenge to functionality and sustainability.

Catalytic Science and Technology in Sustainable Energy II
This special issue of Catalysis Today results from four sessions, under the collective theme "Catalysis in Sustainable Energy", of the 2ndInternational Symposium on Catalytic Science and Technology in Sustainable Energy and Environment, held in Tianjin, China during October 12-14, 2016. This biennial symposium offers an international forum for discussing and sharing the cutting-edge researches and the most recent breakthroughs in energy and environmental technologies based on catalysis principles. Included in this special issue are 36 invited contributions, which is a noticeable expansion as compared with the 29 contributions published two years ago in the previous special issue of Catalysis Today under the same title "Catalytic Science and Technology in Sustainable Energy". We gratefully acknowledge all the authors and reviewers of the manuscripts and the editorial team of Elsevier, without whom the special issue would not have been possible. As the organizer of the EECAT 2016, Y Li expresses his special gratitude to the sponsors, especially Haldor Topsoe and Synfuels China, the participants and the co-organizers for their great contribution to the success of EECAT 2016.
Cathepsin-S degraded decorin are elevated in fibrotic lung disorders - development and biological validation of a new serum biomarker

Background: Decorin is one of the most abundant proteoglycans of the extracellular matrix and is mainly secreted and deposited in the interstitial matrix by fibroblasts where it plays an important role in collagen turnover and tissue homeostasis. Degradation of decorin might disturb normal tissue homeostasis contributing to extracellular matrix remodeling diseases. Here, we present the development and validation of a competitive enzyme-linked immunosorbent assay (ELISA) quantifying a specific fragment of degraded decorin, which has potential as a novel non-invasive serum biomarker for fibrotic lung disorders.

Methods: A fragment of decorin cleaved in vitro using human articular cartilage was identified by mass-spectrometry (MS/MS). Monoclonal antibodies were raised against the neo-epitope of the cleaved decorin fragment and a competitive ELISA assay (DCN-CS) was developed. The assay was evaluated by determining the inter-and intra-assay precision, dilution recovery, accuracy, analyte stability and interference. Serum levels were assessed in lung cancer patients, patients with idiopathic pulmonary fibrosis (IPF), patients with chronic obstructive pulmonary disease (COPD) and healthy controls.

Results: The DCN-CS ELISA was technically robust and was specific for decorin cleaved by cathepsin-S. DCN-CS was elevated in lung cancer patients (p <0.0001) and IPF patients (p <0.001) when compared to healthy controls. The diagnostic power for differentiating lung cancer patients and IPF patients from healthy controls was 0.96 and 0.77, respectively.

Conclusion: Cathepsin-S degraded decorin could be quantified in serum using the DCN-CS competitive ELISA. The clinical data indicated that degradation of decorin by cathepsin-S is an important part
of the pathology of lung cancer and IPF.

General information
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Organisations: Department of Biotechnology and Biomedicine, Disease Systems Immunology, Nordic Bioscience A/S, ProScion A/S, Janssen Pharmaceutical Companies
Authors: Kehlet, S. N. (Intern), Bager, C. L. (Ekstern), Willumsen, N. (Ekstern), Dasgupta, B. (Ekstern), Brodmerkel, C. (Ekstern), Curran, M. (Ekstern), Pedersen, S. B. (Intern), Leeming, D. J. (Ekstern), Karsdal, M. (Ekstern)
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Web of Science (2017): Indexed Yes
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Scopus rating (2016): CiteScore 2.76 SJR 1.128 SNIP 1.131
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.078 SNIP 1.026 CiteScore 2.69
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.142 SNIP 1.145 CiteScore 2.97
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.111 SNIP 1.177 CiteScore 3.24
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.246 SNIP 1.448 CiteScore 3.41
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.257 SNIP 1.252 CiteScore 3.08
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.996 SNIP 1.011
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.883 SNIP 1.138
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.007 SNIP 0.806
Scopus rating (2007): SJR 0.577 SNIP 0.705
Scopus rating (2006): SJR 0.666 SNIP 0.594
Scopus rating (2005): SJR 0.279 SNIP 0.402
Scopus rating (2004): SJR 0.243 SNIP 0.346
Scopus rating (2003): SJR 0.211 SNIP 0.111
Scopus rating (2002): SJR 0.263 SNIP 0.085
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Decorin, Cathepsin-S, Extracellular matrix, Cancer, Idiopathic pulmonary fibrosis, Serum biomarker
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Cathode-supported hybrid direct carbon fuel cells
The direct conversion of coal to heat and electricity by a hybrid direct carbon fuel cell (HDCFC) is a highly efficient and cleaner technology than the conventional combustion power plants. HDCFC is defined as a combination of solid oxide fuel cell and molten carbonate fuel cell. This work investigates cathode-supported cells as an alternative configuration for HDCFC, with better catalytic activity and performance. This study aims to define the best processing route to manufacture highly efficient cathode-supported cells based on La0.75Sr0.25MnO3/yttria-stabilized zirconia infiltrated backbones. The challenges on the development of high-performance backbones are discussed. In this study, cathode-supported configuration was confirmed to be more efficient for the oxidation of carbon than anode supported configuration. The maximum power density of the cathode-supported cell increased almost by a factor of two when compared with the anode-supported cell.
Cavity prediction in sand mould production applying the DISAMATIC process

The sand shot in the DISAMATIC process is simulated by the discrete element method (DEM) taking into account the influence and coupling of the airflow with computational fluid dynamics (CFD). The DEM model is calibrated by a ring shear test, a sand pile experiment and a slump test. Subsequently, the DEM model is used to model the propagation of the green sand inside the mold chamber and the results are compared to experimental video footage. The chamber contains two cavities designed to quantify the deposited mass of green sand. The deposition of green sand in these two cavities is investigated with three cases of different air vent settings which control the ventilation of the chamber. These settings resulted in different air- and particle-velocities as well as different accumulated masses in the cavities, which were successfully simulated by the model.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Fluid Mechanics, Coastal and Maritime Engineering, DISA Industries A/S
Authors: Hovad, E. (Intern), Larsen, P. (Ekstern), Spangenberg, J. (Intern), Walther, J. H. (Intern), Thorborg, J. (Intern), Hattel, J. H. (Intern)
Number of pages: 51
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Powder Technology
ISSN (Print): 0032-5910
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.16 SJR 0.983 SNIP 1.482
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.965 SNIP 1.598 CiteScore 2.99
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.89 SNIP 1.649 CiteScore 2.67
C code generation applied to nonlinear model predictive control for an artificial pancreas

This paper presents a method to generate C code from MATLAB code applied to a nonlinear model predictive control (NMPC) algorithm. The C code generation uses the MATLAB Coder Toolbox. It can drastically reduce the time required for development compared to a manual porting of code from MATLAB to C, while ensuring a reliable and fairly optimized code. We present an application of code generation to the numerical solution of nonlinear optimal control problems (OCP). The OCP uses a sequential quadratic programming algorithm with multiple shooting and sensitivity computation. We consider the problem of glucose regulation for people with type 1 diabetes as a case study. The average computation time when using generated C code is 0.21 s (MATLAB: 1.5 s), and the maximum computation time when using generated C code is 0.97 s (MATLAB: 5.7 s). Compared to the MATLAB implementation, generated C code can run in average more than 7 times faster.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Scientific Computing
Authors: Boiroux, D. (Intern), Jørgensen, J. B. (Intern)
Pages: 327-332
Publication date: 2017
**CD49a Expression Defines Tissue-Resident CD8+ T Cells Poised for Cytotoxic Function in Human Skin**

Tissue-resident memory T (Trm) cells form a heterogeneous population that provides localized protection against pathogens. Here, we identify CD49a as a marker that differentiates CD8+ Trm cells on a compartmental and functional basis. In human skin epithelia, CD8+CD49a+ Trm cells produced interferon-γ, whereas CD8+CD49a− Trm cells produced interleukin-17 (IL-17). In addition, CD8+CD49a+ Trm cells from healthy skin rapidly induced the expression of the effector molecules perforin and granzyme B when stimulated with IL-15, thereby promoting a strong cytotoxic response. In skin from patients with vitiligo, where melanocytes are eradicated locally, CD8+CD49a+ Trm cells that constitutively expressed perforin and granzyme B accumulated both in the epidermis and dermis. Conversely, CD8+CD49a− Trm cells from psoriasis lesions predominantly generated IL-17 responses that promote local inflammation in this skin disease. Overall, CD49a expression delineates CD8+ Trm cell specialization in human epithelial barriers and correlates with the effector cell balance found in distinct inflammatory skin diseases.

**General information**

**State:** Published

**Organisations:** Department of Bio and Health Informatics, Integrative Systems Biology, Karolinska Institutet, Karolinska University Hospital, University of Bergen

**Authors:** Cheuk, S. (Ekstern), Schlums, H. (Ekstern), Sérézal, I. G. (Ekstern), Martini, E. (Ekstern), Chiang, S. C. (Ekstern), Marquardt, N. (Ekstern), Gibbs, A. (Ekstern), Detlofsson, E. (Ekstern), Introni, A. (Ekstern), Forkel, M. (Ekstern), Höög, C. (Ekstern), Tjernlund, A. (Ekstern), Michaelsson, J. (Ekstern), Folkersen, L. W. (Intern), Mjösberg, J. (Ekstern), Blomqvist, L. (Ekstern), Ehrström, M. (Ekstern), Stähle, M. (Ekstern), Bryceson, Y. T. (Ekstern), Eidsmo, L. (Ekstern)

**Pages:** 287-300

**Publication date:** 2017

**Main Research Area:** Technical/natural sciences

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**Journal:** Immunity

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- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): SJR 16.467 SNIP 4.611 CiteScore 17.17
- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 16.226 SNIP 4.044 CiteScore 15.52
- BFI (2013): BFI-level 2
- Scopus rating (2013): SJR 14.375 SNIP 3.922 CiteScore 15.26
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): SJR 15.631 SNIP 4.006 CiteScore 16.16
Cell Factory Engineering

Rational approaches to modifying cells to make molecules of interest are of substantial economic and scientific interest. Most of these efforts aim at the production of native metabolites, expression of heterologous biosynthetic pathways, or protein expression. Reviews of these topics have largely focused on individual strategies or cell types, but collectively they fall under the broad umbrella of a growing field known as cell factory engineering. Here we condense >130 reviews and key studies in the art into a meta-review of cell factory engineering. We identified 33 generic strategies in the field, all applicable to multiple types of cells and products, and proven successful in multiple major cell types. These apply to three major categories: production of native metabolites and/or bioactives, heterologous expression of biosynthetic pathways, and protein expression. This meta-review provides general strategy guides for the broad range of applications of rational engineering of cell factories.

General information

State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, CHO Cell Line Engineering and Design, Department of Biotechnology and Biomedicine, Network Engineering of Eukaryotic Cell factories, Technical University of Denmark
Authors: Davy, A. M. (Ekstern), Kildegaard, H. F. (Intern), Andersen, M. R. (Intern)
Pages: 262-275
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information

Journal: Cell Systems
Volume: 4
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Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 4.31
Centre-surround organization of fast sensorimotor integration in human motor hand area

Using the short-latency afferent inhibition (SAI) paradigm, transcranial magnetic stimulation (TMS) of the primary motor hand area (M1HAND) can probe how sensory input from limbs modulates corticomotor output in humans. Here we applied a novel TMS mapping approach to chart the spatial representation of SAI in human hand-knob. We hypothesized SAI is somatotopically expressed in M1HAND depending on both the site of peripheral electrical nerve stimulation and the cortical spot targeted by TMS within M1HAND. The left index or little finger was stimulated 23 ms before focal single-pulse TMS of the right M1HAND. Using frameless stereotaxy, we applied biphasic-TMS pulses at seven stimulation positions above right M1HAND and recorded the motor evoked potentials (MEPs) from relaxed left first-dorsal-interosseous (FDI) and abductor-digi-teri-minimi (ADM) muscles. Homotopic stimulation of the finger close to the muscle targeted by TMS revealed a somatotopic expression of afferent inhibition matching the somatotopic representation of unconditioned MEPs (homotopic SAI). Conversely, heterotopic stimulation of a finger distant to the muscle targeted by TMS induced short-latency afferent facilitation (SAF) of MEPs in M1HAND. Like homotopic SAI, heterotopic SAF was somatotopically expressed in M1HAND. Together, the results provide first-time evidence that fast sensorimotor integration involves centre-inhibition and surround-facilitation in human M1HAND.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Magnetic Resonance, Copenhagen University Hospital
Authors: Dubbioso, R. (Ekstern), Raffin, E. (Ekstern), Karabanov, A. (Ekstern), Thielscher, A. (Intern), Siebner, H. R. (Ekstern)
Pages: 37-47
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Neuroimage
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 6.31 SJR 3.823 SNIP 1.752
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 4.48 SNIP 1.84 CiteScore 6.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.201 SNIP 2.029 CiteScore 6.9
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 4.376 SNIP 2.026 CiteScore 7.06
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.922 SNIP 1.937 CiteScore 6.86
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.626 SNIP 1.81 CiteScore 6.31
ISI indexed (2011): ISI indexed yes
Cerebellar mutism syndrome in children with brain tumours of the posterior fossa

Background: Central nervous system tumours constitute 25% of all childhood cancers; more than half are located in the posterior fossa and surgery is usually part of therapy. One of the most disabling late effects of posterior fossa tumour surgery is the cerebellar mutism syndrome (CMS) which has been reported in up to 39% of the patients but the exact incidence is uncertain since milder cases may be unrecognized. Recovery is usually incomplete. Reported risk factors are tumour type, midline location and brainstem involvement, but the exact aetiology, surgical and other risk factors, the clinical course and strategies for prevention and treatment are yet to be determined.

Methods: This observational, prospective, multicentre study will include 500 children with posterior fossa tumours. It opened late 2014 with participation from 20 Nordic and Baltic centres. From 2016, five British centres and four Dutch centres will join with a total annual accrual of 130 patients. Three other major European centres are invited to join from 2016/17. Follow-up will run for 12 months after inclusion of the last patient. All patients are treated according to local practice. Clinical data are collected through standardized online registration at pre-determined time points pre- and postoperatively. Neurological status and speech functions are examined pre-operatively and postoperatively at 1-4 weeks, 2 and 12 months. Pre- and postoperative speech samples are recorded and analysed. Imaging will be reviewed centrally. Pathology is classified according to the 2007 WHO system. Germline DNA will be collected from all patients for associations between CMS characteristics and host genome variants including pathway profiles.

Discussion: Through prospective and detailed collection of information on 1) differences in incidence and clinical course of CMS for different patient and tumour characteristics, 2) standardized surgical data and their association with CMS, 3) diversities and results of other therapeutic interventions, and 4) the role of host genome variants, we aim to achieve a better understanding of risk factors for and the clinical course of CMS - with the ultimate goal of defining strategies for prevention and treatment of this severely disabling condition.

General information
State: Published
Organisations: Department of Bio and Health Informatics, Disease Intelligence and Molecular Evolution, Rigshospitalet, St Olavs University Hospital, Skåne University Hospital, Aarhus University Hospital, Karolinska University Hospital,
CFD modeling of condensation process of water vapor in supersonic flows

The condensation phenomenon of vapor plays an important role in various industries, such as the steam flow in turbines and refrigeration system. A mathematical model is developed to predict the spontaneous condensing phenomenon in the supersonic flows using the nucleation and droplet growth theories. The numerical approach is validated with the experimental data, which shows a good agreement between them. The condensation characteristics of water vapor in the Laval nozzle are described in detail. The results show that the condensation process is a rapid variation of the vapor-liquid phase change both in the space and in time. The spontaneous condensation of water vapor will not appear immediately when the steam reaches the saturation state. Instead, it occurs further downstream the nozzle throat, where the steam is in the state of supersaturation.
CFD Modeling of Flow and Ion Exchange Kinetics in a Rotating Bed Reactor System

A rotating bed reactor (RBR) has been modeled using computational fluid dynamics (CFD). The flow pattern in the RBR was investigated and the flow through the porous material in it was quantified. A simplified geometry representing the more complex RBR geometry was introduced and the simplified model was able to reproduce the main characteristics of the flow. Alternating reactor shapes were investigated, and it was concluded that the use of baffles has a very large impact on the flows through the porous material. The simulations suggested, therefore, that even faster reaction rates could be achieved by making the baffles deeper. Two-phase simulations were performed, which managed to reproduce the deflection of the gas–liquid interface in an unbaffled system. A chemical reaction was implemented in the model, describing the ion-exchange phenomena in the porous material using four different Sherwood number correlations. The simulations were overall in good agreement with experimental data.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, Technical University of Denmark, SpinChem AB
Authors: Larsson, H. K. (Intern), Schjøtt Andersen, P. A. (Ekstern), Byström, E. (Ekstern), Gernaey, K. (Intern), Krühne, U. (Intern)
Pages: 3853–3865
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Industrial & Engineering Chemistry Research
Volume: 56
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.1 SJR 0.945 SNIP 1.139
The supersonic separator is a novel technique to remove the condensable components from gas mixtures. But the particle behavior is not well understood in this complex supersonic flow. The Discrete Particle Method was used here to study the particle motion in supersonic flows with a strong swirl. The results showed that the gas flow was accelerated to supersonic velocity, and created the low pressure and temperature conditions for gas removal. Most of the particles collided with the...
wells or entered into the liquid-collection space directly, while only a few particles escaped together with the gas flow from the dry gas outlet. The separation efficiency reached over 80%, when the droplet diameter was more than 1.5 μm. The optimum length of the cyclonic separation section was approximate 16–20 times of the nozzle throat diameter to obtain higher collection efficiency for the supersonic separator with a delta wing.

**General information**

State: Published  
Organisations: Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, Changzhou University  
Authors: Yang, Y. (Ekstern), Wen, C. (Intern)  
Pages: 22-28  
Publication date: 2017  
Main Research Area: Technical/natural sciences

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Journal: Separation and Purification Technology  
Volume: 174  
ISSN (Print): 1383-5866  
Ratings:  
BFI (2017): BFI-level 2  
Web of Science (2017): Indexed yes  
BFI (2016): BFI-level 2  
Scopus rating (2016): SJR 1.023 SNIP 1.394 CiteScore 3.78  
Web of Science (2016): Indexed yes  
BFI (2015): BFI-level 2  
Scopus rating (2015): SJR 1.078 SNIP 1.504 CiteScore 3.75  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 2  
Scopus rating (2014): SJR 1.257 SNIP 1.54 CiteScore 3.5  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 2  
Scopus rating (2013): SJR 1.325 SNIP 1.678 CiteScore 3.62  
ISI indexed (2013): ISI indexed yes  
Web of Science (2013): Indexed yes  
BFI (2012): BFI-level 2  
Scopus rating (2012): SJR 1.409 SNIP 1.732 CiteScore 3.2  
ISI indexed (2012): ISI indexed yes  
Web of Science (2012): Indexed yes  
BFI (2011): BFI-level 2  
Scopus rating (2011): SJR 1.35 SNIP 1.64 CiteScore 3.48  
ISI indexed (2011): ISI indexed yes  
Web of Science (2011): Indexed yes  
BFI (2010): BFI-level 2  
Scopus rating (2010): SJR 1.376 SNIP 1.586  
BFI (2009): BFI-level 2  
Scopus rating (2009): SJR 1.388 SNIP 1.542  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 1.109 SNIP 1.433  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 1.015 SNIP 1.457  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 1.222 SNIP 1.628  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 1.012 SNIP 1.424  
Scopus rating (2004): SJR 1.042 SNIP 1.314  
Scopus rating (2003): SJR 0.843 SNIP 1.069
Condensation and moisture related problems are the cause of failures in many cases and consequently serious concerns for reliability in electronics industry. Thus, it is important to control the moisture content and the relative humidity inside electronic enclosures. In this work, a computational fluid dynamics (CFD) model is developed to simulate moisture transfer into a typical electronic enclosure. In the first attempt, an isothermal case is developed and compared against the well-known RC circuit analogy considering the behavior of an idealized electronic enclosure. It is shown that the RC method predicts a faster trend for the moisture transfer into the enclosure compared to the CFD. The effect of several important parameters, namely, position of the opening, initial relative humidity inside the enclosure, length and radius of the opening and temperature is studied using the developed CFD model for the isothermal case. The model is then combined with a two level factorial design to identify the significant factors as well as the potential interactions using the numerical simulation results. In the second part of this study, a non-isothermal case is studied, in which the enclosure is exposed to two different conditions, i.e., internal temperature oscillation only and combined cyclic changes of ambient relative humidity and temperature. The results are compared with experimental data from literature, and show that the local climate inside the enclosure responds faster to the temperature changes compared to the RH changes. The trends predicted by the CFD simulations can be used to decide for the right time and position of a commercial adsorbent and/or thermal mass inside the enclosure to control the local climate.
Challenges and opportunities of fibre-reinforced polymers in additive manufacturing with focus on industrial applications

Functional parts made by additive manufacturing of polymers have entered the area of industrial applications in recent years providing a wide range of materials with various mechanical, thermal, and electrical properties. These additive manufacturing processes can be combined with known fibre-reinforcements applying modified material parameters with the use of fibre-reinforced polymers.

An increase of tensile strength and Young’s modulus result from the application of short fibres in a polymer matrix opening up perspectives for a variety of industrial applications such as injection moulding, biomedical engineering, aerospace, racing, and train technology. A literature survey was conducted in order to identify challenges and opportunities in these fields.

General information

State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering
Authors: Hofstätter, T. (Intern), Pedersen, D. B. (Intern), Tosello, G. (Intern), Hansen, H. N. (Intern)
Number of pages: 4
Publication date: 2017

Host publication information

Title of host publication: Proceedings of the Joint Special Interest Group meeting between euspen and ASPE : Dimensional Accuracy and Surface Finish in Additive Manufacturing
Publisher: The European Society for Precision Engineering and Nanotechnology
Main Research Area: Technical/natural sciences
Conference: euspen and ASPE Special Interest Group Meeting: Additive Manufacturing, Leuven, Belgium, 10/10/2017 - 10/10/2017
Publication: Research - peer-review » Article in proceedings – Annual report year: 2017
Challenges Handling Magnetospheric and Ionospheric Signals in Internal Geomagnetic Field Modelling

Measurements of the Earth’s magnetic field collected by low-Earth-orbit satellites such as Swarm and CHAMP, as well as at ground observatories, are dominated by sources in the Earth’s interior. However these measurements also contain significant contributions from more rapidly-varying current systems in the ionosphere and magnetosphere. In order to fully exploit magnetic data to probe the physical properties and dynamics of the Earth’s interior, field models with suitable treatments of external sources, and their associated induced signals, are essential. Here we review the methods presently used to construct models of the internal field, focusing on techniques to handle magnetospheric and ionospheric signals. Shortcomings of these techniques often limit the quality, as well as spatial and temporal resolution, of internal field models. We document difficulties in using track-by-track analysis to characterize magnetospheric field fluctuations, differences in internal field models that result from alternative treatments of the quiet-time ionospheric field, and challenges associated with rapidly changing, but spatially correlated, magnetic signatures of polar cap current systems. Possible strategies for improving internal field models are discussed, many of which are described in more detail elsewhere in this volume.

General information
State: Published
Organisations: National Space Institute, Geomagnetism, Institut de Physique du Globe de Paris, Université de Nantes, German Research Centre for Geosciences, British Antarctic Survey
Authors: Finlay, C. (Intern), Lesur, V. (Ekstern), Thébault, E. (Ekstern), Vervelidou, F. (Ekstern), Morschhauser, A. (Ekstern), Shore, R. (Ekstern)
Pages: 157–189
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Main Research Area: Technical/natural sciences

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Journal: Space Science Reviews
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Ratings:
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 2.982 SNIP 2.688 CiteScore 6.45
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 2.952 SNIP 3.005 CiteScore 5.97
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 3.386 SNIP 2.78 CiteScore 5.94
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.483 SNIP 2.366 CiteScore 4.88
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.102 SNIP 2.06 CiteScore 3.8
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.253 SNIP 1.85 CiteScore 4.23
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.171 SNIP 1.76
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.098 SNIP 1.762
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 1.715 SNIP 1.341
Scopus rating (2007): SJR 2.177 SNIP 1.492
Scopus rating (2006): SJR 2.101 SNIP 1.394
Scopus rating (2005): SJR 1.622 SNIP 1.335
Scopus rating (2004): SJR 1.142 SNIP 0.962
Scopus rating (2003): SJR 1.414 SNIP 1.324
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.856 SNIP 0.911
Challenges in Building a Sustainable Biobased Economy

Moving to a more sustainable economy, where renewable biomass such as crop residues and dedicated energy crops are used for the production of fuels, chemicals, energy and materials, is one of the main challenges faced by the society nowadays. The transition from the current fossil-based to a biobased economy is justified for several reasons, including environmental concerns like climate change and environmental pollution, poverty, the increased consumption of petro-based resources as a consequence of the population growth, and the finite nature of oil resources. Expanding the resource basis for the production of fuels, chemicals, energy and materials is therefore recognized as a need by numerous industries and policy makers in countries around the world. In addition, a biobased economy has the potential to generate new jobs and even new industries, creating new opportunities for entrepreneurship and technological innovation, with further benefits to the global economy and the society.

General information

State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Biomass Conversion and Bioprocess Technology
Authors: Mussatto, S. I. (Intern)
Pages: 1-2
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Main Research Area: Technical/natural sciences

Publication information

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Volume: 106
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Ratings:
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Web of Science (2017): Indexed yes
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Scopus rating (2016): CiteScore 3.78 SJR 1.059 SNIP 1.657
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.051 SNIP 1.787 CiteScore 3.7
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.086 SNIP 1.738 CiteScore 3.26
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 0.969 SNIP 2.072 CiteScore 3.69
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.002 SNIP 1.933 CiteScore 2.96
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 0.968 SNIP 2.081 CiteScore 3.16
ISI indexed (2011): ISI indexed yes
Challenges in simulating coastal effects on an offshore wind farm: Paper
The effect of a coastline on an offshore wind farm is investigated with a Reynolds-averaged Navier-Stokes (RANS) model. The trends of the RANS model compare relatively well with results from a mesoscale model and measurements of wind turbine power. In addition, challenges of modeling a large domain in RANS are discussed.

General information
State: Published
Authors: van der Laan, P. (Intern), Peña, A. (Intern), Volker, P. (Intern), Hansen, K. S. (Intern), Sørensen, N. N. (Intern), Ott, S. (Intern), Hasager, C. B. (Intern)
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Publication: Research - peer-review › Article in proceedings – Annual report year: 2017
Challenges in using allylthiourea and chlorate as specific nitrification inhibitors

Allylthiourea (ATU) and chlorate (ClO3-) are often used to selectively inhibit nitritation and nitratation. In this work we identified challenges with use of these compounds in inhibitory assays with filter material from a biological rapid sand filter for groundwater treatment. Inhibition was investigated in continuous-flow lab-scale columns, packed with filter material from a full-scale filter and supplied with NH4+ or NO2-. ATU concentrations of 0.1-0.5 mM interfered with the indophenol blue method for NH4+ quantification leading to underestimation of the measured NH4+ concentration. Interference was stronger at higher ATU levels and resulted in no NH4+ detection at 0.5 mM ATU. ClO3- at typical concentrations for inhibition assays (1-10 mM) inhibited nitratation by less than 6%, while nitratation was instead inhibited by 91% when NH4+ was supplied. On the other hand, nitratation was inhibited by 67-71% at 10-20 mM ClO3- when NO2- was supplied, suggesting significant nitratation inhibition at higher NO2- concentrations. No chlorite (ClO2-) was detected in the effluent, and thus we could not confirm that nitration inhibition was caused by ClO3- reduction to ClO2-. In conclusion, ATU and ClO3- should be used with caution in inhibition assays, because analytical interference and poor selectivity for the targeted process may affect the experimental outcome and compromise result interpretation.

General information
State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems, Water Technologies, University of Southern Denmark
Authors: Tatari, K. (Intern), Gülay, A. (Intern), Thamdrup, B. (Ekstern), Albrechtsen, H. (Intern), Smets, B. F. (Intern)
Number of pages: 5
Pages: 301-305
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Chemosphere
Volume: 182
ISSN (Print): 0045-6535
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.39 SJR 1.417 SNIP 1.606
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.51 SNIP 1.57 CiteScore 4.04
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.593 SNIP 1.651 CiteScore 3.76
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.724 SNIP 1.767 CiteScore 3.92
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.818 SNIP 1.623 CiteScore 3.5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.961 SNIP 1.515 CiteScore 3.61
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.867 SNIP 1.421
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.836 SNIP 1.573
Challenges of Implementing Renewable Energy Policies at Community Scale: The Case of Strategic Energy Plans in Denmark

The implementation of national energy efficiency targets requires policies at the local scale. It is widely acknowledged that local communities play an important role in implementing these policies: as arena where renewable energy technologies can be combined with socio-economic interests of local stakeholders. Although a vast amount of demonstration projects are well-documented, insufficient attention has been given to the average performing municipalities and their challenges in linking technical energy scenarios with their socio-economic realities in practice. This paper analyses the Strategic Energy Plans (SEP) of 17 Danish municipalities on their development, inclusion of local communities, affected stakeholders, and on their impact on the municipalities’ working procedures.

The main technical, physical, organisational and socio-economic challenges for local energy policy implementation are illustrated by means of the SEPs. Findings indicate lacking capacity in municipalities; in both resources and technical knowledge. This explains partly the technology-focused strategies developed by private sector technocrats, leading to a negligence of socio-technical realities of the local communities, which in combination with lacking capacity makes it difficult for municipalities to implement these energy strategies. Conclusive, an implementation-oriented taxonomy of implementation challenges for communities to optimize the development and scope of SEPs is proposed. This approach might help improving local anchoring of energy strategies in communities, and raise awareness for external challenges to facilitate the strategy production and implementation process.

General information
State: Accepted/In press
Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics
Authors: Petersen, J. (Intern)
Publication date: 2017

Host publication information
Title of host publication: Proceedings of the 13th International Conference on Researches in Science and Technology
Main Research Area: Technical/natural sciences
Conference: 13th International Conference on Researches in Science and Technology, Lisbon, Portugal, 25/05/2017 - 25/05/2017
Renewable Energies, Renewable Energy Policy, Municipal Energy Strategies, Implementation Challenges, Local Communities
Challenges to fisheries management due to stock recovery

General information
State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life
Authors: van Gemert, R. (Intern), Andersen, K. H. (Intern)
Publication date: 2017
Event: Abstract from ICES Annual Science Conference 2017, Fort Lauderdale, United States.
Main Research Area: Technical/natural sciences

Bibliographical note
ICES CM 2017/G:266
Publication: Research › Conference abstract for conference – Annual report year: 2017

Challenging the limits for beam bending designs

The traditional design limits of beams in bending have been challenged by testing from very under-reinforced design to over-reinforced and strengthened over-reinforced designs in order to investigate if the current limits could be abolished. The ductility of normally reinforced beam depends significantly on the amount of reinforcement and an over-reinforced design can be modified to behave as a normally reinforced design, but with extreme ductile behaviours, but may requires stirrups beyond the codes requirements for columns. The ductility of under-reinforced beams may exceed that of some normally reinforced designs.

General information
State: Submitted
Organisations: Department of Civil Engineering, Section for Structural Engineering
Authors: Goltermann, P. (Intern)
Number of pages: 4
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Title of host publication: Proceedings of the XXIII Nordic Concrete Research Symposium
Main Research Area: Technical/natural sciences
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Modelling, Reinforcement, Structural design, Testing
Source: PublicationPreSubmission
Source-ID: 130966414
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Change detection in a series of Sentinel-1 SAR data

Based on an omnibus likelihood ratio test statistic for the equality of several variance-covariance matrices following the complex Wishart distribution with an associated p-value and a factorization of this test statistic, change analysis in a time series of seven multilook, dual polarization Sentinel-1 SAR data in the covariance matrix representation (with diagonal elements only) is carried out. The omnibus test statistic and its factorization detect if and when change occurs.


General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, National Space Institute, Microwaves and Remote Sensing, Research Center Jülich GmbH
Authors: Nielsen, A. A. (Intern), Conradsen, K. (Intern), Skriver, H. (Intern), Canty, M. J. (Ekstern)
Number of pages: 3
Publication date: 2017

Host publication information
Title of host publication: 9th International Workshop on the Analysis of Multitemporal Remote Sensing Images (MultiTemp 2017)
Publisher: IEEE
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Main Research Area: Technical/natural sciences
Conference: 9th International Workshop on the Analysis of Multitemporal Remote Sensing Images (MultiTemp 2017), Bruges, Belgium, 27/06/2017 - 27/06/2017
Changes imposed by pyrolysis, thermal gasification and incineration on composition and phosphorus fertilizer quality of municipal sewage sludge

Fertilizer quality of ash and char from incineration, gasification and pyrolysis of a single municipal sewage sludge sample were investigated by comparing composition and phosphorus (P) plant availability. A process for post oxidation of gasification ash and pyrolysis char was developed and the oxidized materials were investigated as well. Sequential extraction with full elemental balances of the extracted pools as well as scanning electron microscopy with energy dispersive X-ray spectroscopy were used to investigate the mechanisms driving the observed differences in composition and P plant availability in a short-term soil incubation study. The compositional changes related mainly to differences in the proximate composition as well as to the release of especially nitrogen, sulfur, cadmium and to some extent, phosphorus (P). The cadmium load per unit of P was reduced with 75–85% in gasification processes and 10–15% in pyrolysis whereas no reduction was observed in incineration processes. The influence on other heavy metals was less pronounced. The plant availability of P in the substrates varied from almost zero to almost 100% of the plant availability of P in the untreated sludge. Post-oxidized slow pyrolysis char was found to be the substrate with the highest P fertilizer value while ash from commercial fluid bed sludge incineration had the lowest P fertilizer quality. The high P fertilizer value in the best substrate is suggested to be a function of several different mechanisms including structural surface changes and improvements in the association of P to especially magnesium, calcium and aluminum.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CHEC Research Centre, University of Copenhagen
Authors: Thomsen, T. P. (Intern), Sárossy, Z. (Intern), Ahrenfeldt, J. (Intern), Henriksen, U. B. (Intern), Jappe Frandsen, F. (Intern), Müller-Stöver, D. S. (Ekstern)
Pages: 308-318
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.28 SJR 1.141 SNIP 1.779
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.19 SNIP 1.717 CiteScore 3.86
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.228 SNIP 1.921 CiteScore 3.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.203 SNIP 2.014 CiteScore 3.84
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.377 SNIP 2.513 CiteScore 4.01
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.206 SNIP 2.181 CiteScore 3.66
ISI indexed (2011): ISI indexed yes
Changes in distributional patterns of plaice Pleuronectes platessa in the central and eastern North Sea; do declining nutrient loadings play a role?

Since the beginning of the 1990s, there has been a change in the relative distribution of smaller age-classes of plaice Pleuronectes platessa (age 1–3) in the North Sea. The abundances have increased in deeper, more offshore areas, while coastal abundances have been stagnant or declining. For the same time period available time series data on nutrient conditions in the coastal North Sea area show that the freshwater nitrogen loading has decreased by about 50%. While nutrient concentrations in the ambient environment have been shown to influence growth in juvenile plaice through influence on their prey, we here inspect the potential linkage between distributional changes in plaice and the decline in nutrient loading. We compare plaice observations in coastal areas in the eastern North Sea, which have experienced large changes in eutrophication, with observations for the Dogger Bank, a large sandbank in a shallow offshore area of the North Sea. The Dogger Bank was used as a reference location assuming this area has been less influenced from coastal eutrophication but similar regional climate conditions, and here we found no changes in the abundances of juvenile plaice. The increase in the use of offshore habitats as nursery areas by juvenile plaice in the North Sea appears not related to water depth per se but driven by specific processes dominating in near-shore areas and may be related to changes in nutrient loadings. This point to the importance of separating more general depth-related factors from conditions specific for near-shore areas, such as nutrient loadings in coastal waters and export offshore. The concurrent changes in environment and in distribution of juvenile plaice may have implications for environmental and fisheries management.
Changes in intermittent aeration regimes are effective tools to manage bio-granule size and microbial communities in partial nitritation-anammox SBRs

General information
State: Published
Organisations: Department of Environmental Engineering, Water Technologies
Authors: Blum, J. (Intern), Smets, B. F. (Intern)
Pages: 20-20
Publication date: 2017

Host publication information
Title of host publication: Abstract proceedings - 11th annual meeting danish water forum
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Publisher: University of Copenhagen
Editors: Flindt Jørgensen, L., Mosolff Larsen, T., Jensen, B. K.
Main Research Area: Technical/natural sciences
Conference: 11th Annual Meeting of Danish Water Forum, Copenhagen, Denmark, 30/01/2017
Electronic versions:
Abstract proceedings book
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Changes in phenology and the influence on the carbon sequestration in a Danish beech forest over 20 years
Observations of carbon sequestration in a Danish beech forest over the last 20 years have shown a steady increase in NEE. Earlier studies (Pilegaard et al. 2011) have shown, that about half of the increase can be attributed to an increase in the growing season length. The growing season has been determined as the carbon uptake period (CUP); i.e. the period with net uptake, determined from flux data. Additionally, we have determined the period with leaves (LP) from the attenuation of light below the canopy. In this analysis we add information from a phenology camera with data from the last 6 years using the R package Phenopix (Filippa et al. 2016). The new data is compared with CUP and LP to give more detailed information on the phenology. The information is used to examine the evolution of net ecosystem exchange (NEE) over the 20 year period.

General information
State: Published
Organisations: Department of Environmental Engineering, Atmospheric Environment
Authors: Pilegaard, K. (Intern), Ibrom, A. (Intern)
Number of pages: 1
Publication date: 2017
Event: Poster session presented at 2nd ICOS Science Conference on greenhouse gases and biogeochemical cycles, Helsinki, Finland.
Main Research Area: Technical/natural sciences
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Links: https://www.zenodo.org/record/375860#.WMEDAlU1_mF
Publication: Research - peer-review › Poster – Annual report year: 2017

Chapter 3 – VPPD-Lab: The Chemical Product Simulator
Computer-aided methods and tools for current and future product–process design and development need to manage problems requiring efficient handling of models, data, and knowledge from different sources and at different times and size scales. In this chapter, a systematic model-based framework for computer-aided chemical product design and evaluation, implemented in the software called VPPD-Lab, is presented. In the same way a typical process simulator works, the VPPD-Lab allows users to: (1) analyze chemical-based products by performing virtual experiments (product property and performance calculations), (2) predict the properties of products, and (3) create new product property and product performance models when needed. However, unlike process simulators, VPPD-Lab can also be used directly for (1) design of chemicals based products using design templates for various types of products, such as single molecule products, formulations, blends, emulsions, and devices; and (2) to create new product design templates when the needed template for a desired product is not available. VPPD-Lab employs a suite of algorithms (such as database search, molecular and mixture blend design) and toolboxes (such as property calculations and property model consistency tests) for specific product property prediction, design, and/or analysis tasks. The application of VPPD-Lab is highlighted through case studies involving solvent mixture stability check, lubricant blend design, jet fuel blend design, and insect repellent lotion design. Through these case studies, the use of design templates, associated workflows (methods), data flows
Today's society needs many chemical-based products for its survival, nutrition, health, transportation, agriculture, and the functioning of processes. Chemical-based products have to be designed/developed in order to meet these needs, while at the same time, they must be innovative and sustainable to meet the global challenges of resources, competition, and demand. Design/development of these products mostly follows experiment-based trial and error approaches. With the availability of reliable property prediction models, however, computer-aided techniques have become popular, at least for the initial stages of the design/development process. Therefore, computer-aided molecular design and property prediction techniques are two topics that play important roles in chemical product design, analysis, and application. In this chapter, an overview of the concepts, methods, and tools related to these two topics are given. In addition, a generic computer-aided framework for the design of molecules, mixtures, and blends is presented. The application of the framework is highlighted for molecular products through two case studies involving the design of refrigerants and surfactants.
Characterisation and full-scale production testing of multifunctional surfaces for deep drawing applications

Full-scale deep drawing tests using tools featuring multifunctional surfaces are carried out in a production environment. Multifunctional tools display regularly spaced, transversal grooves for lubricant retention obtained by hard-turning, separated by smooth bearing plateaus realized by robot assisted polishing. Advanced methods are employed to characterise the tools' surface topographies, detecting the surface features and analysing them separately according to their specific function. Four different multifunctional dies as well as two un-textured references are selected for testing. The tests are run using a non-hazardous, environmentally friendly lubricant, and the forming forces are constantly recorded. Multifunctional dies exhibit very good performances, with no galling occurrence and punch forces generally lower than the two references.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Strecon A/S
Authors: Godi, A. (Intern), Grønbæk, J. (Ekstern), De Chiffre, L. (Intern)
Number of pages: 8
Pages: 64–71
Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: C I R P - Journal of Manufacturing Science and Technology
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Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.76 SJR 0.81 SNIP 1.991
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 0.953 SNIP 1.862 CiteScore 2.55
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 1.133 SNIP 1.777 CiteScore 2.46
Scopus rating (2013): SJR 0.95 SNIP 1.796 CiteScore 2.01
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.819 SNIP 1.822 CiteScore 1.69
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.946 SNIP 2.037 CiteScore 1.72
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 1.202 SNIP 2.299
Scopus rating (2009): SJR 0.837 SNIP 1.085
Original language: English
Functional surfaces, Metal forming, Production tests, Surface characterisation, Metal drawing, Deep drawing tests, Environmentally friendly lubricants
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Publication: Research - peer-review › Journal article – Annual report year: 2016

Characterisation of an ultra low-background point contact HPGe well-detector for an underground laboratory

Since a few years there are well-type HPGe-detectors with a small, point-like, anode contacts available commercially. This paper describes the characterisation of the first ultra low-background, so-called, SAGe™ well detector with regards to resolution and background performance. Inside a passive lead/copper shield in the underground laboratory HADES a background count rate of $690 \pm 60$ disintegrations per minute per kg Ge was recorded 19 months after taking it underground.

General information
State: Accepted/In press
Organisations: Center for Nuclear Technologies, The Hevesy Laboratory, Radioecology and Tracer Studies, European Commission Joint Research Centre Institute
Characterisation of lactic acid bacteria in spontaneously fermented camel milk and selection of strains for fermentation of camel milk

The microbial communities in spontaneously fermented camel milk from Ethiopia were characterised through metagenomic 16S rRNA sequencing and lactic acid bacteria were isolated with the goal of selecting strains suitable as starter cultures. The fermented camel milk microbiota was dominated either by Lactobacillales or by Enterobacteriaceae, depending on incubation temperature and the provider of the milk. Strains of species with a potential use as starter cultures i.e., Lactococcus lactis, Lactobacillus plantarum, and Pediococcus acidilactici, were isolated. Fast acidifiers of camel milk have been isolated from the species of Lc. lactis, P. acidilactici, and Streptococcus infantarius. Gram-negative and potentially pathogenic microorganisms were frequent in spontaneously fermented camel milk, indicating the need for improved hygiene in Ethiopian camel farms. The profiled microbiota of spontaneously fermented camel milk and the isolated LAB strains will significantly contribute towards improving food safety and food security in dry regions that depend on camel milk production.

General information
State: Published
Organisations: National Food Institute, Research Group for Gut Microbiology and Immunology, Haramaya University, Technical University of Denmark, University of Copenhagen
Authors: Fugl, A. J. B. (Intern), Berhe, T. (Ekstern), Kiran, A. (Ekstern), Hussain, S. (Ekstern), Laursen, M. F. (Intern), Bahl, M. I. (Intern), Hailu, Y. (Ekstern), Sørensen, K. I. (Ekstern), Guya, M. E. (Ekstern), Ipsen, R. (Ekstern), Hansen, E. B. (Intern)
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Journal: International Dairy Journal
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 1.125 SNIP 1.255 CiteScore 2.34
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.978 SNIP 1.17 CiteScore 2.18
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.061 SNIP 1.175 CiteScore 2.24
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.238 SNIP 1.408 CiteScore 2.79
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.282 SNIP 1.467 CiteScore 2.55
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Characterisations of Partition of Units Generated by Entire Functions in \( \mathbb{C}^d \)

Collections of functions forming a partition of unity play an important role in analysis. In this paper we characterise for any \( N \in \mathbb{N} \) the entire functions \( P \) for which the partition of unity condition \( \sum_{n \in \mathbb{Z}^d} P(x+n) \chi_{[0,N]}(x+n) = 1 \) holds for all \( x \in \mathbb{R}^d \). The general characterisation leads to various easy ways of constructing such entire functions as well. We demonstrate the flexibility of the approach by showing that additional properties like continuity or differentiability of the functions \( (P_{x_0,N} \cdot (x+n)) \) can be controlled. In particular, this leads to easy ways of constructing entire functions \( P \) such that the functions in the partition of unity belong to the Feichtinger algebra.

General information

State: E-pub ahead of print
Organisations: Department of Applied Mathematics and Computer Science, Mathematics, Ulsan National Institute of Science and Technology, Yeungnam University
Authors: Christensen, O. (Intern), Kim, H. O. (Ekstern), Kim, R. Y. (Ekstern)
Number of pages: 10
Publication date: 2017
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Publication information

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Ratings:
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.523 SNIP 0.726 CiteScore 0.51
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.505 SNIP 0.771 CiteScore 0.44
Web of Science (2015): Indexed yes
Characteristic Rain Events: A Methodology for Improving the Amenity Value of Stormwater Control Measures

Local management of rainwater using stormwater control measures (SCMs) is gaining increased attention as a sustainable alternative and supplement to traditional sewer systems. Besides offering added utility values, many SCMs also offer a great potential for added amenity values. One way of achieving amenity value is to stage the rainwater and thus bring it to the attention of the public. We present here a methodology for creating a selection of rain events that can help bridge between engineering and landscape architecture when dealing with staging of rainwater. The methodology uses quantitative and statistical methods to select Characteristic Rain Events (CREs) for a range of frequent return periods: weekly, bi-weekly, monthly, bi-monthly, and a single rarer event occurring only every 1–10 years. The methodology for selecting CREs is flexible and can be adjusted to any climatic settings; here we show its use for Danish conditions. We illustrate with a case study how CREs can be used in combination with a simple hydrological model to visualize where, how deep and for how long water is visible in a landscape designed to manage rainwater.

General information
State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems, University of Copenhagen
Authors: Smit Andersen, J. (Ekstern), Lerer, S. M. (Intern), Backhaus, A. (Ekstern), Jensen, M. B. (Ekstern), Serup, H. J. D. (Intern)
Number of pages: 18
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Sustainability
Volume: 9
Issue number: 10
Article number: 1793
ISSN (Print): 2071-1050
Ratings:
Characteristics of Low-latitude Coronal Holes near the Maximum of Solar Cycle 24

We investigate the statistics of 288 low-latitude coronal holes extracted from SDO/AIA-193 filtergrams over the time range of 2011 January 01–2013 December 31. We analyze the distribution of characteristic coronal hole properties, such as the areas, mean AIA-193 intensities, and mean magnetic field densities, the local distribution of the SDO/AIA-193 intensity and the magnetic field within the coronal holes, and the distribution of magnetic flux tubes in coronal holes. We find that the mean magnetic field density of all coronal holes under study is 3.0 ± 1.6 G, and the percentaged unbalanced magnetic flux is 49 ± 16%. The mean magnetic field density, the mean unsigned magnetic field density, and the percentaged unbalanced magnetic flux of coronal holes depend strongly pairwise on each other, with correlation coefficients $cc > 0.92$. Furthermore, we find that the unbalanced magnetic flux of the coronal holes is predominantly concentrated in magnetic flux tubes: 38% (81%) of the unbalanced magnetic flux of coronal holes arises from only 1% (10%) of the coronal hole area, clustered in magnetic flux tubes with field strengths >50 G (10 G). The average magnetic field density and the unbalanced magnetic flux derived from the magnetic flux tubes correlate with the mean magnetic field density and the unbalanced magnetic flux of the overall coronal hole ($cc > 0.93$). These findings give evidence that the overall magnetic characteristics of coronal holes are governed by the characteristics of the magnetic flux tubes.

General information
State: Published
Organisations: National Space Institute, Astrophysics and Atmospheric Physics, University of Graz, HVAR Observatory, Universität Kiel
Authors: Hofmeister, S. J. (Ekstern), Veronig, A. (Ekstern), Reiss, M. A. (Ekstern), Temmer, M. (Ekstern), Vennerstrøm, S. (Intern), Vršnak, B. (Ekstern), Heber, B. (Ekstern)
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Main Research Area: Technical/natural sciences

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Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.26
Characteristics of volatile compound emission and odor pollution from municipal solid waste treating/disposal facilities of a city in Eastern China

Transfer station, incineration plant, and landfill site made up the major parts of municipal solid waste disposal system of S city in Eastern China. Characteristics of volatile compounds (VCs) and odor pollution of each facility were investigated from a systematic perspective. Also major index related to odor pollution, i.e., species and concentration of VCs, olfactory odor concentration, and theoretic odor concentration, was quantified. Oxygenated compounds and hydrocarbons were the most abundant VCs in the three facilities. Different chemical species were quantified, and the following average concentrations were obtained: transfer station, 54 VCs, 2472.47 μg/m³; incineration plant, 75 VCs, 33,129.25 μg/m³; and landfill site, 71 VCs, 1694.33 μg/m³. Furthermore, the average olfactory odor concentrations were 20,388.80; 50,677.50; and 4951.17, respectively. The highest odor nuisance was detected in the waste tipping port of the incineration plant. A positive correlation between the olfactory and chemical odor concentrations was found with $R^2 = 0.918$ ($n = 15, P < 0.01$). The result shows odor pollution risk transfer from landfill to incineration plant when adopting thermal technology to deal with the non-source-separated waste. Strong attention thus needs to be paid on the enclosed systems in incineration plant to avoid any accidental odor emission.
Characterization and compensation of thermo-elastic instability of SWARM optical bench on Micro Advanced Stellar Compass attitude observations

Launched into orbit on November 22, 2013, the Swarm constellation of three satellites precisely measures magnetic signal of the Earth. To ensure the high accuracy of magnetic observation by vector magnetometer (VFM), its inertial attitude is precisely determined by µASC (micro Advanced Stellar Compass). Each of the three Swarm satellites is equipped with three µASC Camera Head Units (CHU) mounted on a common optical bench (OB), which has a purpose of transference of the attitude from the star trackers to the magnetometer measurements. Although substantial pre-launch analyses were made to maximize thermal and mechanical stability of the OB, significant signal with thermal signature is discovered when comparing relative attitude between the three CHU's (Inter Boresight Angle, IBA). These misalignments between CHU's, and consequently geomagnetic reference frame, are found to be correlated with the period of angle between Swarm orbital plane and the Sun (ca. 267 days), which suggests sensitivity of optical bench system on temperature variation. In this paper, we investigate the propagation of thermal effects into the µASC attitude observations and demonstrate how thermally induced attitude variation can be predicted and corrected in the Swarm data processing. The results after applying thermal corrections show decrease in IBA RMS from 6.41 to 2.58 arc-seconds. The model significantly improves attitude determination which, after correction, meets the requirements of Swarm satellite mission. This study demonstrates the importance of the OB pre-launch analysis to ensure minimum thermal gradient on satellite optical system and therefore maximum attitude accuracy.
Characterization and Erosion Modeling of a Nozzle-Based Inflow-Control Device

In the petroleum industry, water-and-gas breakthrough in hydrocarbon reservoirs is a common issue that eventually leads to uneconomic production. To extend the economic production lifetime, inflow-control devices (ICDs) are designed to delay the water-and-gas breakthrough. Because the lifetime of a hydrocarbon reservoir commonly exceeds 20 years and it is a harsh environment, the reliability of the ICDs is vital.

General information
State: Accepted/In press
Organisations: Department of Chemistry, Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, Welltec, Lloyd’s Register Consulting
Authors: Olsen, J. J. (Intern), Hemmingsen, C. S. (Intern), Bergmann, L. (Ekstern), Nielsen, K. K. (Ekstern), Glimberg, S. L. (Ekstern), Walther, J. H. (Intern)
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Characterization and flip angle calibration of 13C surface coils for hyperpolarization studies

The aim of the present work is to address the challenge of optimal flip angle calibration. To this end, we characterize the spatial profile of the flip angle and demonstrate that it allows for a simple calibration improving the signal-to-noise ratio for hyperpolarized C magnetic resonance spectroscopic imaging.

General information
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Organizations: Center for Hyperpolarization in Magnetic Resonance, Department of Electrical Engineering, Center for Magnetic Resonance, University of Copenhagen
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Main Research Area: Technical/natural sciences
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Characterization and genetic variation of vibrio cholerae isolated from clinical and environmental sources in Thailand
Cholera is still an important public health problem in several countries, including Thailand. In this study, a collection of clinical and environmental V. cholerae serogroup O1, O139, and non-O1/non-O139 strains originating from Thailand (1983 to 2013) was characterized to determine phenotypic and genotypic traits and to investigate the genetic relatedness. Using a combination of conventional methods and whole genome sequencing (WGS), 78 V. cholerae strains were identified. WGS was used to determine the serogroup, biotype, virulence, mobile genetic elements, and antimicrobial resistance genes using online bioinformatics tools. In addition, phenotypic antimicrobial resistance was determined by the minimal inhibitory concentration (MIC) test. The 78 V. cholerae strains belonged to the following serogroups O1: (n = 44), O139 (n = 16) and non-O1/non-O139 (n = 18). Interestingly, we found that the typical El Tor O1 strains were the major cause of clinical cholera during 1983-2000 with two Classical O1 strains detected in 2000. In 2004-2010, the El Tor variant strains revealed genotypes of the Classical biotype possessing either only ctxB or both ctxB and rstR while they harbored tcpA of the El Tor biotype. Thirty O1 and eleven O139 clinical strains carried CTXφ (Cholera toxin) and tcpA as well four different pathogenic islands (PAIs). Beside non-O1/non-O139, the O1 environmental strains also presented chxA and Type Three Secretion System (TTSS). The in silico MultiLocus Sequence Typing (MLST) discriminated the O1 and O139 clinical strains from other serogroups and environmental strains. ST69 was dominant in the clinical strains belonging to the 7th pandemic clone. Non-O1/non-O139 and environmental strains showed various novel STs indicating genetic variation. Multidrug-resistant (MDR) strains were observed and conferred resistance to ampicillin, azithromycin, nalidixic acid, sulfamethoxazole, tetracycline, and trimethoprim and harboured variants of the SXT elements. For the first time since 1986, the presence of V. cholerae O1 Classical was reported causing cholera outbreaks in Thailand. In addition, we found that V. cholerae O1 El Tor variant and O139 were pre-dominating the pathogenic strains in Thailand. Using WGS and bioinformatic tools to analyze both historical and contemporary V. cholerae circulating in Thailand provided a more detailed understanding of the V. cholerae epidemiology, which ultimately could be applied for control measures and management of cholera in Thailand.
Characterization and immobilization of engineered sialidases from *Trypanosoma rangeli* for transsialylation

A sialidase (EC 3.2.1.18; GH 33) from non-pathogenic *Trypanosoma rangeli* has been engineered with the aim of improving its transsialylation activity. Recently, two engineered variants containing 15 and 16 amino acid substitutions, respectively, were found to exhibit significantly improved transsialylation activity; both had a 14 times higher ratio between transsialylation and hydrolysis products compared to the first reported mutant TrSA5mut. In the current work, these two variants, Tr15 and Tr16, were characterized in terms of pH optimum, thermal stability, effect of acceptor-to-donor ratio, and acceptor specificity for transsialylation using casein glycomacropeptide (CGMP) as sialyl donor and lactose or other human milk oligosaccharide core structures as acceptors. Both sialidase variants exhibited pH optima around pH 4.8. Thermal stability of each enzyme was comparable to that of previously developed *T. rangeli* sialidase variants and higher than that of the native transsialidase from *T. cruzi* (TcTS). As for other engineered *T. rangeli* sialidase variants and TcTS, the acceptor specificity was broad: lactose, galactooligosaccharides (GOS), xylooligosaccharides (XOS), and human milk oligosaccharide structures lacto-N-tetraose (LNT), lacto-N-fucopentaose (LNFP V), and lacto-N-neofucopentaose V (LNnFP V) were all sialylated by Tr15 and Tr16. An increase in acceptor-to-donor ratio from 2 to 10 had a positive effect on transsialylation. Both enzymes showed high preference for formation α(2,3)-linkages at the non-reducing end of lactose in the transsialylation. Tr15 was the most efficient enzyme in terms of transsialylation reaction rates and yield of 3'-sialyllactose. Finally, Tr15 was immobilized covalently on glyoxyyl-functionalized silica, leading to a 1.5-fold increase in biocatalytic productivity (mg 3'-sialyllactose per mg enzyme) compared to free enzyme after 6 cycles of reuse. The use of glyoxyyl-functionalized silica proved to be markedly better for immobilization than silica functionalized with (3-aminopropyl)trimethoxysilane (APTES) and glutaraldehyde, which resulted in a biocatalytic productivity which was less than half of that obtained with free enzyme.

General information

State: Published
Organisations: Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering, Universidad Rey Juan Carlos
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Main Research Area: Technical/natural sciences
Characterization and optimization of a high-efficiency AlGaAs-On-Insulator-based wavelength converter for 64- and 256-QAM signals

In this paper, we demonstrate wavelength conversion of advanced modulation formats such as 10-GBd 64-QAM and 256-QAM with high conversion efficiency over a 29-nm spectral window by using four-wave mixing in an AlGaAs-On-Insulator (AlGaAsOI) nano-waveguide. A thorough characterization of the wavelength converter is reported, including the optimization of the AlGaAsOI nano-waveguide in terms of conversion efficiency and associated bandwidth and the analysis of the impact of the converter pump quality and power as well as the signal input power. The optimized converter enables generating idlers with optical signal-to-noise ratio (OSNR) above 30 dB over a 29-nm bandwidth leading to error-free conversion of 64-QAM and 256-QAM with OSNR penalty below 1.0 dB and 2.0 dB respectively. The generated idlers exhibit an OSNR margin to the chosen forward error correction thresholds of >3 dB and >7 dB for 64-QAM and 256-QAM, respectively, that can be used for transmission after conversion.
Characterization of a continuous agitated cell reactor for oxygen dependent biocatalysis

Biocatalytic oxidation reactions employing molecular oxygen as the electron acceptor are difficult to conduct in a continuous flow reactor because of the requirement for high oxygen transfer rates. In this paper, the oxidation of glucose to glucono-1,5-lactone by glucose oxidase was used as a model reaction to study a novel continuous agitated cell reactor (ACR). The ACR consists of ten cells interconnected by small channels. An agitator is placed in each cell, which mixes the content of the cell when the reactor body is shaken by lateral movement. Based on tracer experiments, a hydrodynamic
model for the ACR was developed. The model consisted of ten tanks-in-series with back-mixing occurring within and between each cell. The back-mixing was a necessary addition to the model in order to explain the observed phenomenon that the ACR behaved as two continuous stirred tank reactors (CSTRs) at low flow rates, while at high flow rates it behaved as the expected ten CSTRs in series. The performance of the ACR was evaluated by comparing the steady state conversion at varying residence times with the conversion observed in a stirred batch reactor of comparable size. It was found that the ACR could more than double the overall reaction rate, which was solely due to an increased oxygen transfer rate in the ACR caused by the intense mixing as a result of the spring agitators. The volumetric oxygen transfer coefficient, k_L^a, was estimated to be 344 h^{-1} in the 100mL ACR, opposed to only 104 h^{-1} in a batch reactor of comparable working volume. Interestingly, the large deviation from plug flow behavior seen in the tracer experiments was found to have little influence on the conversion in the ACR, since both a plug flow reactor (PFR) model and the backflow cell model described the data sufficiently well. Biotechnol. Bioeng. 2017;9999:1-9. © 2017 Wiley Periodicals, Inc.
Characterization of a Fiber-Coupled 36-Core 3-Mode Photonic Lantern Spatial Multiplexer

A fiber-coupled 108-port photonic lantern spatial-MUX is characterized with a spatially-diverse optical vector network analyzer. Insertion loss, mode-dependent losses, and time response are measured, showing significant mode mixing at a fiber splice.

General information
State: Published
Organisations: Department of Photonics Engineering, Metro-Access and Short Range Systems, Networks Technology and Service Platforms, Mellanox Technologies, National Institute of Information and Communications Technology, National Institute of Information and Communications Technology
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Source: PublicationPreSubmission
Characterization of alginates from Ghanaian brown seaweeds: Sargassum spp. and Padina spp

Alginates of four locally harvested Ghanaian brown seaweeds from the Sargassum and Padina genus were assessed for their rheological and chemical characteristics. The seaweeds contained 16–30% by weight of alginate assessed as the sum of d-mannuronic acid (M) and l-guluronic acid (G). In comparison, alginate samples from Laminaria digitata and Macrocystis pyrifera, used commercially for alginate extraction, contained 29% and 27% by weight of the two constituent uronic acids (M + G), respectively. Alginate extraction yields of the Ghanaian seaweeds ranged from 17 to 23% by weight of dry material; the corresponding yields from L. digitata and M. pyrifera were 26–29% by weight; these yields were equivalent to ~49–99% of the theoretical yields, but the purity of the extracted alginates varied, and were lowest for the Ghanaian seaweed alginates. 1H NMR analysis of the uronic acid block-structure in the alginates gave M/G ratios of 0.47 and 0.70 for the alginates extracted from Sargassum natans and Sargassum vulgare, while alginates from Padina gymnospora and Padina antillarum had M/G ratios of 1.75 and 1.85, respectively. The alginates from the two Ghanaian Sargassum spp. had high contents of dimeric and trimeric homoguluronate elements: FGG and FGGG values were 0.61 and 0.58 for S. natans and 0.49 and 0.44 for S. vulgare. The alginates from the two Padina spp. had gel strengths estimated as G’ surpassing those from the commercial alginates with G’ values after 4 h of rheological oscillation of 340 Pa (P. gymnospora) and 376 Pa (P. antillarum), whereas the gelling properties of the Sargassum spp. alginates were poor. The degree of polymerization of the acid tolerant alginate backbone fragments, but not M/G ratio or homoguluronate dimer and trimer element contents, appeared to correlate to the alginate gel strength. The study shows that notably Ghanaian Padina spp. hold alginate having desirable properties for high gel-strength applications.

General information
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Organisations: Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering, National Food Institute, Research Group for Nano-Bio Science
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BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.251 SNIP 2.564 CiteScore 5.21
Web of Science (2014): Indexed yes
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Scopus rating (2013): SJR 2.1 SNIP 2.292 CiteScore 4.81
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.866 SNIP 2.086 CiteScore 3.69
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
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Scopus rating (2011): SJR 1.615 SNIP 1.921 CiteScore 3.57
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Web of Science (2011): Indexed yes
Characterization of a new open jet wind tunnel to optimize and test vertical axis wind turbines

Based on the increasing interest in urban environmental technologies, the study of small scale vertical axis wind turbines shows motivating challenges. In this paper, we present the characteristics and potentials of a new open jet wind tunnel. It has a nozzle exit area of $1.5 \times 1.5 \text{ m}^2$, and it can be operated with exit velocities from 3 m/s to 17 m/s. The characterization of the flow has been carried out with calibrated pitot tubes, cup anemometers, and hot wire anemometers. Two different configurations of the test area, with and without a ceiling, are considered. Measurements in the range of available exit velocities show that the cross section, where the velocity and turbulence intensities show an acceptable level of uniformity, has an area of $0.8 \times 0.8 \text{ m}^2$ and a streamwise dimension of 2 m from the nozzle exit of the tunnel. In this working section, the maximum turbulence intensity is 4%. The detailed characterization of the flow carried out indicates that the wind tunnel can be used to test small scale models of wind turbines.

**General information**

State: Published
Organisations: Department of Wind Energy, Wind turbine loads & control, Universitat Rovira i Virgili
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Scopus rating (2016): CiteScore 1.2 SJR 0.418 SNIP 0.523
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.372 SNIP 0.52 CiteScore 1.02
Web of Science (2015): Indexed yes
Characterization of annual disease progression of multiple sclerosis patients: A population-based study
Previous research characterizing factors influencing multiple sclerosis (MS) disease progression has typically been based on time to disease milestones (Kaplan-Meier, Cox hazard regression, etc.). A limitation of these methods is the handling of the often large groups of patients not reaching the milestone. To characterize clinical factors influencing MS disease progression as annual transitions from each Expanded Disability Status Scale (EDSS). The annual progression of 11,964 patients from the Swedish MS Registry was analysed with 10 multinomial logistic regressions, that is, one for transition from each full EDSS with explanatory variables age, sex, age at onset, time in current EDSS, highest prior EDSS, MS course and treatment. All factors (except sex) investigated had statistically significant impacts on transitions from at least one EDSS. However, significance and size of the effect are dependent on the EDSS state of the patient. Greater age, longer time in a state, highest prior EDSS, having progressive MS and treatment had significant impacts, whereas age at onset had minor impact. Our study confirms that established factors associated with MS disease worsening in time to disease milestones also have impacts on annual progression. This approach adds granularity to what EDSS these factors have an influence.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Technology and Innovation Management, Karolinska Institutet, Massachusetts Institute of Technology
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Main Research Area: Technical/natural sciences

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BFI (2015): BFI-level 1
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Web of Science (2015): Indexed yes
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Scopus rating (2014): SJR 1.897 SNIP 1.261 CiteScore 3.04
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.873 SNIP 1.458 CiteScore 3.95
We propose a novel fiber characterization method that reveals the four-wave mixing bandwidth for chirped pump operation, using two tunable continuous-wave-lasers. The method accurately predicts the bandwidth for optical time lenses with broadband multi-carrier input.
Characterization of C. jejuni and C. coli broiler isolates by whole genome sequencing

Campylobacter is the most commonly reported cause of bacterial diarrhoeal disease in humans in the EU since 2005. The major source of infection is contaminated poultry meat with most broiler batches at slaughter colonized with Campylobacter. C. jejuni and C. coli are responsible for the isolates vast majority of infections, which may subsequently lead to serious neuropathologies such as Guillain-Barré syndrome. The aim of this study was to take advantage of whole genome sequencing (WGS) to in-depth characterize a subset of 16 C. jejuni and C. coli isolates from broilers from five farms.

Characterization of clay-modified thermoset polymers under various environmental conditions for the use in high-voltage power pylons

The effect of nanoclay on various material properties like damping and strength of typical thermoset polymers, such as epoxy and vinyl ester, was investigated. Different environmental conditions typical for high-voltage transmission pylons made of composite materials were taken into account. Resin samples were prepared with various clay weight fractions ranging from 0% to 3%. Scanning electron microscopy, transmission electron microscopy, X-ray diffraction and rheological analysis were used to study the morphology and the structure of the nanocomposites. For all nanoclay-modified thermoset polymers, the morphology was found to be of exfoliated structure mainly. Static, uniaxial tensile tests showed that the
addition of nanoclay to thermoset polymers led to a beneficial effect on the stiffness, whereas the tensile strength and ductility significantly decreased. When exposed to different environmental conditions, nanoclay was found to have a positive influence on the dynamic properties, analysed by a dynamic mechanical thermal analysis. The addition of nanoclay to the thermoset resin led to an increase of the damping properties by up to 28% for vinyl ester and up to 6% for epoxy at -20 degrees C. The dielectric properties were evaluated by electrical breakdown strength tests resulting in 11% better insulating behaviour for nanoclay-modified vinyl ester.

**General information**

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Organisations: Department of Mechanical Engineering, Solid Mechanics, Aalborg University, Technische Universität Dresden
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Main Research Area: Technical/natural sciences

**Characterization of fine particles using optomagnetic measurements**

The remanent magnetic moment and the hydrodynamic size are important parameters for the synthesis and applications of magnetic nanoparticles (MNPs). We present the theoretical basis for the determination of the remanent magnetic moment and the hydrodynamic size of MNPs with a narrow size distribution using optomagnetic measurements. In these, the 2nd harmonic variation of the intensity of light transmitted through an MNP suspension is measured as a function of an applied axial oscillating magnetic field. We first show how the measurements of the optomagnetic signal magnitude at a low frequency vs. magnetic field amplitude can be used to determine the MNP moment. Subsequently, we use linear response theory to describe the dynamic non-equilibrium response of the MNP suspension at low magnetic field amplitudes and derive a link between optomagnetic measurements and magnetic AC susceptibility measurements. We demonstrate the presented methodology on two samples of commercially available multi-core MNPs. The results compare well with those obtained by dynamic light scattering, AC susceptibility and vibrating sample magnetometry measurements on the same samples when the different weighting of the particle size in the techniques is taken into account. The
Optomagnetic technique is simple, fast and does not require prior knowledge of the concentration of MNPs and it thus has the potential to be used as a routine tool for quality control of MNPs.
Characterization of Industrial Coolant Fluids and Continuous Ageing Monitoring by Wireless Node-Enabled Fiber Optic Sensors

Environmentally robust chemical sensors for monitoring industrial processes or infrastructures are lately becoming important devices in industry. Low complexity and wireless enabled characteristics can offer the required flexibility for sensor deployment in adaptable sensing networks for continuous monitoring and management of industrial assets. Here are presented the design, development and operation of a class of low cost photonic sensors for monitoring the ageing process and the operational characteristics of coolant fluids used in an industrial heavy machinery infrastructure. The chemical, physical and spectroscopic characteristics of specific industrial-grade coolant fluids were analyzed along their entire life cycle range, and proper parameters for their efficient monitoring were identified. Based on multimode polymer or silica optical fibers, wide range (3-11) pH sensors were developed by employing sol-gel derived pH sensitive coatings. The performances of the developed sensors were characterized and compared, towards their coolants’ ageing monitoring capability, proving their efficiency in such a demanding application scenario and harsh industrial environment. The operating characteristics of this type of sensors allowed their integration in an autonomous wireless sensing node, thus enabling the future use of the demonstrated platform in wireless sensor networks for a variety of industrial and environmental monitoring applications.

General information
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Organisations: Department of Photonics Engineering, Fiber Sensors and Supercontinuum Generation, National Hellenic Research Foundation, PRISMA Electronics S.A, Kleemann S.A
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.591 SNIP 1.478 CiteScore 2.21
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 0.636 SNIP 1.705 CiteScore 2.4
Web of Science (2014): Indexed yes
Characterization of Salmonella spp. from wastewater used for food production in Morogoro, Tanzania

Wastewater use for crop irrigation and aquaculture is commonly practiced by communities situated close to wastewater treatment ponds. The objective of this study was to characterize Salmonella spp. and their antimicrobial susceptibility patterns among isolates from wastewater and Tilapia fish. A total of 123 Salmonella spp. isolates were isolated from 52 water and 21 fish intestinal samples. Genotyping of Salmonella spp. isolates was done by Pulsed-field Gel Electrophoresis (PFGE). Antimicrobial susceptibility testing was done by the minimal inhibitory concentration (MIC) technique. A total of 123 Salmonella spp. isolates represented 13 different serovars and 22 PFGE groups. Salmonella serovars showed resistance to 8 out of 14 antimicrobials; sulfamethaxazole (94%), streptomycin (61%), tetracycline (22%), ciprofloxacin and nalidixic acid (17%), trimethoprim (11%); gentamycin and chloramphenicol (6%). Salmonella Kentucky, S. Chandans, S. Durban and S. Kiambu showed multiple antimicrobial resistance to 7, 6 and 3 antimicrobials, respectively. This study has demonstrated that wastewater at the study sites is contaminated with Salmonella spp. which are resistant to common antimicrobials used for treatment of diseases in humans. Wastewater may, therefore, contaminate pristine surface water bodies and foodstuffs including fish and irrigated crops as well as food handlers.

General information
State: Published
Organisations: National Veterinary Institute, Bacteriology & Parasitology, Sokoine University of Agriculture, University of Copenhagen
Authors: Mhongole, O. J. (Ekstern), Mdegela, R. H. (Ekstern), Lughano J. M. Kusiluk (Ekstern), Forslund, A. (Intern), Dalsgaard, A. (Ekstern)
Characterization of small-spored Alternaria from Argentinean crops through a polyphasic approach

Small-spored Alternaria have been isolated from a wide variety of food crops, causing both economic losses and human health risk due to the metabolites produced. Their taxonomy has been discussed widely, but no scientific consensus has
been established in this field to date. Argentina is a major exporter of agricultural products, so it is essential to thoroughly understand the physiological behaviour of this pathogen in a food safety context. Thus, the objective of this work was to characterize small-spored Alternaria spp. obtained from tomato fruits, pepper fruits, wheat grains and blueberries from Argentina by a polyphasic approach involving metabolomic and phylogenetic analyses based on molecular and morphological characters. Morphological analysis divided the population studied into three groups; A. arborescens sp.-grp., A. tenuissima sp.-grp., and A. alternata sp.-grp. However, when these characters were simultaneously analysed with molecular data, no clearly separated groups were obtained. Haplotype network and phylogenetic analysis (both Bayesian and maximum parsimony) of a conserved region yielded the same result, suggesting that all isolates belong to the same species. Furthermore, no correlation could be established between morphological species-groups and a metabolite or group of metabolites synthesized. Thus, the whole set of analyses carried out in the present work supports the hypothesis that these small-spored Alternaria isolates from food belong to the same species. Identification at species level through classical morphology or modern molecular techniques does not seem to be a useful tool to predict toxicological risk in food matrices. The detection of any small-spored Alternaria from Section Alternaria (D.P. Lawr., Gannibal, Peever & B.M. Pryor 2013) in food implies a potential toxicological risk.

**General information**

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Organisations: Department of Biotechnology and Biomedicine, DTU Metabolomics Core, Universidad de Buenos Aires, CONICET
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- BFI (2010): BFI-level 2
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Characterization of the planktonic microbiome in upflow anaerobic sludge blanket reactors during adaptation of mesophilic methanogenic granules to thermophilic operational conditions

Upflow anaerobic sludge blanket (UASB) technology refers to reactor technology where granules, i.e. self-immobilised microbial associations, are the biological catalysts involved in the anaerobic digestion process. During the start-up period, UASB reactors operate at relatively long HRT and therefore the liquid phase of the reactor becomes a favourable environment for microbial growth. The current study aimed to elucidate the dynamicity of the suspended microbial community in UASB reactors, during the transition from mesophilic to thermophilic conditions. High throughput 16S rRNA amplicon sequencing was used to characterize the taxonomic composition of the microbiome. The results showed that the microbial community was mainly composed by hydrolytic and fermentative bacteria. Results revealed relevant shifts in the microbial community composition, which is mainly determined by the operational conditions and the reactor performance. Finally, shared OTUs between the microbial consortia of the suspended and the granular sludge showed that planktonic microbiota is significantly influencing the granule microbial community composition.

General information
State: Published
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Characterization of Thermochemically Surface-Hardened Titanium by Light Optical Microscopy
Thermochemically treated titanium grades 2 and 5 were investigated by light optical microscopy and hardness indentation. Gaseous oxidation in oxygen and N2O containing atmospheres resulted in a diffusion zone of oxygen in solid solution in titanium with a hardness up to 1000 HV. A surface scale consisting of oxide can be present depending on the treatment conditions. A new type of carbo-oxidation treatment was applied, where carbon and oxygen are simultaneously incorporated into the surface. This resulted in new microstructural features such as a deep zone of mixed interstitial solid solution, i.e., a diffusion zone, and surface regions consisting of a mixed interstitial compound (TiC\(_{X}\)O\(_{1-}\) X structure). Carbo-oxidation yields hardness values in excess of 2500 HV in the mixed interstitial compound and values up to 1500 HV in the diffusion zone. Simultaneously, with the surface hardening treatment, core hardening of the material can be obtained.

General information
State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Technical University of Denmark
Characterization of two novel bacterial type A exo-chitobiose hydrolases having C-terminal 5/12-type carbohydrate-binding modules

Type A chitinases (EC 3.2.1.14), GH family 18, attack chitin ((1 → 4)-2-acetamido-2-deoxy-β-D-glucan) and chito-oligosaccharides from the reducing end to catalyze release of chitobiose (N,N'-diacetylchitobiose) via hydrolytic cleavage of N-acetyl-β-D-glucosaminide (1 → 4)-β-linkages and are thus "exo-chitobiose hydrolases." In this study, the chitinase type A from Serratia marcescens (SmaChiA) was used as a template for identifying two novel exo-chitobiose hydrolase type A enzymes, FbalChi18A and MvarChi18A, originating from the marine organisms Ferrimonas balearica and Microbulbifera variabilis, respectively. Both FbalChi18A and MvarChi18A were recombinantly expressed in Escherichia coli and were confirmed to exert exo-chitobiose hydrolase activity on chito-oligosaccharides, but differed in temperature and pH activity response profiles. Amino acid sequence comparison of the catalytic β/α barrel domain of each of the new enzymes showed individual differences, but ~69% identity of each to that of SmaChiA and highly conserved active site residues. Superposition of a model substrate on 3D structural models of the catalytic domain of the enzymes corroborated exo-chitobiose hydrolase type A activity for FbalChi18A and MvarChi18A, i.e., substrate attack from the reducing end. A main feature of both of the new enzymes was the presence of C-terminal 5/12 type carbohydrate-binding modules (SmaChiA has no C-terminal carbohydrate binding module). These new enzymes may be useful tools for utilization of chitin as an N-acetylglucosamine donor substrate via chitobiose.
Characterization of waste from nanoenabled products: Occurrence, distribution, fate and nanoparticle release

In the last decades, benefits provided by nanotechnology have been utilized for example to increase the sustainability and functionality of consumer products. Engineered nanomaterials (ENMs) are widely used in consumer products across different applications, but their use in nanoproducts has not been regulated specifically - as is the case for other chemicals and substances. This has caused concern regarding the possible release and effects of ENMs during the life cycle of...
nanoproducts. Specifically knowledge regarding the end-of-life phase is limited. In order to assess the potential environmental exposure or risks associated with ENMs in waste from nanoproducts, it is necessary to investigate what ENMs are being used and to which extent, how they are treated at the end-of-life of the nanoproduct and, finally, what is the likelihood of them being released during waste treatment. This PhD project addressed these knowledge gaps by mapping and analysing available nano-enabled products, developing a method for categorising waste material fractions of nanoproducts and estimating their likely waste treatment. Furthermore, new experimental data regarding ENM release from nano-enabled products was provided, applying a standardised waste characterisation test. To investigate the abundance and distribution of nanoproducts, different product inventories exist, such as BUND, PEN CPI and The Nanodatabase. However, they are all limited by the lack of available quantitative information about ENM mass or particle number in the products. Overall, the most common product applications for ENMs are the “Health & Fitness” or “Home & Garden” sector, which was still the case, despite the increasing number of nanoproducts. The product inventories PEN CPI and The Nanodatabase are based on manufacturers’ claims regarding nanotechnology, which are often unsubstantial leading to many products being registered with an unknown ENM, such as 64% of all products registered on The Nanodatabase. It was discovered that out of all ENMs registered on The Nanodatabase nano-Ag was used in the greatest number of products and in a range of product applications (e.g. in cosmetics, textiles and food containers). By utilising The Nanodatabase product inventory, a method was developed for analysing the distribution of ENMs in waste, which involved the estimation of ENM fate in selected waste treatments based on their main matrix material. This information was included on The Nanodatabase to enable the online analysis of different waste treatment scenarios. The waste treatment analysis revealed that the most significant waste material fraction was “Plastic packaging” followed by “Electronic”, “Textile” and “Multi material” waste. “Plastic packaging” waste involved mainly the large number of products sold in plastic containers, meaning that the remaining ENM mass at the time of disposal is expected to be minor. Nano-Ag was widespread across the identified waste fractions, thereby corresponding with the wide use of the material in different product categories. Furthermore, titanium-, silicon- and carbon-based ENMs were also present in several different waste material fractions (i.e. “Electronic”, “Multi material”, “Unknown”, “Plastic, other” and “Plastic, packaging”), whereas nano-phosphate and bamboo charcoal were only found in “Batteries” and “Textile” waste, respectively. In terms of waste treatment, it was estimated that on average in the EU around 50% of nano-enabled products are recycled, 19% are incinerated and 26% landfilled. However, these percentages depend on the specific waste treatments available in the investigated region. It is also expected that more ENMs will eventually enter a landfill, since they may accumulate in sewage sludge or waste incineration ashes, both of which are often landfilled. Another prerequisite for ENM characterisation in a waste scenario is the ability to quantify the potential ENM release from a nanowaste matrix. Experimental characterisation of ENM release from nanoproducts or waste matrices is scarce, and most studies are limited by analytical constraints to detect the ENMs, or have investigated an artificial or “spiked” waste matrix. These studies cannot identify the behaviour of ENMs released from a real nano-enabled product nor how realistic environmental conditions will influence this release. The main challenges facing experimental nanowaste characterisation relate to the complexity of the matrices (both the waste matrix itself and the variety of ENM and product matrix combinations), the low concentration of ENMs present in the waste and, for some ENMs, the background quantities of natural particles being high making it near impossible to distinguish between engineered and natural entities. In this thesis, selected nanoproducts were investigated using a standardised waste characterisation test and the potential ENM release was characterised using nano-specific methods, namely single particle-ICP-MS, TEM/EDX and zeta potential. Since more than 50% of ENMs are expected to be landfilled on a global scale, a standardised batch leaching test was applied to characterise the nanoproducts. The case studies represented two different types of ENMs and product matrices: self-cleaning ceramic tiles with a nano-TiO2 coating and wood painted with nano-CuO wood protection paint. Different environmental conditions were mimicked i.e. high ionic strength (added CaCl2) and addition of organic matter. For both materials, the potential ENM release under these conditions was considered to be low, but they indicated that, there was an effect of media conditions on the particles released from a nano-enabled product. For nano-TiO2-coated tiles, total titanium release was approximately 0.01 µg/g material or below detection limit, slightly higher concentrations were found in leachates from nano-enabled tiles. Particle sizes and number concentrations were below calculated limits of detection (with the exception of one sample, “Ti CAL”) and the sp-ICP-MS analysis generally suffered interference from calcium. For wood painted with nano-CuO paint, presence of nano-Cu particles, of approximately 60-80nm in size, was confirmed using sp-ICP-MS. However, these findings are associated with uncertainty, and so additional tests are needed to assess quantitatively the nano-CuO release in terms of particle size and number concentration. While these two case studies showed limited release, it cannot be excluded that other matrix and ENM combinations may cause more significant releases. New approaches concerning nanowaste characterisation, both indirect and direct methods, were presented in this thesis, but further research is needed to develop and validate these methods. Future studies, assessing the potential release of ENMs from waste, should apply nano-enabled products and different product matrix combinations to take into account the transformations of the ENMs which may occur during the product life cycle. The development of analytical methods is promising e.g. the use of fingerprinting or other tracer techniques for ENMs, and sp-ICP-MS is becoming a routine analysis, though large challenges regarding matrix complexity and interferences still persist. Considering the large number of nanoproducts available, the potential release of ENMs from these products would have to be understood to perform a risk assessment of these products. Since ENMs are considered possible contaminants of the solid waste, it is important to include nano-specific characterisation tests in waste characterisation to ensure a safe disposal of the nanowaste.
Current life cycle impact assessment (LCIA) methods lack a consistent and globally applicable characterization model relating nitrogen (N, as dissolved inorganic nitrogen, DIN) enrichment of coastal waters to the marine eutrophication impacts at the endpoint level. This paper introduces a method to calculate spatially explicit characterization factors (CFs) at endpoint and damage to ecosystems levels, for waterborne nitrogen emissions, reflecting their hypoxia-related marine eutrophication impacts, modelled for 5772 river basins of the world.
Exposure to fine particulate matter (PM$_{(2.5)}$) from indoor and outdoor sources is a leading environmental contributor to global disease burden. In response, we established under the auspices of the UNEP/SETAC Life Cycle Initiative a coupled indoor-outdoor emission-to-exposure framework to provide a set of consistent primary PM$_{(2.5)}$ aggregated exposure factors. We followed a matrix-based mass balance approach for quantifying exposure from indoor and ground-level urban and rural outdoor sources using an effective indoor-outdoor population intake fraction and a system of archetypes to represent different levels of spatial detail. Emission-to-exposure archetypes range from global indoor and outdoor averages, via archetypal urban and indoor settings, to 3646 real-world cities in 16 parameterized sub-continental regions. Population intake fractions from urban and rural outdoor sources are lowest in Northern regions and Oceania and highest in Southeast Asia with population-weighted means across 3646 cities and 16 sub-continental regions of, respectively, 39 ppm (95% confidence interval: 4.3–160 ppm) and 2 ppm (95% confidence interval: 0.2–6.3 ppm). Intake fractions from residential and occupational indoor sources range from 470 ppm to 62,000 ppm, mainly as function of air exchange rate and occupancy. Indoor exposure typically contributes 80–90% to overall exposure from outdoor sources. Our framework facilitates improvements in air pollution reduction strategies and life cycle impact assessments.
Characterizing and predicting the distribution of Baltic Sea flounder (*Platichthys flesus*) during the spawning season

Identification of essential fish habitats (EFH), such as spawning habitats, is important for nature conservation, sustainable fisheries management and marine spatial planning. Two sympatric flounder (*Platichthys flesus*) ecotypes are present in the Baltic Sea, pelagic and demersal spawning flounder, both displaying ecological and physiological adaptations to the low-salinity environment of this young inland sea. In this study we have addressed three main research questions: 1) What environmental conditions characterize the spatial distribution and abundance of adult flounder during the spawning season? 2) What are the main factors defining the habitats of the two flounder ecotypes during the spawning season? 3) Where are the potential spawning areas of flounder? We modelled catch per unit of effort (CPUE) of flounder from gillnet surveys conducted over the southern and central Baltic Sea in the spring of 2014 and 2015 using generalized additive models. A general model included all the stations fished during the survey while two other models, one for the demersal and one for the pelagic spawning flounder, included only the stations where each flounder ecotype should dominate. The general model captured distinct ecotype-specific signals as it identified dual salinity and water depth responses. The model for the demersal spawning flounder revealed a negative relation with the abundance of round goby (*Neogobius melanostomus*) and a positive relation with Secchi depth and cod abundance. Vegetation and substrate did not play an important role in the choice of habitat for the demersal ecotype. The model for the pelagic spawning flounder showed a negative relation with temperature and bottom current and a positive relation with salinity. Spatial predictions of potential spawning areas of flounder showed a decrease in habitat availability for the pelagic spawning flounder over the last 20 years in the central part of the Baltic Sea, which may explain part of the observed changes in populations' biomass. We conclude that spatiotemporal modelling of habitat availability can improve our understanding of fish stock dynamics and may provide necessary biological knowledge for the development of marine spatial plans.
Characterizing Green Fiber Bottle Prototypes Using Computed Tomography

Due to ever increasing demand of sustainability and biodegradability, there arises a need to develop environmental friendly packaging products. Green fiber bottle is a packaging product for carbonated beverages, made out of cellulose
fibers. The production process accounts for moulding paper pulp in the desired shape and structure. However, there are certain limitations associated to the product characterization using tactile measuring methods. In this work, a new approach has been applied for defect analysis and quality control of non-homogenous prototype paper products using computed tomography.

**General information**

State: Published
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Computed tomography, Paper products, Porosity analysis, Quality control, Thickness analysis

**Characterizing width two for variants of treewidth**

In this paper, we consider the notion of special treewidth, recently introduced by Courcelle (2012). In a special tree decomposition, for each vertex v in a given graph, the bags containing v form a rooted path. We show that the class of graphs of special treewidth at most two is closed under taking minors, and give the complete list of the six minor obstructions. As an intermediate result, we prove that every connected graph of special treewidth at most two can be constructed by arranging blocks of special treewidth at most two in a specific tree-like fashion. Inspired by the notion of special treewidth, we introduce three natural variants of treewidth, namely spaghetti treewidth, strongly chordal treewidth and directed spaghetti treewidth. All these parameters lie between pathwidth and treewidth, and we provide common structural properties on these parameters. For each parameter, we prove that the class of graphs having the parameter at most two is minor closed, and we characterize those classes in terms of a tree of cycles with additional conditions. Finally, we show that for each k≥3, the class of graphs with special treewidth, spaghetti treewidth, directed spaghetti treewidth, or strongly chordal treewidth, respectively at most k, is not closed under taking minors.

**General information**

State: Published
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Recently, researchers started using cognitive load in various settings, e.g., educational psychology, cognitive load theory, or human–computer interaction. Cognitive load characterizes a tasks’ demand on the limited information processing capacity of the brain. The widespread adoption of eye–tracking devices led to increased attention for objectively measuring cognitive load via pupil dilation. However, this approach requires a standardized data processing routine to reliably measure cognitive load. This technical report presents CEP–Web, an open source platform to providing state of the art data processing routines for cleaning pupillary data combined with a graphical user interface, enabling the management of studies and subjects. Future developments will include the support for analyzing the cleaned data as well as support for Task–Evoked Pupillary Response (TEPR) studies.
Chemical and Electrochemical Properties of La$_{0.58}$Sr$_{0.4}$Fe$_{0.8}$Co$_{0.2}$O$_{3-\delta}$ (LSCF) Thin Films upon Oxygen Reduction and Evolution Reactions

The Oxygen Evolution and Oxygen Reduction Reactions (OER/ORR), occurring at the oxygen electrode of Solid Oxide Cells (SOCs) in the two possible ways of operation, require substantial overpotentials, therefore lowering the operating efficiency of the cells. The reaction mechanisms occurring at these electrodes are still not completely understood due to their complexity and localized character at the interfaces between different materials or between the gas atmosphere and the electrocatalyst, and need in situ techniques with very high chemical sensitivity, with the additional difficulty of probing the materials as close as possible to their realistic operating conditions. In addition, the properties of LSCF are, despite numerous studies, still unclear in many aspects, despite LSCF being one of the state-of-the-art electrocatalysts used for SOCs. It is understood that the surface chemical composition deviates from the nominal bulk composition, and that secondary phases can segregate at the surfaces and interfaces during operation. Furthermore, the electrochemical properties such as Area Specific Resistance (ASR), oxygen exchange coefficient ($k_{ex}$), ASR activation energy ($E_a$) and $pO_2$-exponents for LSCF reported in the literature vary considerably. This study aims to better understand the properties of LSCF, by combining the results of Electrochemical Impedance Spectroscopy (EIS) and Near-Ambient Pressure X-ray Photoelectron Spectroscopy (NAP-XPS) on model electrodes, both in polarized and unpolarized conditions. In particular, NAP-XPS studies of the surface chemistry evolution under operation, as well as the correlation between surface potential changes in relation to the applied overpotential are addressed, in an attempt to determine the real driving force for the oxygen reactions. For this purpose, thin films of LSCF are deposited by Pulsed Laser Deposition (PLD) through shadow masks, in order to obtain well-defined electrode geometries with low risk of contamination, and subsequently tested both in highly clean EIS measuring setups and at the synchrotron beamline. The results of both kinds of experiments are correlated, the goal being a better understanding of the material's properties under operation, as well as possible degradation phenomena.

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Chemical and microbial characteristics of municipal drinking water supply systems in the Canadian Arctic

Drinking water in the vast Arctic Canadian territory of Nunavut is sourced from surface water lakes or rivers and transferred to man-made or natural reservoirs. The raw water is at a minimum treated by chlorination and distributed to customers either by trucks delivering to a water storage tank inside buildings or through a piped distribution system. The objective of this study was to characterize the chemical and microbial drinking water quality from source to tap in three hamlets (Coral Harbour, Pond Inlet and Pangnirtung—each has a population of 0.2 mg/L free chlorine). Some buildings in the four communities contained manganese (Mn), copper (Cu), iron (Fe) and/or lead (Pb) concentrations above Health Canada guideline values for the aesthetic (Mn, Cu and Fe) and health (Pb) objectives. Corrosion of components of the drinking water distribution system (household storage tanks, premise plumbing) could be contributing to Pb, Cu and Fe levels, as the source water in three of the four communities had low alkalinity. The results point to the need for robust disinfection, which may include secondary disinfection or point-of-use disinfection, to prevent microbial risks in drinking water tanks in buildings and ultimately at the tap.
Chemical Editing of Macrocyclic Natural Products and Kinetic Profiling Reveal Slow, Tight-Binding Histone Deacetylase Inhibitors with Picomolar Affinities

Histone deacetylases (HDACs) are validated targets for treatment of certain cancer types and play numerous regulatory roles in biology, ranging from epigenetics to metabolism. Small molecules are highly important as tool compounds for probing these mechanisms as well as for the development of new medicines. Therefore, detailed mechanistic information and precise characterization of the chemical probes used to investigate the effects of HDAC enzymes are vital. We interrogated Nature’s arsenal of macrocyclic nonribosomal peptide HDAC inhibitors by chemical synthesis and evaluation of more than 30 natural products and analogues. This furnished surprising trends in binding affinities for the various macrocycles, which were then exploited for the design of highly potent class I and IIb HDAC inhibitors. Furthermore, thorough kinetic investigation revealed unexpected inhibitory mechanisms of important tool compounds as well as the approved drug Istodax (romidepsin). This work provides novel inhibitors with varying potencies, selectivity profiles, and mechanisms of inhibition and, importantly, affords insight into known tool compounds that will improve the interpretation of their effects in biology and medicine.

General information
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Modern Chemical Engineering was born around the end of the 19th century in Great Britain, Germany, and the USA, the most industrialized countries at that time. Milton C. Whitaker, in 1914, affirmed that the difference between Chemistry and Chemical Engineering lies in the capability of chemical engineers to transfer laboratory findings to the industrial level. Since then, Chemical Engineering underwent huge transformations determining the detachment from the original Chemistry nest. The beginning of the sixties of the 20th century saw the development of a new branch of Chemical Engineering baptized Biomedical Engineering by Peppas and Langer and that now we can name Biological Engineering. Interestingly, although Biological Engineering focused on completely different topics from Chemical Engineering ones, it resorted to the same theoretical tools such as, for instance, mass, energy and momentum balances. Thus, the birth of Biological Engineering may be considered as a Darwinian evolution of Chemical Engineering similar to that experienced by mammals which, returning to water, used legs and arms to swim. From 1960 on, Biological Engineering underwent a considerable evolution as witnessed by the great variety of topics covered such as hemodialysis, release of synthetic
drugs, artificial organs and, more recently, delivery of small interfering RNAs (siRNA). This review, based on the activities developed in the frame of our PRIN 2010-11 (20109PLMH2) project, tries to recount origins and evolution of Chemical Engineering illustrating several examples of recent and successful applications in the biological field. This, in turn, may stimulate the discussion about the Chemical Engineering students curriculum studiorum update.

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**Chemically extracted nanocellulose from sisal fibres by a simple and industrially relevant process**

A novel type of acetylated cellulose nanofibre (CNF) was extracted successfully from sisal fibres using chemical methods. Initially, a strong alkali treatment was used to swell the fibres, followed by a bleaching step to remove the residual lignin and finally an acetylation step to reduce the impact of the intermolecular hydrogen bonds in the nanocellulose. The result of this sequence of up-scalable chemical treatments was a pulp consisting mainly of micro-sized fibres, which allowed simpler handling through filtration and purification steps and permitted the isolation of an intermediate product with a high solids content. An aqueous dispersion of CNF could be obtained directly from this intermediate pulp by simple magnetic stirring. As a proof of concept, the dispersion was used directly for preparing a highly translucent CNF film, illustrating that there are no large aggregates in the prepared CNF dispersion. Finally, CNF films with alkali extracts were also prepared, resulting in flatter films with an increased mass yield and improved mechanical strength.

**General information**

State: Published
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Chemical Synthesis and Electrochemical Characterization of Nanoporous Gold films

Nanoporous gold (NPG) is conventionally made via dealloying methods. We present an alternative method for bottom-up chemical synthesis of nanoporous gold film (cNPGF), with properties resembling those of dealloyed NPG. The developed procedure is simple and only benign chemicals are used. Chloroauric acid is reduced to nanoparticles (NPs) by 2-(N-morpholino)ethanesulfonate, acting also as a protecting agent for the NPs and as a pH buffer, while potassium chloride is used to control ionic strength. The film formation is controlled by parameters such as temperature, ionic strength and protonation of the buffer. Therefore, it is possible to influence the trapping of nanoparticles at the air-liquid interface,
yielding porous thin film structures, Figure 1A. The produced cNPGFs have been investigated by atomic force microscopy (AFM), transmission electron microscopy (TEM) and cyclic voltammetry (CV). The micro- and nanostructure of cNPGFs are shown in Figure 1B and 1C. The film coverage areas that we can achieve are up to 20 cm2, with an average thickness of 500 ± 200 nm. It is also found that in-house synthesized cNPGFs are active electrocatalysts for CO2 reduction and CO oxidation.

General information
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Chemical Synthesis of Oligosaccharides related to the Cell Walls of Plants and Algae
Plant cell walls are composed of an intricate network of polysaccharides and proteins that varies during the developmental stages of the cell. This makes it very challenging to address the functions of individual wall components in cells, especially for highly complex glycans. Fortunately, structurally defined oligosaccharides can be used as models for the glycans, to study processes such as cell wall biosynthesis, polysaccharide deposition, protein-carbohydrate interactions, and cell-cell adhesion. Synthetic chemists have focused on preparing such model compounds, as they can be produced in good quantities and with high purity. This review contains an overview of those plant and algal polysaccharides, which have been elucidated to date. The majority of the content is devoted to detailed summaries of the chemical syntheses of oligosaccharide fragments of cellulose, hemicellulose, pectin, and arabinoxylans, as well as glycans unique to algae. Representative synthetic routes within each class are discussed in detail and the progress in carbohydrate chemistry over recent decades is highlighted.

General information
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Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 42.79 SJR 19.282 SNIP 10.369
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 18.373 SNIP 11.51 CiteScore 45.92
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 18.369 SNIP 11.47 CiteScore 44.56
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 22.176 SNIP 12.915 CiteScore 49.12
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Chemoenzymatic synthesis of fluorogenic phospholipids and evaluation in assays of phospholipases A, C and D

Phospholipases are ubiquitous in nature and the target of significant research aiming at both their physiological roles and technical applications in e.g. the food industry. In the search for sensitive and selective phospholipase assays, we have focused on synthetic FRET (Forster resonance energy transfer) substrates. This has led to the development of a facile, easily scalable and low cost synthesis of fluorogenic phospholipids featuring the dansylidabcyl fluorophore/quencher-pair on the fatty acid co-position and on the phosphatidylethanolamine head group, respectively. Hence, the two substrates lyso-(dansyl-FA)-GPE-dabcyl (6) and (dansyl-FA)_2-GPE-dabcyl (7) were synthesized by a chemoenzymatic strategy, in which preparation of (6) further included a novel selective enzymatic esterification step. As proof of concept, activity of a handful of phospholipases, one from each of the PLA1, PLA2, PLC and PLO classes, were assayed using substrates (6) and (7), and the kinetic parameter $k_{cat}/K_M$ was determined. The PLA1 (Lecitase Ultra™) was found to be highly active on both substrates, whereas the PLO (from white cabbage) had no activity, presumably due to steric effects associated with the dabcyl-functionalization of the head group. It was further substantiated that the substrates are specific towards phospholipase activity as the tested lipase (Lipolase™) showed close to zero activity.
Chemoselective Synthesis of Dithioacetals from Bio-aldehydes with Zeolites under Ambient and Solvent-free Conditions

Dithioacetals are an important class of versatile compounds extensively applied in pharmaceuticals, separations, electrochemistry, and organic synthesis, but few heterogeneous catalytic systems are reported to be generally applicable for their synthesis from a wide range of substrates. A series of commercial and modified zeolites are excellent catalysts for thioacetalization of different thiols with carbonyl compounds, including biomass-derived aldehydes, at room temperature under solvent-free conditions. A near quantitative yield of dithioacetal was obtained over H-beta(19) at room temperature with a low catalyst to substrate ratio of 1: 19, and a method to follow the reaction progress by ex situ UV/Vis absorption analysis was demonstrated. Recycling experiments with H-beta(19) in five consecutive runs resulted in slight loss of activity, but the original activity could be fully restored after calcination at 550 degrees C. The results and physicochemical properties of the zeolites revealed that relatively large pores and moderate acidity with an appropriate distribution of Bronsted/Lewis acid sites contributed to the pronounced performance in the dithioacetal formation.
Children's genuine participation and development of social capital in the school setting

The concern of involving children in decision-making and activities related to their health and well-being in the school has increasingly becoming accepted politically as well as academically in line with the adoption of the UN Convention on the rights of the child. While formal and informal participation is viewed as an integral part of social capital generation according to Putnam, which has been found beneficial for health and well-being, little is known regarding how social capital is generated in relation to children and drawing on children as active participants. Drawing on children’s perspective and the concept of participation, the aims of this study are therefore to explore children’s experiences with their participation in everyday school situations and secondly, to contribute, theoretically, to the conceptualization of social capital in relation to children in the school setting. An abductive research strategy was used based on 10 focus groups interviews with 44 children aged 10-11 and participatory observation at two Danish public schools. We found three forms of participation: 'Child-directed', 'Adult/child-directed' and 'Adult-directed' that relate to different practices and different social capital types. While children actively contribute to the formation of bonding social capital practices as part of child-directed participation, ‘adult/child-directed’ participation with its focus on participatory democratic education tends to reinforce bonding as well as bridging social capital. In line with Putnam’s focus on civic engagement the merged perspectives thus highlight the importance of stressing pupils’ genuine participation as an active social pedagogical principle alongside structural changes at the whole school level.
Choosing the observational likelihood in state-space stock assessment models

Data used in stock assessment models result from combinations of biological, ecological, fishery, and sampling processes. Since different types of errors propagate through these processes it can be difficult to identify a particular family of distributions for modelling errors on observations a priori. By implementing several observational likelihoods, modelling both numbers- and proportions-at-age, in an age based state-space stock assessment model, we compare the model fit for each choice of likelihood along with the implications for spawning stock biomass and average fishing mortality. We propose using AIC intervals based on fitting the full observational model for comparing different observational likelihoods. Using data from four stocks, we show that the model fit is improved by modelling the correlation of observations within years. However, the best choice of observational likelihood differs for different stocks, and the choice is important for the short-term conclusions drawn from the assessment model; in particular, the choice can influence total allowable catch advise based on reference points.
Choreographing Cyber-Physical Distributed Control Systems for the Energy Sector

Energy Systems are facing a significant change in the way their management and control is conceived. With the introduction of distributed and renewable energy based resources, a shift to a more distributed operation paradigm is emerging, overturning the conventional top-down design and operation principles. This shift creates a demand for distributed control systems (DCS) to facilitate a more adaptive and efficient operation of power networks. One key challenge here is to ensure the required reliability of distributed control systems. Whereas proven strategies exist for reliable control for coordination of physical actions, with increasing distribution of such control, the reliability and degradation properties in response to communications issues become more important. We build on the notion of Quality Choreographies, a formal model for the development of failure-aware distributed systems, and discuss how quality choreographies respond to the needs presented by DCS. We demonstrate their applicability by modelling the Bully Algorithm, one of the de-facto election algorithms used in coordination of DCS.

General information
State: E-pub ahead of print
Organisations: Department of Electrical Engineering, Automation and Control, Center for Electric Power and Energy, Energy system operation and management, Department of Applied Mathematics and Computer Science, Formal Methods
Authors: López-Acosta, H. (Intern), Heussen, K. (Intern)
Number of pages: 7
Publication date: 2017
CHROMagar COL-APSE: a selective bacterial culture medium for the isolation and differentiation of colistin-resistant Gram-negative pathogens

Purpose. A selective chromogenic culture medium for the laboratory isolation and differentiation of colistin resistant Acinetobacter, Pseudomonas, Stenotrophomonas and Enterobacteriaceae spp. (CHROMagar COL-APSE) was developed, evaluated and compared to an existing selective bacterial culture medium (SuperPolymyxin).

Methodology. The medium was challenged with 84 isolates, including polymyxin B (POL B)-susceptible and -resistant type strains and colistin (COL)-resistant organisms recovered from human and animal samples. Susceptibility to COL and POL B was determined by agar dilution and broth microtitre dilution. The lower limit for the detection of COL-resistant organisms was also calculated for both CHROMagar COL-APSE and SuperPolymyxin media. The ability to isolate and correctly differentiate COL-resistant organisms within mixed cultures was also assessed and compared using both media.

Results. Using CHROMagar COL-APSE, Gram-negative pathogens (n=71) with intrinsic (n=8) or acquired COL (n=63) resistance were recovered with 100% specificity down to the lower limit of detection of 101 colony-forming units (c.f.u.). The growth on SuperPolymyxin was similar, but notably weaker for COL-resistant non-fermentative bacteria (Acinetobacter, Pseudomonas and Stenotrophomonas). CHROMagar COL-APSE was also more sensitive in supporting the growth of Enterobacteriaceae with COL resistance associated with the carriage of mcr-1.

Conclusion. CHROMagar COL-APSE is a sensitive and specific medium for the growth of COL-resistant bacterial pathogens. Due to the low limit of detection (101 c.f.u.), it may be useful as a primary isolation medium in the surveillance and recovery of COL-resistant bacteria from complex human, veterinary and environmental samples, especially those with plasmid-mediated MCR-1 or novel mechanisms of polymyxin resistance.

General information

State: Accepted/In press
Organisations: National Food Institute, Research Group for Genomic Epidemiology, Queen Mary University of London, Federation University Australia, Université Lyon
Authors: Abdul Momin, M. H. F. (Ekstern), Bean, D. C. (Ekstern), Hendriksen, R. S. (Intern), Haenni, M. (Ekstern), Phee, L. M. (Ekstern), Wareham, D. W. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information

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BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.14 SJR 0.923 SNIP 0.877
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.123 SNIP 0.986 CiteScore 2.27
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.038 SNIP 1.062 CiteScore 2.26
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.021 SNIP 1.047 CiteScore 2.34
ISI indexed (2013): ISI indexed yes
Chromatic number via Turán number

For a graph $G$ and a family of graphs $F$, the general Kneser graph $K_G(G, F)$ is a graph with the vertex set consisting of all subgraphs of $G$ isomorphic to some member of $F$ and two vertices are adjacent if their corresponding subgraphs are edge disjoint. In this paper, we introduce some generalizations of Turán number of graphs. In view of these generalizations, we give some lower and upper bounds for the chromatic number of general Kneser graphs $K_G(G, F)$. Using these bounds, we determine the chromatic number of some family of general Kneser graphs $K_G(G, F)$ in terms of generalized Turán number of graphs. In particular, we determine the chromatic number of every Kneser multigraph $K_G(G, F)$ where $G$ is a multigraph each of whose edges has the multiplicity at least 2 and $F$ is an arbitrary family of simple graphs. Moreover, the chromatic number of general Kneser graph $K_G(G, F)$ is exactly determined where $G$ is a dense graph and $F = \{K_{1,2}\}$

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science , Algorithms and Logic , Shahrood University of Technology
Authors: Alishahi, M. (Ekstern), Hajiabolhassan, H. (Intern)
Pages: 2366-2377
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Discrete Mathematics
Volume: 340
Issue number: 10
Chromosome copy number variation in telomerized human bone marrow stromal cells; insights for monitoring safe ex-vivo expansion of adult stem cells

Adult human bone marrow stromal cells (hBMSC) cultured for cell therapy require evaluation of potency and stability for safe use. Chromosomal aberrations upsetting genomic integrity in such cells have been contrastingly described as "Limited" or "Significant". Previously reported stepwise acquisition of a spontaneous neoplastic phenotype during three-
year continuous culture of telomerized cells (hBMSC-TERT20) didn't alter a diploid karyotype measured by spectral karyotype analysis (SKY). Such screening may not adequately monitor abnormal and potentially tumorigenic hMSC in clinical scenarios. We here used array comparative genomic hybridization (aCGH) to more stringently compare non-tumorigenic parental hBMSC-TERT strains with their tumorigenic subcloned populations. Confirmation of a known chromosome 9p21 microdeletion at locus CDKN2A/B, showed it also impinged upon the adjacent MTAP gene. Compared to reference diploid human fibroblast genomic DNA, the non-tumorigenic hBMSC-TERT4 cells had a copy number variation (CNV) in at least 14 independent loci. The pre-tumorigenic hBMSC-TERT20 cell strain had further CNV including 1q44 gain enhancing SMYD3 expression and 11q13.1 loss downregulating MUS81 expression. Bioinformatic analysis of gene products reflecting 11p15.5 CNV gain in tumorigenic hBMSC-TERT20 cells highlighted networks implicated in tumorigenic progression involving cell cycle control and mis-match repair. We provide novel biomarkers for prospective risk assessment of expanded stem cell cultures.

**General information**

State: Published  
Organisations: Center for Biological sequence analysis, Department of Systems Biology, Center for Biological Sequence Analysis, DTU Multi Assay Core, Odense University Hospital  
Authors: Burns, J. S. (Ekstern), Harkness, L. (Ekstern), Aldahmash, A. (Ekstern), Gautier, L. (Intern), Kassem, M. (Ekstern)  
Pages: 6-17  
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Main Research Area: Technical/natural sciences

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BFI (2016): BFI-level 1  
Scopus rating (2016): CiteScore 4.06 SJR 1.94 SNIP 1.061  
BFI (2015): BFI-level 1  
Scopus rating (2015): SJR 2.049 SNIP 0.965 CiteScore 4.08  
Web of Science (2015): Indexed yes  
BFI (2014): BFI-level 1  
Scopus rating (2014): SJR 1.785 SNIP 0.958 CiteScore 3.88  
Web of Science (2014): Indexed yes  
BFI (2013): BFI-level 1  
Scopus rating (2013): SJR 1.869 SNIP 0.986 CiteScore 4.43  
ISI indexed (2013): ISI indexed yes  
Scopus rating (2012): SJR 1.797 SNIP 1.028 CiteScore 4.5  
ISI indexed (2012): ISI indexed yes  
Scopus rating (2011): SJR 2.325 SNIP 1.242 CiteScore 4.66  
ISI indexed (2011): ISI indexed no  
Scopus rating (2010): SJR 1.688 SNIP 0.87  
Scopus rating (2009): SJR 1.287 SNIP 0.976  
Scopus rating (2008): SJR 1.996 SNIP 0.587  
Original language: English  
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Electronic versions:  
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Source: FindIt  
Source-ID: 2390436901  
Publication: Research - peer-review › Journal article – Annual report year: 2017

**Chromosome-wise Protein Interaction Patterns and Their Impact on Functional Implications of Large-Scale Genomic Aberrations**

Gene copy-number changes influence phenotypes through gene-dosage alteration and subsequent changes of protein complex stoichiometry. Human trisomies where gene copy numbers are increased uniformly over entire chromosomes
provide generic cases for studying these relationships. In most trisomies, gene and protein level alterations have fatal consequences. We used genome-wide protein-protein interaction data to identify chromosome-specific patterns of protein interactions. We found that some chromosomes encode proteins that interact infrequently with each other, chromosome 21 in particular. We combined the protein interaction data with transcriptome data from human brain tissue to investigate how this pattern of global interactions may affect cellular function. We identified highly connected proteins that also had coordinated gene expression. These proteins were associated with important neurological functions affecting the characteristic phenotypes for Down syndrome and have previously been validated in mouse knockout experiments. Our approach is general and applicable to other gene-dosage changes, such as arm-level amplifications in cancer.

**General information**

State: Published
Organisations: Department of Systems Biology, Integrative Systems Biology, Center for Biological Sequence Analysis, Center for Biological sequence analysis, Department of Bio and Health Informatics, Integrative Systems Biology, University of Copenhagen, Københavns Universitet
Pages: 357-364
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): CiteScore 4.31
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Publication: Research - peer-review › Journal article – Annual report year: 2017

**Circular economy, permanent materials and limitations to recycling: Where do we stand and what is the way forward?**

**General information**
State: Published
Organisations: Quantitative Sustainability Assessment, Department of Management Engineering, Politecnico di Milano
Authors: Grosso, M. (Ekstern), Rigamonti, L. (Ekstern), Niero, M. (Intern)
Number of pages: 2
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.76 SJR 0.655 SNIP 1.036
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.617 SNIP 0.899 CiteScore 1.53
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Sex is found in all major eukaryotic groups of organisms. It has been known for some time that the choanoflagellates also possess the genes involved in meiosis and a full sexual cycle was also recently accounted for in Salpingoea rosetta. With reference to the loricate choanoflagellates the current status is that only circumstantial evidence, from wild material of Bicosta spinifera, exists in favour of documenting division patterns that go beyond plain asexual division, and that has the potential to represent stages in a sexual life cycle. Here we present further evidence from wild material documenting possible morphotype changes that might similarly indicate the existence of complex life cycles. In this particular case, it revolves around the existence of so-called ‘combination loricas’ (i.e. two loricas that occur physically united), representing consistent species combinations from the genera Acanthocorbis and Stephanoeca.
CITIESData: a smart city data management framework

Smart city data come from heterogeneous sources including various types of the Internet of Things such as traffic, weather, pollution, noise, and portable devices. They are characterized with diverse quality issues and with different types of sensitive information. This makes data processing and publishing challenging. In
this paper, we propose a framework to streamline smart city data management, including data collection, cleansing, anonymization, and publishing. The paper classifies smart city data in sensitive, quasi-sensitive, and open/public levels and then suggests different strategies to process and publish the data within these categories. The paper evaluates the framework using a real-world smart city data set, and the results verify its effectiveness and efficiency. The framework can be a generic solution to manage smart city data.

**General information**

State: Accepted/In press

Organisations: Department of Management Engineering, Systems Analysis, Department of Civil Engineering, Section for Building Energy, Centre for IT-Intelligent Energy Systems in Cities

Authors: Liu, X. (Intern), Heller, A. (Intern), Nielsen, P. S. (Intern)

Number of pages: 24

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BFI (2015): BFI-level 1

Scopus rating (2015): SJR 0.858 SNIP 1.496 CiteScore 1.89

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 1.353 SNIP 2.414 CiteScore 2.77

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 1.338 SNIP 2.469 CiteScore 3.22

BFI (2012): BFI-level 1

Scopus rating (2012): SJR 1.177 SNIP 1.958 CiteScore 2.5

BFI (2011): BFI-level 1

Scopus rating (2011): SJR 1.141 SNIP 3.009 CiteScore 3.2

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Scopus rating (2010): SJR 1.242 SNIP 2.318

BFI (2009): BFI-level 1

Scopus rating (2009): SJR 1.5 SNIP 2.442

BFI (2008): BFI-level 1

Scopus rating (2008): SJR 1.11 SNIP 2.056

Scopus rating (2007): SJR 0.619 SNIP 1.555

Scopus rating (2006): SJR 0.454 SNIP 1.471

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Data framework, Smart cities, Dara privacy, Data quality, Data sensitivity

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Publication: Research - peer-review › Journal article – Annual report year: 2017

Citrullination only infrequently impacts peptide binding to HLA class II MHC

It has been hypothesized that HLA class II alleles associated with rheumatoid arthritis (RA) preferentially present self-antigens altered by post-translational modification, such as citrullination. To understand the role of citrullination we tested four RA-associated citrullinated epitopes and their corresponding wild-type version for binding to 28 common HLA class II. Binding patterns were variable, and no consistent impact of citrullination was identified. Indeed, in one case citrullination significantly increased binding compared to the WT peptide, in another citrullination was associated with a reduction in promiscuity by 40%. For a more comprehensive analysis, we tested over 200 citrullinated peptides derived from vimentin and collagen II for their capacity to bind the RA-associated shared epitope alleles DRB1*01:01 and DRB1*04:01. The overall effect of citrullination on binding was found to be relatively minor, and only rarely associated with 3-fold increases or decreases in affinity. Previous studies have suggested that citrullination of MHC anchor residues, in particular P4, is associated with generation of novel RA-associated epitopes. However, analysis of the predicted MHC-binding cores of all peptides tested found that in modified peptides with increased binding affinity the citrullinated residue was predicted to occupy an anchor position in only a minority of cases. Finally, we also show that identification of citrullinated peptide binders could be facilitated by using the NetMHCIIpan 3.1 algorithm, representing citrullination as a wildcard. Our studies
identify a total of 117 citrullinated peptides that bound RA-associated alleles with an affinity of 1000 nM or better.
Classification of DNA nucleotides with transverse tunneling currents

It has been theoretically suggested and experimentally demonstrated that fast and low-cost sequencing of DNA, RNA, and peptide molecules might be achieved by passing such molecules between electrodes embedded in a nanochannel. The experimental realization of this scheme faces major challenges, however. In realistic liquid environments, typical currents in tunneling devices are of the order of picoamps. This corresponds to only six electrons per microsecond, and this number affects the integration time required to do current measurements in real experiments. This limits the speed of sequencing, though current fluctuations due to Brownian motion of the molecule average out during the required integration time. Moreover, data acquisition equipment introduces noise, and electronic filters create correlations in time-series data. We discuss how these effects must be included in the analysis of, e.g., the assignment of specific nucleobases to current signals. As the signals from different molecules overlap, unambiguous classification is impossible with a single measurement. We argue that the assignment of molecules to a signal is a standard pattern classification problem and calculation of the error rates is straightforward. The ideas presented here can be extended to other sequencing approaches of current interest.
Clay squirt: Local flow dispersion in shale-bearing sandstones

Dispersion of elastic-wave velocity is common in sandstone and larger in shaly sandstone than in clean sandstone. Dispersion in fluid-saturated shaly sandstone often exceeds the level expected from the stress-dependent elastic moduli of dry sandstone. The large dispersion has been coined clay squirt and is proposed to originate from a pressure gradient between the clay microporosity and the effective porosity. We have formulated a simple model that quantifies the clay-squirt effect on bulk moduli of sandstone with homogeneously distributed shale laminae or dispersed shale. The model predictions were compared with the literature data. For sandstones with dispersed shale, agreement was found, whereas other sandstones have larger fluid-saturated bulk modulus, possibly due to partially load-bearing shales or heterogeneous shale distribution. The data that agree with the clay-squirt model indicated nonuniform pore pressure in the high-frequency regime and uniform pore pressure in the low-frequency regime. Therefore, our model showed that clay-squirt dispersion can attain a sufficient magnitude to explain much of the large dispersion observed in shaly sandstone.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Geotechnics and Geology
Authors: Sørensen, M. K. (Intern), Fabricius, I. L. (Intern)
Number of pages: 13
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Publication date: 2017
Main Research Area: Technical/natural sciences

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Climate Impacts and Adaptation; Towards Local Solutions to Global Challenges

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Organisations: National Space Institute, Geodesy
Authors: Sørensen, C. S. (Intern), Knudsen, P. (Intern), Andersen, O. B. (Intern)
Number of pages: 1
Publication date: 2017
Main Research Area: Technical/natural sciences
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Sørensen_et_al_Sealevel2017_ID310_impacts_poster.pdf

Closing the Loop for Packaging: Finding a Framework to Operationalize Circular Economy Strategies
This paper examines some of the most common frameworks available to companies in implementing circular economy strategies, i.e. the Cradle-to-Cradle design protocol, the Material Circularity Indicator and the Life Cycle Sustainability Assessment framework intended as a combination of Life Cycle Assessment, Environmental Life Cycle Costing and Social Life Cycle Assessment. We focus on the packaging sector and use the case of closed-loop aluminium can supply to illustrate the benefits and limitations of combining some of these frameworks. Our recommendation is to use the Life Cycle Sustainability Assessment framework to evaluate circularity strategies, since it is the most comprehensive and still operational framework and best at preventing burden shifting between stakeholders in the value chain.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, Department of Management Engineering, Quantitative Sustainability Assessment
Authors: Niero, M. (Intern), Hauschild, M. Z. (Intern)
Number of pages: 6
Pages: 685-690
Publication date: 2017
Main Research Area: Technical/natural sciences
Clustering of maintenance tasks for the Danish railway system
Standardisation of the European rail traffic signalling system is an ongoing project for faster travel within the EU, which entails very strict time limits and constraints on recovery operations. Denmark will be the first country to upgrade its entire signalling system to implement the new standards. In this paper, we present a mathematical model for allocation of maintenance tasks to maintenance team members, which is a variant of the Generalized Assignment Problem. The aim is to optimise the following three criteria: (i) the total distance travelled from depots to tasks, (ii) the maximal distance between any maintenance task and its allocated crew member, and (iii) the imbalance in workload among crew members. As test cases, we use a set of instances that simulate the distribution of tasks in the Jutland peninsula, the largest region of Denmark.

General information
State: Published
Organisations: Management Science, Department of Management Engineering, Queen Mary University of London
Authors: Mohammad Pour, S. (Intern), Benlic, U. (Ekstern)
Pages: 791-799
Publication date: 2017

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CMOS Integrated Circuit Simulation: Solutions - 2nd Edition

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State: Published
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Authors: Bruun, E. (Intern)
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Authors: Bruun, E. (Intern)
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ISBN (Print): 978-87-403-1587-5
Original language: English
Main Research Area: Technical/natural sciences
CNS histopathology on 203 bovines with clinical suspicion of BSE in Denmark 2001 to 2016
During 2001 to 2016 a total of 203 bovines were submitted to the institute with clinical suspicion of having BSE. In two cases BSE was confirmed. The most common differential diagnosis was listeriosis, found in 54% of the cases. Listeriosis was characterized by multifocal, necrotizing, non-suppurative encephalitis confined to the brainstem region.

CO2 Capture with Liquid-Liquid Phase Change Solvents: A Thermodynamic Study
Extended UNIQUAC thermodynamic framework was implemented in this work to model the aqueous blend of N, N-Diethylethanolamine (DEEA) and N-Methyl-1,3-diaminopropane (MAPA) for CO2 capture. The model parameters were estimated first for the two ternary systems, H2O-DEEA-CO2 and H2O-MAPA-CO2, followed by the quaternary H2O-DEEAMAPA-CO2 system which gives liquid-liquid phase split when reacted with carbon dioxide. A total of 94 model parameters and 6 thermodynamic properties were fitted to approximately 1500 equilibrium and thermal experimental data consisting of pureamine vapor pressure (Pvap), vapor-liquid equilibrium (VLE), solid-liquid equilibrium (SLE), liquid-liquid equilibrium (LLE), excess enthalpy (H\text{E}), and heat of absorption (\Delta H_{\text{abs}}) of CO2 in aqueous amine solutions. The model developed in this work can accurately represent the equilibrium and thermal data for the studied systems with a single unique set of parameters.
Coastal flood protection management under uncertainty – the Danish case

Local stakeholders responsible for coastal management. In Denmark, the responsibility of defining, planning and implementing coastal flood protection lies with the local stakeholders, such as landowners and municipalities. Similarly, it is a municipal responsibility to define building foundation and flood protection levels in urban planning and long term development. These planning and protection levels are most often defined from the hazard instead of a risk perspective. The Danish Coastal Authority (DCA) guides local stakeholders on general coastal flood protection and implements the EU Flood Directive on flood risk reduction in appointed areas of significant flood risk. DCA is obligated to communicate the concept of risk and, in a thorough and easily comprehensible way, the hazards and uncertainties relating to this today and in the future.

Coastal Hazards and Integration of Impacts on Local Adaptation Planning

General information
State: Published
Organisations: National Space Institute, Geodesy
Authors: Jumppanen Andersen, K. (Ekstern), Sørensen, C. S. (Intern), Piontkowitz, T. (Ekstern)
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Publication date: 2017
Main Research Area: Technical/natural sciences
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Coastal Sea Level from CryoSat-2 SARIn Altimetry in Norway

Conventional (pulse-limited) altimeters determine the sea surface height with an accuracy of a few centimeters over the open ocean. Sea surface heights and tide-gauge sea level serve as each other's buddy check. However, in coastal areas, altimetry suffers from numerous effects, which degrade its quality. The Norwegian coast adds further challenges due to its complex coastline with many islands, mountains, and deep, narrow fjords.

The European Space Agency CryoSat-2 satellite carries a synthetic aperture interferometric radar altimeter, which is able to observe sea level closer to the coast than conventional altimeters. In this study, we explore the potential of CryoSat-2 to provide valid observations in the Norwegian coastal zone. We do this by comparing time series of CryoSat-2 sea level anomalies with time series of in situ sea level at 22 tide gauges, where the CryoSat-2 sea level anomalies are averaged in a 45-km area around each tide gauge. For all tide gauges, CryoSat-2 shows standard deviations of differences and correlations of 16 cm and 61%, respectively. We further identify the ocean tide and inverted barometric geophysical corrections as the most crucial, and note that a large amount of observations at land-confined tide gauges are not assigned an ocean tide value. With the availability of local air pressure observations and ocean tide predictions, we substitute the standard inverted barometric and ocean tide corrections with local corrections. This gives an improvement of 24% (to 12.2 cm) and 12% (to 68%) in terms of standard deviations of differences and correlations, respectively.

Finally, we perform the same in situ analysis using data from three conventional altimetry missions, Envisat, SARAL/AltiKa, and Jason-2. For all tide gauges, the conventional altimetry missions show an average agreement of 11 cm and 60% in terms of standard deviations of differences and correlations, respectively. There is a tendency that results improve with decreasing distance to the tide gauge and a smaller footprint, underlining the potential of SAR altimetry in coastal zones.
Coating Nanoparticles with Plant-Produced Transferrin-Hydrophobin Fusion Protein Enhances Their Uptake in Cancer Cells

The encapsulation of drugs to nanoparticles may offer a solution for targeted delivery. Here, we set out to engineer a self-assembling targeting ligand by combining the functional properties of human transferrin and fungal hydrophobins in a single fusion protein. We showed that human transferrin can be expressed in Nicotiana benthamiana plants as a fusion with Trichoderma reesei hydrophobins HFBI, HFBII, or HFBIV. Transferrin-HFBIV was further expressed in tobacco BY-2 suspension cells. Both partners of the fusion protein retained their functionality; the hydrophobin moiety enabled migration to a surfactant phase in an aqueous two-phase system, and the transferrin moiety was able to reversibly bind iron. Coating porous silicon nanoparticles with the fusion protein resulted in uptake of the nanoparticles in human cancer cells. This study provides a proof-of-concept for the functionalization of hydrophobin coatings with transferrin as a targeting ligand.

General information
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Coccidia infections in Danish farmed mink

Although Danish farmed mink are frequently infected with Coccidia, knowledge of factors affecting the infection is scarce. Thus, we studied age, geographical and season-related factors affecting coccidia prevalence. Unsporulated oocysts excretion was quantified microscopically (n=4142) every 7-14th day (April-October 2016) from bitches and cups on 30 farms (n=335 mink) from South- or North Jutland, or Zealand. Minimum once, 60.9% (n=204) mink excreted Eimeria, 56.7% (n=190) Isospora and 20.9% (n=70) excreted both coccidia. Positive mink were identified on all farms. Eimeria
Prevalence was higher on the Zealand farms (25.4±2.2%, P<0.0001) compared to South- and North Jutland farms (5.4±2.9%; 7.5±4.1%). *Isospora* prevalence was similar regardless of farm locality (12.2±3.5%, 11.8±3.5%, 9.2±7.1%). Eimeria prevalence peaked in June-July (12.6%-24.9%), while *Isospora* prevalence peaked in July-August (12.1%-27.6%). More cups (19.5%) than bitches (4.6%) were *Isospora* positive, while *Eimeria* prevalence was similar for cups (15.7%) and bitches (10.5%). For cups, *Eimeria* prevalence peaked when cups were 7-11 weeks old and again when 18-24 weeks old. *Isospora* prevalence peaked in cups 13-15 weeks old. Three *Eimeria* types were characterized by size and wall thickness (unverified by PCR): A, B and C. Types B and C (40.9%, 39.8%) were more prevalent than A (19.3%). Bitches were primarily infected with type B (50.4%), while type C (48.0%) predominated in cups. Type B infections dominated in mink from Zealand (56.5±13.7%), while mink from Jutland were primarily infected with type C (55.6±28.6%; 81.9±19.4%). Farmed mink showed high coccidia prevalence with seasonal- and age-related *Isospora* prevalence, and seasonal- and geographical-related *Eimeria* prevalence.

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**Coccidie-infection hos danske farmmink – et overset problem?**

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Authors: Petersen, H. H. (Intern), Hansen, M. S. (Intern), Chriél, M. (Intern), Holm, T. (Ekstern)

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**Cocoa butter-like lipid production ability of non-oleaginous and oleaginous yeasts under nitrogen-limited culture conditions**

Cocoa butter (CB) extracted from cocoa beans is the main raw material for chocolate production. However, growing chocolate demands and limited CB production has resulted in a shortage of CB supply. CB is mainly composed of three different kinds of triacylglycerols (TAGs), POP (C16:0â€“C18:1â€“C16:0), POS (C16:0â€“C18:1â€“C18:0), and SOS (C18:0â€“C18:1â€“C18:0). The storage lipids of yeasts, mainly TAGs, also contain relative high-level of C16 and C18 fatty acids and might be used as CB-like lipids (CBL). In this study, we cultivated six different yeasts, including one non-oleaginous yeast strain, Saccharomyces cerevisiae CEN.PK113-7D, and five oleaginous yeast strains, Trichosporon oleaginosus DSM11815, Rhodotorula graminis DSM 27356, Lipomyces starkeyi DSM 70296, Rhodosporidium toruloides DSM 70398, and Yarrowia lipolytica CBS 6124, in nitrogen-limited medium and compared their CBL production ability.

Under the same growth conditions, we found that TAGs were the main lipids in all six yeasts and that T. oleaginosus can produce more TAGs than the other five yeasts. Less than 3% of the total TAGs were identified as potential SOS in the six yeasts. However, T. oleaginosus produced 27.8% potential POP and POS at levels of 378Â mg TAGs/g dry cell weight, hinting that this yeast may have potential as a CBL production host after further metabolic engineering in future.
Codend selectivity in a commercial Danish anchor seine

Danish seining (or anchor seining) is a fishing technique that is gaining increasing attention because its considered to be a fuel-efficient fishing method with low environmental impact. However, scientific documentation of the selectivity characteristics of Danish seines is lacking, and the gear generally is grouped with bottom trawls and Scottish seines in fisheries management legislation. In this study, we developed a codend cover to estimate the selectivity of a standard commercial Danish seine codend for four fish species. The data for the dominant species, dab (Limanda limanda) and plaice (Pleuronectes platessa), was best described by models that combine two or three logistic models, which indicated that more than one selection process was at work. Selectivity of cod (Gadus morhua) was best described by a Richard curve and selectivity of red gurnard (Chelidonichthys lucernus) by a logistic curve. The estimated selectivity curve of dab indicated, contrary to cod and plaice, low retention of individuals below MLS. Confidence limits for larger length classes of cod and red gurnard were relatively wide. For plaice, the estimated selection factor, which is the length with 50% retention divided by mesh size, was comparable to literature values from trawl studies. The average value for cod was similar for Danish and Scottish seines, but lower for trawls. The results are discussed in the context of fisheries management with focus on the landing obligation of the new Common Fisheries Policy.
Co-existence of Anaerobic Ammonium Oxidation Bacteria and Denitrifying Anaerobic Methane Oxidation Bacteria in Sewage Sludge: Community Diversity and Seasonal Dynamics

Anaerobic ammonium oxidation (ANAMMOX) and denitrifying anaerobic methane oxidation (DAMO) have been recently discovered as relevant processes in the carbon and nitrogen cycles of wastewater treatment plants. In this study, the
seasonal dynamics of ANAMMOX and DAMO bacterial community structures and their abundance in sewage sludge collected from wastewater treatment plants were analysed. Results indicated that ANAMMOX and DAMO bacteria co-existed in sewage sludge in different seasons and their abundance was positively correlated (P <0.05). The high abundance of ANAMMOX and DAMO bacteria in autumn and winter indicated that these seasons were the preferred time to favour the growth of ANAMMOX and DAMO bacteria. The community structure of ANAMMOX and DAMO bacteria could also shift with seasonal changes. The “Candidatus Brocadia” genus of ANAMMOX bacteria was mainly recovered in spring and summer, and an unknown cluster was primarily detected in autumn and winter. Similar patterns of seasonal variation in the community structure of DAMO bacteria were also observed. Group B was the dominant in spring and summer, whereas in autumn and winter, group A and group B presented almost the same proportion. The redundancy analysis revealed that pH and nitrate were the most significant factors affecting community structures of these two groups (P <0.01). This study reported the diversity of ANAMMOX and DAMO in wastewater treatment plants that may be the basis for new nitrogen removal technologies.
Coherent structural trapping through wave packet dispersion during photoinduced spin state switching

The description of ultrafast nonadiabatic chemical dynamics during molecular photo-transformations remains challenging because electronic and nuclear configurations impact each other and cannot be treated independently. Here we gain experimental insights, beyond the Born-Oppenheimer approximation, into the light-induced spin-state trapping dynamics of the prototypical [Fe(bpy)$_3$]$^{2+}$ compound by time-resolved X-ray absorption spectroscopy at sub-30-femtosecond resolution and high signal-to-noise ratio. The electronic decay from the initial optically excited electronic state towards the high spin state is distinguished from the structural trapping dynamics, which launches a coherent oscillating wave packet (265 fs period), clearly identified as molecular breathing. Throughout the structural trapping, the dispersion of the wave packet along the reaction coordinate reveals details of intramolecular vibronic coupling before a slower vibrational energy dissipation to the solution environment. These findings illustrate how modern time-resolved X-ray absorption spectroscopy can provide key information to unravel dynamic details of photo-functional molecules.
Numerical analysis of slab on grade structures subjected to mechanical loads is a complex matter often requiring computationally expensive models. In order to develop a simplified and general concept for non-linear analysis of slab on grade structures, this paper presents a cohesive cracked-hinge model aimed at the analysis of the bending fracture of the cemented material. The model is based on the fracture mechanics concepts of the fictitious crack model with a linear stress-crack opening relationship. Moreover, the paper presents a two-parameter spring foundation model applied to realistically capture the continuity in the supporting medium. The functionality of the proposed model is compared to numerical analysis with application of the more conventional cohesive zone model. The results obtained show that the methodology is a attractive and powerful one well-suited for practical use and further development.
Cohesive zone modelling of nucleation, growth and coalesce of cavities

The stress-deformation relation i.e. cohesive law representing the fracture process in an almost incompressible adhesive tape is measured using the double cantilever beam specimen. As in many ductile materials, the fracture process of the tape involves nucleation, growth and coalesce of cavities. This process is studied carefully by exploiting the transparency of the used materials and the inherent stability of the specimen configuration. Utilising the path independence of the J-integral, the cohesive law is measured. The law is compared to the results of butt-joint tests. The law contains two stress peaks-the first is associated with nucleation of cavities at a stress level conforming to predictions of void nucleation in rubber elasticity. The second stress peak is associated with fracture of stretched walls between fully-grown cavities. After this second peak, a macroscopic crack is formed. The tape suffers at this stage an engineering strain of about 800%. A numerical analysis with the determined cohesive law recreates the global specimen behaviour.
Cold Atmospheric Plasma Manipulation of Proteins in Food Systems

Plasma processing has been getting a lot of attention in recent applications as a novel, eco-friendly, and highly efficient approach. Cold plasma has mostly been used to reduce microbial counts in foodstuff and biological materials, as well as in different levels of packaging, particularly in cases where there is thermal sensitivity. As it is a very recent application, the impact of cold plasma treatment has been studied on the protein structures of food and pharmaceutical systems, as well as in the packaging industry. Proteins, as a food constituent, play a remarkable role in the techno-functional characteristics of processed foods and/or the physico-chemical properties of protein-based films. At the same time, some proteins are responsible for reduction in quality and nutritional value, and/or causing allergic reactions in the human body. This study is a review of the influences of different types of plasma on the conformation and function of proteins with food origin, especially enzymes and allergens, as well as protein-made packaging films. In enzyme manipulation with plasma, deactivation has been reported to be either partial or complete. In addition, an activity increase has been observed in some cases. These variations are caused by the effect of different active species of plasma on the enzyme structure and its function. The level and type of variations in the functional properties of food proteins, purified proteins in food, and plasma-treated protein films are affected by a number of control factors, including treatment power, time, and gas type, as well as the nature of the substance and the treatment environment.

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Organisations: National Food Institute, Research Group for Food Production Engineering
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Collaborative Filtering Fusing Label Features Based on SDAE

Collaborative filtering (CF) is successfully applied to recommendation system by digging the latent features of users and items. However, conventional CF-based models usually suffer from the sparsity of rating matrices which would degrade model’s recommendation performance. To address this sparsity problem, auxiliary information such as labels are utilized. Another approach of recommendation system is content-based model which can’t be directly integrated with CF-based model due to its inherent characteristics. Considering that deep learning algorithms are capable of extracting deep latent
features, this paper applies Stack Denoising Auto Encoder (SDAE) to content-based model and proposes LCF (Deep Learning for Collaborative Filtering) algorithm by combing CF-based model which fuses label features. Experiments on real-world data sets show that DLCF can largely overcome the sparsity problem and significantly improves the state of art approaches.

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Collective design in 3D printing: A large scale empirical study of designs, designers and evolution
This paper provides an empirical study of a collective design platform (Thingiverse); with the aim of understanding the phenomenon and investigating how designs concurrently evolve through the large and complex network of designers. The case study is based on the meta-data collected from 158 489 designs and 247 768 users; and it reveals that (i) Designs can be shared and quickly evolved into other designs through a distributed network of designers, (ii) only a small portion of the users are designers and (iv) collective design has deep and strong evolutionary roots. Better understanding of collective design platforms can help design practitioners to identify lead users in their respective domains and to discover latent needs that stem from different sub-communities or geographic regions.

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Collective Thomson scattering data analysis for Wendelstein 7-X
Collective Thomson scattering (CTS) diagnostic is being installed on the Wendelstein 7-X stellarator to measure the bulk ion temperature in the upcoming experimental campaign. In order to prepare for the data analysis, a forward model of the diagnostic (eCTS) has been developed and integrated into the Bayesian data analysis framework Minerva. Synthetic spectra have been calculated with the forward model and inverted using Minerva in order to demonstrate the feasibility to measure the ion temperature in the presence of nuisance parameters that also influence CTS spectra. In this paper we report on the results of this analysis and discuss the main sources of uncertainty in the CTS data analysis.

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Colloidal Flower-Shaped Iron Oxide Nanoparticles: Synthesis Strategies and Coatings

The assembly of magnetic cores into regular structures may notably influence the properties displayed by a magnetic colloid. In this work, key synthesis parameters driving the self-assembly process capable of organizing colloidal magnetic cores into highly regular and reproducible multi-core nanoparticles are determined. In addition, a self-consistent picture that explains the collective magnetic properties exhibited by these complex assemblies is achieved through structural, colloidal, and magnetic means. For this purpose, different strategies to obtain flower-shaped iron oxide assemblies in the size range 25–100 nm are examined. The routes are based on the partial oxidation of Fe(OH)$_2$, polyol-mediated synthesis or the reduction of iron acetylacetonate. The nanoparticles are functionalized either with dextran, citric acid, or alternatively embedded in polystyrene and their long-term stability is assessed. The core size is measured, calculated, and modeled using both structural and magnetic means while the Debye model and multi-core extended model are used to study interparticle interactions. This is the first step toward standardized protocols of synthesis and characterization of flower-shaped nanoparticles.

General information

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Organisations: Department of Physics, Neutrons and X-rays for Materials Physics, Department of Micro- and Nanotechnology, Magnetic Systems, Instituto de Ciencia de Materiales de Madrid, Micromod Partikeltechnologie GmbH, nanoPET Pharma GmbH, SP Technical Research Institute of Sweden, UCL Healthcare Biomagnetics Laboratory, Physikalisch-Technische Bundesanstalt, Chalmers University of Technology, University of Cantabria, Technische Universität Braunschweig, Uppsala University
Colonization of the bovine uterus by Candida kefyr

Background. While fungal infections of the bovine uterus are well-known diseases in pregnant cattle, very limited knowledge exists on the presence and significance of fungi in the uterus of non-pregnant cows. Presence of fungi in the uterine lumen of postpartum (pp) cows has been reported, but little attention has been paid to this as most studies of the bovine pp uterus have focused on bacteria. Case presentation. Microscopy of uterine lavage cytology slides of three cows from one herd revealed the presence of numerous yeast-like organisms, which were located either free in the fluid or within macrophages. Two of the cows were around 30 days pp, while the third was 7 months pp. None of the cows had been treated with antibiotics. Culturing of the flush samples was unsuccessful, but Sanger sequencing of DNA extracted
from an endometrial biopsy of one of the cows revealed the presence of Candida kefyr (Kluyveromyces marxianus). Fluorescence in situ hybridization examination of endometrial tissue sections of two cows using probes targeting 18S rRNA of the K. marxianus group was performed and revealed the presence of yeast cells on the endometrium. Histology was performed and demonstrated hyphal and non-hyphal yeast-like organisms on the surface of endometrium and in the crypts. Tissue invasion was restricted to the superficial part of the epithelium and although endometrial inflammation was present, this was mild and considered as not being caused by the fungi. One of the cows became pregnant and delivered a normal calf at term, while the two others were not bred. Conclusions. Candida kefyr is commonly isolated from milk of cows with mastitis, but has not been reported in association with other diseases of cattle. The infection was present as a monoculture in all three cows, but the fungi had only colonized the uterine lumen and the endometrial surface. Only a mild non-suppurative endometrial inflammation was present, but within the uterine luminal content, many macrophages having phagocytized yeast cells were present. Re-examination of the cows did not reveal a persistent infection, so the infection probably resolved spontaneously.
A majority of printed circuit board surfaces are covered with tin, therefore tin corrosion under humid conditions and movement of tin ions under the influence of an electric field plays an important role in the corrosion failure development. Tracking tin corrosion products spread on the printed circuit board assembly (PCBA) provides a basis for the mechanistic understanding of PCBA corrosion failures and leak current tracks which eventually can lead to electrochemical migration. This paper presents a method for identification of such failures at the early stage of corrosion by using a colorimetric tin ion indicator applied as a gel. The examples provided in this paper include visualization of corrosion caused by weak organic acids found in solder fluxes, corrosion profiling on the PCBAs after climatic device level testing, and failure analysis of field returns.
Comammox Nitrospira are key nitrifiers in diverse groundwater-fed drinking water filters

Nitrification is a dominant process in groundwater-fed rapid sand filters (RSFs) used for drinking water purification. Near complete removal of ammonium and nitrite is required in the EU and Denmark due to strict regulatory limits that enable high water stability in the distribution system. RSFs are a unique environment harboring diverse microbial communities including a range of ammonia oxidizers (AOs); Betaproteobacterial ammonia oxidizers (Nitrosomonas, Nitrosospira), ammonia oxidizing archaea, diverse heterotrophs and a large fraction of Nitrospira spp., which in one studied filter have been shown to comprise both nitrite oxidizers as well as complete nitrifying (comammox) Nitrospira spp. (Palomo et al. 2016). We developed a new qPCR assay for the quantification of the comammox Nitrospira amoA gene which amplifies both clades A and B and applied this assay to the study of 12 drinking water treatment plants across Denmark. We further sequenced amplicons of the 16S rRNA gene of total Bacteria and amoA gene of Nitrospira to examine the microbial biodiversity present in the filters. Our results show that comammox Nitrospira are present in high abundance making up an average of 19% of the microbial communities in the examined filters. While members of both clades A (41 sequence variants) and B (47 sequence variants) were both present in high abundance, the majority of comammox diversity (70-90% in each filter) was made up by clade B. Ordination analysis with variance partitioning was performed on the total microbial communities and the comammox Nitrospira communities to identify physicochemical parameters of the influent water, filter material, or operational parameters which influenced the community structures in an effort to understand the success of comammox Nitrospira in these filters. Temperature as well as the sulfate and calcium content of the influent water made significant contributions towards explaining both the total and comammox community structures, while the iron content of the filter material made a significant contribution to explaining only the structure of the comammox Nitrospira communities. Further examination of groundwater-fed RSFs with higher variability in microbial communities and physicochemical parameters may provide further information on the ecology of comammox Nitrospira and explain their success in the groundwater-fed filters examined in this study. Together this work provides a new assay for the simultaneous detection of clade A and B comammox Nitrospira and expands our current knowledge of the diversity of comammox Nitrospira, while attempting to explain the success of comammox Nitrospira in these groundwater-fed filters.
Combating antibiotic resistance - A Policy Roadmap to Reduce Use of Medically Important Antibiotics in Livestock

Medical and public health organizations around the world agree that more prudent use of antibiotics in human medicine and in livestock production is paramount to slow the spread of antibiotic resistance. Of particular concern is the widespread use of antibiotics important to human medicine in food animals. In the U.S., such use accounts for 70% of all sales of medically important antibiotics. It is against this backdrop that 12 antibiotic resistance experts from the fields of infectious disease medicine, veterinary medicine, microbiology, epidemiology and public health joined to craft a policy roadmap to help move the U.S. forward in addressing the contribution of livestock antibiotic use to the growing global threat of antibiotic resistance.

The policy roadmap consists of 11 core policy recommendations that are aimed at a broad set of stakeholders: federal, state and local policymakers, food companies, institutional food purchasers (i.e. hospitals, schools and universities), and medical groups. The recommendations are split into three key areas: 1) decreasing livestock use of medically important antibiotics; 2) monitoring livestock antibiotic use, and 3) enhancing surveillance and data integration to inform antibiotic resistance policy.

Combination of phage and Gram-positive bacterial display of human antibody repertoires enables isolation of functional high affinity binders

Surface display couples genotype with a surface exposed phenotype and thereby allows screening of gene-encoded protein libraries for desired characteristics. Of the various display systems available, phage display is by far the most popular, mainly thanks to its ability to harbour large size libraries. Here, we describe the first use of a Gram-positive bacterial host for display of a library of human antibody genes which, when combined with phage display, provides ease of use for screening, sorting and ranking by flow cytometry. We demonstrate the utility of this method by identifying low nanomolar affinity scFv fragments towards human epidermal growth factor receptor 2 (HER2). The ranking and performance of the scFv isolated by flow sorting in surface-immobilised form was retained when expressed as soluble scFv and analysed by biolayer interferometry, as well as after expression as full-length antibodies in mammalian cells. We also demonstrate the possibility of using Gram-positive bacterial display to directly improve the affinity of the identified binders via an affinity maturation step using random mutagenesis and flow sorting. This combined approach has the
potential for a more complete scan of the antibody repertoire and for affinity maturation of human antibody formats.

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Combinatorial Drug Screening Identifies Ewing Sarcoma-specific Sensitivities

Improvements in survival for Ewing sarcoma pediatric and adolescent patients have been modest over the past 20 years. Combinations of anticancer agents endure as an option to overcome resistance to single treatments caused by compensatory pathways. Moreover, combinations are thought to lessen any associated adverse side effects through reduced dosing, which is particularly important in childhood tumors. Using a parallel phenotypic combinatorial screening approach of cells derived from three pediatric tumor types, we identified Ewing sarcoma-specific interactions of a diverse set of targeted agents including approved drugs. We were able to retrieve highly synergistic drug combinations specific for Ewing sarcoma and identified signaling processes important for Ewing sarcoma cell proliferation determined by EWS-FLI1.

We generated a molecular target profile of PKC412, a multikinase inhibitor with strong synergistic propensity in Ewing sarcoma, revealing its targets in critical Ewing sarcoma signaling routes. Using a multilevel experimental approach including quantitative phosphoproteomics, we analyzed the molecular rationale behind the disease-specific synergistic effect of simultaneous application of PKC412 and IGF1R inhibitors. The mechanism of the drug synergy between these inhibitors is different from the sum of the mechanisms of the single agents. The combination effectively inhibited pathway crosstalk and averted feedback loop repression, in EWS-FLI1-dependent manner. Mol Cancer Ther; 16(1); 88-101. ©2016 AACR.

General information

State: Published
Organisations: Department of Bio and Health Informatics, Integrative Systems Biology, Austrian Academy of Sciences, Georgetown University Medical Center, University of Copenhagen, University of Glasgow, Children's Cancer Research Institute, Medical University of Vienna
Authors: Radic-Sarikas, B. (Ekstern), Tsafou, K. P. (Ekstern), Emdal, K. B. (Ekstern), Papamarkou, T. (Ekstern), Huber, K. V. M. (Ekstern), Muiz, C. (Ekstern), Toretsky, J. A. (Ekstern), Bennett, K. L. (Ekstern), Olsen, J. V. (Ekstern), Brunak, S. (Intern), Kvar, H. (Ekstern), Superti-Furga, G. (Ekstern)
Number of pages: 14
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Publication information

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Scopus rating (2016): SJR 2.632 SNIP 1.306 CiteScore 5.61
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 3.189 SNIP 1.371 CiteScore 5.87
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 3.006 SNIP 1.5 CiteScore 5.76
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 3.077 SNIP 1.45 CiteScore 6.09
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.93 SNIP 1.424 CiteScore 5.73
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.869 SNIP 1.309 CiteScore 5.49
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.905 SNIP 1.336
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.645 SNIP 1.263
BFI (2008): BFI-level 2
Combined Active and Reactive Power Control of Wind Farms based on Model Predictive Control

This paper proposes a combined wind farm controller based on Model Predictive Control (MPC). Compared with the conventional decoupled active and reactive power control, the proposed control scheme considers the significant impact of active power on voltage variations due to the low X=R ratio of wind farm collector systems. The voltage control is improved. Besides, by coordination of active and reactive power, the Var capacity is optimized to prevent potential failures due to Var shortage, especially when the wind farm operates close to its full load. An analytical method is used to calculate the sensitivity coefficients to improve the computation efficiency and overcome the convergence problem. Two control modes are designed for both normal and emergency conditions. A wind farm with 20 wind turbines was used to verify the proposed combined control scheme.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems, Argonne National Laboratory, Illinois Institute of Technology, State Grid Electric Power System Research Institute
Authors: Zhao, H. (Intern), Wu, Q. (Intern), Wang, J. (Ekstern), Liu, Z. (Intern), Shahidehpour, M. (Ekstern), Xue, Y. (Ekstern)
Number of pages: 11
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Journal: IEEE Transactions on Energy Conversion
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Issue number: 3
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.08 SJR 1.524 SNIP 2.213
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.601 SNIP 2.624 CiteScore 5.22
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.633 SNIP 2.876 CiteScore 5.03
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.077 SNIP 3.285 CiteScore 5.67
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.719 SNIP 3.218 CiteScore 5.48
ISI indexed (2012): ISI indexed yes
Combined Colorimetric and Gravimetric CMUT Sensor for Detection of Phenylacetone

General information
State: Accepted/In press
Organisations: Department of Micro- and Nanotechnology, MEMS-AppliedSensors, Surface Engineering, Colloids and Biological Interfaces
Authors: Mølgaard, M. J. G. (Intern), Laustsen, M. (Intern), Thygesen, I. L. (Intern), Jakobsen, M. H. (Intern), Andresen, T. L. (Intern), Thomsen, E. V. (Intern)
Number of pages: 4
Publication date: 2017
Main Research Area: Technical/natural sciences
Electronic versions: 
Publication: Research - peer-review › Paper – Annual report year: 2017

Combined exposure to low doses of pesticides causes decreased birth weights in rats
Decreased birth weight is a common effect of many pesticides in reproductive toxicity studies, but there are no empirical data on how pesticides act in combination on this endpoint. We hypothesized that a mixture of six pesticides (cyromazine, MCPB, pirimicarb, quinoclamine, thiram, and ziram) would decrease birth weight, and that these mixture effects could be predicted by the Dose Addition model. Data for the predictions were obtained from the Draft Assessment Reports of the individual pesticides. A mixture of equi-effective doses of these pesticides was tested in two studies in Wistar rats, showing mixture effects in good agreement with the additivity predictions. Significantly lower birth weights were observed when compounds were present at individual doses below their no-observed adverse effect levels (NOAELs). These results emphasize the need for cumulative risk assessment of pesticides to avoid potentially serious impact of mixed exposure on prenatal development and pregnancy in humans.
Combined immunodeficiency and Epstein-Barr virus-induced B cell malignancy in humans with inherited CD70 deficiency

In this study, we describe four patients from two unrelated families of different ethnicities with a primary immunodeficiency, predominantly manifesting as susceptibility to Epstein-Barr virus (EBV)-related diseases. Three patients presented with EBV-associated Hodgkin’s lymphoma and hypogammaglobulinemia; one also had severe varicella infection. The fourth had viral encephalitis during infancy. Homozygous frameshift or in-frame deletions in CD70 in these patients abolished either CD70 surface expression or binding to its cognate receptor CD27. Blood lymphocyte numbers were normal, but the proportions of memory B cells and EBV-specific effector memory CD8+ T cells were reduced. Furthermore, although T cell proliferation was normal, in vitro-generated EBV-specific cytotoxic T cell activity was reduced because of CD70 deficiency. This reflected impaired activation by, rather than effects during killing of, EBV-transformed B cells. Notably, expression of 2B4 and NKG2D, receptors implicated in controlling EBV infection, on memory CD8+ T cells from CD70-deficient individuals was reduced, consistent with their impaired killing of EBV-infected cells. Thus, autosomal recessive CD70 deficiency is a novel cause of combined immunodeficiency and EBV-associated diseases, reminiscent of inherited CD27 deficiency. Overall, human CD70-CD27 interactions therefore play a nonredundant role in T and B cell-mediated immunity, especially for protection against EBV and humoral immunity.

General information
State: Published
Organisations: Department of Biotechnology and Biomedicine, Karolinska University Hospital, Garvan Institute of Medical Research, Ankara University, National Institutes of Health, Hospital St. Georg Leipzig, University of Pennsylvania, Merck & Co., Inc., Cardiff University, University of Sydney, Universal Scientific Education and Research Network, Paris Descartes University, University of New South Wales
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Scopus rating (2015): SJR 10.73 SNIP 2.633 CiteScore 11.63
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 11.621 SNIP 2.764 CiteScore 12.55
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 12.085 SNIP 2.933 CiteScore 13.66
ISI indexed (2013): ISI indexed yes
Combined Life Cycle Assessment and Life Cycle Costing in the Eco-Care-Matrix: A case study on the performance of a modernized manufacturing system for glass containers

The objects of Life Cycle Assessment (LCA) case studies are often individual components or individual products. Studies focusing on larger industrial manufacturing systems are relatively rare. The purpose of this case study was to assess environmental and cost-related performance of an updated complex manufacturing system for glass containers (i.e. jars, glass bottles, etc.) compared to the predecessor manufacturing system. The objective was also to identify the most relevant drivers for the environmental and the cost profile of the system solution in application context by the means of Life Cycle Assessment, as well as Life Cycle Costing (LCC). The results were then to be displayed in an Eco-Care-Matrix (ECM) in order to quantitatively visualize the improvements when comparing the updated manufacturing system to the previous one and they were to be discussed in terms of (i) ecodesign levers, (ii) efficiency of the LCA process and (iii) their relevance for the speed and cost of the decision-making process. The LCA results of the production stage of the optimized components showed that the largest contributors to the potential environmental impact of the manufacturing system are the motors due to their material composition, number and mass. The use stage was subsequently recognized as the dominant life cycle stage with Global Warming Potential (GWP) as the leading indicator, due to the long service life (20 years) and the corresponding energy consumption. The analysis of a produced glass bottle’s GWP showed that it was reduced by about 40% through optimizing the production system. The LCC showed that the modernization pays off after about five years of service life and that the decision for making an Investment should not only be based on the required capital expenditure (CAPEX). Rather, operation expenditure (OPEX) should also be considered in order to reflect the savings gained from lower operating costs, which compensate relatively quickly any higher initial expenditure or initial investment. In order to apply Life Cycle Assessment on larger-scale industrial systems, smart and pragmatic LCA modeling approaches have to be developed and adopted, balancing accuracy of results against efficiency in achieving them. An adequate ecological-and-economic assessment tool would reduce the time and effort when making decisions in this context.
Combined micro-cogeneration and electric vehicle system for household application: An energy and economic analysis in a Northern European climate

In recent years, Denmark boosted investments in renewable energy and electrification of transportation. The Danish Agenda proposed that all primary energy consumption will be covered by renewable sources such as wind, biomass and solar by 2050. These changes require significant investment and re-thinking of entire energy infrastructures and types of consumption. The Agenda also suggested, among other things, improving the efficiency of energy systems.

In this paper, the interactions between charging an electric car and an innovative cogeneration system for household application (micro-solid oxide fuel cell with an integrated heating system) are investigated. The charge of the electric car by the cogenerator produces waste heat that can be used to partially cover the heat demand of the house. In this way it may be possible to increase overall efficiency and decrease total energy costs. Different innovative strategies are proposed and analyzed to manage charging an electric car and efficiently using the waste heat available. The aims of this study are to make the system grid-independent, to decrease the thermal stress of SOFCs and to determine the nominal power of an integrated heating system. The results show energy efficiency and economic profitability of the system, even if subsidies are not included.

General information
State: Published
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Web of Science (2014): Indexed yes
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BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.515 SNIP 1.729 CiteScore 3.96
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.456 SNIP 1.837 CiteScore 4.42
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.589 SNIP 1.871
Combined shape and topology optimization for minimization of maximal von Mises stress

This work shows that a combined shape and topology optimization method can produce optimal 2D designs with minimal stress subject to a volume constraint. The method represents the surface explicitly and discretizes the domain into a simplicial complex which adapts both structural shape and topology. By performing repeated topology and shape optimizations and adaptive mesh updates, we can minimize the maximum von Mises stress using the p-norm stress measure with p-values as high as 30, provided that the stress is calculated with sufficient accuracy.

General information
State: Published
Organisations: Department of Mechanical Engineering, Solid Mechanics, Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, Acoustic Technology, Lawrence Livermore National Laboratory
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Number of pages: 17
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BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.42
Web of Science (2015): Indexed yes
Both UV treatment and ozonation are used to reduce different types of disinfection by-products (DBPs) in swimming pools. UV treatment is the most common approach, as it is particularly efficient at removing combined chlorine. However, the UV treatment of pool water increases chlorine reactivity and the formation of chloro-organic DBPs such as trihalomethanes. Based on the similar selective reactivity of ozone and chlorine, we hypothesised that the created reactivity to chlorine, as a result of the UV treatment of dissolved organic matter in swimming pool water, might also be expressed as increased reactivity to ozone. Moreover, ozonation might saturate the chlorine reactivity created by UV treatment and mitigate increased formation of a range of volatile DBPs. We found that UV treatment makes pool water highly reactive to ozone. The subsequent reactivity to chlorine decreases with increasing ozone dosage prior to contact with chlorine. Furthermore, ozone had a half-life of 5 min in non-UV treated pool water whereas complete consumption of ozone was obtained in less than 2 min in UV treated pool water. The ozonation of UV-treated pool water induced the formation of some DBPs that are not commonly reported in this medium, in particular trichloronitromethane, which is noteworthy for its genotoxicity, though this issue was removed by UV treatment when repeated combined UV/ozone treatment interchanging with chlorination was conducted over a 24-h period. The discovered reaction could form the basis for a new treatment method for swimming pools.

**General information**

State: Published
Organisations: Department of Environmental Engineering, Water Technologies
Authors: Cheema, W. A. (Intern), Kaarsholm, K. M. S. (Intern), Andersen, H. R. (Intern)
Combining eco-efficiency and eco-effectiveness for continuous loop beverage packaging systems: learnings from the Carlsberg Circular Community

Eco-efficiency (i.e., increasing value while reducing resource use and pollution) can with advantage be combined with eco-effectiveness (i.e., maximizing the benefits to ecological and economical systems) to address the challenges posed by the circular economy in the design of circular industrial systems. We present a framework combining life cycle assessment (LCA) and the Cradle to Cradle® (C2C) certification program for the development of continuous loop packaging systems, which was conceived for aluminum cans in the context of the Carlsberg Circular Community. As a first step, the environmentally optimal beverage packaging life cycle scenario is identified, both in terms of defined use and reuse. Second, the limiting factors are identified for the continuous use of materials in multiple loops, meeting the two requirements in the C2C certification process that address the material level (i.e., "material health" and "material reutilization" criteria) and the "renewable energy" criterion. Then, alternative scenarios are built to meet C2C certification criteria, and LCA is used to quantify the environmental impacts of the resulting improvement strategies, for example, change in material composition, in order to guide the identification of the optimal scenario from an eco-efficiency point of view. Finally, the business perspective is addressed by assessing the potential for a green value network business model for a closed-loop supply. The outcome is a list of prioritized actions needed to implement the most efficient and effective "upcycling" strategy for the beverage packaging, both from an environmental and an economic point of view. In the case of the aluminum cans, the main recommendation from both the LCA and C2C perspective is to ensure a system that enables can-to-can recycling.

General information
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Organisations: Quantitative Sustainability Assessment, Department of Management Engineering, Carlsberg Breweries A/S
Authors: Niero, M. (Intern), Hauschild, M. Z. (Intern), Hoffmeyer, S. B. (Ekstern), Olsen, S. I. (Intern)
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.44 SNIP 1.689 CiteScore 3.82
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.628 SNIP 1.706 CiteScore 3.07
Combining Gas Bearing and Smart Material Technologies for Improved Machine Performance Theory and Experiment

According to industry leaders, the world is on the verge of the fourth industrial revolution in which the Internet of Things and cyber-physical systems are central concepts. Where the previous industrial revolution evolved around electronics, IT and automated production on machine level, Industry 4.0 will enable a much stronger interaction between all of these technical achievements, from factory level all the way down to the individual machine elements. This can be exemplified by its the impact on machine maintenance. Nowadays, to avoid unwanted machine stops, maintenance cycles are scheduled based on the principle of the weakest link, e.g., the minimum expected lifetime of any machine element. In the future individual machine elements will not only send information about their performance, they will also be able to compensate for "wear and tear" or adapt to new operating conditions autonomously in coordination with adjacent machine elements. This requires mechatronic machine elements, which combine traditional passive mechanical components with sensors, actuators, electronics and computer algorithms, which thereby become "self-acting" machine elements, e.g. the piezoelectric air foil bearing (PAFB).

One way of supporting a rotor running at higher speed is by using air foil bearing (AFB). An AFB utilizes the aerodynamic pressure created by the relative velocity difference between the rotor and the bearing surface. In an AFB the bearing surface is flexible and is made up by a thin top foil and a bump foil placed between the top foil and bearing housing. The PAFB combines the traditional AFB with piezoelectric material incorporated into the top foil. This creates a link between the mechanical domain of the traditional machine element and the electrical domain, i.e., ultimately a computer. The thesis deals with the development of the PAFB, and gives three main contributions: the design of a multifunctional test facility; the development of a state-of-the-art mathematical model of the PAFB and AFB; and interpretation of numerical results contributing to the understanding of both AFBs’ and PAFBs’ static and dynamic behaviours. The facility is designed to experimentally study the PAFB and its sub-systems. This allows for validation of mathematical models and gain of further knowledge of the PAFB’s static and dynamic behaviour. The mathematical models, based on the finite element method...
(FEM), are created as a combination of AFB models and models of piezoelectric material and their constitutive equations. The model includes journal, air film, piezoelectric top foil (PTF), bump foil and electrical circuit. It takes non-linear effects resulting from the aerodynamic pressure into account allowing for a separation of the top foil and bump foil. Numerical results obtained with a sub-model of the PTF shows good agreement with experiments, while simulations of a passive PAFB closely resembles results obtained with a non-linear AFB model known from literature.

A numerical investigation shows that rotor-bearing sub-harmonic vibrations associated with large journal unbalance can be eliminated when the top foil is only partly supported by the bump foil, i.e., "shallow pocket" effect. The aerodynamic forces are significantly affected by the deformations of the PTF caused by the piezoelectric material due to an electrical potential difference (EPD) imposed between the electrodes. It is possible to increase the aerodynamic forces, and thereby the bearing load capacity, by a factor of two. The future steps in the development of PAFB are the design of feedback control laws and the experimental validation of a fully-controlled PAFB aided by the designed test facility and mathematical model derived in the thesis.
Combining litter observations with a regional ocean model to identify sources and sinks of floating debris in a semi-enclosed basin: The Adriatic Sea

Visual ship transect surveys provide crucial information about the density, and spatial distribution of floating anthropogenic litter in a basin. However, such observations provide a 'snapshot' of local conditions at a given time and cannot be used to deduce the provenance of the litter or to predict its fate, crucial information for management and mitigation policies. Particle tracking techniques have seen extensive use in these roles, however, most previous studies have used simplistic initial conditions based on bulk average inputs of debris to the system. Here, observations of floating anthropogenic macro debris in the Adriatic Sea are used to define initial conditions (number of particles, location, and time) in a Lagrangian particle tracking model. Particles are advected backward and forward in time for 60 days (120 days total) using surface velocities from an operational regional ocean model. Sources and sinks for debris observed in the central and southern Adriatic in May 2013 and March 2015 included the Italian coastline from Pescara to Brindisi, the Croatian island of Mljet, and the coastline from Dubrovnik through Montenegro to Albania. Debris observed in the northern Adriatic originated from the Istrian peninsula to the Italian city of Termoli, as well as the Croatian island of Cres and the Kornati archipelago. Particles spent a total of roughly 47 days afloat. Coastal currents, notably the eastern and western Adriatic currents, resulted in large alongshore displacements. Our results indicate that anthropogenic macro debris originates largely from coastal sources near population centers and is advected by the cyclonic surface circulation until it strands on the southwest (Italian) coast, exits the Adriatic, or recirculates in the southern gyre.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Ecosystem based Marine Management, Florida Atlantic University, Consiglio Nazionale delle Ricerche, Jerusalem College of Technology, National Institute of Oceanography and Experimental Geophysics, Universita Politecnica delle Marche
Authors: Carlson, D. F. (Ekstern), Suaria, G. (Ekstern), Aliani, S. (Ekstern), Fredj, E. (Ekstern), Fortibuoni, T. (Ekstern), Griffa, A. (Ekstern), Russo, A. (Ekstern), Melli, V. (Intern)
Publication date: 2017
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.53 SJR 0.173 SNIP 0.109
BFI (2015): BFI-level 1
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Combining or Separating Forward and Reverse Logistics
Purpose – While forward logistics handles and manages the flow of goods downstream in the supply chain from suppliers to customers, reverse logistics (RL) manages the flow of returned goods upstream. A firm can combine reverse logistics
with forward logistics, keep the flows separated, or choose a position between the two extremes. The purpose of this paper is to identify the contextual factors that determine the most advantageous position, which the paper refers to as the most advantageous degree of combination.

Design/methodology/approach—The paper first develops a scale ranging from 0% combination to 100% combination (i.e. full separation). Second, using contingency theory the paper identifies the contextual factors described in RL-literature that determine the most advantageous degree of combination. The set of factors is subsequently tested using a case study, which applies a triangulation approach that combines a qualitative and a quantitative method.

Findings—Results show six distinct contextual factors that determine the most advantageous degree of combination. Examples of factors are technical product complexity, product portfolio variation, and the loss of product value over time.

Practical implications—For practitioners the scale of possible positions and set of contextual factors constitute a decision making framework. Using the framework practitioners can determine the most advantageous position of the scale for their firm.

Originality/value—Much RL-research addresses intra-RL issues while the relationship between forward and reverse logistics is under-researched. This paper contributes to RL-theory by identifying the contextual factors that determine the most advantageous relationship between forward and reverse logistics, and proposes a novel decision making framework for practitioners.
Combining theory and experiment in electrocatalysis: Insights into materials design

Electrocatalysis plays a central role in clean energy conversion, enabling a number of sustainable processes for future technologies. This review discusses design strategies for state-of-the-art heterogeneous electrocatalysts and associated materials for several different electrochemical transformations involving water, hydrogen, and oxygen, using theory as a means to rationalize catalyst performance. By examining the common principles that govern catalysis for different electrochemical reactions, we describe a systematic framework that clarifies trends in catalyzing these reactions, serving as a guide to new catalyst development while highlighting key gaps that need to be addressed. We conclude by extending this framework to emerging clean energy reactions such as hydrogen peroxide production, carbon dioxide reduction, and nitrogen reduction, where the development of improved catalysts could allow for the sustainable production of a broad range of fuels and chemicals.

General information
State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, Stanford University
Authors: Seh, Z. W. (Ekstern), Kibsgaard, J. (Intern), Dickens, C. F. (Ekstern), Chorkendorff, I. (Intern), Nørskov, J. K. (Ekstern), Jaramillo, T. F. (Ekstern)
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Main Research Area: Technical/natural sciences

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BFI (2016): BFI-level 2
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 12.012 SNIP 8.269 CiteScore 12.68
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 12.305 SNIP 7.87 CiteScore 12.43
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 13.159 SNIP 8.124 CiteScore 12.39
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 14.049 SNIP 8.309 CiteScore 11.97
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BFI (2010): BFI-level 2
Combining X-ray and Electron Based in situ Characterization of Catalysts

General information
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Authors: Damsgaard, C. D. (Intern)
Number of pages: 2
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Event: Abstract from Combining electrons with X-rays for integrated in-operando experiments, trieste, Italy.
Main Research Area: Technical/natural sciences
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Commentary: Benefits and risks of antimicrobial use in food-producing animals

General information
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Comment on "Active sites for CO₂ hydrogenation to methanol on Cu/ZnO catalysts"

Kattel et al (Reports, 24 March 2017, p. 1296) report that a zinc on copper (Zn/Cu) surface undergoes oxidation to zinc oxide/copper (ZnO/Cu) during carbon dioxide (CO2) hydrogenation to methanol and conclude that the Cu-ZnO interface is the active site for methanol synthesis. Similar experiments conducted two decades ago by Fujitani and Nakamura et al demonstrated that Zn is attached to formate rather than being fully oxidized.

General information

State: Published
Organisations: Department of Physics, Experimental Surface and Nanomaterials Physics, University of Tsukuba, National Institute of Advanced Industrial Science and Technology, Haldor Topsoe AS
Authors: Nakamura, J. (Ekstern), Fujitani, T. (Ekstern), Kuld, S. (Ekstern), Helveg, S. (Ekstern), Chorkendorff, I. (Intern), Sehested, J. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Science
Volume: 357
Comment on "Assessing Aromatic-Hydrocarbon Toxicity to Fish Early Life Stages Using Passive-Dosing Methods and Target-Lipid and Chemical-Activity Models"

General information
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Organisations: Department of Environmental Engineering, Environmental Chemistry
Authors: Mayer, P. (Intern), Nørgaard Schmidt, S. (Intern)
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Publication date: 2017
Main Research Area: Technical/natural sciences

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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.584 SNIP 1.828 CiteScore 5.61
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.777 SNIP 2.017 CiteScore 5.5
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
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ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 3.146 SNIP 2.056 CiteScore 5.17
ISI indexed (2012): ISI indexed yes
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BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.178 SNIP 1.953 CiteScore 5.16
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.964 SNIP 1.729
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.835 SNIP 1.803
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.943 SNIP 1.942
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.8 SNIP 1.927
Web of Science (2007): Indexed yes
Comment on "Density functional theory is straying from the path toward the exact functional"

Medvedev et al (Reports, 6 January 2017, p. 49) argue that recent density functionals stray from the path toward exactness. This conclusion rests on very compact 1s2 and 1s22s2 systems favored by the Hartree-Fock picture. Comparison to actual energies for the same systems indicates that the "straying" is not chemically relevant and is at best specific to the studied dense systems.
Comments on "Screening and identification of novel ochratoxin A-producing fungi from grapes. Toxins 2016,8,833" - in reporting ochratoxin A production from strains of Aspergillus, Penicillium and Talaromyces

Recently a species in the genus Talaromyces, a uniseriate species of Aspergillus section Nigri and an isolate each of two widespread species, Penicillium rubens and P. commune, were reported to produce ochratoxin A. This claim was based on insufficient biological and chemical data. We propose a list of criteria that need to be met before an unexpected mycotoxin producer is reported. There have only been convincing data on ochratoxin A production for Penicillium verrucosum, P. nordicum, P. thymicola, all from Penicillium series Verrucosa, and from species in three sections of Aspergillus: section Circumdati, section Nigri and section Flavi.

General information
State: Published
Organisations: Department of Biotechnology and Biomedicine, Fungal Chemodiversity, National Research Council of Italy, CNR
Authors: Perrone, G. (Ekstern), Logrieco, A. F. (Ekstern), Frisvad, J. C. (Intern)
Number of pages: 5
Publication date: 2017
Comminution of B₄C powders with a high-energy mill operated in air in dry or wet conditions and its effect on their spark-plasma sinterability

The comminution of a typical submicrometre B₄C powder with a high-energy mill (i.e., a shaker mill) operated in air in either a dry or a wet environment was investigated. It was found that dry shaker milling (i.e., high-energy ball-milling) is able to progressively refine the B₄C particles to the nanoscale. While this is accompanied by oxidation and aggregation, these are not serious drawbacks. Wet shaker milling in methanol (i.e., conventional ball-milling) resulted only in a moderate B₄C particle refinement with greater contamination by the milling tools, which limits its usefulness. It was also found that both dry and wet milling modify the B₄C crystal structure, attributable to carbon enrichment. Consequently, dry shaker milling was found to be more recommendable than wet shaker milling to provide B₄C starting powders with superior sinterability. A comparative densification study by spark-plasma sintering confirmed this recommendation, and also showed the usefulness of dry shaker milling to obtain refined B₄C microstructures for structural applications.
Common Carotid Artery Flow Measured by 3-D Ultrasonic Vector Flow Imaging and Validated with Magnetic Resonance Imaging
Ultrasound (US) examination of the common carotid artery was compared with a through-plane magnetic resonance imaging (MRI) sequence to validate a recently proposed technique for 3-D US vector flow imaging. Data from the first volunteer examined were used as the training set, before volume flow and peak velocities were calculated for the remaining eight volunteers. Peak systolic velocities (PSVs) and volume flow obtained with 3-D US were, on average, 34% higher and 24% lower than those obtained with MRI, respectively. A high correlation was observed for PSV (r = 0.79), whereas a lower correlation was observed for volume flow (r = 0.43). The overall standard deviations were ±5.7% and ±5.7% for volume flow and PSV with 3-D US, compared with ±2.7% and ±3.2% for MRI. Finally, the data were re-processed with a change in the parameter settings for the echo-canceling filter to investigate its influence on overall performance. PSV was less affected by the re-processing, whereas the difference in volume flow between 3-D vector flow imaging and MRI was reduced to -9%, and with an improved overall standard deviation of ±4.7%. The results illustrate the feasibility of using 3-D US for precise and angle-independent volume flow and PSV estimation in vivo.

General information
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Organisations: Department of Electrical Engineering, Biomedical Engineering, Center for Fast Ultrasound Imaging, University of Copenhagen
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Main Research Area: Technical/natural sciences

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BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.7 SJR 0.964 SNIP 1.13
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.927 SNIP 1.184 CiteScore 2.53
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.027 SNIP 1.416 CiteScore 2.65
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.891 SNIP 1.245 CiteScore 2.71
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.946 SNIP 1.455 CiteScore 2.66
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.915 SNIP 1.44 CiteScore 2.68
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.261 SNIP 1.597
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.083 SNIP 1.49
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.26 SNIP 1.332
Scopus rating (2007): SJR 1.073 SNIP 1.508
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.288 SNIP 1.549
Scopus rating (2005): SJR 1.388 SNIP 1.674
Common genetic variants are associated with lower serum 25-hydroxyvitamin D concentrations across the year among children at northern latitudes

In a longitudinal study including 642 healthy 8-11-year-old Danish children, we investigated associations between vitamin D dependent SNP and serum 25-hydroxyvitamin D (25(OH)D) concentrations across a school year (August-June). Serum 25(OH)D was measured three times for every child, which approximated measurements in three seasons (autumn, winter, spring). Dietary and supplement intake, physical activity, BMI and parathyroid hormone were likewise measured at each time point. In all, eleven SNP in four vitamin D-related genes: Cytochrome P450 subfamily IIR1 (CYP2R1); 7-dehydrocholesterol reductase/nicotinamide adenine dinucleotide synthetase-1 (DHCR7/NADSYN1); group-specific complement (GC); and vitamin D receptor were genotyped. We found minor alleles of CYP2R1 rs10500804, and of GC rs4588 and rs7041 to be associated with lower serum 25(OH)D concentrations across the three seasons (all P

General information
State: Published
Organisations: National Food Institute, Research Group for Risk-Benefit, University of Copenhagen, Aalborg University Hospital
Authors: Petersen, R. A. (Ekstern), Larsen, L. H. (Ekstern), Damsgaard, C. T. (Ekstern), Sørensen, L. B. (Ekstern), Hjorth, M. F. (Ekstern), Andersen, R. (Intern), Tetens, I. (Intern), Krarup, H. (Ekstern), Ritz, C. (Ekstern), Astrup, A. (Ekstern), Michaelsen, K. F. (Ekstern), Malgaard, C. (Ekstern)
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Scopus rating (2015): SJR 1.583 SNIP 1.446 CiteScore 3.52
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.468 SNIP 1.278 CiteScore 3.18
Web of Science (2014): Indexed yes
This paper presents the findings of a research project evaluating community benefit models for offshore renewables. We identify and analyse UK and international case studies of different forms of community benefit, and provide evidence of how such benefits are delivered. In particular we consider the key relationship between the identification of communities, perception of impact, and the apportionment of benefits. In doing so, we develop a range of different definitions of 'community', 'benefit', and 'impact' when considering community benefits. We propose that the way in which community, benefit, and impact are understood is crucial in determining whether or how benefits should be apportioned and delivered; and that these definitions are closely connected to each other. We develop a new series of typologies as a way to understand this. Finally, we assess different mechanisms and schemes of community benefits to identify good practice.
Community cascades in a marine pelagic food web controlled by the non-visual apex predator Mnemiopsis leidyi

Trophic cascades are a ubiquitous feature of many terrestrial and fresh-water food webs, but have been difficult to demonstrate in marine systems with multispecies trophic levels. Here we describe significant trophic cascades in an open coastal planktonic ecosystem exposed to an introduced top predator. The ctenophore Mnemiopsis leidyi was monitored for an 8-year period concurrent with measures of the food web structure of the plankton and strong trophic cascades were evident. In the 5 years when M. leidyi were found, their target prey (grazing copepods) were reduced 5-fold and the primary producers doubled their biomass when released from the grazing pressure. The increased phytoplankton biomass could unequivocally be assigned to grazing release since concurrent measurements of primary production did not differ between years with or without M. leidyi. Copepod biomass prior to the mass occurrence of the ctenophore was important. The years without M. leidyi had significantly higher biomass of copepods in July, the month preceding the outburst of the ctenophore. The profound changes of the pelagic ecosystem faced with a non-selective apex predator shows that marine communities are not exceptions from trophic cascade mechanisms.
Compact First-Order Probe for Spherical Near-Field Antenna Measurements at Low Frequencies

Guidelines for designing compact and lightweight first-order probes for spherical near-field antenna measurements at frequencies below 1 GHz that exploit first-order properties of electrically small self-resonant radiators combined into superdirective endfire arrays are established theoretically, exemplified numerically, and validated experimentally. A prototype of the probe designed to operate at a central frequency of 435 MHz exhibits the impedance bandwidth of 15 MHz with a directivity of more than 9 dBi and parasitic $|\mu|\neq 1$ spherical modes suppressed to at least −42 dB. The probe height is just 343 mm above a 720-mm circular ground plane and weighs about 5 kg.

General information

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Organisations: Department of Electrical Engineering, Electromagnetic Systems
Authors: Kim, O. S. (Intern)
Pages: 3684 - 3690
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.841 SNIP 2.526 CiteScore 3.48
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.828 SNIP 2.644 CiteScore 3.36
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.536 SNIP 2.256 CiteScore 3.65
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.471 SNIP 2.237 CiteScore 3.63
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.366 SNIP 2.16 CiteScore 3.42
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.141 SNIP 2.097
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.505 SNIP 2.188
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.165 SNIP 2.062
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.074 SNIP 2.669
Scopus rating (2005): SJR 2.236 SNIP 2.837
Scopus rating (2004): SJR 1.709 SNIP 2.481
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.38 SNIP 2.438
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.689 SNIP 2.338
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.475 SNIP 1.595
Web of Science (2001): Indexed yes
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Compact multichannel high-resolution micro-electro-mechanical systems-based interrogator for Fiber Bragg grating sensing
We propose a novel type of compact high-resolution multichannel micro-electro-mechanical systems (MEMS)-based interrogator, where we replace the linear detector with a digital micromirror device (DMD). The DMD is typically cheaper and has better pixel sampling than an InGaAs detector used in the 1550 nm range, which leads to cost reduction and better performance. Moreover, the DMD is a 2D array, which means that multichannel systems can be implemented without any additional optical components in the interrogator. This makes the proposed interrogator highly cost-effective, particularly for multichannel systems. The digital nature of the DMD also provides opportunities for advanced programmable Hadamard spectroscopy, which, without significant penalties, can greatly improve the wavelength fit
resolution. Our results show that DMDs can be used in high-resolution spectroscopy and for Fiber Bragg grating (FBG) interrogation.
Compact multichannel MEMS based spectrometer for FBG sensing

We propose a novel type of compact multichannel MEMS based spectrometer, where we replace the linear detector with a Digital Micromirror Device (DMD). The DMD is typically cheaper and has better pixel sampling than an InGaAs detector used in the 1550 nm range, which leads to cost reduction and better performance. Moreover, the DMD is a 2D array, which means that multichannel systems can be implemented without any additional optical components in the spectrometer. This makes the proposed interrogator highly cost-effective. The digital nature of the DMD also provides opportunities for advanced programmable spectroscopy.

Compact silicon multimode waveguide spectrometer with enhanced bandwidth

Compact, broadband, and high-resolution spectrometers are appealing for sensing applications, but difficult to fabricate. Here we show using calibration data a spectrometer based on a multimode waveguide with 2GHz resolution, 250GHz bandwidth, and a 1.6mm×2.1mm footprint. Typically, such spectrometers have a bandwidth limited by the number of modes supported by the waveguide. In this case, an on-chip mode-exciting element is used to repeatably excite distinct collections of waveguide modes. This increases the number of independent spectral channels from the number of modes to this number squared, resulting in an extension of the usable range.
Compact Spectrometer based on a silicon multimode waveguide
A multimode waveguide spectrometer with 4 GHz resolution, 250 GHz usable range, and a 1.6 mm × 2.1 mm footprint is demonstrated. The operating range is greatly extended by including distinct mode-exciting elements on chip.
Comparative assessment of Vibrio virulence in marine fish larvae

Vibrionaceae infections are a major obstacle for marine larviculture; however, little is known about virulence differences of Vibrio strains. The virulence of Vibrio strains, mostly isolated from vibriosis outbreaks in farmed fish, was tested in larval challenge trials with cod (Gadus morhua), turbot (Scophthalmus maximus) and halibut (Hippoglossus hippoglossus) using a multiwell dish assays with single-egg/larvae cultures. The strains differed significantly in virulence as some caused a high mortality of larva reaching 100% mortality after a few days, while others had no or only marginal effects on survival. Some Vibrio strains were pathogenic in all of the larva species, while some caused disease only in one of the species. Twenty-nine of the Vibrio anguillarum strains increased the mortality of larvae from at least one fish species; however, pathogenicity of the strains differed markedly. Other Vibrio species had no or less pronounced effects on larval mortalities. Iron uptake has been related to V. anguillarum virulence; however, the presence or absence of the plasmid pJM1 encoding anguibactin did not correlate with virulence. The genomes of V. anguillarum were compared (D. Castillo, P.W. D’Alvise, M. Middelboe & L. Gram, unpublished data) and most of the high-virulent strains had acquired virulence genes from other pathogenic Vibrio.

General information

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Organisations: Department of Systems Biology, Bacterial Ecophysiology and Biotechnology, Department of Environmental Engineering, National Food Institute, Department of Biotechnology and Biomedicine, Bacterial Ecophysiology and Biotechnology, University of Copenhagen, University of Bergen, Fishlab, Institute of Marine Research
Authors: Rønneseth, A. (Ekstern), Castillo, D. (Ekstern), D’Alvise, P. (Intern), Tønnesen, Ø. (Ekstern), Haugland, G. (Ekstern), Grotkjær, T. (Intern), Engell-Sørensen, K. (Ekstern), Nørremark, L. (Ekstern), Bergh, Ø. (Ekstern), Wergeland, H. I. (Ekstern), Gram, L. (Intern)
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.99
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.74
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Comparative Genome Analyses of Vibrio anguillarum Strains Reveal a Link with Pathogenicity Traits

Vibrio anguillarum is a marine bacterium that can cause vibriosis in many fish and shellfish species, leading to high mortalities and economic losses in aquaculture. Although putative virulence factors have been identified, the mechanism of pathogenesis of V. anguillarum is not fully understood. Here, we analyzed whole-genome sequences of a collection of V. anguillarum strains and compared them to virulence of the strains as determined in larval challenge assays. Previously identified virulence factors were globally distributed among the strains, with some genetic diversity. However, the pan-genome revealed that six out of nine high-virulence strains possessed a unique accessory genome that was attributed to pathogenic genomic islands, prophage-like elements, virulence factors, and a new set of gene clusters involved in biosynthesis, modification, and transport of polysaccharides. In contrast, V. anguillarum strains that were medium to nonvirulent had a high degree of genomic homogeneity. Finally, we found that a phylogeny based on the core genomes clustered the strains with moderate to no virulence, while six out of nine high-virulence strains represented phylogenetically separate clusters. Hence, we suggest a link between genotype and virulence characteristics of Vibrio anguillarum, which can be used to unravel the molecular evolution of V. anguillarum and can also be important from survey and diagnostic perspectives.

Importance: Comparative genome analysis of strains of a pathogenic bacterial species can be a powerful tool to discover acquisition of mobile genetic elements related to virulence. Here, we compared 28 V. anguillarum strains that differed in virulence in fish larval models. By pan-genome analyses, we found that six of nine highly virulent strains had a unique core and accessory genome. In contrast, V. anguillarum strains that were medium to nonvirulent had low genomic diversity. Integration of genomic and phenotypic features provides insights into the evolution of V. anguillarum and can also be important for survey and diagnostic purposes.

General information
State: Published
Organisations: Department of Systems Biology, Department of Biotechnology and Biomedicine, Bacterial Ecophysiology and Biotechnology, University of Copenhagen, BGI Park, China, Copenhagen Bio Science Park
Authors: Castillo, D. (Ekstern), D’Alvise, P. (Intern), Xu, R. (Ekstern), Zhang, F. (Ekstern), Middelboe, M. (Ekstern), Gram, L. (Intern)
Number of pages: 14
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: mSystems
Comparative genomics reveals high biological diversity and specific adaptations in the industrially and medically important fungal genus Aspergillus

Background:
The fungal genus Aspergillus is of critical importance to humankind. Species include those with industrial applications, important pathogens of humans, animals and crops, a source of potent carcinogenic contaminants of food, and an important genetic model. The genome sequences of eight aspergilli have already been explored to investigate aspects of fungal biology, raising questions about evolution and specialization within this genus.

Results:
We have generated genome sequences for ten novel, highly diverse Aspergillus species and compared these in detail to sister and more distant genera. Comparative studies of key aspects of fungal biology, including primary and secondary metabolism, stress response, biomass degradation, and signal transduction, revealed both conservation and diversity among the species. Observed genomic differences were validated with experimental studies. This revealed several highlights, such as the potential for sex in asexual species, organic acid production genes being a key feature of black aspergilli, alternative approaches for degrading plant biomass, and indications for the genetic basis of stress response. A genome-wide phylogenetic analysis demonstrated in detail the relationship of the newly genome sequenced species with other aspergilli.

Conclusions:
Many aspects of biological differences between fungal species cannot be explained by current knowledge obtained from genome sequences. The comparative genomics and experimental study, presented here, allows for the first time a genus-wide view of the biological diversity of the aspergilli and in many, but not all, cases linked genome differences to phenotype. Insights gained could be exploited for biotechnological and medical applications of fungi.

General information
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Organisations: Department of Biotechnology and Biomedicine, Network Engineering of Eukaryotic Cell factories, Fungal Chemodiversity, Westerdijk Fungal Biodiversity Institute, Utrecht University, U.S. Department of Energy, Universidad Nacional Autonoma de Mexico, University of Athens, Centro Nacional de Pesquisa em Energia e Materiais, VTT Brasil, National Institute of Chemistry Ljubljana, University of Debrecen, Leiden University, CSIRO, University of Gottingen, Maynooth University, Max Planck Partner Group, Universidade de Seville, University of Natural Resources and Applied Life Sciences, Broad Institute, Huazhong Agricultural University, Universidade Estadual de Campinas, CNR, Demokritos National Centre for Scientific Research, Universite Libre de Bruxelles, University of Nottingham, Aix Marseille Universite, Institut Pasteur de Montevideo, ANEP, INRA Institut National de La Recherche Agronomique, King Abdulaziz University, University of Helsinki, Dutch DNA Biotech BV, University of Amsterdam, University of St Andrews, University of Ioannina, St. Petersburg State University, Aix Marseille Universite, CSIC, Universidade Federal de Sao Carlos, Swedish University of Agricultural Sciences, Swedish Chemicals Agency, Technische Universitat Berlin, CONICET, Concordia University, Kyungpook National University, Universite Paris Saclay, Universidad de la Republica, Karlsruhe Institute of Technology KIT, University of Sulaimani, University of Ljubljana, Leibniz Institute for Natural Product Research and Infection Biology - Hans Knoll Institute (HKI), J, Stanford University, Kansas State University, BaseClear B.V., University of Wisconsin, Pacific Northwest National Laboratory, Friedrich-Schiller-Universitat Jena, Universidade de Sao Paulo, University of Kansas, Imperial College London, Universite Paris-Sud XI, Vienna University of Technology, Seres Therapeutics
Comparative Genomics Reveals High Genomic Diversity in the Genus Photobacterium

Vibrionaceae is a large marine bacterial family, which can constitute up to 50% of the prokaryotic population in marine waters. Photobacterium is the second largest genus in the family and we used comparative genomics on 35 strains representing 16 of the 28 species described so far, to understand the genomic diversity present in the Photobacterium genus. Such understanding is important for ecophysiology studies of the genus. We used whole genome sequences to evaluate phylogenetic relationships using several analyses (16S rRNA, MLSA, fur, amino-acid usage, ANI), which allowed us to identify two misidentified strains. Genome analyses also revealed occurrence of higher and lower GC content clades, correlating with phylogenetic clusters. Pan-and core-genome analysis revealed the conservation of 25% of the genome throughout the genus, with a large and open pan-genome. The major source of genomic diversity could be traced to the smaller chromosome and plasmids. Several of the physiological traits studied in the genus did not correlate with phylogenetic data. Since horizontal gene transfer (HGT) is often suggested as a source of genetic diversity and a potential driver of genomic evolution in bacterial species, we looked into evidence of such in Photobacterium genomes. Genomic islands were the source of genomic differences between strains of the same species. Also, we found transposase genes and CRISPR arrays that suggest multiple encounters with foreign DNA. Presence of genomic exchange traits was widespread and abundant in the genus, suggesting a role in genomic evolution. The high genetic variability and indications of genetic exchange make it difficult to elucidate genome evolutionary paths and raise the awareness of the roles of foreign DNA in the genomic evolution of environmental organisms.
Comparative performance of the BGISEQ-500 versus Illumina HiSeq2500 sequencing platforms for palaeogenomic sequencing

Background: Ancient DNA research has been revolutionised following development of “Next Generation” Sequencing platforms. Although a number of such platforms have been applied to ancient DNA samples, the Illumina series are the dominant choice today, mainly because of high production capacities and short read production. Recently a potentially attractive alternative platform for palaeogenomic data generation has been developed, the BGISEQ-500, whose sequence output are comparable with the Illumina series. In this study, we modified the standard BGISEQ-500 library preparation specifically for use on degraded DNA, then directly compared the sequencing performance and data quality of the BGISEQ-500 to the Illumina HiSeq2500 platform, on DNA extracted from eight historic and ancient dog and wolf samples.

Results: The data generated was largely comparable between sequencing platforms, with no statistically significant difference observed for parameters including level (p = 0.371) and average sequence length (p = 0718) of endogenous nuclear DNA, sequence GC content (p = 0.311), double stranded DNA damage rate (p = 0.309), and sequence clonality (p = 0.093). Small significant differences were found in single strand DNA damage rate (δS, slight lower for the BGISEQ-500, p = 0.011) and the background rate of difference from the reference genome (θ, slightly higher for BGISEQ-500, p = 0.012). This may result from the differences in amplification cycles used to PCR amplify the libraries. A significant difference was also observed in the mitochondrial DNA percentages recovered (p = 0.018), although we believe this is likely a stochastic effect relating to the extremely low levels of mitochondria that were sequenced from three of the samples with overall very low levels of endogenous DNA.

Conclusions: Although we acknowledge our analyses were limited to animal material, our observations suggest that the BGISEQ-500 holds the potential to represent valid and potentially valuable alternative platform for palaeogenomic data generation, that is worthy of future exploration by those interested in the sequencing and analysis of degraded DNA.

General information
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Organisations: Department of Bio and Health Informatics, Metagenomics, University of Copenhagen, BGI-Shenzhen, Barcelona Institute of Science and Technology, Royal Belgian Institute of Natural Sciences, University of Tubingen, North-Eastern Federal University, Institute of Evolutionary Biology (UPF-CSIC)
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Comparative proteomics of oxidative stress response of Lactobacillus acidophilus NCFM reveals effects on DNA repair and cysteine de novo synthesis

Probiotic cultures encounter oxidative conditions during manufacturing, yet protein abundance changes induced by such stress have not been characterized for some of the most common probiotics and starters. This comparative proteomics investigation focuses on the response by Lactobacillus acidophilus NCFM to H2O2, simulating an oxidative environment. Bacterial growth was monitored by BioScreen and batch cultures were harvested at exponential phase for protein profiling by 2D gel-based comparative proteomics. Proteins identified in 19 of 21 spots changing in abundance due to H2O2 were typically related to carbohydrate and energy metabolism, cysteine biosynthesis, and stress. In particular, increased cysteine synthase activity may accumulate a cysteine pool relevant for protein stability, enzyme catalysis and the disulfide-reducing pathway. The stress response further included elevated abundance of biomolecules reducing damage such as enzymes from DNA repair pathways and metabolic enzymes with active site cysteine residues. By contrast, a protein-refolding chaperone showed reduced abundance, possibly reflecting severe oxidative protein destruction that was not overcome by refolding. The proteome analysis provides novel insight into resistance mechanisms in lactic acid bacteria against reactive oxygen species and constitutes a valuable starting point for improving industrial processes, food design or strain engineering preserving microorganism viability.

General information
State: Published
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Comparative use of different emission measurement approaches to determine methane emissions from a biogas plant

A sustainable anaerobic biowaste treatment has to mitigate methane emissions from the entire biogas production chain, but the exact quantification of these emissions remains a challenge. This study presents a comparative measurement campaign carried out with on-site and ground-based remote sensing measurement approaches conducted by six measuring teams at a Swedish biowaste treatment plant. The measured emissions showed high variations, amongst
others caused by different periods of measurement performance in connection with varying operational states of the plant. The overall methane emissions measured by ground-based remote sensing varied from 5 to 25kgh⁻¹ (corresponding to a methane loss of 0.6-3.0% of upgraded methane produced), depending on operating conditions and the measurement method applied. Overall methane emissions measured by the on-site measuring approaches varied between 5 and 17kgh⁻¹ (corresponding to a methane loss of 0.6 and 2.1%) from team to team, depending on the number of measured emission points, operational state during the measurements and the measurement method applied. Taking the operational conditions into account, the deviation between different approaches and teams could be explained, in that the two largest methane-emitting sources, contributing about 90% of the entire site's emissions, were found to be the open digestate storage tank and a pressure release valve on the compressor station.

**General information**

State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, Deutsches Biomasseforschungszentrum gemeinnützige GmbH, SP Technical Research Institute of Sweden
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- Web of Science (2016): Indexed yes
- BFI (2015): BFI-level 2
- Scopus rating (2015): SJR 1.739 SNIP 2.256 CiteScore 4.33
- Web of Science (2015): Indexed yes
- BFI (2014): BFI-level 2
- Scopus rating (2014): SJR 1.777 SNIP 2.482 CiteScore 3.43
- Web of Science (2014): Indexed yes
- BFI (2013): BFI-level 1
- Scopus rating (2013): SJR 1.822 SNIP 2.435 CiteScore 3.39
- ISI indexed (2013): ISI indexed yes
- Web of Science (2013): Indexed yes
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- Scopus rating (2012): SJR 1.611 SNIP 2.184 CiteScore 2.91
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- Web of Science (2012): Indexed yes
- BFI (2011): BFI-level 1
- Scopus rating (2011): SJR 1.698 SNIP 2.085 CiteScore 2.99
- ISI indexed (2011): ISI indexed yes
- Web of Science (2011): Indexed yes
- BFI (2010): BFI-level 1
- Scopus rating (2010): SJR 1.555 SNIP 1.78
- Web of Science (2010): Indexed yes
- BFI (2009): BFI-level 1
- Scopus rating (2009): SJR 1.502 SNIP 1.899
- Web of Science (2009): Indexed yes
- BFI (2008): BFI-level 2
- Scopus rating (2008): SJR 1.378 SNIP 2.13
- Web of Science (2008): Indexed yes
Comparing low volume saphenous-obturator block with placebo and femoral-obturator block for anterior cruciate ligament reconstruction: a randomized controlled trial

BACKGROUND: Anterior cruciate ligament reconstruction (ACL-RC) is often associated with moderate to severe postoperative pain even with a multimodal analgesic regimen. We aimed to compare the analgesic efficacy of low volume saphenous-obturator block with placebo and femoral-obturator block in patients undergoing ACL-RC.

METHODS: In a randomized controlled trial eighty-two patients undergoing ACL-RC with hamstring autograft were allocated to either low volume saphenous-obturator block, placebo block or femoral-obturator block. Ropivacaine 0.75% was used for active blocks and saline for placebo. Primary outcome was pain-scores at rest quantified as area-under-the-curve 0-6 hr postoperatively. Secondary outcomes were postoperative opioid consumption and pain localization in the knee.

RESULTS: No statistical difference existed between groups in area-under-the-curve 6 hr pain-scores. However, pain-scores were significantly lower in the two ropivacaine groups compared to placebo at emergence $t=0$ ($P<0.018$), at $t=5$ ($P<0.042$) and at $t=6$ hours ($P<0.002$) postoperatively. Furthermore, ropivacaine blocks exhibited significantly reduced total opioid consumption (15.81 and 18.44 mg) postoperatively compared with placebo (26.38 mg) ($P<0.018$). Patients receiving ropivacaine blocks localized pain in the posterolateral knee, whereas placebo block patients reported anteromedial and central pain. Other secondary outcomes were similar between groups.

CONCLUSIONS: Low volume saphenous-obturator block is significantly more effective than placebo in reducing both early and late pain-scores as well as postoperative opioid consumption in patients undergoing ACL-RC. No statistical difference existed when comparing low volume saphenous-obturator block to femoral-obturator block regarding early and late pain-scores and postoperative opioid consumption.

General information
State: Accepted/in press
Organisations: National Veterinary Institute, Bacteriology & Parasitology, University of Copenhagen, University of Toronto, Copenhagen University Hospital
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Scopus rating (2014): CiteScore 1.45 SJR 1.013 SNIP 0.889
Scopus rating (2013): CiteScore 1.8 SJR 0.965 SNIP 1.043
Comparing three methods for participatory simulation of hospital work systems

Summative Statement: This study compared three participatory simulation methods using different simulation objects: Low resolution table-top setup using Lego figures, full scale mock-ups, and blueprints using Lego figures. It was concluded the three objects by differences in fidelity and affordance addressed different elements of a hospital work system.

Problem statement: Different methods for simulating the future work system for healthcare professionals have been applied in a number of green field and renovation design projects of hospitals in Denmark. The methods differed in the type of simulation objects representing the work system. Hence, this was an opportunity to study if these differences influenced which elements of a work system were in focus when healthcare professionals simulated and evaluated future work. Preliminary observations indicated this was the case but it was not understood how and why this influence took place.

Research Objective / Question: How does the simulation object influence which elements of a work system are being evaluated in participatory simulation events?

Methodology: Observation notes and video recordings of three types of simulation events using different objects were analyzed in respect to which elements of a work system were being targeted. A work system was defined as consisting of human work practices embedded in the three interdependent dimensions: space, organization and technology. All simulation events were based on participants playing clinical scenarios using the objects.

Results: Full scale mock-ups significantly addressed the local space and technology/tool elements of a work system. In contrast, the table-top simulation object addressed the organizational issues of the future work system. The blueprint based simulation addressed the organizational issues in combination with a global space outlook, e.g. the layout of an entire department.

Discussion: It is proposed that the simulation objects influence on work system focus is based on two attributes: Fidelity and affordance. Fidelity concerns the degree of resolution or the level of detail of what are being manifested by the simulation object. The affordance is a property of the object concerning how simulation participants will perceive how it may be used. When having a low-resolution model of a work system as in the table-top setup it is much easier to test a number of "what if" scenarios on how to organize the work in different spatial layouts. In addition to the object attributes other factors may play a role in what work system elements are being addressed. An important one seems to be at which point in the hospital design process the simulation is carried out.

Conclusions: Different simulation objects may to a certain degree influence what part of a work system is being addressed in participatory simulation events. For human factors practitioners in hospital design projects it is important to pay attention to this when planning and facilitating simulation events to evaluate different designs.

General information
State: Published
Organisations: Copenhagen Center for Health Technology, Department of Management Engineering, Engineering Systems, Transport DTU
Comparing TMS perturbations to occipital and parietal cortices in concurrent TMS-fMRI studies-Methodological considerations

Neglect and hemianopia are two neuropsychological syndromes that are associated with reduced awareness for visual signals in patients' contralesional hemifield. They offer the unique possibility to dissociate the contributions of retinogeniculate and retino-colliculo circuitries in visual perception. Yet, insights from patient fMRI studies are limited by heterogeneity in lesion location and extent, long-term functional reorganization and behavioural compensation after stroke. Transcranial magnetic stimulation (TMS) has therefore been proposed as a complementary method to investigate the effect of transient perturbations on functional brain organization. This concurrent TMS-fMRI study applied TMS perturbation to occipital and parietal cortices with the aim to 'mimick' neglect and hemianopia. Based on the challenges and interpretational limitations of our own study we aim to provide tutorial guidance on how future studies should compare TMS to primary sensory and association areas that are governed by distinct computational principles, neural dynamics and functional architecture.

General information
State: Published
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.414 SNIP 1.131 CiteScore 3.32
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.545 SNIP 1.141 CiteScore 3.54
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Scopus rating (2013): SJR 1.74 SNIP 1.147 CiteScore 3.94
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.945 SNIP 1.142 CiteScore 4.15
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Comparing two enhancing methods for improving kitchen waste anaerobic digestion: bentonite addition and autoclaved de-oiling pretreatment

The effects of different enhancement methods, including adding bentonite (1.25%, w/w, wet substrate) and autoclaved de-oiling pretreatment (121 °C, 30 minutes), on the anaerobic digestion of kitchen waste (KW) were comparably studied. Mesophilic continuous stirred tank reactors were used under different organic loading rates (OLRs) of 1.11 to 1.84 gVS (volatile solid)L−1d−1 and two different hydraulic retention times (HRTs) (20 d and 25 d). In this study, two enhancement methods and extending HRT could prevent volatile fatty acids (VFA) accumulation and obtain a high methane production at low OLR. Owing to the effect of providing nutrients and buffering capacity, the maximum methane yield was obtained with adding bentonite at OLR of 1.39 gVSL−1d−1. However, for high OLR (1.84 gVSL−1d−1), a decrease of the methane yield and system breakdown occurred due to the accumulation of VFAs. Engineering design and process evaluation of a CSTR biogas plant treating with KW based on the laboratory experiment was stated.

General information
State: Accepted/In press
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Scopus rating (2016): CiteScore 3 SJR 0.685 SNIP 1.642
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.662 SNIP 1.352 CiteScore 2.55
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.078 SNIP 2.118 CiteScore 2.85
Comparison between AGC and a Tuning-less LFC Approach Based on Direct Observation of DERs

Automatic Generation Control (AGC) used in secondary frequency control requires manual tuning to maintain a balance between reaction speed and stability. This task becomes increasingly difficult due to the rising number of inverter-coupled devices and High-Voltage Direct Current (HVDC) links, and the resulting reduction of available inertia. In this paper, we propose a tuning-less Load-Frequency Control (LFC) approach able to cope with the changing dynamics of electric power grids.

Harnessing the possibilities of modern monitoring and communication means, the so-called Direct Load-Frequency Control (DLFC) employs two concurrently operating processes: a power matching stage responsible for secondary power adjustment using directly observed area imbalances; and a frequency control stage that adjusts primary reserves’ frequency setpoints in a systematic manner. As opposed to the AGC, the DLFC does not require an integrator to mitigate frequency deviations. The only free parameter is the secondary control interval, from which all other parameters are derived. Small-signal stability investigations show that the DLFC exhibits 40 dB falloff of steady-state deviations versus the AGC’s 20 dB. Simulations on the non-linear singlearea system confirm the DLFC’s response speed and stability advantage.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Energy resources, services and control, Energy system operation and management
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Number of pages: 6
Publication date: 2017
Comparison between analyzed and calculated nutrient content of fast foods using two consecutive versions of the Danish food composition databank: FOODCOMP and FRIDA

The objective of this study was to compare the content of selected nutrients of fast foods determined by chemical analysis versus estimated by recipe calculation based on data from two versions of the Danish food composition databank, FOODCOMP and the latest FRIDA. A total of 155 samples of ready-to-eat fast foods were collected from fast food outlets, separated into their components and weighed. Typical components were bread, French fries, vegetables, meat and dressings. The fast foods were analyzed, and energy, protein, saturated fat, iron, thiamin, potassium and sodium contents were compared to recipe calculation. When using the FOODCOMP in recipe calculation, the error percentage was largest for saturated fat (28%). When using FRIDA, the error percentage for saturated fat decreased to 11% and was below 15% for all nutrients. The correlations ranged from 0.49 to 0.89 with both databanks. For the individual fast foods, the error percentages were both acceptable (<15%) and large (>50%). Future challenges for the databank in relation to recipe calculation are to include more varieties, a better coverage of foods used as ingredients, and inclusion of analytical values of mixed dishes if they are commonly eaten from fast food outlets.

General information
State: Accepted/In press
Organisations: National Food Institute, Division of Risk Assessment and Nutrition
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BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.141 SNIP 1.645 CiteScore 2.99
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.185 SNIP 1.764 CiteScore 2.71
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.242 SNIP 1.702 CiteScore 2.8
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.129 SNIP 1.563 CiteScore 2.44
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Scopus rating (2011): SJR 1.304 SNIP 1.643 CiteScore 2.72
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.209 SNIP 1.473
Comparison between Synthetic Inertia and Fast Frequency Containment Control Based on Single Phase EVs in a Microgrid

The increasing share of distributed and inertia-less resources entails an upsurge in balancing and system stabilisation services. In particular, the displacement of conventional generation reduces the available rotational inertia in the power system, leading to high interest in synthetic inertia solutions. The objective of this paper is twofold: first, it aims to implement and validate fast frequency control and synthetic (virtual) inertia control, employing single phase electric vehicles as flexibility resources. Second, it proposes a trade-off analysis between the two controllers. The interdependency between frequency containment and synthetic inertia control on the transient frequency variation is shown analytically. The capabilities and limits of series produced EVs in providing such services are investigated, first on a simulation based approach and subsequently by using real hardware. The results show that fast frequency control can improve the transient frequency behaviour. However, both on the simulation and on the experimental level, the implementation of synthetic inertia control is more challenging. In fact, due its derivative nature and the system dynamics, its performance is limited. Furthermore, the crucial importance of the EVs’ response time for both controllers is highlighted.
Comparison of antimicrobial resistance in E. coli isolated from rectal and floor samples in pens with diarrhoeic nursery pigs in Denmark

Introduction. The prudent use of antibiotics in veterinary medicine necessitates the selection of antibiotic compounds with narrow-spectrums targeted against the specific pathogens involved. The same pathotype of enterotoxigenic E. coli (ETEC) was recently found both in diarrhoeic pigs and in samples from the pen floor where the pigs were housed. The first objective of this study was to compare resistance profiles from ETEC isolates and Non-ETEC isolates. The second
The objective was to evaluate the agreement between resistance profiles of ETEC isolated from pen floor samples and from individual rectal samples from pigs. Across three Danish pig herds, faecal samples were collected from the floors of 31 pens that had a within-pen diarrhoea prevalence of >25%, and from rectal samples of 93 diarrhoeic nursery pigs from the same pens. A total of 380 E. coli isolates were analysed by PCR and classified as ETEC when genes for adhesin factors and enterotoxins were detected. Minimum inhibitory concentrations of 13 antimicrobial agents were determined by the broth micro dilution method. Isolates were classified as resistant based on clinical breakpoints. Results. Based on logistic regression models, the odds of Non-ETEC isolates (n = 291) being pan-susceptible were significantly higher compared to ETEC isolates (n = 89), (P < 0.001, OR = 20.22, CI95% = 6.35-64.35). The odds of ETEC isolates having multidrug resistance were significantly higher compared to Non-ETEC isolates (p < 0.001, OR: 7.21, CI95%: 2.87-18.10). The odds of an isolate being resistant were significantly higher in ETEC isolates compared to Non-ETEC isolates for ampicillin (p < 0.001), apramycin (p = 0.003), sulphamethoxazole (p < 0.001) and trimethoprim (p<0.001). No overlap of resistance patterns between the three study herds was observed in the sampled ETEC isolates. In addition, there was generally good or excellent agreement when comparing resistance profiles from isolates from the same pen (pen floor and pig samples), and perfect agreement (Kappa = 1.000, SE = 0.316) was observed for ampicillin, apramycin, gentamycin, sulphamethoxazole, tetracycline and trimethoprim. Conclusions. We found that ETEC isolates were more resistant than Non-ETEC isolates. Furthermore, this study indicates that resistance testing of ETEC isolates from pen floor samples can be used as a convenient sampling method for resistance testing and in the selection of clinically relevant antimicrobial agents in the treatment of diarrhoeic pigs. The herd-level variation of resistance in ETEC isolates emphasises the importance of performing antimicrobial susceptibility testing at farm level when selecting antimicrobial agents for the treatment of E. coli-related diarrhoea.
Comparison of approaches for assessing sustainable remediation of contaminated sites

It has been estimated that there are approximately 2.5 million potentially contaminated sites in Europe. Of these, approximately 340,000 sites are thought to be contaminated to a degree that may require remediation (Joint Research Center, 2014). Until recently, remediation was considered to be inherently green or sustainable since it removes a contaminant problem. However, it is now broadly recognized that while remediation is intended to address a local environmental threat, it may cause other local, regional and global impacts on the environment, society and economy. Over the last decade, the broader assessment of these criteria is occurring in a movement toward ‘sustainable remediation’. This paper aims to review the available methods for assessing the sustainability of remediation alternatives.

Sustainable remediation seeks to reduce direct contaminant point source impacts on the environment, while minimizing the indirect cost of remediation to the environment, society and economy. Here we present and compare the available tools and methods for assessing the sustainability of remedial solutions and discuss some of the key issues and future challenges. The aim of a sustainability assessment is to compare the sustainability of two or more remedial solutions for a contaminated site. A sustainability assessment does not provide an absolute measure of whether remediation of a specific site is sustainable. Instead it provides a relative measure which can be used to select the most sustainable solution from amongst a number of defined remedial scenarios.

Results of the review show that most approaches use multi-criteria assessment methods (MCA) to structure a decision support process because it allows the combined assessment of criteria which may be either quantitatively or qualitatively assessed. Different combinations of environmental, social and economic criteria are employed, and are assessed either in qualitative or quantitative forms with various tools such as life cycle assessment and cost benefit analysis. Stakeholder involvement, which is a key component of sustainable remediation, is conducted in various ways. Some approaches involve stakeholders directly in the evaluation or weighting of criteria, whereas other approaches only indirectly consider stakeholder preferences.
This study has reviewed available methods for assessing and comparing the sustainability of contaminated site remediation alternatives. It is concluded that MCA methods are very useful when comparing remediation alternatives, since they allow for a joint assessment of many types of indicators; however the available tools and methods differ substantially, for instance in their selection of indicators, criteria evaluation methods, and approaches to stakeholder involvement and uncertainty analysis. Further work is needed in order to test the assessment approaches for real case studies, since to date only few documented case applications have been published. The presentation will give specific examples of approaches ranging from more qualitative assessments to more quantitative assessments of criteria.

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, Office for Study Programmes and Student Affairs
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Comparison of bacterial culture and qPCR testing of rectal and pen floor samples as diagnostic approaches to detect enterotoxigenic Escherichia coli in nursery pigs
Enterotoxigenic E. coli (ETEC) are a major cause of diarrhoea in weaned pigs. The objective of this study was to evaluate the agreement at pen level among three different diagnostic approaches for the detection of ETEC in groups of nursery pigs with diarrhoea. The diagnostic approaches used were: bacterial culturing of faecal samples from three pigs (per pen) with clinical diarrhoea and subsequent testing for virulence genes in E. coli isolates; bacterial culturing of pen floor samples and subsequent testing for virulence genes in E. coli isolates; qPCR testing of pen floor samples in order to determine the quantity of F18 and F4 genes. The study was carried out in three Danish pig herds and included 31 pens with a pen-level diarrhoea prevalence of > 25%, as well as samples from 93 diarrhoeic nursery pigs from these pens. All E. coli isolates were analysed by PCR and classified as ETEC when genes for one or more adhesin factors and one or more enterotoxins were detected. Results: A total of 208 E. coli colonies from pig samples and 172 E. coli colonies from pen floor samples were isolated. Haemolytic activity was detected on blood agar plates in 111 (29.2%) of the 380 colonies that were isolated. The only adhesin factor detected in this study was F18. When comparing bacterial culture or qPCR testing of pen floor samples with detection of ETEC-positive diarrhoeic pigs by culture, agreement was found in 26 (83.9%, Kappa = 0.665) and 23 (74.2%, Kappa = 0.488) of the pens, respectively. Agreement was observed between the detection of ETEC by bacterial culture and qPCR in the same pen floor sample in 26 (83.9%, Kappa = 0.679) pens. Conclusion: We observed an acceptable agreement for the detection of ETEC-positive diarrhoeic nursery pigs in pen samples for both bacterial culture of pen floor samples and qPCR. This study showed that both bacterial culture and qPCR testing of pen floor samples can be used as a diagnostic approach for detecting groups of ETEC-positive diarrhoeic nursery pigs.

General information
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Organisations: National Veterinary Institute, Virology, Diagnostic & Development, University of Copenhagen, Pig Research Centre
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BFI (2016): BFI-level 2
Comparison of different MSWI fly ash treatment processes on the thermal behavior of As, Cr, Pb and Zn in the ash

To reduce heavy metal leaching and stabilize municipal solid waste incineration (MSWI) fly ash, different methods and combination of methods were tested: water washing, electrodialytic separation and thermal treatment at 1000°C. A comparison of heavy metal concentration and leaching levels of As, Cr, Pb and Zn for the different untreated and treated ashes was made. The results showed that minimizing leaching to meet the limiting values of the all the studied heavy metals can be obtained at the same time by combining water washing, electrodialytic separation and thermal treatment. The ash subjected to this combination had lower Cr than the ash solely subjected to thermal treatment or subjected to water washing prior to thermal treatment. The electrodialytic separation (EDS) of the washed ash lowered pH from alkaline to acidic, which resulted in elevated leaching of Cd and Zn, while the Cr leaching was reduced. Up to 58.6% of Zn and 5.5% of Pb were extracted by EDS compared to less than 0.6% extraction by water washing. During thermal treatment of the EDS treated ash, the ash was re-alkalized. Due to solidification and possibly evaporation, most heavy elements left in the thermally treated ash were stabilized and immobilized. However, leaching of As and/or Cr was still problematic and did not meet the limit value for the thermally treated ash being recycled in construction work. The removal of Ca and decomposition of Ca oxides and minerals during EDS was linked to the leaching patterns of As and Cr after thermal treatment.

General information
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Organisations: Department of Civil Engineering, ARTEK, Section for Arctic Engineering and Sustainable Solutions
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.739 SNIP 2.256 CiteScore 4.33
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.777 SNIP 2.482 CiteScore 3.43
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.822 SNIP 2.435 CiteScore 3.39
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.611 SNIP 2.184 CiteScore 2.91
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.698 SNIP 2.085 CiteScore 2.99
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.555 SNIP 1.78
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Comparison of Fenton, UV-Fenton and nano-Fe3O4 catalyzed UV-Fenton in degradation of phloroglucinol under neutral and alkaline conditions: Role of complexation of Fe(III) with hydroxyl group in phloroglucinol

Phloroglucinol degradation at initial pH from 7.0 to 9.0 has been investigated in Fenton, UV-Fenton and nano-Fe3O4 catalyzed UV-Fenton (Hetero-Fenton). Within the reaction time given in this study (not more than 4 h), 150 mg·L−1 phloroglucinol was completely removed, while there was some difference in TOC removal efficiency: about 90% for UV-Fenton, nearly 60% for Fenton and Hetero-Fenton. Increasing initial pH from 7.0 to 9.0, there was an obvious decline in the degradation rate. The average values of H2O2 utilization efficiency were 0.65 ± 0.01 for Fenton, 0.66 ± 0.09 for UV-Fenton, and 1.35 ± 0.15 for Hetero-Fenton, suggesting Hetero-Fenton required less H2O2 consumption. Solution pH could decrease to strongly acidic conditions of pH <4.0 and the generation of organic acids including formic, acetic, oxalic, and maleic acids depended on the type of oxidation process. The spectrophotometric study showed phloroglucinol would complex with Fe(III) at pH 7.0 to form homogeneous aqueous solution which exhibited strong light absorption in the wavelength range of 400 nm to 600 nm. Therefore, formation of Fe(III)-phloroglucinol complex and pH decrease to strongly acidic condition played important roles in Fenton degradation under neutral and alkaline pH. The result of effect of pollutant content showed phloroglucinol at lower concentrations of 20 and 50 mg·L−1 could still be completely removed by all Fenton-based systems at pH 7.0, however, in Fenton with 20 mg·L−1 phloroglucinol, a significantly decreased degradation rate was observed due to the slowdown of pH drop and inhibited formation of Fe(III)-phloroglucinol complex.

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, Third Institute of Oceanography
Authors: Wang, Y. (Ekstern), Lin, X. (Ekstern), Shao, Z. (Ekstern), Shan, D. (Ekstern), Li, G. (Ekstern), Angelidaki, I. (Intern)
Number of pages: 8
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Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Biochemical Engineering Journal
Volume: 313
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Comparison of Five Computational Methods for Computing Q Factors in Photonic Crystal Membrane Cavities

Five state-of-the-art computational methods are benchmarked by computing quality factors and resonance wavelengths in photonic crystal membrane L5 and L9 line defect cavities. The convergence of the methods with respect to resolution, degrees of freedom and number of modes is investigated. Special attention is paid to the influence of the size of the computational domain. Convergence is not obtained for some of the methods, indicating that some are more suitable than others for analysing line defect cavities.

General information
State: Published
Organisations: Department of Photonics Engineering, Plasmonics and Metamaterials, Nanophotonic Devices, Centre of Excellence for Silicon Photonics for Optical Communications, Department of Electrical Engineering, Electromagnetic Systems, Department of Mechanical Engineering, Solid Mechanics, Nanophotonics Theory and Signal Processing, Zuse Institute Berlin, ITMO University

Chemistry (all), Environmental Chemistry, Chemical Engineering (all), Industrial and Manufacturing Engineering, Fe(III)-phloroglucinol complex, Fenton, Nano-Fe3O4 catalyzed UV-Fenton, Phloroglucinol degradation, UV-Fenton

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Comparison of Five Numerical Methods for Computing Quality Factors and Resonance Wavelengths in Photonic Crystal Membrane Cavities

General information
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Organisations: Department of Photonics Engineering, Nanophotonics Theory and Signal Processing, Nanophotonic Devices, Centre of Excellence for Silicon Photonics for Optical Communications, Department of Electrical Engineering, Electromagnetic Systems, Department of Mechanical Engineering, Solid Mechanics, Plasmonics and Metamaterials, ITMO University, Zuse Institute Berlin
Authors: Gregersen, N. (Intern), de Lasson, J. R. (Intern), Frandsen, L. H. (Intern), Kim, O. S. (Intern), Breinbjerg, O. (Intern), Wang, F. (Intern), Sigmund, O. (Intern), Ivinskaya, A. (Ekstern), Lavrinenko, A. (Intern), Gutsche, P. (Ekstern), Burger, S. (Ekstern), Häyrynen, T. (Intern), Mørk, J. (Intern)
Number of pages: 1
Publication date: 2017

Comparison of fracture properties of cellulose nanopaper, printing paper and buckypaper
Cellulose nanopaper consists of a dense fibrous self-binding network composed of cellulose nanofibres connected by physical entanglements, hydrogen bonding, etc. Compared with conventional printing paper, cellulose nanopaper has higher strength and modulus because of stronger fibres and inter-fibre bonding. The aim of this paper is to investigate the fracture properties of cellulose nanopaper using double edge notch tensile tests on samples with different notch lengths. It was found that strength is insensitive to notch length. A cohesive zone model was used to describe the fracture behaviour of notched cellulose nanopaper. Fracture energy was extracted from the cohesive zone model and divided into an energy component consumed by damage in the material and a component related to pull-out or bridging of nanofibres between crack surfaces which was not facilitated due to the limited fibre lengths for the case of nanopapers. For comparison, printing paper which has longer fibres than nanopaper was tested and modelled to demonstrate the importance of fibre length. Buckypaper, a fibrous network made of carbon nanotubes connected through van der Waals forces and physical entanglements, was also investigated to elaborate on the influence of inter-fibre connections.

General information
State: Published
Organisations: Department of Wind Energy, Composites and Materials Mechanics, Queen Mary University of London, Huazhong University of Science and Technology, Royal Institute of Technology
Authors: Mao, R. (Ekstern), Goutianos, S. (Intern), Tu, W. (Ekstern), Meng, N. (Ekstern), Yang, G. Y. (Ekstern), Berglund, L. A. (Ekstern), Peijs, T. (Ekstern)
Number of pages: 12
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BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.49 SJR 0.762 SNIP 1.064
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.811 SNIP 1.081 CiteScore 2.36
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.985 SNIP 1.431 CiteScore 2.54
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.933 SNIP 1.472 CiteScore 2.36
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.991 SNIP 1.407 CiteScore 2.2
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.941 SNIP 1.393 CiteScore 2.05
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.965 SNIP 1.097
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.842 SNIP 0.963
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.68 SNIP 0.772
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 0.623 SNIP 0.869
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 0.545 SNIP 0.799
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 0.554 SNIP 0.887
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 0.574 SNIP 0.999
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.678 SNIP 1.055
Scopus rating (2002): SJR 0.662 SNIP 0.879
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 0.735 SNIP 1.026
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.732 SNIP 1.027
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.788 SNIP 1.075
Original language: English
DOIs:
Comparison of GERG-2008 and simpler EoS models in calculation of phase equilibrium and physical properties of natural gas related systems

Accurate description of thermodynamic properties of natural gas systems is of great significance in the oil and gas industry. For this application, non-cubic equations of state (EoSs) are advantageous due to their better density and compressibility description. Among the non-cubic models, GERG-2008 is a new wide-range EoS for natural gases and other mixtures of 21 natural gas components. It is considered as a standard reference equation suitable for natural gas applications where highly accurate thermodynamic properties are required. Soave’s modification of Benedict-Webb-Rubin (Soave-BWR) EoS is another model that despite its empirical nature, provides accurate density description even around the critical point. It is much simpler than GERG-2008 and easier to handle and generalize to reservoir oil fluids. This study presents a comprehensive comparison between GERG-2008 and other cubic (SRK and PR) and noncubic EoSs (Soave-BWR and PC-SAFT) with a focus on Soave-BWR in description of pure components density and compressibility in a wide temperature and pressure range, calculation of binary Vapor-Liquid-Equilibria (VLE) and density, prediction of multicomponent phase envelopes and gas compressibility factor. In addition, the performance of GERG-2008 is compared with that of cubic and non-cubic models in calculation of thermal properties such as heat capacity and Joule-Thomson coefficient for pure components and multicomponent mixtures over a wide pressure and temperature range. The results are compared with available experimental data in the literature and special emphasis has been given to the reverse Joule-Thomson effects at high pressure high temperature (HPHT) conditions. © 2016 Elsevier B.V. All rights reserved.

General information
State: Published
Organisations: Department of Chemistry, Center for Energy Resources Engineering, Department of Chemical and Biochemical Engineering, CERE – Center for Energy Resources Engineering
Authors: Varzandeh, F. (Intern), Stenby, E. H. (Intern), Yan, W. (Intern)
Pages: 21-43
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Main Research Area: Technical/natural sciences

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Journal: Fluid Phase Equilibria
Volume: 434
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Ratings:
  - BFI (2017): BFI-level 2
  - Web of Science (2017): Indexed yes
  - BFI (2016): BFI-level 2
  - Scopus rating (2016): CiteScore 2.33 SJR 0.869 SNIP 1.155
    - Web of Science (2016): Indexed yes
    - BFI (2015): BFI-level 2
    - Scopus rating (2015): SJR 0.874 SNIP 0.998 CiteScore 1.99
      - Web of Science (2015): Indexed yes
      - BFI (2014): BFI-level 2
      - Scopus rating (2014): SJR 0.982 SNIP 1.248 CiteScore 2.28
        - Web of Science (2014): Indexed yes
        - BFI (2013): BFI-level 2
        - Scopus rating (2013): SJR 1.007 SNIP 1.274 CiteScore 2.31
          - ISI indexed (2013): ISI indexed yes
          - Web of Science (2013): Indexed yes
          - BFI (2012): BFI-level 2
          - Scopus rating (2012): SJR 1.152 SNIP 1.286 CiteScore 2.31
            - ISI indexed (2012): ISI indexed yes
            - Web of Science (2012): Indexed yes
            - BFI (2011): BFI-level 2
            - Scopus rating (2011): SJR 1.034 SNIP 1.234 CiteScore 2.26
              - ISI indexed (2011): ISI indexed yes
Comparison of global gene expression profiles of microdissected human foetal Leydig cells with their normal and hyperplastic adult equivalents

STUDY QUESTION: Do human adult Leydig cells (ALCs) within hyperplastic micronodules display characteristics of foetal LCs (FLCs)?

SUMMARY ANSWER: The gene expression profiles of FLCs and all ALC subgroups were clearly different, but there were no significant differences in expressed genes between the normally clustered and hyperplastic ALCs.

WHAT IS KNOWN ALREADY: LCs are the primary androgen producing cells in males throughout development and appear in chronologically distinct populations; FLCs, neonatal LCs and ALCs. ALCs are responsible for progression through puberty and for maintenance of reproductive functions in adulthood. In patients with reproductive problems, such as infertility or testicular cancer, and especially in men with high gonadotrophin levels, LC function is often impaired, and LCs may cluster abnormally into hyperplastic micronodules (defined as clusters of > 15 LCs in a cross-section).

STUDY DESIGN, SIZE, DURATION: A genome-wide microarray study of LCs microdissected from human foetal and adult tissue samples (n = 12). Additional tissue specimens (n = 15) were used for validation of the mRNA expression data at the protein level.

PARTICIPANTS/MATERIALS, SETTING, METHODS: Frozen human tissue samples were used for the microarray study, including morphologically normal foetal (gestational week 10-11) testis tissue samples used for the microarray study, including morphologically normal foetal (gestational week 10-11) testis tissue samples, adult testis tissue samples and testis specimens adjacent to hCG-producing testicular germ cell tumours. Transcriptome profiling was performed on Agilent whole human genome microarray 4 x 44 K chips. Microarray data pre-processing and statistical analysis were performed using the limma R/Bioconductor package in the R software, and differentially expressed genes were further analysed for gene set enrichment using the DAVID Bioinformatics software. Selected genes were studied at the protein level by immunohistochemistry.

MAIN RESULTS AND THE ROLE OF CHANCE: The transcriptomes of FLCs and ALCs differed significantly from each other, whereas the profiles of the normally clustered and hyperplastic ALCs were similar despite morphological heterogeneity. The study revealed several genes not known previously to be expressed in LCs during early development, including sulfotransferase family 2A member 1 (SULT2A1), WNT1-inducible signalling pathway protein 2 (WISP2), hydroxyprostaglandin dehydrogenase (HPGD) and insulin-like growth factor 2 mRNA binding protein 1 (IGF2BP1), whose expression changes were validated at the protein level.

LARGE SCALE DATA: The transcriptomic data are deposited in ArrayExpress.
LIMITATIONS, REASONS FOR CAUTION: The small number of biological replicates and the necessity of RNA amplification due to the scarcity of human tissues, especially foetal specimens, are the main limitations of the study. Heterogeneous subpopulations of LCs within micronodules were not discriminated during microdissection and might have affected the expression profiling. The study was constrained by the lack of availability of truly normal controls. Testis samples used as 'controls' displayed complete spermatogenesis and were from patients with germ cell neoplasia but with undetectable hCG and normal hormone levels. WIDER IMPLICATIONS OF THE FINDINGS: The changes in LC morphology and function observed in patients with reproductive disorders possibly reflect subtle changes in the expression of many genes rather than regulatory changes of single genes or pathways. The study provides new insights into the development and maturation of human LCs by the identification of a number of potential functional markers for FLC and ALC.
Comparison of linear and non-linear monotonicity-based shape reconstruction using exact matrix characterizations

Detecting inhomogeneities in the electrical conductivity is a special case of the inverse problem in electrical impedance tomography, that leads to fast direct reconstruction methods. One such method can, under reasonable assumptions, exactly characterize the inhomogeneities based on monotonicity properties of either the Neumann-to-Dirichlet map (non-linear) or its Fréchet derivative (linear). We give a comparison of the non-linear and linear approach in the presence of measurement noise, and show numerically that the two methods give essentially the same reconstruction in the unit disk domain. For a fair comparison, exact matrix characterizations are used when probing the monotonicity relations to avoid errors from numerical solution to PDEs and numerical integration. Using a special factorization of the Neumann-to-Dirichlet map also makes the non-linear method as fast as the linear method in the unit disk geometry.

General information
State: E-pub ahead of print
Organisations: Scientific Computing, Department of Applied Mathematics and Computer Science
Authors: Garde, H. (Intern)
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Publication information
Journal: Inverse Problems in Science and Engineering
ISSN (Print): 1741-5977
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.459 SNIP 0.889 CiteScore 1.01
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.474 SNIP 0.865 CiteScore 0.83
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.557 SNIP 0.944 CiteScore 0.95
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.479 SNIP 1.065 CiteScore 0.98
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.433 SNIP 0.836 CiteScore 0.77
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.362 SNIP 0.746 CiteScore 0.81
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.449 SNIP 0.818
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.396 SNIP 0.759
Web of Science (2009): Indexed yes
Comparison of Low-temperature District Heating Concepts in a Long-Term Energy System Perspective

District heating (DH) systems are important components in an energy efficient heat supply. With increasing amounts of renewable energy, the foundation for DH is changing and the approach to its planning will have to change. Reduced temperatures of DH are proposed as a solution to adapt it to future renewable energy systems. This study compares three alternative concepts for DH temperature level: Low temperature (55/25 °C), Ultra-low temperature with electric boosting (45/25 °C), and Ultra-low temperature with heat pump boosting (35/20 °C) taking into account the grid losses, production efficiencies and building requirements. The scenarios are modelled and analysed in the analysis tool EnergyPLAN and compared on primary energy supply and socioeconomic costs. The results show that the low temperature solution (55/25°C) has the lowest costs, reducing the total costs by about 100 M€/year in 2050.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Building Energy, Aalborg University
Authors: Lund, R. S. (Ekstern), Østergaard, D. S. (Intern), Yang, X. (Intern), Mathiesen, B. V. (Ekstern)
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Main Research Area: Technical/natural sciences

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Scopus rating (2016): SJR 0.326 SNIP 0.114 CiteScore 0.84
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Scopus rating (2015): SJR 0.302 SNIP 0.039
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Original language: English
Energy system analysis, Socioeconomic costs, Fuel consumption, Energy efficiency, EnergyPLAN simulations
Source: FindIt
Source-ID: 2355605626
Publication: Research - peer-review › Journal article – Annual report year: 2017

Comparison of OpenFOAM and EllipSys3D actuator line methods with (NEW) MEXICO results: Paper

The Actuator Line Method exists for more than a decade and has become a well established choice for simulating wind rotors in computational fluid dynamics. Numerous implementations exist and are used in the wind energy research community. These codes were verified by experimental data such as the MEXICO experiment. Often the verification...
against other codes were made on a very broad scale. Therefore this study attempts first a validation by comparing two different implementations, namely an adapted version of SOWFA/OpenFOAM and EllipSys3D and also a verification by comparing against experimental results from the MEXICO and NEW MEXICO experiments.

**General information**

State: Published
Organisations: Department of Wind Energy, Aerodynamic design, ETS
Authors: Nathan, J. (Ekstern), Meyer Forsting, A. R. (Intern), Troldborg, N. (Intern), Masson, C. (Ekstern)
Number of pages: 9
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Applied fluid mechanics, General fluid dynamics theory, simulation and other computational methods, Civil and mechanical engineering computing, Fluid mechanics and aerodynamics (mechanical engineering), Mechanical components, Mechanical engineering applications of IT, computational fluid dynamics, rotors (mechanical), wind, wind power, OpenFOAM, EllipSys3D actuator line methods, wind rotors, wind energy research community, SOWFA

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Source: FindIt
Source-ID: 2371467291
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**Comparison of optomagnetic and AC susceptibility readouts in a magnetic nanoparticle agglutination assay for detection of C-reactive protein**

There is an increasing need to develop biosensor methods that are highly sensitive and that can be combined with low-cost consumables. The use of magnetic nanoparticles (MNPs) is attractive because their detection is compatible with low-cost disposables and because application of a magnetic field can be used to accelerate assay kinetics. We present the first study and comparison of the performance of magnetic susceptibility measurements and a newly proposed optomagnetic method. For the comparison we use the C-reactive protein (CRP) induced agglutination of identical samples of 100 nm MNPs conjugated with CRP antibodies. Both methods detect agglutination as a shift to lower frequencies in measurements of the dynamics in response to an applied oscillating magnetic field. The magnetic susceptibility method probes the magnetic response whereas the optomagnetic technique probes the modulation of laser light transmitted through the sample. The two techniques provided highly correlated results upon agglutination when they measure the decrease of the signal from the individual MNPs (turn-off detection strategy), whereas the techniques provided different results, strongly depending on the read-out frequency, when detecting the signal due to MNP agglomerates (turn-on detection strategy). These observations are considered to be caused by differences in the volumedependence of the magnetic and optical signals from agglomerates. The highest signal from agglomerates was found in the optomagnetic signal at low frequencies.

**General information**

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Organisations: Department of Micro- and Nanotechnology, Magnetic Systems, Uppsala University
Authors: Fock, J. (Intern), Parmvi, M. (Intern), Strömberg, M. (Ekstern), Svedlindh, P. (Ekstern), Donolato, M. (Intern), Hansen, M. F. (Intern)
Number of pages: 19
Pages: 94–100
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Main Research Area: Technical/natural sciences

**Publication information**

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Comparison of phosphorus recovery from incineration and gasification sewage sludge ash

Incineration of sewage sludge is a common practice in many western countries. Gasification is an attractive option because of its high energy efficiency and flexibility in the usage of the produced gas. However, they both unavoidably produce sewage sludge ash (SSA), a material which is rich in phosphorus (P), but that it is commonly landfilled or used in construction materials. With current uncertainty in phosphate rock (PR) supply, P recovery from SSA has become
interesting. In the present work, ashes from incineration and gasification of the same sewage sludge were compared in terms of P extractability using electrodialytic (ED) methods. The results show that comparable recovery rates of P were achieved with a single ED step for incineration SSA and a sequential combination of two ED steps for gasification SSA, which was due to a higher influence of Fe and/or Al in P solubility for the latter. A product with lower level of metallic impurities and comparable to wet process phosphoric acid (WPA) was eventually obtained from gasification SSA. Thus, gasification becomes an interesting alternative to incineration also in terms of P separation.
Comparison of radar and numerical weather model rainfall forecasts in the perspective of urban flood prediction

An early flood warning system has been developed for urban catchments and is currently running in online operation in Copenhagen. The system is highly dependent on the quality of rainfall forecast inputs. An investigation of precipitation inputs from Radar Nowcast (RN), Numerical Weather Prediction (NWP) with assimilation of radar and cloud data (RA3), and Ensemble NWP with 25 members (S05) is conducted by comparing against rain gauge measurements and flood extent. Despite lower spatial and temporal resolution, the ensemble product seems promising for forecasting extreme events. A combination of the three forecast products is expected to yield the optimal input for flood warning.

General information
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Organisations: Department of Environmental Engineering, Urban Water Systems, Technical University of Denmark, Biofos A/S, Krüger A/S, Danish Meteorological Institute
Authors: Lovring, M. M. (Ekstern), Löwe, R. (Intern), Courdent, V. A. T. (Intern), Meneses, E. J. (Ekstern), Petersen, S. O. (Ekstern), Vedel, H. (Ekstern), Petersen, H. M. (Ekstern), Mikkelsen, P. S. (Intern)
Number of pages: 4
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Main Research Area: Technical/natural sciences
Source: PublicationPreSubmission
Source-ID: 137133740
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Comparison of the impacts of urban development and climate change on exposing European cities to pluvial flooding

The economic and human consequences of extreme precipitation and the related flooding of urban areas have increased rapidly over the past decades. Some of the key factors that affect the risks to urban areas include climate change, the densification of assets within cities and the general expansion of urban areas. In this paper, we examine and compare quantitatively the impact of climate change and recent urban development patterns on the exposure of four European cities to pluvial flooding. In particular, we investigate the degree to which pluvial floods of varying severity and in different geographical locations are influenced to the same extent by changes in urban land cover and climate change. We have selected the European cities of Odense, Vienna, Strasbourg and Nice for analyses to represent different climatic conditions, trends in urban development and topographical characteristics. We develop and apply a combined remote-sensing and flood-modelling approach to simulate the extent of pluvial flooding for a range of extreme precipitation events for historical (1984) and present-day (2014) urban land cover and for two climate-change scenarios (i.e. representative concentration pathways, RCP 4.5 and RCP 8.5). Changes in urban land cover are estimated using Landsat satellite imagery for the period 1984-2014. We combine the remote-sensing analyses with regionally downscaled estimates of precipitation extremes of current and expected future climate to enable 2-D overland flow simulations and flood-hazard assessments. The individual and combined impacts of urban development and climate change are quantified by examining the variations in flooding between the different simulations along with the corresponding uncertainties. In addition, two different assumptions are examined with regards to the development of the capacity of the urban drainage system in response to urban development and climate change. In the "stationary" approach, the capacity resembles
present-day design, while it is updated in the "evolutionary" approach to correspond to changes in imperviousness and precipitation intensities due to urban development and climate change respectively. For all four cities, we find an increase in flood exposure corresponding to an observed absolute growth in impervious surfaces of 7-12% during the past 30 years of urban development. Similarly, we find that climate change increases exposure to pluvial flooding under both the RCP 4.5 and RCP 8.5 scenarios. The relative importance of urban development and climate change on flood exposure varies considerably between the cities. For Odense, the impact of urban development is comparable to that of climate change under an RCP 8.5 scenario (2081-2100), while for Vienna and Strasbourg it is comparable to the impacts of an RCP 4.5 scenario. For Nice, climate change dominates urban development as the primary driver of changes in exposure to flooding. The variation between geographical locations is caused by differences in soil infiltration properties, historical trends in urban development and the projected regional impacts of climate change on extreme precipitation. Developing the capacity of the urban drainage system in relation to urban development is found to be an effective adaptation measure as it fully compensates for the increase in runoff caused by additional sealed surfaces. On the other hand, updating the drainage system according to changes in precipitation intensities caused by climate change only marginally reduces flooding for the most extreme events.

**General information**

State: Published
Organisations: Department of Management Engineering, Systems Analysis, Department of Environmental Engineering, Urban Water Systems, LNHI Water, DHI Denmark
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BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.658 SNIP 1.656
Comparison of three control strategies for optimization of spray dryer operation

Spray drying is the preferred process to reduce the water content of many chemicals, pharmaceuticals, and foodstuffs. A significant amount of energy is used in spray drying to remove water and produce a free flowing powder product. In this paper, we present and compare the performance of three controllers for operation of a four-stage spray dryer. The three controllers are a proportional-integral (PI) controller that is used in industrial practice for spray dryer operation, a linear model predictive controller with real-time optimization (MPC with RTO, MPC-RTO), and an economically optimizing nonlinear model predictive controller (E-NMPC). The MPC with RTO is based on the same linear state space model in the MPC and the RTO layer. The E-NMPC consists of a single optimization layer that uses a nonlinear system of ordinary differential equations for its predictions. The PI control strategy has a fixed target that is independent of the disturbances, while the MPC-RTO and the E-NMPC adapt the operating point to the disturbances. The goal of spray dryer operation is to optimize the profit of operation in the presence of feed composition and ambient air humidity variations; i.e. to maximize the production rate, while minimizing the energy consumption, keeping the residual moisture content of the powder below a maximum limit, and avoiding that the powder sticks to the chamber walls. We use an industrially recorded disturbance scenario in order to produce realistic simulations and conclusions. The key performance indicators such as the profit of operation, the product flow rate, the specific energy consumption, the energy efficiency, and the residual moisture content of the produced powder are computed and compared for the three controllers. In this simulation study, we find that the economic performance of the MPC with RTO as well as the E-NMPC is considerably improved compared to the PI control strategy used in industrial practice. The MPC with RTO improves the profit of operation by 8.61%, and the E-NMPC improve.

General information
State: Published
Organisations: Scientific Computing, Department of Applied Mathematics and Computer Science, Dynamical Systems, Department of Electrical Engineering, Automation and Control, GEA Process Engineering A/S
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Comparison of traditional field retting and *Phlebia radiata* Cel 26 retting of hemp fibres for fibre-reinforced composites

Classical field retting and controlled fungal retting of hemp using *Phlebia radiata* Cel 26 (a mutant with low cellulose degrading ability) were compared with pure pectinase treatment with regard to mechanical properties of the produced fibre/epoxy composites. For field retting a classification of the microbial evolution (by gene sequencing) and enzyme profiles were conducted. By phylogenetic frequency mapping, different types of fungi, many belonging to the Ascomycota phylum were found on the fibres during the first 2 weeks of field retting, and thereafter, different types of bacteria, notably Proteobacteria, also proliferated on the field retted fibres. Extracts from field retted fibres exhibited high glucanase activities, while extracts from *P. radiata* Cel 26 retted fibres showed high polygalacturonase and laccase activities. As a result, fungal retting gave a significantly higher glucan content in the fibres than field retting (77 vs. 67%) and caused a higher removal of pectin as indicated by lower galacturonan content of fibres (1.6%) after fibres were retted for 20 days with *P. radiata* Cel 26 compared to a galacturonan content of 3.6% for field retted fibres. Effective fibre stiffness increased
slightly after retting with *P. radiata* Cel 26 from 65 to 67 GPa, while it decreased after field retting to 52 GPa. Effective fibre strength could not be determined similarly due to variations in fibre fracture strain and fibre-matrix adhesion. A maximum composite strength with 50 vol% fibres of 307 MPa was obtained using *P. radiata* Cel 26 compared to 248 MPa with field retting.

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**Comparison of zero-sequence injection methods in cascaded H-bridge multilevel converters for large-scale photovoltaic integration**

Photovoltaic (PV) power generation levels in the three phases of a multilevel cascaded H-bridge (CHB) converter can be significantly unbalanced, owing to different irradiance levels and ambient temperatures over a large-scale solar PV power plant. Injection of a zero-sequence voltage is required to maintain three-phase balanced grid currents with unbalanced power generation. This study theoretically compares power balance capabilities of various zero-sequence injection methods based on two metrics which can be easily generalised for all CHB applications to PV systems. Experimental results based on a 430 V, 10 kW, three-phase, seven-level cascaded H-bridge converter prototype confirm superior performance of the optimal zero-sequence injection technique.
Compensation for geometric modeling errors by positioning of electrodes in electrical impedance tomography: Paper

Electrical impedance tomography aims at reconstructing the conductivity inside a physical body from boundary measurements of current and voltage at a finite number of contact electrodes. In many practical applications, the shape of the imaged object is subject to considerable uncertainties that render reconstructing the internal conductivity impossible if they are not taken into account. This work numerically demonstrates that one can compensate for inaccurate modeling of the object boundary in two spatial dimensions by finding compatible locations and sizes for the electrodes as a part of a reconstruction algorithm. The numerical studies, which are based on both simulated and experimental data, are complemented by proving that the employed complete electrode model is approximately conformally invariant, which
suggests that the obtained reconstructions in mismodeled domains reflect conformal images of the true targets. The numerical experiments also confirm that a similar approach does not, in general, lead to a functional algorithm in three dimensions.
Competition between weak OH···π and CH··O hydrogen bonds: THz spectroscopy of the C$_2$H$_2$—H$_2$O and C$_2$H$_4$—H$_2$O complexes

THz absorption spectra have been recorded for the weakly bound molecular complexes of H$_2$O with C$_2$H$_2$ and C$_2$H$_4$ embedded in cryogenic neon matrices at 2.8 K. The observation and assignment of a large-amplitude acceptor OH librational mode of the C$_2$H$_2$—H$_2$O complex at 145.5 cm$^{-1}$ confirms an intermolecular CH··O hydrogen-bonded configuration of C$_2v$ symmetry with the H$_2$O subunit acting as the hydrogen bond acceptor. The observation and assignment of two large-amplitude donor OH librational modes of the C$_2$H$_4$—H$_2$O complex at 255.0 and 187.5 cm$^{-1}$, respectively, confirms an intermolecular OH···π hydrogen-bonded configuration with the H$_2$O subunit acting as the hydrogen bond donor to the π-cloud of C$_2$H$_4$. A (semi)-empirical value for the change of vibrational zero-point energy of 4.0–4.1 kJ mol$^{-1}$ is proposed and the combination with quantum chemical calculations at the CCSD(T)-F12b/aug-cc-pVQZ level provides a reliable estimate of 7.1 ± 0.3 kJ mol$^{-1}$ for the dissociation energy $D_0$ of the C$_2$H$_4$—H$_2$O complex. In addition, tentative assignments for the two strongly infrared active OH librational modes of the ternary C$_4$H$_4$—HOH—C$_2$H$_4$ complex having H$_2$O as a doubly OH···π hydrogen bond donor are proposed at 213.6 and 222.3 cm$^{-1}$. The present findings demonstrate that the relative stability of the weak hydrogen bond motifs is not entirely rooted in differences of electronic energy but also to a large extent by differences in the vibrational zero-point energy contributions arising from the class of large-amplitude intermolecular modes.

General information
State: Published
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Competition of van der Waals and chemical forces on gold–sulfur surfaces and nanoparticles

Chemists generally believe that covalent and ionic bonds form much stronger links between atoms than the van der Waals force does. However, this is not always so. We present cases in which van der Waals dispersive forces introduce new competitive bonding possibilities rather than just modulating traditional bonding scenarios. Although the new possibilities could arise from any soft–soft chemical interaction, we focus on bonding between gold atoms and alkyl or arylsulfur ligands, RS. Consideration of all the interactions at play in sulfur-protected gold surfaces and gold nanoparticles is necessary to understand their structural, chemical and spectroscopic properties. In turn, such knowledge opens pathways to new chemical entities and innovative nanotechnological devices. Such experimentation is complemented by modern theory, and presented here is a broad overview of computational methods appropriate to fields ranging from gas-phase chemistry to device physics and biochemistry.

General information

State: Published
Organisations: Department of Chemistry, NanoChemistry, Shanghai University, University of Technology, Sydney, La Trobe University, University of Sydney
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Publication date: 2017
Main Research Area: Technical/natural sciences

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Journal: Nature Reviews Chemistry
Volume: 1
Competitive Liner Shipping Network Design

We present a solution method for the liner shipping network design problem which is a core strategic planning problem faced by container carriers. We propose the first practical algorithm which explicitly handles transshipment time limits for all demands. Individual sailing speeds at each service leg are used to balance sailing speed against operational costs, hence ensuring that the found network is competitive on both transit time and cost. We present a matheuristic for the problem where a MIP is used to select which ports should be inserted or removed on a route. Computational results are presented showing very promising results for realistic global liner shipping networks. Due to a number of algorithmic enhancements, the obtained solutions can be found within the same time frame as used by previous algorithms not handling time constraints. Furthermore, we present a sensitivity analysis on fluctuations in bunker price which confirms the applicability of the algorithm.
Complementary electron microscopic-spectroscopic characterization of Ti and Cr adhesion layers

General information
State: Published
Organisations: DTU Danchip, Center for Electron Nanoscopy
Authors: Todeschini, M. (Intern), Bastos da Silva Fanta, A. (Intern), Wagner, J. B. (Intern), Jensen, F. (Intern), Han, A. (Intern)
Publication date: 2017
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Complementary Methods for the Characterization of Corrosion Products on a Plant-Exposed Superheater Tube
In this work, complex corrosion products on a superheater tube exposed to biomass firing were characterized by the complementary use of energy-dispersive synchrotron diffraction, electron microscopy, and energy-dispersive X-ray spectroscopy. Non-destructive synchrotron diffraction in transmission geometry measuring with a small gauge volume from the sample surface through the corrosion product allowed depth-resolved phase identification and revealed the presence of (Fe,Cr)2O3 and FeCr2O4. This was supplemented by microstructural and elemental analysis correlating the additional presence of a Ni-rich austenite phase to selective removal of Fe and Cr from the alloy, via a KCl-induced corrosion mechanism. Compositional variations were related to diffraction results and revealed a qualitative influence of the spinel cation concentration on the observed diffraction lines.

General information
Complete elimination of nonlinear light-matter interactions with broadband ultrafast laser pulses

The absorption of a single photon that excites a quantum system from a low to a high energy level is an elementary process of light-matter interaction, and a route towards realizing pure single-photon absorption has both fundamental and practical implications in quantum technology. Due to nonlinear optical effects, however, the probability of pure single-photon absorption is usually very low, which is particularly pertinent in the case of strong ultrafast laser pulses with broad bandwidth. Here we demonstrate theoretically a counterintuitive coherent single-photon absorption scheme by eliminating nonlinear interactions of ultrafast laser pulses with quantum systems. That is, a completely linear response of the system with respect to the spectral energy density of the incident light at the transition frequency can be obtained for all transition probabilities between 0 and 100% in multilevel quantum systems. To that end, a multiobjective optimization algorithm is developed to find an optimal spectral phase of an ultrafast laser pulse, which is capable of eliminating all possible nonlinear optical responses while maximizing the probability of single-photon absorption between quantum states. This work not only deepens our understanding of light-matter interactions, but also offers a way to study photophysical and photochemical processes in the "absence" of nonlinear optical effects.

General information

State: Published
Organisations: Department of Chemistry, Physical and Biophysical Chemistry, University of New South Wales
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Number of pages: 6
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The Oriental Hornet (Vespa orientalis) is a social insect belonging to the Vespiade family (Wasps, Hornets, Yellowjackets), genus Vespa (true Hornets). The oriental hornet is a scavenger and an agricultural pest, especially to bee farmers, but is...
also recently described as a harvester of solar energy. Here, we report the mitochondrial genome sequence of the Oriental Hornet, Vespa orientalis F., which may play a vital role in understanding this wasp biology, light trapping and generation of electricity. The mitochondrial genome of this hornet is 16,099 bp in length, containing 13 protein-coding genes, 21 transfer RNA genes, and 2 ribosomal RNA genes. The overall base composition of the heavy-strand is 40.3% A, 5.9% C, 13.2% G, and 40.6% T, the percentages of A and T being higher than that of G and C. The mitochondrial genome of the Oriental Hornet, Vespa orientalis F., represents the first mitogenome of a solar energy harvesting insect.

**General information**

State: Published
Organisations: Department of Bio and Health Informatics, Metagenomics, Department of Biotechnology and Biomedicine, Center for Energy Resources Engineering, Department of Chemical and Biochemical Engineering, CERE – Center for Energy Resources Engineering, National Center for Agricultural Research and Extension, Swedish Museum of Natural History
Authors: Haddad, N. J. (Ekstern), Al-Nakeeb, K. A. A. (Intern), Petersen, B. (Intern), Dalén, L. (Ekstern), Sorgenfrei Blom, N. (Intern), Sicheritz-Pontén, T. (Intern)
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**Complete sequence-based pathway analysis by differential on-chip DNA and RNA extraction from a single cell**

**General information**

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Organisations: Department of Micro- and Nanotechnology, Optofluidics, Philips Research Laboratories, Philips Biocell, Fasteris SA, XGenomes
Authors: van Strijp, D. (Ekstern), Vulders, R. C. M. (Ekstern), Larsen, N. (Ekstern), Schira, J. (Ekstern), Baerlocher, L. (Ekstern), van Driel, M. A. (Ekstern), Jensen, M. P. (Intern), Hansen, T. S. (Ekstern), Kristensen, A. (Intern), Mir, K. U. (Ekstern), Olesen, T. (Ekstern), Verhaegh, W. F. J. (Ekstern), Marie, R. (Intern), van der Zaag, P. J. (Ekstern)
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Complexation and synergistic boundary lubrication of porcine gastric mucin and branched poly(ethyleneimine) in neutral aqueous solution

Lubrication of soft polydimethylsiloxane (PDMS) elastomer interfaces was studied in aqueous mixtures of porcine gastric mucin (PGM) and branched polyethyleneimine (b-PEI) at neutral pH and various ionic strengths (0.1–1.0 M). While neither PGM nor b-PEI improved lubrication compared to polymer-free buffer solution, their mixtures produced a synergistic lubricating effect by reducing friction coefficients by nearly two orders of magnitude, especially at slow sliding speed in the boundary lubrication regime. An array of spectroscopic studies revealed that small cationic b-PEI molecules were able to strongly bind and penetrate into large anionic PGM molecules, producing an overall contraction of the randomly coiled PGM conformation. The interaction also affected the structure of the folded PGM proteinteins, decreased the surface potential and increased light absorbance in PGM:b-PEI mixtures. Adding electrolyte (NaCl) weakened the aggregation between PGM and b-PEI, and degraded the lubricationsynergy, indicating that electrostatic interactions drive PGM:b-PEI complexation.
The complex conductivity of soil remains poorly known despite the growing importance of this method in hydrogeophysics. In order to fill this gap of knowledge, we investigate the complex conductivity of 71 soils samples (including 4 peat samples) and one clean sand in the frequency range 0.1 Hertz to 45 kHz. The soil samples are saturated with 6 different NaCl brines with conductivities (0.031, 0.53, 1.15, 5.7, 14.7, and 22 S m$^{-1}$, NaCl, 25°C) in order to determine their intrinsic formation factor and surface conductivity. This dataset is used to test the predictions of the dynamic Stern polarization model of porous media in terms of relationship between the quadrature conductivity and the surface conductivity. We also investigate the relationship between the normalized chargeability (the difference of in phase conductivity between two frequencies) and the quadrature conductivity at the geometric mean frequency. This dataset confirms the relationships between the surface conductivity, the quadrature conductivity, and the normalized chargeability. The normalized chargeability depends linearly on the cation exchange capacity and specific surface area while the chargeability shows no dependence on these parameters. These new data and the dynamic Stern layer polarization model are observed to be mutually consistent. Traditionally, in hydrogeophysics, surface conductivity is neglected in the analysis of resistivity data. The relationships we have developed can be used in field conditions to avoid neglecting surface conductivity in the interpretation of DC resistivity tomograms. We also investigate the effects of temperature and saturation and, here again, the dynamic Stern layer predictions and the experimental observations are mutually consistent.
Complex terrain experiments in the New European Wind Atlas

The New European Wind Atlas project will create a freely accessible wind atlas covering Europe and Turkey, develop the model chain to create the atlas and perform a series of experiments on flow in many different kinds of complex terrain to validate the models. This paper describes the experiments of which some are nearly completed while others are in the planning stage. All experiments focus on the flow properties that are relevant for wind turbines, so the main focus is the mean flow and the turbulence at heights between 40 and 300 m. Also extreme winds, wind shear and veer, and diurnal and seasonal variations of the wind are of interest. Common to all the experiments is the use of Doppler lidar systems to supplement and in some cases replace completely meteorological towers. Many of the lidars will be equipped with scan heads that will allow for arbitrary scan patterns by several synchronized systems. Two pilot experiments, one in Portugal and one in Germany, show the value of using multiple synchronized, scanning lidar, both in terms of the accuracy of the measurements and the atmospheric physical processes that can be studied. The experimental data will be used for validation of atmospheric flow models and will by the end of the project be freely available. This article is part of the themed issue 'Wind energy in complex terrains'.

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Compositional data analysis of household waste recycling centres in Denmark

General information
Compositional data analysis of household waste recycling centres in Denmark

The Danish government has set a target of 50% recycling rates for household waste by 2022. To achieve this goal, the Danish municipalities should increase the source separation of household waste. While significant knowledge and experiences were locally gained, lessons learnt have not been extensively exploited country-wise, an important reason being that the influence of these changes has not been rigorously investigated and quantified, meaning that generalized conclusions could not be drawn so far. One of the reasons is that a consistent calculation method to assess and document the effect of these projects on the recycling rates does not exist. Thus, compositional data analysis technique was applied to analyze consistently waste data. Based on the waste composition obtained from a recycling center in Denmark, we analyzed the composition of waste treatment and disposal options. Zero and non-zero pattern was used to describe historical changes in the definition and components of waste fractions. Variation array was applied to determine the relationship between waste treatment and disposal options. As a result, compositional data analysis technique enables to analyze waste data regardless of the unit (mass or percentage).

General information
State: Published
Organisations: Department of Environmental Engineering, Residual Resource Engineering, University of Girona
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Compositional Model Checking of Interlocking Systems for Lines with Multiple Stations

In the railway domain safety is guaranteed by an interlocking system which translates operational decisions into commands leading to field operations. Such a system is safety critical and demands thorough formal verification during its development process. Within this context, our work has focused on the extension of a compositional model checking approach to formally verify interlocking system models for lines with multiple stations. The idea of the approach is to decompose a model of the interlocking system by applying cuts at the network modelling level. The paper introduces an alternative cut (the linear cut) to a previously proposed cut (border cut). Powered with the linear cut, the model checking approach is then applied to the verification of an interlocking system controlling a real-world multiple station line.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Software Engineering
Authors: Macedo, H. D. D. S. (Intern), Fantechi, A. (Intern), Haithausen, A. E. (Intern)
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Conference: NASA Formal Methods Symposium 2017, Moffett Field, United States, 16/05/2017 - 16/05/2017
Compositional variations of brown seaweeds *Laminaria digitata* and *Saccharina latissima* in Danish waters

Around Denmark, *Laminaria digitata* and *Saccharina latissima* are particularly common macroalgae species and are considered as prospective candidates for biorefineries. In this study, the carbohydrate composition and protein levels of *L. digitata* and *S. latissima* from three different sites in Denmark were compared for 1 year, and compositional variations of wild *L. digitata* harvested in August from the North Sea was monitored for 3 years. Glucan levels of *L. digitata* were consistently higher than those of *S. latissima* irrespective of harvest site and time of the year. Glucan levels in wild *L. digitata* from Kattegat peaked in October with 37.0% by dry weight compared to 22.6% by dry weight in wild *S. latissima* (Kattegat) and were accompanied by lower ash contents (18.5% w/w in *L. digitata* versus 26.5% w/w in *S. latissima*).

Alginate contents were almost constant throughout the year, but mannuronic/glucuronic acid ratios differed between species and location from 1.33 to 3.64. Wild *L. digitata* harvested from the North Sea in August contained >50% glucans by weight and had low ash contents for three consecutive years (2012-2014). Compositional variation of the seaweeds was mainly related to season but also varied with species, location, and within populations. Among environmental variables (temperature, salinity, phosphate, nitrate, ammonia), only temperature was found to correlate with the chemical composition of the seaweeds. Amino acid profiles were dominated by glutamic acid, aspartic acid, and alanine and varied with season, especially for *L. digitata* from the North Sea, and location. Total nitrogen contents fluctuated more between samples than the actual protein contents; hence, application of a common N-to-protein factor cannot be recommended.

**General information**

State: Published

Organisations: Department of Chemical and Biochemical Engineering, Center for BioProcess Engineering, Aarhus Universitet, University of Hamburg

Authors: Manns, D. M. (Intern), Nielsen, M. M. (Ekstern), Bruhn, A. (Ekstern), Saake, B. (Ekstern), Meyer, A. S. (Intern)

Number of pages: 14

Pages: 1493-1506

Publication date: 2017

Main Research Area: Technical/natural sciences

**Publication information**

Journal: Journal of Applied Phycology

Volume: 29

Issue number: 3

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BFI (2017): BFI-level 1

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 2.46

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): CiteScore 2.32

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): CiteScore 2.88

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): CiteScore 2.78

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): CiteScore 2.68

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

BFI (2011): BFI-level 1
Railway interlocking systems are responsible to grant exclusive access to a route, that is a sequence of track elements, through a station or a network. Formal verification that basic safety rules regarding exclusive access to routes are satisfied by an implementation is still a challenge for networks of large size due to the exponential computation time and resources needed. Some recent attempts to address this challenge adopt a compositional approach, targeted to track layouts that are easily decomposable into sub-networks such that a route is almost fully contained in a sub-network: in this way granting the access to a route is essentially a decision local to the sub-network, and the interfaces with the rest of the network easily abstract away less interesting details related to the external world. Following up on previous work, where we defined a compositional verification method that started considering routes that overlap between sub-networks in interlocking systems governing a multi-station line, we attack the verification of large networks, which are typically those in main stations of major cities, and where routes are very intertwined and can hardly be separated into sub-networks that are independent at some degree. At this regard, we study how the division of a complex network into sub-networks, using stub elements to abstract all the routes that are common between sub-networks, may still guarantee compositionality of verification of safety properties.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Software Engineering
Authors: Fantechi, A. (Intern), Haxthausen, A. E. (Intern), Macedo, H. D. D. S. (Intern)
Pages: 236-252
Publication date: 2017

Host publication information
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Volume: 10469
Publisher: Springer
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Series: Lecture Notes in Computer Science
Volume: 10469
ISSN: 0302-9743
Main Research Area: Technical/natural sciences
Conference: 15th International Conference on Software Engineering and Formal Methods, Vienna, Austria, 04/09/2017 - 04/09/2017
Computer Science, Software Engineering, Programming Languages, Compilers, Interpreters, Programming Techniques, Theory of Computation, System Performance and Evaluation, Artificial Intelligence (incl. Robotics), Railway interlocking, Compositional verification, Model checking
Electronic versions:
main_sefm.pdf
DOIs:
10.1007/978-3-319-66197-1_15
Comprehensive Deformation Analysis of a Newly Designed Ni-Free Duplex Stainless Steel with Enhanced Plasticity by Optimizing Austenite Stability

A new metastable Ni-free duplex stainless steel has been designed with superior plasticity by optimizing austenite stability using thermodynamic calculations of stacking fault energy and with reference to literature findings. Several characterization methods comprising optical microscopy, magnetic phase measurements, X-ray diffraction (XRD) and electron backscattered diffraction were employed to study the plastic deformation behavior and to identify the operating plasticity mechanisms. The results obtained show that the newly designed duplex alloy exhibits some extraordinary mechanical properties, including an ultimate tensile strength of ~900 MPa and elongation to fracture of ~94 pct due to the synergistic effects of transformation-induced plasticity and twinning-induced plasticity. The deformation mechanism of austenite is complex and includes deformation banding, strain-induced martensite formation, and deformation-induced twinning, while the ferrite phase mainly deforms by dislocation slip. Texture analysis indicates that the Copper and Rotated Brass textures in austenite (FCC phase) and {001}〈110〉 texture in ferrite and martensite (BCC phases) are the main active components during tensile deformation. The predominance of these components is logically related to the strain-induced martensite and/or twin formation.

General information

State: Published
Organisations: Center for Electron Nanoscopy, University of Tehran, Shahid Chamran University of Ahvaz
Authors: Moallemi, M. (Ekstern), Zarei-Hanzaki, A. (Ekstern), Eskandari, M. (Ekstern), Burrows, A. (Intern), Alimadadi, H. (Intern)
Number of pages: 17
Pages: 3675-3691
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information

Volume: 48
Issue number: 8
ISSN (Print): 1073-5623
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.91 SJR 1.179 SNIP 1.179
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.231 SNIP 1.332 CiteScore 1.78
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.671 SNIP 1.877 CiteScore 2.06
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 1.481 SNIP 1.63 CiteScore 1.9
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.419 SNIP 1.706 CiteScore 1.76
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 1.508 SNIP 1.703 CiteScore 1.78
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Comprehensive In Vitro Analysis of Aciytransferase Domain Exchanges in Modular Polyketide Synthases and Its Application for Short-Chain Ketone Production

Type I modular polyketide synthases (PKSs) are polymerases that utilize acyl-CoAs as substrates. Each polyketide elongation reaction is catalyzed by a set of protein domains called a module. Each module usually contains an acyltransferase (AT) domain, which determines the specific acyl-CoA incorporated into each condensation reaction. Although a successful exchange of individual AT domains can lead to the biosynthesis of a large variety of novel compounds, hybrid PKS modules often show significantly decreased activities. Using monomodular PKSs as models, we have systematically analyzed the segments of AT domains and associated linkers in AT exchanges in vitro and have identified the boundaries within a module that can be used to exchange AT domains while maintaining protein stability and enzyme activity. Importantly, the optimized domain boundary is highly conserved, which facilitates AT domain replacements in most type I PKS modules. To further demonstrate the utility of the optimized AT domain boundary, we have constructed hybrid PKSs to produce industrially important short-chain ketones. Our in vitro and in vivo analysis demonstrated production of predicted ketones without significant loss of activities of the hybrid enzymes. These results greatly enhance the mechanistic understanding of PKS modules and prove the benefit of using engineered PKSs as a synthetic biology tool for chemical production.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Synthetic Biology Tools for Yeast, Sandia Natl Labs, Sandia Natl Labs, Livermore, CA 94551 USA, Lawrence Berkeley Natl Lab, Lawrence Berkeley Natl Lab, Environn Genom & Syst Biol Div, Berkeley, CA 94720 USA, Synthet Biol Res Ctr, Synthet Biol Res Ctr, Emeryville, CA 94608 USA, Lawrence Berkeley Natl Lab, Lawrence Berkeley Natl Lab, Mol Biophys & Integrated Bioimaging Div, Berkeley, CA 94720 USA, Univ Calif Berkeley, Univ Calif Berkeley, Inst QB3, Berkeley, CA 94720 USA, Univ Calif Berkeley, Univ Calif Berkeley, Dept Bioeng, Berkeley, CA 94720 USA, Lawrence Berkeley Natl Lab, Lawrence Berkeley Natl Lab, Biol Syst & Engn Div, Berkeley, CA 94720 USA, Univ Calif Berkeley, Univ Calif Berkeley, Dept Biomol & Chem Engn, Berkeley, CA 94720 USA, Tech Univ Denmark, Tech Univ Denmark, Novo Nordisk Fdn Ctr Biosustainabil, Kogle Alle, DK-2970 Horsholm, Denmark, Joint BioEnergy Inst, Joint BioEnergy Inst, Emeryville, CA 94608 USA, University of California, Joint Bioenergy Institute
Compressed Subsequence Matching and Packed Tree Coloring

We present a new algorithm for subsequence matching in grammar compressed strings. Given a grammar of size n compressing a string of size N and a pattern string of size m over an alphabet of size \(\sigma\), our algorithm uses \(O(n+\frac{n\sigma}{w})\) space and \(O(n+\frac{n\sigma}{w}+m\log N \cdot \text{occ})\) or \(O(n+\frac{n\sigma}{w}\log w+m\log N \cdot \text{occ})\) time. Here w is the word size and occ is the number of minimal occurrences of the pattern. Our algorithm uses less space than previous algorithms and is also faster for \(\text{occ}=o(\frac{n}{\log N})\) occurrences. The algorithm uses a new data structure that allows us to efficiently find the next occurrence of a given character after a given position in a compressed string. This data structure in turn is based on a new data structure for the tree color problem, where the node colors are packed in bit strings.

General information

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Algorithms and Logic
Authors: Bille, P. (Intern), Cording, P. H. (Intern), Gørtz, I. L. (Intern)
Pages: 336–348
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information

Journal: Algorithmica
Volume: 77
Issue number: 2
ISSN (Print): 0178-4617
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): SJR 0.685 SNIP 1.338 CiteScore 1.11
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 0.77 SNIP 1.354 CiteScore 1.15
Web of Science (2015): Indexed yes
Compression fatigue of Wind Turbine Blade composites materials and damage mechanisms

According to the new IEC 61400-5-rev0 recommendation, which is under preparation it will be required to qualify wind turbine blade (WTB) composite materials in fatigue at R=0.1, R=-1, and R=10. As a minimum fatigue at R=-1 is required. This is a consequence of the ever-growing blades, where gravity driven edgewise bending introduces significant fully reversed cycling at the leading and trailing edges. Therefore, material manufacturer and WTB manufacturer demand test results of highest reliability and reproducibility. However, these requirements for compression-compression and tension-compression fatigue properties are a big challenge for the test institutes to meet. Tests are very difficult to perform, as it is nearly impossible to design an optimal test setup. This study shows a newly developed sample geometry and test method in order to obtain representative and reliable results. Two different laminate architectures have been tested in order to validate the test method. Damage mechanisms and damage progression in compression fatigue have been investigated using 3D X-Ray Tomography and a qualitative explanation of the damage mechanisms is presented.

General information
State: Published
Organisations: Department of Wind Energy, Composites and Materials Mechanics
Authors: Fraisse, A. (Intern), Brøndsted, P. (Intern)
Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences
Electronic versions:
Compression_fatigue_of_Wind_Turbine_Blade_composites_materials_and_damage_mechanisms.pdf
Computational assessment of the DeepWind aerodynamic performance with different blade and airfoil configurations

An aerodynamic improvement of the DeepWind rotor is conducted adopting different rotor geometries and solutions with respect to the original configuration while keeping the comparison as fair as possible. The objective of this work is to find the most suitable configuration in order to maximize the power production and minimize the blade stress and the cost of energy. Different parameters are considered for the study. The DeepWind blade is characterized by a shape similar to the Troposkien geometry but asymmetric between the top and bottom parts. The blade shape is considered as a fixed parameter in the optimization process and, because of different blade element radii, it will experience different tip speed ratios in the same operational condition. This leads to a complex optimization problem, which must be carefully analyzed in order to find the most suitable parameter set. The number of blades in the analysis is varied from 1 to 4. In order to keep the comparison fair among the different configurations, the solidity is kept constant and, therefore, the chord length reduced. A second comparison is conducted by considering different blade profiles belonging to the symmetric NACA airfoil family. Finally, a chord optimization along the blade span is conducted, in order to find the optimal chord distribution to maximize the power production.

General information
State: Published
Organisations: Test and Measurements, Department of Wind Energy, Aeroelastic Design, University of Padua
Authors: Bedon, G. (Ekstern), Schmidt Paulsen, U. (Intern), Aagaard Madsen, H. (Intern), Belloni, F. (Ekstern), Raciti Castelli, M. (Ekstern), Benini, E. (Ekstern)
Number of pages: 9
Pages: 1100–1108
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Applied Energy
Volume: 185
Issue number: 2
ISSN (Print): 0306-2819
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 7.78 SJR 3.058 SNIP 2.573
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.912 SNIP 2.61 CiteScore 6.4
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 3.254 SNIP 3.28 CiteScore 6.93
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 3.164 SNIP 3.377 CiteScore 6.59
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.854 SNIP 3.108 CiteScore 5.69
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.473 SNIP 2.84 CiteScore 5.5
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.516 SNIP 2.25
Computational chemical product design problems under property uncertainties

Three different strategies of how to combine computational chemical product design with Monte Carlo based methods for uncertainty analysis of chemical properties are outlined. One method consists of a computer-aided molecular design (CAMD) solution and a post-processing property uncertainty propagation through the considered process. It is demonstrated for an industrial case study on identification of a suitable working fluid in a thermodynamic cycle for waste heat recovery. The results show that including property uncertainties gives an additional criterion for the fluid ranking in working fluid design. While the higher end of the uncertainty range of the process model output is similar for the best performing fluids, the lower end of the uncertainty range differs largely.

General information
State: Accepted/In press
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS
Authors: Frutiger, J. (Intern), Cignitti, S. (Intern), Abildskov, J. (Intern), Woodley, J. (Intern), Sin, G. (Intern)
Number of pages: 6
Publication date: 2017

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Title of host publication: Proceedings of the 27th European Symposium on Computer Aided Process Engineering (ESCAPE 27)
Volume: 40
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Editors: Espuña, A., Graells, M., Puigjaner, L.
Edition: 1
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Conference: 27th European Symposium on Computer Aided Process Engineering, Barcelona, Spain, 01/10/2017 - 01/10/2017
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Publication: Research - peer-review › Article in proceedings – Annual report year: 2017
Computational Fluid Dynamics - en genvej til procesindsigt
I artiklen gives der tre konkrete eksempler på, hvordan CFD kan bruges til at opnå procesindsigt på nuværende anlæg og på processer i udviklingsfasen.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, PROSYS - Process and Systems Engineering Centre, Novozymes A/S
Authors: Bach, C. (Intern), Spann, R. (Intern), Larsson, H. K. (Intern), Pereira Rosinha Grundtvig, I. (Intern), Albæk, M. O. (Ekstern), Gernaey, K. V. (Intern), Krühne, U. (Intern)
Pages: 14-17
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Dansk Kemi
Volume: 97
Issue number: 10
ISSN (Print): 0011-6335
Original language: Danish
Electronic versions:
Computational_Fluid_Dynamics_En_genvej_til_procesindsigt.pdf
Publication: Communication › Journal article – Annual report year: 2017

Computational High-throughput Screening for Solar Energy Materials

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Department of Physics, Atomic scale modelling and materials, Theoretical Atomic-scale Physics
Authors: Castelli, I. E. (Intern), Thygesen, K. S. (Intern), Jacobsen, K. W. (Intern)
Number of pages: 30
Publication date: 2017

Host publication information
Title of host publication: Theoretical Modeling of Organohalide Perovskites for Photovoltaic Applications
Publisher: CRC Press
ISBN (Print): 9781498750783
Main Research Area: Technical/natural sciences
Publication: Research › Book chapter – Annual report year: 2017

Computational Study of Nb-Doped-SnO$_2$/Pt Interfaces: Dopant Segregation, Electronic Transport, and Catalytic Properties
Carbon black, a state-of-the-art cathode material for proton exchange membrane fuel cells (PEMFCs), suffers from severe corrosion in practical applications. Niobium-doped tin dioxide (NTO) is a promising alternative to support the Pt catalysts at the cathodes. Here, through a combined density functional theory and non equilibrium Green's function study, we investigate the Nb segregation at Pt/NTO interfaces under operational electrochemical conditions, and reveal the resulting effects on the electronic transport, as well as the catalytic properties. We find that the Nb dopants tend to aggregate in the subsurface layers of the NTO substrate, whereas their transport across the Pt/NTO interface is hindered by a high thermodynamic barrier under the operating condition of PEMFCs. The interfacial transport of Sn is, however, more facile, indicating possible formations of Sn Pt alloys and tin oxides. The electronic conductivities of the Pt/NTO systems are not particularly sensitive to the distance of the Nb dopants relative to the interface, but depend explicitly on the Nb concentration and configuration. Through a dopant induced ligand effect, the NTO substrates can improve the catalytic activity of the Pt adsorbate toward the oxygen reduction reaction. We also investigate the co-doped SnO$_2$ substrates by both Nb and Sb elements, and find that a small amount of Nb dopants could further improve the electronic transport of the Pt/Sb-doped-SnO$_2$ interface. The fundamental understanding generated here will help shed light on future applications of Nb-doping and Nb-Sb co-doping in Pt/SnO$_2$ type cathodes for PEMFC applications.

General information
Computer simulations analysis for determining the polarity of charge generated by high energy electron irradiation of a thin film

Detailed simulations are necessary to correctly interpret the charge polarity of electron beam irradiated thin film patch. Relying on systematic simulations we provide guidelines and movies to interpret experimentally the polarity of the charged area, to be understood as the sign of the electrostatic potential developed under the beam with reference to a ground electrode. We discuss the two methods most frequently used to assess charge polarity: Fresnel imaging of the irradiated area and Thom rings analysis. We also briefly discuss parameter optimization for hole free phase plate (HFPP) imaging. Our results are particularly relevant to understanding contrast of hole-free phase plate imaging and Berriman effect.
Computer Vision for Additive Manufacturing.

Ever since the commercialization of additive manufacturing in the late 80’s, it has been clear what enormous potential the technology could have, potentially disrupting several industries. However, we have yet to see the technology fully adopted by the manufacturing industry. One of the issues that has prevented widespread adoption of 3D printing for use within manufacturing is the apparent lack of quality control during and after the printing process. This thesis demonstrates how computer vision may be applied in beneficial ways within additive manufacturing. The main contributions aim at solving part of the challenges required for the technology to reach its full envisioned potential, and to reach widespread industry adoption as a de-facto manufacturing modality. Quality control has been a major milestone to overcome in this regard. As a result, a core part of the contributions revolves around this central topic. The work is separated into three main categories: The first two concerning process and quality control of appearance and geometry. The third category concerns machine interaction paradigms within additive manufacturing. Here, challenges are addressed within the 3D ecosystem, aiming towards facilitating a fluid integration of additive manufacturing within the factory of tomorrow.
Computing interval-valued reliability measures: application of optimal control methods

The paper describes an approach to deriving interval-valued reliability measures given partial statistical information on the occurrence of failures. We apply methods of optimal control theory, in particular, Pontryagin's principle of maximum to solve the non-linear optimisation problem and derive the probabilistic interval-valued quantities of interest. It is proven that the optimisation problem can be translated into another problem statement that can be solved on the class of piecewise continuous probability density functions (pdfs). This class often consists of piecewise exponential pdfs which appear as soon as among the constraints there are bounds on a failure rate of a component under consideration. Finding the number of switching points of the piecewise continuous pdfs and their values becomes the focus of the approach described in the paper. Examples are provided.

General information
State: Published
Organisations: Department of Management Engineering, Engineering Systems, Ufa State Academy of Economics and Service
Authors: Kozin, I. (Intern), Krymsky, V. (Ekstern)
Number of pages: 14
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Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: International Journal of General Systems
Volume: 46
Issue number: 2
ISSN (Print): 0308-1079
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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.57 SJR 1.014 SNIP 1.415
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.835 SNIP 1.191 CiteScore 1.73
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.668 SNIP 1.34 CiteScore 1.53
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.484 SNIP 0.957 CiteScore 1.17
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.581 SNIP 1.209 CiteScore 0.93
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.481 SNIP 1.003 CiteScore 0.92
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.31 SNIP 0.932
Computational algorithm for lifetime exposure to antimicrobials in pigs using register data – the LEA algorithm

Accurate and detailed data on antimicrobial exposure in pig production are essential when studying the association between antimicrobial exposure and antimicrobial resistance. Due to difficulties in obtaining primary data on antimicrobial exposure in a large number of farms, there is a need for a robust and valid method to estimate the exposure using register data. An approach that estimates the antimicrobial exposure in every rearing period during the lifetime of a pig using register data was developed into a computational algorithm. In this approach data from national registers on antimicrobial purchases, movements of pigs and farm demographics registered at farm level are used. The algorithm traces batches of pigs retrospectively from slaughter to the farm(s) that housed the pigs during their finisher, weaner, and piglet period. Subsequently, the algorithm estimates the antimicrobial exposure as the number of Animal Defined Daily Doses for treatment of one kg pig in each of the rearing periods. Thus, the antimicrobial purchase data at farm level are translated into antimicrobial exposure estimates at batch level. A batch of pigs is defined here as pigs sent to slaughter at the same day from the same farm. In this study we present, validate, and optimise a computational algorithm that calculates the lifetime exposure of antimicrobials for slaughter pigs. The algorithm was evaluated by comparing the computed estimates to data on antimicrobial usage from farm records in 15 farm units. We found a good positive correlation between the two estimates. The algorithm was run for Danish slaughter pigs sent to slaughter in January to March 2015 from farms with more than 200 finishers to estimate the proportion of farms that it was applicable for. In the final process, the algorithm was successfully run for batches of pigs originating from 3,026 farms with finisher units (77% of the initial population). This number can be increased if more accurate register data can be obtained. The algorithm provides a systematic and repeatable approach to estimating the antimicrobial exposure throughout the rearing period, independent of rearing site for finisher batches, as a lifetime exposure measurement.

General information
State: Published
Organisations: National Veterinary Institute, Epidemiology, National Food Institute, Research Group for Genomic Epidemiology
Authors: Birkegård, A. C. (Intern), Dalhoff Andersen, V. (Intern), Hisham Beshara Halasa, T. (Intern), Jensen, V. F. (Intern), Toft, N. (Intern), Vigre, H. (Intern)
Pages: 173-180
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Preventive Veterinary Medicine
Volume: 146
ISSN (Print): 0167-5877
Concentration Impedance in Testing of Solid Oxide Cells Revisited

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Applied Electrochemistry, Mixed Conductors, Innovation Fund Denmark
Number of pages: 1
Publication date: 2017

Host publication information
Title of host publication: ECS Meeting Abstracts
Volume: MA2017-03
Publisher: Electrochemical Society, Incorporated
Article number: 271
Main Research Area: Technical/natural sciences
Conference: 15th International Symposium on Solid Oxide Fuel Cells (SOFC-XV), Hollywood, United States, 23/07/2017 - 23/07/2017
Links:
http://ma.ecsdl.org.proxy.findit.dtu.dk/content/MA2017-03/1/271
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Concentration Impedance in Testing of Solid Oxide Cells Revisited
The concentration impedance originating from diffusion and reactant conversion impedance of the Ni-YSZ supported fuel electrode in solid oxide cell has been treated many times during the latest couple of decades. In spite of this, the separation of the diffusion impedance from the conversion impedance is still not trivial. Therefore, combined theoretical and experimental methods available for breakdown of the concentration impedance are outlined and discussed.

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Applied Electrochemistry, Mixed Conductors
Pages: 2133-2139
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: ECS Transactions
Volume: 78
Issue number: 1
ISSN (Print): 1938-5862
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.4 SJR 0.231 SNIP 0.246
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.214 SNIP 0.257 CiteScore 0.36
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.214 SNIP 0.246 CiteScore 0.36
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.192 SNIP 0.237 CiteScore 0.27
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.24 SNIP 0.263 CiteScore 0.29
ISI indexed (2012): ISI indexed no
We here present the principles and main physics capabilities behind the design of the radial gamma ray spectrometers (RGRS) system for alpha particle and runaway electron measurements at ITER. The diagnostic benefits from recent advances in gamma-ray spectrometry for tokamak plasmas and combines space and high energy resolution in a single device. The RGRS system as designed can provide information on α particles on a time scale of 1/10 of the slowing down time for the ITER 500 MW full power DT scenario. Spectral observations of the 3.21 and 4.44 MeV peaks from the $^{9}$Be ($\alpha$, n$\gamma$) $^{12}$C reaction make the measurements sensitive to α particles at characteristic resonant energies and to possible anisotropies of their slowing down distribution function. An independent assessment of the neutron rate by gamma-ray emission is also feasible. In case of runaway electrons born in disruptions with a typical duration of 100ms, a time resolution of at least 10ms for runaway electron studies can be achieved depending on the scenario and down to a current of 40 kA by use of external gas injection. We find that the bremsstrahlung spectrum in the MeV range from confined runaways is sensitive to the electron velocity space up to $E \approx 30$–$40$ MeV, which allows for measurements of the energy distribution of the runaway electrons at ITER.
Conceptualization of residual contamination using depth discrete monitoring of dynamic PCE concentration changes during and after remedial pumping and pumping test

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, Office for Study Programmes and Student Affairs, Office for Innovation & Sector Services, Region Hovedstaden
Authors: Broholm, M. M. (Intern), Fjordbøge, A. S. (Intern), Mosthaf, K. (Intern), Binning, P. J. (Intern), Brauns, B. (Intern), Tsitseli, T. (Intern), Bjerg, P. L. (Intern), Kerrn-Jespersen, H. (Ekstern)
Pages: 92-92
Conceptualization of residual contamination using depth discrete monitoring of dynamic PCE concentration changes during and after remedial pumping and pumping test

General information
State: Published
Organisations: Department of Environmental Engineering, Water Resources Engineering, Office for Study Programmes and Student Affairs, Office for Innovation & Sector Services, Capital Region of Denmark
Authors: Broholm, M. M. (Intern), Fjordbøge, A. S. (Intern), Mosthaf, K. (Intern), Binning, P. J. (Intern), Brauns, B. (Intern), Tsitseli, T. (Intern), Bjerg, P. L. (Intern), Kerrn-Jespersen, H. (Ekstern)
Number of pages: 1
Publication date: 2017
Main Research Area: Technical/natural sciences
Electronic versions: C5_abstract_47_UpdAbs_Broholm.pdf
Source: PublicationPreSubmission
Source-ID: 133815030
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Condensed Tannins in the Gastrointestinal Tract of Cattle after Sainfoin (Onobrychis viciifolia) Intake and Their Possible Relationship with Anthelmintic Effects

Condensed tannins’ (CTs) fate along the digestive tract of ruminants may account for the variable efficacy of CTs against gastrointestinal nematodes. We analyzed CTs in the digesta of cattle fed sainfoin. With the acetone-butanol-HCl assay, the total CTs concentrations in the digesta were close to those in the diets (6.3 and 1.5% of DM in experiments 1 and 2, respectively); thus, CTs remained potentially largely undegraded/unabsorbed. With the thiolysis assay, CTs concentration was much higher in the abomasum (2.3% of DM; expt 1) compared with the rumen and intestines, along with higher mean size and prodelphinidins percentage, corroborating CTs efficacy reported only against Ostertagia ostertagi in the abomasum. In expt 2, the dietary levels of CTs were probably too low to demonstrate anthelmintic effects in the rumen. Overall, the level of CTs accessible to thiolysis is favored under the acidic conditions of the abomasum, which seems critical for anthelmintic activity.

General information
State: Published
Organisations: National Veterinary Institute, University of Copenhagen, University of Reading, Wageningen University & Research
Authors: Desrues, O. (Ekstern), Mueller-Harvey, I. (Ekstern), Pellikaan, W. F. (Ekstern), Enemark, H. (Intern), Thamsborg, S. M. (Ekstern)
Number of pages: 8
Pages: 1420-1427
Publication date: 2017
Main Research Area: Technical/natural sciences
Publication information
Journal: Journal of Agricultural and Food Chemistry
Volume: 65
Issue number: 7
ISSN (Print): 0021-8561
Ratings:
BFI (2017): BFI-level 2
proanthocyanidins, diet, helminth parasite, Ostertagia ostertagi, Cooperia oncophora, digesta, feces

DOIs:
10.1021/acs.jafc.6b05830
Source: FindIt
Source-ID: 2351498924
**Conditions for mould growth on typical interior surfaces**

Prediction of the risk for mould growth is an important parameter for the analysis and design of the hygrothermal performance of building constructions. However, in practice the mould growth does not always follow the predicted behavior described by the mould growth models. This is often explained by uncertainty in the real conditions of exposure. In this study, laboratory experiments were designed to determine mould growth at controlled transient climate compared to growth at constant climate. The experiment included three building materials with four different surface treatments. The samples were inoculated with 8 common indoor moulds. Even after 40 weeks no growth was observed on any sample. The paper describes different hypotheses for the missing growth, and how these have been tested.

**General information**

State: Accepted/In press
Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics, Department of Biotechnology and Biomedicine, Fungal Degradation, Aalborg University
Authors: Møller, E. B. (Ekstern), Andersen, B. (Intern), Rode, C. (Intern), Peuhkuri, R. (Ekstern)
Number of pages: 6
Publication date: 2017
Conference: 11th Nordic Symposium on Building Physics, Trondheim, Norway, 11/06/2017 - 11/06/2017
Main Research Area: Technical/natural sciences

**Publication Information**

Journal: Energy Procedia
ISSN (Print): 1876-6102
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.16 SJR 0.467 SNIP 0.586
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.365 SNIP 0.561 CiteScore 0.92
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.433 SNIP 0.81 CiteScore 1.09
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.425 SNIP 0.785 CiteScore 1.02
ISI indexed (2013): ISI indexed no
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 0.425 SNIP 0.563 CiteScore 1.08
ISI indexed (2012): ISI indexed no
Web of Science (2012): Indexed yes
Scopus rating (2011): SJR 0.918 SNIP 1.505 CiteScore 2.42
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.433 SNIP 0.957
Web of Science (2009): Indexed yes
Original language: English
Constant climate, Fungicides, Germination of spores, Mode of inoculation, Mould growth, transient climate, Nutrients, Water damage

**Congestion management of electric distribution networks through market based methods**

Rapidly increasing share of intermittent renewable energy production poses a great challenge of the management and operation of the modern power systems. Deployment of a large number of flexible demands, such as electrical vehicles (EVs) and heat pumps (HPs), is believed to be a promising solution for handling the challenge. Equipped with batteries and hot water storage systems, EVs and HPs are able to shift the consumption according to the production level of renewable energy. However, most of today’s distribution networks are not able to accommodate such large number of flexible demands if coordination is not exercised. Congestion can occur on distribution networks if the EVs and HPs consume power simultaneously. This thesis is dedicated to handle the congestion problems on distribution
networks when there is high penetration of distributed energy resources (DERs), including EVs and HPs. Market-based congestion management methods are the focus of the thesis. They handle the potential congestion at the energy planning stage; therefore, the aggregators can optimally plan the energy consumption and have the least impact on the customers. After reviewing and identifying the shortcomings of the existing methods, the thesis fully studies and improves the dynamic tariff (DT) method, and proposes two new market-based congestion management methods, namely the dynamic subsidy (DS) method and the flexible demand swap method. The thesis improves the DT method from four aspects. Firstly, the formulation of the DT method has been improved. Based on the locational marginal pricing (LMP) concept, the DT method has been proposed in several previous works for congestion management in a decentralized manner. However, linear programming models are not suitable for determining DT due to the multiple-response issue (one price set can have multiple flexible demand responses from aggregators). The thesis proposes a quadratic programming model for the DT method which can avoid the multiple-response issue and make the DT method an efficient decentralized congestion management method. Secondly, the combination of the DT method and direct control methods is studied and the feeder reconfiguration based DT method is proposed for more efficient congestion management and loss reduction on distribution networks. Thirdly, the stochastic nature of flexible demands is studied and a method for uncertainty management of the DT method is proposed. The probability of congestion events is controlled to be under a certain level through the modified DT method, where the behavior and parameters of the flexible demands have a given probability distribution. At last, a convex relaxation based AC optimal power flow (OPF) model is proposed for determining DT where voltage constraints are included. Moreover, a sufficient condition for exact convex relaxation is proposed and validated. The condition is that there is no reverse power flow, or only active or reactive reverse power flow on the distribution network. After the study of the DT method, the thesis proposes the DS method for day-ahead congestion management, which is conceptually opposite to the DT method; however, it doesn’t discriminate the customers. Finally, the thesis proposes the flexible demand swap method for real-time congestion management, which handles the residual congestion after the day-ahead market and the congestion caused by forecast errors and contingent events. As such, a series of market-based methods, including DT, DS and flexible demand swap, are formed systematically in this thesis for handling congestion more comprehensively and efficiently.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electric power systems
Authors: Huang, S. (Intern), Wu, Q. (Intern), Nielsen, A. H. (Intern)
Number of pages: 188
Publication date: 2017

Publication information
Publisher: Technical University of Denmark, Department of Electrical Engineering
Original language: English
Main Research Area: Technical/natural sciences
Electronic versions: congestion_management_of_distribution_networks_FINAL_v_1.7.pdf

Relations
Projects:
Congestion management of electric distribution networks through market based methods
Source: PublicationPreSubmission
Source-ID: 137366055
Publication: Research › Ph.D. thesis – Annual report year: 2017

Connecting single-stock assessment models through correlated survival
Fisheries management is mainly conducted via single-stock assessment models assuming that fish stocks do not interact, except through assumed natural mortalities. Currently, the main alternative is complex ecosystem models which require extensive data, are difficult to calibrate, and have long run times. We propose a simple alternative. In three case studies each with two stocks, we improve the single-stock models, as measured by Akaake information criterion, by adding correlation in the cohort survival. To limit the number of parameters, the correlations are parameterized through the corresponding partial correlations. We consider six models where the partial correlation matrix between stocks follows a band structure ranging from independent assessments to complex correlation structures. Further, a simulation study illustrates the importance of handling correlated data sufficiently by investigating the coverage of confidence intervals for estimated fishing mortality. The results presented will allow managers to evaluate stock statuses based on a more accurate evaluation of model output uncertainty. The methods are directly implementable for stocks with an analytical assessment and do not require any new data sources

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources
Authors: Albertsen, C. M. (Intern), Nielsen, A. (Intern), Thygesen, U. H. (Intern)
Connecting strategy and execution in global R&D

The paper investigates the relationship between global product development strategic decisions, which include outsourcing, offshoring practices as well as strategic alliances, and their impact on the day-to-day business in a global and open innovation context. By adopting an exploratory inductive research, founded on core literature in the area and using empirical data from four companies in different industries, the study intends to understand the interconnection between the shift toward a global R&D strategy, and the dependent changes at the operational and managerial level. The series of changes in the innovation network are strictly connected with the company’s source of competitive advantage, their internationalisation drivers, the internationalisation practices adopted, and the series of organisational capabilities needed.
to support the internationalization as well as externalization of innovation sources. Topics: Design organisation and management, Design to advance resource-limited societies, Design research applications and case studies, Design to embrace resource limitations

**General information**

State: Published
Organisations: Department of Management Engineering, Management Science, Operations Management
Authors: Sbernini, F. (Ekstern), Granini, N. (Ekstern), Herbert-Hansen, Z. N. L. (Intern)
Pages: 169-178
Publication date: 2017

**Host publication information**

Title of host publication: Proceedings of the 21st International Conference on Engineering Design (ICED 17) : Design Processes, Design Organisation and Management
Volume: 2
Publisher: Design Society
Editors: Maier, A., Škec, S., Kim, H., Kokkolaras, M., Oehmen, J., Fadel, G., Salustri, F., Van der Loos, M.
Main Research Area: Technical/natural sciences
Conference: ICED17: 21st International Conference on Engineering Design, Vancouver, Canada, 21/08/2017 - 21/08/2017
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

**Connectivity and Dispersal of Salmon Lice in a Tidal Energetic Island System: Faroe Islands**

**General information**

State: Published
Organisations: National Institute of Aquatic Resources, Centre for Ocean Life, Section for Marine Ecology and Oceanography, Aquaculture Research Station of the Faroes
Authors: Kragesteen, T. J. (Intern), Simonsen, K. (Ekstern), Visser, A. (Intern), Andersen, K. H. (Intern)
Publication date: 2017
Event: Abstract from Dansk Havforskmøde, Helsingør, Denmark.
Main Research Area: Technical/natural sciences
Publication: Research › Conference abstract for conference – Annual report year: 2017

**Consequences of eye fluke infection on anti-predator behaviours in invasive round gobies in Kalmar Sound**

Larvae of the eye fluke, Diplostomum, emerge from snails and infect fish by penetrating skin or gills, then move to the lens where they may impair the vision of the fish. For the fluke to reproduce, a bird must eat the infected fish, and it has been suggested that they therefore actively manipulate the fish’s behaviour to increase the risk of predation. We found that round gobies Neogobius melanostomus, a species that was recently introduced to the Kalmar Sound of the Baltic Sea, had an eye fluke prevalence of 90–100%. We investigated how the infection related to behavioural variation in round gobies. Our results showed that the more intense the parasite-induced cataract, the weaker the host’s response was to simulated avian attack. The eye flukes did not impair other potentially important anti-predator behaviours, such as shelter use, boldness and the preference for shade. Our results are in accordance with the suggestion that parasites induce changes in host behaviour that will facilitate transfer to their final host.

**General information**

State: Published
Organisations: Section for Marine Living Resources, Linnaeus University
Authors: Flink, H. (Ekstern), Behrens, J. W. (Intern), Svensson, P. A. (Ekstern)
Pages: 1653-1663
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Parasitology Research
Volume: 116
Issue number: 6
ISSN (Print): 0932-0113
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.882 SNIP 0.958 CiteScore 2.2
BFI (2015): BFI-level 1
Conservation physiology can inform threat assessment and recovery planning processes for threatened species

Conservation physiology has emerged as a discipline with many success stories. Yet, it is unclear how conservation physiology is currently integrated into the activities of bodies such as the IUCN and other agencies/organizations/bodies which undertake international, national, or regional species threat assessments and work with partners to develop recovery plans. Here we argue that conservation physiology has much to offer for the threat assessment process and outline the ways in which this can be operationalized. For instance, conservation physiology is effective at revealing causal relationships and mechanisms that explain observed patterns (e.g., population declines). Identifying the causes of population declines is a necessary precursor to reverse or mitigate such threats. Conservation physiology can also identify complex interactions and support modeling activities that consider emerging threats. When a population or species is deemed "threatened" and recovery plans are needed, physiology can be used to predict how organisms will respond to the conservation intervention and future threats. For example, if a recovery plan was focused on translocation, understanding how to safely translocate organisms would be necessary, as would ensuring that the recipient habitat provides the necessary environmental characteristics to meet the fundamental physiological needs/tolerances of that organism. Our hope is that this paper will clarify ways in which physiological data can play an important role in the conservation activities of bodies like the IUCN that are engaged in threat assessment and recovery of endangered organisms. Although we focus on activities at the international scale, these same concepts are relevant and applicable to national and regional bodies.
Considerations on the Construction of a Powder Bed Fusion Platform for Additive Manufacturing

As the demand for moulds and other tools becomes increasingly specific and complex, an additive manufacturing approach to production is making its way to the industry through laser based consolidation of metal powder particles by a method known as powder bed fusion. This paper concerns a variety of design choices facilitating the development of an experimental powder bed fusion machine tool, capable of manufacturing metal parts with strength matching that of conventional manufactured parts and a complexity surpassing that of subtractive processes. To understand the different mechanisms acting within such an experimental machine tool, a fully open and customizable rig is constructed. Emphasizing modularity in the rig, allows alternation of lasers, scanner systems, optical elements, powder deposition, layer height, temperature, atmosphere, and powder type. Through a custom-made software platform, control of the process is achieved, which extends into a graphical user interface, easing adjustment of process parameters and the job file generation.

General information
State: Published
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Department of Micro- and Nanotechnology
Authors: Andersen, S. A. (Intern), Nielsen, K. (Intern), Pedersen, D. B. (Intern), Nielsen, J. S. (Intern)
Pages: 3-10
Publication date: 2017
Conference: Nordic Laser Materials Processing Conference (NOLAMP16), Aalborg, Denmark, 22/08/2017 - 22/08/2017
Main Research Area: Technical/natural sciences
Considering built environment and spatial correlation in modelling pedestrian injury severity

This study looks at mitigating and aggravating factors that are associated with the injury severity of pedestrians when they have crashes with another road user and overcomes existing limitations in the literature by posing attention on the built environment and considering spatial correlation across crashes. Reports for 6539 pedestrian crashes occurred in Denmark between 2006 and 2015 were merged with geographic information system resources containing detailed information about built environment and exposure at the crash locations. A linearised spatial logit model estimated the probability of pedestrians to sustain a severe or fatal injury conditional on the occurrence of a crash with another road user. This study confirms previous findings about older pedestrians and intoxicated pedestrians being the most vulnerable road users, and crashes with heavy vehicles and in roads with higher speed limits being related to the most severe outcomes. This study provides also novel perspectives by showing positive spatial correlation of crashes with the same severity outcome and emphasising the role of the built environment in the proximity of the crash. This study emphasises the need for thinking about traffic calming measures, illumination solutions, road maintenance programs and speed limit reductions. Moreover, this study emphasises the role of the built environment, as shopping areas, residential areas, and walking traffic density are positively related to a reduction in pedestrian injury severity. Often, these areas have in common a larger pedestrian mass that is more likely to make other road users more aware and attentive, while the same does not seem to apply to areas with lower pedestrian density.

General information
State: Accepted/In press
Organisations: Department of Management Engineering, Transport DTU, Transport Modelling, University of Queensland, Technical University of Denmark
Authors: Prato, C. G. (Ekstern), Kaplan, S. (Intern), Patrier, A. (Ekstern), Rasmussen, T. K. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
General information
State: Submitted
Organisations: Department of Management Engineering, Management Science, Operations Management, Operations Research, Transport DTU
Authors: Kidd, M. P. (Intern), Lusby, R. M. (Intern), Larsen, J. (Intern)
Number of pages: 22
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Transportation Research. Part B: Methodological
ISSN (Print): 0191-2615
Ratings:

Considering passenger and operator inconvenience in the scheduling of large railway projects
The continued development and renewal of railway infrastructure and technology is necessary to enable railway operators to provide high quality services subject to ever increasing demand. However, the execution of large infrastructure projects causes disturbances in the network due to the occupation of infrastructure over extended periods of time. In this paper we propose a multiobjective project scheduling optimization model for railway infrastructure projects that takes inconvenience caused to users of the infrastructure into account. We illustrate how the model can be used in an interactive way by planners based on their preferences, and we show that Pareto optimal solutions can be found in reasonable time using instances with realistic features. The result is a decision support model to aid infrastructure project planners in ensuring that passenger and operator inconvenience are also taken into account.
Consistent cost curves for identification of optimal energy savings across industry and residential sectors

Energy savings are a key element in reaching ambitious climate targets and may contribute to increased productivity as well. For identification of the most attractive saving options cost curves for savings are constructed illustrating potentials of savings with associated costs. In optimisation modelling these cost options are then compared with the cost of producing energy and all savings with negative costs and cost below the cost of producing the energy including the associated externality costs are expected to be implemented. There are however several methodological issues associated with constructing and applying the cost curves in modelling: • Cost curves do not have the same cost interpretation across economic subsectors and end-use technologies (investment cost for equipment varies – including/excluding installation – adaptation costs – indirect production costs) • The time issue of when the costs are incurred and savings (difference in
discount rates both private and social) • The issue of marginal investment in a case of replacement anyway or a full investment in the energy saving technology • Implementation costs (and probability of investment) differs across sectors • Cost saving options are not additive - meaning that marginal energy savings from one option depends on what other options implemented We address the importance of these issues and illustrate with Danish cases how large the difference in savings cost curves can be if different methodologies are used. For example, the difference between marginal investment costs in residential heating of a more efficient building element (windows) in a larger renovation project compared to the costs of just replacing the windows. This is done based on some of the results from Zvingilaite & Klinge Jacobsen 2016. We compare to the results found for residential savings in Giraudet et. al. 2012 and Amstalden et. al. 2007. For our case the resulting savings potential below a given level of costs can be up to a factor of 5 times larger if only the marginal cost measure is used. For national energy plan strategies this results in much more emphasis on energy savings, than renewable energy expansion as a way to achieve fossil fuel reductions if it is possible to implement all heating savings with their marginal costs. As saving potentials are not additive for savings in a specific end-use entity it is difficult to compare savings in one sector comprising many options together and single options in another sector. We illustrate that a saving option in one sector (eg a more efficient pump) would be difficult to compare with the savings from replacing an entire production line in a factory with a more efficient one. If the average cost of the two are compared then probably the efficient pump would be preferred due to low costs compared to the full production line. This would leave out the elements of the production line where independent savings investments might have cost that are just as low as for the pump. We argue that comparing across sectors should be carried out with similar sets of savings options (small individual replacements in each sector, and comparable larger technology switches in each sector).

General information
State: Published
Organisations: Department of Management Engineering, Systems Analysis
Authors: Klinge Jacobsen, H. (Intern), Baldini, M. (Intern)
Publication date: 2017
Main Research Area: Technical/natural sciences
Electronic versions:
IAEE_Singapore_2017_Extended_Abstract_Cost_curves_for_energy_savings.pdf
Links:
Source: PublicationPreSubmission
Source-ID: 133357295
Publication: Research - peer-review › Conference abstract for conference – Annual report year: 2017

Constant interchain pressure effect in extensional flows of oligomer diluted polystyrene and poly(methyl methacrylate) melts
The constant ‘interchain pressure’ idea has been addressed, to evaluate if it is an adequate quantitative assumption to describe the fluid mechanics of oligomer diluted entangled NMMD polymer systems. The molecular stress function constitutive framework has been used with the constant interchain pressure assumption. Furthermore, the maximal extensibility based on the number of Kuhn steps in an entanglement has been used based on the relative Padé inverse Langevin function. The model predictions agree with the extensional measurements on all previously published poly(methyl methacrylate)s and almost all published oligomer diluted NMMD polystyrenes. The only deviation is on the most diluted and largest molecular weight case of an 18% 1880 kg/mol polystyrene in oligomer diluent. In this case, the maximal extensibility is not needed.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, The Danish Polymer Centre, Technical University of Denmark
Authors: Rasmussen, H. K. (Ekstern), Huang, Q. (Intern)
Number of pages: 8
Pages: 27–34
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Rheologica Acta
Volume: 56
Issue number: 1
ISSN (Print): 0035-4511
Ratings:
BFI (2017): BFI-level 2
Construction of Lightweight Loudspeaker Enclosures

On the basis of bass cabinets, this paper deals with the problem of reducing loudspeaker enclosure weight. An introductory market analysis emphasizes that lighter cabinets are sought, but maintenance of sound quality is vital. The problem is challenged through experiments and simulations in COMSOL Multiphysics, which indicate that weight reduction and sound quality maintenance is possible by reducing wall thickness and using adequate bracing and lining.

The proliferation of increasingly energy-efficient (EE) appliances is a key strategy to address the impacts of rising residential electricity demand (Danish Energy Agency 2017). To this end, governments and institutions are interested in understanding the drivers of consumer choice between conventional and environmentally friendly alternatives when purchasing new household electric appliances. This study employs empirical data from a survey conducted by the Danish Energy Agency to model the decision criteria behind Danish consumer investment in energy-efficient labeled appliances. The analysis uses logistic regression over a set of socioeconomic, demographic, and behavioral variables to predict purchase propensities. The findings are relevant for policy makers interested in targeting consumers in the appliance market, particularly for a relatively wealthy national context. The study concludes by integrating the predicted propensities with an energy-systems model to assess the nation-wide impact of efficient appliances' uptake in terms of electricity, emissions and economic savings.

Contact activity and dynamics of the social core

Humans interact through numerous communication channels to build and maintain social connections: they meet face-to-face, make phone calls or send text messages, and interact via social media. Although it is known that the network of physical contacts, for example, is distinct from the network arising from communication events via phone calls and instant messages, the extent to which these networks differ is not clear. We show here that the network structure of these channels show large structural variations. The various channels account for diverse relationships between pairs of individuals and the corresponding interaction patterns across channels differ to an extent that social ties cannot easily be reduced to a single layer. Each network of interactions, however, contains both central and peripheral individuals: central members are characterized by higher connectivity and can reach a large fraction of the network within a low number of steps, in contrast to the nodes on the periphery. The origin and purpose of each communication network also determine the role of their respective central members: highly connected individuals in the person-to-person networks interact with their environment in a regular manner, while members central in the social communication networks display irregular behavior with respect to their physical contacts and are more active through irregular social events. Our results suggest that due to the inherently different functions of communication channels, each one favors different social behaviors and different strategies for interacting with the environment. These findings can facilitate the understanding of the varying roles...
and impact individuals have on the population, which can further shed light on the prediction and prevention of epidemic outbreaks, or information propagation.

**General information**
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Cognitive Systems, Copenhagen Center for Health Technology, Massachusetts Institute of Technology
Authors: Mones, E. (Intern), Stopczynski, A. (Ekstern), Jørgensen, S. L. (Intern)
Number of pages: 16
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Epj Data Science
Volume: 6
Issue number: 1
ISSN (Print): 2193-1127
Ratings:
Web of Science (2017): Indexed yes
Scopus rating (2016): SJR 0.879 SNIP 1.16 CiteScore 3.05
Scopus rating (2015): SJR 0.943 SNIP 1.453 CiteScore 3.51
Scopus rating (2014): SJR 1.378 SNIP 2.789
Scopus rating (2013): SJR 1.167 SNIP 1.687
Original language: English
Social networks, Online behavior, Contact patterns, Physical proximity
DOIs:
10.1140/epjds/s13688-017-0103-y
Source: FindIt
Source-ID: 2370882955
Publication: Research - peer-review » Journal article – Annual report year: 2017

**Container shipping service selection and cargo routing with transshipment limits**
We address the tactical planning problem faced by container liner shipping companies to select a set of sailing services from a given pool of candidate services and route available cargo over the chosen services so as to maximize profit. One of the distinctive features of our model is that it incorporates limits on the number of transshipments for each container, a common service requirement in practice. These limits can vary by shipment attributes such as origin and destination, and cargo priority. We propose a new stage-indexed multi-commodity flow model that is based on an augmented network containing links (representing sub-paths) between every pair of ports visited by a candidate service. This sub-path structure, together with our approach of indexing the flow variables by transportation stage, enables the model to accurately capture transshipment costs and enforce transshipment limits. To reduce the computational time to solve this problem, we develop preprocessing steps that exploit network structure to eliminate variables, describe valid inequalities to strengthen the model's linear programming relaxation, and propose an optimization-based heuristic algorithm to generate good initial solutions. We report successful computational results for realistic problem instances from a benchmark suite of liner shipping problems, solved using a standard solver applied to our reduced and strengthened model.

**General information**
State: Published
Organisations: Department of Management Engineering, University of Texas
Authors: Balakrishnan, A. (Ekstern), Karsten, C. V. (Intern)
Pages: 652-663
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
Journal: European Journal of Operational Research
Volume: 263
ISSN (Print): 0377-2217
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.83 SJR 2.505 SNIP 2.339
Contaminant mass discharge to streams: Comparing direct groundwater velocity measurements and multi-level groundwater sampling with an in-stream approach

General information
State: Accepted/In press
Organisations: Department of Environmental Engineering, Water Resources Engineering, University of Kansas
Contamination of the Arctic reflected in microbial metagenomes from the Greenland Ice sheet: Letter

Globally emitted contaminants accumulate in the Arctic and are stored in the frozen environments of the cryosphere. Climate change influences the release of these contaminants through elevated melt rates, resulting in increased contamination locally. Our understanding of how biological processes interact with contamination in the Arctic is limited. Through shotgun metagenomic data and binned genomes from metagenomes we show that microbial communities, sampled from multiple surface ice locations on the Greenland ice sheet, have the potential for resistance to and degradation of contaminants. The microbial potential to degrade anthropogenic contaminants, such as toxic and persistent polychlorinated biphenyls, was found to be spatially variable and not limited to regions close to human activities. Binned genomes showed close resemblance to microorganisms isolated from contaminated habitats. These results indicate that, from a microbiological perspective, the Greenland ice sheet cannot be seen as a pristine environment.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Department of Bio and Health Informatics, Department of Biotechnology and Biomedicine, Metagenomics, DTU Multi Assay Core, Geological Survey of Denmark and Greenland, Chr. Hansen A/S, Clinical-Microbiomics ApS, Charles University
Authors: Hauptmann, A. Z. E. L. (Intern), Sicheritz-Pontén, T. (Intern), Cameron, K. A. (Ekstern), Bælum, J. (Ekstern), Plichta, D. R. (Ekstern), Dalgaard, M. D. (Intern), Stibal, M. (Ekstern)
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Web of Science (2014): Indexed yes
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ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.1 SNIP 1.583 CiteScore 3.65
ISI indexed (2012): ISI indexed yes
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BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.907 SNIP 1.511 CiteScore 3.51
ISI indexed (2011): ISI indexed yes
Continuous Strip Reduction Test Simulating Tribological Conditions in Ironing

Laboratory testing of tribo-systems for sheet metal forming applications must ensure similar conditions with the tribo-parameters that are commonly utilized in real production in order to generate data that is meaningful for industry. The main parameters to consider are the tool and workpiece materials, surface roughnesses, normal pressure, sliding length, sliding speed, interface temperature and lubrication. This paper proposes a new Strip Reduction Test (SRT) for industrial ironing processes that is capable of replicating the highly severe tribological conditions that are experienced during both the forward stroke and the backward retraction of the punch. The new SRT tool design is implemented in a new Universal Sheet Tribo-Tester (UST), which can run multiple tests continuously from a coil. The test is capable of simulating various process parameters such as reduction, drawing speed, tool temperature, sliding length and quantifying the onset of breakdown of the lubricant film and subsequent galling after several strokes not only when emulating the forward strokes but also the backward strokes. Preliminary tests disclose promising results as regards the identification of lubricant film breakdown by detecting changes in measured force, surface roughness and/or torque values.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Manufacturing Engineering, Technical University of Lisbon
Authors: Üstünyagiz, E. (Intern), Nielsen, C. V. (Intern), Christiansen, P. (Intern), Martins, P. A. (Ekstern), Bay, N. O. (Intern)
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ISSN (Print): 1877-7058
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Scopus rating (2016): CiteScore 0.74
Scopus rating (2015): CiteScore 0.56
Scopus rating (2014): CiteScore 0.53
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ISI indexed (2013): ISI indexed no
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ISI indexed (2012): ISI indexed no
Scopus rating (2011): CiteScore 0.45
ISI indexed (2011): ISI indexed no
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Simulative test, Sheet metal forming, Ironing, Tribology
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Continuous versus pulsating flow boiling. Experimental comparison, visualization, and statistical analysis
This experimental study investigates an active method for flow boiling heat transfer enhancement by means of fluid flow pulsation. The hypothesis is that pulsations increase the flow boiling heat transfer by means of better bulk fluid mixing, increased wall wetting, and flow-regime destabilization. The fluid pulsations are introduced by a flow modulating expansion device and are compared with continuous flow by a stepper-motor expansion valve in terms of time-averaged heat transfer coefficient. The cycle time ranges from 1 to 9 s for the pulsations. The time-averaged heat transfer coefficients are reduced from transient measurements immediately downstream of the expansion valves at low vapor qualities. The results show that the pulsations improve the time-averaged heat transfer coefficient by 3.2% on average at low cycle time (1 to 2 s), whereas the pulsations may reduce the time-averaged heat transfer coefficient by as much as 8% at high heat flux (q 35 kW/m²) and cycle time (8 s). The latter reduction is attributed to a significant dry-out that occurs when the flow modulating expansion valve is closed. Additionally, the effect of fluid flow pulsations is found to be statistically significant, disregarding the lowest heat flux measurements.

General information
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Organisations: Department of Mechanical Engineering, Thermal Energy, Fluid Mechanics, Coastal and Maritime Engineering, Royal Institute of Technology, Danfoss Drives A/S
Authors: Kærn, M. R. (Intern), Elmegaard, B. (Intern), Meyer, K. E. (Intern), Palm, B. (Ekstern), Holst, J. (Ekstern)
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Main Research Area: Technical/natural sciences

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BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.01
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.514 SNIP 0.731
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.561 SNIP 0.891
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.544 SNIP 1.104
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.498 SNIP 0.742
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.93 SNIP 0.956
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.614 SNIP 1.187
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.791 SNIP 0.903
Web of Science (2008): Indexed yes
Contrasting Coping Styles Meet the Wall: A Dopamine Driven Dichotomy in Behavior and Cognition

Individual variation in the ability to modify previously learned behavior is an important dimension of trait correlations referred to as coping styles, behavioral syndromes or personality. These trait clusters have been shaped by natural selection, and underlying control mechanisms are often conserved throughout vertebrate evolution. In teleost fishes, behavioral flexibility and coping style have been studied in the high (HR) and low-responsive (LR) rainbow trout lines. Generally, proactive LR trout show a behavior guided by previously learned routines, while HR trout show a more flexible behavior relying on environmental cues. In mammals, routine dependent vs. flexible behavior has been connected to variation in limbic dopamine (DA) signaling. Here, we studied the link between limbic DA signaling and individual variation in flexibility in teleost fishes by a reversal learning approach. HR/LR trout were challenged by blocking a learned escape route, previously available during interaction with a large and aggressive conspecific. LR trout performed a higher number of failed escape attempts against the transparent blockage, while HR trout were more able to inhibit the now futile escape impulse. Regionally discrete changes in DA neurochemistry were observed in micro dissected limbic areas of the telencephalon. Most notably, DA utilization in the dorsomedial telencephalon (DM, a suggested amygdala equivalent) remained stable in HR trout in response to reversal learning under acute stress, while increasing from an initially lower level in LR trout. In summary, these results support the view that limbic homologs control individual differences in behavioral flexibility even in non-mammalian vertebrates.

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Organisations: National Institute of Aquatic Resources, Section for Aquaculture, Norwegian Institute for Water Research, University of Algarve, Uni Research AS, Norwegian University of Life Sciences
Authors: Höglund, E. (Ekstern), Silva, P. I. D. M. E. (Intern), Vindas, M. A. (Ekstern), Øverli, Ø. (Ekstern)
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Scopus rating (2016): CiteScore 3.85 SJR 1.88 SNIP 1.087
Scopus rating (2015): SJR 2.022 SNIP 1.093 CiteScore 3.72
Scopus rating (2014): SJR 2.04 SNIP 1.097 CiteScore 3.84
Scopus rating (2013): SJR 2.068 SNIP 1.089 CiteScore 3.61
Scopus rating (2012): SJR 1.718 SNIP 1.004 CiteScore 3.25
Contrasting physiological responses to future ocean acidification among Arctic copepod populations

Widespread ocean acidification (OA) is modifying the chemistry of the global ocean, and the Arctic is recognised as the region where the changes will progress at the fastest rate. Moreover, Arctic species show lower capacity for cellular homeostasis and acid-base regulation rendering them particularly vulnerable to OA. In the present study, we found physiological differences in OA response across geographically separated populations of the keystone Arctic copepod *Calanus glacialis*. In copepodite stage CIV, measured reaction norms of ingestion rate and metabolic rate showed severe reductions in ingestion and increased metabolic expenses in two populations from Svalbard (Kongsfjord and Billefjord) whereas no effects were observed in a population from the Disko Bay, West Greenland. At pH 7.87, which has been predicted for the Svalbard west coast by year 2100, these changes resulted in reductions in scope for growth of 19% in the Kongsfjord and a staggering 50% in the Billefjord. Interestingly, these effects were not observed in stage CV copepodites from any of the three locations. It seems that CVs may be more tolerant to OA perhaps due to a general physiological reorganisation to meet low intracellular pH during hibernation. Needless to say, the observed changes in the CIV stage will have serious implications for the *C. glacialis* population health status and growth around Svalbard. However, OA tolerant populations such as the one in the Disko Bay could help to alleviate severe effects in *C. glacialis* as a species. This article is protected by copyright. All rights reserved.

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Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, Aarhus University, Norwegian Polar Institute, University of Gothenburg, Université de Québec à Rimouski, The University Centre in Svalbard, University of Florence, UI T The Arctic University of Norway, Norwegian Institute for Water Research, East China Normal University
Authors: Thor, P. (Ekstern), Bailey, A. (Ekstern), Dupont, S. (Ekstern), Calosi, P. (Ekstern), Søreide, J. E. (Ekstern), De Wit, P. (Ekstern), Guscelli, E. (Ekstern), Loubet-Sartrou, L. (Ekstern), Deichmann, I. M. (Ekstern), Candee, M. M. (Intern), Svensen, C. (Ekstern), King, A. L. (Ekstern), Bellerby, R. G. J. (Ekstern)
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BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 8.75 SJR 4.768 SNIP 2.615
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 5.239 SNIP 2.585 CiteScore 8.48
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 4.636 SNIP 2.693 CiteScore 8.33
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 4.624 SNIP 2.655 CiteScore 8.4
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Contrasting responses in the niches of two coral reef herbivores along a gradient of habitat disturbance in the Spermonde Archipelago, Indonesia

General information
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Organisations: National Institute of Aquatic Resources, Centre for Ocean Life
Authors: Plass-Johnson, J. G. (Intern), Bednarz, V. N. (Ekstern), Hill, J. M. (Ekstern), Jompa, J. (Ekstern), Ferse, S. C. A. (Ekstern), Teichberg, M. C. (Ekstern)
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Frontiers in Marine Science
Ratings:
BFI (2017): BFI-level 1
BFI (2016): BFI-level 1
Copy number variants (CNVs) have been strongly implicated in the genetic etiology of schizophrenia (SCZ). However, genome-wide investigation of the contribution of CNV to risk has been hampered by limited sample sizes. We sought to address this obstacle by applying a centralized analysis pipeline to a SCZ cohort of 21,094 cases and 20,227 controls. A genome-wide investigation of the contribution of CNV to risk has been hampered by limited sample sizes. We sought to address this obstacle by applying a centralized analysis pipeline to a SCZ cohort of 21,094 cases and 20,227 controls. A global enrichment of CNV burden was observed in cases (odds ratio (OR) = 1.11, P = 5.7 × 10^-15), which persisted after excluding loci implicated in previous studies (OR = 1.07, P = 1.7 × 10^-6). CNV burden was enriched for genes associated with synaptic function (OR = 1.68, P = 2.8 × 10^-11) and neurobehavioral phenotypes in mouse (OR = 1.18, P = 7.3 × 10^-5). Genome-wide significant evidence was observed for eight loci, including 1q21.1, 2p16.3 (NRXN1), 3q29, 7q11.2, 15q13.3, distal 16p11.2, proximal 16p11.2 and 22q11.2. Suggestive support was found for eight additional candidate susceptibility and protective loci, which consisted predominantly of CNVs mediated by nonallelic homologous recombination.

## General information

**State:** Published

**Organisations:** Department of Civil Engineering, Center for Bachelor of Engineering Studies, Afdelingen for Byggeri og Infrastruktur, Department of Biotechnology and Biomedicine, Aarhus University, University of Copenhagen

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Contribution of organic farming to public goods in Denmark

The potential contribution of organic farming to the public goods, ‘Nature and Biodiversity’, ‘Environment’, ‘Energy and Climate’, ‘Human Health and Welfare’ and ‘Animal Health and Welfare’ in Denmark is guided and partly secured by the principles and specific requirements of the EU Organic Regulation. However, other factors, such as the production type, farm size, geographical location and not the least the management of the farm, also influence the contribution. Using the ban on synthetic pesticides and restricted use of antibiotics, including the requirements to compensate for and prevent such uses in organic farming, as examples, the positive and negative contributions of organic farming in relation to selected public goods were analysed. The contributions of organic farming to Nature and Biodiversity and Human and Animal Health and Welfare are mainly positive compared to conventional farming for all farm types, whilst the effects on Environment and Energy and Climate are mixed; i.e. some effects are positive and others are negative. The analysis revealed a need for further documentation and revision of the organic principles and specific organic requirements in particular in relation to the public goods Energy and Climate, which at present are not addressed in the EU Organic Regulation. Moreover, some organic farming requirements and practices cause dilemmas; e.g. more space per animal and outdoor access improves Animal Health and Welfare but at the same time has negative effects on Environment, Energy Consumption and Climate Change. These dilemmas should be solved before OA may be fully attractive as an integrated policy measure supporting jointly several public goods objectives.
Contributions of Local Farming to Urban Sustainability in the Northeast United States

Food consumption is an important contributor to a city’s environmental impacts (carbon emissions, land occupation, water use, etc.) Urban farming (UF) has been advocated as a means to increase urban sustainability by reducing food-related transport and tapping into local resources. Taking Boston as an illustrative Northeast U.S. city, we developed a novel method to estimate sub-urban, food-borne carbon and land footprints using multiregion input-output modeling and nutritional surveys. Computer simulations utilizing primary data explored UF’s ability to reduce these footprints using select farming technologies, building on previous city-scale UF assessments which have hitherto been dependent on proxy data for UF. We found that UF generated meagre food-related carbon footprint reductions (1.1−2.9% of baseline 2211 kg CO2 equivalents/capita/annum) and land occupation increases (<1% of baseline 9000 m2 land occupation/capita/annum) under optimal production scenarios, informing future evidence-based urban design and policy crafting in the region.

Notwithstanding UF’s marginal environmental gains, UF could help Boston meet national nutritional guidelines for vegetable intake, generate an estimated $160 million U.S. in revenue to growers and act as a pedagogical and community building tool, though these benefits would hinge on large-scale UF proliferation, likely undergirded by environmental remediation of marginal lands in the city.

General information
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Organisations: Quantitative Sustainability Assessment, Department of Management Engineering, Massachusetts Institute of Technology
Authors: Goldstein, B. P. (Intern), Hauschild, M. Z. (Intern), Fernandez, J. E. (Ekstern), Birkved, M. (Intern)
Number of pages: 10
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.584 SNIP 1.828 CiteScore 5.61
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.777 SNIP 2.017 CiteScore 5.5
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.956 SNIP 2.103 CiteScore 5.52
ISI indexed (2013): ISI indexed yes
Controllability and stability of primary frequency control from thermostatic loads with delays

There is an increasing interest in exploiting the flexibility of loads to provide ancillary services to the grid. In this paper we study how response delays and lockout constraints affect the controllability of an aggregation of refrigerators offering primary frequency control (PFC). First we examine the effect of delays in PFC provision from an aggregation of refrigerators, using a two-area power system. We propose a framework to systematically address frequency measurement and response delays and we determine safe values for the total delays via simulations. We introduce a controllability index to evaluate PFC provision under lockout constraints of refrigerators compressors. We conduct extensive simulations to study the effects of measurement delay, ramping times, lockout durations and rotational inertia on the controllability of the aggregation and system stability. Finally, we discuss solutions for offering reliable PFC provision from thermostatically controlled loads under lockout constraints and we propose a supervisory control to enhance the robustness of their controllers.

General information
State: Published
Controllable generation and manipulation of micro-bubbles in water with absorptive colloid particles by CW laser radiation

Micrometer-sized vapor-gas bubbles are formed due to local heating of a water suspension containing absorptive pigment particles of 100 nm diameter. The heating is performed by CW near-infrared (980 nm) laser radiation with controllable power, focused into a 100 μm spot within a 2 mm suspension layer. By changing the laser power, four regimes are realized: (1) bubble generation; (2) stable growth of the existing bubbles; (3) stationary existence of the bubbles and (4) the bubbles' shrinkage and collapse. This behavior is interpreted based on the temperature conditions. The generation and evolution of single bubbles and ensembles of bubbles with controllable sizes and numbers is demonstrated. The bubbles are grouped within the laser-illuminated region and form quasi-ordered structures. They can easily be moved and transported controlled by the focal spot. The results are useful for applications associated with the precise manipulation, sorting and specific delivery in nano- and micro-engineering problems. (C) 2017 Optical Society of America
Controlling Citrate Synthase Expression by CRISPR/Cas9 Genome Editing for n-Butanol Production in Escherichia coli

Genome editing using CRISPR/Cas9 was successfully demonstrated in Escherichia coli to effectively produce n-butanol in a defined medium under microaerobic condition. The butanol synthetic pathway genes including those encoding oxygen-tolerant alcohol dehydrogenase were overexpressed in metabolically engineered E. coli, resulting in 0.82 g/L butanol production. To increase butanol production, carbon flux from acetyl-CoA to citric acid cycle should be redirected to acetoacetyl-CoA. For this purpose, the 5'-untranslated region sequence of gltA encoding citrate synthase was designed using an expression prediction program, UTR designer, and modified using the CRISPR/Cas9 genome editing method to reduce its expression level. E. coli strains with decreased citrate synthase expression produced more butanol and the citrate synthase activity was correlated with butanol production. These results demonstrate that redistributing carbon flux using genome editing is an efficient engineering tool for metabolite overproduction.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Bacterial Synthetic Biology, Korea University
Authors: Heo, M. (Ekstern), Jung, H. (Ekstern), Um, J. (Ekstern), Lee, S. (Intern), Oh, M. (Ekstern)
Pages: 182–189
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: A C S Synthetic Biology
Volume: 6
Issue number: 2
ISSN (Print): 2161-5063
Ratings:
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 4.7 SJR 2.736 SNIP 1.024
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 2.269 SNIP 1.049 CiteScore 4.41
Web of Science (2015): Indexed yes
Scopus rating (2014): SJR 3.783 SNIP 1.219 CiteScore 3.84
Web of Science (2014): Indexed yes
Scopus rating (2013): SJR 1.796 SNIP 0.859 CiteScore 3.42
ISI indexed (2013): ISI indexed yes
ISI indexed (2012): ISI indexed no
Original language: English
5'-untranslated region, CRISPR/Cas9, Escherichia coli, genome editing, n-butanol
DOIs:
10.1021/acssynbio.6b00134
Source: PublicationPreSubmission
Source-ID: 132942315
Publication: Research - peer-review → Journal article – Annual report year: 2017

Controlling sewer systems – a critical review based on systems in three EU cities

The term Real Time Control (RTC) is widely used to describe all types of control systems in sewer systems. Today the term covers everything from the simplest to the most advanced types of control systems, making it difficult to communicate about sewer system control in a precise manner, as well as search and find specific types of control systems for comparison. Through a survey of implemented control systems in three EU cities today and with the perspectives of current research within the field of sewer system control, the needs for a new control system design framework is identified. With the basis of existing frameworks for control system design, a new time-scale dependent framework is proposed. We believe this comprehensive time-scale dependent framework can help water utilities to retrofit and design new control solutions and facilitate knowledge sharing about existing designs.

General information
State: Published
Controlling the Carrier Density of SrTiO₃-Based Heterostructures with Annealing

The conducting interface between the insulating oxides LaAlO₃ (LAO) and SrTiO₃ (STO) displays numerous physical phenomena that can be tuned by varying the carrier density, which is generally achieved by electrostatic gating or adjustment of growth parameters. Here, it is reported how annealing in oxygen at low temperatures (T < 300 °C) can be used as a simple route to control the carrier density by several orders of magnitude. The pathway to control the carrier density relies on donor oxidation and is thus applicable to material systems where oxygen vacancies are the dominant source of conductivity. Using STO capped with epitaxial γ-Al₂O₃ (GAO) or amorphous LAO (a-LAO), the pathways for changing the carrier density in the two STO-based cases are identified where oxygen blocking (GAO) and oxygen permeable (a-LAO) films create interface conductivity from oxygen vacancies located in STO near the interface. For a-LAO/STO, the rate limiting step (Eₐ = 0.25 eV) for oxidizing oxygen vacancies is the transportation of oxygen from the...
Control of bacterial chromosome replication by non-coding regions outside the origin

Chromosome replication in Eubacteria is initiated by initiator protein(s) binding to specific sites within the replication origin, oriC. Recently, initiator protein binding to chromosomal regions outside the origin has attracted renewed attention; as such binding sites contribute to control the frequency of initiations. These outside-oriC binding sites function in several different ways: by steric hindrances of replication fork assembly, by titration of initiator proteins away from the origin, by performing a chaperone-like activity for inactivation- or activation of initiator proteins or by mediating crosstalk between chromosomes. Here, we discuss initiator binding to outside-oriC sites in a broad range of different taxonomic groups, to highlight the significance of such regions for regulation of bacterial chromosome replication. For Escherichia coli, it was recently shown that the genomic positions of regulatory elements are important for bacterial fitness, which, as we discuss, could be true for several other organisms.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Infection Microbiology, University of Copenhagen
Authors: Frimodt-Møller, J. (Intern), Charbon, G. (Ekstern), Løbner-Olesen, A. (Ekstern)
Pages: 607-611
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Current Genetics
Volume: 63
Issue number: 4
ISSN (Print): 0172-8083
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.3 SJR 1.174 SNIP 1.063
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.077 SNIP 0.788 CiteScore 2.13
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.075 SNIP 0.776 CiteScore 2.23
Control of exceptional points in photonic crystal slabs

Various ways of controlling the extent of the ring of exceptional points in photonic crystal slabs are investigated. The extent of the ring in photonic crystal slabs is found to vary with the thickness of the slab. This enables recovery of Dirac cones in open, non-Hermitian systems, such as a photonic crystal slab. In this case, all three bands exhibit a bound state in the continuum in close proximity of the Γ point. These results may lead to new designs of small photonic-crystal-based lasers exhibiting high-quality factors.
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.54 SJR 1.864 SNIP 1.658
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.142 SNIP 1.642 CiteScore 3.53
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.497 SNIP 2.056 CiteScore 3.86
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.458 SNIP 2.095 CiteScore 3.95
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.596 SNIP 1.95 CiteScore 3.52
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.518 SNIP 2.475 CiteScore 3.69
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.669 SNIP 2.293
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 3.167 SNIP 2.665
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 3.408 SNIP 2.378
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 3.489 SNIP 2.102
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 3.143 SNIP 2.334
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 3.251 SNIP 2.483
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 3.521 SNIP 2.718
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 3.708 SNIP 2.573
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 3.702 SNIP 2.39
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 3.62 SNIP 2.244
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 3.416 SNIP 1.705
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 4.044 SNIP 1.699
DOIs:

Original language: English

Atomic and Molecular Physics, Periodic structures, Bound state, Close proximity, Dirac cones, Exceptional points, Gamma point, Hermitians, High quality factors, Photonic crystal slab, Photonic crystals
Control of human pathogenic Yersinia enterocolitica in minced meat: Comparative analysis of different interventions using a risk assessment approach

This study aimed to evaluate the effect of different processing scenarios along the farm-to-fork chain on the contamination of minced pork with human pathogenic Y. enterocolitica. A modular process risk model (MPRM) was used to perform the assessment of the concentrations of pathogenic Y. enterocolitica in minced meat produced in industrial meat processing plants. The model described the production of minced pork starting from the contamination of pig carcasses with pathogenic Y. enterocolitica just before chilling. The endpoints of the assessment were (i) the proportion of 0.5 kg minced meat packages that contained pathogenic Y. enterocolitica and (ii) the proportion of 0.5 kg minced meat packages that contained more than $10^5$ pathogenic Y. enterocolitica at the end of storage, just before consumption of raw pork or preparation. Comparing alternative scenarios to the baseline model showed that the initial contamination and different decontamination procedures of carcasses have an important effect on the proportion of highly contaminated minced meat packages at the end of storage. The addition of pork cheeks and minimal quantities of tonsillar tissue into minced meat also had a large effect on the endpoint estimate. Finally, storage time and temperature at consumer level strongly influenced the number of highly contaminated packages.

General information
State: Published
Organisations: National Food Institute, Research Group for Risk-Benefit, Ghent University
Authors: Van Damme, I. (Ekstern), De Zutter, L. (Ekstern), Jacxsens, L. (Ekstern), Nauta, M. (Intern)
Number of pages: 13
Pages: 83-95
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Food Microbiology
Volume: 64
ISSN (Print): 0740-0020
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 4.31 SJR 1.702 SNIP 1.695
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 1.714 SNIP 1.776 CiteScore 4.24
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 1.548 SNIP 1.755 CiteScore 3.74
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.759 SNIP 1.85 CiteScore 3.81
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.618 SNIP 1.647 CiteScore 3.54
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.578 SNIP 1.885 CiteScore 3.72
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.669 SNIP 1.765
Web of Science (2010): Indexed yes
Controls on dryland mountain landscape development along the NW Saharan desert margin: Insights from Quaternary river terrace sequences (Dadès River, south-central High Atlas, Morocco)

This study documents river terraces from upstream reaches of the Dadès River, a major fluvial system draining the south-central High Atlas Mountains. Terraces occur as straths with bedrock bases positioned at 10 m altitudinal intervals up to 40 m (T1-T5) above the valley floor, becoming less common between 50 and 140 m. The rock strength, stratigraphy and structure of the mountain belt influences terrace distribution. Terraces are absent in river gorges of structurally thickened limestone; whilst well-developed, laterally continuous terraces (T1-T4) form along wide valleys occupying syncline structures dominated by weaker interbedded limestone-mudstone. Terrace staircases develop in confined canyons associated with weaker lithologies and influence from structural dip and stratigraphic configuration. Terraces comprise a bedrock erosion surface over lain by fluvial conglomerates, rare overbank sands and colluvium. This sequence with some OSL/IRSL age control, suggests terrace formation over a 100 ka climate cycle with valley floor aggradation during full glacial and incision during glacial-interglacial transitions. This integration with other archives (e.g. lakes, glaciers, dunes), appearing typical of landscape development along the NW Saharan margin south of the High Atlas, and similar to patterns in the western-southern Mediterranean. The 100 ka climate cycle relationship suggests that the terrace sequence documents Late-Middle Pleistocene landscape development. Consistent altitudinal spacing of terraces and their distribution throughout the orogen suggests sustained base-level lowering linked to uplift-exhumation of the High Atlas. Low incision rates (<0.2 mm a⁻¹) and general absence of terrace deformation suggests dominance of isostatically driven base-level lowering with relief generation being Early Pleistocene or older.

General information
State: Published
Organisations: Center for Nuclear Technologies, University of Plymouth, Universite Ibn Zohr, Universidade de Coimbra
Authors: Stokes, M. (Ekstern), Mather, A. (Ekstern), Belfoul, M. (Ekstern), Fai k, F. (Ekstern), Bouzid, S. (Ekstern), Geach, M. (Ekstern), Cunha, P. P. (Ekstern), Boulton, S. J. (Ekstern), Thiel, C. (Intern)
Number of pages: 17
Pages: 363-379
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Quaternary Science Reviews
Volume: 166
ISSN (Print): 0277-3791
Ratings:
BFI (2017): BFI-level 2
An experimental study on an n-octane pool fire bound by one side by an ice wall was carried out to investigate the effects on ice melting by convection within the liquid part of the fuel. Experiments were conducted in a square glass tray (9.6cm × 9.6cm × 5cm) with a 3cm thick ice wall (9.6cm × 6.5cm × 3cm) placed on one side of the tray. The melting front velocity, as an indicator of the melting rate of the ice, increased from 0.04cm/min to 1cm/min. The measurement of the burning rates and flame heights showed two distinctive behaviors; an induction period from the initial self-sustained flame to the peak mass loss rate followed by a steady phase from the peak of mass loss rate until the manual extinguishment. Similarly, the flow field measurements by a 2-dimensional PIV system indicated the existence of two different flow regimes. In the moments before ignition of the fuel, coupling of surface tension and buoyancy forces led to a combined one roll structure in the fuel. After ignition the flow field began transitioning toward an unstable flow regime (separated) with an increase in number of vortices around the ice wall. The separated regime started with presence of a multi-roll structure separating from a primary horizontal flow on the top driven by Marangoni convection. As the burning rate/flame height increased the
velocity and evolving flow patterns enhanced the melting rate of the ice wall. Experimentally determined temperature contours, using an array of finely spaced thermocouples in the liquid fuel, were used to further investigate the two layer temperature structure; an upper layer (~8mm thick) with steep temperature gradient in the vertical direction and a layer of low temperature in deeper regions. A hot zone with thickness of ~3mm was present below the free surface corresponding to the multi-roll location. The multi-roll structure could be the main reason for the transport of the heat received from the flame toward the ice wall which causes the melting.

**General information**
State: Published
Organisations: Department of Civil Engineering, Section for Building Design, Worcester Polytechnic Institute
Authors: Farahani, H. F. (Ekstern), Alva, W. U. R. (Intern), Rangwala, A. S. (Ekstern), Jomaas, G. (Intern)
Number of pages: 9
Pages: 219-227
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Combustion and Flame
Volume: 179
ISSN (Print): 0010-2180
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 4.41 SJR 1.125 SNIP 2.165
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.919 SNIP 2.448 CiteScore 5.12
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.388 SNIP 2.347 CiteScore 3.78
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.925 SNIP 2.639 CiteScore 4.85
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.43 SNIP 2.88 CiteScore 4.12
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 3.318 SNIP 2.817 CiteScore 4.13
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.181 SNIP 2.548
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.984 SNIP 2.308
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 0.961 SNIP 2.326
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 3.165 SNIP 2.367
Scopus rating (2006): SJR 2.019 SNIP 2.581
Scopus rating (2005): SJR 2.363 SNIP 2.314
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.079 SNIP 1.719
Convenient one-step synthesis of 5-carboxy-seminaphthofluoresceins

The one-step synthesis and characterization of a series of regioisomerically pure 5-carboxy-seminaphthofluoresceins (5-carboxy-SNAFLs) is reported. The optical properties were determined in aqueous buffer at around biological pH, and highly pH sensitive, large Stokes-shift fluorophores with emission in the deep-red to near-infrared region were identified.
Convergence on Self-Generated vs. Crowdsourced Ideas in Crisis Response: Comparing Social Exchange Processes and Satisfaction with Process

Social media allow crowds to generate many ideas to swiftly respond to events like crises, public policy discourse, or online town hall meetings. This allows organizations and governments to harness the innovative power of the crowd. As part of this setting, teams that process crowd ideas must engage in social exchange processes to converge on a few promising ideas. Traditionally, teams work on self-generated ideas. However, in a crowdsourcing scenario, such as public participation in crisis response, teams may have to process crowd-generated ideas. To better understand this new practice, it is important to investigate how converging on crowdsourced ideas affects the social exchange processes of teams and resulting outcomes. We conducted a laboratory experiment in which small teams working in a crisis response setting converged on self-generated or crowdsourced ideas in an emergency response context. Our findings suggest that teams converging on self-generated ideas have better social exchange processes in terms of dominance and coordination. We found support that evaluation and coordination positively affect team member satisfaction under both experimental conditions. Implications for research and practice are discussed.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Software Engineering, University of South Florida, University of Innsbruck
Authors: Seeber, I. (Ekstern), Merz, A. B. (Ekstern), Maier, R. (Ekstern), Vreede, G. J. D. (Ekstern), Weber, B. (Intern)
Pages: 687-696
Publication date: 2017

Host publication information
Title of host publication: Proceedings of the 50th Hawaii International Conference on System Sciences (HICSS 2017)
ISBN (Print): 978-0-9981331-0-2
BFI conference series: Hawaii International Conference on System Sciences (5000413)
Main Research Area: Technical/natural sciences
Conference: 50th Hawaii International Conference on System Sciences (HICSS 2017), Waikoloa, United States, 04/01/2017 - 04/01/2017
Convergent strategy for the synthesis of S-linked oligoxylans

Arabinoxylans (AX) are a major class of hemicellulose and an important polysaccharide component of lignocellulosic biomass. To utilize the glycan polymer effectively, it is desirable to learn more about the enzymatic hydrolysis of AXs. Well-defined glycans can help to elucidate these processes. Here, we report the efficient synthesis of a mixed O- and S-linked tetraxylan. This thio-oligosaccharide has been developed as a putative inhibitor of arabinoxylan degrading enzymes used for the saccharification of biomass. Two common approaches for the synthesis of thio-oligosaccharides, either involving 1-thioglycoside donors or thioacceptors, are presented and compared regarding byproduct formation and yields. Both methods have shown to be useful for the synthesis of thiolinkages in oligoxylans assembly. However, the success of the reaction is highly dependent on the “match” between donors and acceptors.

General information
State: Published
Organisations: Department of Chemistry, Organic Chemistry, Center for Nanomedicine and Theranostics
Authors: Bonora, B. (Intern), Boos, I. (Intern), Clausen, M. H. (Intern)
Pages: 53-57
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Carbohydrate Research
ISSN (Print): 0008-6215
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.03 SJR 0.654 SNIP 0.801
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.59 SNIP 0.839 CiteScore 1.98
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.638 SNIP 0.856 CiteScore 2.01
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.639 SNIP 0.86 CiteScore 2.22
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.773 SNIP 1.017 CiteScore 2.2
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.76 SNIP 1.062 CiteScore 2.43
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.722 SNIP 0.868
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Conversion of furan derivatives for preparation of biofuels over Ni-Cu/C catalyst

Conversions of furfural and 5-hydroxymethylfurfural as model components in bio-oil were investigated over Ni-Cu/C catalyst with formic acid as hydrogen donor in isopropanol solvent to produce biofuels. The effects of reaction temperature, feed ratio, and reaction time were studied. A high yield of 2-methylfuran up to 91 mol% was obtained from furfural in 8 h at 200°C, and under same conditions 80 mol% yield of 2,5-dimethylfuran could also be obtained from 5-hydroxymethylfurfural in 6 h. The results verified the catalyst performance and the availability of the reaction conditions for producing biofuels from furan derivatives.

General information

State: Published
Organisations: Department of Chemical and Biochemical Engineering, CHEC Research Centre, Chinese Academy of Sciences
Authors: Fu, Z. (Ekstern), Wang, Z. (Ekstern), Lin, W. (Intern), Song, W. (Ekstern)
Number of pages: 6
Pages: 1176-1181
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information

Journal: Energy Sources. Part A. Recovery, Utilization, and Environmental Effects
Volume: 39
Issue number: 11
ISSN (Print): 1556-7036
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.64 SJR 0.289 SNIP 0.491
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.344 SNIP 0.664 CiteScore 0.53
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.322 SNIP 0.746 CiteScore 0.53
BFI (2013): BFI-level 1
3-Hydroxypropanoic acid (3-HP) is an important biomass-derivable platform chemical that can be converted into a number of industrially relevant compounds. There have been several attempts to produce 3-HP from renewable sources in cell factories, focusing mainly on Escherichia coli, Klebsiella pneumoniae, and Saccharomyces cerevisiae. Despite the significant progress made in this field, commercially exploitable large-scale production of 3-HP in microbial strains has still not been achieved. In this study, we investigated the potential of Bacillus subtilis as a microbial platform for bioconversion of glycerol into 3-HP. Our recombinant B. subtilis strains overexpress the two-step heterologous pathway containing glycerol dehydratase and aldehyde dehydrogenase from K. pneumoniae. Genetic engineering, driven by in silico optimization, and optimization of cultivation conditions resulted in a 3-HP titer of 10 g/L, in a standard batch cultivation. Our findings provide the first report of successful introduction of the biosynthetic pathway for conversion of glycerol into 3-HP in B. subtilis. With this relatively high titer in batch, and the robustness of B. subtilis in high density fermentation conditions, we expect that our production strains may constitute a solid basis for commercial production of 3-HP.
The spatial structure of a turbulent velocity field is of great theoretical interest as its kinematics describe the distribution of spatial scales and its dynamics describe their evolution from large energy carrying scales to smaller scales and finally to dissipation. However, the overwhelming number of turbulence measurements results in time records from stationary probes, either hot-wire probes (hot-wire anemometers, HWA) or laser beam probes (laser Doppler anemometers, LDA). The spatial structure of the turbulent velocity field is then inferred by “Taylor’s hypothesis,” as first presented in [1], assuming a “frozen” velocity field carried past the probe with the local mean velocity. However, Taylor’s hypothesis breaks down at higher turbulence intensities and can then only be applied with additional corrections, see, for example, [2–4].

Conversion of Measured Turbulence Spectra from Temporal to Spatial Domain

The spatial structure of a turbulent velocity field is of great theoretical interest as its kinematics describe the distribution of spatial scales and its dynamics describe their evolution from large energy carrying scales to smaller scales and finally to dissipation. However, the overwhelming number of turbulence measurements results in time records from stationary probes, either hot-wire probes (hot-wire anemometers, HWA) or laser beam probes (laser Doppler anemometers, LDA). The spatial structure of the turbulent velocity field is then inferred by “Taylor’s hypothesis,” as first presented in [1], assuming a “frozen” velocity field carried past the probe with the local mean velocity. However, Taylor’s hypothesis breaks down at higher turbulence intensities and can then only be applied with additional corrections, see, for example, [2–4].

General information
State: Published
Organisations: Department of Mechanical Engineering, Fluid Mechanics, Coastal and Maritime Engineering, Intarsia Optics
Authors: Buchhave, P. (Ekstern), Velte, C. M. (Intern)
Pages: 343-362
Publication date: 2017

Host publication information
Title of host publication: Whither Turbulence and Big Data in the 21st Century?
Publisher: Springer
Editors: Pollard, A., Castillo, L., Danaila, L., Glauser, M.
ISBN (Print): 978-3-319-41215-3
ISBN (Electronic): 978-3-319-41217-7
Chapter: 18
Main Research Area: Technical/natural sciences
DOIs: 10.1007/978-3-319-41217-7_18
Publication: Research - peer-review Book chapter – Annual report year: 2016
Converting mesophilic upflow sludge blanket (UASB) reactors to thermophilic by applying axenic methanogenic culture bioaugmentation

The application of thermophilic conditions in anaerobic digesters leads to higher methane production rates and better sanitation of the effluents compared to mesophilic operation. However, an increase in operational temperature is challenging due to the tremendous selective pressure imposed on the microbial consortium. The adaptation of microbial community to a new environment or condition can be accelerated by a process known as “bioaugmentation” or “microbial community manipulation”, during which exogenous microorganisms harbouring specific metabolic activities are introduced to the reactor. The aim of the current study was to rapidly convert the operational temperature of up-flow anaerobic sludge blanket (UASB) reactors from mesophilic to thermophilic conditions by applying microbial community manipulation techniques. Three different bioaugmentation strategies were compared and it was proven that the injection of axenic methanogenic culture was the most efficient approach leading to improved biomethanation process with 40% higher methane production rate compared to the control reactor. Microbial community analyses revealed that during bioaugmentation, the exogenous hydrogenotrophic methanogen could be encapsulated in granular structures and concomitantly promote the growth of syntrophic fatty acid oxidizing bacteria. The results derived from the current study indicated that microbial community manipulation is an efficient alternative method to speed up transition of UASB reactors from mesophilic to thermophilic conditions.

General information
State: Accepted/In press
Organisations: Department of Environmental Engineering, Residual Resource Engineering, University of Padova
Authors: Zhu, X. (Intern), Treu, L. (Intern), Kougias, P. G. (Intern), Campanaro, S. (Ekstern), Angelidaki, I. (Intern)
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BFI (2012): BFI-level 1
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Web of Science (2012): Indexed yes
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ISI indexed (2011): ISI indexed yes
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BFI (2009): BFI-level 1
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Web of Science (2005): Indexed yes
Converting wastewater into fertilizing irrigation

General information
State: Published
Organisations: Department of Environmental Engineering, Water Technologies, Danish Technological Institute, Minor Change Group, Samse spildevand
Authors: Litty, K. (Ekstern), Lindholst, S. (Ekstern), Mikkelsen, N. (Ekstern), Moestrup, N. (Ekstern), Aagaard, J. (Ekstern), Rasmussen, P. E. (Ekstern), Heinen, N. (Ekstern), Haase, J. (Ekstern), Andersen, H. R. (Intern)
Pages: 26-26
Publication date: 2017

Convex Relaxations of Chance Constrained AC Optimal Power Flow

High penetration of renewable energy sources and the increasing share of stochastic loads require the explicit representation of uncertainty in tools such as the optimal power flow (OPF). Current approaches follow either a linearized approach or an iterative approximation of non-linearities. This paper proposes a semidefinite relaxation of a chance constrained AC-OPF which is able to provide guarantees for global optimality. Using a piecewise affine policy, we can ensure tractability, accurately model large power deviations, and determine suitable corrective control policies for active power, reactive power, and voltage. We state a tractable formulation for two types of uncertainty sets. Using a scenario-based approach and making no prior assumptions about the probability distribution of the forecast errors, we obtain a robust formulation for a rectangular uncertainty set. Alternatively, assuming a Gaussian distribution of the forecast errors, we propose an analytical reformulation of the chance constraints suitable for semidefinite programming. We demonstrate the performance of our approach on the IEEE 24 and 118 bus system using realistic day-ahead forecast data and obtain tight near-global optimality guarantees.

General information
State: Accepted/In press
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electricity markets and energy analytics, ETH Zurich
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Main Research Area: Technical/natural sciences
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Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 3.602 SNIP 3.486 CiteScore 6.6
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.831 SNIP 3.577 CiteScore 5.31
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BFI (2013): BFI-level 2
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Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.177 SNIP 3.516 CiteScore 5.84
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
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ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.949 SNIP 2.826
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.94 SNIP 2.723
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.537 SNIP 2.448
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.242 SNIP 2.521
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.233 SNIP 2.316
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.582 SNIP 2.547
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Convolutional Neural Networks - Generalizability and Interpretations

Sufficient data is key when training Machine Learning algorithms in order to obtain models that generalize for operational use. Sometimes sufficient data is infeasible to obtain and this prevents the use of Machine Learning in many applications. The goal of this thesis is to gain insights and learn from data despite it being limited in amount or context representation. Within Machine Learning this thesis focuses on Convolutional Neural Networks for Computer Vision. The research aims to answer how to explore a model's generalizability to the whole population of data samples and how to interpret the model's function. The thesis presents three overall approaches to gaining insights on generalizability and interpretation. First, one can change the main objective of a problem to study expected insufficiencies and based on this make better a choice of model. For this first approach the thesis presents both a study on translational invariance as well as an example of changing the objective of a problem from classification to segmentation to robustly extract lower level information. The second approach is the use of simulated data which can help by inferring knowledge in our model if real data is scarce. The results show clear advantages both when using rendered Synthetic Aperture Radar images, but also when predictions from physical models are used as target variables which are matched with real data to form a large dataset. The third approach to cope with data insufficiencies is to visualize and understand the internal representations of a model. This approach is explored and concrete examples of learnings that can be obtained are shown. There is no doubt that large quantities of well representing data is the best foundation for training Machine Learning models. On the other hand, there are many tools and techniques available to interpret and understand properties of our models. With these at hand we can still learn about our models and use this knowledge to e.g. collect better datasets or improve on the modeling.

General information
State: Submitted
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, National Space Institute, Microwaves and Remote Sensing
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Cooperative epistemic multi-agent planning for implicit coordination
Epistemic planning can be used for decision making in multi-agent situations with distributed knowledge and capabilities. Recently, Dynamic Epistemic Logic (DEL) has been shown to provide a very natural and expressive framework for epistemic planning. We extend the DEL-based epistemic planning framework to include perspective shifts, allowing us to define new notions of sequential and conditional planning with implicit coordination. With these, it is possible to solve planning tasks with joint goals in a decentralized manner without the agents having to negotiate about and commit to a joint policy at plan time. First we define the central planning notions and sketch the implementation of a planning system built on those notions. Afterwards we provide some case studies in order to evaluate the planner empirically and to show that the concept is useful for multi-agent systems in practice.

General information
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Organisations: Department of Applied Mathematics and Computer Science, Algorithms and Logic, Albert Ludwigs Universität Freiburg
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Main Research Area: Technical/natural sciences

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Journal: Electronic Proceedings in Theoretical Computer Science
Volume: 243
Coordinated control of wind power plants in offshore HVDC grids

During the recent years, there has been a significant penetration of offshore wind power into the power system and this trend is expected to continue in the future. The North Sea in Europe has higher potential for offshore wind power; therefore, the North Seas Countries' Offshore Grid initiative was formed among nine North Sea countries. They agreed on closer energy cooperation to enable development of an efficient and economic offshore grid infrastructure for advantages, interconnectors based on the voltage source converter based high voltage DC (HVDC) transmission system is being used to exchange power between different countries, and different synchronous areas. It is very likely that they will then be combined with offshore wind power plant (OWPP) connections in the North Sea, transforming it in a multi terminal DC (MTDC) grid and, therefore, in a fully meshed offshore DC grid in near future. However, increased penetration of offshore wind power into the power system poses several challenges to its security. This thesis deals with two main research challenges, (1) Develop, and analyze the coordinated control strategies for AC voltage and reactive power control in the cluster of OWPPs connected to common offshore HVDC station, (2). Develop, analyze, and test the control strategies for ancillary services from OWPPs to the AC grid, mainly fast primary frequency control from OWPPs. Moreover, the impact of wind speed on the frequency control from OWPPs is also studied in this thesis. The main results of this research work show that the OWPPs in the HVDC grid can participate in fast primary frequency control of the power system by using the proposed frequency control methods. Also, wind speed has a significant impact on the frequency control, particularly at below rated wind speeds. The proposed methods for AC voltage and reactive power control can improve the steady state and dynamic AC voltage profile of the offshore AC grid with cluster of OWPPs connected to common HVDC station, while minimizing the active power losses in the offshore AC grid. The research work is carried at the Technical University of Denmark (DTU) in the Department of Wind Energy and it is funded by the People Programme (Marie Curie Actions) of the EU FP7/2007-2013/ under REA grants agreement no. 317221, project title MEDOW.

General information
State: Published
Organisations: Department of Wind Energy, Integration & Planning
Authors: Sakamuri, J. N. (Intern), Cutululis, N. A. (Intern), Sørensen, P. E. (Intern), Hansen, A. D. (Intern)
Number of pages: 208
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Coordinated frequency control from offshore wind power plants connected to multi terminal DC system considering wind speed variation

A coordinated fast primary frequency control scheme from offshore wind power plants (OWPPs) integrated to a three terminal high voltage DC (HVDC) system is proposed in this study. The impact of wind speed variation on the OWPP active power output and thus on the AC grid frequency and DC grid voltage is analysed. The removal of active power
support from OWPP after the frequency control action may result in second frequency (and DC voltage) dips. Three different methods to mitigate these secondary effects are proposed, such as, (i) Varying the droop gains of the HVDC converter (ii) Releasing the active power support from OWPP with a ramp rate limiter and (iii) An alternative method for the wind turbine overloading considering rotor speed. The effectiveness of the proposed control scheme is demonstrated on a wind power plant integrated into a three terminal HVDC system developed in DiGSI1ENT PowerFactory. The results show that the proposed coordinated frequency control method performs effectively at different wind speeds and minimises the secondary effects on frequency and DC voltage.

General information
State: Published
Organisations: Integration & Planning, Department of Wind Energy
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Web of Science (2016): Indexed yes
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Scopus rating (2015): SJR 1.054 SNIP 1.64 CiteScore 3.13
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ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 1.5 SNIP 2.854 CiteScore 4.64
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.374 SNIP 2.474 CiteScore 4.43
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.893 SNIP 2.631
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.856 SNIP 2.568
Web of Science (2009): Indexed yes
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Scopus rating (2008): SJR 0.878 SNIP 1.975
Original language: English
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This paper proposes a coordinated voltage control scheme based on model predictive control (MPC) for voltage source converter-based high voltage direct current (VSC-HVDC) connected wind power plants (WPPs). In the proposed scheme, voltage regulation capabilities of VSC and WTGs are fully utilized and optimally coordinated. Two control modes, namely operation optimization mode and corrective mode, are designed to coordinate voltage control and economic operation of the system. In the first mode, the control objective includes the bus voltages, power losses and dynamic Var reserves of wind turbine generators (WTGs). Only the terminal voltages of WTGs are taken into account in the second mode. The predictive model of the system including VSC and WTGs is developed firstly. The calculation of sensitivity coefficients is done by an analytical method to improve the computational efficiency. Simulation results are presented to demonstrate the effectiveness of the proposed controller and the control performance is compared with conventional optimal control and loss minimization control. Besides, the robustness of the proposed controller to communication time delay and measurement errors is investigated in the last.
Coordinating Flexibility under Uncertainty in Multi-Area AC and DC Grids

In the future, mixed AC and DC grids, spanning multiple areas operated by different transmission system operators (TSO), are expected to offer the necessary controllability for integrating large amounts of intermittent renewable generation. This is facilitated by high voltage direct current transmission based on voltage source converter technology that can offer recourse actions in the form of preventive and corrective control of both active and reactive power. Market-clearing procedures, based on optimal power flow algorithms, need to be revised to account for DC transmission, flexibility and privacy requirements. To this end, we propose a decentralized two-stage stochastic market-clearing algorithm that incorporates meshed DC grids and allows the sharing of flexibility resources between areas. The benefit of this approach lies in its pricing mechanism, used for coordinating the different area subproblems and requiring only a moderate exchange of information while ensuring system-wide optimality. Case studies are presented to illustrate the methodology and to demonstrated the benefits of additional controllability provided by DC grids.

General information
State: Published
Organisations: Department of Electrical Engineering, Center for Electric Power and Energy, Electricity markets and energy analytics
Authors: Halilbasic, L. (Ekstern), Chatzivasileiadis, S. (Intern), Pinson, P. (Intern)
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Copenhagen ITS: Forsøg med wifi-baseret positionering på H.C. Andersens Boulevard

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Organisations: National Space Institute, Geodesy, Technical University of Denmark
Authors: Høeg, P. (Intern), Nielsen, T. S. (Ekstern), Olsen, A. (Ekstern)
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Volume: 2017
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Individual differences in physiological and behavioural responses to stressors are increasingly recognised as adaptive variation and thus raw material for evolution and fish farming improvements including selective breeding. Such individual variation has been evolutionarily conserved and is present in all vertebrate taxa including fish. In farmed animals, the interest in consistent trait associations, that is coping styles, has increased dramatically over the last years because many studies have demonstrated links to performance traits, health and disease susceptibility and welfare. This study will review (i) the main behavioural, neuroendocrine, cognitive and emotional differences between reactive and proactive coping styles in farmed fish; (ii) the methodological approaches used to identify coping styles in farmed fish, including individual (group) mass-screening tests; and (iii) how knowledge on coping styles may contribute to improved sustainability of the aquaculture industry, including welfare and performance of farmed fish. Moreover, we will suggest areas for future research, where genetic basis (heritability/epigenetic) of coping styles, and the neuroendocrine mechanisms behind consistent as well as flexible behavioural patterns are pinpointed as central themes. In addition, the ontogeny of coping styles and the influence of age, social context and environmental change in coping styles will also be discussed.

General information
State: Published
Organisations: National Institute of Aquatic Resources, Section for Aquaculture, Universidade do Algarve, French Research Institute for the Exploitation of the Sea, Universidad Autonoma de Barcelona, University of Tromsø, Institute of Marine Research, University of Agder, Norwegian University of Life Sciences
Authors: Castanheira, M. F. (Ekstern), Conceição, L. E. (Ekstern), Millot, S. (Ekstern), Rey, S. (Ekstern), Bégout, M. (Ekstern), Damsgård, B. (Ekstern), Kristiansen, T. (Ekstern), Höglund, E. (Intern), Øverli, Ø. (Ekstern), Martins, C. I. (Ekstern)
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Scopus rating (2014): SJR 1.51 SNIP 1.757 CiteScore 3.38
Scopus rating (2013): SJR 0.979 SNIP 1.142 CiteScore 2.05
Scopus rating (2012): SJR 1.001 SNIP 1.83 CiteScore 2.46
Scopus rating (2011): SJR 0.658 SNIP 1.658 CiteScore 1.13
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Original language: English
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Source-ID: 2265714634
Publication: Research - peer-review › Journal article – Annual report year: 2015
Core Flooding Experiments and Reactive Transport Modeling of Seasonal Heat Storage in the Hot Deep Gassum Sandstone Formation

Seasonal storage of excess heat in hot deep aquifers is considered to optimize the usage of commonly available energy sources. The chemical effects of heating the Gassum Sandstone Formation to up to 150 degrees C is investigated by combining laboratory core flooding experiments with petrographic analysis and geochemical modeling. Synthetic formation water is injected into two sets of Gassum Formation samples at 25, 50 (reservoir temperature), 100, and 150 degrees C with a velocity of 0.05 and 0.1 PV/h, respectively. Results show a significant increase in the aqueous concentration of silicium and iron with increasing temperature due to dissolution of silica and siderite. Increasing the reservoir temperature from 50 to 100 degrees C enhanced the naturally occurring weathering of Na-rich feldspar to kaolinite. Dissolution of quartz increased sharply above 100 degrees C and was the dominating process at 150 degrees C, resulting in a significant increase in the aqueous silicium concentration. At temperatures, 100 degrees C, the silicium concentration was controlled by a quasi-stationary state between feldspar dissolution and kaolinite precipitation whereas the concentration was kinetically controlled by quartz dissolution at 150 degrees C. Furthermore, a strong coupling between dissolution, precipitation, and flow velocity was observed. The results of this study show that the effects of heat storage of up to 150 degrees C in the Gassum Formation in the Stenlille area is expected to have only minor effects on the properties of the reservoir and that storage of excess heat in the Gassum Formation in the Stenlille area may be possible provided operational precautions are taken.

General information
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Organisations: Department of Civil Engineering, Section for Geotechnics and Geology, Center for Energy Resources Engineering, Geological Survey of Denmark and Greenland
Authors: Holmslykke, H. D. (Ekstern), Kjøller, C. (Ekstern), Fabricius, I. L. (Intern)
Number of pages: 10
Pages: 251-260
Publication date: 2017
Main Research Area: Technical/natural sciences

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Volume: 1
Issue number: 5
ISSN (Print): 2472-3452
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Original language: English
High-temperature aquifer thermal energy storage, Deep aquifer thermal energy storage, Reactive transport modeling, Flooding experiments, Gassum Formation
DOIs:
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Source-ID: 2373025949
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Cormorant predation overlaps with fish communities and commercial-fishery interest in a Swedish lake

The increase of the fish-eating cormorant (Phalacrocorax carbo sinensis) in Europe has resulted in conflicts with fisheries. In Lake Roxen, Sweden, cormorants are blamed for causing a decrease in fishery catches. To study and describe the potential effects that cormorants may have had on fish in the lake, their diet was analysed in relation to fish catches in gill-net surveys and fishery catches. Estimates of predation were achieved by ‘tag and recovery’ on eel, pike-perch and perch. Cormorants predated on the most common species and sizes, which were mainly smaller perch, ruffe and roach (mean sizes of 9, 8 and 13 cm respectively). Tag recoveries from perch, eel and pike-perch detected predation estimates of 14, 7 and 15% respectively. From a highly eutrophic state, the lake has shown improvements in water quality and a development towards larger predatory fish was expected, but the results from gill-net surveys did not show this. Results indicated that cormorants and fisheries may both be responsible, but because cormorants remove more fish, they may be the main factor for the lack of recovery of large predatory fish. Their predation keeps recruitment high, but the number of fish that reach large sizes remains low

General information
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Organisations: National Institute of Aquatic Resources, Section for Freshwater Fisheries Ecology, Swedish University of Agricultural Sciences
Authors: Ovegård, K. M. (Ekstern), Öhman, K. (Ekstern), Mikkelsen, J. S. (Intern), Jepsen, N. (Intern)
Pages: 1677-1685
Correction: Large-scale electricity storage utilizing reversible solid oxide cells combined with underground storage of CO₂ and CH₄

Correction for 'Large-scale electricity storage utilizing reversible solid oxide cells combined with underground storage of CO₂ and CH₄' by S. H. Jensen et al., Energy Environ. Sci., 2015, 8, 2471–2479.
Corrections to "Lower Bounds on Q for Finite Size Antennas of Arbitrary Shape"

Equations (24) and (25) in [1, Appendix B] should, respectively, read as:
\begin{align*}
&\int \nabla G_{1} G_{2}^{*} - \hat{r} jk \frac{e^{jk(\hat{r}_{1}-\hat{r}_{2})\cdot\hat{r}}}{16\pi^{2}|\hat{r}|^{2}} \, dV = -\frac{\hat{r}_{12}}{|\hat{r}_{12}|} \frac{\cos (k|\hat{r}_{12}|)}{8\pi} \\
&\quad - j \frac{2 \hat{r}_{1}}{8\pi k^{2}} \left( \frac{\sin

Bibliographical note
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Source: FindIt
Source-ID: 2349275059
Publication: Research > Comment/debate – Annual report year: 2017
\begin{align*}
&\left( k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|}\right) \sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|}) - \frac{k \cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} \right )
\end{align*}

\begin{align*}
&\frac{|\boldsymbol{r}_{1}|^2 - |\boldsymbol{r}_{2}|^2}{8\pi k^2} \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|^2}
\times \left( \frac{k^2 \sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|} - 3 \left( \frac{\sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^3} - \frac{k \cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} \right ) \right )
\end{align*}

\begin{align*}
&\int_{V_{\infty}} j(\nabla G_{1}) G_{2}^{*} - \hat{\boldsymbol{r}} k \frac{e^{jk(\boldsymbol{r}_{1} - \boldsymbol{r}_{2}) \cdot \hat{\boldsymbol{r}}}}{16\pi^2 |\boldsymbol{r}|^2} \, dV
= \frac{\boldsymbol{r}_{12}}{8\pi} \frac{\cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} - \frac{\boldsymbol{r}_{12}}{8\pi k^2} \left( \frac{\sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^3} - \frac{k \cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} \right )
- \frac{\boldsymbol{r}_{1} + \boldsymbol{r}_{2}}{8\pi k^2} \left( \frac{\sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^3} - \frac{k \cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} \right )
- \frac{|\boldsymbol{r}_{1}|^2 - |\boldsymbol{r}_{2}|^2}{8\pi k^2} \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|^2}
\times \left( \frac{k^2 \sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|} - 3 \left( \frac{\sin (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^3} - \frac{k \cos (k \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|})}{|\boldsymbol{r}_{12}|^2} \right ) \right )
\end{align*}

\begin{align*}
&= j \frac{\boldsymbol{r}_{12}}{2} \text{Re}\{G_{12}\} - \frac{1}{2k^2} \text{Im}\{\nabla_{1} G_{12}\}
- \frac{\boldsymbol{r}_{1} + \boldsymbol{r}_{2}}{2k^2} \text{Im}\{\nabla_{1} G_{12} \cdot \frac{\boldsymbol{r}_{12}}{|\boldsymbol{r}_{12}|^2}\}
+ \frac{|\boldsymbol{r}_{1}|^2 - |\boldsymbol{r}_{2}|^2}{2k^2 |\boldsymbol{r}_{12}|^2} \text{Im}\{\boldsymbol{r}_{12}k^2 G_{12} + 3 \nabla_{1} G_{12}\}. 
\end{align*}
Correction to Creation of High Mobility Two-Dimensional Electron Gases via Strain Induced Polarization at an Otherwise Nonpolar Complex Oxide Interface

General information
State: Published
Organisations: Department of Energy Conversion and Storage, Electrofunctional materials, Center for Electron Nanoscopy, Imaging and Structural Analysis, University of Copenhagen
Pages: 2738
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Nano Letters
Volume: 17
Issue number: 4
ISSN (Print): 1530-6984
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 13.4
Correction to Development of Comparative Toxicity Potentials of TiO₂ Nanoparticles for Use in Life Cycle Assessment

General information
State: Published
Organisations: Quantitative Sustainability Assessment, Department of Environmental Engineering, Environmental Chemistry, Department of Management Engineering, Technical University of Denmark, Quantis, Radboud University Nijmegen
Authors: Ettrup, K. (Ekstern), Kounina, A. (Ekstern), Hansen, S. F. (Intern), Meesters, J. A. J. (Ekstern), Blikra Vea, E. (Ekstern), Laurent, A. (Intern)
Pages: 7295-7295
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Environmental Science and Technology
Volume: 51
Issue number: 12
ISSN (Print): 0013-936X
Ratings:
Correlation of the allergenicity and tolerogenicity of two cow’s milk protein products with intestinal uptake

General information
State: Published
Organisations: National Food Institute, Research Group for Gut Microbiology and Immunology, Technical University of Denmark, Utrecht University, Arla Foods
Authors: Graversen, K. (Intern), Hornslet, S. E. (Ekstern), Smit, J. J. (Ekstern), Heydenreich Jensen, L. (Intern), Christoffersen, H. F. (Ekstern), Jacobsen, L. N. (Ekstern), Bøgh, K. L. (Intern)
Pages: 320-320
Publication date: 2017
Conference: European Academy of Allergy and Clinical Immunology Congress 2017, Helsinki, Finland, 17/06/2017 - 17/06/2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Allergy
Volume: 72
Issue number: S103
Article number: 0455
ISSN (Print): 0105-4538
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 6.23 SJR 2.724 SNIP 2.475
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 3.13 SNIP 2.127 CiteScore 5.73
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 2.464 SNIP 2.121 CiteScore 5.51
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 2.195 SNIP 1.902 CiteScore 4.91
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 2.008 SNIP 1.818 CiteScore 4.81
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 2.328 SNIP 1.781 CiteScore 4.89
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.826 SNIP 1.845
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.681 SNIP 0.958
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.433 SNIP 1.937
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.374 SNIP 1.862
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.523 SNIP 2.691
Corrigendum to "Comparison of Different Strategies for Selection/Adaptation of Mixed Microbial Cultures Able to Ferment Crude Glycerol Derived from Second-Generation Biodiesel"

[This corrects the article DOI: 10.1155/2015/932934.]

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, SINTEF
Authors: Varrone, C. (Intern), Heggeset, T. M. B. (Ekstern), Le, S. B. (Ekstern), Haugen, T. (Ekstern), Markussen, S. (Ekstern), Skiadas, I. V. (Intern), Gavala, H. N. (Intern)
Number of pages: 1
Pages: 7602495
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Biomedicine and Biotechnology
Volume: 2017
ISSN (Print): 1110-7243
Ratings:
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.32 SJR 0.843 SNIP 0.875
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.822 SNIP 0.756 CiteScore 1.77
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.753 SNIP 0.716 CiteScore 1.29
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.086 SNIP 0.876
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.998 SNIP 0.771
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.853 SNIP 0.668
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.514 SNIP 0.468
Corrigendum to "Large Gliadin Peptides Detected in the Pancreas of NOD and Healthy Mice following Oral Administration"

In the article titled "Large Gliadin Peptides Detected in the Pancreas of NOD and Healthy Mice following Oral Administration" [1], there was an error in the peptide sequences in Section . Gliadin Peptides, which should be corrected as follows:

The sequences H-LQLQFPFQPELPYPQPELPYPQPELPYPQPQPF-OHY and H-LGQQQPFPPQQPYPQPF-OHY should be corrected to H-LQLQFPFQPELPYPQPELPYPQPELPYPQPQPF-OH and H-LGQQQPFPPQQPYPQPF-OH.

General information
State: Published
Organisations: The Hevesy Laboratory, Rigshospitalet, Statens Serum Institut, Novozymes A/S
Number of pages: 1
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Diabetes Research
Volume: 2017
Article number: 9709704
ISSN (Print): 2314-6745
Ratings:
Web of Science (2017): Indexed Yes
Scopus rating (2016): SJR 1.027 SNIP 0.874 CiteScore 2.64
Web of Science (2016): Indexed yes
Scopus rating (2015): SJR 1.583 SNIP 1.406 CiteScore 2.36
Scopus rating (2014): SJR 1.483 SNIP 1.372 CiteScore 2.17
Scopus rating (2013): SJR 1.224 SNIP 1.068
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): SJR 0.614 SNIP 0.619
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Scopus rating (2011): SJR 0.634 SNIP 0.561
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.754 SNIP 2.863
Scopus rating (2009): SJR 0.693 SNIP 2.705
Scopus rating (2008): SJR 0.715 SNIP 3.179
Scopus rating (2007): SNIP 0.779 SJR 0.592
Scopus rating (2006): SNIP 0.791 SJR 0.696
Scopus rating (2005): SNIP 0.653 SJR 0.421
Scopus rating (2004): SNIP 0.574 SJR 0.343
Scopus rating (2003): SNIP 0.722 SJR 0.924
Scopus rating (2002): SNIP 0.659 SJR 0.751
Scopus rating (2001): SNIP 0.176 SJR 0.243
Original language: English
Electronic versions: 9709704.pdf
DOIs: 10.1155/2017/9709704

Bibliographical note
This corrects the article DOI: 10.1155/2016/2424306
Source: FindIt
Source-ID: 2356059519
Publication: Research - peer-review › Journal article – Annual report year: 2017

Corrigendum to "Microbial pesticide removal in rapid sand filters for drinking water treatment - Potential and kinetics" [Water Res. 48 (2014) 71-81]

General information
State: Published
Organisations: Department of Environmental Engineering, Urban Water Systems
Authors: Hedegaard, M. J. (Intern), Albrechtsen, H. (Intern)
Pages: 708-713
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Water Research
Volume: 122
ISSN (Print): 0043-1354
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 7.49 SJR 2.629 SNIP 2.558
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.689 SNIP 2.507 CiteScore 6.63
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.957 SNIP 2.727 CiteScore 6.13
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.956 SNIP 2.693 CiteScore 6.02
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.966 SNIP 2.456 CiteScore 5.15
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.867 SNIP 2.374 CiteScore 5.43
Corrosion failure analysis of hearing aid battery-spring contacts

Reliability of low power electrical contacts such as those in hearing aid battery-spring systems is a very critical aspect for the overall performance of the device. These systems are exposed to certain harsh environments like high humidity and elevated temperatures, and often in combination with high levels of salt from human perspiration and environmental pollutants. In addition, the design aspects of such systems often call for multi-material combinations of substrate and coatings for catering to various requirements such as electrical conductivity and wear resistance, which in turn enhance the susceptibility of these systems to galvanic corrosion. In this study, traditional behind the ear (BTE) hearing aid systems, which failed during service were analysed. Failure analysis was performed on the dome type battery-spring contact systems. The morphology of the contact areas was observed using scanning electron microscopy, and the compositional analysis of the corrosion products and contaminants was performed using energy dispersive X-ray spectroscopy. Wear track morphology was observed on the contact points, and the top coating on the dome was worn out exposing the substrate spring material. The obtained results were correlated to the underlying corrosion mechanism and the failure mode is presented.

General information
State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering
Authors: Gudla, V. C. (Intern), Ambat, R. (Intern)
Pages: 980–987
Publication date: 2017
Main Research Area: Technical/natural sciences
After only a few years operation, corrosion damage was observed in the flue gas cleaning system of a biomass power plant. The corrosion was on the lower part of the gas/gas heat exchanger fabricated from A242 weathering steel, where UNS S31600 bolts were used to attach sealing strips to the rotor. Thick iron oxides (up to 5 mm) had formed on the weathering steel, and these oxides also contained chlorine and sulfur. In this area of the heat exchanger, weathering steel has not had the optimal wet/dry cycles required to achieve a protective oxide. Due to the thick growing oxide on the rotor, the UNS S31600 bolts were under stress and this together with the presence of accumulated chlorine between the sealing strips and bolts resulted in stress corrosion cracking and rupture. In addition, Zn-K-Cl deposits were agglomerated in the duct after the DeNOx unit. Zn was also a constituent of corrosion products in various places in the ducts resulting inhygroscopic
Compounds. The presence of Zn in these cases was not from the fuel and is assumed to have originated from Zn containing primer (used to protect the plant during construction) reacting with flue gas constituents containing chlorine (KCl and HCl).

**General information**

State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, COWI A/S, HOFOR A/S
Authors: Montgomery, M. (Intern), Olesen, R. E. (Ekstern), Gensmann, P. (Ekstern)
Pages: 195–204
Publication date: 2017
Main Research Area: Technical/natural sciences

**Publication information**

Journal: Journal of Failure Analysis and Prevention
Volume: 17
Issue number: 2
ISSN (Print): 1547-7029
Ratings:

Web of Science (2017): Indexed yes
Scopus rating (2016): SJR 0.236 SNIP 0.469 CiteScore 0.42
Scopus rating (2015): SJR 0.251 SNIP 0.474 CiteScore 0.41
Scopus rating (2014): SJR 0.198 SNIP 0.585 CiteScore 0.3
Scopus rating (2013): SJR 0.249 SNIP 0.803 CiteScore 0.39
ISI indexed (2013): ISI indexed no
Scopus rating (2012): SJR 0.197 SNIP 0.681 CiteScore 0.28
ISI indexed (2012): ISI indexed no
Scopus rating (2011): SJR 0.307 SNIP 0.68 CiteScore 0.35
ISI indexed (2011): ISI indexed no
Scopus rating (2010): SJR 0.266 SNIP 0.581
Scopus rating (2009): SJR 0.189 SNIP 0.429
Scopus rating (2008): SJR 0.221 SNIP 0.263
Scopus rating (2007): SJR 0.171 SNIP 0.475
Scopus rating (2006): SJR 0.218 SNIP 0.4
Scopus rating (2005): SJR 0.215 SNIP 0.502
Scopus rating (2004): SJR 0.117 SNIP 0.127
Scopus rating (2003): SJR 0.141 SNIP 0.192
Scopus rating (2002): SJR 0.162 SNIP 0.53

Original language: English
Corrosion failure analysis, Deposits, ilure analysis Deposits Flu

**Corrosion reliability of lead-free solder systems used in electronics**

Corrosion reliability of five Sn-Ag-Cu (SAC) based lead-free solder alloys under humid and corrosive conditions has been investigated to understand the microstructure effects on corrosion performance. Electrochemical experiments such as potentiodynamic and potentiostatic tests were conducted in 3.5 wt% sodium chloride electrolyte at room temperature. Microstructure of the solder alloys and corrosion surface morphology was evaluated using light optical microscope (LOM) scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD). During the potentiostatic tests, the cathodically active Bi phase in No. 5 alloy introduced pitting in the Sn phase nearby, whereas AgSn phase prompted pitting on the adjacent to β-Sn phase in No. 1–4 solder alloys (Table 1.).

**General information**

State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Budapest University of Technology and Economics
Authors: Li, F. (Intern), Verdingovas, V. (Intern), Medgyes, B. (Ekstern), Ambat, R. (Intern)
Number of pages: 6
Publication date: 2017
Corrosion Reliability of Lead-free Solder Systems Used in Electronics
The present work investigated the corrosion reliability of Sn-Ag-Cu based five lead-free solder alloys. The corrosion and electrochemical migration (ECM) susceptibility study of the solder alloys has been carried out by water droplet (WD) tests on pure alloy ingot samples, and by accelerated humidity/temperature cycling tests on soldered surface insulation resistance (SIR) comb pattern. Complimentary microstructural and phase analysis of solder alloys has been carried out using the scanning electron microscope (SEM), energy dispersive spectroscopy (EDS), and X-ray diffraction (XRD) methods. The galvanic corrosion was found between cathodically active Bi phase and anodic (Sn, Sb) solid solution in InnoLot alloy, while the Ag3Sn phase was cathodically active in the other four alloys. The paper theoretically illustrated the reason for the differences in corrosion reliability in the five alloys based on the composition and distribution of intermetallic compounds (IMCs).

General information
State: Published
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, Budapest University of Technology and Economics
Authors: Li, F. (Intern), Verdingovas, V. (Intern), Medgyes, B. (Ekstern), Ambat, R. (Intern)
Number of pages: 10
Publication date: 2017

Corrosion Resistance of AISI 316L Coated with an Air-Cured Hydrogen Silsesquioxane Based Spin-On-Glass Enamel in Chloride Environment
The efficiency of thin hydrogen silsesquioxane (HSQ)-based corrosion barrier coatings on 316L substrates after oxidative thermal curing at 400-550 ºC in air was investigated. Infrared spectroscopy and electrochemical impedance spectroscopy showed that an increasing curing temperature leads to progressing coating densification, accompanied by decreasing barrier properties. Cyclic polarization measurements indicated that defects due to substrate oxidation are detrimental for the substrate passivity. Insufficiently polymerized coatings showed poor chemical stability in neutral salt spray testing and the chemical coating stability increased with curing temperature. Oxidative curing was found inadequate as polymerization treatment of HSQ-based corrosion barrier coatings on 316L substrate.

General information
State: Accepted/In press
Organisations: Department of Mechanical Engineering, Materials and Surface Engineering, SiOx ApS, Delft University of Technology
Authors: Lampert, F. (Intern), Bruun Christiansen, A. (Ekstern), Din, R. U. (Intern), Gonzalez-Garcia, Y. (Ekstern), Møller, P. (Intern)
Number of pages: 39
Publication date: 2017
Main Research Area: Technical/natural sciences
Co-Simulation of Cyber-Physical System with Distributed Embedded Control

Cyber-Physical Systems (CPS) are integrations of computation and physical processes, with distributed embedded computation units, connected by network, controlling and monitoring a physical plant. The development of physical components is essentially different from the object-oriented software of the computation units. A major challenge developing CPS, is the nonlinear interaction between the discrete domain of the computational units and the continuous domain of the physical process. Model based development of both discrete and continuous systems has significantly benefited from specialized modelling and simulation tools in each domain. However, to realize the full potential of CPS, the abstraction-level of models and simulation has to unify both computation and physical dynamics. A solution to this, is a so
Co-simulation where the coupled problem is divided into sub-systems where each constituent model can be solved by its optimum tool/solver in a distributed manner. This enables domain expert to work in domain specific tools while being able to simulate the complete CPS in a holistic manner. This dissertation provides a solution for doing co-simulation of CPS with distributed embedded control. This research has been conducted in collaboration with MAN Diesel & Turbo (MD&T) using their CPS, consisting of a two-stroke low speed engine with a distributed engine control system, as case study. Adapting a distributed control system to enable co-simulation is not trivial. How the lower layers of the embedded system software has been adapted to enable a deterministic and temporally controlled simulation will be presented. This includes how multiple controllers are compiled to dynamic link libraries that can be executed in parallel by a main process.

A method for controlling execution and time progression on each controller has been developed along with a scheduling and network communication solution. To enable co-simulation with tools for modelling physical dynamics, the Functional Mockup Interface (FMI) standard for co-simulation has been implemented in the control system simulation. The solutions presented are validated through a set co-simulation experiments using the MD&T engine control system and different physical dynamic modelling tools. During the research new applications and requirements to the co-simulation environment was discovered. In large organizations like MD&T, tools, platforms and architecture used by different departments often deviate, making co-simulation and model exchange difficult. In collaboration with the EU Horizon 2020 project; Integrated Tool-chain for the model based design of Cyber-Physical Systems (INTO-CPS), a distributed co-simulation was made possible, that was able to co-simulate sub-systems of any architecture (32/64bit) and platform (Windows/Linux). Furthermore, when developing safety critical CPS that include a Human Machine Interface (HMI), the human interaction and cognitive assessment is of great importance. However, it is often difficult to obtain quantitative and evidence based data on the human in the loop. With an extension to the co-simulation environment it is possible to connect the control system simulation with the HMI in a hybrid co-simulation. In the hybrid co-simulation scenarios requiring human inter action can be formulated and tracked. The collected data can be used for analyzing the system applicability and intuitiveness, insuring correct and secure operation of MD&T engines. Validation and verification on hardware and engine test-benches is a major part of the development cost at MD&T. With the possibility of simulating the complete distributed control system, engineers are able to verify more of the component design before moving to the hardware test-bench. Furthermore, by introducing co-simulation, engineers can investigate and validate the holistic system dynamics during development before moving to the Engine test-bench and do model sharing between departments, reducing redundant modelling efforts. This research provides a solution for doing co-simulation of CPS with distributed control and proves that co-simulation can improve the development process, by reducing the amount of design and test loops during the design phase, thereby reducing the overall verification and validation cost.

**General information**

State: Submitted
Organisations: Department of Applied Mathematics and Computer Science, Embedded Systems Engineering
Authors: Pedersen, N. (Intern), Madsen, J. (Intern)
Number of pages: 136
Publication date: 2017

**Publication information**

Publisher: DTU Compute
Original language: English
Main Research Area: Technical/natural sciences

**Relations**

Projects:
Co-Simulation of Cyber-Physical System with Distributed Embedded Control
Publication: Research › Ph.D. thesis – Annual report year: 2017

**Co-simulation with DlgSILENT PowerFactory and Matlab: Optimal integration of plug-in electric vehicles in distribution networks**

Smart grid concept is gaining more and more importance in electric power systems. In near term, electric grids will be more intelligent, interconnected and decentralised. Dealing with a significant number of distributed resources in a smart way, frequently requires the use of optimal control techniques, which find the best solution according to a defined objective function. Taking into account all these aspects, the simulation of these types of problems are characterised by having a great number of controlled resources and the use of advanced control techniques. In this context, DlgSILENT PowerFactory provides useful tools to simulate complex systems. On the one hand, the DlgSILENT Programming Language (DPL) can be used for multiple purposes such as automation of simulations, automatic generation of simulation scenarios, analysis of results, etc. On the other hand, the DlgSILENT Simulation Language (DSL) and the digexfun interface allow the implementation of advanced control techniques. Using the digexfun interface, DlgSILENT PowerFactory can send and receive data from other mathematical software APIs such as Matlab. This chapter presents a co-simulation framework developed to test optimal control methods for root mean square (RMS) simulations on DlgSILENT PowerFactory. As an example, the implementation of a smart charging control for plug-in electric vehicles in electric distribution networks is explained.

**General information**

State: Accepted/In press
Cost-Benefit Analysis of a Novel DC Fast-Charging Station with a Local Battery Storage for EVs

The increasing penetration of Electric Vehicles (EVs) and their charging systems is representing new highpower consumption loads for the distribution system operators (DSOs). To solve the problem of the EV range in terms of driving kilometers, the car manufacturers have invested resources on new EV models by increasing the size of the batteries. To satisfy EV load demand of the new EV models in urban areas the public DC Fast-Charging Station (DCFCS) is indispensable to recharge EVs rapidly. The introduction of the Battery Energy Storage within the DCFCSs is considered in this paper an alternative solution to reduce the operational costs of the charging stations as well as the ability to mitigate negative impacts during the congestion on the power grids. An accurate description of the DCFCS and its design system, which is able to decouple the peak load demand caused by EVs on the main grid and decrease the connection fees. Finally, an economic evaluation is done to evaluate the feasibility and the cost-benefit analysis (CBA) of the DCFCSs. The proposed approach considers various technical and economic issues, such as cost of installation, connection fees and life cycle cost of the batteries. The proposed cost-benefit analysis can be used to verify the effectiveness and applicability of DCFCS in large scale.
Cost competitive "soft sensor" for determining product recovery in industrial methanol

The measurement of ratio of product recovery in industrial methanol distillation is of high economic importance and represent a key performance index (KPI) of the distillation unit. In current operations, the product recovery of many industrial distillation units are not actively monitored, instead back calculated from daily production reports. The active monitoring of product recovery can be a costly affair as it requires expensive gas chromatographs and accurate feed mass flow measuring devices to be installed. Historically, this has been one of the key reasons for not actively monitoring product recovery. In this work a novel, simple and economical method based on density and flow rate measurements to calculate the product recovery of industrial methanol distillation columns has been developed. This method has been validated against plant measurements as well as a validated process simulation. Step and disturbance tests carried out suggest the proposed method is able to accurately estimate the product recovery within the plant operational envelope, but lacks the ability to capture the process dynamics during process changes.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, CAPEC-PROCESS, S&D Consulting LLC, Technical University of Applied Sciences, Nürnberg, University of Auckland
Authors: S.B.A. Udugama, I. (Intern), Mansouri, S. S. (Intern), Huusom, J. K. (Intern), Taube, M. A. (Ekstern), Maidl, A. (Ekstern), Young, B. (Ekstern)
Pages: 23-28
Publication date: 2017

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Title of host publication: 2017 Moratuwa Engineering Research Conference (MERCon)
Publisher: IEEE
Main Research Area: Technical/natural sciences
Conference: 2017 Moratuwa Engineering Research Conference (MERCon), Moratuwa, Sri Lanka, 29/05/2017 - 29/05/2017
Soft sensor, High Purity, Industrial Distillation
DOIs: 10.1109/MERCon.2017.7980450
Source: PublicationPreSubmission
Source-ID: 134132256
Publication: Research - peer-review › Article in proceedings – Annual report year: 2017

Cost-effective evolution of research prototypes into end-user tools: The MACH case study

Much of Software Engineering research needs to provide an implementation as proof-of-concept. Often such implementations are created as exploratory prototypes without polished user interfaces, making it difficult to (1) run user studies to validate the tool's contribution, (2) validate the author's claim by fellow scientists, and (3) demonstrate the utility and value of the research contribution to any interested parties. However, turning an exploratory prototype into a “proper” tool for end-users often entails great effort. Heavyweight mainstream frameworks such as Eclipse do not address this issue; their steep learning curves constitute substantial entry barriers to such ecosystems.

In this paper, we present the Model Analyzer/Checker (MACH), a stand-alone tool with a command-line interpreter. MACH integrates a set of research prototypes for analyzing UML models. By choosing a simple command line interpreter rather than (costly) graphical user interface, we achieved the core goal of quickly deploying research results to a broader audience while keeping the required effort to an absolute minimum. We analyze MACH as a case study of how requirements and constraints in an academic environment influence design decisions in software tool development. We argue that our approach while perhaps unconventional, serves its purpose with a remarkable cost-benefit ratio.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Software Engineering
Authors: Störrle, H. (Intern)
Number of pages: 14
Pages: 47–60
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Science of Computer Programming
Volume: 134
ISSN (Print): 0167-6423
Ratings: BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
Cost estimation of a specifically designed direct light processing (DLP) additive manufacturing machine for precision printing

Additive Manufacturing (AM) refers to a portfolio of novel manufacturing technologies based on a layer-by-layer fabrication method. The market and industrial application of additive manufacturing technologies as an established manufacturing process have increased exponentially in the last years creating new opportunities for manufacturers in a variety of industrial sectors. AM is an essential prototyping technique for product design and development that is used in many different fields. However, the suitability of AM applications in actual production in an industrial context needs to be determined. This study, presents a cost estimation model for precision printing with a specifically designed Digital Light Processing (DLP) AM machine built and validated at the Technical University of Denmark. The model presented in this study can be easily adapted and applied to estimate within a high level of confidence the cost of any part manufactured with the mentioned 3D printing technology.
Counter-diffusion biofilms have lower N\textsubscript{2}O emissions than co-diffusion biofilms during simultaneous nitrification and denitrification: Insights from depth-profile analysis

The goal of this study was to investigate the effectiveness of a membrane-aerated biofilm reactor (MABR), a representative of counter-current substrate diffusion geometry, in mitigating nitrous oxide (N\textsubscript{2}O) emission. Two laboratory-scale reactors with the same dimensions but distinct biofilm geometries, i.e., a MABR and a conventional biofilm reactor (CBR) employing co-current substrate diffusion geometry, were operated to determine depth profiles of dissolved oxygen (DO), nitrous oxide (N\textsubscript{2}O), functional gene abundance and microbial community structure. Surficial nitrogen removal rate was slightly higher in the MABR (11.0 ± 0.80 g-N/(m\textsuperscript{2} day)) than in the CBR (9.71 ± 0.94 g-N/(m\textsuperscript{2} day)), while total organic carbon removal efficiencies were comparable (96.9 ± 1.0% for MABR and 98.0 ± 0.8% for CBR). In stark contrast, the dissolved N\textsubscript{2}O concentration in the MABR was two orders of magnitude lower (0.011 ± 0.001 mg N\textsubscript{2}O-N/L) than that in the CBR (1.38 ± 0.25 mg N\textsubscript{2}O-N/L), resulting in distinct N\textsubscript{2}O emission factors (0.0058 ± 0.0005% in the MABR vs. 0.72 ± 0.13% in the CBR). Analysis on local net N\textsubscript{2}O production and consumption rates unveiled that zones for N\textsubscript{2}O production and consumption were adjacent in the MABR biofilm. Real-time quantitative PCR indicated higher abundance of denitrifying genes, especially nitrous oxide reductase (nosZ) genes, in the MABR versus the CBR. Analyses of the microbial community composition via 16S rRNA gene amplicon sequencing revealed the abundant presence of the genera Thauera (31.2 ± 11%), Rhizobium (10.9 ± 6.6%), Stenotrophomonas (6.8 ± 2.7%), Sphingobacteria (3.2 ± 1.1%) and Brevundimonas (2.5 ± 1.0%) as potential N\textsubscript{2}O-reducing bacteria in the MABR.
This thesis studies the wind-wave interactions through the coupling between the atmospheric model and ocean surface wave models. Special attention is put on storm simulations in the North Sea for wind energy applications in the coastal zones. The two aspects, namely storm conditions and coastal areas, are challenging for the wind-wave coupling system because: in storm cases, the wave field is constantly modified by the fast varying wind field; in coastal zones, the wave field is strongly influenced by the bathymetry and currents. Both conditions have complex, unsteady sea state varying with time and space that challenge the current coupled modeling system.

The conventional approach of estimating the momentum exchange is through parameterizing the aerodynamic roughness length ($z_0$) with wave parameters such as wave age, steepness, significant wave height, etc. However, it is found in storm and coastal conditions, $z_0$ parameterization method often fails in reproducing $z_0$ because the complexity of the sea state cannot be represented by a few selected wave parameters. Different from the parameterization method, physics-based methods take the idea that the loss of momentum and kinetic energy from the atmosphere must, by conservation, result in
the generation of the surface waves and currents. The physics-based methods are sensitive to
the choice of wind-input source function (Sin), parameterization of high-frequency wave spectra tail, and numerical cut-off
frequencies. Unfortunately, literature survey shows that in most wind-wave coupling systems, either the Sin in the wave
model is different from the one used for the momentum flux estimation in the atmospheric model, or the methods are too
sensitive to the parameterization of high-frequency spectra tail and numerical cut-off frequencies.

To confront the above mentioned challenges, a wave boundary layer model (WBLM) is implemented in the wave model
SWAN as a new Sin. The WBLM Sin is based on the momentum and kinetic energy conservation. The wave-induced
mean wind profile changes at all vertical levels within the wave boundary layer, and the spectral sheltering effect at each
frequency within the wave spectrum are explicitly considered. The WBLM Sin is used for both the calculation of the wave
growth and the estimation of the air-sea momentum flux. Moreover, the WBLM Sin extended the model ability in high-
frequency ranges so that the issue of high-frequency spectra tail and numerical cut-off frequencies are automatically
solved. The new WBLM method is proved to be able to improve both the wave simulation and stress estimation in
idealized fetch-limited wind-wave evolution studies.

To apply the WBLM method in real cases, proper setup of the dissipation source function, numerical stability and model
efficiency are needed to be considered. Therefore, a revised dissipation source function for the wave model and a
refinement of the numerical algorithm of WBLM Sin is done. The new pair of wind-input and dissipation source functions
are evaluated with point measurements through wave simulations during offshore and onshore storms in the west coast of
Denmark. The WBLM method is proved to provide significant wave height and mean wave period that outperforms the
other approaches in SWAN when compared with measurements.

The WBLM method is further applied in the wind-wave coupling system during a number of North Sea storms. In
comparison, six other coupling method have also been used for one of the storms. Results of wind, wave, and stress have
been validated with point measurements at a coastal, shallow water site. In particular, the spatial distribution of z0 from
WBLM is found to have similar spatial patterns as the Advanced Synthetic Aperture Radar (ASAR) radar backscatter; both
show features of the bathymetry. Analysis of the wind field from the non-coupled and WBLM coupled experiments show
that the wind-wave coupling is important in strong wind conditions, varying wind conditions
(e.g. front system, open cellular convections during a storm), and coastal areas.

General information
State: Published
Organisations: Department of Wind Energy, Resource Assessment Modelling, DHI Hørsholm
Authors: Du, J. (Intern), Larsén, X. G. (Intern), Kelly, M. C. (Intern), Larsen, S. E. (Intern), Bolanos, R. (Ekstern)
Number of pages: 136
Publication date: 2017

Publication information
Place of publication: Kgs. Lyngby
Publisher: Technical University of Denmark (DTU)
Original language: English
Series: DTU Wind Energy PhD
Main Research Area: Technical/natural sciences
Electronic versions:
  JiantingDu_PhD_Thesis.pdf
DOIs:
  10.11581/DTU:00000020

Relations
Projects:
  Coupling atmospheric and ocean wave models for storm simulation
Publication: Research › Ph.D. thesis – Annual report year: 2017

Coupling between creep and redox behavior in nickel - yttria stabilized zirconia observed in-situ by monochromatic
neutron imaging
Ni-YSZ (nickel - yttria stabilized zirconia) is a material widely used for electrodes and supports in solid oxide
electrochemical cells. The mechanical and electrochemical performance of these layers, and thus the whole cell, depends
on their microstructure. During the initial operation of a cell, NiO is reduced to Ni. When this process is conducted under
external load, like also present in a stack assembly, significant deformations of NiO/Ni-YSZ composite samples are
observed. The observed creep is orders of magnitude larger than the one observed after reduction during operation. This
phenomenon is referred to as accelerated creep and is expected to have a significant influence on the microstructure
development and stress field present in the Ni-YSZ in solid oxide electrochemical cells (SOCs), which is highly important
for the durability of the SOC. In this work we present energy selective neutron imaging studies of the accelerated creep
phenomenon in Ni/NiO-YSZ composite during reduction and also during oxidation. This approach allowed us to observe
the phase transition and the creep behavior simultaneously in-situ under SOC operation-like conditions.
Covalent organic polymer functionalization of activated carbon surfaces through acyl chloride for environmental clean-up

Nanoporous networks of covalent organic polymers (COPs) are successfully grafted on the surfaces of activated carbons, through a series of surface modification techniques, including acyl chloride formation by thionyl chloride. Hybrid composites of activated carbon functionalized with COPs exhibit a core-shell formation of COP material grafted to the outer layers of activated carbon. This general method brings features of both COPs and porous carbons together for target-specific environmental remediation applications, which was corroborated with successful adsorption tests for organic dyes and metals.

General information
State: Published
Organisations: Department of Environmental Engineering, Surface Engineering, Department of Micro- and Nanotechnology, Korea Advanced Institute of Science and Technology
Pages: 766-771
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Chemical Engineering Journal
Volume: 309
ISSN (Print): 1385-8947
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 6.34
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 5.68
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 4.92
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 4.59
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.92
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 3.96
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Activated carbon, Covalent organic polymers, Water treatment, Acyl chloride, Surface grafting

DOIs: 10.1016/j.cej.2016.10.085

Publication: Research - peer-review › Journal article – Annual report year: 2016

Projects:

**Smart Cities Acclerator**
European Interreg Project with 6 municipality implementing the research findings of the CITIES project in cooperation with other universities in the area Copenhagen, Southern Sweden.

Centre for IT-Intelligent Energy Systems in Cities

Department of Civil Engineering
Department of Applied Mathematics and Computer Science
Department of Management Engineering
Period: 20/04/2018 → 20/07/2018
Number of participants: 3
Acronym: SCA
Project participant: Heller, Alfred (Intern)
Nielsen, Per Sieverts (Intern)
Project Manager, academic: Madsen, Henrik (Intern)

**Smooth advanced silicon NEMS devices**

DTU Danchip
Period: 01/12/2017 → …
Number of participants: 1
Project participant: Jansen, Henri (Intern)

**Investigation of the relationships between the subjective assessment and objective parameters of music listening spaces**

Department of Electrical Engineering
Period: 15/10/2017 → 14/10/2021
Number of participants: 4
Phd Student: Wincentz, Jakob Nygård (Intern)
Supervisor: Brunskog, Jonas (Intern)
Gade, Anders Christian (Intern)
Main Supervisor: Jeong, Cheol-Ho (Intern)
**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Novel Tools for Ultra-Specific Targeting of Nucleic Acids**
Department of Chemistry
Period: 15/10/2017 → 14/04/2019
Number of participants: 3
Phd Student:
Taskova, Maria (Intern)
Supervisor:
Clausen, Mads Hartvig (Intern)
Main Supervisor:
Astakhova, Kira (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Multiple working time arrangements and work process coordination in complex health and care systems**
Department of Management Engineering
Management Science
Implementation and Performance Management
International Research Institute of Stavanger
Period: 01/10/2017 → …
Number of participants: 1
Project participant:
Edwards, Kasper (Intern)
Project

**Advanced Landing, Interception and Exploration Navigation through Sensorfusion**
National Space Institute
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
Phd Student:
Christensen, Lukas Alexander Mads (Intern)
Supervisor:
Jørgensen, John Leif (Intern)
Main Supervisor:
Merayo, José M.G. (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Bacteriophage based technology to control Flavobacterium pathogens in aquaculture**
National Veterinary Institute
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
Phd Student:
Donati, Valentina Laura (Intern)
Supervisor:
Madsen, Lone (Intern)
Main Supervisor:
Dalsgaard, Inger (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Biomineralization and Biomimetics**
Department of Micro- and Nanotechnology
Period: 01/10/2017 → 30/09/2020
Number of participants: 2
Phd Student:
Mandsberg, Nikolaj Kofoed (Intern)
Main Supervisor:
Berg, Rolf Henrik (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Characterization of wind turbine siting parameters in complex terrain using remote sensing**
Department of Wind Energy
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
Phd Student:
De Azevedo Santos, Pedro Alvim (Intern)
Supervisor:
Vasiljevic, Nikola (Intern)
Main Supervisor:
Mann, Jakob (Ekstern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

**Design Approaches for Terahertz Electronics using Active Device Configurations**
Department of Electrical Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
Phd Student:
Turhaner, Arsen (Intern)
Supervisor:
Boppel, Sebastian (Ekstern)
Main Supervisor:
Johansen, Tom Keinicke (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

**Development of advanced drug delivery systems for therapeutic radionuclides in cancer treatment**
Department of Micro- and Nanotechnology
Period: 01/10/2017 → 30/09/2020
Number of participants: 4
Phd Student:
Magnus, Charlotte Busk (Intern)
Supervisor:
Andresen, Thomas Lars (Intern)
Herth, Matthias (Ekstern)
Main Supervisor:
Jensen, Andreas Tue Ingemann (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Gaseous surface hardening and heat treatment of martensitic stainless steel

Department of Mechanical Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 5
Phd Student:
Tibollo, Chiara (Intern)
Supervisor:
Barrallier, Laurent (Ekstern)
Christiansen, Thomas Lundin (Intern)
Michel, Grégory (Ekstern)
Main Supervisor:
Somers, Marcel A. J. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Modelling the thermo-metalurgical-mechanical conditions in precision additive metal manufacturing

Department of Mechanical Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 5
Phd Student:
Bayat, Mohamad (Intern)
Supervisor:
Mohanty, Sankhya (Intern)
Thorborg, Jesper (Intern)
Tiedje, Niels Skat (Intern)
Main Supervisor:
Hattel, Jesper Henri (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD
Thorborg, Jesper (Intern)
Tiedje, Niels Skat (Intern)
Main Supervisor:
Hattel, Jesper Henri (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Non-Gaussian Cluster States
Department of Physics
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
Phd Student:
Larsen, Mikkel Vilsbøll (Intern)
Supervisor:
Neergaard-Nielsen, Jonas Schou (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-Su Stipendium, Eksperiment
Project: PhD

Optical phase conjugation for high-spectrally efficient transmission
Department of Photonics Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 4
Phd Student:
Kaminski, Pawel Marcin (Intern)
Supervisor:
Da Ros, Francesco (Intern)
Forchhammer, Søren (Intern)
Main Supervisor:
Galili, Michael (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Optical Sensor Disc
Department of Micro- and Nanotechnology
Period: 01/10/2017 → 30/09/2020
Number of participants: 4
Phd Student:
Serioli, Laura (Intern)
Supervisor:
Rindzevicius, Tomas (Intern)
Zor, Kinga (Intern)
Main Supervisor:
Boisen, Anja (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Performance optimization of wind farms using model-based data analysis

Department of Wind Energy
Period: 01/10/2017 → 30/09/2020
Number of participants: 5
PhD Student:
Schröder, Laura (Intern)
Supervisor:
Mirzaei, Mahmood (Intern)
Sørensen, John Aasted (Intern)
Verelst, David Robert (Intern)
Main Supervisor:
Hansen, Morten Hartvig (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Reconstituted high-density lipoproteins for immuno- and chemotherapeutic drug delivery

Department of Micro- and Nanotechnology
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
PhD Student:
Pedersbæk, Dennis (Ekstern)
Supervisor:
Andresen, Thomas Lars (Intern)
Main Supervisor:
Simonsen, Jens Bæk (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Ship propulsion in waves

Department of Mechanical Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 3
PhD Student:
Saettone, Simone (Intern)
Supervisor:
Steen, Sverre (Ekstern)
Main Supervisor:
Andersen, Poul (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Supplier Relationship Management at FLSmidth

Department of Management Engineering
Period: 01/10/2017 → 30/09/2020
Number of participants: 4
PhD Student:
Piatto, Alberto (Intern)
Systems Biology of the Infant Gut Microbiome

Department of Systems Biology  
Period: 01/10/2017 → 30/09/2020  
Number of participants: 4  
PhD Student:  
Myers, Pernille Neve (Intern)  
Supervisor:  
Nielsen, Henrik Bjørn (Intern)  
Pedersen, Anders Gorm (Intern)  
Main Supervisor:  
Pedersen, Susanne Brix (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Industrial PhD  
Project: PhD

Towards accurate prediction of T cell targets: Learning the rules of T cell receptor interaction

National Veterinary Institute  
Period: 01/10/2017 → 30/09/2020  
Number of participants: 3  
PhD Student:  
Holm, Jeppe Sejerø (Intern)  
Supervisor:  
Nielsen, Morten (Intern)  
Main Supervisor:  
Hadrup, Sine Reker (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Offentlig finansiering  
Project: PhD

Advanced meteorological modeling across scales

Department of Wind Energy  
Period: 15/09/2017 → 14/09/2020  
Number of participants: 3  
PhD Student:  
Imberger, Marc (Intern)  
Supervisor:  
Davis, Neil (Intern)  
Main Supervisor:  
Larsén, Xiaoli Guo (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Forskningsrådsfinansiering  
Project: PhD
Applied Biodiversity for Identification of Superior Cell Factories for Industrial Enzyme Production

Department of Systems Biology
Period: 15/09/2017 → 14/09/2020
Number of participants: 3
Phd Student:
Rendsvig, Jakob Kræmmer (Intern)
Supervisor:
Persson, Martin (Ekstern)
Main Supervisor:
Mortensen, Uffe Hasbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-Su Stipendium, Eksperiment
Project: PhD

Data driven UX engineering of cognitive interfaces for augmented hearing

Department of Applied Mathematics and Computer Science
Period: 15/09/2017 → 14/09/2020
Number of participants: 4
Phd Student:
Korzepa, Maciej Jan (Intern)
Supervisor:
Larsen, Jakob Eg (Intern)
Petersen, Michael Kai (Intern)
Main Supervisor:
Larsen, Jan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Developing Modular Product and Process Architectures in Engineer to Order (ETO) Companies

Department of Mechanical Engineering
Period: 15/09/2017 → 14/09/2020
Number of participants: 3
Phd Student:
Christensen, Carsten Keinicke Fjord (Intern)
Supervisor:
Hvam, Lars (Intern)
Main Supervisor:
Mortensen, Niels Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Extension of a Fast Potential Flow Solver to Fully-Nonlinear Wave Loading on Offshore Structures

Department of Mechanical Engineering
Period: 15/09/2017 → 14/09/2020
Number of participants: 4
Phd Student:
Hicks, Jacob Bjarke Hansen (Intern)
Supervisor:
Lindberg, Ole (Intern)  
Read, Robert (Intern)  
Main Supervisor:  
Bingham, Harry B. (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD  

Integrating Micro and Nano structures on Steel Surfaces - Process Chain Implementation and Validation  
Department of Mechanical Engineering  
Period: 15/09/2017 → 14/09/2020  
Number of participants: 4  
Phd Student:  
Loaldi, Dario (Intern)  
Supervisor:  
Calaon, Matteo (Intern)  
Zhang, Yang (Intern)  
Main Supervisor:  
Tosello, Guido (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD  

Latency Critical Networking  
Department of Photonics Engineering  
Period: 15/09/2017 → 14/09/2020  
Number of participants: 4  
Phd Student:  
Zhou, Zifan (Intern)  
Supervisor:  
Berger, Michael Stübert (Intern)  
Wessing, Henrik (Intern)  
Main Supervisor:  
Yan, Ying (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD  

Model Predictive Control in Urban Systems  
Department of Applied Mathematics and Computer Science  
Period: 15/09/2017 → 14/09/2020  
Number of participants: 5  
Phd Student:  
Svensen, Jan Lorenz (Intern)  
Supervisor:  
Falk, Anne Katrine Vinther (Intern)  
Madsen, Henrik (Intern)  
Niemann, Hans Henrik (Intern)  
Main Supervisor:  
Poulsen, Niels Kjølstad (Intern)  

Financing sources
New industrial paradigm for design of wind turbine blades - tip and root optimization for increasing power performance

Department of Wind Energy
Period: 15/09/2017 → 14/09/2020
Number of participants: 4
Phd Student:
Lønbæk, Kenneth (Ekstern)
Supervisor:
Madsen, Jens Ingemann (Ekstern)
Zahle, Frederik (Intern)
Main Supervisor:
Bak, Christian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Novel Response Methods for Challenging Phenomena

Department of Chemistry
Period: 15/09/2017 → 14/09/2020
Number of participants: 3
Phd Student:
Lopez Vidal, Marta (Intern)
Supervisor:
Møller, Klaus Braagaard (Intern)
Main Supervisor:
Coriani, Sonia (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Stochastic Predictive Control of Wastewater Treatment Processes

Department of Applied Mathematics and Computer Science
Period: 15/09/2017 → 14/09/2020
Number of participants: 6
Phd Student:
Stentoft, Peter Alexander (Intern)
Supervisor:
Madsen, Henrik (Intern)
Mikkelsen, Peter Steen (Intern)
Munk-Nielsen, Thomas (Ekstern)
Vezzaro, Luca (Intern)
Main Supervisor:
Møller, Jan Kloppenborg (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Topology optimization for transient problems
Department of Mechanical Engineering
Period: 15/09/2017 → 14/09/2020
Number of participants: 4
Phd Student:
Kristiansen, Hansotto (Intern)
Supervisor:
Poulios, Konstantinos (Intern)
Sigmund, Ole (Intern)
Main Supervisor:
Aage, Niels (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Viscoelastic Simulation and Optimization of Filament based 3D Printing
Department of Mechanical Engineering
Period: 15/09/2017 → 14/09/2020
Number of participants: 3
Phd Student:
Serdeczny, Marcin Piotr (Intern)
Supervisor:
Pedersen, David Bue (Intern)
Main Supervisor:
Spangenberg, Jon (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Protein valorization through informatics, hydrolysis, and separation
WP leader on the industrialization part of proteins from seaweed
National Food Institute
Research Group for Bioactives – Analysis and Application
Research Group for Gut Microbiology and Immunology
Period: 01/09/2017 → 31/08/2021
Number of participants: 4
Acronym: PROVIDE
Project participant:
Holdt, Susan Løvstad (Intern)
Jacobsen, Charlotte (Intern)
Hansen, Egon Bech (Intern)
García Moreno, Pedro Jesús (Intern)

Cyber Resilience for the Shipping Industry
The CyberShip project is aimed at providing shipping companies and regulators with a reference framework and decision support model to better cope with disruptions originating from a cyber-attack.
Department of Management Engineering
Management Science
Transport DTU
Operations Management
Department of Applied Mathematics and Computer Science

Cyber Security

Copenhagen Center for Health Technology
Period: 01/09/2017 → 31/08/2019
Number of participants: 4
Acronym: CyberShip
Project participant:
Psaraftis, Harilaos N. (Intern)
Jensen, Christian D. (Intern)
Sepúlveda Estay, Daniel Alberto (Intern)

Project Manager, organisational:
Barfod, Michael Bruhn (Intern)

Adaptability of tropical copepods to warmer and polluted future: with emphasis on metagenomics after multiple-generation exposure
The adaptability of tropical copepods to global warming and polluted environment will be tested using metagenomics approach.

National Institute of Aquatic Resources
Section for Oceans and Arctic
Period: 01/09/2017 → 31/08/2019
Number of participants: 1

Tropical marine ecosystem, Pseudodiaptomus annandalei, global warming, adaptation, metagenomics, gut microbiomes, contaminants, PAH
Project Manager, academic:
Dinh, Khuong Van (Intern)

3D Ultrasound Cardiac Vector Flow Imaging
Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
PhD Student:
Parkhomenko, Kseniya (Intern)
Supervisor:
Jensen, Jørgen Arendt (Intern)
Traberg, Marie Sand (Intern)
Main Supervisor:
Stuart, Matthias Bo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Advanced Game-Theoretical Aspects in Electricity Markets
Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
PhD Student:
Dvorkin, Vladimir (Intern)
Supervisor:
Kazempour, Jalal (Intern)
Main Supervisor:
Pinson, Pierre (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Air-pollutant sensor system for wood stoves
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Du, Yifan (Ekstern)
Supervisor:
Clausen, Sønnik (Intern)
Illerup, Jytte Boll (Intern)
Main Supervisor:
Glarborg, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Air-pollutant sensor system for wood stoves
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Du, Yifan (Intern)
Supervisor:
Clausen, Sønnik (Intern)
Illerup, Jytte Boll (Intern)
Main Supervisor:
Glarborg, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Anticorrosive coatings and pigments engineering
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
SedaghatNezhad, Sina (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Erik Weinell, Claus (Intern)
Main Supervisor:
Kiil, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Automatic Decomposition of Mixed Integer Linear Programs
Biofuel production based on Integrated Systems combining Biomass Gasification and Solid Oxide Cells

Characterization and Reducing the Influence of Model Errors in Inverse Problems

Characterization of intestinal stromal cells
Climate tipping indicators for improved environmental sustainability assessment of bioplastics

Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Fabbri, Serena (Intern)
Supervisor: Hauschild, Michael Zwicky (Intern)
Main Supervisor: Owsianiak, Mikolaj (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

CodeSphere - Molecular encoding of Nanoparticles for targeted cargo delivery

National Veterinary Institute
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student: Moss, Keith Henry (Intern)
Supervisor: Andresen, Thomas Lars (Intern)
Jakobsen, Søren Nyboe (Intern)
Main Supervisor: Hadrup, Sine Reker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Computational design of electrocatalysts for CO2 reduction

Department of Energy Conversion and Storage
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Kildgaard, Jens Vive (Intern)
Supervisor: Hansen, Heine Anton (Intern)
Main Supervisor: Vegge, Tejs (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD
Deep Metric Learning
Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Detlefsen, Nicki Skafte (Intern)
Supervisor:
Winther, Ole (Intern)
Main Supervisor:
Hauberg, Søren (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Designing New Ways of Working in Industry 4.0
Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Kadir, Bzhwen A (Intern)
Supervisor:
Souza da Conceição, Carolina (Intern)
Maier, Anja (Intern)
Main Supervisor:
Broberg, Ole (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Design of heterogeneous metal catalysts for C-H Functionalization
Department of Chemistry
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Bennedsen, Niklas Rosendal (Intern)
Supervisor:
Kramer, Søren (Intern)
Mielby, Jerrik Jørgen (Intern)
Main Supervisor:
Kegnæs, Søren (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Development and Application of Novel Free-floating Sensor Device for Bioprocess Optimization
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 5
Phd Student:
Bisgaard, Jonas (Intern)
Supervisor:
Huusom, Jakob Kjøbsted (Intern)
Development of polymer-particle composites for adhesive formulations with controlled water uptake kinetics

Department of Chemistry
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Eiler, Johannes (Intern)
Supervisor:
Almdal, Kristoffer (Intern)
Bingöl, Bahar (Ekstern)
Main Supervisor:
Thormann, Esben (Intern)

Development of Porous Electrodes for Alkaline Electrolyzers

Department of Energy Conversion and Storage
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Reumert, Alexander Kappel (Intern)
Supervisor:
Cleemann, Lars Nilausen (Intern)
Kraglund, Mikkel Rykær (Intern)
Main Supervisor:
Jensen, Jens Oluf (Intern)

Efficient 3D Shape Optimization

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Limkilde, Asger (Intern)
Supervisor:
Evgrafov, Anton (Intern)
Main Supervisor:
Gravesen, Jens (Intern)
Efficient and Scalable Market Design for Renewable-based Integrated Energy Systems

Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Schwele, Anna (Intern)
Supervisor:
Kazempour, Jalal (Intern)
Main Supervisor:
Pinson, Pierre (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Engineering of Polyketide Synthases for Production of Polyketides in Saccharomyces cerevisiae

Technical University of Denmark
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Romero Suarez, David (Intern)
Supervisor:
Keasling, Jay (Intern)
Weber, Tilmann (Intern)
Main Supervisor:
Jensen, Michael Krogh (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsstipendium
Project: PhD

Error Reconcilliation Protocols for Continuous-Variable Quantum Key Distribution

Department of Physics
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Mani, Hossein (Intern)
Supervisor:
Gehring, Tobias (Intern)
Pacher, Christoph (Ekstern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Explainability of uncertainty for neutral networks

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Rieger, Laura (Ekstern)
Supervisor: Nielsen, Finn Årup (Intern)
Main Supervisor: Hansen, Lars Kai (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Explainability of uncertainty for neural networks

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Rieger, Laura (Intern)
Supervisor: Nielsen, Finn Årup (Intern)
Main Supervisor: Hansen, Lars Kai (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Flexible operations research methods for health care

Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Bodvarsdottir, Elin Bjørk (Intern)
Supervisor: Pisinger, David (Intern)
Main Supervisor: Stidsen, Thomas Jacob Riis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Fully-nonlinear Wave Interaction with Moored Floating marine Structures

Department of Mechanical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Xu, Yan (Ekstern)
Supervisor: Shao, Yanlin (Intern)
Main Supervisor: Bingham, Harry B. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD
Functional Polysilazanes for Coating Applications
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student: Kristiansen, Thomas (Intern)
Supervisor: Dam-Johansen, Kim (Intern)
Daugaard, Anders Egede (Intern)
Main Supervisor: Skov, Anne Ladegaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Future Feeder-line operation - International transportation and Netowork design under uncertainty
Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Sacramento Lechado, David (Intern)
Supervisor: Vilhelmsen, Charlotte (Intern)
Main Supervisor: Pisinger, David (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Growth of Hexogonal-boron Nitride (h-BN) for Large-scale Graphene Devices
Department of Micro- and Nanotechnology
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Chen, Xin (Intern)
Supervisor: Booth, Tim (Intern)
Main Supervisor: Bøggild, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

High-Speed Time-stretch Optical coherence tomography
Department of Photonics Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Jensen, Mikkel (Intern)
Supervisor: Israelsen, Niels Møller (Intern)
Main Supervisor:
Bang, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

High Reynolds Number Rotor Design
Department of Wind Energy
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Kiefer, Janik (Intern)
Supervisor:
Bak, Christian (Intern)
Hultmark, Marcus (Ekstern)
Main Supervisor:
Hansen, Martin Otto Laver (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

In situ Structural Characterization of Multilayer Formation during Large-scale Processing of 3rd Generation Solar Cells
Department of Energy Conversion and Storage
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Rogowska, Melania (Intern)
Supervisor:
Kuhn, Luise Theil (Intern)
Main Supervisor:
Andreasen, Jens Wenzel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Interconnected Activities and Functions of Matrix Metalloproteinases at the Wound Edge
Department of Systems Biology
Period: 01/09/2017 → 31/08/2020
Number of participants: 2
Phd Student:
Savickas, Simonas (Ekstern)
Supervisor:
Svensson, Birte (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Interconnected Activities and Functions of Matrix Metalloproteinases at the Wound Edge
Department of Systems Biology
Period: 01/09/2017 → 31/08/2020
Number of participants: 2
Phd Student:
Savickas, Simonas (Intern)
Supervisor:
Svensson, Birte (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Kinetics of Scale Formation in Oil and Gas Production**
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Lomsøy, Petter (Intern)
Supervisor:
Ambat, Rajan (Intern)
Fosbøl, Philip Loldrup (Intern)
Main Supervisor:
Thomsen, Kaj (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

**Management of product and production data**
Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Battistello, Loris (Intern)
Supervisor:
Mortensen, Niels Henrik (Intern)
Main Supervisor:
Hvam, Lars (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering m/virksomhed
Project: PhD

**Membrane-based in-situ product removal**
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Jaksland, Anders (Intern)
Supervisor:
Pinelo, Manuel (Intern)
Wan, Yinhua (Ekstern)
Main Supervisor:
Woodley, John (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD
Modelling of Public Transport Systems
Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Eltved, Morten (Intern)
Supervisor:
Rasmussen, Thomas Kjær (Intern)
Main Supervisor:
Nielsen, Otto Anker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Multimodal Biophotonics Imaging of Biomarkers for Bladder Cancer
Department of Photonics Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Meyer, Björn-Ole (Intern)
Supervisor:
Broeng, Jes (Intern)
Marti, Dominik (Intern)
Main Supervisor:
Andersen, Peter E. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

NOx control in combustion of alternative fuels
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Krum, Kristian Røhe Kongsted (Intern)
Supervisor:
Norman, Thomas (Intern)
Wu, Hao (Intern)
Main Supervisor:
Glarborg, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Numerical modelling of heat treatment and post processing of additive manufactured metal parts
Department of Mechanical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 5
Phd Student:
De Baere, David (Intern)
Supervisor:
Mohanty, Sankhya (Intern)
Thorborg, Jesper (Intern)
Tiedje, Niels Skat (Intern)
Main Supervisor:
Hattel, Jesper Henri (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Optimal Dispatch and Online Control of Integrated Energy Systems
Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Nie, Yinghui (Intern)
Supervisor:
Huang, Shaojun (Intern)
Main Supervisor:
Wu, Qiuwei (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Perfusion Ultrasound Imaging
Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Schou, Mikkel (Intern)
Supervisor:
Stuart, Matthias Bo (Intern)
Main Supervisor:
Jensen, Jørgen Arendt (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Polymer Optical Fiber Bragg Gratings for high sensitivity distributed biochemical sensors
Department of Photonics Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Inglev, Rune (Intern)
Supervisor:
Janting, Jakob (Intern)
Nielsen, Kristian (Intern)
Main Supervisor:
Bang, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Real-Time Multi-Core Communication and Synchronization
Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2019
Number of participants: 3
Phd Student: Strøm, Tórur Biskopstø (Intern)
Supervisor: Sparsø, Jens (Intern)
Main Supervisor: Schoeberl, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Remote sensing of land ice
National Space Institute
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Andersen, Natalia Havelund (Intern)
Supervisor: Simonsen, Sebastian Bjerregaard (Intern)
Main Supervisor: Sørensen, Louise Sandberg (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Robust Congestion Management and Self-healing for Active Distribution Networks
Department of Electrical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student: Shen, Feifan (Intern)
Supervisor: Huang, Shaojun (Intern)
Xu, Yan (Ekstern)
Main Supervisor: Wu, Qiuwei (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Robust Decision Making for the Management of Large Engineering Projects
Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student: Wied, Morten (Intern)
Security in Fog Computing

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
De Donno, Michele (Intern)
Supervisor:
Probst, Christian W. (Intern)
Main Supervisor:
Dragoni, Nicola (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Stochastic Dynamic Optimization and Control Theory

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Brok, Niclas Laursen (Intern)
Supervisor:
Jørgensen, John Bagterp (Intern)
Poulsen, Niels Kjølstad (Intern)
Main Supervisor:
Madsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Supporting water infrastructure investment planning with hydro-economic models

Department of Environmental Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 5
Phd Student:
Payet-burin, Raphaël (Intern)
Supervisor:
Cardenal, Silvio Javier Pereira (Intern)
Kromann, Mikkel Aabenhhus (Ekstern)
Strzepek, Kenneth Marc (Ekstern)
Main Supervisor:
Bauer-Gottwein, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Synthetic Biology Strategies for Engineering of Human Microbiome Related Species for Therapeutic Applications

Technical University of Denmark
Period: 01/09/2017 → 31/08/2020
Number of participants: 2
Phd Student:
Tueros Farfan, Felipe Gonzalo (Intern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Systems approach to the development of integrated solutions in the Nordic manufacturing industry

Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Ramirez Hernandez, Tabea (Intern)
Supervisor:
Pigosso, Daniela Cristina Antelmi (Intern)
Main Supervisor:
Kreye, Melanie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Technology Foresight for Smart Specialisation Development: The case study in development countries context

Department of Management Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Poonjan, Amonpat (Intern)
Supervisor:
Tanner, Anne Nygaard (Intern)
Main Supervisor:
Andersen, Per Dannemand (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsstipendium
Project: PhD

The stochastic geometry of latent variable models

Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Jørgensen, Martin (Intern)
Supervisor:
Hansen, Lars Kai (Intern)
Main Supervisor:
Hauberg, Søren (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Topology of Exotic Wakes
Department of Applied Mathematics and Computer Science
Period: 01/09/2017 → 31/08/2020
Number of participants: 3
Phd Student:
Nielsen, Anne Ryelund (Intern)
Supervisor:
Heil, Matthias (Ekstern)
Main Supervisor:
Brøns, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

UV degradation and interlayer adhesion loss
Department of Chemical and Biochemical Engineering
Period: 01/09/2017 → 31/08/2020
Number of participants: 4
Phd Student:
Wang, Ting (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Erik Weinell, Claus (Intern)
Main Supervisor:
Kiil, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

An in vitro method for toxicity testing of inhaled particles
Department of Environmental Engineering
Period: 15/08/2017 → 14/08/2020
Number of participants: 4
Phd Student:
Silva, Emilie Da (Intern)
Supervisor:
Housgaard, Karin Sørig (Ekstern)
Sørli, Jorid Birkelund (Intern)
Main Supervisor:
Baun, Anders (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Big Data Processing and shaping in SeaStatus
Department of Applied Mathematics and Computer Science
Period: 15/08/2017 → 14/08/2020
Number of participants: 3
Phd Student:
Sengupta, Sayantan (Intern)
Supervisor:
Ersbøll, Bjarne Kjær (Intern)
Main Supervisor:
Stockmarr, Anders (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Coatings for high pressure and high temperature
Department of Chemical and Biochemical Engineering
Period: 15/08/2017 → 14/08/2020
Number of participants: 4
Phd Student:
Ferrero, Gianni (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Erik Weinell, Claus (Intern)
Main Supervisor:
Kiil, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Decision support tools for managing water resources in mixed land use catchments
Department of Environmental Engineering
Period: 15/08/2017 → 14/08/2020
Number of participants: 3
Phd Student:
Lemaire, Grégory Guillaume (Intern)
Supervisor:
McKnight, Ursula S. (Intern)
Main Supervisor:
Bjerg, Poul Legstrup (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Detection and evaluation of abnormal events in complex industrial processes
Department of Electrical Engineering
Period: 15/08/2017 → 14/08/2020
Number of participants: 3
Phd Student:
Hallgrimsson, Asgeir Daniel (Intern)
Supervisor:
Lind, Morten (Intern)
Main Supervisor:
Niemann, Hans Henrik (Intern)

Financing sources
Development of substantive topicals with high sweat resistance

Department of Chemistry
Period: 15/08/2017 → 14/08/2020
Number of participants: 4
Phd Student: Keshavarzi, Fatemeh (Intern)
Supervisor: Jafarzadeh, Shadi (Ekstern) Lauemøller, Sanne Lise (Ekstern)
Main Supervisor: Thormann, Esben (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Documentation and quantification of natural and enhanced degradation of chlorinated contaminants in the subsurface

Department of Environmental Engineering
Period: 15/08/2017 → 14/08/2020
Number of participants: 3
Phd Student: Ottosen, Cecilie Bang (Intern)
Supervisor: Bjerg, Poul Løgstrup (Intern)
Main Supervisor: Broholm, Mette Martina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Estimation of Surface Radiometry

Department of Applied Mathematics and Computer Science
Period: 15/08/2017 → 14/08/2020
Number of participants: 4
Phd Student: Doest, Mads Emil Brix (Intern)
Supervisor: Aanæs, Henrik (Intern) Moeslund, Thomas (Ekstern)
Main Supervisor: Frisvad, Jeppe Revall (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Light-matter interaction and laser dynamics in nanophotonic structures

Department of Photonics Engineering
**Period:** 15/08/2017 → 14/08/2020  
**Number of participants:** 4

**PhD Student:**  
Rasmussen, Thorsten Svend (Intern)  
Supervisor:  
Gregersen, Niels (Intern)  
Yu, Yi (Intern)  
Main Supervisor:  
Mørk, Jesper (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD

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**Long distance quantum communication**  
Department of Photonics Engineering  
Period: 15/08/2017 → 14/08/2020  
Number of participants: 4

**PhD Student:**  
da Lio, Beatrice (Ekstern)  
Supervisor:  
Bacco, Davide (Intern)  
Ding, Yunhong (Intern)  
Main Supervisor:  
Rottwitt, Karsten (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD

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**Numerical Modelling of Material Flow in the Resin Infusion Pultrusion Process**  
Department of Mechanical Engineering  
Period: 15/08/2017 → 14/08/2020  
Number of participants: 4

**PhD Student:**  
Sandberg, Michael (Intern)  
Supervisor:  
Baran, Ismet (Intern)  
Hattel, Jesper Henri (Intern)  
Main Supervisor:  
Spangenberg, Jon (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

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**Real-Time Multicore Systems**  
Department of Applied Mathematics and Computer Science  
Period: 15/08/2017 → 14/08/2020  
Number of participants: 3

**PhD Student:**  
Baris, Oktay (Ekstern)  
Supervisor:  
Sparsø, Jens (Intern)  
Main Supervisor:
Schoeberl, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Real-Time Multicore Systems
Department of Applied Mathematics and Computer Science
Period: 15/08/2017 → 14/08/2020
Number of participants: 3
Phd Student:
Baris, Oktay (Intern)
Supervisor:
Sparsø, Jens (Intern)
Main Supervisor:
Schoeberl, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

REBUS
Department of Civil Engineering
Section for Indoor Climate and Building Physics
Period: 01/08/2017 → …
Number of participants: 1
Project participant:
Elarga, Hagar (Intern)

3D electron microscopy of nanostructures in energy devices
Department of Energy Conversion and Storage
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Colding-Jørgensen, Sofie (Intern)
Supervisor:
Schmidt, Søren (Intern)
Simonsen, Søren Bredmose (Intern)
Main Supervisor:
Kuhn, Luise Theil (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Active Deep Learning for Nano Sensor Systems
Department of Applied Mathematics and Computer Science
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Vording, Maximillian Fornitz (Intern)
Supervisor:
Alstrøm, Tommy Sonne (Intern)
**Advanced wound care adhesives with new functional properties**

Department of Chemical and Biochemical Engineering  
Period: 01/08/2017 → 31/07/2020  
Number of participants: 6  
PhD Student:  
Chiaula, Valeria (Intern)  
Supervisor:  
Mazurek, Piotr Stanislaw (Intern)  
Nielsen, Anders Christian (Ekstern)  
Tornøe, Jens (Intern)  
Main Supervisor:  
Skov, Anne Ladegaard (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Advancing 2D Materials by Metal-Organic Framework Engineering**

Department of Chemistry  
Period: 01/08/2017 → 31/07/2020  
Number of participants: 3  
PhD Student:  
Voigt, Laura (Intern)  
Supervisor:  
Mossin, Susanne (Intern)  
Main Supervisor:  
Pedersen, Kasper Steen (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Industrial PhD  
Project: PhD

**Big Data Analysis on Food Supply Chain Data**

Department of Applied Mathematics and Computer Science  
Period: 01/08/2017 → 31/07/2020  
Number of participants: 3  
PhD Student:  
Svendsen, Kira Dynnes (Intern)  
Supervisor:  
Hansen, Lars Kai (Intern)  
Main Supervisor:  
Ersbøll, Bjarne Kjaer (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD
Biosensor development and next-generation sequencing approaches for studying molecular evolution in bacteria

Technical University of Denmark
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Capucci, Silvia (Intern)
Supervisor:
Jensen, Michael Krogh (Intern)
Main Supervisor:
Nørholm, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Collateral sensitivity cycling as a treatment for multi drug resistant chronic infections

Technical University of Denmark
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Quainoo, Scott (Intern)
Supervisor:
Imamovic, Lejla (Intern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Comparison of Tokamak Plasma Midplane with Divertor Conditions and Consequences for Modelling

Department of Physics
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Nem, Raheesty Devi (Ekstern)
Supervisor:
Eich, Thomas Hubert (Ekstern)
Main Supervisor:
Naulin, Volker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Main Supervisor:
Naulin, Volker (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Ecology of Atlantic Salmon**
National Institute of Aquatic Resources
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Flávio, Hugo de Moura (Intern)
Supervisor:
Jepsen, Niels (Intern)
Koed, Anders (Intern)
Main Supervisor:
Aarestrup, Kim (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Electrolysis of Water: New Catalyst for the Oxygen Evolution Reaction**
Department of Physics
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Moon, Choongman (Ekstern)
Supervisor:
Kibsgaard, Jakob (Intern)
Stephens, Ifan (Intern)
Main Supervisor:
Chorkendorff, Ib (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Evergreen methods for phylogeny

Department of Bio and Health Informatics
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Szarvas, Judit (Intern)
Supervisor:
Aarestrup, Frank Møller (Intern)
Main Supervisor:
Lund, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Fatigue behaviour of polymer composite materials at the sub-structural and structural scale

Department of Civil Engineering
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Quinlan, Alex (Intern)
Supervisor:
Berggreen, Christian (Intern)
Branner, Kim (Intern)
Main Supervisor:
Stang, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Gas-filled Hollow-Core Photonic Crystal Fibers for sensing applications and ultrafast non-linear optics

Department of Photonics Engineering
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Adamu, Abubakar Isa (Intern)
Supervisor:
Markos, Christos (Intern)
Main Supervisor:
Bang, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Hej med dig igen

Technical University of Denmark
Period: 01/08/2017 → 31/07/2020
Number of participants: 2
Phd Student:
Mejse (testperson), Fugl (Ekstern)
Main Supervisor:
Immune activation status as predictive marker for cancer progression

National Veterinary Institute
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Snejbjerg, Dorthe Blirup (Intern)
Supervisor:
Kirschner, Benny (Ekstern)
Kjær, Susanne Krüger (Ekstern)
Main Supervisor:
Hadrup, Sine Reker (Intern)

Impact of cellular stress recombinant monoclonal antibody produced by high yielding Chinese Hamster overy(CHO) cell cultures in bioreactors

Department of Systems Biology
Period: 01/08/2017 → 31/07/2020
Number of participants: 2
Phd Student:
Chevallier, Valentine (Ekstern)
Main Supervisor:
Andersen, Mikael Rørdam (Intern)

Impact of secondary metabolites on the ecology of Bacillus subtilis

Department of Systems Biology
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Kiesewalter, Heiko T. (Intern)
Supervisor:
Gram, Lone (Intern)
Main Supervisor:
Kovács, Ákos T. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Influence of Parasite Load on the Growth and Bioenergetics of Baltic cod
National Institute of Aquatic Resources
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Plambech, Marie (Intern)
Supervisor:
Skov, Peter Vilhelm (Intern)
Main Supervisor:
Behrens, Jane (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

New thin solar cell films makes silicon cells better
Department of Photonics Engineering
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Martinho, Filipe Mesquita Alves (Intern)
Supervisor:
Schou, Jørgen (Intern)
Stamate, Eugen (Intern)
Main Supervisor:
Canulescu, Stela (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Next generation SDN/NFV-based Management of Service
Department of Photonics Engineering
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
Phd Student:
Ollora Zaballa, Eder (Intern)
Supervisor:
Christiansen, Henrik Lehrmann (Intern)
Main Supervisor:
Soler, José (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Prospactive Motion Correction in Magnetic Resonance Imaging

Department of Electrical Engineering
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Laustsen, Malte (Intern)
Supervisor:
Madsen, Kristoffer Hougaard (Intern)
Xue, Rong (Ekstern)
Main Supervisor:
Hanson, Lars G. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Resource Management in Fog Computing for Industrial Applications

Department of Applied Mathematics and Computer Science
Period: 01/08/2017 → 30/09/2017
Number of participants: 3
Phd Student:
Raagaard, Michael Lander (Intern)
Supervisor:
Madsen, Jan (Intern)
Main Supervisor:
Pop, Paul (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Stochastic grey-box models for marine ecosystems

Department of Applied Mathematics and Computer Science
Period: 01/08/2017 → 31/07/2020
Number of participants: 4
Phd Student:
Moazzami, Hamidreza (Intern)
Supervisor:
Carstensen, Niels Jacob (Intern)
Møller, Jan Kloppenborg (Intern)
Main Supervisor:
Christiansen, Lasse Engbo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Systems Genomic and Transcriptomics approaches for simultaneous improvement of feed efficiency and production in Danish Pigs

Department of Bio and Health Informatics
Period: 01/08/2017 → 31/07/2019
Number of participants: 3
Phd Student:
Theoretical studies of materials for water splitting

Department of Physics
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
PhD Student:
Garijo del Río, Estefanía (Intern)
Supervisor:
Thygesen, Kristian Sommer (Intern)
Main Supervisor:
Jacobsen, Karsten Wedel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Using Biodiversity to Identify Superior Cell Factories for Therapeutic Peptide Production

Department of Systems Biology
Period: 01/08/2017 → 31/07/2020
Number of participants: 3
PhD Student:
Hansen, Sebastian Ro Toft (Intern)
Supervisor:
Olesen, Kjeld (Ekstern)
Main Supervisor:
Mortensen, Uffe Hasbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Computational studies of two-dimension materials and heterosstructures

Department of Physics
Period: 15/07/2017 → 14/07/2020
Number of participants: 3
PhD Student:
Riis-Jensen, Anders Christian (Intern)
Supervisor:
Jacobsen, Karsten Wedel (Intern)
Main Supervisor:
Thygesen, Kristian Sommer (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Synthesis and characterization of hydrogels to be used as dielectric elastomers

Department of Chemical and Biochemical Engineering
Period: 15/07/2017 → 14/07/2020
Number of participants: 3
Phd Student:
Vaicekauskaite, Justina (Intern)
Supervisor:
Yu, Liyun (Intern)
Main Supervisor:
Skov, Anne Ladegaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Forbedret lysmålesystem til internationalt marked

Department of Photonics Engineering
Diode Lasers and LED Systems
Viso Systems
Period: 01/07/2017 → 01/07/2018
Number of participants: 2
Project participant:
Thorseth, Anders (Intern)
Dam-Hansen, Carsten (Intern)

Related projects:
Center for LED metrology
EMPIR 15SIB07 PhotoLED, Future photometry based on solid-state lighting products
Activities:
Light source characterization and air movement under CIE S 025
Project

Operational monitoring and Forecasting system for Resilience of agriculture and forestry under intensification of the Water cycle: a Big Data approach

Department of Environmental Engineering
Water Resources Engineering
TSK
Period: 01/07/2017 → 01/09/2019
Number of participants: 1
Acronym: FORWARD
Project participant:
Garcia, Monica (Intern)
Project

COPL - COnsortia based Production of biochemicals from Lignocellulosic biomass

Novo Nordisk Foundation Center for Biosustainability
Bacterial Cell Factory Optimization
Period: 01/07/2017 → 30/06/2020
Number of participants: 2
Acronym: COPL
Project participant:
Ingemann Jensen, Sheila (Intern)
Other:
Kjiproski, Darko (Intern)

Financial sources
Source: Public research programme (public)
Name of research programme: DFF - Teknologi og Produktion (FTP)
Project

3D micro/nanotopography and material cues for stem cell differentiation
Department of Micro- and Nanotechnology
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
PhD Student:
Asif, Afia (Intern)
Supervisor:
Keller, Stephan Sylvest (Intern)
Serrano, Alberto M. (Ekstern)
Main Supervisor:
Emnéus, Jenny (Intern)

Financial sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Bioinspired Targeted Polymeric Nanomedicines for Atherosclerosis Therapy
Department of Micro- and Nanotechnology
Period: 01/07/2017 → 30/06/2020
Number of participants: 2
PhD Student:
Bazban-Shotorbani, Salime (Intern)
Main Supervisor:
Kamaly, Nazila (Intern)

Financial sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Causal fingerprints of brain connectivity
Department of Applied Mathematics and Computer Science
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
PhD Student:
Krohne, Lærke Karen (Intern)
Supervisor:
Hansen, Lars Kai (Intern)
Main Supervisor:
Madsen, Kristoffer Hougaard (Intern)
Siebner, Hartwig R. (Ekstern)

Financial sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Development of the next generation of Aquaporin Inside TM biomimetic membranes

Department of Environmental Engineering
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
Phd Student:
Górecki, Radoslaw Pawel (Intern)
Supervisor:
Spulber, Mariana (Ekstern)
Trzaskus, Krzysztof Wojciech (Ekstern)
Main Supervisor:
Hélix-Nielsen, Claus (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Fast-tracking the identification of safe and effective probiotic bacteria by in silico prediction of bacterial genomic features

Department of Bio and Health Informatics
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
Phd Student:
Karlsen, Signe Tang (Ekstern)
Supervisor:
Bælum, Jacob (Intern)
Henderson, Gemma (Ekstern)
Main Supervisor:
Lund, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

High Power Frequency Converted Tapered Diode Lasers

Department of Photonics Engineering
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
Phd Student:
Jamal, Muhammad Tahir (Intern)
Supervisor:
Andersen, Peter E. (Intern)
Hansen, Anders Kragh (Intern)
Main Supervisor:
Jensen, Ole Bjarlin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Mesoscopic Simulation of Multi-Modal Urban Traffic

Department of Management Engineering
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
Phd Student:
Paulsen, Mads (Intern)
Supervisor:
Multiplex digital analysis of serum samples for Alzheimer's disease diagnostics

Department of Micro- and Nanotechnology
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
PhD Student:
Toppi, Arianna (Intern)
Supervisor:
Taboryski, Rafael J. (Intern)
Main Supervisor:
Dufva, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Numerical modelling of near wellbore flow

Department of Applied Mathematics and Computer Science
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
PhD Student:
Kadeethum, Teeratorn (Intern)
Supervisor:
Salimzadeh, Saeed (Intern)
Main Supervisor:
Nick, Hamid (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Portable Diagnostic Laboratory to Diagnose Thyroid Gland Related Disorders

Department of Applied Mathematics and Computer Science
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
PhD Student:
Tanev, Georgi Plamenov (Intern)
Supervisor:
Schjøler, Karin (Ekstern)
Svendsen, Winnie Edith (Intern)
Main Supervisor:
Madsen, Jan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Robust Identification

Department of Civil Engineering
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
Phd Student:
Friis, Tobias (Intern)
Supervisor:
Katsanos, Evangelos (Intern)
Main Supervisor:
Brincker, Rune (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Thermochemical Heat Storage

Department of Energy Conversion and Storage
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
Phd Student:
Karabanova, Anastasiia (Intern)
Supervisor:
Johnsen, Rune E. (Intern)
Main Supervisor:
Blanchard, Didier (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Typing and pheno typing based on direct sequencing of samples

Department of Bio and Health Informatics
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
Phd Student:
Clausen, Philip Thomas Lanken Conradsen (Intern)
Supervisor:
Aarestrup, Frank Møller (Intern)
Main Supervisor:
Lund, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Utilization of Wood Ash in Mortar and Concrete

Department of Civil Engineering
Period: 01/07/2017 → 30/06/2020
Number of participants: 4
Phd Student:
Sigvardsen, Nina Marie (Intern)
Supervisor:
Jensen, Pernille Erland (Intern)
Kirkelund, Gunvor Marie (Intern)
Main Supervisor:
Ottosen, Lisbeth M. (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Velocity-space tomography from KeV MeV-range ions in fusion plasmas**
Department of Physics
Period: 01/07/2017 → 30/06/2020
Number of participants: 3
Phd Student:
Madsen, Birgitte (Intern)
Supervisor:
Huang, Juan (Ekstern)
Main Supervisor:
Salewski, Mirko (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

**3D perfusion LOCs with integrated bioreactorisand sensors for modelling neuronal disorders**
Department of Micro- and Nanotechnology
Period: 15/06/2017 → 14/06/2020
Number of participants: 3
Phd Student:
Khan, Muhammad Salman (Intern)
Supervisor:
Heiskanen, Arto (Intern)
Main Supervisor:
Emnéus, Jenny (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

**Designing Sustainable Circular Business Models on Product/Service-Systems**
Department of Mechanical Engineering
Period: 15/06/2017 → 14/06/2020
Number of participants: 4
Phd Student:
de Pádua Pieroni, Marina (Intern)
Supervisor:
Hildenbrand, Jutta (Ekstern)
McAloone, Tim C. (Intern)
Main Supervisor:
Pigosso, Daniela Cristina Antelmi (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Genomics, epigenetic and metabolomics analysis of production and welfare in Danish cattle and pigs**
Department of Bio and Health Informatics
Multi-Scale 3D Imaging of Heterogeneous Nucleation in Ferroelectrics

Department of Physics
Period: 15/06/2017 → 14/06/2020
Number of participants: 4
Phd Student:
Omrstrup, Jeppe (Intern)
Supervisor:
Matheiesen, Ragnvald (Ekstern)
Simons, Hugh (Intern)
Main Supervisor:
Poulsen, Henning Friis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

The role of coating composition on the development of the optics for the Athena X-ray Observatory

National Space Institute
Period: 15/06/2017 → 14/06/2020
Number of participants: 3
Phd Student:
Svendsen, Sara (Intern)
Supervisor:
Christensen, Finn Erland (Intern)
Main Supervisor:
Della Monica Ferreira, Desiree (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

KOMET-projektet (Test af energiforbrug og måling af kostindtag med to metoder)

National Food Institute
Division of Risk Assessment and Nutrition
Period: 09/06/2017 → 15/10/2017
Number of participants: 1
Project participant:
Christensen, Julia (Intern)
Project

H2020-5GPPP - Next Generation Platform as a Service
Department of Photonics Engineering

Networks Technology and Service Platforms
Period: 01/06/2017 → 01/06/2019
Number of participants: 2
Acronym: NGPaaS
Project participant:
Soler, José (Intern)
Dittmann, Lars (Intern)

Adaptive, context-aware Cognitive Behavioural Therapy for youth mental health

Department of Applied Mathematics and Computer Science
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
PhD Student:
Hafiz, Pegah (Ekstern)
Supervisor:
Kessing, Lars Vedel (Ekstern)
Main Supervisor:
Bardram, Jakob Eyvind (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Balancing Costs and Benefits of New Urban Water Management Objectives for Both Real Time Applications and Urban Planning

Department of Environmental Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
PhD Student:
Skrydstrup, Julie (Intern)
Supervisor:
Gregersen, Ida Bülow (Intern)
Löwe, Roland (Intern)
Main Supervisor:
Ambjerg-Nielsen, Karsten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Brain-Computer Interface Controlled Functional Electrical Stimulation as a Complete Neurorehabilitation Tool for Post-Stroke Patients

Department of Electrical Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
PhD Student:
Møller, Jakob Skadkær (Intern)
Supervisor:
Iversen, Helle Klinkenberg (Ekstern)
Larsson, Henrik B.W. (Ekstern)
Main Supervisor:
Puthusserypaday, Sadasivan (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Capelin Migration and Stock Structure using Otolith Microchemistry
National Institute of Aquatic Resources
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Fink-Jensen, Peter (Intern)
Supervisor:
Jansen, Teunis (Intern)
Main Supervisor:
Hüssy, Karin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Computer- and Smartphone-based Assessment of Cognitive Functioning in Affective Disorders in Young People
Department of Applied Mathematics and Computer Science
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Hafiz, Pegah (Intern)
Supervisor:
Kessing, Lars Vedel (Ekstern)
Main Supervisor:
Bardram, Jakob Eyvind (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Design of innovative low-cost expanders for organic Rankine cycle power systems
Department of Mechanical Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 5
Phd Student:
Geiselhart, Matthias (Intern)
Supervisor:
Almdal, Kristoffer (Intern)
Lenau, Torben Anker (Intern)
Schiftmann, Jürg Alexander (Ekstern)
Main Supervisor:
Haglind, Fredrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Development of polymer skin adhesives with a controlled moisture and sweat removal capacity
Department of Chemistry
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
Phd Student:
Hansen, Daniel (Intern)
Supervisor:
Almdal, Kristoffer (Intern)
Hansen, Kristoffer Karsten (Intern)
Main Supervisor:
Thormann, Esben (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

**Development of Targeted Drug Delivery Systems for The Brain**
Department of Micro- and Nanotechnology
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Kostrikov, Serhii (Intern)
Supervisor:
Hempel, Casper (Intern)
Main Supervisor:
Andresen, Thomas Lars (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

**Fishery and Fisheries Ecosystem Impac Modelling**
National Institute of Aquatic Resources
Period: 01/06/2017 → 31/05/2020
Number of participants: 5
Phd Student:
Rufener, Marie-Christine (Intern)
Supervisor:
Dinesen, Grete E. (Intern)
Kristensen, Kasper (Intern)
Nielsen, J. Rasmus (Intern)
Main Supervisor:
Bastardie, Francois (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**High performance immobilization of enzymes in inorganic membranes**
Department of Chemical and Biochemical Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
Phd Student:
Sigurardóttir, Sigyn Björk (Intern)
Supervisor:
Della Negra, Michela (Intern)
Kaiser, Andreas (Intern)
Main Supervisor:
Pinelo, Manuel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Improving the thermotolerance of the mesophilic starter
National Food Institute
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Dorau, Robin (Ekstern)
Supervisor:
Jensen, Peter Ruhdal (Intern)
Main Supervisor:
Solem, Christian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Miniaturized AC-DC offline converters for Solid State Lighting Applications
Department of Electrical Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Ammar, Ahmed Morsi (Intern)
Supervisor:
Jørgensen, Ivan Harald Holger (Intern)
Main Supervisor:
Knott, Arnold (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Multi-tone supercontinuum sources for food control applications with IR spectroscopy
Department of Photonics Engineering
**New Concepts for Efficient Immobilization of Enzymes in Inorganic Membrane Reactors**

Department of Energy Conversion and Storage  
Period: 01/06/2017 → 31/05/2020  
Number of participants: 4  
Phd Student: Lehmann, Jonas (Intern)  
Supervisor: Kaiser, Andreas (Intern)  
Pinelo, Manuel (Intern)  
Main Supervisor: Della Negra, Michela (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD

**Opportunities and Limits of New Trends in Hospital Architecture: The Case of Government Hospital, Thailand**

Department of Management Engineering  
Period: 01/06/2017 → 31/05/2020  
Number of participants: 3  
Phd Student: Prugsiganont, Supuck (Intern)  
Supervisor: Nielsen, Susanne Balslev (Intern)  
Main Supervisor: Jensen, Per Anker (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Stipendie fra udlandet  
Project: PhD

**Optimization, Control, and Stability of AC-DC Grids under Uncertainty**

Department of Electrical Engineering  
Period: 01/06/2017 → 31/05/2020  
Number of participants: 3  
Phd Student: Venzke, Andreas (Intern)  
Supervisor: Chatzivasileiadis, Spyros (Intern)  
Main Supervisor: Pinson, Pierre (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)
Perfusable 3D scaffold based drug and compound delivery systems for developmental patterning and regenerative medicine

Department of Micro- and Nanotechnology
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
Phd Student:
Ghani, Mozhdeh (Intern)
Supervisor:
Alm, Martin (Ekstern)
Heiskanen, Arto (Intern)
Main Supervisor:
Emnéus, Jenny (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret

Powder Technologies for Additive Manufacturing

Department of Mechanical Engineering
Period: 01/06/2017 → 31/05/2020
Number of participants: 3
Phd Student:
Andersen, Sebastian Aagaard (Intern)
Supervisor:
Pedersen, David Bue (Intern)
Main Supervisor:
Hansen, Hans Nørgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet

Technology for CZTS-Silicon Tandem Solar Cells

Department of Micro- and Nanotechnology
Period: 01/06/2017 → 31/05/2020
Number of participants: 4
Phd Student:
Hajijifarassar, Alireza (Intern)
Supervisor:
Crovetto, Andrea (Intern)
Pedersen, Thomas (Intern)
Main Supervisor:
Hansen, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet

Design and optimization of electrical infrastructures in offshore wind power clusters

Department of Wind Energy
Period: 15/05/2017 → 14/05/2020
Number of participants: 4
Phd Student:
Pérez-Rúa, Juan-Andrés (Intern)  
Supervisor:  
Das, Kaushik (Intern)  
Sørensen, Poul Ejnar (Intern)  
Main Supervisor:  
Cutululis, Nicolaos Antonio (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Forskningsrådsfinansiering  
Project: PhD

Department of Electrical Engineering  
Period: 15/05/2017 → 14/05/2020  
Number of participants: 4  
Phd Student:  
Hildebrandt, Christina Berndt (Intern)  
Supervisor:  
Jóhannsson, Hjörtur (Intern)  
Sommer, Stefan Horst (Intern)  
Main Supervisor:  
Nielsen, Arne Hejde (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Identification and exploration of neuronal protein fragments in serum as biomarkers for neurodegenerative diseases**  
Department of Systems Biology  
Period: 15/05/2017 → 14/05/2020  
Number of participants: 3  
Phd Student:  
Tzara, Ourania (Intern)  
Supervisor:  
Henriksen, Kim (Ekstern)  
Main Supervisor:  
Svensson, Birte (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Eksternt EU-finansieret  
Project: PhD

**Using satellite altimetry to predict future sea level fingerprints**  
National Space Institute  
Period: 15/05/2017 → 14/05/2020  
Number of participants: 3  
Phd Student:  
Ludwigsen, Carsten Ankjær (Intern)  
Supervisor:  
Khan, Shfaqat Abbas (Intern)  
Main Supervisor:  
Andersen, Ole Baltazar (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet
Innovative Methods for Optimal Operation of Multiple HVDC Connections and Grids
Department of Electrical Engineering
Center for Electric Power and Energy
Electricity markets and energy analytics
Energinet.dk
ABB Power Technologies
Svenska Kraftnat
KTH - Royal Institute of Technology
University of Liège
Period: 01/05/2017 → 30/04/2021
Number of participants: 2
Acronym: MULTI-DC
Number of related Ph.D. students: 3
Project Coordinator:
Chatzivasileiadis, Spyros (Intern)
Østergaard, Jacob (Intern)

Financing sources
Source: Public research programme (public)
Name of research programme: Innovation Fund Denmark
Web address: https://innovationsfonden.dk
Amount: 25,700,000.00 Danish Kroner
Year of approval: 2017

Greenlandic seaweeds for human consumption
PhD project
National Food Institute
Research Group for Bioactives – Analysis and Application
Research Group for Analytical and Predictive Microbiology
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Number of related Ph.D. students: 1
Project participant:
Holdt, Susan Løvstad (Intern)
Kreissig, Katharina Johanna (Intern)
Hansen, Lisbeth Truelstrup (Intern)
Jacobsen, Charlotte (Intern)

Barrierer for og potentialer ved at etablere en rækkeproduktion i Qeqertat i Qaanaaq distrikt
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions
Period: 01/05/2017 → …
Number of participants: 2
Project participant:
Hoffmann, Birgitte (Ekstern)
Project Manager, academic:
Hendriksen, Kåre (Intern)
**Nanocrafts - nano jewelry proof of concept**

At DTU Nanotech several nanotechnologies were intensively used for texturing, patterning, and protection of surfaces. Nanotechnology can provide a new space for creative design in jewelry with unique features and effects (for instance optical effects implied by nanostructures), bring the deep meaning of emotions and relations to a new level – the nanolevel.

With significant value to the jewelry industry nanotechnology can result in unique technical qualities such as improved durability of items and fraud protection and data encryption technology, and a new way of sensing the item. Micro and nanopatterning allow individual design fabrication on a single wafer. With nanoceramic layers, we can protect golden or other jewelry items from mechanical damage or natural degradation. In this project, we apply:

- Surface nanostructuring for physical effects enhancement
- Optical coloring with thin film deposition
- Visual patterning with laser engraving and UV photolithography
- Nanoplasmonic coloring
- Laser engraving on surfaces for data encryption and individual design patterns at the scale of few micrometers

Department of Energy Conversion and Storage
Department of Micro- and Nanotechnology

**Silicon Microtechnology**
Period: 01/05/2017 → 30/09/2017
Number of participants: 1
Acronym: Nanocrafts
Project participant:
Plakhotnyuk, Maksym (Intern)

**5G Mobile Networks Optimization using Cloud-RAN architecture**

Department of Photonics Engineering
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Hansen, Line Maria Pyndt (Intern)
Supervisor:
Berger, Michael Stübert (Intern)
Ruepp, Sarah Renée (Intern)
Main Supervisor:
Christiansen, Henrik Lehrmann (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Allosteric regulation of tryptophan hydroxylase isoform 2**

Department of Chemistry
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Skawinska, Natalia Teresa (Intern)
Supervisor:
Christensen, Hans Erik Mølager (Intern)
Harris, Pernille (Intern)
Main Supervisor:
Peters, Günther H.J. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
A Model of Big Data Utilisation in the Danish Healthcare System

Department of Management Engineering
Period: 01/05/2017 → 30/04/2020
Number of participants: 3
Phd Student:
Ivan Rehfeld, Claus (Intern)
Supervisor:
Kondo Steffensen, Sam (Intern)
Main Supervisor:
Perunovic, Zoran (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Determination and assessment of critical material parameters for severely cracked alkali-silica reaction damaged concrete structures' function and load bearing capacity

Department of Civil Engineering
Period: 01/05/2017 → 10/03/2021
Number of participants: 5
Phd Student:
Thomsen, Hans Christian Brolin (Intern)
Supervisor:
Barbosa, Ricardo Antonio (Intern)
Grelk, Bent (Intern)
Larsen, Erik Stoklund (Ekstern)
Main Supervisor:
Hansen, Kurt Kielsgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Development of continuous non-invasive monitoring system for early detection and prevention of serious morbidity and mortality after abdominal cancer- surgery

Department of Electrical Engineering
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Olsen, Rasmus Munch (Intern)
Supervisor:
Aasvang, Eske Kvanner (Ekstern)
Meyhoff, Christian Sahlholt (Ekstern)
Main Supervisor:
Sørensen, Helge Bjarup Dissing (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Environmental Sustainability Assessment of Advanced Agricultural Waste Technologies and Agricultural Territories

Department of Management Engineering
Environmental Sustainability Assessment of Advanced Agricultural Waste Technologies and Agricultural Territories

Department of Management Engineering
Period: 01/05/2017 → 13/08/2020
Number of participants: 4
Phd Student:
Sohn, Joshua (Intern)
Supervisor:
Goldstein, Benjamin Paul (Intern)
Kalbar, Pradip (Intern)
Main Supervisor:
Birkved, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Greenland seaweeds for human consumption

National Food Institute
Period: 01/05/2017 → 30/04/2020
Number of participants: 3
Phd Student:
Kreissig, Katharina Johanna (Intern)
Supervisor:
Jensen, Pernille Erland (Intern)
Main Supervisor:
Hansen, Lisbeth Truelstrup (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Image Synthesis and Analysis of Engineered Surface Microstructure

Department of Applied Mathematics and Computer Science
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Falster, Viggo (Intern)
Supervisor:
Aanaes, Henrik (Intern)
Nielsen, Jannik Boll (Intern)
Main Supervisor:
Frisvad, Jeppe Revall (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Samfinansieret - Andet
- Project: PhD

**Industry 4.0 Digital Technologies For High Added Value Zero Defect Manufacturing**
- Department of Mechanical Engineering
- Period: 01/05/2017 → 02/07/2020
- Number of participants: 5
- PhD Student:
  - Charalambis, Alessandro (Intern)
  - Calaon, Matteo (Intern)
  - Hansen, Hans Nørgaard (Intern)
  - Pedersen, David Bue (Intern)
- Supervisor:
  - Tosello, Guido (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Samfinansieret - Andet
- Project: PhD

**Market design and operations for Energy Collectives**
- Department of Electrical Engineering
- Period: 01/05/2017 → 30/04/2020
- Number of participants: 3
- PhD Student:
  - Moret, Fabio (Intern)
  - Papakonstantinou, Athanasios (Intern)
- Supervisor:
  - Pinson, Pierre (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Offentlig finansiering
- Project: PhD

**Mechanistic modelling of heat and mass transfer in processing of solid and semi-solid foods**
- National Food Institute
- Period: 01/05/2017 → 30/04/2020
- Number of participants: 3
- PhD Student:
  - Rabeler, Felix (Intern)
  - Feyissa, Aberham Hailu (Intern)
- Supervisor:
  - Mohammadifar, Mohammad Amin (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Samfinansierede - Virksomhed
- Project: PhD
Mitigation Cultures of Mussels - Ecological Impact
National Institute of Aquatic Resources
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Taylor, Daniel (Intern)
Supervisor:
Nielsen, Pernille (Intern)
Saurel, Camille (Intern)
Main Supervisor:
Petersen, Jens Kjerulf (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

PhD Scholarship in Fish Stock Assessment and Population Dynamics Modelling
National Institute of Aquatic Resources
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Mildenberger, Tobias (Intern)
Supervisor:
Berg, Casper Willestofte (Intern)
Kokkalis, Alexandros (Intern)
Main Supervisor:
Nielsen, J. Rasmus (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Polymer and carbon based optoelectrical waveguides
Department of Micro- and Nanotechnology
Period: 01/05/2017 → 30/04/2020
Number of participants: 3
Phd Student:
Vasudevan, Shashank (Intern)
Supervisor:
Keller, Stephan Sylvest (Intern)
Main Supervisor:
Emnéus, Jenny (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Real time sound field control for outdoor concerts - silent zones, adaptation and objective-subjective performance
Department of Electrical Engineering
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student:
Plewe, Daniel (Intern)
Supervisor:
Brunskog, Jonas (Intern)
Fernandez Grande, Efren (Intern)
Main Supervisor: Agerkvist, Finn T. (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Sensors on disc**
Department of Micro- and Nanotechnology
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student: Rajendran, Sriram Thoppe (Intern)
Supervisor: Matteucci, Marco (Intern)
Zor, Kinga (Intern)
Main Supervisor: Boisen, Anja (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

**Sustainable Process Synthesis and Design**
Department of Chemical and Biochemical Engineering
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student: Al, Resul (Intern)
Supervisor: Gernaey, Krist V. (Intern)
Zubov, Alexandr (Intern)
Main Supervisor: Sin, Gürkan (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

**Synthesis of heterogeneous base metal catalysis for C-H functionalization**
Department of Chemistry
Period: 01/05/2017 → 30/04/2020
Number of participants: 4
Phd Student: Christensen, David Benjamin (Intern)
Supervisor: Kramer, Søren (Intern)
Mielby, Jerrik Jørgen (Intern)
Main Supervisor: Kegnæs, Søren (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD
Innovations in Interdisciplinary Research in Built Environment within the Baltic Sea Region
Funded by Federal Ministry of Education and Research (BMBF) of Germany / Inno-BSR. Project owner prof. Annette Boegle, HCU

Department of Civil Engineering
Section for Building Design
Period: 30/04/2017 → 01/02/2019
Number of participants: 1
Project participant:
Jensen, Lotte Bjerregaard (Intern)

Cryogenic Receiver Array Coils for Hyperpolarized Magnetic Resonance

Department of Electrical Engineering
Period: 15/04/2017 → 14/04/2020
Number of participants: 4
Phd Student:
Baron, Rafael Antonio (Intern)
Supervisor:
Grivel, Jean-Claude (Intern)
Zhurbenko, Vitaliy (Intern)
Main Supervisor:
Ardenkjær-Larsen, Jan Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Fracture of Fiber Composites under Transient Loading

Department of Mechanical Engineering
Period: 15/04/2017 → 14/04/2020
Number of participants: 6
Phd Student:
Pérez, Ignacio Vidal (Intern)
Supervisor:
Eriksen, Rasmus Normann Wilken (Intern)
Kepler, Jørgen Asbøll (Ekstern)
Riisgaard, Benjamin (Intern)
Toftegaard, Helmuth Langmaack (Intern)
Main Supervisor:
Berggreen, Christian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

GIANT-E: Microstructural forging of electromechanically active bulk ceria

Department of Energy Conversion and Storage
Period: 15/04/2017 → 14/04/2020
Number of participants: 3
Phd Student:
Kabir, Ahsanul (Intern)
Supervisor:
Van Nong, Ngo (Intern)
The effect of hearing loss and noise on conversational dynamics

Department of Electrical Engineering
Period: 15/04/2017 → 14/04/2020
Number of participants: 3
Phd Student:
Sørensen, Anna Josefine (Intern)
Supervisor:
Lunner, Thomas Fritiof (Ekstern)
Main Supervisor:
MacDonald, Ewen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Agricultural Water Innovations in the Tropics

Department of Environmental Engineering
Water Resources Engineering
Period: 01/04/2017 → 01/05/2020
Number of participants: 1
Acronym: AgWIT
Project participant:
Garcia, Monica (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Danske tangressourcer i spil- til fødevarer, foder og som en håndsrækning til havmiljøet
WP leader of the food and feed safety issues

National Food Institute
Research Group for Bioactives – Analysis and Application
Period: 01/04/2017 → 31/03/2021
Number of participants: 1
Acronym: Tang.nu
Project participant:
Holdt, Susan Løvstad (Intern)

Across Continents Electric Vehicle Services
ACES intends to holistically investigate technical and economic system benefits and impacts by large scale electric vehicles integration in Bornholm, augmented by real usage patterns, grid data and field testing for across continents replicability.

A full scale penetration scenario of EVs in Bornholm will be simulated in order to assess how new aggregating functionality can support both technically and economically the successful integration of electric vehicles into the energy system. It will also initiate a small scale pilot project involving up to 50 publicly and privately owned Nissan vehicles and V2G chargers for proving that EVs can be used for effectively balance the system.

The analysis, although focused on a Danish context, is enhanced also by comparing existing electricity market services in UK and in Japan, taking advantage by the strong collaboration established with the Japanese and UK based research centers of Nissan.
Smart Load
The increasing capacity of container vessels is pressuring container terminals worldwide to improve their performance. Simple improvements of work practices are no longer a viable option even for the medium and small container terminals we find in Denmark. With this project we wish to initiate a pilot study on the possibility of improving terminal performance by exploiting the flexibility that arises from a possible collaboration between the terminal planners and the ship owners. A preliminary study, done in collaboration with APM Terminals – Cargo Service A/S (APMT) in Aarhus, has shown that giving the terminal some decision power over the arrangement of the containers in the vessel can result in improved vessel handling times. With this research application we wish to initiate a pilot project that can demonstrate the potential of this collaboration on an industrial scale. In order to do so, APMT has agreed to provide data and domain expertise to the research team at the Technical University of Denmark (DTU), and be an active partner in this project. The research team envision the use of operation research methods to optimize the new planning problems that arise from this collaboration.

Department of Management Engineering
Management Science
Transport DTU
Period: 01/04/2017 → 01/04/2018
Number of participants: 2
Acronym: SMARTLOAD
Project participant:
Larsen, Rune (Intern)
Project Manager, academic:
Pacino, Dario (Intern)
An experimental assessment of how trees affect the wind field

Department of Wind Energy
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student:
Angelou, Nikolas (Intern)
Supervisor:
Mann, Jakob (Intern)
Main Supervisor:
Dellwik, Ebba (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Characterization of protein solution structure using light scattering techniques and SAXS

Department of Chemistry
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Pohl, Christin (Intern)
Supervisor:
Nørgaard, Allan (Intern)
Peters, Günther H.J. (Intern)
Main Supervisor:
Harris, Pernille (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret
Project: PhD

Design of pervasive systems for chronic sleep/brain disorders

Department of Electrical Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Olsen, Mads (Intern)
Supervisor:
Jennum, Poul (Ekstern)
Mignot, Emmanuel (Ekstern)
Main Supervisor:
Serensen, Helge Bjarup Dissing (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Determining the influence of benthic substrate on Biodiversity-Ecosystem Function relationships in coral reef ecosystems

National Institute of Aquatic Resources
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Maginnis, Neil (Intern)
Supervisor:
Keith, Sally A. (Ekstern)
Wisz, Mary (Intern)
Main Supervisor:
Lindegren, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Discovery and engineering of new enzymes for efficient enzymatic conversion of CO2 to CH2OH

Department of Chemical and Biochemical Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Nielsen, Christian Førgaard (Intern)
Supervisor:
Christensen, Jakob Munkholt (Intern)
Lange, Lene (Intern)
Main Supervisor:
Meyer, Anne S. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Efficient mid-IR supercontinuum generation in quadratic nonlinear waveguides

Department of Photonics Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Li, Gaoyuan (Intern)
Supervisor:
Moselund, Peter M. (Intern)
Zhou, Binbin (Intern)
Main Supervisor:
Bache, Morten (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Electrochemical N2 reduction under ambient conditions
Department of Physics
Period: 01/04/2017 → 31/03/2020
Number of participants: 5
Phd Student:
Andersen, Suzanne Zamy (Intern)
Supervisor:
Chorkendorff, Ib (Intern)
Kibsgaard, Jakob (Intern)
Vesborg, Peter Christian Kjærgaard (Intern)
Main Supervisor:
Vesborg, Peter Christian Kjærgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Engineering of high-temperature and inhibitor in Kluyveromyces marxianus for simultaneous saccharification and fermentation (SSF) process
Technical University of Denmark
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student:
Nurani, Wasti (Intern)
Supervisor:
Stovicek, Vratislav (Intern)
Main Supervisor:
Borodina, Irina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Fabrication and electrical properties of advanced thin film materials for resistive switching memories
Department of Energy Conversion and Storage
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Li, Yang (Intern)
Supervisor:
Esposito, Vincenzo (Intern)
Traulsen, Marie Lund (Intern)
Main Supervisor:
Pryds, Nini (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
Improving customer experience and retention with Big Data analytics

Department of Applied Mathematics and Computer Science
Period: 01/04/2017 → 31/03/2020
Number of participants: 5
Phd Student:
Kowalczyk, Damian (Intern)
Supervisor:
Derungs, Jörg (Ekstern)
Hansen, Lars Kai (Intern)
Kjall, Uffe (Ekstern)
Main Supervisor:
Larsen, Jan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Integrated process chains based on additive manufacturing precision processes and technologies for production of high accuracy mould components

Department of Mechanical Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 5
Phd Student:
Moshiri, Mandaná (Intern)
Supervisor:
Hansen, Hans Nørgaard (Intern)
Harder, Ronen (Ekstern)
Høvsgaard, Per (Ekstern)
Main Supervisor:
Tosello, Guido (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Investigating learning effectiveness in virtual simulations by cognition-driven design

Technical University of Denmark
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student:
Wismer, Philip (Intern)
Supervisor:
Córdoba, Ainara López (Ekstern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Metal-Catalyzed Dehydrogenation of Alcohols

Department of Chemistry
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student:
Samuelsen, Simone Vestermann (Intern)
Supervisor:
Clausen, Mads Hartvig (Intern)
Main Supervisor:
Madsen, Robert (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Institut stipendie (DTU)
- Project: PhD

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**Modelling and Control of Multi-Energy System for Wind Power Integration**

Department of Electrical Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Chyhryn, Serafym (Intern)
Supervisor:
You, Shi (Intern)
Zong, Yi (Intern)
Main Supervisor:
Bindner, Henrik W. (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Forskningsrådsfinansiering
- Project: PhD

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**Nanophotonics devices for ultra-fast nonlinear processes in the infrared**

Department of Photonics Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Christensen, Simon (Intern)
Supervisor:
Torres-Company, Victor (Ekstern)
Zhou, Binbin (Intern)
Main Supervisor:
Bache, Morten (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Institut stipendie (DTU)
- Project: PhD

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**New thin solar cell films makes silicon cells better**

Department of Photonics Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student:
Ganskukh, Mungunshagai (Intern)
Supervisor:
Schou, Jørgen (Intern)
Main Supervisor:
Canulescu, Stela (Intern)

**Financing sources**
- Source: Internal funding (public)
- Name of research programme: Institut stipendie (DTU)
Numerical Modelling and Experimental Characterization of the Resin Injection Pultrusion Process

Department of Mechanical Engineering
Period: 01/04/2017 → 05/05/2020
Number of participants: 4
Phd Student: Rasmussen, Filip Salling (Intern)
Supervisor: Sonne, Mads Rostgaard (Intern)
Spangenberg, Jon (Intern)
Main Supervisor: Hattel, Jesper Henri (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Optimisation of future mobile communication systems using Deep Learning

Department of Photonics Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student: Thrane, Jakob (Intern)
Supervisor: Zibar, Darko (Intern)
Main Supervisor: Christiansen, Henrik Lehrmann (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Quantum Communication with non-Gaussian states

Department of Physics
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student: Breum, Casper Rubæk (Intern)
Supervisor: Neergaard-Nielsen, Jonas Schou (Intern)
Main Supervisor: Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Reduction of Fatigue Damage Estimation based on Actual Fatigue Stress

Department of Civil Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 3
Phd Student: Silva Nabuco, Bruna (Intern)
Simulation of Three-Wave Interactions in Microwave Heated Fusion Plasmas

Department of Physics
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Senstius, Mads Givskov (Intern)
Supervisor:
Madsen, Jens (Intern)
Vann, Roddy (Ekstern)
Main Supervisor:
Nielsen, Stefan Kragh (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Synthesis and characterization of Tubular Oxygen transport membranes

Department of Energy Conversion and Storage
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Martinez Aguilera, Lev (Intern)
Supervisor:
Bjørnetun Haugen, Astri (Intern)
Kaiser, Andreas (Intern)
Main Supervisor:
Kiebach, Wolff-Ragnar (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Vibrations for Estimating Bolted Joint Integrity (VEBJI)

Department of Mechanical Engineering
Period: 01/04/2017 → 31/03/2020
Number of participants: 4
Phd Student:
Brøns, Marie (Intern)
Supervisor:
Fidlin, Alexander (Ekstern)
Tcherniak, Dmitri (Intern)
Main Supervisor:
Thomsen, Jon Juel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
2-Dimensional Materials as Substrate and base materials for catalytic reactive centers

Department of Physics
Period: 15/03/2017 → 14/03/2020
Number of participants: 3
Phd Student:
Secher, Niklas Mørch (Intern)
Supervisor:
Kibsgaard, Jakob (Intern)
Main Supervisor:
Chorkendorff, Ib (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

BEAM-ME
The project aims at speeding up GAMS-based energy system models. The System Analysis group takes part in the project with the open source energy system model Balmorel.

Department of Management Engineering
Systems Analysis
Management Science
Operations Research
RAM-lose

German Aerospace Center (DLR)
Period: 15/03/2017 → 30/09/2018
Number of participants: 2
Balmorel, Energy System Modelling, Speed-up Models
Project ID: 82552
Project participant:
Wiese, Frauke (Intern)
Buchholz, Stefanie (Intern)

Big Data Analytics with special emphasis on Food Supply Chain Data

Department of Applied Mathematics and Computer Science
Period: 15/03/2017 → 14/03/2020
Number of participants: 3
Phd Student:
Vermue, Laurent (Intern)
Supervisor:
Hansen, Lars Kai (Intern)
Main Supervisor:
Ersbøll, Bjarne Kjær (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Development of novel drug delivery systems for cancer immunotherapy

Department of Micro- and Nanotechnology
Period: 15/03/2017 → 14/03/2020  
Number of participants: 3  
Phd Student:  
Stavnsbjerg, Camilla (Intern)  
Supervisor:  
Hansen, Anders Elias (Intern)  
Main Supervisor:  
Andresen, Thomas Lars (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Offentlig finansiering  
Project: PhD  

**Drug delivery of cancer immunotherapeutics**  
Department of Micro- and Nanotechnology  
Period: 15/03/2017 → 14/03/2020  
Number of participants: 3  
Phd Student:  
Weywadt, Matilda Felicia de Val (Intern)  
Supervisor:  
Hansen, Anders Elias (Intern)  
Main Supervisor:  
Andresen, Thomas Lars (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Offentlig finansiering  
Project: PhD  

**Induction-heated catalytic hydrogen production - amagnetic investigation**  
Department of Physics  
Period: 15/03/2017 → 14/03/2020  
Number of participants: 3  
Phd Student:  
Almind, Mads Radmer (Intern)  
Supervisor:  
Chorkendorff, Ib (Intern)  
Main Supervisor:  
Frandsen, Cathrine (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD  

**Micromachined 2D Transducers and Phantoms for 3D Super-resolution Ultrasound Imaging**  
Department of Micro- and Nanotechnology  
Period: 15/03/2017 → 14/03/2020  
Number of participants: 4  
Phd Student:  
Ommen, Martin Lind (Intern)  
Supervisor:  
Jensen, Jørgen Arendt (Intern)  
Larsen, Niels Bent (Intern)  
Main Supervisor:  
Thomsen, Erik Vilain (Intern)  

**Financing sources**
**The Correlation of Reactivity and Activity of Mass Selected Nanoparticles**

Department of Physics  
**Period:** 15/03/2017 → 14/03/2020  
**Number of participants:** 3  
**Phd Student:** Sørensen, Jakob Ejler (Intern)  
**Supervisor:** Kibsgaard, Jakob (Intern)  
**Main Supervisor:** Chorkendorff, Ib (Intern)

**Financing sources**

Source: Internal funding (public)  
**Name of research programme:** Offentlig finansiering  
**Project:** PhD

**Studies of Polynuclear Clusters for Biomass Conversion**

Department of Chemistry  
Centre for Catalysis and Sustainable Chemistry  
Organic Chemistry  
**Period:** 01/03/2017 → 31/08/2017  
**Number of participants:** 1  
**Project ID:** 12-134779  
**Project participant:** Nielsen, Martin (Intern)

**Risk Based Asset Management of subsurface wells against corrosion and scale**

Centre for oil and gas – DTU  
Aalborg University  
**Period:** 01/03/2017 → …  
**Number of participants:** 1  
**Project participant:** Miraglia, Simona (Intern)

**Growing Food CPH**  
Øge antal af job og skabe vækst i region Hovedstaden gennem stimulering af entreprenørskab fra universiteterne i hovedstadsområdet indenfor fødevareområdet

National Food Institute  
**Period:** 01/03/2017 → 29/02/2020  
**Number of participants:** 4  
**Project participant:** Jensen, Henning Høgh (Intern)  
Vierick, Nanna (Ekstern)  
Kristensen, Niels Heine (Ekstern)  
Mayland, Søren (Ekstern)

**Science and Innovation with Thunderstorms**

SAINT is a Marie Curie project of 15 Ph.D. students and 19 academic and industrial partners funded by the EU H2020 programme. SAINT will study the physics of thunderstorm processes and their effects on the atmosphere, and new
concepts of lightning detection and protection. SAINT will analyze data from the ASIM instruments on the International Space Station with observations of thunderstorm from the ground, laboratory experiments, and with modelling and simulations.

National Space Institute

Astrophysics and Atmospheric Physics
Period: 01/03/2017 → 01/03/2021
Number of participants: 10
Acronym: SAINT
Number of related Ph.D. students: 15
Project participant:
Ebert, Ute (Ekstern)
Füllekrug, Martin (Ekstern)
Østgaard, Nikolai (Ekstern)
Nijdam, Sander (Ekstern)
Vazquez, Francisco Gordillo (Ekstern)
Soula, Serge (Ekstern)
Montanya, Joan (Ekstern)
Lorenzo-Prado, Victor P. (Ekstern)
Bennet, Alec (Ekstern)

Project Coordinator:
Neubert, Torsten (Intern)

H2020-Shift2Rails-Safe Architecture for Robust Distributed Application Integration in Rolling Stock

Department of Photonics Engineering

Networks Technology and Service Platforms
Period: 01/03/2017 → 30/06/2018
Number of participants: 3
Acronym: Safe 4Rails
Project participant:
Soler, José (Intern)
Yan, Ying (Intern)
Dittmann, Lars (Intern)

Safe quality improvement in healthcare - a human centred systems engineering approach

Department of Management Engineering

Management Science

Implementation and Performance Management
Period: 01/03/2017 → 01/03/2020
Number of participants: 3
Project participant:
Edwards, Kasper (Intern)
Hasle, Peter (Intern)

Project Manager, academic:
Neuman, Patrick (Ekstern)

Measurement of lubricant film thicknesses by laser induced fluorescence

Department of Mechanical Engineering

Solid Mechanics
Regn med Thyborøn
Thyborøn is challenged by water from all sides. Rain from above, the North Sea and Limfjord from the sides and a rising groundwater level from below. Lemvig Municipality Lemvig and Water & Wastewater participate in Rain & Cities to develop their cooperation so that they together with the citizens can deal with the major challenges that the city face. The combination of more rainfall, higher sea levels, increasing groundwater levels and a flat terrain, makes floods a challenge. The existing storm water system has been functioning for many years, but due to climate change, the system is not sustainable in the future and there is a need for new thinking. The complexity requires close cooperation between the municipality of Lemvig and Lemvig Water & Wastewater. By participating in Rain & Cities will have the opportunity to develop their long-term cooperation, develop solutions to handle rain water on the surface and through the calculation tool 'splask' to build a common knowledge base on the economy in several different alternative projects. In particular, Lemvig Municipality and Lemvig Water & Wasteewater focus on a new large stormwater basin. The basin is strategically placed in the context of Thyborøn Fritidscenter, serves as focal point for the city's population, and close to the city campground. There is plenty of scope for thinking basin along with recreational functions and turn Thyborøn challenging location for an exciting story that can arouse interest among both residents, students and tourists. In addition to the specific project area by Thyborøn Fritidscenter, participation in Rain & Cities also form the basis for identifying other possible collaborative projects in Thyborøn where investments by the municipality and the water company can match. Project is developed in close cooperation with the Central Denmark Region's EU project Coast to Coast Climate Challenge, Klimatorium in Lemvig and Aqua Globe in Skanderborg. The collaboration provides, inter alia, good opportunities for communication and to involve students, researchers and technicians.

National Space Institute
Geodesy
Lemvig municipality
Lemvig Water and Wastewater
Region of Central Denmark
Ramboll Group AS
Agency for Data Supply and Efficiency (SDFE)
Skanderborg Utility
Period: 01/03/2017 → 31/12/2017
Number of participants: 2
Number of related Ph.D. students: 1
Project participant:
Sørensen, Carlo Sass (Intern)
Knudsen, Per (Intern)

Relations
Related projects:
Coastal flooding hazards due to storm surges and subsidence
Project

Biomimetic and responsive adhesives for a challenging biological environment
Department of Chemistry
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student:
Jiang, Tao (Intern)
Supervisor:
Almdal, Kristoffer (Intern)
Main Supervisor:
Thormann, Esben (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Characterisation of T cell responses induced following immunotherapy

National Veterinary Institute
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student:
Hansen, Ulla Kring (Intern)
Supervisor:
Lassen, Ulrik (Ekstern)
Main Supervisor:
Hadrup, Sine Reker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Damage Tolerance of Sandwich Structures in Naval Operating in Arctic Regions Vessels

Department of Mechanical Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 4
Phd Student:
Sabbadin, Pietro (Intern)
Supervisor:
Hayman, Brian (Intern)
Legarth, Brian Nyvang (Intern)
Main Supervisor:
Berggreen, Christian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-stipendium
Project: PhD

Development of 3-dimensiona Graphene Biocatalysts for Enzymatic Biofuel Cells

Department of Chemistry
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student:
Tang, Jing (Intern)
Supervisor:
Engelbrekt, Christian (Intern)
Main Supervisor:
Zhang, Jingdong (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Fabrication of biodegradable microcontainers for oral drug delivery

Department of Micro- and Nanotechnology
Period: 01/03/2017 → 29/02/2020
Number of participants: 4
Phd Student: Abid, Zarmeena (Intern)
Supervisor: Boisen, Anja (Intern)
Petersen, Ritika Singh (Intern)
Main Supervisor: Keller, Stephan Sylvest (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

High Dimensional Quantum Key Distribution Based on Space Division Multiplexing

Department of Photonics Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 4
Phd Student: Cozzolino, Daniele (Intern)
Supervisor: Bacco, Davide (Intern)
Rottwitt, Karsten (Intern)
Main Supervisor: Oxenløwe, Leif Katsuo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Integration of Informatics and Metabolic Engineering for the discovery of Novel Antibiotics

Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Network Reconstruction in Silico Biology
Fundación MEDINA
Korea Advanced Institute of Science and Technology (KAIST)
Period: 01/03/2017 → 31/03/2023
Number of participants: 2
Acronym: iimena
Project participant: Weber, Tilmann (Intern)
Palsson, Bernhard (Intern)

Financing sources
Source: Forsk. Private danske - Fonde
Name of research programme: Novo Nordisk Foundation Challenge Program
Web address: http://www.novonordiskfonden.dk
Amount: 58,832,942.00 Danish Kroner
Year of approval: 2017

Relations
Activities:
In silico and experimental approaches to understand and engineer the biosynthesis of antibiotics
Lectures on antibiotics biosynthesis: polyketides, aminoglycosides, RiPPs and others

Project

**Microfabrication Technology for X-ray Optical Elements**

Department of Micro- and Nanotechnology

Period: 01/03/2017 → 29/02/2020

Number of participants: 3

PhD Student:

Silvestre, Chantal (Intern)

Supervisor:

Jansen, Henri (Intern)

Main Supervisor:

Hansen, Ole (Intern)

**Financing sources**

Source: Internal funding (public)

Name of research programme: Samfinansieret - Andet

Project: PhD

**Optimization of antibiotic therapy in mink - MIC values and consumption**

National Veterinary Institute

Period: 01/03/2017 → 29/02/2020

Number of participants: 5

PhD Student:

Nikolaisen, Nanett Kvist (Intern)

Supervisor:

Chriél, Mariann (Intern)

Larsen, Peter Foged (Intern)

Struve, Tina (Intern)

Main Supervisor:

Pedersen, Karl (Intern)

**Financing sources**

Source: Internal funding (public)

Name of research programme: ErhvervsPhD-ordningen VTU

Project: PhD

**Physiological characterization of the impact of gradients on fermentation processes**

Department of Chemical and Biochemical Engineering

Period: 01/03/2017 → 29/02/2020

Number of participants: 4

PhD Student:

Nadal Rey, Gisela (Intern)

Supervisor:

Cornelissen, Sjef (Ekstern)

Eliasson Lantz, Anna (Intern)

Main Supervisor:

Gernaey, Krist V. (Intern)

**Financing sources**

Source: Internal funding (public)

Name of research programme: Samfinansieret - Andet

Project: PhD

**Quantum emitters in Epsilon-Near-Zero Medium**

Department of Photonics Engineering
Rheology of matrix and concrete with crushed aggregates
Department of Mechanical Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 4
Phd Student:
Skare, Elisabeth Leite (Intern)
Supervisor:
Jacobsen, Stefan (Ekstern)
Mørtsell, Ernst (Ekstern)
Main Supervisor:
Spangenberg, Jon (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Joint degree
Project: PhD

Robust solutions of design of internal insulation in historic buildings with regards to hygrothermal performance
Department of Civil Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student:
Jensen, Nicolaj Feldt (Ekstern)
Supervisor:
Nielsen, Peter Rode (Intern)
Main Supervisor:
Bjarløv, Søren Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

**Surface Engineering of Bulk Metallic Glasses**
Department of Mechanical Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student: Haratian, Saber (Intern)
Supervisor: Christiansen, Thomas Lundin (Intern)
Main Supervisor: Somers, Marcel A. J. (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Synthesis of heterogeneous nanoparticle catalysts**
Department of Chemistry
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student: Zacho, Simone Louise (Intern)
Supervisor: Mielby, Jerrik Jørgen (Intern)
Main Supervisor: Kegnæs, Søren (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

**Theory and modeling of acoustic streaming in microfluidic devices**
Department of Physics
Period: 01/03/2017 → 29/02/2020
Number of participants: 3
Phd Student: Bach, Jacob Søberg (Intern)
Supervisor: Bohr, Tomas (Intern)
Main Supervisor: Bruus, Henrik (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Waste heat recovery on liquefied natural gas-fuelled ships**
Department of Mechanical Engineering
Period: 01/03/2017 → 29/02/2020
Number of participants: 4
Phd Student: Baldasso, Enrico (Intern)
Supervisor:
Larsen, Ulrik (Intern)
Montagud, Maria E. Mondejar (Intern)
Main Supervisor:
Haglind, Fredrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-stipendium
Project: PhD

Innovation Klimatilpasning med borgere
Department of Management Engineering
Period: 16/02/2017 → 16/02/2017
Number of participants: 2
Project participant:
Alsbjørn, Lene (Intern)
Project Manager, organisational:
Hoffmann, Birgitte (Intern)

Financing sources
Source: Sam.arb.aftaler - Statslige danske
Name of research programme: Sam.arb.aftaler - Statslige danske
Amount: 2,730,000.00 Danish Kroner
Project

Advanced Accurate and Computationally Efficient Numerical Methods for Wind Turbine Rotor Blade Design
Department of Wind Energy
Period: 15/02/2017 → 14/02/2020
Number of participants: 4
Phd Student:
Bertolini, Paola (Intern)
Supervisor:
Eder, Martin Alexander (Ekstern)
Lindby, Torben (Ekstern)
Main Supervisor:
Stolpe, Mathias (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Advanced oil recovery processess: Modifications of injection water composition
Department of Chemical and Biochemical Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Hao, Jiasheng (Intern)
Supervisor:
Shapiro, Alexander (Intern)
Main Supervisor:
Nielsen, Sidsel Marie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Augmenting metagenomic-wide association studies by grouping species that share a functional potential or ecological role

Department of Bio and Health Informatics
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student: Petersen, Anders Østergaard (Intern)
Supervisor: Nielsen, Henrik Bjørn (Intern)
Main Supervisor: Rasmussen, Simon (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Creating the scientific foundation for alternative ways of managing North Sea sandeel

National Institute of Aquatic Resources
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student: Henriksen, Ole (Intern)
Supervisor: Christensen, Asbjørn (Intern)
Main Supervisor: van Deurs, Mikael (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Decolorization, Desalination and Purification of Molasses by Nanofiltration

Department of Chemical and Biochemical Engineering
Period: 15/02/2017 → 15/09/2017
Number of participants: 4
Phd Student: Tan, Sheng (Intern)
Supervisor: Krühne, Ulrich (Intern)
Luo, Jianquan (Intern)
Main Supervisor: Pinelo, Manuel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Directed evolution of small-molecule receptors and enzymes

Technical University of Denmark
Period: 15/02/2017 → 14/02/2020
Number of participants: 4
Phd Student: D'ambrosio, Vasil (Intern)
Supervisor:
Keasling, Jay (Intern)
Lassen, Lærke Marie Münter (Intern)
Main Supervisor:
Jensen, Michael Krogh (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Engineering of Kluveromyces marxianus for production of bulk chemicals in biorefinery

Technical University of Denmark
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Marella, Eko Roy (Intern)
Supervisor:
Rosgaard, Lisa (Ekstern)
Main Supervisor:
Borodina, Irina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Evaluate and Establish Surveillance program of Salmonella in Imported and domestic Poultry Meat in Jordan

National Food Institute
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Hantash, Tariq (Ekstern)
Supervisor:
Alali, Walid (Ekstern)
Main Supervisor:
Vigre, Håkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Evaluate and Establish Surveillance program of Salmonella in Imported and domestic Poultry Meat in Jordan

National Food Institute
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Hantash, Tariq (Ekstern)
Supervisor:
Alali, Walid (Ekstern)
Main Supervisor:
Vigre, Håkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD
Fundamentals and Boundaries of Optical Time Lenses

Department of Photonics Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Klejs, Frederik (Intern)
Supervisor:
Galili, Michael (Intern)
Main Supervisor:
Oxenløwe, Leif Katsuo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Giant-E - Ceria Thin Films Giant Electrostrictors

Department of Energy Conversion and Storage
Period: 15/02/2017 → 14/02/2020
Number of participants: 4
Phd Student:
Santucci, Simone (Intern)
Supervisor:
Lubomirsky, Igor (Ekstern)
Pryds, Nini (Intern)
Main Supervisor:
Esposito, Vincenzo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Near Term Commercial Space Resource Operations and Utilisation

National Space Institute
Period: 15/02/2017 → 12/02/2019
Number of participants: 4
Phd Student:
Culton, John (Intern)
Supervisor:
Andersen, Niels (Intern)
Chytka, Trina (Ekstern)
Main Supervisor:
Jørgensen, John Leif (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Supercontinuum generation with rugged femtosecond fibre lasers

Department of Photonics Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 4
Phd Student:
Rao Delanthabettu Shivarama, Shreesha (Intern)
Supervisor:
Moselund, Peter M. (Intern)
Zhou, Binbin (Intern)
Main Supervisor:
Bache, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

TBD

Department of Electrical Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
PhD Student:
Jørgensen, Kasper Lüthje (Intern)
Supervisor:
Andersen, Michael A. E. (Intern)
Main Supervisor:
Zhang, Zhe (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

The Thermodynamics and Transport Properties on Ionic-Liquids Based Compounds

Department of Chemical and Biochemical Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
PhD Student:
Cai, Yingjun (Ekstern)
Supervisor:
von Solms, Nicolas (Intern)
Main Supervisor:
Thomsen, Kaj (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

The Thermodynamics and Transport Properties on Ionic-Liquids Based Compounds

Department of Chemical and Biochemical Engineering
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
PhD Student:
Cai, Yingjun (Intern)
Supervisor:
von Solms, Nicolas (Intern)
Main Supervisor:
Thomsen, Kaj (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD
Understanding the biodiversity-ecosystem functioning relationship in marine food webs through large-scale observations and modelling

National Institute of Aquatic Resources
Period: 15/02/2017 → 14/02/2020
Number of participants: 3
Phd Student:
Maureaud, Aurore (Intern)
Supervisor:
Andersen, Ken Haste (Intern)
Main Supervisor:
Lindegren, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Monitoring of the Yucatan Peninsula with UAVs
Deployment of Unmanned Aerial Vehicles (UAVs) to observe water level, bathymetry and temperature in the worldwide unique water bodies of the Yucatan peninsula (Mexico).

Department of Environmental Engineering
Water Resources Engineering
Period: 10/02/2017 → 05/04/2017
Number of participants: 4
cenote, lagoon, Yucatan, bathymetry, water level, temperature, UAVs
Project participant:
Bandini, Filippo (Intern)
Lopez, Alejandro (Ekstern)
Project Manager, organisational:
Merediz-Alonso, Gonzalo (Ekstern)
Project Manager, academic:
Bauer-Gottwein, Peter (Intern)
Documents:
Research contract
Project

EFSA .Pilot Project on Data Quality with DENMARK
Research Group for Diagnostic Engineering
Division of Food Microbiology
National Food Institute
Division of Risk Assessment and Nutrition
European Food Safety Authority
Period: 10/02/2017 → …
Number of participants: 1
Project participant:
Christensen, Julia (Intern)
Project

Environment in Manufacturing
Embedding sustainability metrics in the planning and operation of high volume production lines
Department of Management Engineering
Quantitative Sustainability Assessment
Lego Group
Investigation of metallic-ceramic 3D network-structures for solid oxide fuel cell technology

Investigation of metallic/ceramic Cu-Mn/Cu-Mn-O spinel foam structures and development of Cu-Mn/Cu-Mn-O spinel oxide nanofibers.

Department of Energy Conversion and Storage

Electrofunctional materials

Proton conductors

Mixed Conductors

Period: 01/02/2017 → 23/06/2017
Number of participants: 4

SOFC, oxide spinel, SEM-EDS, microstructure, thermal analysis, electrochemistry, Nanofibers, crystallography

Project participant:
Lund, Rasmus Kvist (Ekstern)
Supervisor:
Zhang, Wenjing (Angela) (Intern)
Main Supervisor:
Wulff, Anders Christian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Aero-acoustic wind tunnel tests

Department of Wind Energy

Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Lylloff, Oliver Ackermann (Intern)
Supervisor:
Bak, Christian (Intern)
Fernandez Grande, Efren (Intern)
Main Supervisor:
Fischer, Andreas (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
**Airborne and satellite remote sensing for hydrologic modelling applications**

Department of Environmental Engineering  
Period: 01/02/2017 → 31/01/2020  
Number of participants: 4  
Phd Student:  
Kittel, Cecile Marie Margaretha (Intern)  
Supervisor:  
Garcia, Monica (Intern)  
Tøttrup, Christian (Ekstern)  
Main Supervisor:  
Bauer-Gottwein, Peter (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet

**An open quantum systems approach to few photon scattering in photonic devices**

Department of Photonics Engineering  
Period: 01/02/2017 → 31/01/2020  
Number of participants: 4  
Phd Student:  
Joanesarson, Kristoffer Bitsch (Intern)  
Supervisor:  
Gregersen, Niels (Intern)  
Iles-Smith, Jake (Intern)  
Main Supervisor:  
Mørk, Jesper (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden

**Ballistic graphene devices for electron optics and switches**

Department of Micro- and Nanotechnology  
Period: 01/02/2017 → 18/06/2020  
Number of participants: 3  
Phd Student:  
Gejl, Aske Nørskov (Intern)  
Supervisor:  
Caridad, Jose (Intern)  
Main Supervisor:  
Bøggild, Peter (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet

**CFD Modelling of dynamic microfiltration for application in biotechnology processes**

Department of Chemical and Biochemical Engineering  
Period: 01/02/2017 → 31/01/2020  
Number of participants: 4  
Phd Student:
Construction of Superior Cell Factories for Vanillin Glucoside Production using a Synthetic Biology based Approach

Technical University of Denmark
Period: 01/02/2017 → 31/01/2020
Number of participants: 2
PhD Student:
Olsson, Helén Emelie (Intern)
Main Supervisor:
Mortensen, Uffe Hasbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Control of Flywheel energy storage in the role of peak power reduction

Department of Electrical Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
PhD Student:
D'Ambrosio, Alessandro (Intern)
Supervisor:
Vikelgaard, Hans Henrik (Ekstern)
Main Supervisor:
Mijatovic, Nenad (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Design of multifunctional heterogeneous catalysts

Department of Chemistry
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
PhD Student:
Rasmussen, Kristoffer Hauberg (Intern)
Supervisor:
Mielby, Jerrik Jørgen (Intern)
Main Supervisor:
Kegnæs, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
Developing High Performance Aluminium Tube Alloys for heat exchange Applications

Department of Mechanical Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 5
Phd Student:
Zaffaroni, Giorgio Giovanni Battista (Intern)
Supervisor:
Gudla, Visweswara Chakravarthy (Intern)
Nordlien, Jan Halvor (Ekstern)
Sørensen, Jens Sandahl (Ekstern)
Main Supervisor:
Ambat, Rajan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Development of NanoBiosensor for Detection of Food Contaminants

Department of Micro- and Nanotechnology
Period: 01/02/2017 → 31/01/2020
Number of participants: 5
Phd Student:
Feng, Xiaotong (Intern)
Supervisor:
Bang, Dang Duong (Intern)
Wolff, Anders (Intern)
Zhang, Jingdong (Intern)
Main Supervisor:
Sun, Yi (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Engineering biomimicking microenvironments for functional drug-safety screening

Department of Micro- and Nanotechnology
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Christensen, Rie Kjær (Intern)
Supervisor:
Skafte-Pedersen, Peder (Intern)
Wilson, Sandra (Ekstern)
Main Supervisor:
Larsen, Niels Bent (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

High-power visible-near-IR Supercontinuum sources for spectroscopic photoacoustic microscopy

Department of Photonics Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Dasa, Manoj Kumar (Intern)
Supervisor:
Jain, Deepak (Intern)
Markos, Christos (Intern)
Main Supervisor:
Bang, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

High Pressure Phase Behavior of Asymmetric Mixtures for Oil Production

Department of Chemistry
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Liu, Yiqun (Intern)
Supervisor:
Regueira Muñiz, Teresa (Intern)
Stenby, Erling Halfdan (Intern)
Main Supervisor:
Yan, Wei (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Privatist
Project: PhD

Investigation of oil production well corrosion issues and prevention

Department of Mechanical Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Rizzo, Riccardo (Intern)
Supervisor:
Fosbøl, Philip Loldrup (Intern)
Thomsen, Kaj (Intern)
Main Supervisor:
Ambat, Rajan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Investigations of Compositions and Fluid-Fluid Association Mechanisms for Petroleum Fluids

Department of Chemistry
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Mihrin, Dmytro (Intern)
Supervisor:
Henriksen, Jonas Rosager (Intern)
Larsen, René Wugt (Intern)
Main Supervisor:
Feilberg, Karen Louise (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Multi-model bus Arrival Prediction with Intelligent Handling of Uncertainties
Department of Management Engineering
Period: 01/02/2017 → 30/01/2021
Number of participants: 3
Phd Student:
Petersen, Niklas Christoffer (Intern)
Supervisor:
Heckscher, Annette (Ekstern)
Main Supervisor:
Pereira, Francisco Camara (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Numerical simulation of modified brine water flooding in chalk reservoirs
Department of Applied Mathematics and Computer Science
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
Phd Student:
Baghooee, Hadise (Intern)
Supervisor:
Eftekhari, Ali Akbar (Intern)
Main Supervisor:
Nick, Hamid (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Øjenstyring for mennesker med motoriske handicaps/ Gaze interaction for people with motor disabilities
Department of Management Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
Phd Student:
Sørensen, Lars Yndal (Intern)
Supervisor:
Bardram, Jakob Eyvind (Intern)
Main Supervisor:
Hansen, John Paulin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-lønnet stipendie
Project: PhD

Photonic quantum technologies in structured environments
Department of Photonics Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Denning, Emil Vosmar (Intern)
Supervisor:
Iles-Smith, Jake (Intern)
Willatzen, Morten (Intern)
Main Supervisor:
Mørk, Jesper (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Production of the platform chemical 3-hydroxypropanoate in Bacillus subtilis

Technical University of Denmark
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
Phd Student:
Stancik, Ivan Andreas (Intern)
Supervisor:
Jers, Carsten (Intern)
Main Supervisor:
Mijakovic, Ivan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Quantum-optical networks with solid state spins and photons

Department of Physics
Period: 01/02/2017 → …
Number of participants: 3
Phd Student:
Yakovlev, George (Intern)
Supervisor:
Huck, Alexander (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Spin-valley physics and quantum transport in 2D materials

Department of Micro- and Nanotechnology
Period: 01/02/2017 → 31/01/2020
Number of participants: 4
Phd Student:
Handberg Juul Martiny, Johannes (Intern)
Supervisor:
Kaasbjerg, Kristen (Intern)
Thygesen, Kristian Sommer (Intern)
Main Supervisor:
Jauho, Antti-Pekka (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
**Topology optimization of acoustic-mechanical interaction**

Department of Electrical Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
Phd Student: Dilgen, Sümer Bartug (Intern)
Supervisor: Aage, Niels (Intern)
Main Supervisor: Jensen, Jakob Søndergaard (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

**Understanding the cellular and molecular cues of yo T cells**

National Veterinary Institute
Period: 01/02/2017 → 31/01/2020
Number of participants: 3
Phd Student: Agerholm, Rasmus (Intern)
Supervisor: Lahl, Katharina (Intern)
Use of Zeolites for Tar De-Oxygenation

Department of Chemical and Biochemical Engineering
Period: 01/02/2017 → 31/01/2020
Number of participants: 5
Phd Student:
Eschenbacher, Andreas (Intern)

Supervisor:
Ahrenfeldt, Jesper (Intern)
Henriksen, Ulrik Birk (Intern)
Jensen, Peter Arendt (Intern)

Main Supervisor:
Jensen, Anker Degn (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Enhanced Oil Recovery Methods targeting Danish North Sea Chalk Reservoirs

Department of Chemical and Biochemical Engineering
Period: 15/01/2017 → 14/01/2020
Number of participants: 3
Phd Student:
Taheriotaghsara, Mirhossein (Intern)

Supervisor:
Shapiro, Alexander (Intern)

Main Supervisor:
Nielsen, Sidsel Marie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Micro particles in Aquaculture: cause and effects and ways to remove them

National Institute of Aquatic Resources
Period: 15/01/2017 → 14/01/2020
Number of participants: 4
Phd Student:
de Jesus Gregersen, Joao (Intern)

Supervisor:
Pedersen, Per Bovbjerg (Intern)
Pedersen, Lars-Flemming (Intern)

Main Supervisor:
Dalsgaard, Anne Johanne Tang (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Modelling of ultrafast scattering experiments probing electronic dynamics in solar cells

Department of Energy Conversion and Storage
Period: 15/01/2017 → 14/01/2020
Number of participants: 3
Phd Student: Khalili, Khadijeh (Intern)
Supervisor: Santra, Robin (Ekstern)
Main Supervisor: Andreasen, Jens Wenzel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Nonlinear Silicon Carbide Waveguide

Department of Photonics Engineering
Period: 15/01/2017 → 14/01/2020
Number of participants: 4
Phd Student: Zheng, Yi (Intern)
Supervisor: Hu, Hao (Intern)
Pu, Minhao (Intern)
Main Supervisor: Ou, Haiyan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Numerical Uncertainty Quantification for Stochastic Wave Loads

Department of Applied Mathematics and Computer Science
Period: 15/01/2017 → 14/01/2020
Number of participants: 4
Phd Student: Sehic, Kenan (Intern)
Supervisor: Bredmose, Henrik (Intern)
Sørensen, John Dalsgaard (Intern)
Main Supervisor: Karamehmedovic, Mirza (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Yeast cell factories for production of diols from biomass hydrolyzates

Technical University of Denmark
Period: 15/01/2017 → 14/01/2020
Number of participants: 3
Phd Student: Dahlin, Jonathan (Intern)
Supervisor:
Bengtsson, Oskar Jan Erik (Ekstern)
Main Supervisor:
Borodina, Irina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Introduction to ESEM microscopy for the characterization of the wetting behavior of nanotextured surfaces

Center for Electron Nanoscopy
DTU Danchip
Department of Micro- and Nanotechnology
Polymer Micro & Nano Engineering
Period: 02/01/2017 → 27/01/2017
Number of participants: 3
Project participant:
Lyck Smitshusyen, Thomas Erik (Ekstern)
Supervisor:
Taboryski, Rafael J. (Intern)
Main Supervisor:
Mateiu, Ramona Valentina (Intern)

Future risk assessment of chemicals (MIraculIX)
Development of Physiologically Based Kinetic (PBK) models for risk assessment of chemicals.

National Food Institute
Copenhagen Center for Health Technology
Research Group for Molecular Toxicology
Research Group for Reproductive Toxicology
Brunel University
Period: 02/01/2017 → 31/12/2018
Number of participants: 5
PBK modeling, Risk assessment
Project participant:
Bonomo, Silvia (Intern)
Project Manager, academic:
Taxvig, Camilla (Intern)
Svingen, Terje (Intern)
Boberg, Julie (Intern)
Project Coordinator:
Vinggaard, Anne Marie (Intern)

Relations
Activities:
Copenhagen Workshop on Endocrine Disrupters
Project

ALLEVIATE - A novel strategy for food allergy prevention and treatment
Food allergy is an adverse effect to otherwise harmless proteins in the food, whereas oral tolerance is the default result from ingestion of food proteins. Food allergy is a major health problem of growing concern, affecting ~5-8% of young children and 2-4% of adults. No reliable strategy exists for prevention and treatment of food allergy, and strict avoidance of the offending food is presently the only viable management option. Living with food avoidance has a huge impact on the quality of life of food allergic patients, with daily fear of serious or even fatal reactions. The need for efficient methods for prevention and treatment is therefore evident and urgent.
The purpose of the project is to develop methods to prevent and treat food allergy using a novel strategy, recently invented. Our vision is to overcome limitations in current strategies for food allergy prevention and treatment; being efficient without inducing allergic reactions.

The specific goals of the project are:
1) To develop protein ingredients for a new generation of hypoallergenic (HA) infant formulas (IF) for cow's milk allergy (CMA) prevention
2) To develop a drug candidate for use in immunotherapy (IT) for peanut allergy (PA) treatment.

These products would have the capacity to enhance the quality of life for millions of patients in risk of developing CMA and of patients with an already established PA. The market potential is great for both product categories. In addition, the newly developed strategy may form the basis for prevention, treatment and diagnostic products targeting other food allergies.

National Food Institute
Research Group for Gut Microbiology and Immunology
Department of Chemistry
Organic Chemistry
Research Group for Microbial Biotechnology and Biorefining
Office for Innovation & Sector Services
Medical University of Vienna
University of Toronto
University of Leeds
Arla Foods Ingredients Group P/S
Period: 01/01/2017 → 31/12/2020
Number of participants: 7
Food Allergy, Immunotherapy, Infant formula, Allergy, Milk allergy, Peanut allergy
Acronym: ALLEVIATE
Project participant:
Madsen, Charlotte Bernhard (Intern)
Kryger, Karsten (Intern)
Qvortrup, Katrine (Intern)
Jensen, Peter Ruhdal (Intern)
Bang-Berthelsen, Claus Heiner (Intern)
Hulgaard, Egil (Intern)
Project Manager, academic:
Bøgh, Katrine Lindholm (Intern)

Reduktion af risiko for overtemperatur i etageboliger i forbindelse med facaderenovering

Department of Civil Engineering
Section for Building Energy
Period: 01/01/2017 → 01/01/2018
Number of participants: 4
Number of related Ph.D. students: 0
Project participant:
Zukowska-Tejsen, Daria (Intern)
Kolarik, Jakub (Intern)
Sarey Khanie, Mandana (Intern)
Project Coordinator:
Nielsen, Toke Rammer (Intern)

Financing sources
Source: Private funding (private)
Name of research programme: Grundejernes Investeringsfond
Web address: http://www.gi.dk
Amount: 990,000.00 Danish Kroner
Year of approval: 2016
Project
**Big Data Applications in Energy Optimization, Smart City and Agriculture**

Goal of the project is to bring together employees, external partners and students in the exploitation of Big Data applications in a number of fields:

- Energy optimization (saving of energy)
- Smart city (traffic monitoring)
- Agriculture, weeding (automated mechanical weeding)
- Agriculture, weather forecast (weather stations)

In all the cases Big Data from many sensors, including historical data, can be applied in data fusion algorithms in the search for more efficient and cheaper solutions. The exploitation will end up in the definition of new research projects and possibly the submission of project proposals for attracting externals funds, e.g., Horizon 2020 proposals.

Center for Bachelor of Engineering Studies

Afdelingen for Informatik

Afdelingen for El-teknologi

Period: 01/01/2017 → 01/01/2018

Number of participants: 7

Project participant:

Blaszczyk, Tomasz (Intern)

Kaur, Bipjeet (Intern)

Bridgwood, Ian (Intern)

Bechmann, Henrik (Intern)

Friesel, Anna (Intern)

Project Manager, academic:

Andersen, Birger (Intern)

Schultz, Ole (Intern)

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**The fabrication and testing of two terminal memristor device - Nano Ionic Conducting Engineered materials for information application**


Department of Energy Conversion and Storage

Ceramic Engineering & Science

Electrofunctional materials

Fundamental Electrochemistry

ETH Zurich

Period: 01/01/2017 → 31/01/2020

Number of participants: 3

Acronym: NICE

Number of related Ph.D. students: 1

Project participant:

Esposito, Vincenzo (Intern)

Traulsen, Marie Lund (Intern)

Project Manager, organisational:

Pryds, Nini (Intern)

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**Disease databases**

The general purpose of the project is to explore the potential use and value of different data sources as a monitoring tool for detection of diseases in Danish swine herds. The project is a continuation of the PhD project “Veterinary Epidemiology with the focus on monitoring livestock disease using diagnostic databases”, in which different databases and monitoring methods were explored in the context of endemic diseases.

As a starting point, the project will be focused on methods to detect changes in mortality and to find possible links among diseases occurrence, antibiotic usage, and other data streams (such as meat inspection and laboratory diagnostic data).

National Veterinary Institute

Epidemiology
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Project participant:
Lopes Antunes, Ana Carolina (Intern)
Jensen, Vibeke Frøkjær (Intern)
Project Manager, academic:
Toft, Nils (Intern)

IEA Task Material and component development for thermal storage systems
The aims of the project are within the IEA (International Energy Agency) SHC (Solar Heating & Cooling) Programme Task project "Material and component development for thermal storage systems" to develop economically attractive compact long term heat storages and to elucidate the suitability of the heat storages for different applications. The project is the Danish part of the IEA Task project "Material and component development for thermal storage systems". Work will be carried out in the following fields: Component development Application areas Numerical simulation methods The expert meetings of the project will be attended so that knowledge on the results of the international partners is achieved. The Danish activities is focused on development of inexpensive compact heat storages based on salt hydrates, on optimization of energy systems based on these heat storages and on the interplay between the systems and the future energy system. In cooperation with interested companies development work is carried out. Among other things a heat storage module based on sodium acetate trihydrate from Nilan A/S will be investigated by means of experiments. Further, a combined solar heating/heat pump system with a PCM heat storage will be investigated.

Department of Civil Engineering
Section for Building Energy
Department of Applied Mathematics and Computer Science
Nilan A/S
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Project participant:
Furbo, Simon (Intern)
Englmair, Gerald (Intern)
Dannemand, Mark (Intern)
Kong, Weiqiang (Intern)

PigLED - Optimal lighting system for pigs
Light and vitamin D are essential for human and animal well-being. In this project, researchers using specially developed LED lighting will reduce the mortality in piglets, improve the welfare of sows during gestation, and thus improve the pig farmer's economy.
The challenge of this project is to improve the statistics in pig production. Every year, approximately 9,000,000 piglets die during birth or before weaning - an alarmingly high figure, which is not compatible with sustainability or animal welfare. In addition, it costs about 1.8 billion Danish kroner in lost profits for the Danish pig producers.
Piglets need vitamin D. They are born with a low level of vitamin D and in the first three weeks the only receive the sow's milk, which contains minimal amounts of vitamin D. Vitamin D is often referred to as the sunshine vitamin, since animals and humans produce vitamin D in the skin. We cannot bring sunlight into the pig sheds, but we can develop a light source, which contains the portion of the sunlight which produces vitamin D in the skin of pigs.

For more information see attached document in Danish

National Food Institute
Research Group for Bioactives – Analysis and Application
Department of Photonics Engineering
Diode Lasers and LED Systems
København Universitet
Kongsdal Multisite A/S
Bio-macromolecules from municipal solid bio-waste fractions and fish waste for high added value applications

Novo Nordisk Foundation Center for Biosustainability

Research Groups

Yeast Metabolic Engineering

Period: 01/01/2017 → 31/12/2020

Number of participants: 3

biorefinery, cell factories, metabolic engineering, synthetic biology, municipal solid waste, bio-based chemicals

Acronym: DAFIA

Number of related Ph.D. students: 1

Project participant:

Borodina, Irina (Intern)
Darvishi Harzevili, Farshad (Intern)
Chekina, Ksenia (Intern)

Project

Videreudvikling af Campylobacter smittekilderegnskabet

National Food Institute

Division of Risk Assessment and Nutrition

Fødevarestyrelsen (FVST)

Period: 01/01/2017 → …

Number of participants: 1

Project participant:

Christensen, Julia (Intern)

Project

Demonstration of energy savings and indoor climate with sustainable adiabatic cooling using rainwater

Public buildings in Denmark do not have cooling systems, which often leads to uncomfortable high indoor temperatures in spring and summertime. The project will demonstrate that cooling by adiabatic cooling system using rainwater is a simple and cheap method for improving the indoor environment in public buildings without increasing the energy consumption.

Department of Civil Engineering

Section for Building Energy

Systemair A/S

Period: 01/01/2017 → 30/06/2019

Number of participants: 3

energy, cooling, buildings, sustainability

Project participant:

Hviid, Christian Anker (Intern)
Zukowska-Tejsen, Daria (Intern)
Nielsen, Vilhjálmur (Intern)

Financing sources
**Danish Seaweed Organisation**  
Platform for the Danish seaweed Companies to go on the export market

National Food Institute

Research Group for Bioactives – Analysis and Application  
Period: 01/01/2017 → …  
Number of participants: 1  
Acronym: DSO  
Project participant: Holdt, Susan Løvstad (Intern)

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**inVALUABLE - Insect value chain in a circular bioeconomy**

Food production has been estimated to contribute with approximately 20-30% of the environmental impact of EU-citizens. In addition, the UN's Food and Agriculture Organization (FAO) estimates that the global food production must increase 70% by 2050 to feed the growing world population, highlighting the importance of generating new and sustainable protein sources. FAO has recently placed food production from insects on the global agenda due to several advantages, e.g. high nutritional value (40-60% protein), high production efficiency (>5x), low land (<10x) and water (<1,000x) requirements, and low climate impact (<1,000x) as compared to conventional livestock. Moreover, insects may also be a solution to sourcing non-GMO and organic animal protein. The vision of inVALUABLE is to create a sustainable resource-efficient industry for animal protein production based on insects. The partners span the entire value chain and include entrepreneurs, experts in biology (entomology and nutrition), biotech, automation, processing and food tech and -safety, as well as an international leading insect producer. This interaction of competences is key to lifting insect production to an industrial level. The project operates at an applied research level with focus on three main areas: 1) biological knowledge of the production organisms (e.g. production environment, dietary needs and health); 2) automation and monitoring of production; and 3) product documentation of safety, nutrition and health. The goal is that inVALUABLE, 3-5 years post-project, can facilitate Danish industrial insect production and be an enabler of new market opportunities for insects as feed and food and other high-value components, with an overall value of 200-300M DKK annually and creating 100-200 related jobs.

National Food Institute

Research Group for Microbial Food Safety

Danish Technological Institute

University of Copenhagen

Aarhus University

Proti-Farm R&D

Ausumgaard

ScrapTrans

AgroKorn

Novozymes A/S

Hannemann Engineering

DryingMate  
Period: 01/01/2017 → 31/12/2019  
Number of participants: 2  
Insects mealworm production processing, feed & food safety, microbiological risks, hazard analysis, HACCP  
Acronym: inVALUABLE  
Project participant: Jensen, Annette Nygaard (Intern)

Baggesen, Dorte Lau (Intern)
A novel off-grid thermoelectric-photovoltaic desalination system

Desalination of brackish water/sea water is a sustainable way to meet water demand in arid locations. A number of humidification/dehumidification (HDH) devices based on conventional vapor compression technology are currently available. However, these devices have a number of inherent problems such as high noise levels, compressor vibration and excessive weight and size.

The overall objective of the project is to develop and demonstrate a novel off-grid desalination system using thermoelectric technology combined with a photovoltaic system.

The combination of photovoltaic (PV) and thermoelectric (TE) technologies will not only overcome the problems of a conventional desalination system, but it also brings many additional advantages such as being off-grid, having less moving parts, easy to install, less maintenance, and on top being environmentally friendly.

The outcome of the project will be:
(i) High performance thermoelectric-solar desalination prototype to cheaply produce potable water with a targeted coefficient of performance (COP) of more than 1.5.
(ii) Demonstration of a future environmentally friendly energy technological concept with high commercial potential.

In this project, DTU Energy, AquaDania A/S, SunPower Applications A/S, and All Things Considered A/S work closely together toward a goal to develop a novel off-grid desalination system using a thermoelectric module coupled with a PV system. We address the needs of people's drinking water in remote areas of the world, or the emergency needs of catastrophic situation especially people living in arid countries.

Advanced tailoring of 3D microstructures for superconducting magnets

Superconducting magnets capable of producing large magnetic fields are indispensable for magnetic resonance imaging (MRI) for medical diagnostics. The higher the field is, the higher the spatial resolution achievable in the scanner is; this is crucial for the early detection of, e.g., cancer tumors. The present research project focuses on a new concept for the superconducting magnet which will enable an increase in the magnetic field by a factor of more than three. This is done by using ceramic superconductors in combination with a novel substrate configuration recently developed by the applicant. The substrate makes it possible to produce many thin superconducting 3D structured filaments instead of a single wide conductor, thus increasing the field produced and improving the resolution of the MRI device. The project aims to solve the
scientific problems currently impeding the achievement of sufficiently small filaments. A major scientific problem is related to oxygen formation and spread during electro-etching of 3D profiles resulting in undesired structural filament variations.

Department of Energy Conversion and Storage

Electrofunctional materials

Imaging and Structural Analysis
Period: 01/01/2017 → 01/01/2019
Number of participants: 7
surface modification, electrochemistry, topography, Coated conductor, Superconductor, ceramic processing
Acronym: ATOMIS
Project ID: DFF – 6111-00252)
Project participant:
Ininga, Andrea Roberto (Intern)
Griev, Jean-Claude (Intern)
Nielsen, Pernille Hedemark (Intern)
Wichmann, Mike (Intern)
Usoskin, Alexander (Ekster)
Gömöry, Fedor (Ekster)
Project Manager, academic:
Wulff, Anders Christian (Intern)

Adhesive development for flexible thin film electronic encapsulation

Department of Energy Conversion and Storage
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Kovrov, Aleksandr (Intern)
Supervisor:
Helgesen, Martin (Intern)
Main Supervisor:
Søndergaard, Roar R. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Advanced Modelling, Simulation and Optimization for in Silivo Process Design

Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 6
Phd Student:
Öner, Merve (Intern)
Supervisor:
Abildskov, Jens (Intern)
Gernaey, Krist V. (Intern)
Shibabaw Molla, Getachew (Intern)
Stocks, Stuart M. (Ekster)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Advancing Numerical Analysis of Large Scale Crack Propagation in Plate Structures

Department of Mechanical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Andersen, Rasmus Grau (Intern)
Supervisor:
Niordson, Christian Frithiof (Intern)
Main Supervisor:
Nielsen, Kim Lau (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Alternative liquid fuels in burners optimized for low NOx emissions and high burn out

Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Cafaggi, Giovanni (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Glarborg, Peter (Intern)
Main Supervisor:
Jensen, Peter Arendt (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Analysis of protected areas in the North Sea and the Central Baltic (Beskyttede områder) (39425)
The project aims at delivering a report on the scientific basis and coherence of the current system of marine protected areas in the Danish North Sea, Skagerrak and central Baltic Sea EEZ’s. This will enable the Danish Nature Agency to decide whether the existing network of protected areas is coherent (representative, adequate and connected) with respect to the requirements of the MSFD art. 13 part 4.

The most important biodiversity elements, habitats and ecological processes of the North Sea/Skagerrak and the central Baltic Sea will be addressed including selected ecosystem components, oceanographic features and seabed habitats. The work will be based on available data, literature studies and results from recent investigations. Furthermore, ecologically valuable – “hot-spots” – and areas of economic value are to be identified.

The network of ecologically valuable areas will be analyzed based on data, distribution mapping, weighting of data and connectivity consideration using several types of software. Areas of economic value inside and outside the Natura2000 network will be identified based on existing data collected by the partners and located at the partner’s database. Finally, areas of economic importance will be combined to suggest marine protected areas.

The project is coordinated by DTU Aqua.

The project is funded by Danish Agrifish Agency.
National Institute of Aquatic Resources
Section for Oceans and Arctic
DCE - Danish Centre for Environment and Energy
DHI Denmark
Geological Survey of Denmark and Greenland
Period: 01/01/2017 → 31/12/2017
Number of participants: 2
Research area: Ecosystem Based Marine Management
Project participant:
Gislason, Henrik (Intern)
Project Coordinator:
Edelvang, Karen (Intern)

Antibiotic Drug Development
Technical University of Denmark
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Silva Matias, Carina Sofia (Intern)
Supervisor:
Ingmer, Hanne (Ekstern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret
Project: PhD

Antimicrobial Polymers for Catheter Coatings
Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Andersen, Christian (Intern)
Supervisor:
Madsen, Niels Jørgen (Ekstern)
Skov, Anne Ladegaard (Intern)
Main Supervisor:
Daugaard, Anders Egede (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Applying modular architecture and LEAN thinking to well head platforms
Department of Mechanical Engineering
Period: 01/01/2017 → 10/01/2017
Number of participants: 3
Phd Student:
Hilstrøm, Kristine Wille (Intern)
Supervisor:
Bek-Pedersen, Erik (Intern)
Main Supervisor:
Mortensen, Niels Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
A Probabilistic Framework for Tensor Methods with Applications in Life Sciences
Department of Applied Mathematics and Computer Science
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Hinrich, Jesper Løve (Intern)
Supervisor:
Madsen, Kristoffer Hougaard (Intern)
Main Supervisor:
Mørup, Morten (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Big Data Analytics with special emphasis on Food Supply Chain Data
Department of Applied Mathematics and Computer Science
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Jørgensen, Philip Johan Havemann (Intern)
Supervisor:
Hansen, Lars Kai (Intern)
Main Supervisor:
Ersbøll, Bjarne Kjær (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Chiral Magnetism from Mean Field Theory
Department of Physics
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Torelli, Daniele (Intern)
Supervisor:
Christensen, Niels Bech (Intern)
Olsen, Thomas (Intern)
Main Supervisor:
Jacobsen, Karsten Wedel (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Coast to Coast Climate Challenge
The project is supported by the LIFE program by about 52 million kr. and has a total budget of approximately 90 million in addition to construction costs in connection with the realization of the many solutions developed during the project.
The overall objective
The project is led by Central Denmark Region, in close cooperation with the other 30 partners will work to create a climate resilient region by:
• formulating a shared vision among local players, and by
• implement local climate change adaptation plans targeted as the necessary analyzes and activities coordinated, and the
• identify and improve the resources and capabilities among citizens, municipalities, utilities and companies in the water industry.
The project is implemented in a number of sub-projects (24 pcs.) and horizontal activities. Various partners have brought subprojects into the C2C CC.

Main contributions to subprojects C9, C17, C21.

National Space Institute
Geodesy
Region of Central Denmark
Lemvig municipality
Lemvig Water and Wastewater
Period: 01/01/2017 → 31/12/2022
Number of participants: 1
adaptation, innovation, water, sustainability
Acronym: c2c cc
Project participant:
Sørensen, Carlo Sass (Intern)

Relations
Activities:
Kick off Coast to Coast Climate Challenge
Project

Conceptual design of yeast propagation strategies for improved bioethanol production

Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Lopez, Pau Cabañeros (Intern)
Supervisor:
Gernaey, Krist V. (Intern)
Main Supervisor:
Eliasson Lantz, Anna (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Density functional theory based modelling of materials for resistive switching memories

Department of Energy Conversion and Storage
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Pedersen, Christian Søndergaard (Intern)
Supervisor:
Pryds, Nini (Intern)
Vegge, Tejs (Intern)
Main Supervisor:
García Lastra, Juan Maria (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Developing a decision support tool for process optimization for fish product
National Food Institute  
Period: 01/01/2017 → 31/12/2019  
Number of participants: 4  
Phd Student:  
Jordbrekk Blikra, Marthe (Intern)  
Supervisor:  
Feyissa, Aberham Hailu (Intern)  
Skipnes, Dagbjørn (Ekstern)  
Main Supervisor:  
Jessen, Flemming (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Ansat eksternt  
Project: PhD

**Development of improved neoepitope vaccination through elucidation of patients naïve T-cell repertoire**  
National Veterinary Institute  
Period: 01/01/2017 → 31/12/2019  
Number of participants: 3  
Phd Student:  
Petersen, Nadia Viborg (Intern)  
Supervisor:  
Kringelum, Jens Vindahl (Intern)  
Main Supervisor:  
Hadrup, Sine Reker (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Industrial PhD  
Project: PhD

**Development of Novel Anti-Cancer Drugs using Fragment-Based Drug Discovery**  
Department of Chemistry  
Period: 01/01/2017 → 31/12/2019  
Number of participants: 3  
Phd Student:  
Andersen, Nikolaj Sten (Intern)  
Supervisor:  
Gotfredsen, Charlotte Held (Intern)  
Main Supervisor:  
Clausen, Mads Hartvig (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

**Disruptive technologies in design**  
Department of Management Engineering  
Period: 01/01/2017 → 31/12/2019  
Number of participants: 4  
Phd Student:  
Ernstsen, Sidsel Katrine (Intern)  
Supervisor:  
Larsen, Laurids Rolighed (Ekstern)  
Thuesen, Christian (Intern)  
Main Supervisor:
Maier, Anja (Intern)

**Financing sources**
- **Source:** Internal funding (public)
- **Name of research programme:** Industrial PhD
- **Project:** PhD

**DronEL**
The purpose of this project is to develop and bring to market an aerial drone based automated solution (DronEL) used for a full PV plant survey for more accurate survey in less time. The automatic drone-based inspection method combines IR, EL and PL imaging, and visual images.

Department of Photonics Engineering
Diode Lasers and LED Systems
Coding and Visual Communication
Centre of Excellence for Silicon Photonics for Optical Communications
Department of Energy Conversion and Storage
Organic Energy Materials
Aalborg University
Sky Watch
SiCon
Kenergy
Skive Kommune
- **Period:** 01/01/2017 → 31/12/2019
- **Number of participants:** 8
- **Project ID:** 71001
- **Project participant:**
  - Thorsteinsson, Sune (Intern)
  - Forchhammer, Søren (Intern)
  - Benatto, Gisele Alves dos Reis (Intern)
  - Riedel, Nicholas (Intern)
  - Thorseth, Anders (Intern)
  - Dam-Hansen, Carsten (Intern)
  - Mantel, Claire (Intern)
  - Project Manager, organisational:
    - Poulsen, Peter Behrensdorff (Intern)

**Relations**
- **Related projects:**
  - PV LED ENGINE
  - PV BALCONY FENCE – a highly esthetic cost efficient PV integrated balcony

**Activities:**
- 7th International SpectroRadiometer Comparison (ISRC 2017)

**Publications:**
- Optimizing sensitivity of Unmanned Aerial System optical sensors for low zenith angles and cloudy conditions
- Development of outdoor luminescence imaging for drone-based PV array inspection

**Engineering of Yeast Cell Factories for Biorefineries**
- **Technical University of Denmark**
- **Period:** 01/01/2017 → 31/12/2019
- **Number of participants:** 3
- **Phd Student:**
  - Chekina, Ksenia (Intern)
Supervisor:
Stovicek, Vratislav (Intern)
Main Supervisor:
Borodina, Irina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Freeze casting to create micro-channel structures
Department of Energy Conversion and Storage
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Christiansen, Cathrine Deichmann (Intern)
Supervisor:
Nielsen, Kaspar Kirstein (Intern)
Main Supervisor:
Bjørk, Rasmus (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

From Passive to Controllable Gas Foil Bearings - Modelling & Control Design
Department of Mechanical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
von Osmanski, Alexander Sebastian (Intern)
Supervisor:
Larsen, Jon Steffen (Intern)
Main Supervisor:
Santos, Ilmar (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Innovativt design af ståldragere til kabelbårne broer
Department of Civil Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Baandrup, Mads Jacob (Intern)
Supervisor:
Olesen, John Forbes (Intern)
Sigmund, Ole (Intern)
Main Supervisor:
Poulsen, Peter Noe (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD
Integrated optimization of vehicle and driver scheduling in public transport

Department of Management Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 6
Phd Student:
Govinda Raja Perumal, Shyam Sundar (Intern)
Supervisor:
Lusby, Richard Martin (Intern)
Petersen, Jeanne Aslak (Ekstern)
Riis, Morten (Ekstern)
Sørensen, Kasper Stengaard (Ekstern)
Main Supervisor:
Larsen, Jesper (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Learning-based Model Predictive Control of Spray Dryers

Department of Electrical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 6
Phd Student:
Miklos, Robert (Intern)
Supervisor:
Jørgensen, John Bagterp (Intern)
Petersen, Lars Norbert (Intern)
Poulsen, Niels Kjølstad (Intern)
Utzen, Christer (Ekstern)
Main Supervisor:
Niemann, Hans Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Mechanical and photochemical stabilization of flexible organic solar cells

Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Ogliani, Elisa (Intern)
Supervisor:
Hvilsted, Søren (Intern)
Yu, Liyun (Intern)
Main Supervisor:
Skov, Anne Ladegaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
**Mechanistic approach to ocean ecology (39427)**

The overarching goal of the proposed research is to develop a mechanistically underpinned, trait-based model of marine plankton ecosystems ranging across multiple trophic levels from bacteria to zooplankton. The rationale and methods and rooted in the trait-based approach developed by the Centre for Ocean Life. Zooplankton has a key role in the model, and the themes guiding model design are trait biogeography (i.e., spatio-temporal distributions of traits) and vertical material fluxes and carbon sequestration.

The work will be organized in four interlinked work packages (WPs), each guided by a particular research question. All models will be implemented in a physical setting, and WPs 1-3 represent an increasing degree of complexity from unicellular plankton in a 0D environment toward a full size-based model in 2D environment. WP1 and 2 develop the unicellular and multicellular components, WP3 the full size based model, and WP4 sets up the model for the California Current system and tests the model against field observations collected by the Zooglider and through the CalCOFI monitoring program.

The project is coordinated by DTU Aqua.

The project is funded by Gordon and Betty Moore Foundation.

National Institute of Aquatic Resources

Centre for Ocean Life

Scripps Institution of Oceanography

Period: 01/01/2017 → 30/06/2020

Number of participants: 4

Research areas: Oceanography & Marine Populations and Ecosystem Dynamics

Contact person:

Visser, Andre (Intern)

Project participant:

Andersen, Ken Haste (Intern)

Chakraborty, Subhendu (Intern)

Project Coordinator:

Kiørboe, Thomas (Intern)

Project

**NOBLE - Non digestible oligosaccharides (NDOs) from food processing residues**

The objective of the project is to use byproducts from the Brazilian food industry to develop non-digestible soluble fibers with specific health benefits for applications in food and feed. Non-digestible oligosaccharides (NDOs) have been established as food and feed supplements due to their beneficial effect on microbiota of the intestinal tract. NDOs vary in composition and structure depending on the source, and different NDOs also differ in their effect on the intestinal microbiota. We will take advantage of the specific properties of side streams from the Brazilian food industry to develop novel types of NDOs. We will use enzyme technology developed at Sao Paulo State University to produce the novel NDOs. The biological activity of the NDOs will be characterized by technology established and developed at the Technical University of Denmark. The research will be conducted in close collaboration with industrial partners and the project is expected to result in commercial applications that will bring food and feed with improved nutritional value on the market. The project will generate new bioactive food and feed ingredients from residues not currently utilized by the Brazilian food industry. The processing technology will be based on membrane reactors with immobilized enzymes. The technology will minimize generation of waste and minimize consumption of water and other resources. The technology developed represents in itself a major result of the project. We expect several of the NDOs developed in this project to be significantly different from currently available NDOs, due to the specific raw materials and due to our specific enzymes and process technology. The impact on human and animal health will be examined through state of the art microbiological and metagenomic analyses. In this aspect the project use nutrigenomics to analyze health aspects of novel ingredients.

For the participating universities and industries an important outcome will be a close collaboration around development of technology and products. The industries are expected to implement the research results without unnecessary delay, and the universities intend to continue and expand the collaboration around research and training of young scientists.

National Food Institute

Research Group for Gut Microbiology and Immunology

University of Sao Paolo

Period: 01/01/2017 → 30/06/2019

Number of participants: 2

oligosaccharides, enzymes

Acronym: NOBLE
NOPROBLEM - Novel tasty dairy products obtained through intelligent resource management

Diacetyl, an important contributor to the buttery aroma of many fermented dairy products, is formed by lactic acid bacteria present in the starter culture. Mesophilic starters are efficient producers of diacetyl, but are unsuited for production of certain harder cheeses, because of the high temperatures needed to attain cheese firmness. Such cheeses are made using thermophilic starters, that unfortunately are poor diacetyl formers, and taste is thus compromised (pers. comm. Søren Lillevang, Arla Foods). Besides the butter flavour content, another important factor is butter flavour formation rate. There are several cheese products where butter flavour is formed very slowly, in the course of several weeks of storage, and for some dairy products, technical issues limit butter flavor formation. In the current project we wish to address these issues while at the same time create value from processed whey streams that currently are discarded as pig-feed. 1) We want to make the mesophilic starter more thermotolerant, so that it can be used for making harder cheese variants. 2) Produce diacetyl from whey side-streams which can be added to various dairy products/sold. One way to make the mesophilic starter more thermostolerant is through adaptive evolution, an approach we previously have used with great success (Chen et al., 2015), and which will be applied in this project as well. We have optimized one of the starter culture bacteria into being extremely efficient at producing diacetyl from sugar (Liu et al., 2016). To attain a rich buttery flavor in dairy products, less than <10 mg/kg is needed. Our strain can generate 5-10 g/l under non-optimized conditions. This strain as well as its non-GMO version (to be constructed) will be used in the current project.

National Food Institute
Research Group for Microbial Biotechnology and Biorefining
Arla Foods Ingredients Group P/S
Period: 01/01/2017 → 30/06/2020
Number of participants: 2
Acronym: NOPROBLEM

Nuutaq: New concept for production of cod in Greenland - Best-practice with focus on quality and sustainability

National Food Institute
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Sørensen, Jonas Steenholdt (Intern)
Supervisor:
Bøknæs, Niels (Intern)
Main Supervisor:
Optical Monitoring of Zooplankton

Department of Photonics Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student: Nielsen, Josefine Holm (Intern)
Supervisor: Pedersen, Christian (Intern)
Prangsma, Jord (Ekstern)
Main Supervisor: Rodrigo, Peter John (Intern)

Optimised Combinatorial Construction using Algorithms (OCCA)

Department of Management Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student: Kolsker, Torkil (Intern)
Supervisor: Repke, Stefan (Intern)
Stolpe, Mathias (Intern)
Main Supervisor: Stidsen, Thomas Jacob Riis (Intern)

Optimization of flavour formation in hard cheeses

Hard cheeses are normally made using thermophilic starters because of the high cooking temperatures (>39°C) involved. Mesophilic starters cannot presently be used because the high temperature would affect the subsequent acidification and flavor formation. Thermophilic starters tolerate the high temperature, but are unable to produce some of the desirable flavor compounds produced by their mesophilic counterparts. In this project we wish to study whether this problem can be solved by changing process parameters and/or starter so that harder cheeses can be made using mesophilic starters.

National Food Institute
Research Group for Microbial Biotechnology and Biorefining
Arla Foods

Arla Foods Ingredients Group P/S
Period: 01/01/2017 → 21/12/2019
Number of participants: 1
Project Coordinator:
Solem, Christian (Intern)

Source: Public research council
Name of research programme: The Danish Dairy Research Foundation
Amount: 2,824,000.00 Danish Kroner
Project

Pre-clinical exploration of cancer neoepitope immunotherapy
Department of Bio and Health Informatics
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Jappe, Emma Christine (Intern)
Supervisor:
Kringelum, Jens Vindahl (Intern)
Main Supervisor:
Nielsen, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Quantity of Interest Tomography
Department of Applied Mathematics and Computer Science
Period: 01/01/2017 → 31/12/2019
Number of participants: 4
Phd Student:
Jensen, Bjørn Christian Skov (Intern)
Supervisor:
Adesokan, Bolaji James (Intern)
Andersen, Martin Skovgaard (Intern)
Main Supervisor:
Knudsen, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Surface engineering of Fe-C coatings
Department of Mechanical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Nielsen, Jacob Obitsø (Intern)
Supervisor:
Møller, Per (Intern)
Main Supervisor:
Pantleon, Karen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Sustainable Catalytic Alcohol Synthesis from Hydrogen and Carbon Dioxide
Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
The invasive round goby in Danish waters: Investigations of depth distributions in relation to a targeted, efficient fishery after the species for human consumption (39402)

Round goby is an invasive benthic fish, native to the Ponto-Caspian region. It has on several occasions been introduced to the Baltic region, and is now wide spread here, with established populations in many areas. In some areas it dominates the local fish fauna, having out-competed native, and often commercially important, fish species.

Round goby is generally referred to as a coastal, shallow-water species. Yet, when temperatures drop at the onset of winter, the fish disappear from the shallow, cool waters, presumably to migrate to deeper, water waters. How deep they go, and how the onset of migration to deeper waters may relate to temperature (and hence season) however remains unknown. This information is nevertheless imperative in an evaluation of when, at what depths, and with what type of gear a potential targeted fishery after round goby should occur.

The present project will use all available national and international survey data throughout the Baltic region to map depths distributions of round goby, and analyze the correlations between depth distributions and temperature.

The project is coordinated by DTU Aqua.

The project is funded by Direktør J.P. A. Espersen og hustru fru Dagny Espersens Fond.

National Institute of Aquatic Resources

Section for Marine Living Resources

Period: 01/01/2017 → 31/12/2017

Number of participants: 1

Research area: Marine Living Resources

Project Coordinator:

Behrens, Jane (Intern)

PhD Student:

Theoretical investigations of the sudden death process in metal-air batteries

Department of Energy Conversion and Storage

Period: 01/01/2017 → 31/12/2019

Number of participants: 3

PhD Student:

Tygesen, Alexander Sougaard (Intern)

Supervisor:

Vegge, Tejs (Intern)

Main Supervisor:

García Lastra, Juan Maria (Intern)

Financing sources

Source: Internal funding (public)

Name of research programme: Eksternt finansieret virksomhed

Project: PhD

The Statistics of Estimated Surfaces

Department of Applied Mathematics and Computer Science

Period: 01/01/2017 → 31/12/2019

Number of participants: 4

PhD Student:
The Thermodynamics and Electrochemical Performance of Polymeric Ionic Liquids Gel Composite Electrolyte

Department of Chemical and Biochemical Engineering
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Shen, Peng (Intern)
Supervisor:
Daugaard, Anders Egede (Intern)
Main Supervisor:
Szabo, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Tools for Reliable Energy Performance Characterisation of Buildings

Department of Applied Mathematics and Computer Science
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Rasmussen, Christoffer (Intern)
Supervisor:
Rode, Carsten (Intern)
Main Supervisor:
Madsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Wind turbine dynamics

Department of Wind Energy
Period: 01/01/2017 → 31/12/2019
Number of participants: 3
Phd Student:
Gözcü, Ozan (Intern)
Supervisor:
Hansen, Anders Melchior (Intern)
Main Supervisor:
Hansen, Morten Hartvig (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU-stipendium
Project: PhD
Risikovurdering af planter og andre råvarer fra den danske natur i forhold til anvendelse som fødevarer samt videnskabelig og populær formidling af den indsamlede viden

National Food Institute

Research Group for Risk-Benefit

Division of Risk Assessment and Nutrition
Period: 31/12/2016 → 31/01/2018
Number of participants: 5
Project participant:
Pilegaard, Kirsten (Intern)
Ravn-Haren, Gitte (Intern)
Eriksen, Folmer Damsted (Intern)
Olesen, Pelle Thonning (Intern)
Egebjerg, Mikael Mandrup (Intern)

Financing sources
Source: Other public support (public)
Name of research programme: Miljø- og Fødevareministeriet
Year of approval: 2016

Innogy Idealab - Dashboard for evaluation of an ideation platform
The purpose of the project is to support the development of a dashboard for the evaluation (measurement of outcomes) of an idea generation platform, i.e., Idealab by Innogy.

Department of Management Engineering
Management Science
Implementation and Performance Management
innogy
Period: 21/12/2016 → 21/12/2017
Number of participants: 1
Project ID: 82058
Project participant:
Nardelli, Giulia (Intern)

Advanced neutron imaging of energy devices in 2D and 3D
Department of Energy Conversion and Storage
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Lacatusu, Monica-Elisabeta (Intern)
Supervisor:
Schmidt, Søren (Intern)
Strobl, Markus (Ekstern)
Main Supervisor:
Kuhn, Luise Theil (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Biomedical Signal Processing for Improved Diagnosis of Sleep Disorders and Brain Diseases
Department of Electrical Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Olesen, Alexander Neergaard (Intern)
Supervisor:
Jennum, Poul (Ekstern)
Mignot, Emmanuel (Ekstern)
Main Supervisor:
Sørensen, Helge Bjarup Dissing (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Conceptual research of a multi megawatt downwind turbine
Department of Wind Energy
Period: 15/12/2016 → 14/12/2019
Number of participants: 5
Phd Student:
Wanke, Gesine (Ekstern)
Supervisor:
Buhl, Thomas (Intern)
Larsen, Torben J. (Intern)
Madsen, Jens Ingemann (Ekstern)
Main Supervisor:
Hansen, Morten Hartvig (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Drug transport in in vitro intestine models
Department of Micro- and Nanotechnology
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Jepsen, Morten Leth (Intern)
Supervisor:
Boisen, Anja (Intern)
Nielsen, Line Hagner (Intern)
Main Supervisor:
Dufva, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Efficient low frequency room acoustic modelling
Department of Electrical Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Mondet, Boris Jean-Francois (Intern)
Supervisor:
Christensen, Claus Lynge (Ekstern)
Jeong, Cheol-Ho (Intern)
Main Supervisor:
Brunskog, Jonas (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Environmental sustainability assessment of the aquaculture sector at global and national scales
Department of Management Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Bohnes, Florence Alexia (Intern)
Supervisor:
Hauschild, Michael Zwicky (Intern)
Schlundt, Jørgen (Intern)
Main Supervisor:
Laurent, Alexis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Feasibility of geothermal energy extraction from medium depth Danish limestone aquifers
Department of Civil Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Paci, Laura (Intern)
Supervisor:
Niemi Sørensen, Stig (Ekstern)
Rocchi, Irene (Intern)
Main Supervisor:
Fabricius, Ida Lykke (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Genomic analysis of DNA from archived shark jaws
National Institute of Aquatic Resources
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Manuzzi, Alice (Intern)
Supervisor:
Hansen, Jakob Hemmer (Intern)
Ovenden, Jennifer (Ekstern)
Main Supervisor:
Eg Nielsen, Einar (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
Improving the interface adherence in solid oxide fuel cell stacks

Department of Energy Conversion and Storage
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Ritucci, Ilaria (Intern)
Supervisor:
Agersted, Karsten (Ekstern)
Frandsen, Henrik Lund (Intern)
Main Supervisor:
Kiebach, Wolff-Ragnar (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Integration of Gas, District Heating and the Electric Power Systems- Integrated Simulation Framework

Department of Electrical Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Wang, Jiawei (Intern)
Supervisor:
You, Shi (Intern)
Zong, Yi (Intern)
Main Supervisor:
Træholt, Chresten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Privatist
Project: PhD

Investigating the effects of barriers on fish in European streams and rivers

National Institute of Aquatic Resources
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Bimie-Gauvin, Kim (Ekstern)
Supervisor:
Jepsen, Niels (Intern)
Koed, Anders (Intern)
Main Supervisor:
Aarestrup, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD
Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Investigations on deep UV and NIR transitions in feldspars for novel applications in luminescence dosimetry
Department of Physics
Period: 15/12/2016 → 14/12/2019
Number of participants: 3
Phd Student:
Kumar, Raju (Intern)
Supervisor:
Kook, Myung Ho (Intern)
Main Supervisor:
Jain, Mayank (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

mid-IR Si Photonic Chips for Optical Interconnects
Department of Photonics Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Hui, Tak Lok (Intern)
Supervisor:
Ding, Yunhong (Intern)
Hu, Hao (Intern)
Main Supervisor:
Galili, Michael (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Outdoor Sound Propagation and Monitoring for Sound Field Control Applications
Department of Electrical Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Nozal, Diego Caviedes (Intern)
Supervisor:
Agerkvist, Finn T. (Intern)
Fernandez Grande, Efren (Intern)
Main Supervisor:
Brunskog, Jonas (Intern)

Financing sources
Productivity and agglomeration
Department of Management Engineering  
Period: 15/12/2016 → 14/12/2019  
Number of participants: 3  
Phd Student:  
Pedersen, Jesper Hybel (Intern)  
Supervisor:  
Mulalic, Ismir (Intern)  
Main Supervisor:  
Fosgerau, Mogens (Intern)  

Reproductive Physiology of Female European Eel
National Institute of Aquatic Resources  
Period: 15/12/2016 → 14/12/2019  
Number of participants: 4  
Phd Student:  
Jørgensen, Michelle Grace Pinto (Intern)  
Supervisor:  
Kjørsvik, Elin (Ekstern)  
Eg Nielsen, Einar (Intern)  
Main Supervisor:  
Tomkiewicz, Jonna (Intern)  

Solid oxide fuel cells and biogas
Department of Energy Conversion and Storage  
Period: 15/12/2016 → 14/12/2019  
Number of participants: 3  
Phd Student:  
Langnickel, Hendrik (Intern)  
Supervisor:  
Olsen, Rasmus (Ekstern)  
Main Supervisor:  
Hagen, Anke (Intern)  

Sound field control for outdoor concerts
Department of Electrical Engineering  
Period: 15/12/2016 → 14/12/2019  
Number of participants: 4  
Phd Student:
Heuchel, Franz Maria (Intern)
Supervisor:
Brunskog, Jonas (Intern)
Fernandez Grande, Efren (Intern)
Main Supervisor:
Agerkvist, Finn T. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

THz-enabled electron emission devices

Department of Photonics Engineering
Period: 15/12/2016 → 14/12/2019
Number of participants: 4
Phd Student:
Lange, Simon Lehnskov (Intern)
Supervisor:
Broeng, Jes (Intern)
Iwaszczuk, Krzysztof (Intern)
Main Supervisor:
Jepsen, Peter Uhd (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Homology to peptide pattern for annotation of carbohydrate-active enzymes and prediction of function

Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering
Period: 14/12/2016 → …
Number of participants: 5
Acronym: Hotpep-carbohydrate
Project participant:
Busk, Peter Kamp (Intern)
Pilgaard, Bo (Intern)
Lezyk, Mateusz Jakub (Intern)
Meyer, Anne S. (Intern)
Lange, Lene (Intern)

Development of biorefineries using brewer’s spent grains as feedstock

Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology
Period: 14/12/2016 → …
Number of participants: 2
brewer's spent grains, biorefinery, proteins, extraction, fermentation, bioconversion
Acronym: BSG Refinery
Project participant:
Qin, Fen (Intern)
Project Coordinator:
Mussatto, Solange I. (Intern)
Bioprocess development using non-conventional yeasts and biomass hydrolysates

Novo Nordisk Foundation Center for Biosustainability

Research Groups

Biomass Conversion and Bioprocess Technology

Period: 14/12/2016 → …
Number of participants: 2
fermentation, hydrolysate, biomass, non-conventional yeasts, pentoses, stress conditions

Project participant:
Yamakawa, Celina Kiyomi (Intern)

Project Coordinator:
Mussatto, Solange I. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: -
Year of approval: 2016
Project

H2020-Shift2Rails-Start-up activities for Advanced Signalling and Automation Systems

Department of Photonics Engineering

Networks Technology and Service Platforms

Period: 01/12/2016 → 31/12/2018
Number of participants: 2
Acronym: X2Rail-1

Project participant:
Soler, José (Intern)
Dittmann, Lars (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: -
Year of approval: 2016
Project

Big Data Analytics with special emphasis on Food Supply Chain data(1/)

Department of Applied Mathematics and Computer Science

Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Ipsen, Niels Bruun (Intern)
Supervisor:
Hansen, Lars Kai (Intern)
Main Supervisor:
Ersbøll, Bjarne Kjær (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Bycatch of seabirds in Danish gillnet fisheries - assessing scale and testing mitigation

National Institute of Aquatic Resources

Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Glemarec, Gildas (Intern)
Supervisor: Kindt-Larsen, Lotte (Intern)
Main Supervisor: Larsen, Finn (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Characterized Parts Libraries & Pathway Evolver
Technical University of Denmark
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student: Petersen, Søren Dalsgård (Intern)
Supervisor: Hillson, Nathan J. (Ekstern)
Keasling, Jay (Intern)
Main Supervisor: Jensen, Michael Krogh (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Circular Economy: Integrated sustainability assessment of resource recovery and cycling
Department of Environmental Engineering
Period: 01/12/2016 → 10/04/2020
Number of participants: 3
Phd Student: Andreasi Bassi, Susanna (Intern)
Supervisor: Boldrin, Alessio (Intern)
Main Supervisor: Astrup, Thomas Fruergaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Circular Economy: Life cycle assessment of chemicals in material cycles
Department of Environmental Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student: Xanthopoulou, Larisa (Intern)
Supervisor: Baun, Anders (Intern)
Main Supervisor: Astrup, Thomas Fruergaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Computer Vision for Flexible Automation

Department of Applied Mathematics and Computer Science
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student: Hannemose, Morten (Intern)
Supervisor: Savarimuthu, Thiusius Rajeeth (Ekstern)
Wilm, Jakob (Intern)
Main Supervisor: Frisvad, Jeppe Revall (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Cultivation potential of brown and red macroalgae species integrated with open Salmond fish Aquaculture

National Institute of Aquatic Resources
Period: 01/12/2016 → 30/11/2020
Number of participants: 5
Phd Student: Etter, Siv Anina (Ekstern)
Supervisor: Håndå, Alexander (Ekstern)
Olsen, Yngvar (Ekstern)
Petersen, Jens Kjerulf (Intern)
Main Supervisor: Petersen, Jens Kjerulf (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Development of Strategies for Efficient Water Usage for Production of Safe Fresh and Ready-to-eat Seafood Products in Remote Communities

National Food Institute
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student: Hvitved, Annemette (Intern)
Supervisor: Jensen, Pernille Erland (Intern)
Main Supervisor: Hansen, Lisbeth Truelstrup (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Efficient Operation of Energy Grids

Department of Applied Mathematics and Computer Science
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Banis, Frederik (Intern)
Supervisor:
Guericke, Daniela (Intern)
Madsen, Henrik (Intern)
Main Supervisor:
Poulsen, Niels Kjølstad (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Exploration of knowledge sharing mechanism in maritime innovation networks
Department of Management Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Gary, Magnus (Intern)
Supervisor:
Hansen, Mette Sanne (Intern)
Kreye, Melanie (Intern)
Main Supervisor:
Perunovic, Zoran (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Exploring the Molecular Basis of Glycan Utilization by Health Relevant Members of the Human Gut Microbiota
Department of Systems Biology
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Pichler, Michael Jakob (Intern)
Supervisor:
Westereng, Bjørge (Ekstern)
Main Supervisor:
Abou Hachem, Maher (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Fabrication and Magnetic characterization of layered structures by means of election holography
Department of Physics
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Hyllested, Jes Ærøe (Intern)
Supervisor:
Jensen, Flemming (Intern)
Wagner, Jakob Birkedal (Intern)
Main Supervisor:
Kasama, Takeshi (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Formal methods for Secure Trust Infrastructures
Department of Applied Mathematics and Computer Science
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Birkedal, Rasmus (Intern)
Supervisor:
Lluch Lafuente, Alberto (Intern)
Main Supervisor:
Mödersheim, Sebastian Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Generic open science data platform for surveillance, exposure assessment and risk analysis
National Food Institute
Period: 01/12/2016 → 10/02/2020
Number of participants: 5
Phd Student:
Backhaus, Liv Louise Victoria (Intern)
Supervisor:
Lund, Ole (Intern)
Pamp, Sünje Johanna (Intern)
Vigre, Håkan (Intern)
Main Supervisor:
Aarestrup, Frank Møller (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Impact of low-grade inflammation on influenza
National Veterinary Institute
Period: 01/12/2016 → 30/11/2019
Number of participants: 5
Phd Student:
Starbæk, Sofie Maiken Riisgård (Intern)
Supervisor:
Heegaard, Peter Mikael Helweg (Intern)
Jungersen, Gregers (Intern)
Larsen, Lars Erik (Intern)
Main Supervisor:
Skovgaard, Kerstin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Impedance calibration and measurement techniques in hearing diagnostics

Department of Electrical Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Nørgaard, Kren Rahbek (Intern)
Supervisor:
Laugesen, Søren (Intern)
Laugesen, Søren (Intern)
Main Supervisor:
Fernandez Grande, Efren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Integrating operational knowledge in design of energy efficient facilities

Department of Management Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 5
Phd Student:
Rasmussen, Helle Lohmann (Intern)
Supervisor:
Gregg, Jay Sterling (Intern)
Hartmann, Tanja Schou (Ekstern)
Jakobsen, Arne (Intern)
Main Supervisor:
Jensen, Per Anker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Lean Risk Management in Engineering Projects

Department of Management Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Willumsen, Pelle Lundquist (Intern)
Supervisor:
Welo, Torgeir (Ekstern)
Main Supervisor:
Oehmen, Josef (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Life cycle assessment modelling of advanced (bio)energy technologies

Department of Environmental Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Lodato, Concetta (Intern)
Supervisor:
Mechanisms of action involved in chemically-induced effects on male reproductive health

National Food Institute
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student:
Schwartz, Camilla Victoria Lindgren (Intern)
Supervisor:
Svingen, Terje (Intern)
Main Supervisor:
Vinggaard, Anne Marie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Optimal and holistic implementation of central drinking water softening

Department of Environmental Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Tang, Camilla (Intern)
Supervisor:
Rygaard, Martin (Intern)
Wormslev, Erik C. (Ekstern)
Main Supervisor:
Albrechtsen, Hans-Jørgen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Optimizing and refining 3D culturing of human stem cells for predictive toxicity

National Food Institute
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student:
Lauschke, Karin (Intern)
Supervisor:
Emnéus, Jenny (Intern)
Taxvig, Camilla (Intern)
Main Supervisor:
Vinggaard, Anne Marie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Piscine orthoreovirus in salmonids: geographic distribution, molecular characterization, pathogenesis under experimental conditions

National Veterinary Institute
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student: Vendramin, Niccolò (Intern)
Supervisor: Rimstad, Espen (Ekstern)
Main Supervisor: Olesen, Niels Jørgen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Protein sorting in pathogenic unicellular eukaryotes

Department of Bio and Health Informatics
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student: Almagro Armenteros, Jose Juan (Intern)
Supervisor: Winther, Ole (Intern)
Main Supervisor: Nielsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Stability of Tungsten Plates during High Temperatures

Department of Mechanical Engineering
Period: 01/12/2016 → 30/11/2019
Number of participants: 3
Phd Student: Ciucani, Umberto Maria (Intern)
Supervisor: Luo, Guangnan (Ekstern)
Main Supervisor: Pantleon, Wolfgang (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

The Protein Corona of Liposomes for Drug Delivery

Department of Micro- and Nanotechnology
Period: 01/12/2016 → 30/11/2019
Number of participants: 4
Phd Student: Lassen, Rasmus Mikkel Münter (Intern)
Supervisor: Kristensen, Kasper (Intern)
Simonsen, Jens Bæk (Intern)
Main Supervisor:
Andresen, Thomas Lars (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**A Traceable 3D Scanning and Reconstruction Pipeline**
Department of Applied Mathematics and Computer Science
Period: 15/11/2016 → 14/11/2019
Number of participants: 3
Phd Student:
Gawrilowicz, Florian (Intern)
Supervisor:
Dahl, Anders Bjørholm (Intern)
Main Supervisor:
Bærentzen, Jakob Andreas (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

**Measurements and modelling of Arctic coastal environments**
National Space Institute
Period: 15/11/2016 → 14/11/2019
Number of participants: 4
Phd Student:
Monteban, Dennis (Intern)
Supervisor:
Ingeman-Nielsen, Thomas (Intern)
Lubbad, Raed (Ekstern)
Main Supervisor:
Pedersen, Jens Olaf Pepke (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Modelling of renewable energy under stressed power system stability conditions**
Department of Wind Energy
Period: 15/11/2016 → 14/11/2019
Number of participants: 5
Phd Student:
Sarkar, Moumita (Intern)
Supervisor:
Altin, Müfit (Intern)
Hansen, Anca Daniela (Intern)
Jóhannsson, Hjörtur (Intern)
Main Supervisor:
Sørensen, Poul Ejnar (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Neutrals in the East Sol/Edge region and their impact on plasma operation

Department of Physics
Period: 15/11/2016 → 24/01/2020
Number of participants: 3
Phd Student: Sindbjerg Poulsen, Aslak (Intern)
Supervisor: Li, Jiangang (Ekstern)
Main Supervisor: Naulin, Volker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Optimized utilization of transmission grid capacity - Dynamic rating versus grid performance

Department of Electrical Engineering
Period: 15/11/2016 → 14/11/2019
Number of participants: 3
Phd Student: Viafora, Nicola (Intern)
Supervisor: Kristensen, Anders Steen (Ekstern)
Main Supervisor: Holbøll, Joachim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Targeted adjuvant delivery to antigen presenting cells

Department of Micro- and Nanotechnology
Period: 15/11/2016 → 14/11/2019
Number of participants: 3
Phd Student: Christensen, Esben (Intern)
Supervisor: Parhamifar, Ladan (Intern)
Main Supervisor: Andresen, Thomas Lars (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Advanced modeling, simulation and tools integration for in-silico process design and optimization

Department of Chemical and Biochemical Engineering
CAPEC-PROCESS
Period: 01/11/2016 → …
Number of participants: 1
Project participant: Shibabaw Molla, Getachew (Intern)
Project
Vind i ROSkilde

Vind i ROSkilde (VIROS) projektet vil undersøge om man kan benytte en vindkraftstrategi, som er baseret på mellemstørrelses møller under 100 m totalhøjde og som dermed kan opstilles i mange flere områder end 125-150 m møller tidligere undersøgt for Roskilde kommune. Samtidigt undersøges det, om vindmøllerne via placering og udfømnning kan bruges som en "grøn" kunst installation på lige fod med forbrændingsanlægget for derved at signalere Roskildes grønne aftryk og udvikling. VIROS kommer med tre forslag til, hvortil man kan bruge vindmøller i Roskilde kommune. 1) Mellemstore møller placeret nær infrastruktur, hvor eksempelvis 10 møller placeres langs kommunens infrastruktur i form af motorvej, jernbane eller industri, 2) Erstatning af gamle møller med mellemstore møller (repowering) og 3) Mellemstore møller placeret i landzoner. Disse forslag er i overensstemmelse med Roskilde kommunes strategiske energiplan for 2015-2020 med overvejelser for vindkraft med borgere i centrum. For at øge medejerskabet af møllerne vil der blive arrangeret en informationsmøde i samarbejde med Roskilde Festival og Musicon, hvor interesserede partnere i kommunen vil blive inviteret. Projektet vil til sidst evaluere om en vindstrategi baseret på møller af mellemstørrelse er en mulighed for Roskilde og skitsere hvordan den i givet fald kan implementeres.

Department of Wind Energy

Meteorology & Remote Sensing

Test and Measurements

Integration & Planning

Musicon

EMD International A/S

Period: 01/11/2016 → 31/01/2018

Number of participants: 7

Acronym: VIROS

Project participant:

Kock, Carsten Weber (Intern)
Clausen, Niels-Erik (Intern)
Kjær, Tyge (Ekstern)
Sander, Mikkel (Ekstern)
Hermansen, Søren (Ekstern)

Project Manager, organisational:

Dellwik, Ebba (Intern)

Project Manager, academic:

Abrahamsen, Asger Bech (Intern)

Financing sources

Source: Other public support (public)

Name of research programme: Klimafonden Roskilde Kommune

Web address: http://roskilde.dk/klimafond

Amount: 110,000.00 Danish Kroner

Year of approval: 2016

Project

Ground clearance and power performance v2

The influence of the hub height on the power of a wind turbine and wind farm is investigated using Computational Fluid Dynamics

Department of Wind Energy

Aerodynamic design

Dong Energy Wind Power A/S

Period: 01/11/2016 → 01/01/2017

Number of participants: 1

Project participant:

van der Laan, Paul (Intern)

Documents:

Report_Groud_Clearance_public_2017-08-31

Project
Thermal performance of tracking concentrating solar collectors
Theoretical calculations of thermal performance of tracking concentrating solar collectors. Different locations and temperature levels are considered.

Department of Civil Engineering
Section for Building Energy

Absolicon Solar Concentrator AB
Period: 01/11/2016 → 31/12/2016
Number of participants: 2
Concentrating solar collectors, tracking
Acronym: ABSOLICON
Project participant:
Furbo, Simon (Intern)
Perers, Bengt (Intern)

DynaStow
The use of larger vessels is increasing the planning complexity of stowage coordinators. Stowage planning main goal is to find an arrangement of the containers such that time at port is minimised. In order to do so, stowage coordinators must ensure that situations where containers going to later ports are stowed on top of containers to be discharged earlier. Such containers are called overstowing containers. A worse situation appears when overstowing containers are in between hatch-covers (metallic structures dividing the upper and lower deck). In this situation, a container terminal is forced to remove all containers above the hatch, lift the hatch itself, to then finally discharge the needed containers. Such a situation is clearly undesirable. Aside from the minimization of container moves, it is also important that the stowage plans are designed for efficient port operations. Liner shippers and container terminals, often, agree on an expected cargo handling performance (often in terms of container moves per hour). Stowage coordinators must, to the best of their ability, generate stowage plans tailored to the agreed terminal performance. This is not an easy task since cargo loaded in earlier ports can have a large negative impact on handling operations in later ports. Even though those objectives in themselves are complex to achieve, stowage coordinators also need to ensure the sea-worthiness of the vessel. Weight balance, stress forces, handling of dangerous cargo and stacking constraints are but a few examples of the rules that a stowage plan must obey. The possibility of cost reduction, by use of optimisation techniques, are not small. Consider the number of containers Maersk has moved in this year’s first quarter (ca. 2.500 thousand FFU), and assume a total of just 5% of overstowing containers. A conservative price of 60,00 USD per re-stow will result in an estimated cost of 60 mils. USD. It is easy to see that even a small percent reduction of the overstowing containers would bring savings in the order of millions.

This project has two main goals:
1. Reinforce the Danish status of being the top research country for stowage planning
2. Produce research results that can have an impact on the Danish maritime industry
Wrt. to 1) we wish to become the main authority in terms of stowage planning research in the world. Our research results so far have granted us the respect of many maritime researchers. As the main researchers on stowage planning we have the responsibility of setting the correct research standard. The amount of knowledge on stowage planning of the applicants and of the Danish maritime industry places Denmark in a unique position to do so. Wrt. 2) we believe that applied research must have an impact. We, therefore, have engaged in a partnership with Optivation, and through them, Seago Line (part of the Maersk consortium), to help us in guiding the project toward solutions tailored for the industry.

Department of Management Engineering
Management Science

Transport DTU
Period: 01/11/2016 → 30/09/2017
Number of participants: 3
Acronym: DynaStow
Project participant:
Larsen, Rune (Intern)
Roberti, Roberto (Intern)
Project Manager, academic:
Pacino, Dario (Intern)
Activation and Migration characteristics of mucosal dendritic cell subsets
National Veterinary Institute
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Garcia Lopez, Agnes (Intern)
Supervisor:
Bekiaris, Vasileios (Intern)
Main Supervisor:
Lahl, Katharina (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Analysis of reservoir water samples and injected sea water for enhanced oil recovery
Department of Chemistry
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Nitsche Gottfredsen, Sofie (Intern)
Supervisor:
Yan, Wei (Intern)
Main Supervisor:
Feilberg, Karen Louise (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Architecture acoustics: an improved design process using integrated hybrid room acoustic simulations
Department of Electrical Engineering
Period: 01/11/2016 → 31/10/2019
Number of participants: 4
Phd Student:
Pind Jörgensson, Finnur Kári (Intern)
Supervisor:
Engsig-Karup, Allan Peter (Intern)
Strømann-Andersen, Jakob Bjørn (Intern)
Main Supervisor:
Jeong, Cheol-Ho (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Biomarkers for prognosis and prediction of childhood ALL treatment outcome
Department of Bio and Health Informatics
Period: 01/11/2016 → 31/10/2019
Number of participants: 5
Phd Student:
Nielsen, Rikke Linnemann (Intern)
Supervisor:
Efficacy of multi-modal biomaterial scaffolds in a lab-on-a-chip model of Parkinson's Diseases

Department of Micro- and Nanotechnology
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student: Kajtez, Janko (Intern)
Supervisor: Heiskanen, Arto (Intern)
Main Supervisor: Emnéus, Jenny (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Metagenomic Data Stratified using Artificial Intelligence

Department of Bio and Health Informatics
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student: Nissen, Jakob Nybo (Intern)
Supervisor: Nielsen, Morten (Intern)
Main Supervisor: Sicheritz-Pontén, Thomas (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

New approaches to chemical recovery and chelation of underdeveloped radiometals and application of their novel bioconjugates to PET

Department of Chemistry
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student: Pedersen, Kristina Søborg (Intern)
Supervisor: Elema, Dennis Ringkjøbing (Intern)
Main Supervisor: Zhuravlev, Fedor (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
New Multi-Modal Registration Methods: Application in Fetal Image Reconstruction
Department of Applied Mathematics and Computer Science
Period: 01/11/2016 → 31/10/2019
Number of participants: 4
Phd Student:
Engberg, Astrid Margareta Elisabet (Intern)
Supervisor:
Cuadra, Meritxell Bach (Ekstern)
Thiran, Jean-Philippe (Ekstern)
Main Supervisor:
Van Leemput, Koen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Novel Anodes for Solid Oxide Fuel Cells
Department of Energy Conversion and Storage
Period: 01/11/2016 → 31/10/2019
Number of participants: 4
Phd Student:
Drasbæk, Daniel Bøgh (Intern)
Supervisor:
Sudireddy, Bhaskar Reddy (Intern)
Traulsen, Marie Lund (Intern)
Main Supervisor:
Holtappels, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Novel Cobalt Free Oxygen Electrodes for Solid Oxide Electrolysis Cells
Department of Energy Conversion and Storage
Period: 01/11/2016 → 31/10/2019
Number of participants: 4
Phd Student:
Tong, Xiaofeng (Intern)
Supervisor:
Hendriksen, Peter Vang (Intern)
Ovtar, Simona (Intern)
Main Supervisor:
Chen, Ming (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Phase Behavior of Inhomogeneous Fluids
Department of Chemical and Biochemical Engineering
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Camacho Vergara, Edgar Luis (Intern)
Supervisor: 
Liang, Xiaodong (Intern)
Main Supervisor:
Kontogeorgis, Georgios (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Plant Uptake of Environmental Chemicals
Department of Environmental Engineering
Period: 01/11/2016 → 24/10/2020
Number of participants: 4
Phd Student:
Jensen, Christian Kjær (Intern)
Supervisor:
Mikkelsen, Teis Nørgaard (Intern)
Rein, Arno (Ekstern)
Main Supervisor:
Trapp, Stefan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Predicting and mobilizing energy flexibility in intelligent buildings
Department of Electrical Engineering
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Christensen, Morten Herget (Intern)
Supervisor:
Rensberg, Søren (Ekstern)
Main Supervisor:
Pinson, Pierre (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Production of aromatics from light alkanes using metal sulfide catalysts
Department of Chemistry
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Goodarzi, Farnoosh (Intern)
Supervisor:
Joensen, Finn Høgni (Ekstern)
Main Supervisor:
Kegnæs, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD
Quantification of trace gas emissions from waste management facilities

Department of Environmental Engineering
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Duan, Zhenhan (Intern)
Supervisor:
Scheutz, Charlotte (Intern)
Main Supervisor:
Kjeldsen, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Synthetic Biology tool Development for Protein engineering and study of adaptive evolution in Bacteria

Technical University of Denmark
Period: 01/11/2016 → 31/10/2019
Number of participants: 3
Phd Student:
Lauritsen, Ida (Intern)
Supervisor:
Nielsen, Alex Toftgaard (Intern)
Main Supervisor:
Nørholm, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Transition Modeling for Wind Turbine Rotors/TRMOD

Department of Wind Energy
Period: 01/11/2016 → 31/10/2019
Number of participants: 4
Phd Student:
Özçakmak, Özge Sinem (Intern)
Supervisor:
Aagaard Madsen, Helge (Intern)
Sørensen, Jens Nørkær (Intern)
Main Supervisor:
Sørensen, Niels N. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

4D Seismics for Fracture Characterization

Department of Physics
Period: 15/10/2016 → 14/10/2019
Number of participants: 2
Phd Student:
Sören Dramsch, Jesper (Intern)
Main Supervisor:
Lüthje, Mikael (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Chemical & Biochemical Sustainable Process Synthesis - Intensification**
Department of Chemical and Biochemical Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Garg, Nipun (Intern)
Supervisor:
Gani, Rafiqul (Intern)
Kontogeorgis, Georgios (Intern)
Main Supervisor:
Woodley, John (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

**Design of Knowledge-Driven and Data-Driven Algorithms for Neurodegenerative Diseases**
Department of Electrical Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 3
Phd Student:
Cesari, Matteo (Intern)
Supervisor:
Jennum, Poul (Ekstern)
Main Supervisor:
Sørensen, Helge Bjarup Dissing (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Design, synthesis and development of biologically inspired polymeric nanomedicines for the treatment of advanced atherosclerosis**
Department of Micro- and Nanotechnology
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Basak, Suman (Intern)
Supervisor:
Almdal, Kristoffer (Intern)
Andresen, Thomas Lars (Intern)
Main Supervisor:
Kamaly, Nazila (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Development of a Raman spectroscopy based control system for the U-Loop fermentor

Department of Chemical and Biochemical Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Petersen, Leander Adrian Haaning (Intern)
Supervisor:
Christensen, Ib (Ekstern)
Eliasson Lantz, Anna (Intern)
Main Supervisor:
Gernaey, Krist V. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Investigations of high speed neutral particle injection into K-STAR plasmas

Department of Physics
Period: 15/10/2016 → 14/10/2019
Number of participants: 3
Phd Student:
Avdeeva, Galina (Ekstern)
Supervisor:
Choe, Wonho (Ekstern)
Main Supervisor:
Naulin, Volker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Metrology for electrical characterization of advanced materials

Department of Micro- and Nanotechnology
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Kalhauge, Kristoffer Gram (Intern)
Supervisor:
Hansen, Ole (Intern)
Jepsen, Peter Uhd (Intern)
Main Supervisor:
Petersen, Dirch Hjorth (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Modelling of Hydraulic Fracturing
Department of Mechanical Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Lynggaard, Julie (Intern)
Supervisor:
Andreasen, Casper Schousboe (Intern)
Jørgensen, Ole (Intern)
Main Supervisor:
Niordson, Christian Frithiof (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Novel testing methods for intumescent coating
Department of Chemical and Biochemical Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 3
Phd Student:
Zeng, Ying (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Kiil, Søren (Intern)
Main Supervisor:

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Risk-based inspection Planning and Value of Information
Department of Civil Engineering
Period: 15/10/2016 → 14/10/2019
Number of participants: 4
Phd Student:
Agusta, Arifian (Ekstern)
Supervisor:
Faber, Michael Havbro (Intern)
Sørensen, John Dalsgaard (Intern)
Main Supervisor:
Thöns, Sebastian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Supporting the development of robust and comparable mitigation actions through the Mitigation Action Assessment Protocol.

The World Bank has developed the Mitigation Action Assessment Protocol (MAAP) tool, aimed at achieving transparency in how mitigation actions (MAs) are designed and how they compare in terms of mitigation value. The long-term goal is to have the MAAP serve as an internationally accepted system for assessing how MAs are robust and ambitious enough to contribute to achieving the mitigation targets of their relevant jurisdiction, and eventually, the trade potential and exchangeability of carbon credits. As an expansion of the MAAP tool and due to the fact that many MAs that are planned to contribute to countries Nationally Determined Contributions still are at the design stage, the World Bank is in the process of developing the MAAP-Design, aimed at assessing MA at design stage. The MAAP-Design will therefore be an important tool to assess how MA at the design stage are robust and ambitious enough to contribute to the achievement of NDC goals, and national and regional climate and development strategies. In addition, in spite of numerous available MA designs, the number of implemented actions falls short of the expected and needed level of implementation. This has been attributed to a mismatch between the design of MA and expected design standards of international financiers, leading to a backlog in disbursement of readily available funds. Therefore, the MAAP-Design will also enable practitioners to compare their MA design with existing good practices, and will allow financiers to access pre-assessed quality MAs. UDP will review the MAAP-Design and provide suggestions on how the tool can be more attuned to the design phase of mitigation actions (MAs). The peer review will be based on UDP's extensive knowledge and capacity building support on mitigation actions (MA) in developing countries. The MAAP tool and MAAP-Design will be piloted in an independent approach on 20 MAs, both at design and implementation stage. Out of the 20 MA, 5 will be selected for a full assessment including coordination and site visits with the country's MA representative. This initial product will be used to showcase the MAAP tool and MAAP-Design's utility through a set of outreach activities based on UDP's extensive network of partner countries and institutions, and on specific events in coordination with the World Bank. The outreach activities will also serve as a donor outreach process with the aim to fund future activities to develop and maintain a Mitigation Actions Database based on MA assessed through the MAAP tool, and to increase the MAAP Tool's application, ease of access and visibility.

Further, dependent on the donor outreach phase's success, UDP proposes to apply the tool to a selection of 50 MAs. Lastly, to increase the tool's utility and visibility, UDP proposes to create and maintain a database of MAs assessed with
the MAAP tool and MAAP-Design and make the information publicly available in a user-friendly design on a dedicated website.

The following specifies how UDP intends to carry out the three tasks described in the Terms of Reference:

1. Support the development of a version of the MAAP Tool aimed at assessing mitigation actions at the design stage.
2. Design and implement an independent assessment process for mitigation actions using the MAAP Tool.
3. Enhance the comparability of mitigation actions by providing the relevant information to different stakeholders in the form of a publicly available database.

Department of Management Engineering

UNEP DTU Partnership
Period: 12/10/2016 → 30/12/2016
Number of participants: 1
Project Manager, organisational:
CANU, FEDERICO ANTONIO (Intern)

Design and operation optimization of constructed wetlands at rainbow trout farms (39430)
This project aims at improving the design and operation of constructed wetlands with respect to the removal of waste nutrients and organic matter deriving from model trout farm systems type I and III.

The project contains five work packages:
1. Selection of representative fish farms to be part of a user group and where testing and measurements will be carried out
2. Mapping and characterization of selected wetlands
3. Measuring the effects of flow velocity, water column depth, and hydraulic retention time on the removal of nutrients and organic matter
4. Data analysis
5. Project management, administration and dissemination of results.

The projects is coordinated by

The project is funded by Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF)
National Institute of Aquatic Resources
Section for Aquaculture
Danish Aquaculture Association
Period: 06/10/2016 → 11/01/2019
Number of participants: 3
Research area: Aquaculture
Project participant:
Pedersen, Per Bovbjerg (Intern)
Dalsgaard, Anne Johanne Tang (Intern)
von Ahnen, Mathis (Intern)

System solutions for demand-control and continuous-commissioning of room-based ventilation in dwellings
The objective of the project is to develop solutions for demand-control and continuous-commissioning of room-based ventilation in dwellings. The system will extend ventilation units with various sensors and wireless communication. The project will synergize monitoring and control of indoor climate to enable new investment models. Online monitoring will ensure that systems work as intended throughout their lifetime. The project will enable broad deployment by removing financial and structural barriers and will ensure optimal performance.

The project will target building owners, administrators, tenants and energy-service companies that seek a model for investment, installation and operation of effective ventilation systems. The system will add the most value for the tenant, who will experience personal controls, reduce or maintain their energy bill, improve sleep quality, avoid moisture issues, minimize pollutants and reduce discomfort due to over-heating. These items would address common issues in renovated buildings. The added value for the tenant implies a better product for building owners and administrators through higher rent and lower tenant turnover. Continuous commissioning would ensure greater longevity of the ventilation systems and building constructions, which would add future value for building owners.

Department of Civil Engineering
Section for Building Energy
### IEA Task 55 Large scale solar district heating and cooling systems

Investigations on large solar heating plants

Department of Civil Engineering
Section for Building Energy
Solar Key Int.
Aalborg CSP

Period: 01/10/2016 → 31/12/2018
Number of participants: 4

**solar heating plants**

Acronym: IEA Task 55
Project participant:
Furbo, Simon (Intern)
Perers, Bengt (Intern)
Tian, Zhiyong (Intern)
Huang, Junpeng (Intern)

### SUPUVIR

SUPUVIR is the acronym for SUPercontinuum broadband light sources covering UV to IR applications. SUPUVIR will combine the efforts of 6 academic and 4 non-academic beneficiaries to train 15 early-stage researchers (ESRs) for the growing industry within SC broadband light sources, giving them extensive knowledge in silica and soft-glass chemistry, preform design and fibre drawing, linear and nonlinear fibre and waveguide characterization, nonlinear fibre optics, SC modelling, SC system design, patent protection, and in-depth knowledge of a broad range of the main applications of SC high-power broadband light sources. The strong blend of academic and non-academic sectors in the Consortium will give the ESRs a unique chance to develop a wide set of technical and transferrable skills, thus preparing them for long-time employment in the academic and industrial sectors.

Scientifically, SUPUVIR aims at solving current challenges preventing SC light sources from taking over key market shares or from being used for cutting-edge research. Specifically, the objectives are to reduce noise and increase pulse energy of SC modules, as well as investigate SC generation in emerging wavelength regimes (UV and mid-IR) including fabrication of novel fibres and waveguides, and finally using SC sources for applications as to gain valuable knowledge of application requirements. This research and development will provide improved SC sources and SC spectra, enabling new science and applications for optical imaging, spectroscopy, sensing and control. Specific fields benefiting from this include optical coherence tomography, IR multimodal spectroscopy, confocal and fluorescence microscopy, photoacoustic imaging, and food quality control.

Department of Photonics Engineering
Ultrafast Infrared and Terahertz Science
Fiber Sensors and Supercontinuum Generation

Period: 01/10/2016 → 30/09/2020
Number of participants: 3

**Supercontinuum broadband light sources, UV to IR applications, silica and soft-glass chemistry, preform design and fibre drawing, linear and nonlinear fibre and waveguide characterization, nonlinear fibre optics, SC modelling, SC system design**

Acronym: SUPUVIR
Number of related Ph.D. students: 15
Contact person:
Reippuert, Mie (Intern)
Project participant:
Bache, Morten (Intern)
Bang, Ole (Intern)

Financing sources
Source: EU research programme (public)
Name of research programme: H2020-MSCA-ITN-2016
Amount: 4,017,699.36 Euro
Year of approval: 2016

Multimodal, Functional Bio-Photonic Imaging
Department of Photonics Engineering
Diode Lasers and LED Systems
Technical University of Munich
Medical University of Vienna
Eindhoven University of Technology
École Polytechnique Fédérale de Lausanne
NKT Photonics A/S
Femtolasers Produktions GmbH
Philips Electronics Nederland B.V.
EKSPLA UAB
iThera Medical GmbH
Period: 01/10/2016 → 01/10/2020
Number of participants: 4
Acronym: FBI
Project ID: 721766
Project participant:
Marti, Dominik (Intern)
Jensen, Ole Bjarlin (Intern)
Hansen, Anders Kragh (Intern)
Project Coordinator:
Andersen, Peter E. (Intern)

PV LED ENGINE 10
Ultra efficient converter electronics for solar powered lighting applications
Department of Photonics Engineering
Diode Lasers and LED Systems
Department of Electrical Engineering
Electronics
Office for Innovation & Sector Services
Period: 01/10/2016 → 30/09/2017
Number of participants: 4
Photovoltaics, LED, Power electronics
Acronym: PVLE10
Project participant:
Ploug, Rasmus Overgaard (Intern)
Thorsteinsson, Sune (Intern)
Kejlberg, Jørgen (Intern)
Project Manager, organisational:
Poulsen, Peter Behrensdorff (Intern)
The objective of the EUDP project is to develop and manufacture a novel type of solar panel based on a new type of solar cell (black silicon solar cell), which – apart from a high and preferably improved efficiency and an implementable and cheaper production method – should have several significant advantages in terms of building integration. The black solar cells will be further processed to make the front conducting grid completely black through an electrochemical deposition technology. The tabbing wires interconnecting the cells in the panel will be processed into non-reflecting black strings in a scalable, inorganic electrochemical process step securing a completely black appearance of the solar panel later produced. A compatible panel production process with traditional PV panel process will be demonstrated for the total black silicon BIPV module.

Department of Photonics Engineering
Diode Lasers and LED Systems
Department of Micro- and Nanotechnology
Silicon Microtechnology
Experimental Surface and Nanomaterials Physics
Department of Energy Conversion and Storage
Organic Energy Materials
Gaia Solar A/S
Institute for Product Development
SoliTek
Nines Photovoltaics
Period: 01/10/2016 → 30/09/2018
Number of participants: 7
BIPV, Black Silicon
Acronym: BS2
Project participant:
Thorsteinsson, Sune (Intern)
Davidsen, Rasmus Schmidt (Intern)
Iandolo, Beniamino (Intern)
Hansen, Ole (Intern)
Riedel, Nicholas (Intern)
Benatto, Gisele Alves dos Reis (Intern)
Project Manager, organisational:
Poulsen, Peter Behrensdorf (Intern)

Predictive and Accelerated Metabolic Engineering Network
PAcMEN is a European training network, which offers excellent training in biotech research and innovation for 16 talented young scientists. PhD students will carry out cutting-edge research in metabolic engineering, modeling, systems and synthetic biology. In collaboration with industrial partners, they will create novel solutions for sustainable production of fuels and chemicals. The graduates will be prepared through research, business, and entrepreneurship training to launch their careers in industry or academia.

Novo Nordisk Foundation Center for Biosustainability
Yeast Cell Factories
Research Groups
Yeast Metabolic Engineering
Synthetic Biology Tools for Yeast
Eukaryotic Molecular Cell Biology
Period: 01/10/2016 → 30/09/2020
Number of participants: 10
Biotechnology
Acronym: PAcMEN
Project participant:
Lohmann, Ricarda (Intern)
Phd Student:
Dahlin, Jonathan (Intern)
Petersen, Søren Dalsgård (Intern)
Olsson, Helén Emelie (Intern)
D’ambrosio, Vasil (Intern)
Marella, Eko Roy (Intern)
Supervisor:
Borodina, Irina (Intern)
Jensen, Michael Krogh (Intern)
Mortensen, Uffe Hasbro (Intern)
Project Coordinator:
Nielsen, Jens (Intern)

Financing sources
Source: EU research programme (public)
Name of research programme: MSCA-ITN - Marie Skłodowska-Curie actions – International Training Networks
Web address: http://www.pacmen-itn.eu
Project

Animal Influenza Viruses - Impacts of influenza virus in Danish swine herds

National Veterinary Institute
Period: 01/10/2016 → 30/09/2019
Number of participants: 5
Phd Student:
Ryt-Hansen, Pia (Intern)
Supervisor:
Plósz, Benedek G. (Intern)
Krog, Jesper Schak (Intern)
Larsen, Inge (Ekstern)
Main Supervisor:
Larsen, Lars Erik (Intern)

Financial sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Assessing cod growth and age by otolith microchemistry analysis

National Institute of Aquatic Resources
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Nielsen, Kristian Ege (Intern)
Supervisor:
Mosegaard, Henrik (Intern)
Main Supervisor:
Hüssy, Karin (Intern)

Financial sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Balancing costs and benefits of new urban water management objectives for both real time applications and urban planning
Department of Environmental Engineering
Period: 01/10/2016 → 30/12/2016
Number of participants: 4
Phd Student:
Nielsen, Marie Rosenlund (Intern)
Supervisor:
Gregersen, Ida Bülow (Intern)
Löwe, Roland (Intern)
Main Supervisor:
Arnbjerg-Nielsen, Karsten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Building clusters and their impact on flexibility when including the prosumer aspect
Department of Civil Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 2
Phd Student:
Larma, Marijana (Ekstern)
Main Supervisor:
Heller, Alfred (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Building clusters and their impact on flexibility when including the prosumer aspect
Department of Civil Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 2
Phd Student:
Larma, Marijana (Intern)
Main Supervisor:
Heller, Alfred (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

CFD Simulation of Heterogeneous Reacting Systems
Department of Chemical and Biochemical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Luo, Hao (Intern)
Supervisor:
Wu, Hao (Intern)
Main Supervisor:
Dam-Johansen, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD
Control and stability of meshed offshore grids with diode rectifiers and VSC HVDC

Department of Wind Energy
Period: 01/10/2016 → 30/09/2019
Number of participants: 5
Phd Student:
Bidadfar, Ali (Intern)
Supervisor:
Akhmatov, Vladislav (Intern)
Altin, Müfit (Intern)
Cutululis, Nicolaos Antonio (Intern)
Main Supervisor:
Sørensen, Poul Ejnar (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Data analysis methods for process understanding and improvement in injection moulding production

Department of Applied Mathematics and Computer Science
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Frumosu, Flavia Dalia (Intern)
Supervisor:
Aanæs, Henrik (Intern)
Tosello, Guido (Intern)
Main Supervisor:
Kulahci, Murat (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Design Approaches for Terahertz electronics using Active Device Configurations

Department of Electrical Engineering
Period: 01/10/2016 → 23/04/2017
Number of participants: 4
Phd Student:
Zhang, Yaxin (Intern)
Supervisor:
Tafur Monroy, Idelfonso (Intern)
Weimann, Nils (Ekstern)
Main Supervisor:
Johansen, Tom Keinicke (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Development and Validation of Mechanical Micro Polishing of 3D and Free Form Geometries for Application to Micro Forging Dies

Department of Mechanical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
PhD Student:
Ben Achour, Soufian (Intern)
Supervisor:
De Chiffre, Leonardo (Intern)
Main Supervisor:
Bissacco, Giuliano (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Doppler lidar scanning of flow over complex terrain
Department of Wind Energy
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
PhD Student:
Menke, Robert (Intern)
Supervisor:
Vasiljevic, Nikola (Intern)
Main Supervisor:
Mann, Jakob (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

End-to-end configuration
Department of Mechanical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
PhD Student:
Rasmussen, Jeppe Bredahl (Intern)
Supervisor:
Hvam, Lars (Intern)
Main Supervisor:
Mortensen, Niels Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Fabrication and characterization of novel nanophotonic structures with electrical control
Department of Photonics Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
PhD Student:
Marchevsky, Andrey (Intern)
Supervisor:
Mørk, Jesper (Intern)
Ottaviano, Luisa (Intern)
Main Supervisor:
Yvind, Kresten (Intern)

Financing sources
Fabrication and electrical properties of correlated electron systems at the interfaces of complex oxides

Department of Energy Conversion and Storage
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Gan, Yulin (Intern)
Supervisor:
Pryds, Nini (Intern)
Main Supervisor:
Chen, Yunzhong (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Functional Modeling of water treatment system

Department of Electrical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Nielsen, Emil Krabbe (Intern)
Supervisor:
Lind, Morten (Intern)
Sin, Gürkan (Intern)
Main Supervisor:
Ravn, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Future gas markets tariffs and regulation

Department of Management Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Amirkhizi, Tara Sabbagh (Intern)
Supervisor:
Rosager, Frank (Ekstern)
Main Supervisor:
Morthorst, Poul Erik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Heat Pump Integration in the Greater Copenhagen District Heating System

Department of Mechanical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Jørgensen, Pernille Hartmund (Intern)
Supervisor:
Markussen, Wiebke Brix (Intern)
Ommen, Torben Schmidt (Intern)
Main Supervisor:
Elmegaard, Brian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Heat pump solutions for integration with district heating in a renewable energy system

Department of Mechanical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Meesenburg, Wiebke (Intern)
Supervisor:
Markussen, Wiebke Brix (Intern)
Ommen, Torben Schmidt (Intern)
Main Supervisor:
Elmegaard, Brian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Implementation of fiber-based continuous-variable quantum key distribution protocols

Department of Physics
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Nikolic, Dino Solar (Intern)
Supervisor:
Gehring, Tobias (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Learning to Read and Think

Department of Applied Mathematics and Computer Science
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Nørregaard, Jeppe (Intern)
Supervisor:
Larsen, Jan (Intern)
Main Supervisor:
Hansen, Lars Kai (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
**Metal Catalysts for Dehydrogenation and Decarbonylation of Primary Alcohols**

- **Department of Chemistry**
- **Period:** 01/10/2016 → 30/09/2019
- **Number of participants:** 3
- **Phd Student:** Monda, Fabrizio (Ekstern)
- **Supervisor:** Clausen, Mads Hartvig (Intern)
- **Main Supervisor:** Madsen, Robert (Intern)

**Financing sources**
- **Source:** Internal funding (public)
- **Name of research programme:** Eksternt finansieret virksomhed

**Project:** PhD

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**Models for estimation and analyses of emissions from chemical processes and products**

- **Department of Chemical and Biochemical Engineering**
- **Period:** 01/10/2016 → 30/09/2019
- **Number of participants:** 5
- **Phd Student:** Jhamb, Spardha Virendra (Intern)
- **Supervisor:** Dam-Johansen, Kim (Intern)
- **Kontogeorgis, Georgios (Intern)**
- **Liang, Xiaodong (Intern)**
- **Main Supervisor:** Gani, Rafiqul (Intern)

**Financing sources**
- **Source:** Internal funding (public)
- **Name of research programme:** Samfinansierede - Virksomhed

**Project:** PhD

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**Models for real time warning and control strategies in urban drainage and wastewater systems**

- **Department of Environmental Engineering**
- **Period:** 01/10/2016 → 30/09/2019
- **Number of participants:** 4
- **Phd Student:**
Pedersen, Jonas Wied (Intern)
Supervisor:
Madsen, Henrik (Intern)
Vezzaro, Luca (Intern)
Main Supervisor:
Mikkelsen, Peter Steen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Nanomechanical Sensors
Department of Micro- and Nanotechnology
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Padmanabhan Rangacharya, Varadarajan (Intern)
Supervisor:
Larsen, Peter Emil (Intern)
Rindzevicius, Tomas (Intern)
Main Supervisor:
Boisen, Anja (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Nanomedicine Development for Combination with Ultrasound Mediated Brain Cancer Therapy
Department of Micro- and Nanotechnology
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Sereti, Viktoria (Intern)
Supervisor:
Urquhart, Andrew (Intern)
Main Supervisor:
Andresen, Thomas Lars (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Production performance of radial water-jet drilled wells: a modelling and laboratory study
Department of Applied Mathematics and Computer Science
Period: 01/10/2016 → 30/09/2019
Number of participants: 4
Phd Student:
Medetbekova, Maiya (Intern)
Supervisor:
Christensen, Helle Torp (Intern)
Salimzadeh, Saeed (Intern)
Main Supervisor:
Nick, Hamid (Intern)

Financing sources
**Resonant Piezoelectric Shunt Damping of Structures**

Department of Mechanical Engineering  
Period: 01/10/2016 → 30/09/2019  
Number of participants: 4  
PhD Student:  
Toftekær, Johan Frederik (Intern)  
Supervisor:  
Benjeddou, Ayech (Ekstern)  
Krenk, Steen (Intern)  
Main Supervisor:  
Høgsberg, Jan Becker (Intern)

**Financing sources**

Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

**Situation-aware control solutions for enabling smart network services**

Department of Electrical Engineering  
Period: 01/10/2016 → 30/09/2019  
Number of participants: 3  
PhD Student:  
Cai, Hanmin (Intern)  
Supervisor:  
You, Shi (Intern)  
Main Supervisor:  
Bindner, Henrik W. (Intern)

**Financing sources**

Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Systems-level evolutionary pathway engineering in yeast through growth-coupled selection**

Technical University of Denmark  
Period: 01/10/2016 → 30/09/2019  
Number of participants: 4  
PhD Student:  
Hansen, Anne Sofie Lærke (Intern)  
Supervisor:  
Jensen, Michael Krogh (Intern)  
Sonnenschein, Nikolaus (Intern)  
Main Supervisor:  
Herrgard, Markus (Intern)

**Financing sources**

Source: Internal funding (public)  
Name of research programme: Eksternt finansieret virksomhed  
Project: PhD

**The effect of culture conditions on the bioactive potential of marine bacteria**

Department of Systems Biology
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Paulsen, Sara Skøtt (Intern)
Supervisor:
Sonnenschein, Eva (Intern)
Main Supervisor:
Gram, Lone (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Thermodynamic Modeling of CO2 Gas Hydrate Formation Systems
Department of Chemical and Biochemical Engineering
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Sun, Li (Intern)
Supervisor:
Liang, Xiaodong (Intern)
Main Supervisor:
Kontogeorgis, Georgios (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Tunable and Responsive Properties of Surface Grafted Cross-linked Multilayer Films Containing Alginate Derivatives
Department of Chemistry
Period: 01/10/2016 → 30/09/2019
Number of participants: 3
Phd Student:
Huang, Junhao (Intern)
Supervisor:
Larsen, René Wugt (Intern)
Main Supervisor:
Thormann, Esben (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Advanced mathematical modeling related to comprehensive energy system models
Department of Management Engineering
Period: 15/09/2016 → 21/10/2019
Number of participants: 3
Phd Student:
Buchholz, Stefanie (Intern)
Supervisor:
Gamst, Mette (Intern)
Main Supervisor:
Pisinger, David (Intern)

Financing sources
Source: Internal funding (public)
**Computational modelling and simulation of anaerobic biomass conversion to biogas, focusing on the effects of substrate characterisation, solid-liquid-gas phase interactions and microbial growth dynamics**

Department of Environmental Engineering  
Period: 15/09/2016 → 14/01/2020  
Number of participants: 3  
Phd Student: Kovalovszki, Adam (Intern)  
Supervisor: Alvarado-Morales, Merlin (Intern)  
Main Supervisor: Angelidaki, Irini (Intern)

**Financial sources**  
Source: Internal funding (public)

**Creativity workshop facilitation in the business context**

Department of Management Engineering  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student: Wróbel, Agata Ewa (Intern)  
Supervisor: Lomberg, Carina (Intern)  
Main Supervisor: Cash, Philip (Intern)

**Financial sources**  
Source: Internal funding (public)

**Design, synthesis and development of hypoxia reactive drug delivery systems**

Department of Micro- and Nanotechnology  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student: Björk Sigurdardóttir, Sara (Intern)  
Supervisor: Kamaly, Nazila (Intern)  
Main Supervisor: Andresen, Thomas Lars (Intern)

**Financial sources**  
Source: Internal funding (public)

**Development of environmental footprints for large-scale systems**

Department of Management Engineering  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 4  
Phd Student: Leclerc, Alexandra Segolene Corinne (Intern)
Supervisor:
Hauschild, Michael Zwicky (Intern)
Wood, Richard (Ekstern)
Main Supervisor:
Laurent, Alexis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Development Reactors
Department of Chemical and Biochemical Engineering
Period: 15/09/2016 → 14/09/2019
Number of participants: 4
Phd Student:
Svith, Casper Stryhn (Intern)
Supervisor:
Lin, Weigang (Intern)
Wu, Hao (Intern)
Main Supervisor:
Dam-Johansen, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Electrocatalytic Materials
Department of Mechanical Engineering
Period: 15/09/2016 → 14/09/2019
Number of participants: 3
Phd Student:
Villadsen, Sebastian Nis Bay (Intern)
Supervisor:
Nielsen, Lars Pleth (Ekstern)
Main Supervisor:
Møller, Per (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

High Fidelity CFD-based Shape Optimization of Wind Turbine Blades
Department of Wind Energy
Period: 15/09/2016 → 14/09/2019
Number of participants: 4
Phd Student:
Madsen, Mads Holst Aagaard (Intern)
Supervisor:
Andersen, Søren Juhl (Intern)
Sørensen, Niels N. (Intern)
Main Supervisor:
Zahle, Frederik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
**Liposome based vaccines in cancer immunotherapy**  
Department of Micro- and Nanotechnology  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student:  
Jæhger, Ditte Elisabeth (Intern)  
Supervisor:  
Parhamifar, Ladan (Intern)  
Main Supervisor:  
Andresen, Thomas Lars (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Fonde  
Project: PhD

**Market and Policy Design for Fossil-free Energy Systems**  
Department of Management Engineering  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student:  
Sekamane, Jonas Khubute (Intern)  
Supervisor:  
Morthorst, Poul Erik (Intern)  
Main Supervisor:  
Skytte, Klaus (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Micromachined Integrated 2D Transducers for Ultrasound Imaging**  
Department of Micro- and Nanotechnology  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student:  
Havreland, Andreas Spandet (Intern)  
Supervisor:  
Jensen, Jørgen Arendt (Intern)  
Main Supervisor:  
Thomsen, Erik Vilain (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Modelling of the gas system as an integrated part of the future energy system**  
Department of Management Engineering  
Period: 15/09/2016 → 14/09/2019  
Number of participants: 3  
Phd Student:  
Pedersen, Rasmus Bo Bramstoft (Intern)  
Supervisor:  
Ravn, Hans V. (Intern)
Main Supervisor: Münster, Marie (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Mucoadhesive microcontainers for oral drug delivery
Department of Micro- and Nanotechnology
Period: 15/09/2016 → 14/09/2019
Number of participants: 4
Phd Student: Mosgaard, Mette Dalskov (Intern)
Supervisor:
Andersen, Alina Joukainen (Intern)
Müllertz, Anette (Ekstern)
Main Supervisor:
Boisen, Anja (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Statistics and Data Analytics on Smart Zero
Department of Applied Mathematics and Computer Science
Period: 15/09/2016 → 14/09/2019
Number of participants: 2
Phd Student: Wolf, Sebastian (Ekstern)
Main Supervisor:
Madsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Statistics and Data Analytics on Smart Zero
Department of Applied Mathematics and Computer Science
Period: 15/09/2016 → 14/09/2019
Number of participants: 3
Phd Student: Wolf, Sebastian (Intern)
Supervisor:
Krogstie, John (Ekstern)
Main Supervisor:
Madsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Tool Sets for System Operators in Future Market Setting
Department of Electrical Engineering
Effects of seal-related liver worm on Baltic cod growth and mortality (39411)

The number of grey seals has increased markedly in the Baltic Sea within recent years. Grey seal is final host for the liver worm *Contraceum osculatum*, where cod is one of several transport hosts. Concurrent with the rise in number of grey seal, the prevalence (number of infected cod) and intensity of infection (number of liver worms per infected cod) with liver worm has increased, and up to 340 worms can now be found in single cod livers. Field studies have shown that intensity of infection correlates negatively with the condition of the fish, indicating that liver worm may have a negative effect on the health status of the fish. Yet, from field investigations it is difficult to separate potentially negative effects of liver worms from that of reduced food availability or poor oxygen conditions.

In the present study we will perform controlled laboratory experiments to i) determine the potential costs of housing liver worm, ii) estimate the effects of liver worm on cod growth and mortality, and iii) use data generated in i) and ii) in bioenergetic modeling to calculate the effect of liver worm on the maximal food consumption and growth of individual cod.
This will subsequently be scaled to the level of the population. The projects is coordinated by University of Copenhagen. The project is funded by Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Marine Living Resources
University of Copenhagen
Danish Fishermen's Association
Period: 08/09/2016 → 15/12/2018
Number of participants: 3
Research area: Marine Living Resources
Project participant:
Skov, Peter Vilhelm (Intern)
Andersen, Niels Gerner (Intern)
Project Manager, academic:
Behrens, Jane (Intern)

Production of alkali from cocoa husk ash and biological extraction of hydrocolloid from Sargassum sp.
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering
Period: 05/09/2016 → 06/02/2017
Number of participants: 4
Project participant:
Rhein-Knudsen, Nanna (Intern)
Bentil, Joseph Asankomah (Intern)
Supervisor:
Ale, Marcel Tutor (Intern)
Main Supervisor:
Meyer, Anne S. (Intern)

Production of alkali from cocoa husk ash for extraction of hydrocolloid from biologically pretreated red seaweed
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering
Period: 05/09/2016 → 06/02/2017
Number of participants: 4
Phd Student:
Rhein-Knudsen, Nanna (Intern)
Bentil, Joseph Asankomah (Intern)
Supervisor:
Ale, Marcel Tutor (Intern)
Main Supervisor:
Meyer, Anne S. (Intern)

Relations
Parent project:
Seaweed Biorefinery in Ghana

Guidance note on assessment of transformational change
Department of Management Engineering
UNEP DTU Partnership
Mitigation and MRV Partnership
Period: 01/09/2016 → 30/06/2017
Number of participants: 1
Project participant:
Olsen, Karen Holm (Intern)

Cool PVT
The aim is to develop PVT panels which can be used for heat and electricity production during daytime and for cooling during night time.

Differently designed PVT panels will be tested experimentally in laboratory test facilities

Department of Civil Engineering
Section for Building Energy
Department of Applied Mathematics and Computer Science
RACELL SAPHIRE Technologies ApS
COWI A/S
Period: 01/09/2016 → 31/12/2016
Number of participants: 2
PVT panels, heating cooling
Project participant:
Furbo, Simon (Intern)
Dannemand, Mark (Intern)

Science Cloud for Cities
A Deic/Deff project developing a science cloud for research (in cities).

Centre for IT-Intelligent Energy Systems in Cities
Department of Civil Engineering
Department of Management Engineering
Aarhus University
University of Southern Denmark
Aalborg University
Period: 01/09/2016 → 16/12/2017
Number of participants: 3
Project participant:
Nielsen, Per Sieverts (Intern)
Madsen, Henrik (Intern)
Project Manager, academic:
Heller, Alfred (Intern)

Bekæmpelse af ESBL producerende, colistin og multiresistente Salmonella og E. coli
National Food Institute
Research Group for Genomic Epidemiology
University of Copenhagen
Period: 01/09/2016 → 31/12/2016
Number of participants: 1
ESBL, colistin, phage
Project participant:
Bortolaia, Valeria (Intern)
EMPIR 15SIB07 PhotoLED, Future photometry based on solid-state lighting products

Solid-state lighting, which uses light-emitting diodes (LEDs), is globally replacing traditional incandescent lighting, due to lower power consumption and greater durability. Photometers are used to measure the performance of lights, and are calibrated using standard lamps to ensure the accuracy and consistency of measurements. However, the standard lamps used for calibration are currently based on incandescent lights, not LEDs. This project will develop new standard lamps based on LEDs and new measurement techniques for defining the properties of solid-state lights. The results will be used by National Measurement Institutes and test laboratories to accurately calibrate solid-state light photometers and will give European industry an advantage in the development of new commercial standard lamps. These outputs will result in a more reliable classification of the energy efficiency of solid-state lighting, increasing consumer confidence in this new greener technology.

Department of Photonics Engineering
Diode Lasers and LED Systems
VTT - Technical Research Centre of Finland
Aalto University
Swiss Federal Office of Metrology and Accreditation (METAS) (CH)
Physikalisch-Technische Bundesanstalt
National Institute of Standards and Technology
Czech Metrological Institute
Istituto Nazionale di Ricerca Metrologica
Philips
VSL
LMT Lichtmesstechnik GmbH Berlin
École nationale des travaux publics de l'État (ENTPE)
Metrosert
OSRAM GmbH
OSRAM Opto Semiconductors GmbH
Period: 01/09/2016 → 01/09/2019
Number of participants: 4
Acronym: PhotoLED
Project ID: 70983
Project participant:
Thorseth, Anders (Intern)
Lindén, Johannes (Intern)
Dam-Hansen, Carsten (Intern)
Corell, Dennis Dan (Intern)

Financing sources
Source: EU research programme (public)
Name of research programme: EMPIR
Web address: http://msu.euramet.org/calls.html
Year of approval: 2016

Relations
Related projects:
Center for LED metrology
Tests and standards for SSL products - IEA-4E-SSL
Global Test of SSL Products - IEA-4E-SSL
Activities:
LED possibilities and challenges
Light source characterization and air movement under CIE S 025
Highly defective oxides – the next generation of electromechanical materials

Materials capable of changing shape in response to an electrical field work as muscles and have important applications as actuators in many different contexts. At present, the most widely used materials contain lead (Pb) which is highly toxic. Recently, an entirely new class of electromechanically active materials has been discovered: highly defective cerium oxides, i.e. ceria with a large concentration of oxygen vacancies in the crystal lattice. Such materials contain no toxic elements and have a giant electromechanical response even under moderate electric fields. Governed by a still unexplored atomistic mechanism, the main underlying phenomenon seems to be the organization of the oxygen vacancies. This effect is observed so far only in thin films (below 1 micron) in textured microstructures, but in order to replace the current lead-based actuator materials the properties have to be brought to the level of thick films and bulk components. To this scope, the GIANT-E project has 2 success criteria, namely: (1) Understanding the fundamental effect of the film thickness on the electrostrictive properties of highly defective oxides; (2) Identifying a methodology for stabilizing the electromechanical properties in bulk by tailoring microstructure and oxygen defects. Such results will lay the foundations for a new paradigm of bulk lead-free electromechanically active materials for multi-scale applications. The concept will be tested by a Danish industrial player, NOLIAC, for biomedical applications.

Department of Energy Conversion and Storage

Ceramic Engineering & Science

Weizmann Institute of Science

Period: 01/09/2016 → 31/08/2019
Number of participants: 1
Acronym: GIANT-E
Project participant: Esposito, Vincenzo (Intern)

Postdoc

Department of Micro- and Nanotechnology

Silicon Microtechnology

Period: 01/09/2016 → 31/03/2017
Number of participants: 1
Acronym: Postdoc
Project participant: Crovetto, Andrea (Intern)

Digital tools for landscape architects: A case study of digital tools used for analyzing and screening climate adaptation challenges in the early design phase

Danish Title: Undersøgelse af digitale værktøjer hos arkitekttegnestuer til beregning og screening af regnvand i den tidlige designfase

Department of Civil Engineering

Section for Building Design
Department of Environmental Engineering

Urban Water Systems
Period: 01/09/2016 → 31/12/2016
Number of participants: 3
Project participant:
Arnbjerg-Nielsen, Karsten (Intern)
Mikkelsen, Peter Steen (Intern)
Project Manager, academic:
Jensen, Lotte Bjerregaard (Intern)

Abstract Interpretation for Secure Information Flow
Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Vasilikos, Panagiotis (Intern)
Supervisor:
Nielsen, Flemming (Intern)
Main Supervisor:
Nielsen, Hanne Riis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Catalytic Oxidation of CH4
Department of Chemical and Biochemical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Zhang, Yu (Intern)
Supervisor:
Christensen, Jakob Munkholt (Intern)
Jensen, Anker Degn (Intern)
Main Supervisor:
Glarborg, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Cell diagnostics using new light sculpting
Department of Photonics Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Wei, Jingxuan (Intern)
Supervisor:
Bañas, Andrew Rafael (Intern)
Main Supervisor:
Glückstad, Jesper (Intern)

Financing sources
Source: Internal funding (public)
Characterisation of Materials based on Graphene and Gold

Department of Chemistry
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Nielsen, Frederick Stappen (Intern)
Supervisor:
Engelbrek, Christian (Intern)
Main Supervisor:
Zhang, Jingdong (Intern)

Financing sources
Source: Internal funding (public)

CO2 reduction on model catalyst surfaces

Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Vagn Hogg, Thomas (Intern)
Supervisor:
Seger, Brian (Intern)
Stephens, Ifan (Intern)
Main Supervisor:
Chorkendorff, lb (Intern)

Financing sources
Source: Internal funding (public)

Cognitive modeling and electrophysiological characterization of audiovisual speech perception

Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Lindborg, Alma Cornelia (Intern)
Supervisor:
Mørup, Morten (Intern)
Main Supervisor:
Andersen, Tobias (Intern)

Financing sources
Source: Internal funding (public)

Combining functional modeling and reasoning with on-line event analytics

Department of Electrical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Kirchhübel, Denis (Intern)
Control and operation of offshore wind power plants connected via HVDC

Department of Wind Energy
Period: 01/09/2016 → 31/08/2019
Number of participants: 5
Phd Student: Saborío-Romano, Oscar (Intern)
Supervisor: Göksu, Ömer (Intern)
Serensen, Poul Ejnar (Intern)
Zeni, Lorenzo (Intern)
Main Supervisor: Cutululis, Nicolaos Antonio (Intern)

Damping of Torsional Beam Vibrations

Department of Mechanical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student: Hoffmeyer, David (Intern)
Supervisor: Krenk, Steen (Intern)
Main Supervisor: Høgsberg, Jan Becker (Intern)

Development of biotechnological tools for modulating the microbiome of industrial sugarcane ethanol fermentations

Technical University of Denmark
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student: Senne de Oliveira Lino, Felipe (Intern)
Supervisor: Molin, Søren (Intern)
Main Supervisor: Sommer, Morten Otto Alexander (Intern)
Relations
Activities:
novo nordisk foundation cluster days
Project: PhD

Development of Surface-Enhanced Raman Scattering Sensors
Department of Micro- and Nanotechnology
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Viehrig, Marlitt (Intern)
Supervisor: Rindzevicius, Tomas (Intern)
Schmidt, Michael Stenbæk (Intern)
Main Supervisor: Boisen, Anja (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

DNA repair pathway aberrations in personalized chemotherapy and immunotherapy of cancer
Department of Bio and Health Informatics
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student: Diossy, Miklos (Intern)
Supervisor: Eklund, Aron Charles (Intern)
Main Supervisor: Szallasi, Zoltan Imre (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Downstream Processing of Biochemical Processes
Department of Chemical and Biochemical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student: Meyer, Kristian (Intern)
Supervisor: Huusom, Jakob Kjebsted (Intern)
Main Supervisor: Abildskov, Jens (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Elucidating the mechanistic pathways of carbon dioxide electroreduction
Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Scott, Søren Bertelsen (Intern)
Supervisor:
Rossmeisl, Jan (Intern)
Stephens, Ifan (Intern)
Main Supervisor:
Chorkendorff, Ib (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Energy Efficiency Hybrid Separation Process with Ionic Liquid**
Department of Chemical and Biochemical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Liu, Xinyan (Intern)
Supervisor:
Kontogeorgis, Georgios (Intern)
Liang, Xiaodong (Intern)
Main Supervisor:
Gani, Rafiqul (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

**Flavor Tailoring for Future Brewing: Unleashing the Yeast Diversity Potential**
National Food Institute
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Colomer, Marc Serra (Ekstern)
Supervisor:
Förster, Jochen (Intern)
Mortensen, Uffe Hasbro (Intern)
Main Supervisor:
Hobley, Timothy John (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

**Fluidized bed combustion of biomass**
Department of Chemical and Biochemical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Ulusoy, Burak (Intern)
Supervisor:
Lin, Weigang (Intern)
Wu, Hao (Intern)
Main Supervisor:
Dam-Johansen, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Genomics Driven Discovery and Engineering of Fungal Tetracyclines
Department of Systems Biology
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Wolff, Peter Persson (Intern)
Supervisor:
Andersen, Mikael Rørdam (Intern)
Larsen, Thomas Ostenfeld (Intern)
Main Supervisor:
Mortensen, Uffe Hasbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Hospital Staff Planning with Multi-Agent Goals
Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Larsen, John Bruntse (Intern)
Supervisor:
Carstens, Niels (Ekstern)
Holst, Carsten Kehler (Ekstern)
Main Supervisor:
Villadsen, Jørgen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD
Identification of bacterial functional modules applicable for management of gut homeostasis

Technical University of Denmark
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Rosenkilde, Carola Elisa Heesemann (Intern)
Supervisor:
Nielsen, Henrik Bjørn (Intern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Induction-Heated Hydrogen Production

Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Wismann, Sebastian Thor (Intern)
Supervisor:
Frandsen, Cathrine (Intern)
Mortensen, Peter Mølgaard (Intern)
Main Supervisor:
Chorkendorff, Ib (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

In-situ and Personalized Cognitive Behavioural Therapy for Mental Health

Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Rohani, Darius Adam (Intern)
Supervisor:
Kessing, Lars Vedel (Ekstern)
Puthusserypady, Sadasivan (Intern)
Main Supervisor:
Bardram, Jakob Eyvind (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

In situ Electron Microscopy Characterization of Catalysts for Sustainable Energy

Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Nielsen, Monia Runge (Intern)
Supervisor:
08052011, Emma (Ekstern)
Wagner, Jakob Birkedal (Intern)
Main Supervisor:
Hansen, Thomas Willum (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Integrated SILP Catalysts - Membrane Separation Reaction Systems
Department of Chemistry
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Marinkovic, Jakob Maximilian (Intern)
Supervisor:
Fehrmann, Rasmus (Intern)
García Suárez, Eduardo José (Intern)
Main Supervisor:
Riisager, Anders (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

LIGHTest foundation
Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 06/09/2016
Number of participants: 3
Phd Student:
Bjerregaard, Mathias Ormstrup (Intern)
Supervisor:
Lluch Lafuente, Alberto (Intern)
Main Supervisor:
Mödersheim, Sebastian Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Liposome based vaccines in cancer immunotherapy
Department of Micro- and Nanotechnology
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Hübbe, Mie Linder (Intern)
Supervisor:
Kaplinsky, Joseph John (Intern)
Main Supervisor:
Andresen, Thomas Lars (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD
Load Environment Modelling and Forecasting
Department of Management Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 5
Phd Student:
Glavind, Sebastian Tølbøll (Intern)
Supervisor:
Nielsen, Bo Friis (Intern)
Sørensen, John Dalsgaard (Intern)
Thöns, Sebastian (Intern)
Main Supervisor:
Faber, Michael Havbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Marine Ecosystem Climate Services
National Institute of Aquatic Resources
Period: 01/09/2016 → 31/08/2020
Number of participants: 3
Phd Student:
Miesner, Anna Katharina (Intern)
Supervisor:
MacKenzie, Brian (Intern)
Main Supervisor:
Payne, Mark (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Modeling audiovisual speech perception
Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 2
Phd Student:
Gil Carvajal, Juan Camilo (Intern)
Main Supervisor:
Andersen, Tobias (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Modeling of degradation processes in high temperature electrolysis cells
Department of Energy Conversion and Storage
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Trini, Martina (Intern)
Supervisor:
Hauch, Anne (Intern)
Hendriksen, Peter Vang (Intern)
Main Supervisor:
Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Model-optimized Screening of Checked-in Luggage
Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 5
Phd Student:
Busi, Matteo (Intern)
Supervisor:
Frisvad, Jeppe Revall (Intern)
Bergbäck Knudsen, Erik (Intern)
Olsen, Ulrik Lund (Intern)
Main Supervisor:
Haldrup, Kristoffer (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Model Predictive Control strategies for real-time control of urban storm and wastewater systems
Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → …
Number of participants: 5
Phd Student:
Tranos, Damianos (Intern)
Supervisor:
Falk, Anne Katrine Vinther (Intern)
Madsen, Henrik (Intern)
Niemann, Hans Henrik (Intern)
Main Supervisor:
Poulsen, Niels Kjølstad (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Nano-Editor: Development of nano-materials based printing media for all-ceramic solid oxide fuel cells manufacturing
Department of Energy Conversion and Storage
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Rosa, Massimo (Intern)
Supervisor:
Zielke, Philipp (Intern)
Main Supervisor:
Esposito, Vincenzo (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD
Novel methods for detection of contaminants in the environment
Department of Micro- and Nanotechnology
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Noori, Jafar Safaa (Intern)
Supervisor: Dimaki, Maria (Intern)
Mortensen, John (Ekstern)
Main Supervisor: Svendsen, Winnie Edith (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

On Parametric Decay of Electron Cyclotron Heating Beams in ASDEX Upgrade
Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Hansen, Søren Kjer (Ekstern)
Supervisor: Pedersen, Morten Stejner (Intern)
Stober, Jörg Karl (Ekstern)
Main Supervisor: Nielsen, Stefan Kragh (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Optimized water distribution using high-resolution data sources and novel data analysis methods
Department of Environmental Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Kirstein, Jonas Kjeld (Intern)
Supervisor: Borup, Morten (Intern)
Høgh, Klavs (Ekstern)
Main Supervisor: Rygaard, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Photonic Crystal Fano Lasers
Department of Photonics Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Mathiesen, Kristoffer Skaftved (Intern)
Supervisor:
Yvind, Kresten (Intern)
Main Supervisor:
Mørk, Jesper (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Porcine coronavirus - pathogenesis and control
National Veterinary Institute
Period: 01/09/2016 → 13/06/2020
Number of participants: 4
PhD Student:
Lazov, Christina Marie (Intern)
Supervisor:
Belsham, Graham (Intern)
Rasmussen, Thomas Bruun (Intern)
Main Supervisor:
Bøtner, Anette (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Process chains to manufacture micro structures on 3D surfaces by replication
Department of Mechanical Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 5
PhD Student:
Li, Dongya (Intern)
Supervisor:
Bissacco, Giuliano (Intern)
Tang, Peter Torben (Intern)
Tosello, Guido (Intern)
Main Supervisor:
Zhang, Yang (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Privatist
Project: PhD

Processing and Generation of Photon Pairs using Nonlinear Effects in Optical Fibers
Department of Photonics Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
PhD Student:
Koefoed, Jacob Gade (Intern)
Supervisor:
Usuga Castaneda, Mario A. (Intern)
Main Supervisor:
Rottwitt, Karsten (Intern)

Financing sources
Production of Synthetic Fuels
Department of Mechanical Engineering
Period: 01/09/2016 → 31/07/2017
Number of participants: 3
PhD Student:
Warm, Christian (Intern)
Supervisor:
Nielsen, Lars Pleth (Ekstern)
Main Supervisor:
Møller, Per (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Quantum transport and thermoelectric effects in nanostructures and two-dimensional materials
Department of Micro- and Nanotechnology
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
PhD Student:
Walldorf, Nicklas (Intern)
Supervisor:
Kaasbjerg, Kristen (Intern)
Main Supervisor:
Jauho, Antti-Pekka (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Railway substructure system based on asphalt
Department of Civil Engineering
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
PhD Student:
Bose, Tulika (Intern)
Supervisor:
Levenberg, Eyal (Intern)
Main Supervisor:
Zania, Varvara (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Fonde
Project: PhD

Reduktion af lakseinfektioner
National Institute of Aquatic Resources
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
PhD Student:
Kragesteen, Tróndur Jónsson (Intern)
Supervisor:
Simonsen, Knud (Ekstern)
Visser, Andre (Intern)
Main Supervisor:
Andersen, Ken Haste (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Smart Maritime: Norwegian Centre for improved energy efficiency and reduced harmful emissions
Department of Transport
Transport optimisation and technique
Department of Management Engineering
Management Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 1
Acronym: Smart Maritime
Project participant:
Psaraftis, Harilaos N. (Intern)

The catalysis of the selective electrochemical oxidation of hydrocarbons
Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 3
Phd Student:
Winiwarter, Anna (Intern)
Supervisor:
Seger, Brian (Intern)
Main Supervisor:
Chorkendorff, Ib (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Ultrafast electronic and coupled electronic-nuclear dynamics of solvated metal complexes
Department of Physics
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student:
Zederkof, Diana Bregenholt (Intern)
Supervisor:
Nielsen, Martin Meedom (Intern)
Thygesen, Kristian Sommer (Intern)
Main Supervisor:
Haldrup, Kristoffer (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Ultra-long term subcutaneous EEG monitoring of brain function and disease

Department of Applied Mathematics and Computer Science
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Gangstad, Sirin Wilhelmsen (Intern)
Supervisor: Duun-Henriksen, Jonas (Intern)
Kjaer, Troels Wesenberg (Ekstern)
Main Supervisor: Hansen, Lars Kai (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

X-ray phase contrast nano-tomography of 3rd generation solar cells

Department of Energy Conversion and Storage
Period: 01/09/2016 → 31/08/2019
Number of participants: 4
Phd Student: Fevola, Giovanni (Intern)
Supervisor: Carbone, Gerardina (Ekstern)
Dong, Yiqiu (Intern)
Main Supervisor: Andreasen, Jens Wenzel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Human Behavior of Track Pilot
Master Thesis Project

Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Dynamical Systems
FORCE Technology
Period: 29/08/2016 → 29/01/2017
Number of participants: 2
Time Series Analysis, Navigation, PID controller
Supervisor: Poulsen, Niels Kjølstad (Intern)
Main Supervisor: Stockmarr, Anders (Intern)

Multivariate Time Series Modelling of Australian Data on Deaths from Homicide and Suicides

Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Period: 22/08/2016 → 01/01/2017
Number of participants: 2
Time Series Analysis, Multivariate, MARIMA, Australia
Supervisor:
Electrodeposition of Metallic 3D Surface-Profiles for Superconductor Tapes

Master thesis project by Suzanne Zamany Andersen. Thesis abstract: The work in this thesis is based on a recently introduced 3D surface-prole technique, i.e. the two-level undercut-prole substrate (2LUPS) concept [1]-[2], used for production of multi-lamentary high-temperature coated conductor (CC) tapes. Reducing the superconductor lament width linearly reduces the alternating current hysteretic energy losses [3], and it enables manufacturing of stable high-temperature superconducting magnets [4]. A new process of tape masking and Ni-based electroplating on a Ni-W metal alloy substrate to form similar 3D surfaceproles as those achieved by the 2LUPS concept [5], which is based on two levels of plateaus connected via an undercut-prole, is investigated. The undercut-prole should be large enough to enable a shading eect during subsequent physical vapor deposition (PVD) of layers, thereby creating self-formed and physically separated superconductor laments on the two plateaus, while still utilizing the full width of the CC. This will theoretically increase the engineering current density compared to current lament techniques utilizing e.g. laser striation or mechanical scribing. Inspection of the metal substrate cross-section using focused ion beam milling and scanning electron microscopy (FIB-SEM) reveals that an undercut-prole is achieved by using kapton tape as a mask while electroplating nickel to create the upper plateaus. The arithmetic surface roughness of the electroplated nickel layer is determined via atomic force microscopy (AFM) to be suitable for CC fabrication. To verify if the undercut-prole is sucient, an electrically insulating layer of SiO, simulating the buer layers in CCs, followed by an electrically conductive layer of Ag, simulating the superconducting layer, is deposited using PVD, and four-point probe measurements to create I/V characteristics are used to measure resistance across plateaus. The plateaus are deemed electrically insulated from each other, as the resistances from each insulating layer adds up to the total resistance through both plateaus. Accordingly, it is expected that these new electroplated 3D surface-proles will also enable lamentization of superconductors produced by PVD processes. A small caveat to these ndings, is the lack of a suitable prole for the use in CC fabrication being manufactured in this project. The adhesive in the masking tape creates bulges or protrusions in the prole, so a further study on thinner adhesive layers or a dierent masking material altogether is needed. The possibility of texture transfer from the Ni-W metal substrates to the plated Ni layer is also investigated, for the use in the cheaper rolling assisted bi-axially textured substrate (RABiTS) fabrication process. The electrodeposited Ni would during annealing at low temperatures experience an abnormal grain growth stage, thereby rendering it incapable of attaining the texture needed for RABiTS fabrication. Furthermore, the thermal grooving during annealing of the pure Ni could also become a problem for the ion beam assisted deposition (IBAD) process, as a surface roughness of <5nm is desired. The author of this thesis therefore strongly recommends investigating the possibility of plating e.g. Ni-W instead.

Department of Energy Conversion and Storage
Electrofunctional materials
Department of Physics
Experimental Surface and Nanomaterials Physics
Imaging and Structural Analysis
Period: 22/08/2016 → 12/02/2017
Number of participants: 5
Electrochemistry, electroplating, metal substrates, Coated conductor, Superconductor, topography, EBSD, FIB-SEM, texture
Project participant:
Andersen, Suzanne Zamany (Intern)
Supervisor:
Jørgensen, Peter Stanley (Intern)
Nielsen, Pernille Hedemark (Intern)
Main Supervisor:
Wulff, Anders Christian (Intern)
Examiner:
Bentien, Anders (Ekstern)
Project
A Decision Support Tool for Screening Novel WWT Processes

Department of Chemical and Biochemical Engineering
Period: 15/08/2016 → 14/08/2019
Number of participants: 3
PhD Student:
Behera, Chitta Ranjan (Ekstern)
Supervisor:
Gernaey, Krist V. (Intern)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Advanced structuring of adsorbents by electrospinning for gas cleaning and storage

Department of Energy Conversion and Storage
Period: 15/08/2016 → 15/08/2017
Number of participants: 4
PhD Student:
Vinkel, Nadja Maria (Intern)
Supervisor:
Akhtar, Farid (Ekstern)
Zhang, Wenjing (Angela) (Intern)
Main Supervisor:
Kaiser, Andreas (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
Eastern Baltic cod - New knowledge of growth and mortality is the way to improved management advice (39366)
The aim of the project is to improve the knowledge and data basis for stock assessment and management for cod in the eastern Baltic Sea.

In later years, changes in growth and natural mortality of cod have presumably taken place and new knowledge on these parameters is essential for restoring analytical stock assessment for Eastern Baltic cod that is currently lacking. Improved knowledge on cod growth and mortality is therefore a prerequisite for being able to evaluate the stock status in relation to management targets and implement management plans that are built on quantitative stock assessment.

Ecological situation in the Baltic Sea has changed in later years, which requires updated biological information. This is done in the project using different approaches, bringing together expertise of different research areas. The approaches applied include molecular-genetic analyses of cod growth, bioenergetic modelling, and analyses of monitoring data on predation and condition/growth of cod. An important component of the project is cooperation with fishing industry to support tagging experiments of Baltic cod, to obtain updated estimates of cod growth.

Finally, the project combines the new knowledge on cod that becomes available from this and other relevant projects to ensure that the assessment of stocks status and management advice is based on best available scientific information.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management

Danish Fishermen's Association

University of Copenhagen
Period: 15/08/2016 → 15/08/2018
Number of participants: 8
Research areas: Ecosystem based Marine Management & Fish Biology & Marine Populations and Ecosystem Dynamics & Population Genetics & Marine Living Resources & Fisheries Management

Project participant:
Storr-Paulsen, Marie (Intern)
Tomkiewicz, Jonna (Intern)
Hansen, Jakob Hemmer (Intern)
Neuenfeldt, Stefan (Intern)
Christensen, Asbjørn (Intern)
Kindt-Larsen, Lotte (Intern)
Berg, Casper Willestofte (Intern)

Project Coordinator:
Eero, Margit (Intern)
Fiber-coupled scintillator dosimetry for proton therapy

Department of Physics
Period: 15/08/2016 → 14/08/2019
Number of participants: 3
Phd Student:
Christensen, Jeppe Brage (Intern)
Supervisor:
Grau, Cai (Ekstern)
Main Supervisor:
Andersen, Claus E. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Investigations of hatchery techniques and cultivation systems for cost-effective production of valuable seaweeds

National Institute of Aquatic Resources
Period: 15/08/2016 → 14/08/2019
Number of participants: 4
Phd Student:
Schmedes, Peter Søndergaard (Intern)
Supervisor:
Nielsen, Mette Møller (Intern)
Canal-Vergés, Paula (Intern)
Main Supervisor:
Petersen, Jens Kjerulf (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Long-range interfacial electron transfer between electrode and microorganisms

Department of Chemistry
Period: 15/08/2016 → 14/08/2019
Number of participants: 3
Phd Student:
Zheng, Zhiyong (Intern)
Supervisor:
Christensen, Hans Erik Mølager (Intern)
Main Supervisor:
Zhang, Jingdong (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Modelling macroeconomic effects of energy saving investments

Department of Management Engineering
Period: 15/08/2016 → 14/08/2019
Number of participants: 3
Phd Student:
Bjerregaard, Casper (Intern)
Supervisor:
Møller, Niels Framroze (Intern)
Main Supervisor:
Klinge Jacobsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Assessment of a biochemical platform based on two streams model (C6 and C5) for conversion of rice straw into ethanol
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology
Department of Biotechnology, Engineering School of Lorena, University of São Paulo
Period: 01/08/2016 → …
Number of participants: 1
Number of related Ph.D. students: 2
Project participant:
Mussatto, Solange I. (Intern)

NordSecMob Master's Programme in Security and Mobile Computing - 2 continuation
Department of Applied Mathematics and Computer Science
Embedded Systems Engineering
Aalto University
KTH - Royal Institute of Technology
Norwegian University of Science and Technology
University of Tartu
Period: 01/08/2016 → 31/07/2018
Number of participants: 1
Acronym: NordSecMob
Project participant:
Stassen, Flemming (Intern)

Comparison of ADDs used in VetStat with primary data on usage doses obtained at visits in 20 Danish pig herds
Master project
National Food Institute
Research Group for Genomic Epidemiology
Period: 01/08/2016 → 06/01/2017
Number of participants: 1
antimicrobial usage, VetStat, Epidemiology, pigs
Main Supervisor:
Hald, Tine (Intern)

Proof of Concept development project for "New low-cost diabetes measuring device".
Department of Chemistry
NanoChemistry
Organic Chemistry
SMAP Soil Moisture Data To Improve Remotely Sensed Global Estimates of Evapotranspiration

Evapotranspiration is a key variable in the hydrological cycle, however it cannot be measured directly using remote sensing data. This project aims to integrate SMAP NASA soil moisture products directly into global remote sensing evapotranspiration algorithms to improve modeling and assess regional droughts.

Department of Environmental Engineering

Parker project

The Parker project seeks to validate that series produced electric vehicles, as part of an operational vehicle fleet, can be made to participate in advanced, vertically integrated, smart grid services.

Department of Electrical Engineering

Energy resources, services and control

NUVVE Corporation

Insero Energy

Frederiksborg Utility

STROBE-X: X-ray Timing and Spectroscopy Mission

STROBE-X is a NASA probe-class observatory designed for X-ray timing and spectroscopy in the 0.2-30 keV band, with huge collecting area and good spectral resolution. It is optimized for the study of matter in the most extreme conditions found in the Universe and addresses several key science areas including:

- Probing matter spiraling into black holes (BHs) to explore the effects of strong-field general relativity and measure the masses and spins of BHs.
- X-ray reverberation mapping of BH accretion flows across all mass scales, from stellar-mass BHs in our Galaxy to supermassive BHs in active galactic nuclei.
- Fully determining the ultradense matter equation of state by measuring the neutron star (NS) mass-radius relation using > 20 pulsars over an extended mass range.
Exploring cosmic chemical evolution by measuring bulk metallicity of ~100 high-redshift (z > 2) galaxy clusters. Continuously surveying the dynamic X-ray sky with large duty cycle and high spectral and time resolution to characterize source behavior over a vast range of time scales, and to enable multi-wavelength and multi-messenger studies through cross-correlation with high cadence surveys at other wavelengths and in gravitational waves and neutrinos.

National Space Institute
Astrophysics and Atmospheric Physics
Naval Research Laboratory
NASA Marshall Space Flight Center
NASA Goddard Space Flight Center
Massachusetts Institute of Technology
Texas Technical University
The Institute of Space Studies of Catalonia
Istituto di Astrofisica e Planetologia Spaziali Via Fosso del Cavaliere
MSSL
SRON
IAA-Tuebingen
University of Geneva
Period: 01/08/2016 → ...
Number of participants: 1
Acronym: STROBE-X
Project participant:
Brandt, Søren (Intern)

Aided performance of hearing-aid users in realistic listening situations

Department of Electrical Engineering
Period: 01/08/2016 → 31/03/2017
Number of participants: 4
Phd Student:
Pedersen, Anja Kofoed (Intern)
Supervisor:
Bianchi, Federica (Intern)
Santurette, Sébastien (Intern)
Main Supervisor:
Dau, Torsten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

B-cell immunoinformatics

Department of Bio and Health Informatics
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Jespersen, Martin Closter (Intern)
Supervisor:
Marcatili, Paolo (Intern)
Main Supervisor:
Nielsen, Morten (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Characterization of protein solution structure using light scattering techniques and SAXS
Department of Chemistry
Period: 01/08/2016 → 31/12/2016
Number of participants: 4
Phd Student:
Mann-Nüttel, Ritu (Intern)
Supervisor:
Nørgaard, Allan (Intern)
Peters, Günther H.J. (Intern)
Main Supervisor:
Harris, Pernille (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret
Project: PhD

Computational design of catalysts for electroreduction of nitrogen into ammonia
Department of Energy Conversion and Storage
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Pan, Jaysree (Intern)
Supervisor:
Hansen, Heine Anton (Intern)
Main Supervisor:
Vegge, Tejs (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Density Functional Theory Studies of Water Electrolysis on Ceria
Department of Energy Conversion and Storage
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Wu, Tiantian (Intern)
Supervisor:
Hansen, Heine Anton (Intern)
Main Supervisor:
Vegge, Tejs (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Detailed Characterization of weak and strong protein-protein interactions and their structures in concentrated solutions
Department of Chemistry
Period: 01/08/2016 → 31/07/2019
Number of participants: 4
Phd Student:
Mahapatra, Sujata (Ekstern)
Supervisor:
Peters, Günther H.J. (Intern)
Streicher, Werner W. (Ekstern)
Main Supervisor:
Harris, Pernille (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret
Project: PhD

Development of Immunoinformatics prediction methods for improved understanding of TCR-peptide-MHC interactions
Department of Bio and Health Informatics
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Jensen, Kamilla Kjærgaard (Intern)
Supervisor:
Marcatili, Paolo (Intern)
Main Supervisor:
Nielsen, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Economic Incentives and policy design for energy savings
Department of Management Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Wiese, Catharina (Intern)
Supervisor:
Klinge Jacobsen, Henrik (Intern)
Main Supervisor:
Pade, Lise-Lotte (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Experimental and Numerical studies of water flow in choanocytes and choanoflagellates
Department of Mechanical Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Asadzadeh, Seyed Saeed (Ekstern)
Supervisor:
Meyer, Knud Erik (Intern)
Main Supervisor:
Walther, Jens Honore (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Experimental and Numerical studies of water flow in choanocytes and choanoflagellates

Department of Mechanical Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student: Asadzadeh, Seyed Saeed (Intern)
Supervisor: Meyer, Knud Erik (Intern)
Main Supervisor: Walther, Jens Honore (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

From science to innovation in the Nephrops fishery to comply with the Common Fisheries Policy: development of an optimal and flexible selection system for trawl by use of new technology and underutilized fish behaviour (39375)

The aim of the VISION-project is to develop a new generation of trawl designs towards a targeted and controllable species and size selection in the mixed fisheries targeting Nephrops by improving vertical separation of the catch and gear selectivity. This will contribute to an economic viable fishery and sustainable use of resources under a landing obligation.

The mixed fisheries targeting Nephrops is one of the most economically important Danish fisheries. It is characterized by high proportions of discards and will have a low capitalization of the vessels' quotas under a landing obligation.

In the VISION-project, a horizontally divided codend developed in the FishValue-project (vaerdifisk.dk) will be refined to increase the vertical separation of cod, flatfish and small fish in general from Nephrops. The project will combine new technology and knowledge of fish behavior in an innovative way to develop new selection principles and thus gear designs with an increased species and size selectivity. Also, the project seeks to provide solutions for a highly flexible fishery so fishermen can change their gear to match the selective properties with the current fishing situation.

This project is coordinated by DTU Aqua.
National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Euronete Scandinavia A/S
Strandby Net A/S
Danish Fishermen's Association
Period: 01/08/2016 → 08/08/2018
Number of participants: 4
Project participant: Andersen, Niels Gerner (Intern)
Krag, Ludvig Ahm (Intern)
Melli, Valentina (Intern)
Project Coordinator: Karlsen, Junita Diana (Intern)
Project

Generation of Macroscopic Squeezed States for Quantum Sensing

Department of Physics
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student: Pedersen, Mikkel Maag (Intern)
Supervisor: Gehring, Tobias (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Graph Coloring and Decomposition**
Department of Applied Mathematics and Computer Science
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Lyngsie, Kasper Szabo (Intern)
Supervisor:
Gørtz, Inge Li (Intern)
Main Supervisor:
Thomassen, Carsten (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Integration of bycatch in mixed-fisheries management**
National Institute of Aquatic Resources
Period: 01/08/2016 → 16/10/2019
Number of participants: 4
Phd Student:
Schreiber Plet-Hansen, Kristian (Intern)
Supervisor:
Mortensen, Lars O. (Intern)
Nielsen, J. Rasmus (Intern)
Main Supervisor:
Ulrich, Clara (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

**On-Chip quantum communication**
Department of Physics
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Kordts, Arne (Ekstern)
Supervisor:
Gehring, Tobias (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD
On-Chip quantum communication
Department of Physics
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Kordts, Arne (Intern)
Supervisor:
Gehring, Tobias (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Optimized recycling in an integrated melting furnace for production of stone wool melt
Department of Chemical and Biochemical Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 5
Phd Student:
Jensen, Vickie Falk (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Hansen, Lars Elmekilde (Ekstern)
Solvang, Mette (Ekstern)
Main Supervisor:
Jensen, Peter Arendt (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Process technologies for functional anisotropic surfaces generation in Quick Response Code applications
Department of Mechanical Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Regi, Francesco (Intern)
Supervisor:
Tosello, Guido (Intern)
Main Supervisor:
Zhang, Yang (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Radical improvements in sustainable building renovation based on new forms of collaboration and business models
Department of Management Engineering
Period: 01/08/2016 → 31/07/2019
Number of participants: 3
Phd Student:
Berg, Jakob Brinke (Intern)
Supervisor:
Thuesen, Christian (Intern)
Resource efficiency in practice: from sugar beet waste to fish feed ingredient (Starfish) (39368)
Sugar beet is a commonly cultivated crop in Denmark and the waste pulp is primarily sold as cow feed. The pulp, however, contains a potential prebiotic compound (pectin) that, if added to fish feed at low concentrations is hypothesized to:
1) improve the feed utilisation by the fish allowing more fish to be produced per amount of feed applied
2) stabilize the structure of the faecal waste so that it may be easier collected and removed reducing the discharge of nitrogen- and phosphorous
3) improve the overall immunological system/health status of the fish whereby the use of medicine and therapeutics may be reduced.

The objective of the project is to test these potential, beneficial effects of pectin in rainbow trout (Oncorhynchus mykiss) and tilapia (Oreochromis niloticus) by adding different molecular sizes and concentrations to the feed and measuring the effects on feed utilisation, faecal structure and fish health.

The project is coordinated by DTU Aqua.
The project is funded by Ministry of Environment and Food of Denmark through the Green Development and Demonstration Program (GUDP).

National Institute of Aquatic Resources
Section for Aquaculture
CP Kelco ApS
BioMar A/S
Period: 01/08/2016 → 31/07/2019
Number of participants: 4
Research area: Aquaculture
Project participant:
Larsen, Bodil Katrine (Intern)
Skov, Peter Vilhelm (Intern)
Phd Student:
de Jesus Gregersen, Joao (Intern)
Project Coordinator:
Dalsgaard, Anne Johanne Tang (Intern)

Structural Biology
Department of Chemistry
Period: 01/08/2016 → 31/07/2019
Number of participants: 4
Phd Student:
Indrakumar, Sowmya (Intern)
Supervisor:
Harris, Pernille (Intern)
Streicher, Werner W. (Ekstern)
Main Supervisor:
Peters, Günther H.J. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD
**Systematic enzyme discovery, targeted to fungal and algal biomass**

Department of Chemical and Biochemical Engineering  
**Period:** 01/08/2016 → 30/07/2020  
**Number of participants:** 4  
**Phd Student:** Pilgaard, Bo (Intern)  
**Supervisor:** Busk, Peter Kamp (Intern)  
**Meyer, Anne S. (Intern)**  
**Main Supervisor:** Lange, Lene (Intern)  

**Financing sources**  
**Source:** Internal funding (public)  
**Name of research programme:** Samfinansieret - Andet  
**Project:** PhD

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**The frame set for Gabor systems generated by B-splines**

Department of Applied Mathematics and Computer Science  
**Period:** 01/08/2016 → 31/07/2019  
**Number of participants:** 3  
**Phd Student:** Nielsen, Kamilla Haahr (Intern)  
**Supervisor:** Christensen, Ole (Intern)  
**Main Supervisor:** Lemvig, Jakob (Intern)  

**Financing sources**  
**Source:** Internal funding (public)  
**Name of research programme:** Institut stipendie (DTU)  
**Project:** PhD

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**Zero Emission Neighbourhoods in Smart Cities**

Department of Applied Mathematics and Computer Science  
**Period:** 01/08/2016 → 30/07/2020  
**Number of participants:** 3  
**Phd Student:** Resch, Eirik (Ekstern)  
**Supervisor:** Andresen, Inger (Ekstern)  
**Main Supervisor:** Madsen, Henrik (Ekstern)

**Financing sources**  
**Source:** Internal funding (public)  
**Name of research programme:** Ansat eksternt  
**Project:** PhD

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**Research stay with Dr. Mary Gilbert, Perfluorinated Chemicals and Brain Development: Interaction with the Thyroid Axis**

Research stay with Dr. Mary Gilbert at the Toxicity Assessment Division, US Environmental Protection Agency, NC, U.S. The research stay is a central part of my PhD studies and the expertise of Dr. Mary Gilbert within neurobiology is key to the project by complementing my neurobehavioural studies. The research stay was, amongst others, supported by Society for Endocrinology.

National Food Institute  
**Research Group for Reproductive Toxicology**  
**Period:** 19/07/2016 → 19/07/2017  
**Number of participants:** 1
Identification of virulence markers in two Novirhabdoviruses causing serious diseases in fish

National Veterinary Institute
Period: 15/07/2016 → 14/07/2019
Number of participants: 4
Phd Student:
Alencar, Anna Luiza Farias (Intern)
Supervisor:
Bremont, Michel (Ekstern)
Rasmussen, Thomas Bruun (Intern)
Main Supervisor:
Olesen, Niels Jørgen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

SDE-modelling in CITIES

Department of Applied Mathematics and Computer Science
Centre for IT-Intelligent Energy Systems in Cities
Period: 15/07/2016 → 13/11/2019
Number of participants: 4
Phd Student:
Junker, Rune Grønborg (Intern)
Supervisor:
Jørgensen, John Bagterp (Intern)
Thygesen, Uffe Høgsbro (Intern)
Main Supervisor:
Madsen, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Clinical auditory profiling and hearing-aid fitting strategies

In audiological clinics, the choice of a hearing aid and the adjustment of its amplification and processing parameters are today mostly based on the audiogram, a measure of pure-tone hearing sensitivity at different frequencies. While adjusting the gain of a hearing aid based on the loss of sensitivity reflected by the audiogram can be successful in restoring audibility of soft sounds and improving speech intelligibility in quiet situations, it is well established that hearing-impaired listeners still experience difficulty with understanding speech in more complex listening situations that are typical of everyday life, such as noisy and reverberant environments (Moore, 2007). Despite amplification from the hearing aid, sounds are thus still perceived as distorted, and this “distortion loss” (Plomp, 1978) is still a challenge to compensate for in practice.

The idea of the present project is to improve the hearing-aid fitting process and suggest parameter adjustment rationales based on a more complete evaluation of each patient’s hearing profile that reflects distortion loss as well. It is
hypothesized that hearing-aid benefit can be improved by directly relating outcomes from such an extended clinical hearing profile to the choice of hearing-aid fitting.

Department of Electrical Engineering

Hearing Systems
Period: 01/07/2016 → 01/07/2019
Number of participants: 1
Audiology, hearing aid, hearing science
Number of related Ph.D. students: 1
Project participant:
Sanchez Lopez, Raul (Intern)

Nationwide accurate wind prospecting models for Denmark & Turkey
To develop a new wind modelling concept and apply it nationwide to Denmark and Turkey. These nationwide models are proofs-of-concept and allow prediction of accurate long-term wind climate series and associated uncertainties any place in Denmark or Turkey. The model concept integrates three existing model components in a novel setup including large amounts of observational data; production data from >4000 wind turbines in Denmark and wind measurements from hundreds of masts in Turkey.

Department of Wind Energy

Resource Assessment Modelling

EMD International A/S

Üstün Energy Engineering LLC
Period: 01/07/2016 → 01/06/2018
Number of participants: 1
Windprosper, wind resources, Wind turbine, CFD
Acronym: Windprosper
Project participant:
Bechmann, Andreas (Intern)

Relations
Activities:
DTU Wind Energy Department: Danish/Turkish Collaboration and Funds

Development of sectorial drought indices in the Iberian Peninsula: improving monitoring and early warning of droughts in Spain (in Spanish)

Department of Environmental Engineering

Water Resources Engineering
Period: 01/07/2016 → 01/07/2018
Number of participants: 2
Project participant:
Garcia, Monica (Intern)
Vicente-Serrano, Sergio (Ekstern)

Arktisk vandforsyning II

Department of Civil Engineering

ARTEK, Section for Arctic Engineering and Sustainable Solutions
Period: 01/07/2016 → …
Number of participants: 1
Project Manager, academic:
Hendriksen, Kåre (Intern)
Cost-effective and flexible 3D printed SOFC stacks for commercial applications

A Solid Oxide Fuel Cell (SOFC) is a ceramic-based multilayer device that involves expensive and time-consuming multi-step manufacturing processes including tape casting, screen printing, firing, shaping and several high-temperature thermal treatments. In addition, these cells are manually assembled into stacks resulting in extra steps for joining and sealing that difficult the standardization and quality control of the final product while introducing weak parts likely to fail. Since current ceramics processing presents strong limitations in shape and extremely complex design for manufacturing (more than 100 steps), industrially fabricated SOFC cells and stacks are expensive and present low flexibility and long time to market. This is particularly relevant for the commercial segment of the stationary fuel cells market (5-400kW) that is highly heterogeneous in terms of the overall power and heat requirements and requires customization of the final product. The main goal of the Cell3Ditor project is to develop a 3D printing technology for the industrial production of SOFC stacks by covering research and innovation in all the stages of the industrial value chain (inks formulation, 3D printer development, ceramics consolidation and system integration). All-ceramic joint-free SOFC stacks with embedded fluidics and current collection will be fabricated in a two-step process (single-step printing and sintering) to reduce in energy, materials and assembly costs while simplifying the design for manufacturing and time to market. Compared to traditional ceramic processing, the Cell3Ditor manufacturing process presents a significantly shorter time to market (from years to months) and a cost reduction estimated in 63% with an initial investment below one third of an equivalent conventional manufacturing plant (production of 1000 units per year). The project is product-driven and involves SMEs (with proved technologies) in the entire value chain to ensure reaching TRL>6.

Department of Energy Conversion and Storage

Ceramic Engineering & Science
Period: 01/07/2016 → 31/12/2019
Number of participants: 2
Acronym: Cell3Ditor
Project participant:
Esposito, Vincenzo (Intern)
Rosa, Massimo (Intern)

Micro scale metal plasticity: fundamentals and applications
H.C. Ørsted Postdoctoral Fellowships. People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme (FP7/2007-2013) under REA grant agreement nº 609405 (COFUNDPost-docDTU)

Department of Mechanical Engineering

Solid Mechanics
Period: 01/07/2016 → 30/06/2018
Number of participants: 1
Acronym: MICROMETAL
Project ID: 76931
Project participant:
Martínez Pañeda, Emilio (Intern)

Remotely Adjustable Structural Plasmonic Colour
Department of Micro- and Nanotechnology

Optofluidics
Center for Nanostructured Graphene
Department of Photonics Engineering

Structured Electromagnetic Materials
Period: 01/07/2016 → 30/06/2018
Number of participants: 3
Acronym: Smart Colour
Project participant:
Keshavarz Hedayati, Mehdi (Intern)
Kristensen, Anders (Intern)
Mortensen, N. Asger (Intern)
CLAIRcity
Air pollution and citizen engagement
Department of Management Engineering
Systems Analysis
DTU Climate Centre
Period: 01/07/2016 → 31/08/2017
Number of participants: 1
Project participant:
Anderson, Tessa Kate (Intern)

Accelerated Probabilistic Response Modelling and Analysis
Department of Management Engineering
Period: 01/07/2016 → 31/03/2017
Number of participants: 4
Phd Student:
Hundevadt, Drude Hargbøl (Intern)
Supervisor:
Sørensen, John Dalsgaard (Intern)
Thøns, Sebastian (Intern)
Main Supervisor:
Faber, Michael Havbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Beam Steering for Terahertz Signals by using Hybrid Photonic-Electronic Signals
Department of Photonics Engineering
Period: 01/07/2016 → 30/06/2017
Number of participants: 2
Phd Student:
Morales Vicente, Alvaro (Intern)
Main Supervisor:
Tafur Monroy, Idelfonso (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Clinical auditory profiling and hearing-aid fitting strategies
Department of Electrical Engineering
Period: 01/07/2016 → 30/06/2019
Number of participants: 4
Phd Student:
Sanchez Lopez, Raul (Intern)
Supervisor:
Bianchi, Federica (Intern)
Santurette, Sébastien (Intern)
Main Supervisor:
Dau, Torsten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Development and pressure testing of solid oxide electrolyser cells

Department of Energy Conversion and Storage

Period: 01/07/2016 → 30/09/2016

Number of participants: 4

Phd Student:
Gao, Ying (Intern)

Supervisor:
Graves, Christopher R. (Intern)
Hauch, Anne (Intern)
Jensen, Søren Højgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering

Development of electrochemically deposited surfaces based on copper and silver with bacterial effect

Department of Systems Biology

Period: 01/07/2016 → 30/06/2019

Number of participants: 4

Phd Student:
Ciacotich, Nicole (Ekstern)

Supervisor:
Bjarnsholt, Thomas (Intern)
Møller, Per (Intern)

Main Supervisor:
Gram, Lone (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: ErhvervsPhD-ordningen VTU

Development of electrochemically deposited surfaces based on copper and silver with bacterial effect

Department of Systems Biology

Period: 01/07/2016 → 30/06/2019

Number of participants: 4

Phd Student:
Ciacotich, Nicole (Intern)

Supervisor:
Bjarnsholt, Thomas (Intern)
Møller, Per (Intern)

Main Supervisor:
Gram, Lone (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD

Effect of room acoustics and head movements on aided and unaided sound-field auditory steady state response (ASSR) measurements

Department of Electrical Engineering
Period: 01/07/2016 → 30/06/2019
Number of participants: 5
Phd Student: Zapata Rodriguez, Valentina (Intern)
Supervisor: Brunskog, Jonas (Intern)
Harte, James (Intern)
Laugesen, Søren (Intern)
Main Supervisor: Jeong, Cheol-Ho (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Evaluation of Sustainable Exploitation of Major Baltic Fish Stocks under different Climate, Eutrophication and Fishing Pressures
National Institute of Aquatic Resources
Period: 01/07/2016 → 30/06/2019
Number of participants: 5
Phd Student: Bossier, Sieme (Intern)
Supervisor: Bastardie, Francois (Intern)
Christensen, Asbjørn (Intern)
Neuenfeldt, Stefan (Intern)
Main Supervisor: Nielsen, J. Rasmus (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

k.p Theory of Two-Dimensional Materials
Department of Photonics Engineering
Period: 01/07/2016 → 29/11/2019
Number of participants: 3
Phd Student: Jensen, Mathias Rosdahl (Intern)
Supervisor: Mørk, Jesper (Intern)
Main Supervisor: Willatzen, Morten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Machine Learning as a Service
Department of Applied Mathematics and Computer Science
Period: 01/07/2016 → 30/06/2019
Number of participants: 3
Phd Student: Zdyb, Franciszek Olaf (Intern)
Supervisor:
Omics-guided Discovery and Characterization of Enzymes Involved in Utilisation of Xyloglucans, Mannans and Mannooligosaccharides by probiotics and co commensal bacteria

Department of Systems Biology
Period: 01/07/2016 → 30/06/2019
Number of participants: 5
Phd Student:
Bendsen, Sidsel Krogh (Ekstern)
Supervisor:
Abou Hachem, Maher (Intern)
Hägglund, Per (Intern)
Wu, Lin (Ekstern)
Main Supervisor:
Svensson, Birte (Intern)

Optimized real-time management of interacting water systems for a smarter city

Department of Environmental Engineering
Period: 01/07/2016 → 30/06/2019
Number of participants: 5
Phd Student:
Lund, Nadia Schou Vorndran (Intern)
Supervisor:
Borup, Morten (Intern)
Helwigh, Ole Mark (Ekstern)
Madsen, Henrik (Intern)
Main Supervisor:
Mikkelsen, Peter Steen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Prediction Methods for the Environmental Fate of Organic Chemicals
Department of Environmental Engineering
Period: 01/07/2016 → 31/12/2018
Number of participants: 4
Phd Student: Brock, Andreas Libonati (Intern)
Supervisor: Kästner, Matthias (Ekstern)
Rein, Arno (Ekstern)
Main Supervisor: Trapp, Stefan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Theory of superradiance and quantum noise in few-emitter lasers
Department of Photonics Engineering
Period: 01/07/2016 → 30/06/2019
Number of participants: 3
Phd Student: André, Emil Cortes (Intern)
Supervisor: Mørk, Jesper (Intern)
Main Supervisor: Wubs, Martijn (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Combined flue gas cleaning for small scale wood combustion appliances
Department of Chemical and Biochemical Engineering
CHEC Research Centre
PHX innovation ApS
Period: 20/06/2016 → 19/06/2018
Number of participants: 2
Project participant: Azizaddini, Seyednezamaddin (Intern)
Project Coordinator: Illerup, Jytte Boll (Intern)
Project

GN4-2 JRA1 Task 2: SDN/NFV capabilities in GEANT
Department of Photonics Engineering
Networks Technology and Service Platforms
Period: 16/06/2016 → 15/02/2019
Number of participants: 1
Project participant:
Soler, José (Intern)

**Determination of wind load on high-rise buildings by applying Computational Fluid Dynamics**

Department of Civil Engineering
Period: 15/06/2016 → 20/03/2020
Number of participants: 4
Phd Student:
Skytte Thordal, Marie (Intern)
Supervisor:
Bennetsen, Jens Christian (Intern)
Gudmand-Høyer, Tim (Intern)
Main Supervisor:
Koss, Holger (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

**Mixture Effects in Biodegradation Testing of Aromatic and Aliphatic Hydrocarbons**

Department of Environmental Engineering
Period: 15/06/2016 → 14/06/2019
Number of participants: 4
Phd Student:
Hammershøj, Rikke Høst (Intern)
Supervisor:
Andersen, Henrik Rasmus (Intern)
Birch, Heidi (Intern)
Main Supervisor:
Mayer, Philipp (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Survival of Listeria monocytogenes in the food processing environment: Mechanisms and mitigation strategies**

National Food Institute
Period: 15/06/2016 → 19/07/2019
Number of participants: 3
Phd Student:
Kragh, Martin Laage (Intern)
Supervisor:
Forslund, Anita (Intern)
Main Supervisor:
Hansen, Lisbeth Truelstrup (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
System-level simulation and automation of microscale acoustofluidics for biotechnology

Department of Physics
Period: 15/06/2016 → 14/06/2019
Number of participants: 4
Phd Student:
Skov, Nils Refstrup (Intern)
Supervisor:
Stokke, Bjørn Torger (Ekstern)
Wiklund, Martin (Ekstern)
Main Supervisor:
Bruus, Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Food Modelling
National Food Institute
Research Group for Food Production Engineering

Company
Period: 01/06/2016 → 31/05/2017
Number of participants: 2
Project participant:
Feyissa, Aberham Hailu (Intern)
Rabeler, Felix (Intern)

Characterizing Porous Tool Materials for Impulse Drying Technology
Department of Applied Mathematics and Computer Science
Department of Mechanical Engineering
Manufacturing Engineering
Period: 01/06/2016 → 01/07/2017
Number of participants: 1
Project participant:
Stolfi, Alessandro (Intern)

Improving bio-utilisation of marine algae as sustainable feed ingredients to increase efficiency and quality of aquaculture production

Global population growth and increase in living standards will push up the demand for fish-derived protein in the future. However, resource scarcity (feed, water and energy), environmental impacts, and changes in climate and growing conditions can seriously hamper aquaculture that supplies a significant proportion of human food. New sustainable protein and lipid sources and improved technologies to increase bio-availability of existing sources will be needed to ensure adequate supply of aquafeeds to ensure growth of aquaculture. On the other hand, the growth of the industry has caused environmental concerns. Interestingly, aquaculture effluents can be an excellent medium for algal growth, although they are not usually reused since they contain residual organic compounds, minerals and other micro-pollutants.

MARINALGAE4aqua is an innovative research project that targets the development of strategies to increase efficiency of important European farmed fish species (Atlantic salmon and European sea bass) and reduce the environmental impact using micro- & macro-algal biomass as feed ingredients by: I. Culturing marine algae under optimized technological processes to remove organic compounds and minerals from fish farm effluents, and producing high value products for aquafeeds while recycling nutrients; thus improving the water body quality and reducing the environmental impact. II. Identifying novel feed additives to improve fish digestive capacity and nutrient metabolism upon using the selected algae. III. Improving fish growth and end product quality, reducing time to slaughter and providing a safe and healthy food item with wide consumer acceptance. MARINALGAE4aqua aims to tackle the sustainability challenges of the aquafeed industry by developing cost-effective and resource-efficient alternatives to FM and FO by providing: a) efficient new processes to valorise selected marine algae that could reduce EU imports of protein and lipid sources and minimize over-exploitation of wild fish stocks, loss of biodiversity and environmental burden and b) high sensory quality, acceptable fish
products that meet food safety standards and dietary needs for a healthy life. MARINALGAE4aqua will exploit cost-efficient and environmentally sustainable production and processing technologies to produce algal biomass suitable for inclusion in aquafeeds. MARINALGAE4aqua is innovative and cutting edge - it adopts a multidisciplinary approach, integrating molecular (genomics, proteomics) and traditional tools to address physiological, nutritional and environmental challenges in modern aquaculture – providing state-of-the-art knowledge to identify strategies to increase efficiency of farming important European fish species.

National Food Institute

Research Group for Food Production Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 1
Acronym: MARINEALGAE4Aqua
Project participant: Jessen, Flemming (Intern)

Additive manufacturing, a technology used to manufacture parts layer-by-layer from a 3D digital model, offers an effective solution. Indeed, the key advantage of this technology, in the medical sector, is to produce on demand (without the need of a large inventory of different sizes or sterile storage) customised medical devices for specialities such as orthopaedic, spinal, cranial, maxillo-facial, and dental surgery, and to provide grafts that promote bone growth which match the patient’s anatomy. The overall objective of this project is to provide a comprehensive basis to enable the safe and cost efficient use of additive manufacturing (AM) products within the medical sector. Therefore, within this project AM off-the-shelf medical devices as well as patient specific guides (PSG) and patient specific implants (PSI) manufactured from patient X-ray Computed Tomography (XCT) image data sets or computer aided design (CAD) will be qualified. This will guarantee their reliability to notified bodies and facilitate acceptance of this technology, which has proven clinical advantages in the medical sector.

Department of Mechanical Engineering

Manufacturing Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 2
Acronym: MetAMMI
Project participant: Stolfi, Alessandro (Intern)
Project Manager, academic: De Chiffre, Leonardo (Intern)

Relations
Publications:
MetAMMI - Metrology for additively manufactured medical implants

Dark-field hyperlens: Superresolution imaging and label-free sensing device for biological applications
The ability to see and manipulate objects with ever decreasing size in a microscope is paramount to the ongoing development of many areas of modern science and technology, from microelectronics to biology and life sciences. The project goal is to demonstrate a technique enabling to image low-contrast nanoscale biological objects in real time without the need for scanning, fluorescent labelling, or fixation. Such a technique can have as great an impact as the invention of the optical microscope itself.

The project goal is achieved by using artificially engineered metal-dielectric nanostructures (hyperbolic metamaterials) with a unique ability to recover information contained in light waves coming from the object’s subwavelength features. This is contrary to conventional optical systems where the loss of this information limits the resolution. The central idea of the project is engineering the metamaterial so that only the subwavelength information is transmitted, while any other (background) radiation is filtered out, leading to contrast enhancement similar to the dark-field microscopy. As a result, we would combine superior image resolution (a property of hyperbolic metamaterials) and high image contrast (the result of
This will be highly desirable for label-free biological imaging scenarios, where faint, weakly scattering objects are abundant. The project aims to verify the concept through direct experimental realization.

Department of Photonics Engineering

Plasmonics and Metamaterials

DTU Danchip
Period: 01/06/2016 → 06/09/2019
Number of participants: 5
nanophotonics, Metamaterials, Hyperbolic Metamaterials, Biophotonics, imaging, microscopy
Acronym: DarkSILD
Project ID: 70943
Number of related Ph.D. students: 1
Project participant:
Novitsky, Andrey (Intern)
Takayama, Osamu (Intern)
Shkondin, Evgeniy (Intern)
Phd Student:
Repän, Taavi (Intern)
Project Manager, academic:
Lavrinenko, Andrei (Intern)

Relations
Publications:
Highly doped InP as a low loss plasmonic material for mid-IR region
Operator approach to effective medium theory to overcome a breakdown of Maxwell Garnett approximation
Dark-field hyperlens: Super-resolution imaging of weakly scattering objects
Dark-field hyperlens for high-contrast sub-wavelength imaging

A Live PV Testing Platform for Larger Adoption
Reliable solar photovoltaic (PV) generation technology has high potential to contribute significant electric energy to society. Thanks to modern power electronic technology, solar PV plants provide many opportunities to support the grid operation. However, grid operators are still reluctant to welcome more PV capacities to their grids.

The reason lies in the fact that most solar PV plants are relatively small in size compared with other RE sources, and their individual controllability is hard to be utilised by the system operators. This makes difficulties for the operators to accommodate PV plants in operation and planning.

This project aims to bridge the gap between the opportunities that solar PV can provide and the operators’ needs. An extended PV testing platform will be developed on the Campus of DTU incorporating with the facilities of PowerLab for the purpose of implementing the latest technologies and grid codes. Different control functions of PV plants will then tested. Finally the results will be verified in the real power system of Bornholm.

The project consortium is formed by DTU ELEK, DTU CAS, Bornholm Energi og Forsyning, Kenergy, EnergiMidt, and Solarconnectivity, which includes research institute, distribution system operators, PV project developers and practitioners.

Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems
Kenergy
Bornholms Energi og Forsyning
Eniig
Solarconnectivity.eu
Period: 01/06/2016 → 30/09/2018
Number of participants: 1
Solar PV integration, Reactive power control, remote monitoring, distribution system operation, SCADA
Acronym: PVTP
Project participant:
Danish-Colombian Strategic Sector Cooperation on Veterinary and Food Safety within the Colombian pig meat sector

National Veterinary Institute
Section for Public sector service and commercial diagnostics
Section for Epidemiology
Fødevarestyrelsen
Colombian Agricultural Institute
National Institute of Surveillance of Medications and Food
The Danish Embassy to Colombia
The Colombian Pig Producers Organization
Fødevarestyrelsens laboratorium
Period: 01/06/2016 → 01/02/2018
Number of participants: 4
Project participant:
Petersen, Heidi Huus (Intern)
Lauritsen, Klara Tølbøl (Intern)
Andresen, Lars Ole (Intern)
Calvo Artavia, Francisco Fernando (Intern)

Biopsy equivalent Optical Fiber multifunctional Endoscope
The BiOp-FibEnd project aims to develop a functional optical fiber for in-vivo examination of suspect tissues. The information obtained is equivalent to that of a biopsy without removing samples from the living body. The main contribution of this technique is to detect earlier, without bringing distress and discomfort to the patient, diseases such as cancer, coronary obstructions, and many others. To this purpose a hyper-lens providing super-resolved imaging in the mid-IR, mid-IR spectroscopy and optical coherence tomography (OCT) will be combined. A fiber endoscope, ready for in-vivo tests, able to observe and get spectroscopy information of living tissues will be realized.

Department of Photonics Engineering
Fiber Sensors and Supercontinuum Generation
University of Sydney
Period: 01/06/2016 → 31/05/2019
Number of participants: 1
Acronym: BiOp-FibEnd
Project participant:
Stefani, Alessio (Intern)

NordForsk topical network on Engineering, processes and real-space imaging
Department of Energy Conversion and Storage
Imaging and Structural Analysis
Period: 01/06/2016 → 31/05/2019
Number of participants: 1
Project participant:
Kuhn, Luise Theil (Intern)

3D image analysis methods for security X-ray screening
Department of Applied Mathematics and Computer Science
Period: 01/06/2016 → 31/07/2017
Number of participants: 3
Phd Student:
Kheirabadi, Mina (Intern)
Supervisor:
Olsen, Ulrik Lund (Intern)
Main Supervisor:
Dahl, Anders Bjorholm (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

3D Shape Analysis for Morphometric Evolutionary Modelling- based on 3D X-ray Tomography and Optical Scanning
Department of Applied Mathematics and Computer Science
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Messer, Dolores (Intern)
Supervisor:
Dahl, Vedrana Andersen (Intern)
Orlando, Ludovic Antoine Alexandre (Ekstern)
Main Supervisor:
Dahl, Anders Bjorholm (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Aerodynamic Stability of Long Span Bridges
Department of Mechanical Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Møller, Randi Nøhr (Ekstern)
Supervisor:
Pedersen, Claus (Ekstern)
Svendsen, Martin Nymann (Intern)
Main Supervisor:
Krenk, Steen (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Application of solar district heating systems in urban buildings
Department of Civil Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Huang, Junpeng (Intern)
Supervisor:
Furbo, Simon (Intern)
Li, Jing (Ekstern)
Main Supervisor:
Fan, Jianhua (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

**A target diagnostic imaging system for ESS**
Department of Physics
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
Phd Student:
Borghini, Nicolo (Intern)
Supervisor:
Zanini, Luca (Ekstern)
Main Supervisor:
Lauritzen, Bent (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

**Atomic-scale modelling of interfaces in electronic devices**
Department of Physics
Period: 01/06/2016 → 03/02/2021
Number of participants: 5
Phd Student:
Jelver, Line (Intern)
Supervisor:
Stokbro, Kurt (Intern)
Stradi, Daniele (Intern)
Thygesen, Kristian Sommer (Intern)
Main Supervisor:
Jacobsen, Karsten Wedel (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

**Characterization and solution structure of multi-domain proteins and protein complexes**
Department of Chemistry
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Kulakova, Alina (Intern)
Supervisor:
Due, Anne Vindum (Ekstern)
Peters, Günther H.J. (Intern)
Main Supervisor:
Harris, Pernille (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD
**Cutting Force Modelling and Error Compensation in Large Structure Machining**

Department of Mechanical Engineering  
Period: 01/06/2016 → 31/05/2019  
Number of participants: 3  
Phd Student:  
Checchi, Alessandro (Intern)  
Supervisor:  
Hansen, Hans Nørgaard (Intern)  
Main Supervisor:  
Bissacco, Giuliano (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Data-driven Condition Monitoring of Switches and Crossings**

Department of Electrical Engineering  
Period: 01/06/2016 → 31/05/2019  
Number of participants: 3  
Phd Student:  
Barkhordari, Pegah (Intern)  
Supervisor:  
Blanke, Mogens (Intern)  
Main Supervisor:  
Galeazzi, Roberto (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Forskningsrådsfinansiering  
Project: PhD

**Development and characterisation of two animal models (osteomyelitis and exudative epidermitis) for testing a MRSA vaccine**

National Veterinary Institute  
Period: 01/06/2016 → 31/05/2019  
Number of participants: 4  
Phd Student:  
Martinsen, Louise Otterstrøm (Intern)  
Supervisor:  
Andresen, Lars Ole (Intern)  
Nielsen, Ole Lerberg (Ekstern)  
Main Supervisor:  
Jungersen, Gregers (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Electron microscopy of noble metal catalysts for automotive exhaust abatement**

Department of Physics  
Period: 01/06/2016 → 31/05/2019  
Number of participants: 3  
Phd Student:  
Jespersen, Sebastian Pirel Fredsgaard (Intern)
Improving endurance of wind-turbine coatings for use in offshore environments

Department of Mechanical Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
Phd Student:
Johansen, Nicolai Frost-Jensen (Intern)
Supervisor:
Bech, Jakob Ilsted (Intern)
Main Supervisor:
Møller, Per (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Information Theory and Coding in Regenerative and Non-linear Fiber Optical Communications

Department of Photonics Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 5
Phd Student:
Iqbal, Shajeel (Intern)
Supervisor:
Oxenløwe, Leif Katsuo (Intern)
Yankov, Metodi Plamenov (Intern)
Zibar, Darko (Intern)
Main Supervisor:
Forchhammer, Søren (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Interactions between fish probiotic roseobacters and the natural microbiota in aquaculture settings

Department of Systems Biology
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
Phd Student:
Dittmann, Karen Kiesbye (Intern)
Supervisor:
Bentzon-Tilia, Mikkel (Intern)
Main Supervisor:
Gram, Lone (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Large-scale analysis of the blood microbiome of non-communicable disease patients

Technical University of Denmark
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
Phd Student:
Misiakou, Maria-Anna (Intern)
Supervisor:
Panagiotou, Gianni (Intern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Mechanics of steel beams and joints - Advanced modelling of beams and connection components

Department of Civil Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 5
Phd Student:
Hansen, Anders Bau (Intern)
Supervisor:
Andreassen, Michael Joachim (Intern)
Hansen, Thomas (Intern)
P. Hansen, Johannes (Ekstern)
Main Supervisor:
Jönsson, Jeppe (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Modelling of the load carrying capacity of concrete bridges in conjunction with in-situ monitoring

Department of Civil Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Jensen, Thomas Westergaard (Intern)
Supervisor:
Hoang, Linh Cao (Intern)
Schmidt, Jacob Wittrup (Intern)
Main Supervisor:
Poulsen, Peter Noe (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Novel methods for 1 Tb/s signal transmission in large data centers

Department of Photonics Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
Phd Student:
Novel Two-dimensional Plasmonic Materials in Curved and Engineered Geometries

Department of Photonics Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
PhD Student: Dias Gonçalves, Paulo André (Intern)
Supervisor: Jauho, Antti-Pekka (Intern)
Main Supervisor: Peres, Nuno M. R. (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

PhD position in Valorization of Industrial Waste Streams from Tuber Processing - Sino Danish Center (SDC)

Department of Chemical and Biochemical Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 4
PhD Student: Barrett, Kristian (Intern)
Supervisor: Busk, Peter Kamp (Intern)
Main Supervisor: Meyer, Anne S. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Sample preparation for screening analyses by high resolution mass spectrometry

National Food Institute
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
PhD Student: Eyring, Philipp (Intern)
Supervisor: Smedsgaard, Jørn (Intern)
Main Supervisor: Frandsen, Henrik Lauritz (Intern)

Financing sources
Screening of unknown compounds for food monitoring by high resolution mass spectrometry

National Food Institute
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
PhD Student:
Wang, Tingting (Intern)
Supervisor:
Frandsen, Henrik Lauritz (Intern)
Main Supervisor:
Smedsgaard, Jørn (Intern)

Social Spreading in Complex Networks

Department of Applied Mathematics and Computer Science
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
PhD Student:
Mønsted, Bjarke Mørch (Intern)
Supervisor:
Mørup, Morten (Intern)
Main Supervisor:
Jørgensen, Sune Lehmann (Intern)

Thermodynamics, Design, Simulation and Benchmarking of Biofuel Processes

Department of Chemical and Biochemical Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 3
PhD Student:
Torli, Mauro (Intern)
Supervisor:
Kontogeorgis, Georgios (Intern)
Main Supervisor:
Fosbøl, Philip Loldrup (Intern)

Typing for Secure Composition of Distributed Systems

Department of Applied Mathematics and Computer Science
Period: 01/06/2016 → 01/10/2019
Number of participants: 3
PhD Student:
Laursen, Kasper (Intern)
Supervisor:
Probst, Christian W. (Intern)
Main Supervisor:
Mödersheim, Sebastian Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Validation and Improvement of Property and Process Modelling for Oleochemicals
Department of Chemical and Biochemical Engineering
Period: 01/06/2016 → 31/05/2019
Number of participants: 5
Phd Student:
Forero-Hernandez, Hector Alexander (Intern)
Supervisor:
Abildskov, Jens (Intern)
Jensen, Anker Degn (Intern)
Sarup, Bent (Ekstern)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Engineering and structural characterization of perovskite-graphene interfaces for optimizing photovoltaic performance
Department of Chemistry
NanoChemistry
Organic Chemistry
Period: 15/05/2016 → 14/02/2017
Number of participants: 2
Acronym: MAX4ESSFUN
Phd Student:
Halder, Arnab (Intern)
Project Manager, academic:
Chi, Qijin (Intern)

Datadriven models for energy advising leading to behavioural changes in SMEs and residences
Department of Applied Mathematics and Computer Science
Period: 15/05/2016 → 14/05/2019
Number of participants: 4
Phd Student:
Liisberg, Jon Anders Reichert (Intern)
Supervisor:
Bacher, Peder (Intern)
Madsen, Henrik (Intern)
Main Supervisor:
Møller, Jan Kloppenborg (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD
Development of Zeolite Catalysts and Processes for the Selective Conversion of Sugars to Bio-Polymer Monomers

Department of Chemistry
Period: 15/05/2016 → 14/05/2019
Number of participants: 3
Phd Student:
Tosi, Irene (Intern)
Supervisor:
Taarning, Esben (Intern)
Main Supervisor:
Riisager, Anders (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Enzymatic lignin biorefining by cleavage of lignin-carbohydrate complexes

Department of Chemical and Biochemical Engineering
Period: 15/05/2016 → 14/05/2019
Number of participants: 4
Phd Student:
Mosbech, Caroline (Intern)
Supervisor:
Wittrup Agger, Jane (Intern)
Busk, Peter Kamp (Intern)
Main Supervisor:
Meyer, Anne S. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Establishing sampling- and analytical procedures for the quantification of nanoparticles in aerosols and condensing conditions

Department of Micro- and Nanotechnology
Period: 15/05/2016 → 14/05/2019
Number of participants: 4
Phd Student:
Bluhme, Anders Brostrøm (Intern)
Supervisor:
Koponen, Ismo Kalevi (Ekstern)
Lieke, Kirsten Inga (Intern)
Main Supervisor:
Mølhave, Kristian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Voltage Stability in RES based power systems

Department of Electrical Engineering
Period: 15/05/2016 → 14/05/2019
Number of participants: 3
Phd Student:
Access to shared cars may facilitate living without a private car in the household, fewer private cars can pave the way for more sustainable transport patterns, while better opportunities to choose and combine transport modes may enhance multimodal transport chains.

Several international studies indicate positive environmental effects of car-sharing services but many of these studies are solely based on retrospective data or miss a control group.

Based on a longitudinal survey including both DriveNow users and non-users, the project will (1) examine the effects of free-floating car-sharing in the Capital Region with regard to car use and ownership and related intentions and attitudes; (2) monitor the awareness and use of the system; and (3) examine possibilities for system improvements.
Management of Maritime operations under Emission Control Regulations (MANECO)

Brief summary of project:
Air pollution from ships such as NOx and SOx is currently at the center stage of discussion by the world shipping community and the tools of Operations Research (OR) and Management Science (MS) in reducing the environmental externalities of maritime transport will get increased attention. Therefore education and research in the area of maritime management under emission control regulations are needed. Both the education of engineers in maritime management and research in operations under emission control regulations are addressed in this project. In the research part of this project the focus will be on logistic-based (tactical and operational) measures such as routing, scheduling, and monitoring, however in the educational part other areas of operations may be included such as disruption management, stowage and planning. The project also includes an educational part creating a focus on maritime management which will give students insight into management of maritime operations in order to produce graduates who can not only manage maritime operations of companies, but also improve competitiveness. Development of courses and a project portfolio is needed in order to enhance the student competencies within the area of maritime management. The aim is to create a profile for maritime management to promote courses in maritime management to student and accommodate the industry need for engineers with maritime management skills.

Lubricant Transport across the Piston Ring with Flat and Triangular Lubrication Injection Profiles on the Liner in Large Two-Stroke Marine Diesel Engines.

GÉANT Project
The GÉANT project is a truly Pan-European collaboration between 41 National Research and Education Networks and their joint organisations NORDUnet and GÉAN, placing Europe at the forefront of high performance networking and AAI.
Algorithms and Logic
Period: 01/05/2016 → 31/12/2018
Number of participants: 1
High speed networking
Acronym: GN4-2
Project participant:
Olesen, Dorte (Intern)
Project

Greater Copenhagen Food Innovation
CPH-Foods formål er at øge innovationsgraden og udvikle konkrete løsninger hos SMV'er hovedsageligt i Region Sjælland. SMV'erne vil blive støttet i at udvikle nye produkter, processer og koncepter, som vurderes at have en stærk komмерciel fremtid.

Projektet skal sikre, at innovation og vidensamarbejde bliver en integreret del af virksomhedens hverdag og strategi fremover.

CPH-Food udnytter partnernes forenede kompetencer i individuelt tilpassede og målrettede udviklingsforløb for innovations- og vækstorienterede SMV'er. Dette for at skabe værdi for SMV'erne og for fødevaresektoren generelt. CPH-Food vil herved bidrage til at skabe vækst og arbejdspadser på Sjælland.

National Food Institute
Period: 01/05/2016 → 31/10/2019
Number of participants: 5
Acronym: CPH FOOD
Project participant:
Olsen, Lone Ryg (Ekstern)
Thorsen, Bente Rugaard (Ekstern)
Vierick, Nanna (Ekstern)
Project Manager, organisational:
Jensen, Henning Høgh (Intern)
Project Coordinator:
Westh Thon, Rikke (Intern)
Project

PV LED ENGINE
PoC project | Business development of high efficient 3-port converter for solar lighting applications

Department of Photonics Engineering
Diode Lasers and LED Systems
Department of Electrical Engineering
Electronics
Period: 01/05/2016 → 30/04/2017
Number of participants: 2
Project participant:
Poulsen, Peter Behrensdorff (Intern)
Knott, Arnold (Intern)
Project

Thermal Smart Grid - Innovation project under INNO-SE
First investigation on the development of a thermal smart grid for the company GeoDrilling. Innovation project under INNO-SE, CLEAN.

Department of Civil Engineering
Section for Building Energy
Centre for IT-Intelligent Energy Systems in Cities
GeoDrilling
Innovative re-making of markets and business models in a renewable energy system based on wind power

The purpose of the I-REMB project is to assess and develop the technological, market and business options that can support the development of energy systems based predominantly on wind power. The project's aim is to mobilize expertise from renewable energy system engineering, business economics, and economic sociology to generate innovative design solutions to the new technical, regulatory and market contexts of fluctuating energy. For the many actors in the value chain – from generation, distribution to consumption – there are great uncertainties as to how to respond to the unclear commercial opportunities associated with the new variable RES. The conditions for facilitating a successful interaction of the technical and commercial steps towards a successful transition require new design solutions for regulations and market and non-market pricing, as well as an approach to involve existing and new actors in the energy system.

Systems Analysis
Department of Management Engineering
Aalborg University

Copenhagen Business School
Period: 01/05/2016 → 31/03/2019
Number of participants: 4
Acronym: I-REMB
Number of related Ph.D. students: 1
Project participant:
Morthorst, Poul Erik (Intern)
Skytte, Klaus (Intern)
Katz, Jonas (Intern)
Sekamane, Jonas Khubute (Intern)

Relations
Related projects:
Market and Policy Design for Fossil-free Energy Systems

Advanced Design Methods for Active Distribution Networks

Department of Electrical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Klyapovskiy, Sergey (Intern)
Supervisor:
You, Shi (Intern)
Main Supervisor:
Bindner, Henrik W. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Benchmarking Residential Energy Consumption In Indonesia

Department of Management Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Kewo, Angreine (Intern)
Supervisor:
Liu, Xiufeng (Intern)
Main Supervisor:
Nielsen, Per Sieverts (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra uelandet
Project: PhD

BlueSIROS – Satellite Integrated Route Optimisation Service
Department of Transport
Transport optimisation and technique
Department of Management Engineering
Management Science
Period: 01/05/2016 → 30/04/2017
Number of participants: 1
Acronym: BlueSiros
Project participant:
Psaraftis, Harilaos N. (Intern)

Computational Fluid Dynamics (CFD) Study of Bio-Dust Combustion
Department of Chemical and Biochemical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
Phd Student:
Leth-Espensen, Anna (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Jensen, Peter Arendt (Intern)
Main Supervisor:
Glarborg, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Development of an integrated lab-on-a-chip system for point-of-care molecular diagnosis
Department of Micro- and Nanotechnology
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
Phd Student:
Than Linh, Quyen (Intern)
Supervisor:
Bang, Dang Duong (Intern)
Sun, Yi (Intern)
Main Supervisor:
Wolff, Anders (Intern)

Financing sources
Source: Internal funding (public)
**Development of catalytic reactions to prepare bio-based polymer building blocks**

*Department of Chemistry*
*Period: 01/05/2016 → 30/04/2019*
*Number of participants: 3*

**Phd Student:** Jessen, Bo (Intern)

**Supervisor:** Taarning, Esben (Intern)

**Main Supervisor:** Madsen, Robert (Intern)

**Financing sources**
*Source: Internal funding (public)*

**Name of research programme: Samfinansieret - Andet**

**Project: PhD**

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**Encapsulation of metal nanoparticles for heterogeneous catalysis**

*Department of Chemistry*
*Period: 01/05/2016 → 30/04/2019*
*Number of participants: 3*

**Phd Student:** Thumbayil, Rouzana Pulikkal (Intern)

**Supervisor:** Mielby, Jerrik Jørgen (Intern)

**Main Supervisor:** Kegnæs, Søren (Intern)

**Financing sources**
*Source: Internal funding (public)*

**Name of research programme: Offentlig finansiering**

**Project: PhD**

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**Energy system modelling and integrated future scenario analysis of the Nordic energy and transport system through the holistic energy system tool TIME S**

*Department of Management Engineering*
*Period: 01/05/2016 → 30/04/2019*
*Number of participants: 3*

**Phd Student:** Salvucci, Raffaele (Intern)

**Supervisor:** Uteng, Tanu Priya (Ekstern)

**Main Supervisor:** Karlsson, Kenneth Bernard (Intern)

**Financing sources**
*Source: Internal funding (public)*

**Name of research programme: Eksternt finansieret virksomhed**

**Project: PhD**

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**Four-wave Mixing in Higher Order Mode Optical Fibers**

*Department of Photonics Engineering*
*Period: 01/05/2016 → 30/04/2019*
*Number of participants: 3*

**Phd Student:** Christensen, Erik Nicolai (Intern)
Fundamental investigations of electrocatalytic H2O2 production

Department of Physics
Period: 01/05/2016 → 01/07/2016
Number of participants: 3
PhD Student:
Ebert, Kenneth (Intern)
Supervisor:
Chorkendorff, Ib (Intern)
Main Supervisor:
Stephens, Ifan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Heat Transfer in dielectric elastomers

Department of Chemical and Biochemical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
PhD Student:
Madsen, Line Riis (Intern)
Supervisor:
Hassager, Ole (Intern)
Main Supervisor:
Skov, Anne Ladegaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Greening the grid: A comparative policy analysis of South Africa and India

Department of Management Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
PhD Student:
Bhamidipati, Padmasai Lakshmi (Intern)
Supervisor:
Andersen, Per Dannemand (Intern)
Hansen, Ulrich Elmer (Intern)
Main Supervisor:
Haselip, James Arthur (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
High precision tooling for heat assisted micro forging
Department of Mechanical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
PhD Student:
Cannella, Emanuele (Intern)
Supervisor:
Bay, Niels Oluf (Intern)
Enggrob, Hans G. (Intern)
Main Supervisor:
Nielsen, Chris Valentin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Hyperpolarized Parallel MRI
Department of Electrical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
PhD Student:
Hansen, Rie Beck (Intern)
Supervisor:
Hanson, Lars G. (Intern)
Main Supervisor:
Ardenkjær-Larsen, Jan Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Integrated micro product/process quality assurance in micro injection moulding production
Department of Mechanical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
PhD Student:
Baruffi, Federico (Intern)
Supervisor:
Calaon, Matteo (Intern)
Main Supervisor:
Tosello, Guido (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Macroalgae biorefinery for value-added products (MAB4) (39372)
MAB4 will bridge the gap between research, innovation and market within the macroalgae (seaweed) sector. The goal is to establish seaweed cultivation as a Danish discipline for providing seaweed biomass for the business sectors of food and feed ingredients, and cosmetics. MAB4 will breed and mature sea-farmed crops of seaweed by improved and new cultivation methods in Danish and Faroese waters, with particular attention to seasonal development of algae bioactive substances and their conservation during harvesting and storage. The project will also develop sustainable enzymatic and Green Solvent extraction methods for development of new algae products i.e. antioxidants, fucoidan, laminarin, alginate, proteins, and minerals. The products will be tested as food and feed ingredients as well as in skincare products. Techno-economic feasibility and LCA will assess for the whole value chain from cultivation to final marketed seaweed products. MAB4 is a trans-disciplinary project running for 3½ years. The project consists of a strong consortium of national and
international algae cultivators, biorefinery experts from universities, RTO's, SMEs and relevant industrial end-users. The results from MAB4 will provide guidelines for stakeholders from industry and for future seaweed cultivation.

This project is coordinated by Danish Technological Institute.

The project is funded by Innovation Fund Denmark.

National Institute of Aquatic Resources
Danish Shellfish Centre
Aarhus University
University of Copenhagen
Ocean Rainforest
FermentationExperts
At Sea Technology
DTU Food
DTU Department of Chemical Engineering
Morgenfruerne på Læsø
Kattegatcentret
AgroKorn
Melissa
Nordisk Tang
Hortimare
BHJ

Danish Technological Institute
Period: 01/05/2016 → 31/10/2019
Number of participants: 2
Research area: Shellfish and seaweed
Project participant:
Canal-Vergés, Paula (Intern)
Nielsen, Mette Møller (Intern)

Mainstreaming Climate Mitigation Actions in Sectoral and National Sustainable Development Strategies and Policies

Department of Management Engineering
Period: 01/05/2016 → 01/07/2019
Number of participants: 4
Phd Student:
Garcia Hernandez, Alma Lucia (Intern)
Supervisor:
Bolwig, Simon (Intern)
Reutemann, Tim (Intern)
Main Supervisor:
Hinostroza, Miriam L. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Metal-Catalyzed Dehydrogenation and Decarbonylation of Primary Alcohols

Department of Chemistry
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Bottaro, Fabrizio (Intern)
Supervisor:
Clausen, Mads Hartvig (Intern)
Main Supervisor:
Madsen, Robert (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Micro four-point probe based metrology
Department of Micro- and Nanotechnology
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Witthøft, Maria-Louise (Intern)
Supervisor:
Hansen, Ole (Intern)
Main Supervisor:
Petersen, Dirch Hjorth (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Nonlinear fractional order derivative models of components and materials in hearing aids and transducers
Department of Electrical Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
Phd Student:
King, Alexander Weider (Intern)
Supervisor:
Brunskog, Jonas (Intern)
Jensen, Jakob Søndergaard (Intern)
Main Supervisor:
Agerkvist, Finn T. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Optimal integration of district heating, district cooling, heat sources and heat sinks
Department of Mechanical Engineering
Period: 01/05/2016 → 04/06/2019
Number of participants: 4
Phd Student:
Pieper, Henrik (Intern)
Supervisor:
Elmegaard, Brian (Intern)
Ommen, Torben Schmidt (Intern)
Main Supervisor:
Markussen, Wiebke Brix (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet

Relations
Activities:
Performance analysis of heat pumps utilizing different low temperature heat sources to supply district heating
Project: PhD

Process Parameters and Fatigue Properties of High Modulus Composites
Department of Wind Energy
Period: 01/05/2016 → 30/04/2019
Number of participants: 4
Phd Student:
Mortensen, Ulrich Andreas (Intern)
Supervisor:
Løgstrup Andersen, Tom (Intern)
Hansen, Birgitte Møller (Ekstern)
Main Supervisor:
Mikkelsen, Lars Pilgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Proof of food authenticity by chemical methods
National Food Institute
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Wilde, Amelie Sina (Intern)
Supervisor:
Fromberg, Arvid (Intern)
Main Supervisor:
Smedsgaard, Jørn (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Quantifying performance of Modularized Products in an ETO Company
Department of Management Engineering
Period: 01/05/2016 → 30/04/2019
Number of participants: 3
Phd Student:
Markworth Johnsen, Sara Helene (Intern)
Supervisor:
Mortensen, Niels Henrik (Intern)
Main Supervisor:
Hvam, Lars (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Stannosilicates in biomass conversion - a combined spectroscopic and computational study

Department of Chemistry  
Period: 01/05/2016 → 30/04/2019  
Number of participants: 3  
PhD Student:  
Elliot, Samuel Gilbert (Intern)  
Supervisor:  
Meier, Sebastian (Intern)  
Main Supervisor:  
Madsen, Robert (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Offentlig finansiering  
Project: PhD

Surface Characterization of Activated Chalcopyrite Particles

Department of Chemical and Biochemical Engineering  
Period: 01/05/2016 → 30/04/2019  
Number of participants: 4  
PhD Student:  
Karcz, Adam Paul (Intern)  
Supervisor:  
Damø, Anne Juul (Intern)  
Illerup, Jytte Boll (Intern)  
Main Supervisor:  
Dam-Johansen, Kim (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  

Relations  
Activities:  
Materials Science and Technology 2016  
Project: PhD

Thermodynamic modelling and data evaluation for life sciences applications

Department of Chemical and Biochemical Engineering  
Period: 01/05/2016 → 30/04/2019  
Number of participants: 4  
PhD Student:  
Ruszczynski, Lukasz (Intern)  
Supervisor:  
Sin, Gürkan (Intern)  
Zubov, Alexandr (Intern)  
Main Supervisor:  
Abildskov, Jens (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Marie Curie (EU-stipendium)  
Project: PhD

Design and optimization of selected oleochemical processes

Department of Chemical and Biochemical Engineering  
Period: 15/04/2016 → 14/04/2019  
Number of participants: 4
Phd Student:
Jones, Mark Nicholas (Intern)
Supervisor:
Gernaey, Krist V. (Intern)
Sarup, Bent (Ekstern)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD

Diode laser based lighting

Department of Photonics Engineering
Period: 15/04/2016 → 14/04/2019
Number of participants: 3
Phd Student:
Krasnoshchoka, Anastasiia (Intern)
Supervisor:
Petersen, Paul Michael (Intern)
Main Supervisor:
Jensen, Ole Bjarlin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

In-silico Process Design and Evaluation Tool for Pharmaceutical Manufacturing

Department of Chemical and Biochemical Engineering
Period: 15/04/2016 → 14/04/2019
Number of participants: 3
Phd Student:
da Conceiccao Do Carmo Montes, Frederico (Intern)
Supervisor:
Gernaey, Krist V. (Intern)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

Protein structure and protein-protein interactions in formulation

Department of Chemistry
Period: 15/04/2016 → 14/04/2019
Number of participants: 4
Phd Student:
Ryberg, Line Abildgaard (Intern)
Supervisor:
Bukrinsky, Jens T. (Ekstern)
Harris, Pernille (Intern)
Main Supervisor:
Peters, Günther H.J. (Intern)

Financing sources
Source: Internal funding (public)
Room temperature ballistic graphene devices

Department of Micro- and Nanotechnology
Period: 15/04/2016 → 14/04/2019
Number of participants: 3
Phd Student:
Zhao, Xiaojing (Intern)
Supervisor:
Caridad, Jose (Intern)
Main Supervisor:
Bøggild, Peter (Intern)

Financing sources
Source: Internal funding (public)

Name of research programme: Samfinansieret - Andet
Project: PhD

Smart Energy Systems and Sustainable Urban Development

Department of Management Engineering
Period: 15/04/2016 → 31/05/2017
Number of participants: 3
Phd Student:
La Greca, Simone (Intern)
Supervisor:
Morales González, Juan Miguel (Intern)
Main Supervisor:
Halsnæs, Kirsten (Intern)

Financing sources
Source: Internal funding (public)

Name of research programme: Samfinansieret - Andet
Project: PhD

Sustainable Process Synthesis and Design

Department of Chemical and Biochemical Engineering
Period: 15/04/2016 → 31/01/2017
Number of participants: 3
Phd Student:
Maria Dragan, Johanna (Intern)
Supervisor:
Zubov, Alexandr (Intern)
Main Supervisor:
Sin, Gürkan (Intern)

Financing sources
Source: Internal funding (public)

Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

The emissions gap report by the United Nations Environment Programme is an annual scientific assessment of the shortfall between national emission reduction pledges under the United Nations Framework Convention on Climate Change and the levels required to keep global average temperature increases below 2°C, compared to pre-industrial levels.

Department of Management Engineering
**PVT/heat pump system**

Measurements on a PVT/heat pump system are carried out in a laboratory test facility.

Department of Civil Engineering
Section for Building Energy
Department of Applied Mathematics and Computer Science
RACELL SAPHIRE Technologies ApS
COWI A/S

**Breaking the temperature limits of Solid Oxide Fuel Cells: Towards a new family of ultra-thin portable power sources**

Solid Oxide Fuel Cells (SOFCs) are one of the most efficient and fuel flexible power generators. However, a great limitation on their applicability arises from temperature restrictions. Operation approaching room temperature (RT) is forbidden by the limited performance of known electrolytes and cathodes while typical high temperatures (HT) avoid their implementation in portable applications where quick start-ups with low energy consumption are required.

The ULTRASOFc project aims breaking these historical limits by taking advantage of the tremendous opportunities arising from novel fields in the domain of the nanoscale (nanionics or nano photochemistry) and recent advances in the marriage between micro and nanotechnologies. From the required interdisciplinary approach, the ULTRASOFc project addresses materials challenges to (i) reduce the operation to RT and (ii) technological gaps to develop ultra-low-thermal mass structures able to reach high T with extremely low consumption and immediate start up.

A unique μSOFC technology fully integrated in ultrathin silicon will be developed to allow operation with hydrogen at room temperature and based on hydrocarbons at high temperature. Stacking these μSOFCs will bring a new family of ultrathin power sources able to provide 100 mW at RT and 5W at high T in a size of a one-cent coin. A stand-alone device fuelled with methane at HT will be fabricated in the size of a dice.

Apart from breaking the state-of-the-art of power portable generation, the ULTRASOFc project will cover the gap of knowledge existing for the migration of high T electrochemical devices to room temperature and MEMS to high T. Therefore, one should expect that ULTRASOFc will open up new horizons and opportunities for research in adjacent fields like electrochemical transducers or chemical sensors. Furthermore, new technological perspectives of integration of unconventional materials will allow exploring unknown devices and practical applications.

Department of Energy Conversion and Storage
Ceramic Engineering & Science

Acronym: ULTRA-SOFC.

Project participant:
Esposito, Vincenzo (Intern)

Project Manager, organisational:
Taracón, Albert (Ekstern)
In situ nanoscale investigation of microbial extracellular electron transfer

Department of Chemistry
NanoChemistry

Organic Chemistry
Period: 01/04/2016 → 31/03/2018
Number of participants: 2
Supervisor:
Erik Mølager Christensen, Hans (Ekstern)
Main Supervisor:
Zhang, Jingdong (Intern)

Project

GazeIT – Accessibility by Gaze Tracking

Copenhagen Center for Health Technology

Department of Management Engineering

Technology and Innovation Management
Period: 01/04/2016 → 31/03/2021
Number of participants: 1
Acronym: GazeIT
Project participant:
Hansen, John Paulin (Intern)

Project

Otto Mønsted Guest Professorship: R. Budhani

Center for Electron Nanoscopy

DTU Danchip

IIT Kanpur
Period: 01/04/2016 → 30/06/2016
Number of participants: 1
Project participant:
Beleggia, Marco (Intern)

Project

Human Brain Project

The Neurorobotics Platform (NRP) developed in the Human Brain Project (HBP) is an Internet-accessible simulation system that allows the simulation of robots controlled by spiking neural networks. It targets researchers of multiple fields. Prospected users include but are not limited to neuroscientists wanting to validate brain models in the context of closed action-perception loops as well as robotics researchers wanting to develop new neuro-inspired controllers.

Department of Electrical Engineering
Automation and Control
Centre for Playware

Copenhagen Center for Health Technology
Period: 01/04/2016 → 01/04/2018
Number of participants: 4
Acronym: HBP
Project participant:
Tolu, Silvia (Intern)
Lund, Henrik Hautop (Intern)
Baira Ojeda, Ismael (Intern)
Christensen, David Johan (Intern)

Project
Visualization, Analysis and Modelling of On-street Parking Data
Master project
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

EasyPark
Period: 01/04/2016 → 28/09/2016
Number of participants: 3
Project participant:
Notarangelo, Rosaria (Ekstern)
Supervisor:
Thyregod, Camilla (Intern)
Main Supervisor:
Ersbøll, Bjarne Kjær (Intern)

NSON-DK - North Sea Offshore Network - Denmark
The focal point of the NSON-DK project is how the future massive offshore wind power and the associated offshore grid development will affect the Danish power system in the transition towards a future sustainable energy system. NSON-DK is a Danish part of the North Sea Offshore and Storage Network (NSON) project framework, which has emerged from the European Energy Research Alliance (EERA) as a pioneer project framework joining nationally funded research according to the European Commission’s Berlin model.

The objective of the NSON-DK project is to study how the future massive offshore wind power and the associated offshore grid development will affect the Danish power system on short term, medium term and long term towards of the transition towards a future sustainable energy system.

The following research questions will have special attention in the project:
- How will the offshore wind power development affect the variability and uncertainty of variable renewable generation in the Danish power system and neighboring systems?
- How will this increased variability and uncertainty from the offshore wind power development together with onshore renewable generation development influence the balancing and need for reserves in the Danish power system?
- How will the offshore wind power and offshore grid development influence the electricity markets in future systems with large scale energy storage and coordination of the electricity system with other energy systems (mainly heat and transport)?
- How will the scale and architecture of the offshore grid development influence the adequacy and security of supply in the Danish power system?
- Which policy instruments should be applied to support an effective and cost-efficient transition of the Danish power system combining the offshore development with energy storage and coordination between energy systems?

Department of Wind Energy
Integration & Planning
Department of Management Engineering
Energy Economics and Regulation

EA Energy Analysis A/S
Period: 01/04/2016 → 31/03/2020
Number of participants: 5

Wind power, Power systems, Offshore wind, Ancillary services, Variability, Renewables
Acronym: NSON-DK

Project participant:
Das, Kaushik (Intern)
Koivisto, Matti Juhani (Intern)
Pade, Lise-Lotte (Intern)
Skytte, Klaus (Intern)
Project Coordinator:
Sørensen, Poul Ejnar (Intern)

Relations
Related projects:
TWENTIES - Transmission system operation with large penetration of Wind and other renewable Electricity sources in Networks by means of innovative Tools and Integrated Energy Solutions
SIMBA - Simulation of balancing

Publications:

- A Statistical Model for Hourly Large-Scale Wind and Photovoltaic Generation in New Locations
- Multi-terminal Offshore Grid for the North Sea Region for 2030 and 2050 Scenarios
- NSON-DK energy system scenario
- Impacts of offshore grid developments in the North Sea region on market values by 2050: How will offshore wind farms and transmission lines pay?

Project

**Bovine abortions revisited**

Every month, approximately 700 bovine abortions are registered in the national Danish “Kvægdatabasen” but the number is estimated to be significantly higher as abortion-registration is deficient. Our knowledge on the causes of bovine abortion is very limited and prophylactic measures are scarce. Out of more than 100 abortion cases analysed at DTU Vet during 2014, 35% were found to have an infectious cause (bacterial infections and neosporosis). In 44% of submissions, histopathologic lesions in the placenta and/or the foetus were found, that indicate infection however, no infectious agent was detected by routine diagnostic methods. In 22% of the submitted foetuses no specific pathological findings were made.

The aim of this project is to gain in-depth knowledge on the possible bacterial and viral infections of the bovine foetus and placenta by use of state of the art molecular methods for culture-independent identification of bacteria and viruses. Furthermore, placental and foetal infection is to be verified by in situ hybridization of the agents.

On the basis of the project’s results, knowledge will be gained on bacterial and viral infections as causes of bovine abortions in Denmark. For example will the relevance of *Chlamydia* and *Chlamydia*-like bacteria be assessed, since those have lately been shown to play a role in swine production. The results of this study will complement knowledge-based counselling and prophylactic measures on herd-level.

National Veterinary Institute

Section for Bacteriology, Pathology and Parasitology

University of Copenhagen

Period: 01/04/2016 → 31/03/2019

Number of participants: 3

Phd Student:
Wolf-Jäckel, Godelind (Intern)

Supervisor:
Schou, Kirstine Klitgaard (Intern)

Main Supervisor:
Jensen, Tim Kåre (Intern)

Project

**Security Assessment of Renewable Power Systems**

Department of Electrical Engineering

Center for Electric Power and Energy

Electric power systems

Department of Wind Energy

Integration & Planning

Period: 01/04/2016 → 31/03/2020

Number of participants: 5

Acronym: SARP

Project participant:
Sørensen, Poul Ejnar (Intern)

Phd Student:
Karatas, Bahtiyar Can (Intern)

Sarkar, Moumita (Intern)
Active Magnetic regenerator refrigeration with rotary multi-bed technology

Department of Energy Conversion and Storage
Period: 01/04/2016 → 20/09/2016
Number of participants: 7
Phd Student: Eriksen, Dan (Intern)
Supervisor: Bahl, Christian (Intern)
Bjørk, Rasmus (Intern)
Main Supervisor: Engelbrecht, Kurt (Intern)
Examiner: Jensen, Jens Oluf (Intern)
Kitanovski, Andrej (Ekstern)
Palm, Björn (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)

Relations
Publications:
Active magnetic regenerator refrigeration with rotary multi-bed technology
Project: PhD

Bovine Abortions Revisited
National Veterinary Institute
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student: Wolf-Jäckel, Godelind (Intern)
Supervisor: Agerholm, Jørgen Steen (Ekstern)
Schou, Kirstine Klitgaard (Intern)
Main Supervisor: Jensen, Tim Kåre (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Classification and aggregation of energy components
Department of Electrical Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Richert, Thibaut Pierre (Intern)
Supervisor:
Gehrke, Oliver (Intern)
Madsen, Henrik (Intern)
Main Supervisor:
Bindner, Henrik W. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering

Relations
Activities:
CITIES consortium 2016
Project: PhD

Electric Vehicle Integration in an Energy - Optimized Neighbourhood
Department of Electrical Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Gjelaj, Marjan (Intern)
Supervisor:
Andersen, Peter Bach (Intern)
Hashemi Toghroljerdi, Seyedmostafa (Intern)
Main Supervisor:
Træholt, Chresten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

Enhancement of therapeutic protein production in CHO cells: Coping with the ER stress
FTP post doc stipend
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Period: 01/04/2016 → 31/03/2019
Number of participants: 2
Project participant:
Kwang Ha, Tae (Intern)
Supervisor:
Kildegaard, Helene Fastrup (Intern)
Project

Fabrication and characterization of hyperbolic metamaterials
Department of Photonics Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Sukham, Johneph (Intern)
Supervisor:
Lavrinenko, Andrei (Intern)
Stenger, Nicolas (Intern)
Main Supervisor:
Malureanu, Radu (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Highly efficient on-chip frequency comb generation**
Department of Photonics Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Kamel, Ayman Nassar (Intern)
Supervisor:
Pu, Minhao (Intern)
Thomsen, Jan Westenkær (Ekstern)
Main Supervisor:
Rottwitt, Karsten (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

**Light-matter interactions in low-dimensional materials**
Department of Photonics Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Geisler, Mathias (Intern)
Supervisor:
Mortensen, N. Asger (Intern)
Stenger, Nicolas ( Intern)
Main Supervisor:
Xiao, Sanshui (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

**Market Mechanisms for the integration of Distributed Energy Resources**
Department of Applied Mathematics and Computer Science
Period: 01/04/2016 → 31/03/2019
Number of participants: 3
Phd Student:
De Zotti, Giulia (Intern)
Supervisor:
Madsen, Henrik (Intern)
Main Supervisor:
Morales González, Juan Miguel (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
NSON-DK - North Sea Offshore Network - Denmark

The focal point of the NSON-DK project is how the future massive offshore wind power and the associated offshore grid development will affect the Danish power system in the transition towards a future sustainable energy system. NSON-DK is a Danish part of the North Sea Offshore and Storage Network (NSON) project framework, which has emerged from the European Energy Research Alliance (EERA) as a pioneer project framework joining nationally funded research according to the European Commission's Berlin model.

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- How will the increased variability and uncertainty from the offshore wind power development together with onshore renewable generation development influence the balancing and need for reserves in the Danish power system?
- How will the offshore wind power and offshore grid development influence the electricity markets in future systems with large scale energy storage and coordination of the electricity system with other energy systems (mainly heat and transport)?
- How will the scale and architecture of the offshore grid development influence the adequacy and security of supply in the Danish power system?
- Which policy instruments should be applied to support an effective and cost-efficient transition of the Danish power system combining the offshore development with energy storage and coordination between energy systems?

Department of Management Engineering

Systems Analysis
Period: 01/04/2016 → 31/03/2020
Number of participants: 1
Acronym: NSON-DK
Project participant:
Boscán Flores, Luis Rafael (Intern)

Personalizing Hearing Care and Enhancing User Experience by Adapting Devices to the Changing Mobile Context

Department of Applied Mathematics and Computer Science
Period: 01/04/2016 → 31/03/2019
Number of participants: 3
Phd Student:
Johansen, Benjamin (Intern)
Supervisor:
Petersen, Michael Kai (Intern)
Main Supervisor:
Larsen, Jakob Eg (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Promoting cost-optimal energy retrofits through improved energy labelling

Department of Civil Engineering
Period: 01/04/2016 → 30/03/2020
Number of participants: 3
Phd Student:
Cáceres, Alex Arnoldo González (Intern)
Supervisor:
Vik, Tor Arvid (Ekstern)
Main Supervisor:
Karlshej, Jan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Security assessment and protection of cyber-physical energy systems

Department of Electrical Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 4
Phd Student:
Rasmussen, Theis Bo (Intern)
Supervisor:
Dong, Z. Y. (Ekstern)
Nielsen, Arne Hejde (Intern)
Main Supervisor:
Yang, Guangya (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)

Relations
Activities:
Functional modelling in the operation of a cyber physical energy system
Federated Conference on Computer Science and Information Systems
EuroTech Summer School 2016 @ EPFL: Energy Systems
12th IEEE Power and Energy Society PowerTech Conference

Thermodynamics of Petroleum Fluids relevant to Subsea Processing

Department of Chemical and Biochemical Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 3
Phd Student:
Kruger, Francois (Intern)
Supervisor:
Kontogeorgis, Georgios (Intern)
Main Supervisor:
von Solms, Nicolas (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed

Toolsets development for DER aggregators providing concurrent services

Department of Electrical Engineering
Period: 01/04/2016 → 31/03/2019
Number of participants: 3
Phd Student:
Ziras, Charalampos (Intern)
Supervisor:
You, Shi (Intern)
Main Supervisor:
Bindner, Henrik W. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD
3D Nanocarbon chips for microsupercapacitors and ultrasensitive detection

Department of Chemistry
NanoChemistry
Organic Chemistry
Department of Micro- and Nanotechnology
Period: 15/03/2016 → 14/05/2017
Number of participants: 2
Acronym: CapSens
Phd Student:
Halder, Arnab (Intern)
Hemanth, Suhith (Intern)

A Bayesian Approach to Neural Networks

Department of Applied Mathematics and Computer Science
Period: 15/03/2016 → 14/03/2019
Number of participants: 3
Phd Student:
Jørgensen, Peter Bjørn (Intern)
Supervisor:
Marup, Morten (Intern)
Main Supervisor:
Schmidt, Mikkel Nørgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

A trait-based approach for predicting fish community structure, function and services under climate change and exploitation

National Institute of Aquatic Resources
Period: 15/03/2016 → 14/03/2019
Number of participants: 3
Phd Student:
Beukhof, Esther (Intern)
Supervisor:
Andersen, Ken Haste (Intern)
Main Supervisor:
Lindegren, Martin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)

Relations
Activities:
Marine fish traits follow environmental gradients across European shelf seas
Project: PhD

Miniaturization of food safety analysis

National Food Institute
Period: 15/03/2016 → 14/03/2019
Number of participants: 3
Phd Student:
Zhai, Demi Shuang (Intern)  
Supervisor:  
Boisen, Anja (Intern)  
Main Supervisor:  
Smedsgaard, Jørn (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

Module Integrated Converter for Photovoltaic Systems  
Department of Electrical Engineering  
Period: 15/03/2016 → 14/03/2019  
Number of participants: 3  
Phd Student:  
bin Abdul Rahman, Norjasmi (Intern)  
Supervisor:  
Ouyang, Ziwei (Intern)  
Main Supervisor:  
Andersen, Michael A. E. (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Stipendie fra udlandet  
Project: PhD

Selective gut microbiome-immune interplays to identify major disease-driving bacteria and early life dynamics in microbiome establishment  
Department of Systems Biology  
Period: 15/03/2016 → 14/03/2019  
Number of participants: 4  
Phd Student:  
Eriksen, Carsten (Intern)  
Supervisor:  
Arumugan, Manimozhiyan (Ekstern)  
Kristiansen, Karsten (Ekstern)  
Main Supervisor:  
Pedersen, Susanne Brix (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

Seasonal heat storages in Denmark  
Analyses of measurements and experience from operation of water pit heat storage in Gram solar heating plant  
Department of Civil Engineering  
Section for Building Energy  
PlanEnergi  
Period: 04/03/2016 → 31/07/2018  
Number of participants: 1  
water pit, seasonal heat storage  
Project participant:  
Furbo, Simon (Intern)  
Project
Highly structured materials for upgraded biogas and storage

HiGradeGas will develop nanostructured materials for more efficient adsorption processes to remove CO₂ from biogas (upgrading) and to store the resulting biomethane.

Department of Energy Conversion and Storage

Ceramic Engineering & Science

SINTEF

Stockholm University

Syddansk Universitet

Danish Power Systems ApS

NeoZeo AB

Rambøll Oil and Gas

Luleå University of Technology

Period: 01/03/2016 → 29/02/2020

Number of participants: 1

Biogas upgrading, pressure swing adsorption, Nanofibers, gas adsorption

Acronym: HiGradeGas

Number of related Ph.D. students: 2

Project Coordinator:

Kaiser, Andreas (Intern)

Development of novel genome engineering tools to improve CHO cell factories

Novo Nordisk Foundation Center for Biosustainability

CHO Cell Line Engineering and Design

Period: 01/03/2016 → 28/02/2019

Number of participants: 3

Phd Student:

Julie la Cour Karottki, Karen (Intern)

Supervisor:

Lee, Jae Seong (Intern)

Main Supervisor:

Kildegaard, Helene Fastrup (Intern)

Project

PEAKapp - Personal Energy Administration Kiosk application: an ICT-ecosystem for Energy Savings through Behavioural Change, Flexible Tariffs and Fun

Summary

PEAKapp targets the development of an unprecedented ICT-to- Human ecosystem to trigger lasting energy savings through behavioural change and continuous engagement, to enable increased consumption of clean and low-priced electricity from the spot market for household customers, to connect them to social networks, to motivate them through serious gaming, and to boost the efficacy of Smart Home building energy management systems by integrating their functionalities into the PEAKapp solution. With this first close-to-market-ready attempt to provide households with a dynamic electricity tariff in the EU, the door is opened for the most significant impact on the household electricity market since its liberalisation.

The ICT ecosystem will be designed to require smart meters as only hardware with respect to in-house equipment, such that the system can be implemented almost immediately, given the EU targets for smart meter roll-out. These low hardware requirements allow for a fast market uptake, and thus a noticeable impact on EU energy consumption can be experienced with almost no delay and without the need of having to equip the230mio dwellings in the EU with any extra efficiency hardware.

Validation of the ICT ecosystem under real life conditions in the publicly owned social housing sector will be carried out in Austria, Estonia, Sweden and Finland, and analyses of the collected data will allow for ground-breaking insights into consumer behaviour, while outstanding EU energy market analyses will derive implications for regulatory practice to better support energy efficiency goals. An outstanding market uptake strategy makes >3 electricity utilities ready-to-sign the implementation of the ICT-system, advises the European social housing sector about its benefits, and fosters European and international market uptake by distinguished exploitation activities, where the leading US stakeholder EPRI takes responsibility without funding.
**DTU-MAN Focus**

*WP4: Customer engagement analysis and savings impact assessment*

Task 4.1 Modelling consumer behaviour through econometric time-series analysis (8 mm)

*WP5: Market Uptake and Transformation, Privacy and Regulatory Framework*

Task 5.2 Market transformation through dynamic electricity prices - assess effects of the market price and distribution costs of electricity from consumer load shifting via PEAKapp (7 mm)

Task 5.3 Regulatory framework (2 mm) - analyse and develop regulatory framework necessary to enable full exploitation of the PEAKapp

Department of Management Engineering

Systems Analysis

**Department of Management Engineering**

Energy Economics and Regulation

Johannes Kepler Universität Linz

Period: 01/03/2016 → 01/03/2019

Number of participants: 3

Acronym: PEAKapp

Number of related Ph.D. students: 0

Project participant:

Bolwig, Simon (Intern)

Møller Andersen, Frits (Intern)

Henningsen, Geraldine (Intern)

Project

**Integrated Baltic offshore wind electricity grid development**

The offshore wind energy sector in the Baltic Sea requires coordinated transnational grid planning to realise its full growth potential. Baltic InteGrid promotes the meshed grid approach by creating a professional network for the exchange of expertise and state-of-the-art interdisciplinary research.

Department of Management Engineering

Energy Economics and Regulation

Department of Wind Energy

Integration & Planning

Period: 01/03/2016 → 30/09/2019

Number of participants: 5

Acronym: Baltic InteGrid

Project participant:

Pade, Lise-Lotte (Intern)

Bergaentzlé, Claire (Intern)

Boscán Flores, Luis Rafael (Intern)

Cutululis, Nicolaos Antonio (Intern)

Das, Kaushik (Intern)

**The use of wind power capabilities to improve the operation of the distribution network**

NetVind aims toward the green transition in Denmark, by rethinking the way of using wind power plants in distribution systems. NetVind analyses and demonstrates in a large experimental facility, which technical and financial potentials exist to improve the operation of distribution systems by using wind power plants support control capabilities.

The goal of NetVind is to improve the operation of distribution systems with high wind power penetration by using the wind power plants grid support capabilities. This is accomplished through:

- Digitizing the communication between grid devices (i.e. wind turbine’s inverter) and the net monitoring system in relation to IEC 61850.
- Minimizing grid losses in MV distribution systems with high wind power penetration by optimizing the reactive power flow.
- Making optimal use of the existing net and obtain a benefit of the green transition by using regulation rather than to reinforce the net.
- Exploring which business model can be applied between players.
- Testing the IT security infrastructure for data communication in accordance with IEC 62351.
- Building up know-how on modelling the condition of the MV net.
- Contributing to improvement and qualification of future technical regulations which are under preparation at Energinet.dk
and which should bind together the political, technical and financial interests. The project seeks to achieve effective integration of renewable energy, considering the overall system security by optimizing the wind power transmission upwards in the system so that unnecessary losses due to new production/consumption scenarios are minimized and optimized by using the control capabilities of power electronics in wind turbines.

Department of Wind Energy
Integration & Planning

EnergiMidt A/S
Period: 01/03/2016 → 01/10/2018
Number of participants: 5
Acronym: NetVind
Project participant:
Hansen, Anca Daniela (Intern)
Sørensen, Poul Ejnar (Intern)
Das, Kaushik (Intern)
Altin, Müfit (Intern)

Project Manager, organisational:
Thybo, Gitte Wad (Ekstern)

Convergence of Electronics and Photonics Technologies for Enabling Terahertz Applications
CELTA aims to produce the next generation of researchers who will enable Europe to take a leading role in the multidisciplinary area of utilising Terahertz technology for applications involving components and complete systems for sensing, instrumentation, imaging, spectroscopy, and communications. All these technologies are keys to tackling challenges and creating solutions in a large number of focus areas relevant for the societal challenges identified in the Horizon 2020 programme. To achieve this objective, CELTA is comprised of 11 leading research institutions and has assembled a comprehensive research training programme for all the 15 early-stage researchers (ESRs). CELTA integrates multidisciplinary scientific expertise, complementary skills, and experience working in academia and industry to empower ESRs to work in interdisciplinary teams, integrate their activities, share expertise, and promote a vision of a converged co-design and common engineering language between electronics and photonics for Terahertz technologies.

CELTA will introduce the strategy of converged electronics and photonics co-design in its research programme and makes a special effort on establishing a common engineering language in its training programme across the electronics, photonics and applications disciplines. We believe this common engineering language and converged co-design is mandatory to make the next logical step towards efficient and innovative solutions that can reach the market. The detailed compendium of lectures on state-of-the-art technology, soft skills and entrepreneurship is accompanied by a research programme that focuses on THz key technologies. CELTA ESRs will develop three demonstrators: beam steering technology for communication applications, a photonic vector analyser for spectroscopy and materials characterisation, and a THz imager for sensing applications.

Department of Photonics Engineering
Administration
Metro-Access and Short Range Systems

Department of Electrical Engineering
Electromagnetic Systems
Period: 01/03/2016 → 29/02/2020
Number of participants: 3

Convergence of Electronics and Photonics Technologies for Enabling Terahertz Applications, sensing, instrumentation, imaging, spectroscopy
Acronym: CELTA
Number of related Ph.D. students: 15
Contact person:
Reippuert, Mie (Intern)

Project participant:
Tafur Monroy, Idelfonso (Intern)
Johansen, Tom Keinicke (Intern)

Financing sources
Source: EU research programme (public)
Bio4Self
Department of Wind Energy
Composites and Materials Mechanics
Period: 01/03/2016 → …
Number of participants: 5
Project participant:
Beauson, Justine (Intern)
Mikkelsen, Lars Pilgaard (Intern)
Madsen, Bo (Intern)
Christensen, Jacob (Intern)
Mishnaevsky, Leon (Intern)

Porous Carbon Nanomaterials for Bioelectrochemistry
2-year postdoc project
Department of Chemistry
NanoChemistry
Organic Chemistry
Period: 01/03/2016 → 28/02/2018
Number of participants: 2
Project participant:
Zhao, Jianming (Intern)
Project Coordinator:
Zhang, Jingdong (Intern)

SDN-enabled Management of Heterogeneous Optical & Wireless Network Infrastructure
Department of Photonics Engineering
Networks Technology and Service Platforms
Period: 01/03/2016 → 28/02/2019
Number of participants: 3
Project participant:
Kentis, Angelos Mimidis (Intern)
Supervisor:
Soler, José (Intern)
Main Supervisor:
Berger, Michael Stübert (Intern)

Literature survey on migration and risk assessment of nanoparticles from food contact materials
National Food Institute
Division of Risk Assessment and Nutrition
Research Group for Nano-Bio Science
Period: 01/03/2016 → 01/12/2016
Number of participants: 3
Project participant:
Pedersen, Gitte Alsing (Intern)
Jokar, Maryam (Intern)
Reducing the rate and duration of re-admission among patients with unipolar and bipolar disorder using smartphone-based monitoring and treatment

According to WHO, depression is becoming a leading cause of disability. The RADMIS project seeks to design smartphone-based monitoring and treatment technology for depressive patients. The goal is to establish the efficacy of this technology by measuring re-admission and clinical outcome.

Copenhagen Center for Health Technology
Department of Applied Mathematics and Computer Science
Embedded Systems Engineering
Cognitive Systems

Psychiatric Center Copenhagen, Rigshospitalet
Period: 01/03/2016 → 01/09/2019
Number of participants: 2
Acronym: RADMIS
Number of related Ph.D. students: 2
Project participant:
Bardram, Jakob Eyvind (Intern)
Winther, Ole (Intern)

Financing sources
Source: Public research programme (public)
Name of research programme: Innovation Fund Denmark
Web address: http://innovationsfonden.dk/en
Amount: 11,000,000.00 Danish Kroner
Year of approval: 2016

Bioinformatics Services for Data-Driven Design of Cell Factories and Communities

Omics data is not leveraged effectively in the biotechnology industry due to lack of tools to rapidly access public and private data and to design cellular manipulations or interventions based on the data. With this project we aim to make a broad spectrum of omics data useful to the biotechnology industry covering application areas ranging from industrial biotechnology to human health. We will develop novel approaches for integrative model-based omics data analysis to enable 1) Identification of novel enzymes and pathways by mining metagenomic data, 2) Data-driven design of cell factories for the production of chemicals and proteins, and 3) Analysis and design of microbial communities relevant to human health, industrial biotechnology and agriculture. All research efforts will be integrated in an interactive web-based platform that will be available for the industrial and academic research and development communities, in particular enhancing the competitiveness of biotech SMEs by economizing resources and reducing time-to-market within their respective focus areas. The platform will be composed of standardized and interoperable components that service-oriented bioinformatics SMEs involved in the project can reuse in their own products. An important aspect of the platform will be implementation of different access levels to data and software tools allowing controlling access to proprietary data and analysis tools. Two end-user companies will be involved in practical testing of the platform built within the project using proprietary omics data generated at the companies.

Novo Nordisk Foundation Center for Biosustainability

Research Groups
iLoop
Period: 01/03/2016 → 29/02/2020
Number of participants: 8
cell factories, microbial communities, synthetic biology, systems biology
Acronym: DD-DeCaF
Project participant:
Galkina, Svetlana (Intern)
Redestig, Nils Henning (Intern)
Beber, Moritz Emanuel (Intern)
Dannaher, Danny (Intern)
Warm or Cold, Lights influence on thermal comfort

Various indicators point out that a connection exists between the ambient temperature and the correlated color temperature that users prefer for the lit environment. In warm climate the use of cooler lighting is much more common than in a colder climate where people use much warmer light sources. Presumably the use of different colored light sources is due to the experience of cooler climate at cooler light sources and the impression of warmth follows a warmer looking light source. With new LED technology the correlated color temperature (warm white to cool white) is easily controllable.

The goal of the project is to demonstrate how controllable LED lighting can be used to expand the temperature interval that users find comfortable. The project is founded on previous research on colored light. It will lead to a decrease in the energy consumption of buildings.
**Additive Manufacturing and Characterization of Mini Devices for Oral Drug Delivery**

Department of Micro- and Nanotechnology  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 4  
Phd Student: Vaut, Lukas (Intern)  
Supervisor: Jensen, Kristian Ejlebjærg (Intern)  
Tosello, Guido (Intern)  
Main Supervisor: Boisen, Anja (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

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**A platform for microbial production of aromatic and cyclic compounds (PhD1)**

Department of Systems Biology  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 3  
Phd Student: Skovbjerg, Christine Alexandra Egaa (Intern)  
Supervisor: Larsen, Thomas Ostenfeld (Intern)  
Main Supervisor: Frandsen, Rasmus John Normand (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

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**A platform for microbial production of aromatic and cyclic compounds (PhD 2)**

Department of Systems Biology  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 3  
Phd Student: Olsen, Kresten Jon Kromphardt (Intern)  
Supervisor: Frandsen, Rasmus John Normand (Intern)  
Main Supervisor: Larsen, Thomas Ostenfeld (Intern)

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

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**Ballast water - Tool for supporting the delimitation of a "same risk area" (39348)**  
A project financed by the Danish Maritime Fund via the Danish Nature Agency, to develop a decision support tool for authorities and consultants involved with the ballast water convention and measures preventing the spread of marine invasive species. The tool will support decision makers in member nations of the International Maritime Organisation (IMO) to identify and delimit marine areas with high connectivity considering hydrography and species biology. Identification of marine areas with high connectivity can provide a basis for granting exemptions in relation to the ballast water convention and the requirement for ships to treat ballast water before being discharged into the sea. The tool
development is based on existing freeware including "IBM Lib" (DTU Aqua's own individual-based modeling system for linking individual-based models to hydrographical model data), Netlogo (a widely used IBM simulation system) and R (a statistical programming and data handling package).

This project is coordinated by DTU Aqua.

The project is funded by the Danish Maritime Fund via the Danish Nature Agency.

National Institute of Aquatic Resources
Section for Marine Living Resources
Danish Meteorological Institute
Anchor-Lab
Period: 01/03/2016 → 01/12/2016
Number of participants: 9
Research areas: Marine Living Resources & Observation Technology
Project participant:
Mosegaard, Henrik (Intern)
Stage, Bjarne (Intern)
Eg Nielsen, Einar (Intern)
Worsøe Clausen, Lotte (Intern)
van Deurs, Mikael (Intern)
Andersen, Niels Gerner (Intern)
Project Manager, organisational:
Pedersen, Eva Maria (Intern)
Project Manager, academic:
Hansen, Flemming Thorbjørn (Intern)
Project Coordinator:
Christensen, Asbjørn (Intern)

Biomass Corrosion Management
Department of Mechanical Engineering
Period: 01/03/2016 → 28/02/2019
Number of participants: 4
Phd Student:
Malede, Yohanes Chekol (Intern)
Supervisor:
Dahl, Kristian Vinter (Intern)
Montgomery, Melanie (Intern)
Main Supervisor:
Hald, John (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Blue whiting (Micromesistius poutassou): behaviour and distribution in Greenland waters
National Institute of Aquatic Resources
Period: 01/03/2016 → 28/02/2020
Number of participants: 4
Phd Student:
Post, Søren Lorenzen (Intern)
Supervisor:
Balk, Helge (Ekstern)
Hedeholm, Rasmus Berg (Ekstern)
Main Supervisor:
Jansen, Teunis (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Bycatch of marine mammals and seabirds - Assessment and mitigation (39337)
The aim of the project is to develop innovative mitigation methods to reduce the unintended bycatch of marine mammals and seabirds in Danish gillnet fisheries.

The project includes the following components:
- determine the distribution in time and space of the bycatches;
- identify the factors that determine the occurrence of the bycatch and its distribution;
- identify behaviour that are correlated with bycatch;
- conduct pilot trials of mitigation methods;
- propose further mitigation methods to test in a continuation of the project.

The results of the project will contribute to a better management of protected species of marine mammals and seabirds, as well as placing Denmark in a better position with respect to its obligations in relation to the EU Habitats Directive, the EU Bird Directive, the EU Marine Strategy Framework Directive, the EU Council Resolution 812/2004 and the EU Action Plan for reduction of seabird bycatch.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Kolmården Wildlife Park
Period: 01/03/2016 → 28/02/2018
Number of participants: 5
Research areas: Ecosystem based Marine Management & Coastal Ecology
Project participant:
Sørensen, Thomas Kirk (Intern)
Rindorf, Anna (Intern)
Wisz, Mary (Intern)
Project Manager, academic:
Kindt-Larsen, Lotte (Intern)
Project Coordinator:
Larsen, Finn (Intern)
Project

Climate Change and European Aquatic Resources (CERES) (39344)
CERES advances a cause-and-effect understanding of how climate change will influence Europe's most important fish and shellfish resources and the economic activities depending on them. It will provide tools and develop adaptive strategies allowing fisheries and aquaculture sectors and their governance to anticipate and prepare for adverse changes or future benefits of climate change.

The project has 24 additional partners spread across Europe and is coordinated by University of Hamburg, Germany.

The project is funded by EU, Horizon 2020.

National Institute of Aquatic Resources
Section for Oceans and Arctic
University of Hamburg
Period: 01/03/2016 → 29/02/2020
Number of participants: 3
Research areas: Marine Populations and Ecosystem Dynamics & Oceanography & Shellfish and seaweed
Project participant:
Daylight as a Driver for Healthier Energy Optimization

Renovations of existing buildings have primarily focused on the energy consumption and thermal comfort. This project involves health as a priority design parameter, and through an exemplary case study, the project examines how essential health aspects are better served. The project focuses on façade design. The project involves daylight quality as a design parameter and focuses on the clearest glass quality on the market. Through a major housing, the study documents how aspects of health and energy are influenced by the quality of daylight/glass quality.

Department of Photonics Engineering
Diode Lasers and LED Systems
Region Hovedstaden
Statens Byggeforskningsinstitut
Period: 01/03/2016 → 30/06/2018
Number of participants: 5
Project participant:
Petersen, Paul Michael (Intern)
Thorseth, Anders (Intern)
Markvart, Jakob (Ekstern)
Martiny, Klaus (Ekstern)
Project Manager, organisational:
Volf, Carlo (Ekstern)

Relations
Related projects:
Combined daylight and intelligent LED lighting: Getting the daylight into the buildings
Warm or Cold, Lights influence on thermal comfort
Activities:
LED possibilities and challenges
Publications:
Glass Quality and Health in Public Housing

Designing a Real-time Tracking and Feedback System to use During Endoscopic Procedures

Department of Applied Mathematics and Computer Science
Period: 01/03/2016 → 26/04/2019
Number of participants: 4
Phd Student:
Norsk, David (Intern)
Supervisor:
Clemmensen, Line Katrine Harder (Intern)
Svendsen, Lars Bo (Ekstern)
Main Supervisor:
Paulsen, Rasmus Reinhold (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Development of novel genome engineering tools to improve CHO cell factories

Technical University of Denmark
Period: 01/03/2016 → 28/02/2019
Number of participants: 3
Phd Student:
Julie la Cour Karottki, Karen (Intern)
Supervisor:
Lee, Jae Seong (Intern)
Main Supervisor:
Kildegaard, Helene Fastrup (Intern)

Funding sources
Source: Internal funding (public)
Name of research programme: Samfinansierede - Virksomhed
Project: PhD

Fermentation of Synthesis Gas
Department of Chemical and Biochemical Engineering
Period: 01/03/2016 → 28/02/2019
Number of participants: 3
Phd Student:
Grimalt Alemany, Antonio (Intern)
Supervisor:
Skiadas, Ioannis V (Intern)
Main Supervisor:
Gavala, Hariklia N. (Intern)

Funding sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

FishHab-II (39345)
The aim of the project is to map fish habitats to improve data and information for Maritime Spatial Planning. The project focuses on mapping the habitats for 9 commercially important fish species and one invertebrate species in the inner Danish waters. Within the project methods will be developed to map habitats in data-poor as well as data-rich areas. Data derived from different sources; surveys, fisheries, citizen science will be used and combined with information derived from fisher interviews. The mapping will include coastal habitats to provide the basis for advice on management of coastal fish nursery areas.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Danish Fishermen's Association
University of Copenhagen
Period: 01/03/2016 → 28/02/2018
Number of participants: 7
Research areas: Coastal Ecology & Ecosystem based Marine Management
Project participant:
Wisz, Mary (Intern)
Serensen, Thomas Kirk (Intern)
Vinther, Morten (Intern)
Egekvist, Josefine (Intern)
Svendsen, Jon Christian (Intern)
Phd Student:
Brown, Elliot John (Intern)
Project Manager, academic:
**Genomic patterns and processes of population divergence in marine fishes**

National Institute of Aquatic Resources  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 3  
Phd Student:  
Le Moan, Alan (Intern)  
Supervisor:  
Bekkevold, Dorte (Intern)  
Main Supervisor:  
Hansen, Jakob Hemmer (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**InfantBrain - New infant formulas to promote optimal brain development**

Department of Systems Biology  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 4  
Phd Student:  
Heerup, Christine (Intern)  
Supervisor:  
Müllertz, Anette (Ekstern)  
Nielsen, Kristian Fog (Intern)  
Main Supervisor:  
Hellgren, Lars (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Lipid Droplets in Green Cells**

Department of Systems Biology  
Period: 01/03/2016 → 31/01/2018  
Number of participants: 4  
Phd Student:  
Peramuna, Anantha Vithakshana (Intern)  
Supervisor:  
Bae, Hansol (Intern)  
Harholt, Jesper (Ekstern)  
Main Supervisor:  
Simonsen, Henrik Toft (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Forskningsrådsfinansiering  
Project: PhD

**Machine learning for smartphone-based monitoring and treatment of unipolar and bipolar disorders**

Department of Applied Mathematics and Computer Science  
Period: 01/03/2016 → 28/02/2019  
Number of participants: 3
New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal areas (ECOAST) (39339)

ECOAST aims to identify, develop and test new methodologies for spatial and temporal management of fisheries and aquaculture in coastal areas. The overall approach will assess the impact of fisheries and aquaculture on coastal ecosystems, including essential fish habitats and conservation priority habitats, as well as synergies and conflicts between human activities.

Building on previous methodologies and experiences the project will evaluate marine spatial planning in seven coastal case study areas having different ecological and socio-economic characteristics: 1) Adriatic Sea (ADR), 2) Ionian Sea (ION), 3) Black Sea (BLK), 4) Tyrrhenian Sea (TYR), 5) Baltic Sea (BAL), 6) Norwegian Fjords (NOR) and 7) NE Atlantic Coasts (ATL).

The project outcomes will produce case specific evaluation of the ecological footprints of aquaculture and fisheries in coastal areas, maps of optimal areas for fisheries and aquaculture, evaluation of compatibility between fisheries, aquaculture and other human activities in coastal areas, as well as implementation of holistic methods and an operational modelling framework to evaluate and predict stakeholder responses to coastal spatial management options covering marine cross sector occupation of space. Several methodologies already exist to assess the impacts on the ecosystem and the socio-economic effects of some spatial management measures, as well as to spatially manage some cross sector marine activities, but none of them integrate all relevant management aspects for coastal areas. Therefore, the holistic methodology will cover in a single system different approaches and management aspects, identifying realistic spatial and temporal potentials and limitations for the integration of fisheries and aquaculture in coastal areas, in order to allow policy makers and stakeholders to evaluate management measures from different points of view and share decisions in a transparent manner on case specific basis. ECOAST results will support the EU and national policies through the provision of tools and data for an ecosystem based allocation of space and sustainable use of marine resources in coastal areas on case specific basis.

This project is coordinated by Institute of Marine Science of the National Research Council, Italy.

This project is funded by EU, COFASP, ERA-NET.

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
Institute of Marine Science of the National Research Council
Italian National Institute for Environmental Protection and Research
International Research Institute of Stavanger
Institute of Marine Research
Hellenic Centre for Marine Research
National Institute for Marine Research and Development “G. Antipa” Constata
University of Porto
Period: 01/03/2016 → 31/12/2018
Number of participants: 2
Research area: Fisheries Management
Contact person:
Bastardie, Francois (Intern)
Project participant:
Nielsen, J. Rasmus (Intern)
Process integration into multispecies and ecosystem models: Resulting ecological, economic and social trade offs (PRIME TRADE OFFS) (39324)

Extensive multispecies and ecosystem research has been done in the Baltic, North Sea, Barents Sea/Norwegian Sea, Bay of Biscay and the Black Sea in the past about 30 years. There has been invested substantially in the research on multispecies interactions, and ecosystem functioning.

In parallel, significant knowledge on the environmental impacts on recruitment processes, movements or migrations, and species interactions has been accumulated, but not yet consequently integrated in multispecies and ecosystem models and management concepts.

The major questions raised in PRIME TRADE OFFS are hence, (i) how the integration of environmentally-driven variability in population and ecosystem dynamics affects short- and long-term predictions of economically important fish species, and (ii) how the inclusion of environmental variability changes our perceptions of tradeoffs between utilization of different resources, including for example fuel cost due to changed resource distributions in space and effects on targeted species, as well as socio-economic efficiency.

There have been several initiatives to improve multispecies and ecosystem modelling in order to make it operational for both tactical and strategic assessment and ecosystem-based fisheries management. PRIME TRADEOFFS is the logical continuation of these initiatives and will make the concepts of multi-species maximum sustainable yield and environmental impact on biological key process such as distribution, growth and recruitment operational for ecosystem-based management of marine resources, as demanded in the Marine Strategy Framework Directive and the reformed Common Fisheries Policy.

This project is coordinated by DTU Aqua.

The project is funded the EU, COFASP, ERA-NET.

National Institute of Aquatic Resources
Section for Oceans and Arctic
French Research Institute for the Exploitation of the Sea
Institute of Marine Research
AZTI Technalia
University of Hamburg

Perceptual consequences of noise-induced neural degeneration in humans

Department of Electrical Engineering
Period: 01/03/2016 → 28/02/2019
Number of participants: 4
Phd Student:
Holtegaard, Pernille (Intern)
Supervisor:
Dau, Torsten (Intern)
Mehraei, Golbarg (Intern)
Main Supervisor:
Epp, Bastian (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD
SDN-Enabled Management of Heterogeneous Optical and Wireless Network Infrastructure

Department of Photonics Engineering
Period: 01/03/2016 → 28/02/2019
Number of participants: 3
PhD Student:
Kentis, Angelos Mimidis (Intern)
Supervisor:
Soler, Lucas (Extern)
Main Supervisor:
Berger, Michael Stübert (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Sundhed i vækstperioden - årsager til sygdom, diagnostik og forbrug af medicin - delprojekt om coccidiose hos mink

National Veterinary Institute
Bacteriology & Parasitology
Period: 01/03/2016 → 31/12/2016
Number of participants: 1
Project participant:
Petersen, Heidi Huus (Intern)

Sustainable management of Kattegat cod; Improved knowledge about stock components and migration (39348)
The Kattegat cod has been categorized as a data limited stock, mainly due to a large unallocated mortality, which may be caused by migration between Kattegat and neighbouring areas. In this project, we aim to improve our understanding of migration patterns and mixing of different stock components within the Kattegat through a novel combination of genetic and micro-chemical signatures for individual fish. Results from the project will feed directly into the ICES advisory process, including a scheduled benchmark meeting in early 2017 where new procedures for stock assessment will be discussed. As cod are also caught as bycatch in other fisheries, a more robust stock assessment for cod will also be important to fisheries for other species under the landing obligation, which is scheduled for implementation in the Kattegat in 2017.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Section for Marine Living Resources
Danish Fishermen's Association
Period: 01/03/2016 → 28/02/2018
Number of participants: 7
Research areas: Population Genetics & Marine Living Resources & Fisheries Management
Project participant:
Hüssy, Karin (Intern)
Eero, Margit (Intern)
Thygesen, Uffe Høgsbro (Intern)
Storr-Paulsen, Marie (Intern)
Meldrup, Dorte (Intern)
Levinsky, Svend-Erik (Intern)
Project Coordinator:
Hansen, Jakob Hemmer (Intern)
The overarching aim of SORTMUND is to establish a profitable and environmentally sustainable fishery after the invasive round goby in inner Danish waters. Round goby was first seen in south-eastern Danish waters in 2008 and have since then increased rapidly in abundance along the coastline where it has severe negative effects on local biodiversity and the traditional coastal fishery. We aim to launch the fish as a high-quality Nordic product for human consumption, in addition to fur animal feed. The project covers the entire value chain, and has broad participation, ranging from local fishermen and their trade organization, the processing industry, university institutes and a Michelin restaurant. Specific activities will be estimations of stock sizes, investigations of seasonal migrations of the fish, development of seal-safe of gear to avoid damages to the catch, test of methods to fillet the fish for human consumption, documentation of nutritional quality of the fish, development of a fermented fish sauce to add umami to the food, and optimization of logistics in relation to collection, cooling and transportation of fish from small harbors to processing.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark through the Green Development and Demonstration Program (GUDP).

National Institute of Aquatic Resources
Section for Marine Living Resources
National Food Institute
Danish Fishermen's Association
Gilleleje Fillet Factory
Enspire
NF340 Lasse III
Gemba Seafood Consulting
Period: 01/03/2016 → 28/02/2019
Number of participants: 4
Research areas: Fish Biology & Marine Living Resources
Project participant:
Christoffersen, Mads (Intern)
Kindt-Larsen, Lotte (Intern)
van Deurs, Mikael (Intern)
Project Manager, academic:
Behrens, Jane (Intern)

Synthesis of Polymer Bound Flourescent Hydrogen Peroxide Sensors for Biomedical Application

Department of Micro- and Nanotechnology
Period: 01/03/2016 → 28/02/2019
Number of participants: 4
Phd Student:
Tjell, Anders Ørts (Intern)
Supervisor:
Koren, Klaus (Ekstern)
Kühl, Michael (Intern)
Main Supervisor:
Almdal, Kristoffer (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Triple resonant electromagnetic structures for polarization transfer in DNP
Department of Electrical Engineering
Period: 01/03/2016 → 28/02/2019
Number of participants: 4
Phd Student: Albannay, Mohammed (Intern)
Supervisor: Bowen, Sean (Intern)
Zhurbenko, Vitaliy (Intern)
Main Supervisor: Ardenkjær-Larsen, Jan Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Marie Curie (EU-stipendium)
Project: PhD

URBAN
Transport policy and behaviour
Department of Management Engineering
Department of Transport
Traffic modelling and planning
University of Copenhagen
Transportministeriet
Vejdirektoratet
Dansk Industri
Kraks Fond
Incentive Partners
Period: 15/02/2016 → 15/02/2020
Number of participants: 6
Project participant:
Pilegaard, Ninette (Intern)
Mulalic, Ismir (Intern)
Hjorth, Katrine (Intern)
Mabit, Stefan Eriksen (Intern)
Ranjan, Abhishek (Intern)
Project Manager, academic:
Fosgerau, Mogens (Intern)

Financing sources
Source: Public research council
Name of research programme: Innovation Fund

Relations
Activities:
Rejsetidsvariabilitet
Publications:
Modelling the relation between income and commuting distance
Congestion in the bathtub
Press / Media items:
Detektor
Project

Cavity-modified dynamics of Nitrogen-Vacancy centers in Diamond
Department of Physics
Period: 15/02/2016 → 14/02/2019
Number of participants: 3
Phd Student:
Jensen, Rasmus (Intern)
Supervisor:
Huck, Alexander (Intern)
Main Supervisor:
Andersen, Ulrik Lund (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Formulation of Radionuclides and Organometallic Anticancer Compounds in Gels and Liposomes

Department of Micro- and Nanotechnology
Period: 15/02/2016 → 14/02/2019
Number of participants: 5
Phd Student:
Wang, Wenbo (Intern)
Supervisor:
Andresen, Thomas Lars (Intern)
Elema, Dennis Ringkjæbing (Intern)
Jensen, Andreas Tue Ingemann (Intern)
Main Supervisor:
Henriksen, Jonas Rosager (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Reconfigurable Modular Robotic System for Aquatic Environment

Department of Electrical Engineering
Automation and Control
Centre for Playware
National Institute of Aquatic Resources
Section for Oceans and Arctic
Department of Mechanical Engineering
Engineering Design and Product Development
Fluid Mechanics, Coastal and Maritime Engineering
Period: 01/02/2016 → 31/01/2018
Number of participants: 6
Acronym: REMORA
Project participant:
Christensen, David Johan (Intern)
Mariani, Patrizio (Intern)
Visser, Andre (Intern)
Özkil, Ali Gürcan (Intern)
Nielsen, Ulrik Dam (Intern)
Project Manager, academic:
Galeazzi, Roberto (Intern)
Project
ThermoFactories - Thermophilic cell factories for efficient conversion of brown algae biomass to high-value chemicals

Novo Nordisk Foundation Center for Biosustainability
Applied Metabolic Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 1
Acronym: ThermoFactories
Project participant:
Förster, Jochen (Intern)

COMPARE WG 1, Task 1.2: Development of a novel approach for food chain risk assessment based on NGS data

National Food Institute
Research Group for Genomic Epidemiology
Period: 01/02/2016 → 31/12/2018
Number of participants: 1
microbial risk assessment, whole genome sequencing, machine learning, listeria
Supervisor:
Hald, Tine (Intern)

Danish Sound Innovation: Improved sound insulation for headsets

Department of Electrical Engineering
Acoustic Technology
Terma A/S
Period: 01/02/2016 → 31/03/2016
Number of participants: 1
Project participant:
King, Alexander Weider (Intern)

Understanding and Implementing Design for Biodegradability
Bachelor thesis project about designing for biodegradability.

Department of Mechanical Engineering
Engineering Design and Product Development
Period: 01/02/2016 → 17/06/2016
Number of participants: 2
Supervisor:
Meijer, Ellen Brilhuis (Intern)
McAloone, Tim C. (Intern)

Dynamic optimization of total value and environmental performance: Use of real time property data for improved Facilities Management

Department of Management Engineering
Systems Analysis
Centre for Facilities Management
Quantitative Sustainability Assessment
Period: 01/02/2016 → 31/01/2019
Number of participants: 5
Phd Student:
Maslesa, Esmir (Intern)
Supervisor:
Birkved, Morten (Intern)
Hauschild, Michael Zwicky (Intern)
Hultén, Jannik (Ekstern)
Main Supervisor:
Nielsen, Susanne Balslev (Intern)
Documents:
PhD poster - KMD

Implementering af forebyggende psykosociale indsatser
Department of Management Engineering
Management Science
Implementation and Performance Management
Period: 01/02/2016 → 01/09/2018
Number of participants: 3
Project ID: 81546
Project participant:
Ipsen, Christine (Intern)
Edwards, Kasper (Intern)

Smart grid transitions and institutionalizations – market formations and consumers
This project is the Danish contribution to the International Energy Agency smart grid corporation ISGAN, Annex 7.

Smart Grid deployment is seen as a long term endeavour which should be informed by research from multiple disciplinary fields. The general objectives is to: (1) support the development of transition pathways and processes leading to electricity systems with distributed energy resources feeding into distribution grids and (2) to collect knowledge from various studies and make it palpable for policymakers and other stakeholders at multiple administrative levels from and across smart grid related policy fields.

The general Annex 7 activities are led by Senior Researcher Klaus Kubeczko, Austrian Institute of Technology (AIT), Innovation Systems Department. Additional partners are from: Belgium, The Netherlands, Sweden, France, Italy, Canada; and Germany.

The Danish project is made possible through financial support from EUDP.

Department of Management Engineering
Centre for Facilities Management
Systems Analysis
DTU Climate Centre
Energy Economics and Regulation
Period: 01/02/2016 → 28/02/2017
Number of participants: 5
Smart Grid, Sociotechnical change, energy efficiency
Acronym: IEA ISGAN Annex 7: DK
Project participant:
Nielsen, Susanne Balslev (Intern)
Bolwig, Simon (Intern)
Skytte, Klaus (Intern)
Nørregaard, Kjeld (Ekstern)
Dyck-Madsen, Søren (Ekstern)
Future Gas
Department of Management Engineering
Systems Analysis
Period: 01/02/2016 → 31/01/2020
Number of participants: 1
Project participant:
Nielsen, Lise Skovsgaard (Intern)

FutureGas
An effective and economically efficient integration of gas, renewable based gas as well as natural gas, requires three issues to be fulfilled: 1) In an overall system context, gas should be integrated where the system benefits are highest; 2) Gas should be used optimally, that is where the economic net gains are largest taking into account the cost of possible conditioning; and 3) If needed then conditioning of gas should be carried out in the most cost-efficient way. Conditioning here refers to cleaning, upgrading, mixing and/or pressurising to achieve a desired gas quality. Of course, this reflects that the high value areas for gas utilization depend on how gas enters into the energy system. Thus, to find the most efficient and cost-competitive solutions it is crucial in an energy system perspective to address the need, possibilities and cost-effectiveness for conditioning gas to be injected into the gas grids and how different gases most economically and efficiently can be utilized. A central part of this project is therefore to model both renewables injected to the gas grid as well as alternative uses of gas in an overall system context.
The aim of the FutureGas project is twofold:
1) In an energy system context to facilitate the integration of the gas system with the power system, the district heating system and the transportation sector taking into account possible synergies. Despite the huge amounts of energy being transported through the gas grid, it is currently only loosely coupled to the rest of the energy system mainly through use of gas in CHP plants.
2) To facilitate a cost-efficient uptake of renewable gases, hereby in the longer term substituting natural gas and fossil fuels. A number of renewable gases exist, differing in their possible application in the energy system and in their costs and requirements for conditioning. The best and most cost-effective solutions for utilising and conditioning a variety of renewable gases depend on the development of the entire energy system.
In FutureGas these two issues will be looked into with regard to energy system integration, gas conditioning and, finally, economic/policy perspectives. To enable this, a novel modelling framework will be developed comprising the total energy system with an international market dimension and handling risk and uncertainty. Moreover, this new framework will facilitate combined modelling of the physical energy systems with markets and policy instruments. Thus this project has a truly interdisciplinary nature. The major part of the research will be concentrated on addressing the gas supply side on conditioning of RE gases and operation of the gas grid in combination with the demand side (CHP, industry and transport) all in a system context, on developing the gas dimension in advanced system modelling and, finally, on identifying the required policy and market structures for a successful implementation. Thus the overall vision of FutureGas is to pave the way for effective and cost-efficient transition to an energy system independent of fossil fuels, ensuring a strong integration of gas with the entire energy system, an economically optimal conversion to renewable gases substituting natural gas in the long run and good access to gas markets for a wide range of gas producing technologies.

Department of Management Engineering
Systems Analysis
Energy Systems Analysis
Management Science
Operations Research
Energy Economics and Regulation
Novo Nordisk Foundation Center for Biosustainability
Aarhus University
Chalmers University of Technology
University of Exeter
Florence School of Regulation - European University Institute
Delft University of Technology
Danish Gas Technology Centre A/S
HMN Naturgas
Danish Energy Association
Dansk Gas Distribution
NGF Nature Energy
RAM-lose
EA Energy Analysis A/S
Hydrogen Denmark
PlanEnergi
Energinet.dk

Danish Energy Agency
Period: 01/02/2016 → 31/01/2020
Number of participants: 10
Project ID: 82524
Number of related Ph.D. students: 4
Project participant:
Pisinger, David (Intern)
Wiese, Frauke (Intern)
Sadegh, Negar (Intern)
Aryal, Nabin (Intern)
Phd Student:
Nielsen, Lise Skovsgaard (Intern)
Pedersen, Rasmus Bo Bramstoft (Intern)
Amirkhizi, Tara Sabbagh (Intern)
Buchholz, Stefanie (Intern)
Project Manager, academic:
Morthorst, Poul Erik (Intern)
Münster, Marie (Intern)
Financing sources
Source: Other public support (public)
Name of research programme: Innovation Fund Denmark

Forundersøgelser i Qaanaaq
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions
Section for Geotechnics and Geology
Period: 01/02/2016 → 01/05/2018
Number of participants: 3
Project participant:
Ingeman-Nielsen, Thomas (Intern)
Foged, Niels Nielsen (Intern)
Project Manager, academic:
Hendriksen, Kåre (Intern)

Advanced Waterflooding -rock mechanics and fluid saturation
Department of Civil Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student:
Meireles, Leonardo Teixeira Pinto (Intern)
Supervisor:
Welch, Michael (Intern)
Main Supervisor:
Fabricius, Ida Lykke (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Application of Architectures in SME's
Department of Mechanical Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student:
Rask, Lars Christian (Ekstern)
Supervisor:
Hvam, Lars (Intern)
Vestergaard, Jørn (Ekstern)
Main Supervisor:
Mortensen, Niels Henrik (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Atomistic Mechanisms of Functional Molecules
Department of Chemistry
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student:
Abedi, Mostafa (Intern)
Supervisor:
Henriksen, Niels Engholm (Intern)
Pápai, Mátyás Imre (Intern)
Main Supervisor:
Møller, Klaus Braagaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Computational Fluid Dynamics Simulations of electroosmotic phenomena
Department of Environmental Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student:
Aschmoneit, Fynn Jerome (Intern)
Supervisor:
Yde, Lars (Ekstern)
Main Supervisor:
Hélix-Nielsen, Claus (Intern)

Financing sources
Source: Internal funding (public)
Cryogenic Single and Array Coils for Magnetic Resonance Systems

Department of Electrical Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
PhD Student:
Johansen, Daniel Højrup (Intern)
Supervisor:
Ardenkjær-Larsen, Jan Henrik (Intern)
Laustsen, Christoffer (Ekstern)
Main Supervisor:
Zhurbenko, Vitaliy (Intern)

Financing sources
Source: Internal funding (public)

CT metal artifact reduction using MRI for radiotherapy

Department of Applied Mathematics and Computer Science
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
PhD Student:
Nielsen, Jonathan Scharff (Intern)
Supervisor:
Edmund, Jens Morgenthaler (Intern)
Main Supervisor:
Van Leemput, Koen (Intern)

Financing sources
Source: Internal funding (public)

Development of an electrochemical method to remove nitrate in RAS (Electro-nitrate) (39327)
This project is done in collaboration with two industrial partners, testing the nitrate removal potential of an innovative technique applied to aquaculture.

Nitrate is a dissolved N-waste product from fish production in recirculating aquaculture systems (RAS). The amount and concentration of nitrate in the effluent are determined by the daily feeding, biological filtration and the feed loading (kg feed pr. m³ water exchange) among others.

Discharged nitrate is a main factor affecting the recipient hence important to reduce in order to obtain sustainable production in RAS.

As an alternative to denitrification, electrochemical reduction of nitrate to N₂ is considered in this project. Electrochemical water treatment rely on physio-chemically controlled redox processes that includes a flow cell with two electrodes connected to an external current source This aim of this project is preliminary test and screening of different types of electrode material and combinations and investigate factors affecting removal capacity. The effect of current density, flow rates, substrate concentrations and pH on nitrate removal will be tested and removal capacity will be evaluated.

This project is coordinated by DHI.

The project is funded by Innovation Network for Environmental Technologies (Inno-MT), Danish Agency for Science, Technology and Innovation.

National Institute of Aquatic Resources
Section for Aquaculture
DHI Denmark
Aquapri
Electrocell
Period: 01/02/2016 → 31/12/2016
Number of participants: 2
Research area: Aquaculture
Project participant:
Pedersen, Lars-Flemming (Intern)
Pedersen, Per Bovbjerg (Intern)

Dynamic optimization of total value and environmental performance: Use of real time property data for improved Facilities Management
Department of Management Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 6
Phd Student:
Maslesa, Esmir (Intern)
Supervisor:
Birkved, Morten (Intern)
Bolwig, Simon (Intern)
Hauschild, Michael Zwicky (Intern)
Hultén, Jannik (Ekstern)
Main Supervisor:
Jensen, Per Anker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Efficient and innovative fish production via best available technology (RAS2020) (39328)
This project includes a full scale test and development of a conceptual recirculating aquaculture system (RAS) for king fish production. The innovative aspect of this modular RAS2020 concept regards the design—a one unit circular module designed to have a 1200 MT/Y capacity.

The aim of this project is to build and develop a RAS unit with small footprint, low cost and reduced construction time. The RAS2020 unit includes state of the art treatment units (Hydrotech drumfilters, Krüger biofilters—nitrification and denitrification) and is built with flexible interconnected rearing sections. When the RAS2020 is built and stocked with kingfish, an extended sampling and monitoring program will be performed in order to assess system performance in particular N, P and organic matter removal.

This project is coordinated by Sashimi Royal.
The project is funded by the Danish Environmental Protection Agency.

National Institute of Aquatic Resources
Section for Aquaculture
Sashimi Royal
Aqua-Partners Aps
Dansk Akvakultur
Period: 01/02/2016 → 31/12/2018
Number of participants: 7
Research area: Aquaculture
Project participant:
Pedersen, Lars-Flemming (Intern)
Pedersen, Per Bovbjerg (Intern)
Electrochemical Zone for Degradation of Chlorinated Solvents in Aquifers

Department of Civil Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student: Hyldegaard, Bente Højlund (Intern)
Supervisor: Jakobsen, Rasmus (Intern)
Main Supervisor: Ottosen, Lisbeth M. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Facilitation for production of coated X-Ray mirror plates

National Space Institute
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student: Massahi, Sonny (Intern)
Supervisor: Collon, Maximilien J. (Ekstern)
Hornstrup, Allan (Intern)
Main Supervisor: Christensen, Finn Erland (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Fermentation of Synthesis Gas and Design of Bioreactors

Department of Chemical and Biochemical Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student: Asimakopoulos, Konstantinos (Intern)
Supervisor: Gavala, Hariklia N. (Intern)
Main Supervisor: Skiadas, Ioannis V (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD
Highly Sensitive Magnetic Sensing of Neural Activity
Department of Electrical Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student: Karadas, Mürsel (Intern)
Supervisor: Andersen, Ulrik Lund (Intern)
Hanson, Lars G. (Intern)
Main Supervisor: Thielscher, Axel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Forskningsrådsfinansiering
Project: PhD

Limits of lubrication in severe stamping operations
Department of Mechanical Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 5
Phd Student: Moghadam, Marcel (Intern)
Supervisor: Bay, Niels Oluf (Intern)
Christiansen, Peter (Intern)
Møller, Per (Ekstern)
Main Supervisor: Nielsen, Chris Valentin (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

MHC-directed expansion of antigen responsive T cells
National Veterinary Institute
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student: Rafa, Vibeke Mindahl (Intern)
Supervisor: Donia, Marco (Ekstern)
Main Supervisor: Hadrup, Sine Reker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Microproportioning with crushed sand: experiment and simulations of fine particles effect on rheology
Department of Mechanical Engineering
Period: 01/02/2016 → 17/11/2016
Number of participants: 4
Phd Student: Ramenskiy, Evgeny (Ekstern)
Supervisor:
Next generation sepsis diagnosis

Sepsis is a potentially fatal condition that arises when the body’s response to an infection damages its own tissues and organs. It is mainly caused by bacteria and fungi, which spread through the blood circulation. It is one of the biggest public health issues in the EU and worldwide due to its high incidence, mortality, human and economic cost. Early diagnosis is crucial to the management of sepsis, as every hour of delay of appropriate antibiotic therapy increases mortality by 5-10%. Unfortunately, sepsis diagnosis remains one of the greatest clinical challenges in critical care. Current diagnostic methods, including blood culture and different nucleic acid based multiplex technologies, are impaired by the significant time-delay of 1-2 days and/or low sensitivity of 30-50%. Hence there is an urgent need to develop new diagnostic tools that can provide more accurate and earlier sepsis diagnosis, so that patients with sepsis can be administered with rapid and
correct initial antimicrobial treatment. The SMARTDIAGNOS project will advance sepsis diagnosis by simplifying clinical sample analysis methods and integrating the currently required numerous steps into a single streamlined device. This will be achieved by combining a number of innovative technologies: 1) 3-dimensional sample concentration to process large amount of raw sample; 2) direct PCR in the 3D microstructure to circumvent DNA extraction step; 3) solid-phase PCR to achieve unlimited multiplexing capability; 4) supercritical angle fluorescence (SAF) micro lenses array for enhanced fluorescence detection and precise quantification of sepsis-related pathogens.

The SMARTDIAGNOS system will go beyond the state of the art for shorter time (1-3 h), higher sensitivity (95%), higher selectivity (99%), multiplexing capability, antimicrobial resistance profiling, and automation. Fast and correct sepsis diagnosis will improve patient outcome, shorten intensive care stay and thus reduce health costs.

Department of Micro- and Nanotechnology

BioLabChip
Period: 01/02/2016 → 31/01/2020
Number of participants: 2
Acronym: Smartdiagnos
Project Manager, organisational: Christiansen, Mette (Intern)
Project Coordinator: Wolff, Anders (Intern)

Nonlinear integrated photonics
Department of Photonics Engineering
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student: Stassen, Erik (Intern)
Supervisor: Galili, Michael (Intern)
Pu, Minhao (Intern)
Main Supervisor: Yvind, Kresten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Novel methods to quantify health in benefit risk assessment. A case study on fish
National Food Institute
Period: 01/02/2016 → 31/01/2019
Number of participants: 4
Phd Student: Persson, Inez Maria (Intern)
Supervisor: Pires, Sara Monteiro (Intern)
Poulsen, Morten (Intern)
Main Supervisor: Nauta, Maarten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

PhD project in Drone Video Communication
Department of Photonics Engineering
**Plantwide Monitoring and Control of Biochemical Processes**

Department of Chemical and Biochemical Engineering  
Period: 01/02/2016 → 31/10/2019  
Number of participants: 3  
Phd Student:  
Hossain, Kabir (Intern)  
Supervisor:  
Berger, Michael Stübert (Intern)  
Main Supervisor:  
Forchhammer, Søren (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

**Silicon Photonic Integrated Devices for Space Division Multiplexing**

Department of Photonics Engineering  
Period: 01/02/2016 → 31/01/2019  
Number of participants: 4  
Phd Student:  
Baumann, Jan Markus (Intern)  
Supervisor:  
Ding, Yunhong (Intern)  
Morioka, Toshio (Intern)  
Main Supervisor:  
Frandsen, Lars Hagedorn (Intern)  

Financing sources  
Source: Internal funding (public)  
Name of research programme: Grundforskningsfonden  
Project: PhD

**Statistical Tools for Cybersecurity**

Department of Applied Mathematics and Computer Science  
Period: 01/02/2016 → 31/01/2019  
Number of participants: 3  
Phd Student:  
Vejre, Philip Søgaard (Intern)  
Supervisor:  
Knudsen, Lars Ramkilde (Intern)  
Main Supervisor:  
Bogdanov, Andrey (Intern)  

Financing sources
Synthetic biology solutions to phenotypic instability in cell factory engineering

Technical University of Denmark
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student: Sarup-Lytzen, Kira (Intern)
Supervisor: Nielsen, Alex Toftgaard (Intern)
Main Supervisor: Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Two-dimensional nanomaterial composites for flexible energy storage and conversion devices

Department of Chemistry
Period: 01/02/2016 → 31/01/2019
Number of participants: 3
Phd Student: Cao, Xianyi (Intern)
Supervisor: Chi, Qijin (Intern)
Main Supervisor: Duus, Jens Øllgaard (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Valorization of red seaweed biomasses towards future sustainability (VALSEA), Multiextraction of Bioactive Compounds from Macroalgae

National Food Institute
Period: 01/02/2016 → 21/03/2019
Number of participants: 3
Phd Student: Naseri, Alireza (Intern)
Supervisor: Holdt, Susan Løvstad (Intern)
Main Supervisor: Jacobsen, Charlotte (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Establishing Next Generation sequencing Ability for Genomic analysis in Europe.

National Food Institute
Research Group for Genomic Epidemiology
Management of mussel fishery in Horsens Fjord and Lillebælt (39338)

It is the main aim of the project to the scientific basis for managing mussel fishery in two Natura 2000 areas: H52 Horsens Fjord and H96 Lillebælt with focus on the key ecosystem components eelgrass and macro algae. Based on detailed mapping of eelgrass beds, occurrence of macro algae and composition sampled using video transects, sampling by diver of macro algae and sediment sampling maps of eelgrass and macro algae are created. The data will also serve as input to a GIS model of potential recovery of eelgrass based on several different layers of information, e.g. sediment characteristics, shear stress (from hydro dynamic modelling), presence of eelgrass etc. Maps and models will serve as input to management in relation to permits to dredging for mussels in Natura 2000 areas according to guidelines in the Danish mussel policy. As a specific, additional activity it will be tested if drones can be used to map eelgrass beds. This will be performed in collaboration with DTU Space.

This project is coordinated by DTU Aqua.

The project is funded by the Ministry of Environment and Food of Denmark and the European Marine and Fisheries Fund (EMFF).

Development of new tools to assess the environmental effects of fishing (TASSEEF) (39371)

The project aims to develop new knowledge about the indirect effects on the marine environment of fishing dredgers, in particular to develop new tools and methods at the level of entire basins to establish new knowledge about fishing effects. The primary outcome of the project will be new tools for the management of shellfish fisheries in the Limfjorden.

Specifically, it will be possible to establish:
- protection zones around eelgrass.
- ecosystem services that mussel fishing supplies in very nutrient-enriched regions.
- development of the scientific basis for the management of fisheries in coastal areas – mussel translocation/relaying.
- perennity of the tools.

The project is coordinated by DTU Aqua.

The project is funded by Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).
Danish Shellfish Centre
National Centre for Environment and Energy, Aarhus University
Danish Meteorological Institute
Association of Mussel Producers
Limfjorden Fishermen Organization
Period: 18/01/2016 → 04/08/2018
Number of participants: 6
Research area: Shellfish and seaweed
Project participant:
Møller, Lene Friis (Intern)
Barreau, Pascal David Alain (Intern)
Bak, Finn (Intern)
Veicherts, Martin (Intern)
Project Manager, academic:
Saurel, Camille (Intern)
Project Coordinator:
Petersen, Jens Kjerulf (Intern)

Digital infrastructure and Building Information Models in the design and planning of building services
Department of Civil Engineering
Period: 15/01/2016 → 14/01/2019
Number of participants: 4
Phd Student:
Rasmussen, Mads Holten (Intern)
Supervisor:
Hviid, Christian Anker (Intern)
Vendelboe, Morten Vammen (Intern)
Main Supervisor:
Karlshøj, Jan (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD

Relations
Activities:
The Future of Lean Design Management
11th European Conference on Product and Process Modelling
Vidensmodeller - BIM er meget mere end 3D-geometri
Proposing a Central AEC Ontology That Allows for Domain Specific Extensions
The 34th CIB W78 Information Technology for Construction Conference
Gæsteforelæsning ved Technion
LDAC2016 – 4th Linked Data in Architecture and Construction Workshop
Guest lecture at Ecole des Mines de Saint-Etienne
BIM in the industry
Ghent University
Technion-Israel Institute of Technology
Ecole des Mines de Saint-Etienne
Project: PhD

Gut-microbiome-brain-axis signaling affecting pro-inflammatory cues and energy metabolism
Department of Systems Biology
Period: 15/01/2016 → 14/01/2019
Number of participants: 4
Phd Student:
Arora, Pankaj (Intern)
Supervisor:
Kristiansen, Karsten (Ekstern)
Workman, Christopher (Intern)
Main Supervisor:
Pedersen, Susanne Brix (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Loading of microcontainers for oral drug delivery
Department of Micro- and Nanotechnology
Period: 15/01/2016 → 14/01/2019
Number of participants: 3
Phd Student:
Mazzoni, Chiara (Intern)
Supervisor:
Marizza, Paolo (Intern)
Main Supervisor:
Boisen, Anja (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Optimization of processes, yield and biomass composition in large scale macroalgal cultivation in open ocean environments
National Food Institute
Period: 15/01/2016 → 14/01/2019
Number of participants: 4
Phd Student:
Grandorf Bak, Urd (Intern)
Supervisor:
Gregersen, Olavur (Ekstern)
Holdt, Susan Levstad (Intern)
Main Supervisor:
Jacobsen, Charlotte (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Transciptional and post-translational control of T lymphocytes
National Veterinary Institute
Period: 15/01/2016 → 14/01/2019
Number of participants: 3
Phd Student:
Rizk, John (Intern)
Supervisor:
Agace, William Winston (Intern)
Main Supervisor:
Fastsættelse af baggrunds niveau for total fluor i emballager af pap og papir

Til brug for FVST’s fastsættelse af en vejledende national grænseværdi for total fluor i emballager af pap og papir skal niveauet af total fluor i sådanne materialer bestemmes.

National Food Institute
Division of Risk Assessment and Nutrition
Period: 12/01/2016 → 31/12/2017
Number of participants: 1
Project participant:
Pedersen, Gitte Alsing (Intern)

Management plan for development of sustainable fisheries for blue mussels, cockles and oysters in the Danish Wadden Sea (39357)

The aim of this project is to develop options for a sustainable fishery for blue mussels, oysters and cockles in the Wadden Sea both within and outside the Natura 2000 site. This is achieved by estimation of stock sizes of blue mussels, cockles and Pacific oysters within the Natura 2000 site as well as cockles and razor clams in relevant fishing areas outside Natura 2000 site. Furthermore, new and more cost-effective methods for monitoring each target species will be developed and tested. Finally, a management plan for sustainable fishing for mussels, cockles and oysters in the Wadden Sea will be provided.

The effect of the project will be that within 3 years, one or more sustainable fisheries for mussels, cockles and oysters will be initiated in the Wadden Sea, as well as a scientific documentation of important fishing grounds for shellfish is provided to counter potential closures of significant areas for shellfish fishing due to spoil dumping. In addition, new and more cost-effective methods for stock assessments will be developed. In conclusion, this will result in a scientific based management of the shellfish fishery in the Wadden Sea, which will be beneficial for the shellfish fishery.

The project is coordinated by DTU Aqua.

The project is funded by Ministry of Environment and Food of Denmark and the European Maritime and Fisheries Fund (EMFF).

National Institute of Aquatic Resources
Danish Shellfish Centre
National Space Institute
Fiskeriselskabet Cardium
Period: 11/01/2016 → 14/07/2018
Number of participants: 3
Research area: Shellfish and seaweed
Project participant:
Petersen, Jens Kjerulf (Intern)
Nielsen, Mette Møller (Intern)
Project Coordinator:
Nielsen, Pernille (Intern)

CSP (Concentrated Solar Power) plant with biomass heat and power plant and ORC system

Preparation and validation of a simulation model of the CSP (Concentrated Solar Power) plant with biomass heat and power plant and ORC system in Brønderslev. Analyses of measurements from the system in Brønderslev, and calculations with the developed model with the aim to optimize the system design and the control strategy of the plant.

Department of Civil Engineering
Section for Building Energy
Spatial release from masking in complex acoustical scenes and the effect of hearing aid processing

Department of Electrical Engineering
Hearing Systems
Period: 04/01/2016 → 04/07/2016
Number of participants: 5
Speech intelligibility, Spatial Hearing, Spatial Release from Masking
Project participant:
Löw, Vera (Ekstern)
Supervisor:
Westermann, Adam (Ekstern)
Marschall, Marton (Intern)
Cubick, Jens (Intern)
Main Supervisor:
Dau, Torsten (Intern)

Experimental analysis of heat transfer and pressure drop using zeotropic mixtures in plate heat exchangers for low-grade heat to power conversion

Department of Mechanical Engineering
Thermal Energy
Alfa Laval
University of Bayreuth
Period: 01/01/2016 → 31/12/2018
Number of participants: 2
Project participant:
Zhang, Ji (Intern)
Project Manager, organisational:
Haglind, Fredrik (Intern)

Microbiota and cow's milk tolerance
Cow's milk allergy is a health problem of growing concern for which reason efficient strategies for the prevention is urgently needed. In recent years it has been demonstrated that the gut microbiota composition influences the development of allergy. However, our knowledge about how the microbiota composition influences the sensitising or tolerance inducing capacities of the food is only scarcely described. The objectives of this project are: (1) to increase our knowledge about the interplay between food proteins and the gut microbiota, and how this interplay impact on induction of cow's milk allergy versus tolerance, and (2) in a broader perspective to gain knowledge about mechanisms influenced by microbiota, which drives the immune system towards allergy or tolerance.

Intact whey, which is one fraction of cow's milk often used for infant formula, and enzymatic hydrolysed products hereof, used for hypoallergic infant formulas, will used as model protein ingredients. The interplay between whey-based ingredients and the gut microbiota will be investigated in in vitro fermentation studies based on faecal samples from food allergic and healthy infants, as well as in animal studies in which the gut microbiota is manipulated by antibiotics treatment. Microbial composition will be analysed by 16S rRNA gene sequencing in combination with quantitative real-time PCR. The allergy or tolerance inducing capacity of the different whey-based ingredients and the influence of the gut microbiota composition will be analysed by evaluating different serological and cell based end-points. Appropriate
functional in vitro, in vivo and ex vivo assays will be applied to investigate the mechanism by which the gut microbiota and metabolites hereof impact on directing the immune system towards allergy or tolerance.

National Food Institute
Research Group for Gut Microbiology and Immunology
Arla Foods Ingredients Group P/S
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Milk allergy, tolerance, infant formulas, gut microbiota
Number of related Ph.D. students: 1
Project participant:
Graversen, Katrine (Intern)
Licht, Tine Rask (Intern)
Bahl, Martin Iain (Intern)

Project Manager, academic:
Bagh, Katrine Lindholm (Intern)

Right operation of buildings with respect to indoor climate and energy consumption
The ambition of the project is to reduce the gap between the possible low energy consumption together with a good indoor climate and the actual state in buildings. The project will continue and follow up on previous projects concerning “EiSE”. Commissioning will be addressed with focus on the collaboration between project and operation departments. Concepts from Facility management will be included. However, both Commissioning and Facility management are mostly kept at a clarification and description level. Best practice of current technology will be described together with system interactions and building dynamics and general more intelligent use of online data. The cases are in the sectors of shopping centers, office buildings and to some extend municipality buildings. In the latter case the focus will be on the people who actually on a daily basis in situ are operating and monitoring the systems.
The knowhow obtained will be included in the education of civil engineers and marine engineers (maskinmestre). Furthermore vocational training of “ground floor personal” will be included. In the cases the present situation is described, actions are undertaken and the impact on energy consumption and indoor climate are registered and analysed.

Department of Civil Engineering
Section for Building Energy
Period: 01/01/2016 → 31/12/2017
Number of participants: 2
Acronym: EnDRIn
Number of related Ph.D. students: 0
Project participant:
Kolarik, Jakub (Intern)
Christensen, Jørgen Erik (Intern)

seasonal heat storage in Denmark
Measurements and experience from water pits and borehole heat storages are gained

Department of Civil Engineering
Section for Building Energy
PlanEnergi
Period: 01/01/2016 → 31/07/2018
Number of participants: 1
seasonal heat storage, water pit, borehole heat storage
Project participant:
Furbo, Simon (Intern)

IEA Task 46 Solar resource assessment and forecasting
Solar radiation in a solar collector field in Høje Tåstrup is measured and analysed. Thermal performances of solar collector fields are calculated with solar radiation measured in the period 2001-2010 for different locations in Denmark. Detailed solar radiation models for the diffuse radiation are developed.
Department of Civil Engineering
Section for Building Energy
Danish Meteorological Institute
Period: 01/01/2016 → 31/12/2016
Number of participants: 2
solar radiation, diffuse radiation
Acronym: IEA Task 46
Project participant:
Furbo, Simon (Intern)
Andersen, Elsa (Intern)

Evaluation of brewer's spent grains as raw material for a biorefinery: production of energy and value-added products
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology
Universidad de Jaen
Period: 01/01/2016 → …
Number of participants: 1
Number of related Ph.D. students: 1
Project participant:
Mussatto, Solange I. (Intern)

Pilot installation of hybrid solar collectors in district heating plants
A combined tracking concentrating and flat plate collector will be developed and tested experimentally. A solar collector row with the developed solar collector will be installed in Sæby solar heating plant. the thermal performance of the collector row will be measured and compared to the thermal performance of normal flat plate collectors.
Department of Civil Engineering
Section for Building Energy
PolyCSP ApS
Sæby Varmeværk amba
Period: 01/01/2016 → 31/12/2017
Number of participants: 3
solar collector, solar heating plant
Project participant:
Furbo, Simon (Intern)
Perers, Bengt (Intern)
Kong, Weiqiang (Intern)

IEA Task 54 Price reduction of solar thermal systems
Investigations on solar heating systems with the aim to reduce the price of the systems. Both solar domestic hot water systems and combined systems for space heating and domestic hot water supply are considered.
Department of Civil Engineering
Section for Building Energy
SolarKey Int.
Period: 01/01/2016 → 31/12/2017
Number of participants: 3
Solar heating systems, low flow systems, SDHW systems, Solar combi systems
Acronym: IEA Task 54
Project participant:
Furbo, Simon (Intern)
Valorization of red seaweed biomasses towards future sustainability (VALSEA), Multiextraction of Bioactive Compounds from Macroalgae

The aim of this applied research project is to better utilize the valuable compounds in seaweed and thereby achieve a higher return, since at present, Danish and international companies only extract specific stabilizing agents/ingredients from seaweed for use in various food and consumer products, and several valuable compounds go to waste. In this project the National Food Institute will use its expertise within seaweed research in cooperation with four Danish companies; CP Kelco, GEA Niro, Third Wave Nutrition and Nordisk Tang by Endelave. Not only carrageenan or furcellaran as single extraction, but a future multi-extraction of valuable proteins, natural food colours and antioxidants will turn waste into value, to be used in e.g. protein shakes.

The research include the entire value chain from the extraction, drying of the extracted products such as protein, testing and application for ready products, and includes red seaweed species to be researched such as: Eucheuma spinosum, Furcellaria lumbricalis and Palmaria palmata for their different compositions and applications.

DTU Food partners are Charlotte Jacobsen, Susan L. Holdt and Alireza Naseri

National Food Institute

Research Group for Bioactives – Analysis and Application
Period: 01/01/2016 → 31/12/2019
Number of participants: 3
Acronym: VALSEA
Project participant:
Naseri, Alireza (Intern)
Project Manager, academic:
Jacobsen, Charlotte (Intern)
Project Coordinator:
Holdt, Susan Løvstad (Intern)

Relations
Related projects:
Valorization of red seaweed biomasses towards future sustainability (VALSEA), Multiextraction of Bioactive Compounds from Macroalgae
Project

3D imaging center

Department of Physics

Neutrons and X-rays for Materials Physics

Department of Applied Mathematics and Computer Science

Image Analysis & Computer Graphics

Department of Energy Conversion and Storage

Imaging and Structural Analysis

Electrofunctional materials

Centre for oil and gas – DTU
Period: 01/01/2016 → 01/01/2021
Number of participants: 14
Project participant:
Dahl, Anders Bjorholm (Intern)
Oddershede, Jette (Intern)
Trinderup, Camilla Himmelstrup (Intern)
Simonsen, Søren Bredmose (Intern)
Zheng, Yi (Intern)
Brink, Bastian (Intern)
Lauridsen, Torsten (Ekstern)
Relations

Related projects:

Alliance for Imaging and Modelling of Energy Applications

Publications:

- Graphite nodules in fatigue-tested cast iron characterized in 2D and 3D
- In-Situ X-ray Tomography Study of Cement Exposed to CO$_2$ Saturated Brine
- Crack Tip Flipping under Mode I Tearing: Investigated by X-Ray Tomography
- Powder embossing method for selective loading of polymeric microcontainers with drug formulation
- High-Performance Microchanneled Asymmetric Gd$_{0.1}$Ce$_{0.9}$O$_{1.95-\delta}$-La$_{0.6}$Sr$_{0.4}$FeO$_{3-\delta}$-Based Membranes for Oxygen Separation
- Characterization of graphite nodules in thick-walled ductile cast iron
- Surface Detection using Round Cut
- Microstructure and micromechanics of the heart urchin test from X-ray tomography
- Synthesis and characterization of Fe–Ni/γ-Al$_2$O$_3$ egg-shell catalyst for H$_2$ generation by ammonia decomposition

Global sewage surveillance project

The project will serve as proof-of-concept for applying metagenomic approaches, which could initiate a global surveillance of human infectious diseases including antimicrobial resistance from sewage collected in major cities around the world to detect, control, prevent and predict human infectious diseases.

Along with The National Food Institute, DTU (WHO Collaborating Centre and European Union Reference Laboratory for Antimicrobial Resistance in Foodborne Pathogens), several other partners from COMPARE are involved in this joint study with WHO, including Erasmus MC, The Netherlands, and National Institute for Public Health and the Environment, RIVM (WHO Collaborating Centre for Risk Assessment of Pathogens in Water and Food).

National Food Institute

Research Group for Genomic Epidemiology

National Institute for Public Health and the Environment (RIVM)BilthovenThe Netherlands

Erasmus Medical Center

World Health Organization

Period: 01/01/2016 → ...
Number of participants: 2
Project participant:

Hendriksen, Rene S. (Intern)

Project Manager, organisational:

Aarestrup, Frank Møller (Intern)

Project

Multi-modal, Endoscopic Biophotonic Imaging of Bladder Cancer for Point-of-Care Diagnosis

Department of Photonics Engineering

Diode Lasers and LED Systems

Period: 01/01/2016 → 31/12/2020
Number of participants: 4
Acronym: MIB
Project participant:
Marti, Dominik (Intern)
Hansen, Anders Kragh (Intern)
Jensen, Ole Bjarlin (Intern)
Project Manager, academic:
Andersen, Peter E. (Intern)

Relations
Press / Media items:
Innovative Treatment & Frontline Research: Dept. of Urology, Herlev & Gentofte University Hospital

Project

Reapportering af nationale overvågningsdata til den Europæiske Fødevaresikkerhedsautoritet, EFSA
National Food Institute
Division of Risk Assessment and Nutrition
Division of Epidemiology and Microbial Genomics
Fødevarestyrelsen (FVST)
Landbrug og Fødevarer
SEGES Cattle
Danmarks Statistik
Period: 01/01/2016 → ...
Number of participants: 1
Project participant:
Christensen, Julia (Intern)

Annual Report on Zoonoses in Denmark
National Food Institute
Division of Risk Assessment and Nutrition
Division of Food Production Engineering
Section for Diagnostics and Scientific Advice
Division of Toxicology and Risk Assessment
Fødevarestyrelsen (FVST)
Landbrug og Fødevarer
SEGES Cattle
Statens Serum Institut
Danmarks Statistik
SEGES Pig Research Center
Period: 01/01/2016 → ...
Number of participants: 1
Project participant:
Christensen, Julia (Intern)

Case by case -salmonella og campylobacter i DK og importered kød
National Food Institute
Division of Risk Assessment and Nutrition
Period: 01/01/2016 → ...
Number of participants: 1
Project participant:
**High Temperature Superconducting Bolometer**

Department of Energy Conversion and Storage  
Electrofunctional materials  
Department of Physics  
Quantum Physics and Information Technology  
Department of Photonics Engineering  
**Period:** 01/01/2016 → 31/08/2016

**Number of participants:** 3  
**Superconductor**

**Supervisor:**  
Jepsen, Peter Uhd (Intern)

**Main Supervisor:**  
Wulff, Anders Christian (Intern)

**SOFC stack project**

Department of Energy Conversion and Storage  
Electrofunctional materials  
**Period:** 01/01/2016 → 31/12/2016

**Number of participants:** 1  
**Project participant:**  
Wulff, Anders Christian (Intern)

**PROMOTioN - PROgress on Meshed HVDC Offshore Transmission Networks**

The goal of the PROMOTioN project is to develop and demonstrate three key Technologies: diode rectifier offshore converters; multi-vendor high-voltage direct current (HVDC) grid protection system and the full power testing of HVDC circuit breakers. Furthermore, a regulatory and financial framework will be developed for the coordinated planning, construction and operation of integrated offshore infrastructures, including an offshore grid deployment plan (roadmap) for the future offshore grid system in Europe.

DTU is mainly involved in R&D on the first technology using diode rectifiers as offshore converters. DTU leads a work package on Wind turbine - converter interaction studies and a work package on harmonization towards standards and best practices. DTU is also involved in several other work packages.

**Department of Wind Energy**

**Integration & Planning**

**Period:** 01/01/2016 → 31/12/2019

**Number of participants:** 6  
**Acronym:** PROMOTioN

**Project ID:** H2020 Grant Agreement-691714

**Project participant:**
Cutululis, Nicolaos Antonio (Intern)  
Sørensen, Poul Ejnar (Intern)  
Göksu, Ömer (Intern)  
Altin, Müfit (Intern)  
Phd Student:  
Saborío-Romano, Oscar (Intern)  
Bidadfar, Ali (Intern)

**Relations**

**Related projects:**
Control and stability of meshed offshore grids with diode rectifiers and VSC HVDC  
Control and operation of offshore wind power plants connected via HVDC
Publications:
Connection of OWPPs to HVDC networks using VSCs and Diode Rectifiers: an Overview

Project

**Mobilitetspotentiale for Aarhus Letbane**
Department of Management Engineering
Management Science
Transport DTU
Operations Management
Operations Research
Office for Finance and Accounting
Period: 01/01/2016 → 01/01/2017
Number of participants: 5
Project participant:
Barfod, Michael Bruhn (Intern)
Kronbak, Jacob (Intern)
Larsen, Rune (Intern)
Pedersen, Thomas Ross (Intern)
Olsen, Allan (Intern)

Project

**OASIS+ / Open access catastrophe modelling driving adaptation to enable resilience in an uncertain future**
Department of Management Engineering
Systems Analysis
DTU Climate Centre
Period: 01/01/2016 → …
Number of participants: 3
Project participant:
Larsen, Morten Andreas Dahl (Intern)
Halsnæs, Kirsten (Intern)
Drews, Martin (Intern)

Project

**Optimisation of biodevice production**
Master project
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Scandinavian Micro Biodevice ApS
Period: 01/01/2016 → 04/06/2016
Number of participants: 3
Project participant:
Rabel, Mads Peter (Ekstern)
Supervisor:
Thyregod, Camilla (Intern)
Main Supervisor:
Clemmensen, Line Katrine Harder (Intern)

Project

**Role of technologies in an Energy Efficient Economy – Model-based analysis of policy measures and transformation pathways to a sustainable energy system**
Department of Management Engineering

Systems Analysis

DTU Climate Centre
Period: 01/01/2016 → 01/07/2019
Number of participants: 4
Acronym: REEEM
Project participant:
Larsen, Morten Andreas Dahl (Intern)
Karlsson, Kenneth Bernard (Intern)
Drews, Martin (Intern)
Balyk, Oleksandr (Intern)

New Thermoelectric Materials

Department of Energy Conversion and Storage

Electrofunctional materials
Period: 01/01/2016 → …
Number of participants: 1
Acronym: NeTeMa
Project Coordinator:
Van Nong, Ngo (Intern)

Thermal Energy Storage - Lab-Scale prototype

Large quantities of thermal energy – both per weight and price - can be stored reversibly in many salts upon ab-/desorption of water or ammonia. The project is to develop thermochemical heat storage (TCS) system based on NH3 ab/desorption in metal halides. We target for this lab-scale prototype a storage capacity of 1 MJ (2.5 kg NH3) based first on existing mixed metal salts (e.g. SrBaCl2), to demonstrate the system feasibility and document the actual efficiency of the different components and test the mechanical and structural properties of the system during multiple cycles.

Department of Energy Conversion and Storage

Atomic scale modelling and materials
Period: 01/01/2016 → 01/01/2018
Number of participants: 1
Thermal Energy Storage, Thermo chemical energy storage, ammonia
Acronym: TES
Project participant:
Blanchard, Didier (Intern)

High Efficiency Thermoelectric Module

Department of Energy Conversion and Storage

Electrofunctional materials
Period: 01/01/2016 → …
Number of participants: 1
Acronym: HiTEM
Project Coordinator:
Van Nong, Ngo (Intern)

Green Region for Electrification and Alternative fuels for Transport

Department of Transport

Transport policy and behaviour
Traffic modelling and planning

Region Skåne
Period: 01/01/2016 → 31/03/2019
Number of participants: 2
Acronym: GREAT
Number of related Ph.D. students: 0
Project participant:
Nielsen, Thomas Alexander Sick (Intern)
Cherchi, Elisabetta (Intern)

LipoFINE - Yarrowia lipolytica as a platform cell factory for fine chemicals
The project is financed by the Novo Nordisk Foundation. Grant area: Biotechnology-based Synthesis and Production Research. Grant ID: NNF15OC0016592.

Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering
Period: 01/01/2016 → 31/12/2018
Number of participants: 2
Acronym: LipoFINE
Project participant:
Borodina, Irina (Intern)
Kildegaard, Kanchana Rueksomtawin (Intern)

Additive Manufacturing of Fibre-Reinforced Polymers
Department of Mechanical Engineering
Period: 01/01/2016 → 27/05/2019
Number of participants: 4
PhD Student:
Hofstätter, Thomas (Intern)
Supervisor:
Hansen, Hans Nørgaard (Intern)
Tosello, Guido (Intern)
Main Supervisor:
Tosello, Guido (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Biocover systems for greenhouse gas mitigation at landfills
Department of Environmental Engineering
Period: 01/01/2016 → 31/12/2018
Number of participants: 3
PhD Student:
Olesen, Andreas Ole Urup (Intern)
Supervisor:
Scheutz, Charlotte (Intern)
Main Supervisor:
Kjeldsen, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
**Biomass Particle Morphology and Combustion Properties**

Department of Chemical and Biochemical Engineering  
Period: 01/01/2016 → 31/12/2018  
Number of participants: 7  
Phd Student:  
Masche, Marvin (Intern)  
Supervisor:  
Puig Arnavat, Maria (Intern)  
Clausen, Sønnik (Intern)  
Henriksen, Ulrik Birk (Intern)  
Holm, Jens Kai (Intern)  
Jensen, Peter Arendt (Intern)  
Main Supervisor:  
Ahrenfeldt, Jesper (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansierede - Virksomhed  
Project: PhD

**Developing High Frequency Pulse Anodizing Methods for Decorative Aluminium**

Department of Mechanical Engineering  
Period: 01/01/2016 → 31/12/2018  
Number of participants: 4  
Phd Student:  
Jensen, Flemming (Ekstern)  
Supervisor:  
Gudla, Visweswara Chakravarthy (Intern)  
Kongstad, Ib (Ekstern)  
Main Supervisor:  
Ambat, Rajan (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Industrial PhD  
Project: PhD

**Development of receptors for Aqueous Carbohydrate Recognition**

Department of Chemistry  
Period: 01/01/2016 → 31/12/2018  
Number of participants: 4  
Phd Student:  
Baj, Vanessa (Intern)  
Supervisor:  
Behrens, Carsten (Ekstern)  
Nielsen, Thomas Eiland (Intern)  
Main Supervisor:  
Beeren, Sophie (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Eksternt EU-finansieret  
Project: PhD
Effects of dispersed oil droplets and produced water components on growth, development and reproduction of Arctic pelagic copepods (PWC-Arctic) (39297)

As the Oil & Gas industry moves north towards the Arctic, it is crucial to understand and be able to predict the potential for detrimental effects of regular (produced water) and accidental oil spills on Arctic organisms, which often are characterized by high lipid content. Organisms with high lipid content are susceptible to accumulation of lipophilic organic components like produced water components (PWC) including oil droplets. Limited data exist on accumulation of oil components in Arctic lipid-rich species which are parameterized so they can be applied as input to models predicting bioaccumulation and body residues as a function of exposure time/concentration. Even less data exist where body residues of oil components are explicitly linked to sub-lethal and delayed effects (e.g. on offspring). Finally, the potential contribution of oil droplets to bioaccumulation has never been studied in Arctic species.

The present project aims at:
- providing parameterized data on uptake/elimination kinetics and internal administration (partitioning coefficients between lipids and body fluids) for PW components in the Arctic lipid-rich copepods Calanus glacialis and C.hyperboreus;
- determine effect concentrations for PW components on early life stages of these copepods; and finally
- assess the potential for maternal transfer of PW components to eggs by exposing females prior to egg-laying and determine potential developmental effects in early stages developing in clean sea water.

The parameterized data collected in this project will provide direct input to numerical models aimed at predicting impact of PW on Arctic organisms. The approaches and methodologies used are based on extensive experience from previous toxicological studies on the two Arctic species and in particular the related boreal species Calanus finmarchicus. The main objective of the current proposal is to increase the knowledge of the potential effects of dispersed oil and other produced water components on growth and reproduction in lipid-rich Arctic planktonic crustaceans. This project is coordinated by SINTEF, Norway. The project is funded by the Research Council of Norway.

National Institute of Aquatic Resources
Section for Oceans and Arctic
SINTEF
Period: 01/01/2016 → 31/12/2018
Number of participants: 3
Research area: Oceanography
Project participant:
Nielsen, Torkel Gissel (Intern)
Dinh, Khuong Van (Intern)
Phd Student:
Toxværd, Kirstine Underbjerg (Intern)
Project

Engineering of polyketide synthases
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Research Groups
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Project participant:
Weber, Tilmann (Intern)
Musiol-Kroll, Ewa Maria (Intern)
Tong, Yaojun (Intern)
Palazzotto, Emilia (Intern)
Financing sources
Source: Private funding (private)
Name of research programme: Novo Nordisk Foundation
Web address: http://www.novonordiskfonden.dk/en
Amount: 2,700,000.00 Danish Kroner
Year of approval: 2015
Relations
Activities:
In silico and experimental tools for the metabolic engineering of secondary metabolite producing microorganisms
CRISPR-based tools to engineer actinomycetes
In silico and CRISPR/Cas9-based tools for the metabolic engineering of actinomycetes

Project

Enzyme discovery for novel vitamin pathway design and optimization of cell factories

Technical University of Denmark
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Bali, Anne Pihl (Intern)
Supervisor:
Genee, Hans Jasper (Intern)
Gronenberg, Luisa (Ekstern)
Main Supervisor:
Sommer, Morten Otto Alexander (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

Genetic adaptions underlying population structure in herring, Clupea harengus (GENSINC) (39355)
The objective is to document genetic differentiation and local adaptations in Atlantic herring populations spanning the majority of the species' distribution in the Northeast Atlantic, thereby strengthening the scientific basis for management of herring stocks. This will be done by using new genomic analyses and by taking advantage of unique multi-generational experimental populations under controlled environmental conditions. Whole genome resequencing of 19 populations of herring from East Atlantic (including the North Sea, Skagerrak, Kattegat, and the Baltic Sea revealed low genetic differentiation at the great majority of examined genes. This supports earlier genetic studies suggesting that genetic drift at selectively neutral loci is extremely low in these populations. However, highly significant differentiation at a limited number of loci (<5%) was detected between Atlantic and Baltic herring, as well as between spring- and autumn-spawning herring irrespective of the geographic origin of the fish. The results showed that alleles underlying ecological adaptation in herring provide a wealth of information about population subdivisions. An aim of the project is to sequence DNA from a much broader spectrum of herring populations, to assess evolutionary processes acting on the distribution and dynamics of herring populations exhibiting different ecological and phenotypic traits (e.g. spawning time). Concurrently the activities will aim to identify population specific markers that could be used in genetic monitoring of herring stocks.

In order to further study the biological significance of the genetic variants underlying ecological adaptation in the Atlantic herring University of Bergen has established world-unique experimental populations by crossing Atlantic herring (adapted to a salinity of 35 psu) and Baltic herring (adapted to 6 psu). These fish will be used to generate a highly informative F2 intercross that will segregate at the loci responsible for ecological adaptation. Another experimental population consisting of hybrids between spring and autumn spawning herring is planned within this project, allowing novel studies on the genetic basis of reproduction timing in herring. Such multigenerational experiments are considered essential to understand evolutionary and population genetic responses to environmental change.

This project is coordinated by the University of Bergen, Norway.
This project is funded by the Research Council of Norway.

National Institute of Aquatic Resources
Section for Marine Living Resources
University of Bergen
Uppsala University
Institute of Marine Research
Queen's University Belfast

Period: 01/01/2016 → 31/12/2019
Number of participants: 1
Research area: Population Genetics
Project participant:
HPLC – Implementation of new analytical methods (39227)

This is an internally funded project with the purpose of developing and implementing new analytical methods aimed at determining indicators for growth i.e. protein metabolism and synthesis, and includes amino acids and ATP, ADP, AMP in tissue. It is investigated whether a developed technique can be implemented. We will investigate, whether we can use a western blotting technique to enable us to estimate to which degree protein synthesis is stimulated, more specifically by measuring the degree of phosphorylation of certain markers within the mTOR signaling pathway. In addition, selected marker(s) of protein degradation is included. This will enable us to obtain an in-depth knowledge regarding protein synthesis/turnover and protein utilization in fish. We thereby presume to be able to investigate and document which/how nutritional factors (e.g. new protein sources & specific amino acids) and rearing conditions (e.g. feeding strategy, water quality, exercise, stress etc.) affect protein turnover (and thereby growth) in fish. The relationship between growth/protein utilization and mTOR response needs to be investigated further, but potentially this technique may e.g. allow us to compare a large number of diets and very quickly determine the response in muscle tissue. This means that a large number of diets can be screened without the cost of large and long-lasting growth trials, and it may become faster/easier to select the most optimal diets based on the response. As growth and growth efficiency are vital factors in aquaculture, the method might have great potential under a variety of circumstances. This project is coordinated by DTU Aqua.

The project is internally funded.

National Institute of Aquatic Resources

Section for Aquaculture

Period: 01/01/2016 → …

Number of participants: 1

Research area: Aquaculture

Project participant:

Larsen, Bodil Katrine (Intern)

Investigation of Different Piston Ring Curvatures on Lubricant Transport along Cylinder Liner in Large Two-Stroke Marine Diesel Engines

Department of Mechanical Engineering

Solid Mechanics

Period: 01/01/2016 → 30/09/2016

Number of participants: 3

Project participant:

Overgaard, Hannibal Toxvaerd (Intern)

Supervisor:

Vølund, Anders (Intern)

Main Supervisor:

Klit, Peder (Intern)

Investigation of material combinations for gold free electrical contact systems

Department of Mechanical Engineering

Phd Student:

Jensen, Peter Jonatan Bernhardt (Intern)

Supervisor:

Gudla, Visweswara Chakravarthy (Intern)

Jellesen, Morten Stendahl (Intern)

Main Supervisor:

Ambat, Rajan (Intern)

Financing sources

Source: Internal funding (public)

Name of research programme: Samfinansieret - Andet
Investigation of the Added Value of using Differential Cell Count in Addition to Existing Parameters Measured in Milk to Diagnose Intramammary Infection

National Veterinary Institute
Period: 01/01/2016 → 02/07/2019
Number of participants: 5
Phd Student:
Zervens, Lisa Marie-Louise (Intern)
Supervisor:
Hisham Beshara Halasa, Tariq (Intern)
Nielsen, Søren Saxmose (Ekstern)
Schwarz, Daniel (Ekstern)
Main Supervisor:
Toft, Nils (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Investigations of the potential "nitrogen effect" of stone reefs, and contribution to the re-establishment of a stone reef in the Natura 2000 area "Legstar Broad, Vajlerne and Bulbjerg" (The Stone Reef Project) (39354)
As well as many inner Danish waters, Limfjorden is highly eutrophied due to land-based nutrients runoff, and some areas in the fjord often suffer from anoxia events. The current project evaluates the effect of stone reefs as a possible complementary tool in water planning related to the water framework directive (2000/60/EF) to reduce the negative outcome of such events. For this purpose, the project involves the establishment of a stone reef in Legstar Broad in 2017 as well as comprehensive analysis of the potential "nitrogen effect" of already existing stone reefs in the broad.

The outcome of the project will help to assess whether stone reefs can be a future use as an instrument of retaining nitrogen in water management plans.

The project is coordinated by Limfjordsrådet, Aalborg Municipality
National Institute of Aquatic Resources
Danish Shellfish Centre
Limfjordsrådet
Aarhus Universitet
Geological Survey of Denmark and Greenland
NIVA Denmark Water Research
DHI
Period: 01/01/2016 → 31/12/2020
Number of participants: 2
Research areas: Marine Habitats & Ecosystem Based Marine Management
Project participant:
Petersen, Jens Kjerulf (Intern)
Nielsen, Mette Møller (Intern)

Lidar detection of wakes for wind turbine and farm control
Department of Wind Energy
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Held, Dominique Philipp (Ekstern)
Supervisor:
Hu, Qi (Intern)
Mirzai, Mahmood (Intern)
Main Supervisor:
Mann, Jakob (Ekstern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

**Metagenomic Approaches for Determining the Structure and Function of Complex Microbiomes**
National Food Institute
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Kirstahler, Philipp (Intern)
Supervisor:
Lund, Ole (Intern)
Pamp, Sünje Johanna (Intern)
Main Supervisor:
Aarestrup, Frank Møller (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Model-driven cell factory design aided by high-throughput data**
Technical University of Denmark
Period: 01/01/2016 → 31/12/2018
Number of participants: 3
Phd Student:
Jensen, Kristian (Intern)
Supervisor:
Sonnenschein, Nikolaus (Intern)
Main Supervisor:
Herrgard, Markus (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Offentlig finansiering
Project: PhD

**Multi-modal, Endoscopic Biophotonic Imaging of Bladder Cancer for Point-of-Care Diagnosis**
Department of Photonics Engineering
Diode Lasers and LED Systems
Period: 01/01/2016 → 31/12/2020
Number of participants: 2
Acronym: MIB
Project participant:
Jensen, Ole Bjarlin (Intern)
Project Coordinator:
Andersen, Peter E. (Intern)

**Multiscale design methods for Topology Optimization**
Department of Mechanical Engineering
**Period:** 01/01/2016 → 31/12/2018  
**Number of participants:** 4  
**Phd Student:** Groen, Jeroen Peter (Intern)  
**Supervisor:** Aage, Niels (Intern)  
Lazarov, Boyan Stefanov (Intern)  
Main Supervisor: Sigmund, Ole (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Samfinansieret - Andet  
Project: PhD

**Novel high-throughput methods in molecular genetics for rapid cell factory development**  
Technical University of Denmark  
**Period:** 01/01/2016 → 31/12/2018  
**Number of participants:** 3  
**Phd Student:** Klausen, Michael Schantz (Intern)  
**Supervisor:** Herrgard, Markus (Intern)  
Main Supervisor: Sommer, Morten Otto Alexander (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Institut stipendie (DTU)  
Project: PhD

**Ozonation of semi-closed aquatic systems - Online control**  
Department of Environmental Engineering  
**Period:** 01/01/2016 → 31/12/2018  
**Number of participants:** 6  
**Phd Student:** Spiliotopoulou, Aikaterini (Intern)  
**Supervisor:** Jensen, Christian Thybo Anker (Ekstern)  
Martin, Richard (Ekstern)  
Pedersen, Lars-Flemming (Intern)  
Petersen, Paw Allan tinghuus (Ekstern)  
Main Supervisor: Andersen, Henrik Rasmus (Intern)  

**Financing sources**  
Source: Internal funding (public)  
Name of research programme: Industrial PhD  
Project: PhD

**Precision Injection Moulding of Micro Features using Integrated Process/Product Quality Assurance**  
Department of Mechanical Engineering  
**Period:** 01/01/2016 → 31/12/2018  
**Number of participants:** 4  
**Phd Student:** Giannekas, Nikolaos (Intern)  
**Supervisor:** Hansen, Hans Nørgaard (Intern)
Zhang, Yang (Intern)
Main Supervisor:
Tosello, Guido (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Risk-benefit assessment of whole diet**
National Food Institute
Period: 01/01/2016 → 31/12/2018
Number of participants: 5
Phd Student:
Thomsen, Sofie Theresa (Intern)
Supervisor:
Pires, Sara Monteiro (Intern)
Pires, Sara Monteiro (Intern)
Poulsen, Morten (Intern)
Main Supervisor:
Andersen, Rikke (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

**Sensor Based Process Monitoring of Large Scale Vacuum Casting Process**
Department of Applied Mathematics and Computer Science
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Nauheimer, Michael (Intern)
Supervisor:
Kirkeby, Klaus (Ekstern)
Olesen, Bendt (Ekstern)
Main Supervisor:
Madsen, Henrik (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

**Sound herding system for sustainable fisheries (GUDP-SHS) (39365)**
The purpose of the project is to develop a new type of fishing gear, Sound Herding System (SHS), which applies sound to influence fish swimming direction and thereby herding them into a trawl. The sounders are mounted on the trawl boards, so as to create a wall of sound on both sides of the trawl opening. This increases the effective width and height of the trawl opening, resulting in higher catch rates. The frequency of the sounders is selected to be 4 kHz, which can be used to affect the clupeoid species herring, sprat and anchovy. Most other relevant species are not sound sensitive at this frequency.

The system can be used to avoid by-catches of herring in the mackerel fishery by closing trawl opening for herring with sound. Customers receive economic gains from higher catch rates and smaller by catch. The gain for the environment is a reduction in CO2 emissions and improved resource utilization.

The central work in the project is the development of trawl doors equipped with sounders as tested by exploratory scare effect measurements and mapping of sound fields. Fish response to sound is studied experimentally and finally the sounders’ impact on the environment is examined.

This project is coordinated by Sonus Aqua Aps, Denmark.
The project is funded by the Ministry of Environment and Food of Denmark through the Green Development and Demonstration Program (GUDP).

National Institute of Aquatic Resources

Section for Marine Living Resources

Sonus Aqua Aps

Aalborg University

Period: 01/01/2016 → 31/12/2018

Number of participants: 3

Research areas: Observation Technology & Marine Living Resources

Project participant:

Mosegaard, Henrik (Intern)

Pedersen, Eva Maria (Intern)

Project Manager, academic:

Stage, Bjarne (Intern)

Project

**Strengthening the Danish populations of Atlantic salmon – Increasing populations, genetic resources and recreational fishing (39340)**

In the beginning of the 1980’ies indigenous Danish salmon populations were close to extinction due to habitat degradation and stocking with non-native strains. Conservation efforts, led to a resurge of the populations in western Jutland. However, following the initial increases, Danish salmon populations have stagnated in recent years. Whether this is a response to limiting local factors or a correlated response across population (e.g. to climate change), is unknown. A profitable recreational fishery has developed on the Danish salmon. If the productivity of Danish salmon populations can be improved, this fishery and the related economical gain have the potential to increase correspondingly.

Atlantic salmon has a highly complex and specialized life cycle where the weakest link(s) determines the productivity of the salmon population. Accordingly, there is a need for a multifaceted research project The main objectives of this project will be reached through six work packages aiming to: 1. Identify key local and global bottlenecks production of salmon across four life-stages, 2. Determine genetic characteristics ('quality') of local populations and identify how measures of ‘quality’ should be implemented into stocking programmes and 3. Communicate and implement insights on optimal management and exploitation to stakeholders.

The overarching aim of the project is to provide research based knowledge that can be directly implemented into a self-sustainable management framework that maximizes salmon population sizes, and hereby vastly increases local income from a recreational fishery with a high economic potential.

This project is coordinated by Danish Center for Wild Salmon.

The project is funded by Innovation Fund Denmark.

Section for Freshwater Fisheries Ecology

National Institute of Aquatic Resources

Danish Center for Wild Salmon

Period: 01/01/2016 → 31/12/2019

Number of participants: 5

Research areas: Freshwater Fisheries and Ecology & Population Genetics

Project participant:

Mena, Belén Jiménez (Intern)

Project Manager, academic:

Koed, Anders (Intern)

Eg Nielsen, Einar (Intern)

Bekkevold, Dorte (Intern)

Aarestrup, Kim (Intern)

Project

**Study on approaches to management for data-poor stocks in mixed fisheries (MIXDLS) (39342)**

The tender requires advancement of methods for advice on the status and management of data-poor stocks in mixed fisheries. In order to meet this requirement, we will undertake a detailed review of assessment and management approaches for data-poor stocks and identify relevant approaches for application in the case studies and wider EU
The approaches should be compatible with the Common Fisheries Policy (CFP; EU 2013) in terms of (i) fishing mortality ranges compatible with Maximum Sustainable Yield (MSY), (ii) fish caught to be landed, and (iii) addressing uncertainty in significant components of the marine fish ecosystem. The most promising methods will be tested through simulation to ensure robustness to uncertainties and to deliver confidence in methods for future operational use. The suite of identified, assured methods will then be used to develop an objective framework to apply the most relevant assessment or management methods to each stock in each of the case study areas. Based on the output of these assessments of data-poor stocks, and where relevant, the existing assessments of data rich stocks, a mixed fisheries simulation framework will be developed to assess the performance of candidate management strategies. Adaptation of the existing mixed fisheries tools will be required in order to incorporate data-poor stocks in the simulation framework.

This project is coordinated by DTU Aqua & IMARES, Netherlands. The project is funded by EU, Calls for proposals/tenders (EU DG Mare).

National Institute of Aquatic Resources
Section for Ecosystem based Marine Management
IMARES
Centre for Environment Fisheries and Aquaculture Science
Thünen Institute
French Research Institute for Exploitation of the Sea
Galway - Mayo Institute of Technology
AZTI-Tecnalia
National Research Council of Italy
Hellenic Centre for Marine Research
Period: 01/01/2016 → 31/12/2017
Number of participants: 3
Research areas: Fisheries Management & Marine Living Resources
Contact person:
Worsøe Clausen, Lotte (Intern)
Project participant:
Nielsen, J. Rasmus (Intern)
Project Coordinator:
Ulrich, Clara (Intern)
Project

Sulphuric Acid Corrosion in Large 2-Stroke Diesel Engines
Department of Mechanical Engineering
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Kjemtrup, Lars (Intern)
Supervisor:
Cordtz, Rasmus Faurskov (Intern)
Ivarsson, Anders (Intern)
Main Supervisor:
Schramm, Jesper (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Sundhed som driver for energioptimering af LED-lysstyring
Department of Photonics Engineering
Diode Lasers and LED Systems
Period: 01/01/2016 → 01/04/2019
Number of participants: 3
Project participant:
Dam-Hansen, Carsten (Intern)
Thorseth, Anders (Intern)
Project Manager, organisational:
Martiny, Klaus (Ekstern)

Related projects:
Daylight as a Driver for Healthier Energy Optimization

Activities:
Danish national CIE committee (External organisation)

Project

Tagging Baltic cod (TABACOD) (39333)
The aim of this project is to improve the management of eastern Baltic cod by 1) providing new information on growth and mortality patterns, and 2) develop a validated method for deriving this information from historic and future samples.

In recent years, the traditional age-based stock assessment had to be abandoned owing to extensive uncertainties in stock trends. These uncertainties were to a large extent attributable to inconsistencies in age estimation. As a consequence thereof, the current stock status is unknown.

Estimates of growth and mortality rely on unbiased age information. TABACOD will provide this information through a large scale tagging experiment, where 20,000 cod are tagged with and externally visible tag as well as with an internal tag on their otoliths. This experiment will also provide the samples for the development and validation of a new age estimation method based on the chemical composition of the cod's otoliths.

The knowledge gained will be incorporated in length-based assessment models and their performance compared to the traditional methods evaluated in order to provide the ICES stock assessment group with the relevant tools to provide a reliable advice and to improve stock exploitation.

This project is coordinated by DTU Aqua.

The project is funded by BalticSea2020.

National Institute of Aquatic Resources
Section for Oceans and Arctic
Swedish University of Agricultural Sciences
Johann Heinrich von Thünen-Institute
National Marine Fisheries Research Institute
Period: 01/01/2016 → 31/12/2019
Number of participants: 7
Research areas: Marine Populations and Ecosystem Dynamics & Fish Biology & Marine Living Resources
Project participant:
Olesen, Hans Jakob (Intern)
Andersen, Niels Gerner (Intern)
Storr-Paulsen, Marie (Intern)
Thygesen, Uffe Høgsbro (Intern)
Berg, Casper Willestofte (Intern)
Phd Student:
Nielsen, Kristian Ege (Intern)
Project Coordinator:
Hüssy, Karin (Intern)
Project

The effect of sorption and dosing on the degradation of poorly water soluble substances in different environmental matrices using standard OECD guidelines
Department of Environmental Engineering
Period: 01/01/2016 → 31/12/2018
Number of participants: 4
Phd Student:
Shrestha, Prasit (Intern)
Supervisor:
Birch, Heidi (Intern)
Hennecke, Dieter (Ekstern)
Main Supervisor:
Mayer, Philipp (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

ForwardCom CPU instruction set architecture
Proposal for an open CPU instruction set architecture for vector processors

Center for Bachelor of Engineering Studies
Afdelingen for El-technologi
Period: 27/12/2015 → ...
Number of participants: 1
CPU, instruction set architecture, ISA, vector processors, open standard, forward compatible computer system
Acronym: ForwardCom
Project participant:
Fog, Agner (Intern)

Collaborative modular underwater robotic system for long-term autonomous operations (REMORA) (39341)
In this project we aim to bootstrap new high-impact underwater robotics activities at DTU. We propose to develop a novel robotic platform, the REMORA1 system, for research, education and innovation. The objectives of the project are to develop the necessary infrastructure, i.e., underwater robotic system, test facilities, educational framework and external collaboration, to perform world-class research and innovation in the area of offshore underwater robotic technology.

With this project we aim to eventually strengthen the Danish maritime sector in dealing with the high cost and technical challenges of inspections and maintenance in increasing amount of offshore installations. The project is a collaboration between DTU Electrical Engineering, DTU Mechanical Engineering and DTU Aqua who have complementary expertise within development and innovation of robotic technology and applications of underwater robotics.

This project is coordinated by DTU Electrical Engineering.

The project is funded by A/S Dampskibsselskabet Orient’s Fond.

National Institute of Aquatic Resources
Section for Marine Ecology and Oceanography
Technical University of Denmark
Period: 21/12/2015 → 21/12/2017
Number of participants: 2
Research areas: Oceanography & Observation Technology & Marine Populations and Ecosystem Dynamics
Project participant:
Mariani, Patrizio (Intern)
Visser, Andre (Intern)

Electric vehicles in the Nordic countries: Control strategies for coordinated grid services
Nowadays, both Norway and Denmark face challenges in supporting a stable and economic future power system based on renewable energy production and an increasing flexible demand based on electric vehicles (EV). Specifically, the main challenge is to address the adverse effects that the EVs may have on local distribution lines (distribution system operator (DSO) perspective) and enhance their usage to optimize utilization of national renewables, here under the high wind power penetration (transmission system operator (TSO) perspective).
The research emphasis is on power and energy services that EVs can provide both locally and system-wide. Three main topics will be strongly faced:

1. Identification of the technical benefits that ancillary service provision from EVs may provide. EVs may be considered as active grid components and not just mere large loads that cause technical issues on the grid. Under the above mentioned circumstances, also the barriers to EVs grid support services (imposed for instance by national/European grid codes or by the necessity of economic advantages to the EV owner for grid support – also just for the availability) will be identified and classified.

2. Balance of prioritization regarding services between DSO and TSO. This problem comes from the TSOs’ need of grid stability services from small dispatched units, due to displacement of big power plants which traditionally assure reliable grid services. At the same time, it is in the interest of the DSO not to have power provision from distributed energy sources violating the local grid constraints.

3. Common solutions for EV integration across the Nordic countries. Considering the existence of two distinct Danish synchronous regions (DK1 and DK2) managed by the same national TSO and considering that DK2 and Norway, although belonging to the same synchronous region, are managed by two independent TSOs, the investigation will face EVs’ grid support services replicability in different contexts (different constrains). Studies will also consider guidelines and trends at European level (ENTSO).

Through the usage of dedicated simulation platforms, such as Matlab SimPowerSystems and DlgSILENT PowerFactory, static study scenarios - unbalanced and balanced load flows - as well as optimal power flows and transient analysis will be conducted primarily in order to analyze network components’ overloading and voltage violations. Furthermore, micro-grid analysis with different generation sets and EV management will be tested at the DTU facilities including both the Electric Lab of Lyngby Campus and SYSLAB in Risø Campus as well as EVLab that spans both the campuses. The PhD student will be kept in the loop of current and relevant EV projects both at DTU (EnergyLab Nordhavn and Parker) and NTNU (The Smartgrids centre, Smartgrids lab, OADE and ChargeFlex project).

Department of Electrical Engineering
Center for Electric Power and Energy
Energy resources, services and control

Energy system operation and management
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Electric vehicles, Smart Grid, Distributed energy resources
Project participant:
Zecchino, Antonio (Intern)
Supervisor:
Marinelli, Mattia (Intern)
Korpås, Magnus (Ekstern)
Main Supervisor:
Træholt, Chresten (Intern)
Documents:
Short description of the PhD project
Project

EnergyLab Nordhavn PhD Le Ray
Department of Electrical Engineering
Center for Electric Power and Energy
Electricity markets and energy analytics
Period: 15/12/2015 → 15/12/2018
Number of participants: 1
Project participant:
Le Ray, Guillaume (Intern)
Project

Active Filter Solutions for Reducing Harmonic Emissions in Wind Power Plants
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Guest, Emerson (Intern)
Addressing inorganic chemicals in life cycle impact assessment
Department of Management Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
PhD Student:
Kirchhübel, Nienke (Intern)
Supervisor:
Hauschild, Michael Zwicky (Intern)
Main Supervisor:
Fantke, Peter (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Industrial PhD
Project: PhD

ATIS and modal shift: the role and the effectiveness of information provision and perception
Department of Management Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
PhD Student:
Mehdizadeh Dastjerdi, Aliasghar (Intern)
Supervisor:
Kaplan, Sigal (Intern)
Main Supervisor:
Pereira, Francisco Camara (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Biomass Particle ignition in mill equipment
Department of Chemical and Biochemical Engineering
Period: 15/12/2015 → 14/01/2019
Number of participants: 5
PhD Student:
Schwarzer, Lars (Intern)
Supervisor:
Dam-Johansen, Kim (Intern)
Glarborg, Peter (Intern)
Holm, Jens Kai (Intern)
Main Supervisor:
Jensen, Peter Arendt (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Carbon based micromechanical sensors
Department of Micro- and Nanotechnology
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Nguyen, Quang Long (Intern)
Supervisor:
Boisen, Anja (Intern)
Schmid, Silvan (Intern)
Main Supervisor:
Keller, Stephan Sylvest (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt finansieret virksomhed
Project: PhD

Characterization of acoustic properties of surfaces based on spatio-temporal information
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Richard, Antoine Philippe André (Intern)
Supervisor:
Brunskog, Jonas (Intern)
Jeong, Cheol-Ho (Intern)
Main Supervisor:
Fernandez Grande, Efren (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Coherent regulatory frameworks and energy markets that facilitate the integration of variable renewable energy into the Nordic energy system
Department of Management Engineering
Period: 15/12/2015 → 13/01/2019
Number of participants: 4
Phd Student:
Sneum, Daniel Møller (Intern)
Supervisor:
Kitzing, Lena (Intern)
Kitzing, Lena (Intern)
Main Supervisor:
Skytte, Klaus (Intern)
Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)

Relations
Activities:
Framework conditions for flexibility options in the district heating–electricity interface: A comparative study of the district heating sectors in the Nordic and Baltic countries
Smart regulatory framework conditions for smart energy systems? Incentives for flexible district heating in the Nordic countries
Evaluation of regulation for flexibility – a methodology
Project: PhD

Combining ultrasound brain stimulation with MR imaging
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Pasquinelli, Cristina (Intern)
Supervisor:
Hanson, Lars G. (Intern)
Lee, Hyunjoo Jenny (Ekstern)
Main Supervisor:
Thielscher, Axel (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Controlling a hearing aid by electrically assessed eye-gaze
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Favre-Félix, Antoine (Intern)
Supervisor:
Graversen, Carina (Ekstern)
Lunner, Thomas Fritiof (Ekstern)
Main Supervisor:
Dau, Torsten (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Eksternt EU-finansieret
Project: PhD

Development of a new synthesis for highly active fuel cell electrocatalysis
Department of Energy Conversion and Storage
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Brandes, Benedikt Axel (Intern)
Supervisor:
Cleemann, Lars Nilausen (Intern)
Li, Qingfeng (Intern)
Main Supervisor:
Jensen, Jens Oluf (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Early application of tolerance design
Department of Mechanical Engineering
Effects on benthic habitats of fishing activities
National Institute of Aquatic Resources
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: McLaverty, Ciaran (Intern)
Supervisor: Petersen, Jens Kjerulf (Intern)
Main Supervisor: Eigaard, Ole Ritzau (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Egg quality and Offspring Performance in European Eel
National Institute of Aquatic Resources
Period: 15/12/2015 → 14/01/2019
Number of participants: 3
Phd Student: Kottmann, Johanna Sarah (Intern)
Supervisor: Butts, Ian (Intern)
Main Supervisor: Tomkiewicz, Jonna (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Grundforskningsfonden
Project: PhD

Electric vehicles in the Nordic countries: Control strategies for coordinated grid services
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student: Zecchino, Antonio (Intern)
Supervisor: Korpås, Magnus (Ekstern)
Main Supervisor: Marinelli, Mattia (Intern)

Financing sources
Energy production from seaweed and seaweed processing residues

Department of Chemical and Biochemical Engineering
Period: 15/12/2015 → 04/03/2016
Number of participants: 3
Phd Student:
Iddrisu, Abdul-Mumeen (Ekstern)
Supervisor:
Thygesen, Anders (Intern)
Main Supervisor:
Meyer, Anne S. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Foodborne virus on surfaces of soft-fruit and kitchen environment. Efficacy and mechanism of viral inactivation by heat and steam-ultrasound

National Food Institute
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Rajiuddin, Sheikh Md (Intern)
Supervisor:
Hansen, Tina Beck (Intern)
Main Supervisor:
Schultz, Anna Charlotte (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Stipendie fra udlandet
Project: PhD

Fungal Molecular- and Synthetic Biology

Department of Systems Biology
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Futyma, Malgorzata Ewa (Intern)
Supervisor:
Frandsen, Rasmus John Normand (Intern)
Main Supervisor:
Mortensen, Uffe Hasbro (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

High resolution gravity and bathymetry from recent satellite altimetry

National Space Institute
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Abulaitijiang, Adili (Intern)
Supervisor: Knudsen, Per (Intern)
Stenseng, Lars (Intern)
Main Supervisor: Andersen, Ole Baltazar (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Identifying simple and cost effective gear solutions which can lead to an effective implementation of the new EU common Fisheries Policy (CFP)

National Institute of Aquatic Resources
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Melli, Valentina (Intern)
Supervisor: Gislason, Henrik (Intern)
Karlsen, Junita Diana (Intern)
Main Supervisor: Krag, Ludvig Ahm (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Improving Methods for EXAFS studies of Metallo-proteins

Department of Chemistry
Period: 15/12/2015 → 14/12/2019
Number of participants: 3
Phd Student:
Molich, Ulf (Intern)
Supervisor:
Ståhl, Kenny (Intern)
Main Supervisor:
Harris, Pernille (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Improving the decision base for emergency management in the event of airborne radioactive contamination of city areas

Department of Physics
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Hinrichsen, Yvonne (Intern)
Supervisor: Roos, Per (Intern)
Main Supervisor: Andersson, Kasper Grann (Intern)

**Financing sources**
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Improving the efficiency of heat pump and cooling technologies
Department of Energy Conversion and Storage
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Navickaité, Kristina (Intern)
Supervisor:
Bahl, Christian (Intern)
Main Supervisor:
Engelbrecht, Kurt (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Industry lead gear selectivity improvements, its strenghts and weakness in the new CFP
National Institute of Aquatic Resources
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Malta, Tiago Alexandre Matias da Veiga (Intern)
Supervisor:
Feekings, Jordan P. (Intern)
Gislason, Henrik (Intern)
Main Supervisor:
Krag, Ludvig Ahm (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Integrative Systems Immunology in Childhood Asthma
Department of Systems Biology
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Wang, Ni (Intern)
Supervisor:
Bisgaard, Hans (Ekstern)
Workman, Christopher (Intern)
Main Supervisor:
Pedersen, Susanne Brix (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Machine Learning and Mobility
Department of Management Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Managing Complex Systems and Applications fusing methods from AI and Control and Signal Processing

Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Maurin, Adrian Llopart (Intern)
Supervisor:
Andersen, Nils Axel (Intern)
Kim, Jon-Hwan (Ekstern)
Main Supervisor:
Ravn, Ole (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Marine migration behaviour of salmonids and gadoids assessed using biotelemetry and genetic stock identification

National Institute of Aquatic Resources
Period: 15/12/2015 → 29/03/2019
Number of participants: 3
Phd Student:
Kristensen, Martin Lykke (Intern)
Supervisor:
Bekkevold, Dorte (Intern)
Main Supervisor:
Aarestrup, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Anden EU-finansiering
Project: PhD

Material Appearance Prediction

Department of Applied Mathematics and Computer Science
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Luongo, Andrea (Intern)
Supervisor:
Aanæs, Henrik (Intern)
Main Supervisor:
Frisvad, Jeppe Revall (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD
Mathematical Analysis and Computations for Multiphysics Tomography
Department of Applied Mathematics and Computer Science
Period: 15/12/2015 → 13/06/2019
Number of participants: 4
Phd Student:
Kirkeby, Adrian (Intern)
Supervisor:
Evgrafov, Anton (Intern)
Karamehmedovic, Mirza (Intern)
Main Supervisor:
Knudsen, Kim (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Microbial interactions in aquaculture - Probiotic reseobacters as a sustainable means to control fish pathogens
Department of Systems Biology
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Rasmussen, Bastian Barker (Intern)
Supervisor:
Bentzon-Tilia, Mikkel (Intern)
Nielsen, Kristian Fog (Intern)
Main Supervisor:
Gram, Lone (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Microbiota and cow's milk tolerance
National Food Institute
Period: 15/12/2015 → 14/12/2018
Number of participants: 4
Phd Student:
Graversen, Katrine (Intern)
Supervisor:
Bahl, Martin lain (Intern)
Licht, Tine Rask (Intern)
Main Supervisor:
Bøgh, Katrine Lindholm (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Microstructure and Fatigue Properties of Railway Steels for Switches and Crossings
Department of Wind Energy
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student:
Multi-objective wind farm control

Department of Wind Energy
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: Kazda, Jonas (Intern)
Supervisor: Courtney, Michael (Intern)
Main Supervisor: Cutululis, Nicolaos Antonio (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Nanoscale bioelectrochemistry for development of enzymatic fuel cells

Department of Chemistry
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: Shen, Fei (Intern)
Supervisor: Ulstrup, Jens (Intern)
Main Supervisor: Zhang, Jingdong (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Phase-Contrast Imaging of Plasma Density Fluctuations in Wendelstein 7-X

Department of Physics
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: Böttger, Lukas-Georg (Intern)
Supervisor: Gruke, Olaf (Ekstern)
Main Supervisor: Naulin, Volker (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Ansat eksternt
Project: PhD
Quantum Information Networks
Department of Photonics Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: Leandro, Lorenzo (Intern)
Supervisor: Gregersen, Niels (Intern)
Main Supervisor: Akopian, Nika (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Institut stipendie (DTU)
Project: PhD

Resilient overlay networks for the distributed provision of aggregated power systems services
Department of Electrical Engineering
Period: 15/12/2015 → 14/12/2018
Number of participants: 3
Phd Student: Orda, Lasse Dreisig (Intern)
Supervisor: Gehrke, Oliver (Intern)
Main Supervisor: Bindner, Henrik W. (Intern)

Financing sources
Source: Internal funding (public)
Name of research programme: Samfinansieret - Andet
Project: PhD

Activities:

Presentation - Energy and Building Technology - A look into the future
Period: 30 Sep 2019
Alfred Heller (Guest lecturer)
Department of Civil Engineering

Description
Presentation of ideas for the future of building automation, cloud services, IoT and more
Documents:
CKI Conference DTU - sept 2017 - Next gen Building Tec (v2)

Related event
Siemens-DTU CKI conference 2017
19/09/2017 → …
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Cerâmica (Journal)
Period: 2018
Vincenzo Esposito (Editor)
Department of Energy Conversion and Storage
Related journal

Cerâmica
0366-6913
Scopus rating (2016): CiteScore 0.24 SJR 0.165 SNIP 0.226
Indexed in DOAJ
Local database
Activity: Research › Journal editor

5th International Vitamin Conference
Period: 8 Aug 2018 → 10 Aug 2018
Jette Jakobsen (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application
Degree of recognition: International

Related event

5th International Vitamin Conference
08/08/2018 → 10/08/2018
Sydney, Australia
Activity: Attending an event › Participating in or organising a conference

Carbapenemase epidemiology in bacteria of animal and environmental origin: the One Health prospective
Period: 8 Jun 2018
Valeria Bortolaia (Guest lecturer)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related event

ASM Microbe 2018
07/06/2018 → 11/06/2018
Atlanta, United States
Activity: Talks and presentations › Conference presentations

38th International Conference on Information Systems (Event)
Period: 2017 → …
Giulia Nardelli (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: International

Related event

38th International Conference on Information Systems: Transforming Society with Digital Innovation
10/12/2017 → 13/12/2017
Seoul, Korea, Republic of
Activity: Research › Peer review of manuscripts

Academy of Management 2017 (Event)
Period: 2017
Pernille Rydén (Reviewer)
Center for Bachelor of Engineering Studies
A powerful tool to investigate speech perception is the use of speech intelligibility prediction models. Recently, a model was presented, termed correlation-based speech-based envelope power spectrum model (sEPSMcorr), that uses a correlation-based back end at the output of an audio-frequency and modulation-frequency selective auditory preprocessing (Relaño-Iborra et al., 2016). The use of the correlation back-end extended the predictive power of earlier versions of the sEPSM framework (e.g. Jørgensen et al. 2013) towards conditions of non-linear signal processing, such as phase jitter and ideal binary mask processing. Moreover, the model was shown to account for conditions with fluctuating interferers, unlike other correlation-based models.

Here, the back end of the sEPSMcorr was combined with a more realistic auditory pre-processing front end adopted from the computational auditory signal processing and perception model (CASP; Jepsen et al., 2008). The preprocessing contains outer- and middle-ear filtering and a non-linear auditory filterbank (DRNL, López-Poveda and Meddis, 2001), followed by inner hair-cell transduction, adaptation and a modulation filterbank.

The predictions were compared to measured data in conditions of additive masking noise, phase jitter distortions, reverberation and noise-reduction algorithms. The effects of the back end as well as the different preprocessing stages on the predicted results were analyzed. The modelling framework could be useful for the design and evaluation of, e.g. speech transmission algorithms or hearing-instrument algorithms.

Documents:
spin_helia_final_v2
The predictions of the sEPSM-based and the CASP-based models were compared with respect to measured data (NH) in conditions of additive masking noise, phase jitter distortions, reverberation and noise-reduction algorithms. The effects of the back end as well as the different preprocessing stages on the predicted results were analyzed. The resulting modelling framework could be useful for the design and evaluation of, e.g. speech transmission algorithms or hearing-instrument algorithms.

**Related event**

**ARCHES/ICANHEAR 2016: Audiological Research Cores in Europe (ARCHES) meeting and Improved Communication through Applied Hearing Research (ICanHear) conference**

Zurich, Switzerland
Activity: Talks and presentations › Conference presentations

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**Chaotic Mean Field Dynamics in Two Populations of Phase Oscillators with Heterogeneous Phase-Lag**

Period: 2017

Erik Andreas Martens (Speaker)

Department of Applied Mathematics and Computer Science
Dynamical Systems

**Description**
Talk
Degree of recognition: International

**Related event**

**SIAM Conference on Applications of Dynamical Systems 2017**

21/05/2017 → 26/05/2017
Snowbird, United States
Activity: Talks and presentations › Conference presentations

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**Characterization of GaAs nanowires by electron holography**

Period: 2017

Elisabetta Maria Fiordaliso (Speaker)

Center for Electron Nanoscopy
DTU Danchip

**Description**
invited talk at conference
Degree of recognition: International

**Related event**

**EMN nanowires**

04/05/2017 → 07/05/2017
Dubrovnik, Croatia
Activity: Talks and presentations › Conference presentations

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**Chimera states - mythological monsters from math arise in the real world**

Period: 2017

Erik Andreas Martens (Speaker)

Department of Applied Mathematics and Computer Science
Dynamical Systems
Department of Electrical Engineering

**Description**
Invited topical lecture
Degree of recognition: International

Related event

ICMS Complexity Science Winter School 2017
13/02/2017 → 17/02/2017
Eindhoven, Netherlands
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

CIB International Research Week 2017 (Event)
Period: 2017 → …
Giulia Nardelli (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Review of research papers
Degree of recognition: International

Related event

CIB International Research Week 2017
11/09/2017 → 15/09/2017
Manchester, United Kingdom
Activity: Research › Peer review of manuscripts

Co-Supervisor for Lucas Lima, PhD
Period: 2017 → 2020
Maj Munch Andersen (Supervisor)
Department of Management Engineering
Activity: Examinations and supervision › Supervisor activities

Danish Fish Levy Fond (External organisation)
Period: 2017
Charlotte Jacobsen (Participant)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
Board member

Related external organisation

Danish Fish Levy Fond
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Danish Seaweed Organisation (DSO) (External organisation)
Period: 2017 → …
Susan Løvstad Holdt (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
Board member, treasurer of the Danish Seaweed Organisation (DSO)
Degree of recognition: National
Related external organisation

Danish Seaweed Organisation (DSO)
Activity: Membership › Board duties in companies, associations, or public organisations

DANSBATT Annual meeting 2017
Period: 2017
Martin Meedom Nielsen (Organizer)
Department of Physics
Neutrons and X-rays for Materials Physics

Related event

DANSBATT Annual meeting 2017
01/06/2017 → 02/06/2017
Odense, Denmark
Activity: Attending an event › Participating in or organising a conference

Dansk Teknologihistorisk Selskab (External organisation)
Period: 2017 → …
Louise Karlskov Skyggebjerg (Chairman)
Department of Physics

Description
Bestyrelsesmedlem siden 2010
Degree of recognition: National

Related external organisation

Dansk Teknologihistorisk Selskab
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Edmuse Conference
Period: 2017 → …
Laila Zwisler (Speaker)
Department of Physics

Description
Conference
Degree of recognition: International
Links:
http://edmuse.eu/ (Link to Edmuse project)

Related event

Edmuse Conference: EdMuse project - Education and Museum: Cultural Heritage for science learning
26/06/2017 → 27/06/2017
Rome, Italy
Activity: Talks and presentations › Conference presentations

Energy Journal (Journal)
Period: 2017
Emilie Rosenlund Soysal (Reviewer)
Department of Management Engineering
Systems Analysis

Description
Review of submitted article
Degree of recognition: International

Related journal

Energy Journal
0195-6574
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 2.13 SJR 1.537 SNIP 1.305, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

EU CEN 454 standardisation of algae (External organisation)
Period: 2017 → …
Susan Løvstad Holdt (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application
Description
Chair of the national mirror committee of the EU CEN 454 standardisation of algae
Degree of recognition: International

Related external organisation
EU CEN 454 standardisation of algae
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

EUREKA expert (External organisation)
Period: 2017
Susan Løvstad Holdt (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application
Description
EUREKA Expert (invited member of the EUREKA expert database) to evaluate project proposals
Degree of recognition: International

Related external organisation
EUREKA expert
Activity: Membership › Membership in review committee

Extending a computational model of auditory processing towards speech intelligibility prediction
Period: 2017
Helia Relano Iborra (Guest lecturer)
Department of Electrical Engineering
Hearing Systems
Description
A speech intelligibility model is presented, based on the computational auditory signal processing and perception model (CASP; Jepsen et al., 2008). CASP has previously been shown to successfully predict psychoacoustic data of normal hearing (NH) listeners obtained in conditions of, e.g., spectral masking, amplitude-modulation detection, and forward masking (Jepsen et al., 2008). Furthermore, CASP can be tuned to model data from individual hearing-impaired listeners in different behavioral experiments (Jepsen and Dau, 2011). In this study, the CASP model is investigated as a predictor of intelligibility for Danish sentences for NH listeners.

The model receives the clean and degraded speech as input. The signals are processed through outer- and middle-ear filtering, a non-linear auditory filterbank (DRNL, López-Poveda and Meddis, 2001), adaptation loops, and a modulation filterbank. The internal representations produced at the end of these stages are analyzed using a correlation-based back end.

Here, predictions of speech intelligibility obtained with the speech-based CASP implementation are presented and compared to speech intelligibility data measured in conditions of additive noise, phase jitter, spectral subtraction, ideal binary mask processing and reverberation.
Related event

International Symposium on Auditory and Audiological Research
23/08/2017 → 25/08/2017
Nyborg, Denmark
Activity: Talks and presentations › Conference presentations

International Journal of Food Microbiology (Journal)
Period: 2017
Ana Sofia Ribeiro Duarte (Reviewer)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related journal

International Journal of Food Microbiology
0168-1605
Central database
Activity: Research › Peer review of manuscripts

Inverse Problems and Imaging (Journal)
Period: 2017
Tommi Olavi Brander (Reviewer)
Department of Applied Mathematics and Computer Science
Scientific Computing

Related journal

Inverse Problems and Imaging
1930-8337
Central database
Activity: Research › Peer review of manuscripts

ISMRM study group on Detection and Correction of Motion in MRI and MRS (External organisation)
Period: 2017 → 2018
Lars G. Hanson (Chairman)
Department of Electrical Engineering
Center for Magnetic Resonance
Center for Hyperpolarization in Magnetic Resonance

Description
Chairman, ISMRM study group on Detection and Correction of Motion in MRI and MRS
Degree of recognition: International

Related external organisation

ISMRM study group on Detection and Correction of Motion in MRI and MRS
Activity: Membership › Membership of research networks or expert groups

Journal of Applied Phycology (Journal)
Period: 2017
Susan Løvstad Holdt (Reviewer)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
Invited as guest editor of the issue on the proceedings of the International Seaweed Symposium, Copenhagen, June 2016
Degree of recognition: International

Related journal
Journal of Applied Phycology
0921-8971
Central database
Activity: Research › Peer review of manuscripts

Late effects of early exposures to endocrine disrupting chemicals in rats
Period: 2017
Julie Boberg (Guest lecturer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Description
Invited talk in session "Modes of action of non-genotoxic carcinogens: Recent advances in the light of human relevance"

Related event
Eurotox 2017: 53rd Congress of the European Societies of Toxicology
10/09/2017 → 13/09/2017
Bratislava, Slovakia
Activity: Talks and presentations › Conference presentations

Mapping dopant distributions in GaAs nanowires by electron holography
Period: 2017
Elisabetta Maria Fiordaliso (Speaker)
Center for Electron Nanoscopy
DTU Danchip

Description
conference talk

Related event
nanowire week
28/05/2017 → 02/06/2017
Lund, Sweden
Activity: Talks and presentations › Conference presentations

National Food Institute (Organisational unit)
Period: 2017 → …
Silvia Bonomo (Participant)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Description
Founder and Board Member of the Early Career Researcher (ECR) Network.
The ECR Network provides opportunities for ECRs to better equip themselves for challenges that lay ahead, being it a career in academia or private industry.
Related organisation

National Food Institute (Organisational unit)
Bonomo, S. (Participant)
2017 → …
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Organizer and co-chair of the education course "Hormones and Brain Development"
Period: 2017
Marta Axelstad Petersen (Organizer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Related event

Organizer and co-chair of the education course "Hormones and Brain Development" : European Teratology Society 2017
04/09/2017 → 04/09/2017
Budapest, Hungary
Activity: Attending an event › Participating in or organising a conference

PLoS ONE (Journal)
Period: 2017 → …
Silvia Bonomo (Reviewer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Related journal

PLoS ONE
1932-6203
Indexed in DOAJ
Central database
Activity: Research › Peer review of manuscripts

Production of alkali from cocoa husk ash and biological extraction of hydrocolloid from Sargassum sp.
Period: 2017
Marcel Tutor Ale (Other)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering

Description
Coordinated by Marcel Tutor Ale
Activity: Other

Production of alkali from cocoa husk ash for extraction of hydrocolloid from biologically pretreated red seaweed
Period: 2017
Marcel Tutor Ale (Other)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering

Description
Coordinated by Marcel Tutor Ale
Activity: Other
Robotics and Computer-Integrated Manufacturing (Journal)
Period: 2017
Alessandro Stolfi (Reviewer)
Department of Applied Mathematics and Computer Science
Department of Mechanical Engineering
Manufacturing Engineering

Related journal
Robotics and Computer-Integrated Manufacturing
0736-5845
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

Scientific Committee of the European Congress of Medical Physics 2018 (External organisation)
Period: 2017 → 2018
Lars G. Hanson (Member)
Department of Electrical Engineering
Center for Magnetic Resonance
Center for Hyperpolarization in Magnetic Resonance
Degree of recognition: International

Related external organisation
Scientific Committee of the European Congress of Medical Physics 2018
Activity: Membership › Membership of research networks or expert groups

Scientific Reports (Journal)
Period: 2017 → …
Terje Svingen (Reviewer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Description
Editorial Board Member
Degree of recognition: International

Related journal
Scientific Reports
2045-2322
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 4.63 SJR 1.625 SNIP 1.401, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed yes
Indexed in DOAJ
Central database
Activity: Research › Journal editor

Uvildige Ekspertpanel Deponering af radioaktivt affald i DK (External organisation)
Period: 2017 → …
Steffen Foss Hansen (Chairman)
Department of Environmental Engineering
Environmental Chemistry

Description
Member of the independent expert panel on deposit of radioactive waste in Denmark
Related external organisation

Uvildige Ekspertpanel Deponering af radioaktivt affald i DK
Uddannelses- og Forskningsministeriet, Børsgade 4, 2135, København K, Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

DTU Sustain 2017
Period: 6 Dec 2017
Steffen Foss Hansen (Organizer)
Kristian Mølhave (Organizer)
Department of Environmental Engineering
Environmental Chemistry
Department of Micro- and Nanotechnology
Molecular Windows
Description
Steering group member of DTU Sustain 2017
Degree of recognition: National
Links:
http://www.sustain.dtu.dk (Conference website)

Related event

DTU Sustain 2017
06/12/2017 → …
Activity: Attending an event › Participating in or organising a conference

High-throughput knockout of CHO host cell proteins to create a clean CHO cell
Period: 17 Nov 2017
Stefan Kol (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core

Related event

PEGS Europe: protein and antibody engineering summit
02/11/2015 → 06/11/2015
Lisbon, Portugal
Activity: Talks and presentations › Conference presentations

Allelic Imbalance usage in functional genetics
Period: 13 Nov 2017
Lasse Westergaard Folkersen (Invited speaker)
Department of Bio and Health Informatics
Integrative Systems Biology

Related event

World Gene Convention-2017
12/11/2017 → 14/11/2017
Macao, China
Activity: Talks and presentations › Conference presentations
World Gene Convention-2017
Period: 13 Nov 2017
Lasse Westergaard Folkersen (Chairman)
Department of Bio and Health Informatics
Integrative Systems Biology
Links:
http://www.bitcongress.com/wgc2017/ProgramLayout.asp

Related event
World Gene Convention-2017
12/11/2017 → 14/11/2017
Macao, China
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

IEEE Transactions on Sustainable Energy (Journal)
Period: Oct 2017 → …
Theis Bo Rasmussen (Reviewer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Related journal
IEEE Transactions on Sustainable Energy
1949-3029
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 7.8 SJR 2.636 SNIP 2.883, ISI indexed (2013): ISI indexed no,
Web of Science (2017): Indexed yes
Central database
Activity: Research › Peer review of manuscripts

International Journal of Distributed Sensor Networks (Journal)
Period: Oct 2017 → …
Theis Bo Rasmussen (Reviewer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Related journal
International Journal of Distributed Sensor Networks
1550-1329
Scopus rating (2016): CiteScore 1.16 SJR 0.271 SNIP 0.696, Web of Science (2017): Indexed Yes
Indexed in DOAJ
Central database
Activity: Research › Peer review of manuscripts

Assessment of filament LEDs
Period: 24 Oct 2017
Anders Thorseth (Speaker)
Department of Photonics Engineering
Diode Lasers and LED Systems
Degree of recognition: International
Related event

CIE 2017 Mid-term meeting Jeju Island
20/10/2017 → 28/10/2017
Korea, Republic of
Activity: Talks and presentations › Conference presentations

Light source characterization and air movement under CIE S 025
Period: 23 Oct 2017
Anders Thorseth (Speaker)
Department of Photonics Engineering
Diode Lasers and LED Systems
Degree of recognition: International

Related event

CIE 2017 Mid-term meeting Jeju Island
20/10/2017 → 28/10/2017
Korea, Republic of
Activity: Talks and presentations › Conference presentations

Towards New Affect Integrated Interaction Design (Event)
Period: 23 Oct 2017
Anja Maier (External examiner)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology

Description
Norwegian University of Science and Technology, Department of Engineering Design and Materials, TrollLabs

Censor for PhD project
Body type: PhD Assessment Committee
23 October 2017
Degree of recognition: International
Activity: Examinations and supervision › External examination

Evaluation of respiratory motion correction in PET/CT using a 3D printed phantom
Period: 22 Oct 2017
Josefine Holm Vilbsøll (Speaker)
Hasler S. W. Hasler (Guest lecturer)
L. D. L. Duchstein (Guest lecturer)
Jens E. Wilhjelm (Guest lecturer)
M. N. Lonsdale (Guest lecturer)
Department of Electrical Engineering
Biomedical Engineering
Degree of recognition: International

Related event

EANM’17: 30th Annual Congress of the European Association of Nuclear Medicine
21/10/2017 → 25/10/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations
CIE 2017 Mid-term meeting Jeju Island
Anders Thorseth (Participant)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
CIE 2017 Mid-term meeting Jeju Island, Republic of Korea
Degree of recognition: International

Related event
CIE 2017 Mid-term meeting Jeju Island
20/10/2017 → 28/10/2017
Korea, Republic of
Activity: Attending an event › Participating in or organising a conference

Nanoparticles in food – an overview
Period: 13 Oct 2017
Katrin Löschner (Guest lecturer)
National Food Institute
Research Group for Nano-Bio Science

Description
Meeting organized by the Danish Consumer Council (Tænk) for project leaders from other (mainly European) Consumer Councils - Focus: Testing of food
Degree of recognition: International

Related external organisation
Danish Consumer Council (Tænk)
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Surface characterization of activated chalcopyrite particles via the FLSmidth ROL process. Part 2: Surface spectroscopy investigations
Period: 12 Oct 2017
Adam Paul Karcz (Guest lecturer)
Department of Chemical and Biochemical Engineering
CHEC Research Centre

Description
Due to its semiconductor properties, the world’s most abundant copper mineral, chalcopyrite (CuFeS₂), is refractory with respect to atmospheric leaching using traditional acidic ferric sulfate lixivants. FLSmidth® has developed a novel Rapid Oxidative Leach (ROL) process that (a) manipulates the lattice and (b) mechano-chemically processes chalcopyrite with a Stirred Media Reactor (SMRt). This combination yields the benefit of increasing chemical reactivity and dissolution kinetics. By reducing surface passivation, this process is typically able to achieve copper recoveries exceeding 95% in under 6-8 hours. An important factor contributing to this extraordinary performance is a mineral preconditioning step, which uses 0.1-5 mol% of copper(II) to dope the lattice and thereby “activate” chalcopyrite. Previously, we reported the relationship between doping and deformation of the chalcopyrite lattice using electron microscopy. Now, we draw further insights into the electrochemical properties of the activated chalcopyrite particles through a variety of surface spectroscopy studies.
Degree of recognition: International

Related event
Materials Science and Technology 2017
08/10/2017 → 12/10/2017
Pittsburgh, United States
Activity: Talks and presentations › Conference presentations
Flexible Electricity Markets for decarbonized systems  
Period: 11 Oct 2017  
Klaus Skytte (Guest lecturer)  
Department of Management Engineering  

Description  
Eurelectric, Market Design 2050 Workshop  
Bruxelles, 11 October 2017  
Degree of recognition: International  
Documents:  
EurElectric_market_design_klaus_111017

Related external organisation  
Eurelectric  
Boulevard de l'Impératrice, 66, 1000, Brussels, Belgium  
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Food Labelling and Claims  
Period: 11 Oct 2017  
Heddie Mejborn (Guest lecturer)  
National Food Institute  
Division of Risk Assessment and Nutrition  
Degree of recognition: Local

Related event  
Integreteret produktudvikling i fødevareindustrien  
11/10/2017 → …  
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Investigation of echogenic surface enhancements for improved needle visualization in ultrasonography: A PRISMA systematic review  
Period: 11 Oct 2017  
Caroline Harder Hovgesen (Speaker)  
Jens E. Wilhjelm (Guest lecturer)  
Peter Vilmann (Guest lecturer)  
Evangelos Kalaitzakis (Guest lecturer)  
Department of Electrical Engineering  
Biomedical Engineering  
Degree of recognition: National

Related event  
DMTS Annual meeting  
10/10/2017 → 12/10/2017  
Vingsted, Denmark  
Activity: Talks and presentations › Conference presentations

Is it possible to define a “Threshold of Concern for Allergic Sensitisation”?  
Period: 11 Oct 2017  
Charlotte Bernhard Madsen (Guest lecturer)  
National Food Institute
Research Group for Gut Microbiology and Immunology
Degree of recognition: International

Related event

3rd ImpARAS Conference
10/10/2017 → 12/10/2017
Elsinore, Denmark
Activity: Talks and presentations › Conference presentations

The Au-S bond in biomolecular adsorption and electrochemical electron transfer
M.J. Ford (Other)
N.S. Hush (Other)
S. Marcuccio (Other)
J.R. Reimers (Other)
Jens Ulstrup (Invited speaker)
Jingdong Zhang (Other)
Department of Chemistry
NanoChemistry
Organic Chemistry

Description
2nd Gerischer-Kolb Symposium, Modern Aspects of Bioelectrochemistry, International Bunsen Discussion Meeting, Schloss Reisensburg, Germany, October 11 - 13, 2017
Degree of recognition: International
Documents:
AbstractGerischer_KolbOct2017

Related external organisation

University of Ulm
Ulm, Germany
Activity: Talks and presentations › Conference presentations

3rd ImpARAS Conference
Period: 10 Oct 2017 → 12 Oct 2017
Charlotte Bernhard Madsen (Organizer)
Katrine Lindholm Begeh (Organizer)
National Food Institute
Research Group for Gut Microbiology and Immunology

Description
Improving Allergy Risk Assessment Strategy for new food proteins (ImpARAS)
Degree of recognition: International

Related event

3rd ImpARAS Conference
10/10/2017 → 12/10/2017
Elsinore, Denmark
Activity: Attending an event › Participating in or organising a conference

'The minimum resting period for Atlantic cod (Gadus morhua) to regain pre-stressor status after pumping in a capture-based aquaculture operation'. Abstract and poster presentation at 47th Conference of the West European Fish Technologists' Association, in Dublin, Ireland.
Period: 9 Oct 2017 → 12 Oct 2017
Jonas Steenholdt Sørensen (Other)
Sørensen, J.S., Mejlholm, O., Dalgaard, P., Jessen, F. (2017). The minimum resting period for Atlantic cod (Gadus morhua) to regain pre-stressor status after pumping in a capture-based aquaculture operation. Abstract and poster at 47th Conference of the West European Fish Technologists' Association, 9-12 October, Dublin, Ireland.

Degree of recognition: International

**47th Conference of the West European Fish Technologists' Association: WEFTA**
09/10/2017 → 12/10/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

**Consistency and main differences between European regional climate downscaling intercomparison projects**
Period: 5 Oct 2017
Morten Andreas Dahl Larsen (Guest lecturer)
Department of Management Engineering
Systems Analysis

**EsacP meeting: Annual meeting**
05/10/2017 → 06/10/2017
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

**International Journal of Healthcare Technology and Management (Journal)**
Period: 5 Oct 2017 → 15 Nov 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Review of manuscript

**Related journal**
International Journal of Healthcare Technology and Management
1368-2156
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 0.27 SJR 0.13 SNIP 0.058
Central database
Activity: Research › Peer review of manuscripts

**Risk factors associated with spatio-temporal clusters of high mortality in Danish swine herds**
Period: 4 Oct 2017
Ana Carolina Lopes Antunes (Guest lecturer)
National Veterinary Institute
Epidemiology
Conceptualization of contamination using depth-discrete monitoring of dynamic PCE concentration changes during pumping
Period: 3 Oct 2017
Mette Martina Broholm (Speaker)
Annika Sidelmann Fjordbøge (Other)
Klaus Mosthaf (Speaker)
Bentje Brauns (Other)
Philip John Binning (Other)
Poul Løgstrup Bjerg (Other)
Department of Environmental Engineering
Water Resources Engineering
Office for Study Programmes and Student Affairs
Degree of recognition: International

Related event
2017 NGWA Conference on Fractured Rock and Groundwater
02/10/2017 → 03/10/2017
Burlington, United States
Activity: Talks and presentations › Conference presentations

How can we improve public health, food hygiene, and animal welfare in developing country slaughterhouses?
Period: 3 Oct 2017
Ana Carolina Lopes Antunes (Organizer)
National Veterinary Institute
Epidemiology
Degree of recognition: International

Related event
How can we improve public health, food hygiene, and animal welfare in developing country slaughterhouses?
03/10/2017 → …
Liege, Belgium
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

ECVPH AGM & Annual Scientific Conference 2017
Period: 2 Oct 2017 → 4 Oct 2017
Ana Carolina Lopes Antunes (Organizer)
National Veterinary Institute
Epidemiology

Related event
ECVPH AGM & Annual Scientific Conference 2017
Forced-gradient tracer tests in a fractured limestone aquifer designed and interpreted by modeling

Period: 2 Oct 2017
Klaus Mosthaf (Speaker)
Bentje Brauns (Other)
Mette Martina Broholm (Other)
Annika Sidelmann Fjordbøge (Other)
Poul Løgstrup Bjerg (Other)
Magnus Rohde (Other)
Henriette Kern-Jespersen (Other)
Philip John Binning (Other)

Department of Environmental Engineering
Water Resources Engineering

Description
The importance of fracture flow and transport in a fractured limestone was investigated with a hydraulic pumping test combined with 6 tracer tests. The pumping test was conducted in a PCE-contaminated fractured limestone aquifer over several weeks, with head observations being collected at a set of observation wells at several depth intervals in the aquifer. The pumping test was combined with six tracer tests. Fluorescent and ionic tracers were used for injections through the screens of the observation wells and monitored at the pumping well. Before the pumping test, the geology was carefully mapped using borehole cores, flow logs, geophysics etc. 3D modeling guided with the test design and helped with the interpretation of the of the pumping and tracer test results.

The pumping test and the geologic investigations showed that the limestone aquifer was highly permeable, with fracture flow dominating the hydraulic response. Most tracer tests resulted in a very fast tracer arrival, indicating a very good connectivity between wells at a similar depth as the pumping well. Strong diffusive interaction between fractures and matrix was revealed by significant tailing in the tracer breakthrough curves. In one tracer test, tracers were injected before starting to pump to allow the tracers to diffuse more into the matrix. This resulted in lower breakthrough concentrations and longer tailing, representing mainly the back-diffusion from the matrix. Deeper wells and crushed upper layers have less connectivity to the pumping well and show slower tracer breakthroughs.

The breakthrough curves from the tracer tests were used to test different model concepts. A discrete-fracture model could be fitted best to the observed breakthrough curves. It demonstrated the importance of including fracture flow and transport in the modeling of fractured limestone sites. The calibrated model was used to analyze the spreading behavior of the contaminant plume.

Degree of recognition: International

Related event

2017 NGWA Conference on Fractured Rock and Groundwater
02/10/2017 → 03/10/2017
Burlington, United States
Activity: Talks and presentations › Conference presentations

Tools for massive bacterial genome engineering

Period: 30 Sep 2017
Morten Otto Alexander Sommer (Guest lecturer)

Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Degree of recognition: International

Related event

EMBO Synthetic Biology in Action: Programming Bacteria to Do Amazing Things
24/09/2017 → 01/10/2017
Heidelberg, Germany
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities
International Committee for Predictive Modelling Food (ICPMF) (External organisation)
Period: 29 Sep 2017 → …
Maarten Nauta (Member)

National Food Institute
Research Group for Risk-Benefit

Description
Member of committee
Degree of recognition: International
Links:
http://www.icpmf.org

Related external organisation
International Committee for Predictive Modelling Food (ICPMF)
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Can stochastic Consumer Phase Models in Microbial Risk Assessment be simplified to a single factor?
Period: 28 Sep 2017
Maarten Nauta (Speaker)

National Food Institute
Research Group for Risk-Benefit
Degree of recognition: International

Related event
10th International Conference on Predictive Modelling in Food: ICPMF10
26/09/2017 → 29/09/2017
Cordoba, Spain
Activity: Talks and presentations › Conference presentations

IEA Wind Task 32 workshop
Period: 27 Sep 2017
Antoine Boruccino (Guest lecturer)
Rozenn Wagner (Other)
David Schlipf (Other)
Nicolai Gayle Nygaard (Other)

Department of Wind Energy
Meteorology & Remote Sensing

Description
Workshop on: "Power Performance Measurement Using Nacelle Lidars"
Degree of recognition: International
Documents:
2017_09_27_ABoruccino_IEA_wind32_naclidar_calib
2017_09_27_ABoruccino_IEA_wind32_naclidar_PCV_UniTTe

Related event
IEA Wind Task 32 workshop: Power performance measurement using nacelle lidars
27/09/2017 → 27/09/2017
Gentofte, Denmark
Activity: Talks and presentations › Conference presentations

Lidar Measurement for more Accurate Measurements and Higher Energy Yield
Period: 27 Sep 2017
Torben Krogh Mikkelsen (Invited speaker)
Department of Wind Energy
Meteorology & Remote Sensing

**Description**
Real time measurements of Wind Using Lidars
Turbine Control
Turbine Wakes
Data Basis for Model Comparison
Degree of recognition: International

**Related event**
3rd International Conference Digital Data Integration & Management From SCADA to Asset Optimization
26/09/2017 → 28/09/2017
Activity: Talks and presentations › Conference presentations

Searching for Plausible N-k Contingencies Endangering Voltage Stability
Period: 27 Sep 2017
Johannes Tilman Gabriel Weckesser (Guest lecturer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

**Description**
Presentation of a novel search algorithm using time-domain simulations to identify plausible N-k contingencies endangering voltage stability. Starting from an initial list of disturbances, progressively more severe contingencies are investigated. After simulation of a N-k contingency, the simulation results are assessed. If the system response is unstable, a plausible harmful contingency sequence has been found. Otherwise, components affected by the contingencies are considered as candidate next event leading to N-(k+1) contingencies. This implicitly takes into account hidden failures of component protections. The performance of the proposed search algorithm is compared to a brute-force algorithm and demonstrated on the IEEE Nordic test system.
Degree of recognition: International
Documents:
ISGT - N-k search algorithm

**Related event**
2017 IEEE PES Innovative Smart Grid Technologies Conference Europe
26/09/2017 → 29/09/2017
Torino, Italy
Activity: Talks and presentations › Conference presentations

10th International Conference on Predictive Modelling in Food (Event)
Period: 26 Sep 2017 → 29 Sep 2017
Ana Sofia Ribeiro Duarte (Reviewer)
National Food Institute
Research Group for Genomic Epidemiology

**Description**
Member of Scientific Committee
Degree of recognition: International

**Related event**
10th International Conference on Predictive Modelling in Food: ICPMF10
26/09/2017 → 29/09/2017
Cordoba, Spain
Activity: Research › Peer review of manuscripts
Joint EURL FV/CF/AO/SRM-Workshop for Pesticide Residues in Food and Feed  
Period: 26 Sep 2017 → 29 Sep 2017  
Susan Strange Herrmann (Organizer)  
National Food Institute  
Research Group for Analytical Food Chemistry  

Description  
Degree of recognition: International  

Related event  
Joint EURL FV/CF/AO/SRM-Workshop for Pesticide Residues in Food and Feed  
26/09/2017 → 29/09/2017  
Freiburg, Germany  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

'Modelling effects of food characteristics on interaction between lactic acid bacteria and Listeria monocytogenes' at 10th International Conference on Predictive Modelling in Food, Cordoba, Spain  
Period: 26 Sep 2017 → 29 Sep 2017  
Paw Dalgaard (Speaker)  
L.M. Laursen (Other)  
R.L. Pedersen (Other)  
Ole Mejlholm (Other)  
National Food Institute  
Research Group for Analytical and Predictive Microbiology  

Description  
Degree of recognition: International  

Related event  
10th International Conference on Predictive Modelling in Food: ICPMF10  
26/09/2017 → 29/09/2017  
Cordoba, Spain  
Activity: Talks and presentations › Conference presentations

Psychrotolerant pseudomonads - extensive cardinal parameter model to predict and document growth in salt-reduced lightly preserved seafood  
Period: 26 Sep 2017 → 29 Sep 2017  
Veronica Martinez Rios (Speaker)  
Paw Dalgaard (Other)  
National Food Institute  
Research Group for Analytical and Predictive Microbiology  

Description  
Degree of recognition: International  

Related event  
10th International Conference on Predictive Modelling in Food: ICPMF10
26/09/2017 → 29/09/2017
Cordoba, Spain
Activity: Talks and presentations › Conference presentations

**Aalto University**
Period: 25 Sep 2017
Tommi Olavi Brander (Visiting researcher)
Department of Applied Mathematics and Computer Science
Scientific Computing

**Description**
Research collaboration with Antti Hannukainen and Nuutti Hyvönen.
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

**High-throughput knockout of CHO host cell proteins to create a clean CHO cell**
Period: 25 Sep 2017
Stefan Kol (Lecturer)
Novo Nordisk Foundation Center for Biosustainability
CHO Core
Degree of recognition: International

**Related event**
**PEACe Valencia: Conference on Protein Expression in Animal Cells**
24/09/2017 → 28/09/2017
Valencia, Spain
Activity: Talks and presentations › Conference presentations

**NOMAD Summer**
Period: 25 Sep 2017 → 29 Sep 2017
Simon Loftager (Participant)
Department of Energy Conversion and Storage
Atomic scale modelling and materials
Degree of recognition: International

**Related event**
**NOMAD Summer: A hands-on course on tools for novel-materials discovery**
25/09/2017 → 29/09/2017
Berlin, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Visualizing Catalysts in Action**
Period: 25 Sep 2017
Christian Danvad Damsgaard (Invited speaker)
Center for Electron Nanoscopy
DTU Danchip
Department of Physics
Experimental Surface and Nanomaterials Physics

**Description**
invited talk https://mcm2017.irb.hr/
Degree of recognition: International

**Related event**
**13th Multinational Congress on Microscopy**
25/09/2017 → 29/09/2017
Rovinj, Croatia
Activity: Talks and presentations › Conference presentations

**PEACe Valencia**
Period: 24 Sep 2017 → 28 Sep 2017
Daniel Ley (Participant)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design

**Description**
Reprogramming Amino Acid Catabolism in CHO Cells with CRISPR-Cas9 Genome Editing Improves Cell Growth and Reduces By-Product Secretion
Degree of recognition: International

**Related event**
**PEACe Valencia: Conference on Protein Expression in Animal Cells**
24/09/2017 → 28/09/2017
Valencia, Spain
Activity: Attending an event › Participating in or organising a conference

**Combining X-ray and Electron Based in situ Characterization of Catalysts**
Period: 23 Sep 2017
Christian Danvad Damsgaard (Invited speaker)
Center for Electron Nanoscopy
DTU Danchip
Department of Physics
Experimental Surface and Nanomaterials Physics

**Description**
invited talk @ https://coex.iom.cnr.it/
Degree of recognition: International

**Related event**
**Combining electrons with X-rays for integrated in-operando experiments**
23/09/2017 → 24/09/2017
Trieste, Italy
Activity: Talks and presentations › Conference presentations

**In silico and experimental approaches to understand and engineer the biosynthesis of antibiotics**
Period: 22 Sep 2017
Tilmann Weber (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

**Description**
Talk at the seminar of the Department of Veterinary and Animal Sciences, Copenhagen University

**Related external organisation**
**University of Copenhagen**
Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities
**Norwegian University of Life Sciences (External organisation)**  
Period: 22 Sep 2017  
Klaus Skytte (Participant)  
Department of Management Engineering  
Systems Analysis  

**Description**  
PhD evaluation committee, Philosophiae Doctor (PhD), Jon Gustav Kirkerud, Faculty of Environmental Sciences and Natural Resource Management, Norwegian University of Life Sciences  
Degree of recognition: International  

**Related external organisation**  
Norwegian University of Life Sciences  
Norway  
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar  

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**Dynamics of intra-mammary infections causing pathogens: A herd-, cow- and strain-specific model.**  
Period: 21 Sep 2017  
Carsten Thure Kirkeby (Guest lecturer)  
National Veterinary Institute  
Epidemiology  

**Description**  
Presentation at the EMRW meeting 2017  
Degree of recognition: International  
Links:  
http://cphcattle.ku.dk/seminarer/emrw/  

**Related external organisation**  
University of Copenhagen  
Copenhagen, Denmark  
Activity: Talks and presentations › Conference presentations  

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**High Tech Summit**  
Period: 20 Sep 2017 → 21 Sep 2017  
Alfred Heller (Organizer)  
Department of Civil Engineering  
Centre for IT-Intelligent Energy Systems in Cities  

**Description**  
Organizer Smart Cities and Smart Buildings Tracks  

**Related event**  
**High Tech Summit**  
20/09/2017 → 21/09/2017  
Kongnes Lyngby, Denmark  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.  

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**Miniature converters**  
Period: 20 Sep 2017  
Michael A. E. Andersen (Invited speaker)  
Department of Electrical Engineering  
Electronics
Degree of recognition: National
Links:
https://hightechsummit.dk/

Related event

High Tech Summit
20/09/2017 → 21/09/2017
Kongnes Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Risk as a feeling - Psychometric Risk Assessment
Period: 20 Sep 2017
Josef Oehmen (Guest lecturer)
Department of Management Engineering
Engineering Systems

Description
Master Class for the Executive Master in Risk Management, University of Twente
Degree of recognition: International

Related external organisation

University of Twente
Twente, Netherlands
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Succes med big data afhænger af dit digitale mindsæt
Period: 20 Sep 2017
Pernille Rydén (Guest lecturer)
Center for Bachelor of Engineering Studies
Afdelingen for Forretningsudvikling
Degree of recognition: Regional
Links:
https://handel.di.dk/arrangementer/kurserogarrangementer/Pages/Succesmedbigdataafhaengerafditdigitalemindsaet0718-1785.aspx (Workshop details)

Related external organisation

Dansk Industri
H.C.Andersens Boulevard 18, 1787, København V, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

13th EAWE PhD seminar on Wind Energy in Europe
Period: 19 Sep 2017 → 22 Sep 2017
Elliot Simon (Organizer)
Department of Wind Energy
Meteorology & Remote Sensing

Description
Conference co-organiser and scientific committee chair for DTU
Degree of recognition: International

Related event

13th EAWE PhD seminar on Wind Energy in Europe
19/09/2017 → 22/09/2017
Cranfield, United Kingdom
Activity: Attending an event › Participating in or organising a conference
Sampling and sample preparation is critical
Period: 19 Sep 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science
Degree of recognition: International

Related event
NanoDefine Final Outreach Event: Classification of nanomaterials according to the EU definition
19/09/2017 → 20/09/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Diverse Genetic Error Modes in Large-Scale Biological Production
Period: 18 Sep 2017
Peter Rugbjerg (Guest lecturer)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Degree of recognition: International

Related event
Commercializing Industrial Biotechnology 2017
18/09/2017 → 19/09/2017
San Diego, United States
Activity: Talks and presentations › Conference presentations

Influence of tool texture on friction and lubrication in strip reduction
Period: 17 Sep 2017 → 22 Sep 2017
Mohd Hafis Bin Sulaiman (Guest lecturer)
Peter Christiansen (Guest lecturer)
Niels Oluf Bay (Guest lecturer)
Department of Mechanical Engineering
Manufacturing Engineering

Description
International Conference on the Technology of Plasticity, ICTP 2017, 17-22 September 2017, Cambridge, United Kingdom

Abstract:
Tool texturing is studied as a method to enhance lubrication and prevent the occurrence of galling. Strip reduction test
tools manufactured with longitudinal, shallow pocket geometries oriented perpendicular to the sliding direction are tested. The pockets have small angles to the workpiece surface and varying distance. The experiments show an optimum distance between the pockets to exist that creates table mountain topography with flat plateaus and narrow pockets in between. If the flat plateaus are too narrow, an increase in drawing load and pick-up on the tool plateaus is observed. The same occurs for too wide plateaus. A theoretical friction model supports the experimental findings of an optimum distance between the pockets, where the contribution to friction by mechanical interlocking of the strip in the pockets is limited and lubrication of the plateaus is enhanced by micro-plasto-hydrodynamic lubrication.

Degree of recognition: International

Related external organisation

Universiti Malaysia Perlis
Malaysia
Activity: Talks and presentations › Conference presentations

Bevilling - A.N. Neergaard og Hustrus Fond
Period: 14 Sep 2017
Ditte Baun Hermund (Other)
National Food Institute
Research Group for Bioactives – Analysis and Application
Activity: Other

EURL - Campylobacter workshop 2017
Period: 14 Sep 2017 → 15 Sep 2017
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety

Related event

EURL - Campylobacter workshop 2017
14/09/2017 → 15/09/2017
Nantes, France
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Kroniske Sygdomme i Hovedstadsregionen – Borgerklynger, Storforbrugere og Socioøkonomiske Effekter
Period: 14 Sep 2017
Anders Stockmarr (Invited speaker)
Anne Frølich (Other)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Degree of recognition: Local

Related event

Tredie workshop for forsker-og udviklernetværk om multisygdom i Region Hovedstaden
14/09/2017 → 14/09/2017
København, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Lysets dag 2017
Period: 14 Sep 2017
Anders Thorseth (Participant)
Department of Photonics Engineering
Diode Lasers and LED Systems
Investigation of consumer's behavior towards investments in household energy efficient appliances

**Period:** 13 Sep 2017 → 15 Sep 2017

Mattia Baldini (Speaker)
Alessio Trivella (Other)
Jordan William Halverson Wente (Other)

Department of Management Engineering
Systems Analysis
Management Science
Operations Research

**Description**

The previous EEDAL conferences have been very successful in attracting an international audience. EEDAL has established itself as an influential and recognised international event to discuss the progress achieved and latest developments in technologies, behavioural aspects and policies. EEDAL is the venue to establish new collaborations and synergies and build international partnerships among stakeholders.

**Related event**

9th International Conference on Energy Efficiency in Domestic Appliances and Lighting
13/09/2017 → 15/09/2017
Irvine, United States

**Activity:** Talks and presentations › Conference presentations

**Related journal**

**Turkish Journal of Fisheries and Aquatic Sciences**
Period: 13 Sep 2017
Ditte Baun Hermund (Reviewer)
National Food Institute
Research Group for Bioactives – Analysis and Application

**Related journal**

**Turkish Journal of Fisheries and Aquatic Sciences**
1303-2712
Scopus rating (2016): CiteScore 0.67, SJR 0.282, SNIP 0.612, Web of Science (2017): Indexed yes

Central database

**Activity:** Research › Peer review of manuscripts

**Evaluation of regulation for flexibility – a methodology**
Period: 12 Sep 2017
Daniel Møller Sneum (Guest lecturer)
Department of Management Engineering

Systems Analysis

Description
Regulatory changes for increased flexibility in the energy system entail socio-economic consequences, which must be evaluated in addition to the consequences for flexibility, to provide a comprehensive analysis of the impacts. This study proposes a methodology for such evaluation of regulation.

Degree of recognition: International

Documents:
20170912-4DH evaluation parameters-DMS

Related event

3rd international conference on smart energy systems and 4th generation district heating
12/09/2017 → 13/09/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

Performance analysis of heat pumps utilizing different low temperature heat sources to supply district heating
Period: 12 Sep 2017
Henrik Pieper (Speaker)

Department of Mechanical Engineering
Thermal Energy
Degree of recognition: International

Documents:
Performance analysis of heat pumps utilizing different low temperature heat sources to supply district heating

Links:
http://www.4dh.eu/conferences/conference-2017/presentations

Related event

3rd international conference on smart energy systems and 4th generation district heating
12/09/2017 → 13/09/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

Better Training for Safer Foods
Period: 11 Sep 2017 → 15 Sep 2017
Heddie Mejborn (Speaker)

National Food Institute
Division of Risk Assessment and Nutrition

Description
Training coordinator and tutor
Degree of recognition: International

Related event

Better Training for Safer Foods
11/09/2017 → 15/09/2017
Tallinn, Estonia
Activity: Talks and presentations › Conference presentations

International Workshop on High Temperature Heat Pumps
Period: 11 Sep 2017
Brian Elmegaard (Organizer)
Benjamin Zühlsdorf (Organizer)
Reinholdt Lars Ove (Organizer)
Michael Bantle (Organizer)
Department of Mechanical Engineering
Thermal Energy
Degree of recognition: International
Links:
http://www.conferencemanager.dk/HighTemperatureHeatPumps (Workshop Homepage)

Related event
International Workshop on High Temperature Heat Pumps
11/09/2017 → 11/09/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Transferring knowledge from building operation to design - A literature review
Period: 11 Sep 2017
Helle Lohmann Rasmussen (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
CIB Helle Lohmann Rasmussen

Related event
CIB World Congress 2017
11/09/2017 → 15/09/2017
Salford, United Kingdom
Activity: Talks and presentations › Conference presentations

CHRO 2017
Period: 10 Sep 2017 → 14 Sep 2017
Annette Nygaard Jensen (Other)
National Food Institute
Research Group for Microbial Food Safety
Description
Poster presentation

Related event
19th International Workshop on Campylobacter, Helicobacter and Related Organisms: CHRO 2017
10/09/2017 → 14/09/2017
Nantes, France
Activity: Talks and presentations › Conference presentations

International Workshop on Business Process Intelligence
Period: 10 Sep 2017 → 11 Sep 2017
Andrea Burattin (Organizer)
Department of Applied Mathematics and Computer Science
Software Engineering
Degree of recognition: International

Related event
International Workshop on Business Process Intelligence
10/09/2017 → 11/09/2017
Barcelona, Spain
EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland  
Period: 7 Sep 2017  
Sven-Erik Gryning (Chairman)  
Department of Wind Energy  
Degree of recognition: International

Related event
EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland  
04/09/2017 → 08/09/2017  
Dublin, Ireland  
Activity: Attending an event › Participating in or organising a conference

European Meteorological Society (External organisation)  
Period: 7 Sep 2017  
Sven-Erik Gryning (Member)  
Department of Wind Energy  
Description  
European Meteorological Society: Programme and Science Committee Meeting  
Degree of recognition: International

Related external organisation  
European Meteorological Society  
Germany  
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Interview for benchmarking the health cluster in Copenhagen - a study about the economic impact of the Meilahti campus health ecosystem in Helsinki  
Period: 7 Sep 2017  
Kasper Edwards (Consultant)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  
Degree of recognition: International

Related external organisation  
Nordic Healthcare Group  
Vattuniemenranta 2, 4.krs , 00210, Helsinki, Finland  
Activity: Public and private sector consultancy › Consultancy

PACE – Proactive Care for Elderly People with Dementia  
Period: 7 Sep 2017  
Anders Stockmarr (Guest lecturer)  
Department of Applied Mathematics and Computer Science  
Statistics and Data Analysis

Related event  
Hillerød city council: committee meeting  
07/09/2017 → 07/09/2017  
Hillerød, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Proof Assistants and Related Tools - The PART & PART 2 Projects 2017
Period: 7 Sep 2017
Anders Schlichtkrull (Participant)
Department of Applied Mathematics and Computer Science
Algorithms and Logic

Description
Anders Schlichtkrull (joint work with Jasmin Christian Blanchette, Dmitriy Traytel and Uwe Waldmann): Formalization of an Ordered Resolution Prover in Isabelle/HOL

Talk "Formalization of an Ordered Resolution Prover in Isabelle/HOL" at PART

Related event

Proof Assistants and Related Tools - The PART & PART 2 Projects 2017
07/09/2017 → 07/09/2017
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

The microbiome of potable water producing biofilters: taxonomic insights and anomalies, metabolic potentials, biotechnological opportunities?
Period: 7 Sep 2017 → 8 Sep 2017
Barth F. Smets (Keynote speaker)
Department of Environmental Engineering
Water Technologies
Degree of recognition: International

Related event

2nd International Conference on Microbial Resource Management : MRM2
07/09/2017 → 08/09/2017
Gent, Belgium
Activity: Talks and presentations › Conference presentations

EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland (Event)
Period: 6 Sep 2017
Sven-Erik Gryning (Chairman)
Department of Wind Energy

Description
Chairing two sessions
Degree of recognition: International

Related event

EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland
04/09/2017 → 08/09/2017
Dublin, Ireland
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Maul- und Klauenseuche – verschiedene Bekämpfungsmethoden und ihre Auswirkungen
Period: 6 Sep 2017 → 8 Sep 2017
Carola Sauter-Louis (Other)
Christoph Staubach (Other)
Thomas Selhorst (Other)
Tariq Hisham Beshara Halasa (Guest lecturer)
Christine Potgiiese (Other)
Jorn Gethmann (Other)
Carolina Probst (Other)
Brend Haas (Other)
Franz J. Conraths (Other)
National Veterinary Institute
Epidemiology

**Description**
Poster presentation in the DVG-Epidemiologie Conference, DACH-Epi 2017, 6th -8th September 2017, Hall in Tirol, Austria
Degree of recognition: International

**Related event**
the DVG-Epidemiologie Conference,
06/09/2017 → 08/09/2017
Activity: Talks and presentations › Conference presentations

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**Using OR + AI to predict the optimal production of offshore wind parks: a preliminary study**
Period: 6 Sep 2017
Martina Fischetti (Guest lecturer)

**Department of Management Engineering**
Management Science
Operations Research

**Description**
In this paper we propose a new use of Machine Learning together with Mathematical Optimization. We investigate the question of whether a machine, trained on a large number of optimized solutions, can accurately estimate the value of the optimized solution for new instances. We focus on instances of a specific problem, namely, the offshore wind farm layout optimization problem. In this problem an offshore site is given, together with the wind statistics and the characteristics of the turbines that need to be built. The optimization wants to determine the optimal allocation of turbines to maximize the park power production, taking the mutual interference between turbines into account. Mixed Integer Programming models and other state-of-the-art optimization techniques, have been developed to solve this problem. Starting with a dataset of 2000+ optimized layouts found by the optimizer, we used supervised learning to estimate the production of new wind parks. Our results show that Machine Learning is able to well estimate the optimal value of offshore wind farm layout problems.

**Documents:**
ODS2017Fisch

**Related event**
International Conference on Optimization and Decision Science
04/09/2017 → 07/09/2017
Activity: Talks and presentations › Conference presentations

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**What determines the integration of heterologous genes?**
Period: 6 Sep 2017
Andreas Porse (Speaker)

**Novo Nordisk Foundation Center for Biosustainability**
Bacterial Synthetic Biology
Degree of recognition: International

Related event

**CFB Annual Seminar**
06/09/2017 → 07/09/2017
Helsingør, Denmark
Activity: Talks and presentations › Conference presentations

**Sikker fremstilling af fermenterede fødevarer - pølser og kål som cases**
Period: 5 Sep 2017
Tina Beck Hansen (Invited speaker)
National Food Institute
Research Group for Microbial Food Safety
Documents:
fermentering_food_050917

Related event

**Afdelingsmøde Fødevare København**
05/09/2017 → 05/09/2017
Glostrup, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**UV-treatment of foods and animals as a vitamin D enrichment approach**
Period: 5 Sep 2017
Jette Jakobsen (Invited speaker)
National Food Institute
Research Group for Bioactives – Analysis and Application
Degree of recognition: International

Related event

**ODIN Vitamin D and Health in Europe: Current and future perspectives**
05/09/2017 → 06/09/2017
Cork, Ireland
Activity: Talks and presentations › Conference presentations

**26th International Conference of World Association for the Advancement of Veterinary Parasitology (WAAVP)**
Period: 4 Sep 2017 → 8 Sep 2017
Heidi Huus Petersen (Organizer)
National Veterinary Institute
Bacteriology & Parasitology
Degree of recognition: International

Related event

**26th International Conference of World Association for the Advancement of Veterinary Parasitology (WAAVP): Combating Zoonoses: Strength in East-West Partnership**
04/09/2017 → 08/09/2017
Kuala Lumpur, Malaysia
Activity: Attending an event › Participating in or organising a conference

**An emerging European Doppler lidar network for meteorological applications**
Period: 4 Sep 2017 → 8 Sep 2017
Ewan J. O’Connor (Speaker)
Anne Hirsikko (Other)
Doppler lidar horizontal wind retrievals from a meteorological perspective

Period: 4 Sep 2017 → 8 Sep 2017

Ewan O'Connor (Speaker)
Anne Hirsikko (Other)
Christos Halios (Other)
Sven-Erik Gryning (Other)
Ronny Leinweber (Other)
Antti Manninen (Other)
Tobias Marke (Other)
Guðrún Nina Petersen (Other)
Jana Preissler (Other)
Eileen Päschke (Other)
Umar Saeed (Other)
jan sween (Other)
Yang Shu (Other)
Irene Suomi (Other)
Minttu Tuononen (Other)
Ville Vakkari (Other)
Ludovic Thobois (Panel member)
Guy Pearson (Panel member)
Alain Dabas (Other)
Johannes Buehl (Other)

Department of Wind Energy
Related event

EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 |
Dublin, Ireland
04/09/2017 → 08/09/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

European Meteorological Society (External organisation)
Period: 4 Sep 2017
Sven-Erik Gryning (Member)
Department of Wind Energy

Description
Member of the EMS Council
Degree of recognition: International

Related external organisation

European Meteorological Society
Germany
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Marina wind profiles measured by a wind lidar - ability of WRF to predict marine wind profiles
Period: 4 Sep 2017 → 8 Sep 2017
Ekaterina Batchvarova (Speaker)
Sven-Erik Gryning (Other)
Department of Wind Energy
Degree of recognition: International
Documents:
EMS2017-775

Related event

EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 |
Dublin, Ireland
04/09/2017 → 08/09/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

New methodologies to observe wind gusts: research aircraft and Doppler lidar measurements
Period: 4 Sep 2017 → 8 Sep 2017
Irene Suomi (Speaker)
Timo Vihma (Other)
Sven-Erik Gryning (Other)
Christof Lüpkes (Other)
Jörg Hartmann (Other)
Ewan O'Connor (Other)
Department of Wind Energy
Degree of recognition: International
Documents:
EMS2017-197

Related event
Performance of four PBL schemes in WRF at Villum Research Station, Station Nord, Greenland
Period: 4 Sep 2017 → 8 Sep 2017
Hristina Kirova (Other)
Ekaterina Batchvarova (Speaker)
Sven-Erik Gryning (Other)
Henrik Skov (Other)
Lise-Lotte Sørensen (Other)

Department of Wind Energy
Degree of recognition: International
Documents:
EMS2017-778-2

Related event
EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland
04/09/2017 → 08/09/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

Ramp events in the marine boundary-layer investigated by a wind lidar
Period: 4 Sep 2017 → 8 Sep 2017
Sven-Erik Gryning (Speaker)
Ekaterina Batchvarova (Other)

Department of Wind Energy
Degree of recognition: International
Documents:
EMS2017-777

Related event
EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2017 | 4–8 September 2017 | Dublin, Ireland
04/09/2017 → 08/09/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

Federated Conference on Computer Science and Information Systems
Period: 3 Sep 2017 → 6 Sep 2017
Theis Bo Rasmussen (Organizer)

Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Oral presentation of conference paper

Related event
Federated Conference on Computer Science and Information Systems
04/09/2017 → 07/09/2017
Prague, Czech Republic
The Life of Flow Injection Analysis and Academic Mass Innovation
Period: 1 Sep 2017
Laila Zwisler (Speaker)
Department of Physics

Description
The study I will present has taken its offset in a group of artefacts from the historical collection at the Technical University of Denmark (DTU). The artefacts stem from the emergence of the flow analysis platform FIA and the further development of FIA. At DTU this development started in 1974. A tale of academic innovation between chemical science, industry, engineering academia and political spheres spun from these artefacts. The stories have a number of typical traits of a recent technoscience development in academia and in the talk I will discuss these traits. The people involved had to negotiate their way between the ethos of science, patent systems, the cooperate world and funding systems. A number of coincidences as well as conscious efforts brought FIA forward onto the international scene. The uneven distribution of wealth in this world opened a path for a technology for mass chemical analysis on the cheap. The fight for resources and enrollment was on. Money was not a goal but a means to sustain continued work. Honour, novelty and opportunity were precious commodities. FIA was not an island; others were on the same trail. I will look into how and why it was perceived as new by some and not by others.

Degree of recognition: International

Related event
ICHC International Conference on the History of Chemistry: 11ICHC
29/08/2017 → 29/09/2017
Trondheim, Norway
Activity: Talks and presentations › Conference presentations

University of Salamanca
Period: 1 Sep 2017 → 31 Dec 2017
Helia Relano Iborra (Visiting researcher)
Department of Electrical Engineering
Hearing Systems

Description
4 months research stay at the Auditory Computation & Psychoacoustics group of the Institute of Neurosciences f the University of Salamanca with Professor Enrique A. Lopez-Poveda
Activity: Visiting an external institution › Visiting another research institution

Austrian Science Fund / Der Wissenschaftsfonds (External organisation)
Period: Aug 2017 → Oct 2017
Per Dannemand Andersen (Chairman)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Description
Review of research application

Related external organisation
Austrian Science Fund / Der Wissenschaftsfonds
Wien, Austria
Activity: Membership › Membership in review committee

Frontiers in Veterinary Science (Journal)
Period: Aug 2017
Tim Kåre Jensen (Reviewer)
National Veterinary Institute

Description
Review of manuscript for Frontiers in Veterinary Science
Degree of recognition: International

Related journal
Frontiers in Veterinary Science
2297-1769
BFI (2017): BFI-level 1
Indexed in DOAJ
Central database
Activity: Research › Peer review of manuscripts

Helia Relano Iborra (Reviewer)
Department of Electrical Engineering
Hearing Systems

Related journal
Trends in Hearing (Journal)
Period: Aug 2017
Helia Relano Iborra (Reviewer)
Department of Electrical Engineering
Hearing Systems

Related journal
Trends in Hearing
2331-2165
Scopus rating (2016): CiteScore 3.61, Web of Science (2017): Indexed Yes
Indexed in DOAJ
Local database
Activity: Research › Peer review of manuscripts

Tilmann Weber (Member)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

Description
External reviewer of PhD thesis at the Center for Biotechnology (CeBiTec) at Bielefeld University

Related external organisation
Bielefeld University
Germany
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Vratislav Stovicek (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering
Degree of recognition: International

Biorefine-2G: From Waste Biomass To Biopolymers Using Yeast Cell Factories
Period: 31 Aug 2017
Vratislav Stovicek (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering
Degree of recognition: International

Related event
28th International Conference on Yeast Genetics and Molecular Biology
27/08/2017 → 01/09/2017
Prague, Czech Republic
Activity: Talks and presentations › Conference presentations

Conference: 4S/EASST 2017 Boston
Period: 31 Aug 2017 → 2 Sep 2017
Meiken Hansen (Speaker)
Per Dannemand Andersen (Other)
Department of Management Engineering
Technology and Innovation Management
Documents:
Hansen Andersen abstract 4S

Related event

4S/EASST 2017 Boston: Annual Meeting of the Society for Social Studies of Science (4S)
30/08/2017 → 02/09/2017
Boston, United States
Activity: Talks and presentations › Conference presentations

EAAP 2017 Annual Meeting
Period: 31 Aug 2017
Dorte Lau Baggesen (Invited speaker)
National Food Institute

Description
Legislation as framework conditions and challenges for the upcoming insect industry

Related event

EAAP 2017 Annual Meeting: Safety, regulatory issues and consumer acceptance of insects
26/08/2017 → 01/09/2017
Tallin, Estonia
Activity: Talks and presentations › Conference presentations

EAAP 2017 Annual Meeting: One-day insect seminar
Period: 31 Aug 2017
Annette Nygaard Jensen (Speaker)
National Food Institute
Research Group for Microbial Food Safety

Description
European Federation of Animal Science (EAAP)

Related event

EAAP 2017 Annual Meeting: Safety, regulatory issues and consumer acceptance of insects
26/08/2017 → 01/09/2017
Tallin, Estonia
Activity: Talks and presentations › Conference presentations

TRANSFORM YOUR BUSINESS WITH BIG DATA – BUT MIND THE MENTAL GAP
Period: 31 Aug 2017
Pernille Rydén (Guest lecturer)
Center for Bachelor of Engineering Studies
Afdelingen for Forretningsudvikling
Degree of recognition: International
Links:
http://www.efzg.unizg.hr/default.aspx?id=28640 (Even description)

Related external organisation

University of Zagreb
Croatia
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Data-Driven Security-Constrained OPF
Period: 30 Aug 2017
Florian Thams (Guest lecturer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Presentation of the accepted paper.
Degree of recognition: International

Related event

10th Bulk Power Systems Dynamics and Control Symposium
27/08/2017 → 01/09/2017
Espinho, Portugal
Activity: Talks and presentations › Conference presentations

Children's genuine participation and development of social Capital in the school setting
Period: 29 Aug 2017 → 1 Sep 2017
Nanna Wurr Stjernqvist (Speaker)
Nicole Thualagant (Speaker)
National Food Institute
Division of Risk Assessment and Nutrition

Description
This presentation presents the findings from a exploratory qualitative research study
Documents:
Presentation - Children's genuine participation and development of social capital in the school setting

Related organisation

Children's genuine participation and development of social Capital in the school setting
Stjernqvist, N. W. (Speaker), Nicole Thualagant (Speaker)
29 Aug 2017 → 1 Sep 2017
Activity: Talks and presentations › Conference presentations

Journal of Aquatic Food Product Technology (Journal)
Period: 29 Aug 2017
Ditte Baun Hermund (Reviewer)
National Food Institute
Research Group for Bioactives – Analysis and Application

Related journal

Journal of Aquatic Food Product Technology
1049-8850
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 0.59 SJR 0.268 SNIP 0.582, ISI indexed (2013): ISI indexed yes, Web of Science (2017): Indexed Yes
**Related event**

**International workshop on marine geomicrobiology - A matter of energy**
Period: 28 Aug 2017 → 1 Sep 2017
Marlene Mark Jensen (Participant)

Department of Environmental Engineering
Water Technologies
Degree of recognition: International

**Description**
Crude oil reserves are becoming increasingly scarce, and biorefinery systems that integrate biomass conversion processes and equipment to produce fuels, power, and chemicals from annually renewable resources are a promising technology to move away from a petroleum-based society to a biomass-based society. One interesting biomass that has not been extensively utilized is marine biomass such as brown macroalgae (kelp). The composition of brown macroalgae includes up to 55% dry weight of the carbohydrates laminarin, mannitol and alginate, and it does not contain lignin. Hence, macroalgae are a very promising feedstock for microbial conversion of all carbohydrates into biofuels and valuable chemicals. Despite the presence of this native catabolic pathway, many yeast strains cannot catabolize mannitol or require adaptation to do so.

In this study a screening of thirty six strains, isolated from different sources, was performed. The strains were grown on complex and minimal media with mannitol as a main carbon source. Fifteen strains showed growth on complex media-mannitol (CM-mannitol) and just three diploid strains were capable to growth on minimal media-mannitol (MM-mannitol).

After a couple of months of Adaptive Laboratory Evolution (ALE) three Saccharomyces cerevisiae diploid strains (YPS606, RM11 and T7) were successfully adapted to grow on MM-mannitol. Despite the efforts, the laboratory CENPK113-7D strain was unable to utilize this sugar alcohol as a carbon source.

Degree of recognition: International
Documents:
Poster.jplo

**Related event**

**28th International Conference on Yeast Genetics and Molecular Biology**
27/08/2017 → 01/09/2017
Prague, Czech Republic
Activity: Talks and presentations › Conference presentations

**Related event**

**The 15th International Conference on Advanced Materials IUMRS-ICAM**
Period: 27 Aug 2017 → 1 Sep 2017
Ngo Van Nong (Organizer)

Department of Energy Conversion and Storage
Electrofunctional materials
The 15th International Conference on Advanced Materials IUMRS-ICAM  
27/08/2017 → …  
Kyoto, Japan  
Activity: Attending an event › Participating in or organising a conference

**European Society of Cardiology**  
Period: 26 Aug 2017 → 30 Aug 2017  
Signe Holm Nielsen (Organizer)  
Department of Biotechnology and Biomedicine  
Disease Systems Immunology  
Degree of recognition: International  

**Related event**  
**European Society of Cardiology**  
26/08/2017 → 30/08/2017  
Barcelona, Spain  
Activity: Attending an event › Participating in or organising a conference

**Microscopy Conference 2017**  
Period: 24 Aug 2017  
Christian Danvad Damsgaard (Chairman)  
Center for Electron Nanoscopy  
DTU Danchip  
Department of Physics  
Experimental Surface and Nanomaterials Physics  

**Description**  
co-chairing the MS 6 session Nanoparticles, 2D materials, nanocomposites and catalysts http://www.mc2017.ch/  
Degree of recognition: International  

**Related event**  
**Microscopy Conference 2017**  
21/08/2017 → 25/08/2017  
Lausanne, Switzerland  
Activity: Attending an event › Participating in or organising a conference

**Annual Danish Bioinformatics Conference 2017**  
Period: 23 Aug 2017 → 24 Aug 2017  
Lasse Westegaard Følkersen (Organizer)  
Department of Bio and Health Informatics  
Integrative Systems Biology  

**Description**  
Organizer, Elixir-DK 2017  
Links:  
http://elixir-node.cbs.dtu.dk  

**Related event**  
**Annual Danish Bioinformatics Conference 2017: Elixir**  
23/08/2017 → 25/08/2017  
Odense, Denmark  
Activity: Attending an event › Participating in or organising a conference
Data-driven approach for auditory profiling
Raul Sanchez Lopez (Guest lecturer)
Federica Bianchi (Guest lecturer)
Michal Fereczkowski (Guest lecturer)
Sébastien Santurette (Guest lecturer)
Torsten Dau (Guest lecturer)
Department of Electrical Engineering
Hearing Systems

Description
Nowadays, the pure-tone audiogram is the main tool used to characterize hearing loss and to fit hearing aids. However, the perceptual consequences of hearing loss are typically associated not only with a loss of sensitivity, but also with a clarity loss that is not captured by the audiogram. Detailed characterization of hearing loss has to be simplified to efficiently investigate the specific compensation needs of individual listeners. We hypothesized that any listeners' hearing can be characterized along two dimensions of distortion: type I and type II. While type I can be linked to factors affecting audibility, type II reflects non-audibility-related distortions. To test our hypothesis, the individual performance data from two previous studies was re-analyzed using archetypal analysis. Unsupervised learning was used to identify extreme patterns in the data which form the basis for different auditory profiles.
Next, a decision tree was determined to classify the listeners into one of the profiles. The new analysis provides evidence for the existence of four profiles in the data. The most significant predictors for profile identification were related to binaural processing, auditory non-linearity, and speech perception. The current approach is promising for analyzing other existing data sets in order to select the most relevant tests for auditory profiling.

Degree of recognition: International

Related event
International Symposium on Auditory and Audiological Research
23/08/2017 → 25/08/2017
Nyborg, Denmark
Activity: Talks and presentations › Conference presentations

The use of Risk Assessment to support control of Salmonella in pork
Period: 23 Aug 2017
Maarten Nauta (Keynote speaker)
National Food Institute
Research Group for Risk-Benefit
Degree of recognition: International
Links:

Related event
SAFEPORK 2017
21/08/2017 → 24/08/2017
Foz do Iguacu, Brazil
Activity: Talks and presentations › Conference presentations

In situ microscopy of formation of nickel-based bimetallic nanoparticles
Period: 22 Aug 2017
Christian Danvad Damsgaard (Other)
Center for Electron Nanoscopy
DTU Danchip
Department of Physics
Experimental Surface and Nanomaterials Physics

Description
poster presentation http://www.mc2017.ch/
Related event

Microscopy Conference 2017
21/08/2017 – 25/08/2017
Lausanne, Switzerland
Activity: Talks and presentations › Conference presentations

Sustainable solutions for risky problems in urban water management
Period: 22 Aug 2017
Hjalte Jomo Danielsen Sørup (Speaker)
Department of Environmental Engineering
Urban Water Systems

Related organisation

Sustainable solutions for risky problems in urban water management
Sørup, H. J. D. (Speaker)
22 Aug 2017
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

ICED17: 21st International Conference on Engineering Design
Anja Maier (Chairman)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology
Degree of recognition: International
Links:
http://www.iced17.org

Related event

ICED17: 21st International Conference on Engineering Design
21/08/2017 – 25/08/2017
Vancouver, Canada
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Toxoplasma gondii and the role of pork
Period: 21 Aug 2017
Sara Monteiro Pires (Speaker)
National Food Institute
Research Group for Risk-Benefit

Description
Overview of the global and regional burden of disease of toxoplasmosis and the need for studies estimating the relative role of the most important sources of infection
Degree of recognition: International

Related event

12th SafePork: 12th International Symposium on the Epidemiology and Control of Biological, Chemical and Physical Hazards in Pigs and Pork
21/08/2017 – 24/08/2017
Foz de Iguacu, Brazil
Activity: Talks and presentations › Conference presentations
**Auditory profiling through computational data analysis**

Period: 19 Aug 2017

Raul Sanchez Lopez (Other)
Federica Bianchi (Other)
Michal Fereczkowski (Other)
Sébastien Santurette (Other)
Torsten Dau (Other)

Department of Electrical Engineering

**Description**

Nowadays, the pure-tone audiogram is the main tool used to characterize the degree of hearing loss and to fit hearing aids. However, the perceptual consequences of a hearing loss are typically associated not only with a loss of sensitivity, but also with a loss of clarity (distortion loss) that is not captured by the audiogram. Detailed characterization of hearing deficits can be complex and it has to be simplified in order to efficiently investigate the specific compensation needs of individual listeners. The aim of this study is to characterize individual hearing deficits by means of a test battery that allows to capture the diverse aspects of hearing loss, considering not only the loss of sensitivity but also supra-threshold distortions.

It was hypothesized that any listeners’ hearing can be characterized along two dimensions: distortion type I and distortion type II. While distortion type I can be linked to factors affecting audibility, distortion type II is considered as a non-audibility-related distortion, or clarity loss. To evaluate our hypothesis, the data from two studies was re-analyzed using a data-driven approach. Both studies carried out an extensive battery of psychoacoustic tests on potential hearing-aid users. The new analysis was based on an archetypal analysis and uses unsupervised learning to identify extreme patterns in the data which provide the basis for different auditory profiles. Subsequently, a decision tree was obtained that enables a simple classification of the listeners into one of the profiles.

This novel approach provided evidence for the existence of four different “auditory profiles” in the data. The most significant predictors for the profile identification were related to temporal processing, peripheral compression, and speech perception. The current approach is promising for identifying the most relevant tests for auditory profiling and considering new fitting strategies based on the individual’s deficits.

**Related event**

19/08/2017 → 19/08/2017
Stockholm, Sweden

Activity: Talks and presentations › Conference presentations

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**Auditory profiling through computational data analysis**

Period: 19 Aug 2017

Raul Sanchez Lopez (Guest lecturer)
Federica Bianchi (Guest lecturer)
Michal Fereczkowski (Guest lecturer)
Sébastien Santurette (Guest lecturer)
Torsten Dau (Guest lecturer)
Nowadays, the pure-tone audiogram is the main tool used to characterize the degree of hearing loss and to fit hearing aids. However, the perceptual consequences of a hearing loss are typically associated not only with a loss of sensitivity, but also with a loss of clarity (distortion loss) that is not captured by the audiogram. Detailed characterization of hearing deficits can be complex and it has to be simplified in order to efficiently investigate the specific compensation needs of individual listeners. The aim of this study is to characterize individual hearing deficits by means of a test battery that allows to capture the diverse aspects of hearing loss, considering not only the loss of sensitivity but also supra-threshold distortions.

It was hypothesized that any listeners’ hearing can be characterized along two dimensions: distortion type I and distortion type II. While distortion type I can be linked to factors affecting audibility, distortion type II is considered as a non-audibility-related distortion, or clarity loss. To evaluate our hypothesis, the data from two studies was re-analyzed using a data-driven approach. Both studies carried out an extensive battery of psychoacoustic tests on potential hearing-aid users. The new analysis was based on an archetypal analysis and uses unsupervised learning to identify extreme patterns in the data which provide the basis for different auditory profiles. Subsequently, a decision tree was obtained that enables a simple classification of the listeners into one of the profiles.

This novel approach provided evidence for the existence of four different “auditory profiles” in the data. The most significant predictors for the profile identification were related to temporal processing, peripheral compression, and speech perception. The current approach is promising for identifying the most relevant tests for auditory profiling and considering new fitting strategies based on the individual’s deficits.

Degree of recognition: International
The Sixteenth International Symposium on Electroanalytical Chemistry
17/08/2016 → 20/08/2017
Changchun, China
Activity: Talks and presentations › Conference presentations

Nordisk Historikermøde
Period: 17 Aug 2017
Louise Karlskov Skyggebjerg (Speaker)
Department of Physics
Degree of recognition: International
Documents:
Abstract
Links:
http://www.cgs.aau.dk/forskning/konferencer/nhm

Related event

Nordisk historikermøde
15/08/2017 → 18/08/2017
Aalborg, Denmark
Activity: Talks and presentations › Conference presentations

Plasmid Host Range (Permissiveness) In Microbial Communities across Urban Water Systems
Period: 13 Aug 2017 → 17 Aug 2017
Barth F. Smets (Invited speaker)
Arnaud Dechesne (Other)
Liguan Li (Other)
Søren Johannes Sørensen (Other)
Jonas S. Madsen (Other)
Department of Environmental Engineering
Water Technologies
Degree of recognition: International

Related event

4th International Symposium on the Environmental Dimension of Antibiotic Resistance
13/08/2017 → 17/08/2017
Lansing, MI, United States
Activity: Talks and presentations › Conference presentations

Tutorial at ITEC Asia-Pacific 2017: "Advanced bidirectional dc-dc converters with emerging wide-bandgap semiconductor devices"
Period: 7 Aug 2017
Zhe Zhang (Invited speaker)
Department of Electrical Engineering
Electronics
Degree of recognition: International

Related event

Tutorial at ITEC Asia-Pacific 2017: "Advanced bidirectional dc-dc converters with emerging wide-bandgap semiconductor devices"
07/08/2017 → 07/08/2017
Activity: Talks and presentations › Conference presentations

77th Annual Meeting of The Academy of Management (Event)
Period: 4 Aug 2017
Francesco Rosati (Participant)  
Department of Management Engineering  
Technology and Innovation Management  

**Description**  
AOM 2017 Joint SIM-ONE Junior Faculty Consortium  
Degree of recognition: International  

**Related event**  
*77th Annual Meeting of The Academy of Management: At the Interface*  
04/08/2017 → 08/08/2017  
Atlanta, United States  
Activity: Membership › Membership of research networks or expert groups  

**Academy of Management 2017 (Event)**  
Period: 3 Aug 2017  
Pernille Rydén (Participant)  
Center for Bachelor of Engineering Studies  
Afdelingen for Forretningsudvikling  
Degree of recognition: International  

**Related event**  
*Academy of Management 2017: At the Interface*  
04/08/2017 → 08/08/2017  
Atlanta, United States  
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar  

**Ergonomics as a design discipline: Redesigning a local control room in an oil industry**  
Period: 1 Aug 2017  
Daniel Braatz (Lecturer)  
Ole Broberg (Lecturer)  
Department of Management Engineering  
Engineering Systems  

**Description**  
Workshop  

**Related event**  
*12th International Symposium on Human Factors in Organizational Design and Management*  
31/07/2017 → 03/08/2017  
Banff, Canada  
Activity: Talks and presentations › Conference presentations  

**Genome dynamics of vancomycin-resistant Enterococcus faecium in clinical samples**  
Period: 1 Aug 2017 → 1 Feb 2018  
Valeria Bortolaia (Supervisor)  
National Food Institute  
Research Group for Genomic Epidemiology  

**Description**  
Master project by Yasmin Kamel  
Degree of recognition: International  
Activity: Examinations and supervision › Supervisor activities
Density-Functional Theory and Beyond
Period: 31 Jul 2017 → 12 Aug 2017
Adam Paul Karcz (Participant)
Max Schumann (Participant)
Department of Chemical and Biochemical Engineering
CHEC Research Centre

Description
The discovery of novel materials is key on the route to face global challenges like quest for efficient and sustainable use of energy resources. Computational approaches play a central role here as they allow us to explore uncharted territory in chemical and materials space, for example in order to develop novel batteries, highly efficient solar cells, stable biocatalysts, or carbon dioxide fixation strategies.

Novel Materials Discovery by Learning from Electronic-Structure Theory is going to be a central theme of this summer school, we will educate young scientists in the basics and recent advances of electronic-structure theory. The focus will be in particular on density-functional theory (DFT), but also topics beyond DFT will be covered: ab initio thermodynamics and statistical mechanics, excited-state properties, nuclear quantum effects, multi-scale modeling, and machine learning approaches to potential parametrization, Big-Data dimensionality reduction, and property prediction. Such methods are widely applicable from biophysics to materials science and are a driving force for the discovery and design of molecules and materials. During this event, we will discuss the underlying concepts and thereby raise awareness for success stories, problems, and current challenges.

The workshop features morning lectures that introduce basics and advanced topics. In the afternoons, participants will gain experience in hands-on sessions guided by skilled tutors. The main computational workhorse for the afternoon sessions will be the FHI-aims all-electron code, which embodies all necessary methods. The overall workshop, however, is not designed to teach a single code, but rather to introduce scientific concepts.

Degree of recognition: International

Related event
Density-Functional Theory and Beyond: Accuracy, Efficiency and Reproducibility in Computational Materials Science
31/07/2017 → 12/08/2017
Berlin, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

International Congress of History of Science and Technology (ICHST)
Period: 29 Jul 2017
Louise Karlskov Skyggebjerg (Speaker)

Documents:
Abstract
Links:
http://www.ichst2017.sbhc.org.br/
A Scalable Neuro-inspired Robot Controller Integrating a Machine Learning Algorithm and a Spiking Cerebellar-Like Network
Period: 28 Jul 2017
Silvia Tolu (Speaker)
Henrik Hautop Lund (Other)
Department of Electrical Engineering
Automation and Control
Centre for Playware
Centre for Playware

Description
Conference on Biomimetic and Biohybrid Systems
Living Machines 2017
Degree of recognition: International

Accuracy of coastal wind speed gradients from Synthetic Aperture Radar by comparisons with scanning lidars
Period: 26 Jul 2017 → 29 Jul 2017
Tobias Torben Ahsbahs (Speaker)
Merete Badger (Speaker)
Ioanna Karagali (Speaker)
Xiaoli Guo Larsén (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing
Resource Assessment Modelling
Degree of recognition: International
Documents:
presentation_WESC_2017_TTAH

Metod for monitoring bacteria from air samples
Period: 26 Jul 2017
Julia Christensen (Speaker)
Research Group for Diagnostic Engineering
Division of Food Microbiology
National Food Institute
Related event

**Method for monitoring bacteria from air samples**
26/07/2017 → 26/07/2017
København
Activity: Talks and presentations › Conference presentations

**Presentation title:** “A valence force field-Monte Carlo algorithm for quantum dot growth modeling”.
Period: 24 Jul 2017 → 28 Jul 2017
Shima Kadkhodazadeh (Other)
Elizaveta Semenova (Other)
Morten Willatzen (Other)
Alessandro Pecchia (Other)
Matthias Auf de Maur (Other)
Daniele Barettin (Speaker)
Center for Electron Nanoscopy
DTU Danchip
Department of Photonics Engineering
Nanophotonic Devices
Centre of Excellence for Silicon Photonics for Optical Communications
Degree of recognition: International
Documents:
nusod17paper59
Links:

Related event

**17th International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD17)**
24/07/2017 → 28/07/2017
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

**Quantifying Biochemical Activities in Living Cells with $^{13}$C dDNP NMR**
Period: 24 Jul 2017
Mathilde Hauge Lerche (Invited speaker)
Magnus Karlsson (Other)
Jan Henrik Ardenkjær-Larsen (Other)
Pernille Rose Jensen (Other)
Andrea Capozzi (Other)
Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance
Degree of recognition: International
Documents:
ismar2017_Mathilde_Hauge_Lerche

Related event

**International Society of Magnetic Resonance**
23/08/2017 → 28/08/2017
Quebec City, Canada
Activity: Talks and presentations › Conference presentations
ICoN5: 5th International Conference on Nitrification
Period: 23 Jul 2017 → 27 Jul 2017
Carlos Domingo-Felez (Participant)
Department of Environmental Engineering
Water Technologies

Related event

ICoN5: 5th International Conference on Nitrification
23/07/2017 → 27/07/2017
Vienna, Austria
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

N2O dynamics of N-transforming microbial communities: from mechanistic insights to full-scale process control
Period: 23 Jul 2017 → 27 Jul 2017
Barth F. Smets (Invited speaker)
Department of Environmental Engineering
Water Technologies
Degree of recognition: International
Links:
https://icon5.univie.ac.at/welcome/

Related event

ICoN5: 5th International Conference on Nitrification
23/07/2017 → 27/07/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

Functional modelling in the operation of a cyber physical energy system
Period: 19 Jul 2017
Theis Bo Rasmussen (Guest lecturer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Oral presentation at panel session in International practices in smart grid for smart city

Related event

2017 IEEE PES General Meeting
16/07/2017 → 20/07/2017
Chicago, United States
Activity: Talks and presentations › Conference presentations

IFORS 2017
Period: 17 Jul 2017 → 21 Jul 2017
Ignacio Blanco (Speaker)
Department of Applied Mathematics and Computer Science
Dynamical Systems
Degree of recognition: International

Related event
Evolutionary Computation in Computational Biology (2017)
Period: 16 Jul 2017
Mostafa M Hashim Ellabaan (Organizer)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Related event
Evolutionary Computation in Computational Biology (2017)
16/07/2017 → 16/07/2017
Berlin, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Gordons Research Seminar
Period: 16 Jul 2017 → 23 Aug 2017
Signe Holm Nielsen (Organizer)
Department of Biotechnology and Biomedicine
Disease Systems Immunology

Related event
Gordons Research Seminar: Collagens
16/07/2017 → 22/07/2017
New London, United States
Activity: Attending an event › Participating in or organising a conference

Molecular memetic optimization for biomolecular systems
Period: 16 Jul 2017
Mostafa M Hashim Ellabaan (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Related event
Evolutionary Computation in Computational Biology (2017)
16/07/2017 → 16/07/2017
Berlin, Germany
Activity: Talks and presentations › Conference presentations

The Genetic and Evolutionary Computation Conference (2017)
Period: 15 Jul 2017 → 19 Jul 2017
Mostafa M Hashim Ellabaan (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology
Degree of recognition: International

Related event
The Genetic and Evolutionary Computation Conference (2017)
15/07/2017 → 19/07/2017
Berlin, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

1st Summer School on Complex Fluid-Flows in Microfluidics
Period: 14 Jul 2017
Kristian Ejlebjærg Jensen (Speaker)
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics
Department of Micro- and Nanotechnology
Nanoprobes
Links:
http://galindorosales.com/SummerSchool2017/Programme.html

Related external organisation
Campus da Faculdade de Engenharia da Universidade do Porto
Portugal
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Networks: from physical entities to software processes in virtual environments
Period: 14 Jul 2017
José Soler (Speaker)
Department of Photonics Engineering
Networks Technology and Service Platforms
Description
Invited lecture at the postgraduate lectures session in the Computer Science Faculty at Complutense Univeristy of Madrid.

Related event
Networks: from physical entities to software processes in virtual environments: Invited lecture at the Postgraduate lectures session.
14/07/2017 → 14/07/2017
Madrid, Spain
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

4th antiSMASH hackathon
Period: 12 Jul 2017 → 13 Jul 2017
Tilmann Weber (Participant)
Kai Blin (Participant)
Simon Shaw (Participant)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International

Related event
4th antiSMASH hackathon
12/07/2017 → 13/07/2017
Wageningen, Netherlands
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

EU capacity building projects: ENGAGE and COMPARE
Period: 12 Jul 2017
Valeria Bortolaia (Guest lecturer)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related event

Genomics in foodborne pathogen surveillance and outbreak investigation: INNUENDO summer course
12/07/2017 → 13/07/2017
Vitoria-Gasteiz, Spain
Activity: Talks and presentations › Conference presentations

Innovation on Big Data for Healthy Living
Period: 12 Jul 2017
Lasse Westergaard Folkersen (Invited speaker)
Department of Bio and Health Informatics
Integrative Systems Biology

Description

Links:
http://www.biohealth-computing.eu/innovation-on-big-data-for-healthy-living/

Related event

IBD4Health
12/07/2017 → 12/07/2017
Geneva, Switzerland
Activity: Talks and presentations › Conference presentations

Phenotype prediction using WGS data: resistome and virulome
Period: 12 Jul 2017
Valeria Bortolaia (Guest lecturer)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related event

Genomics in foodborne pathogen surveillance and outbreak investigation: INNUENDO summer course
12/07/2017 → 13/07/2017
Vitoria-Gasteiz, Spain
Activity: Talks and presentations › Conference presentations

In situ Characterization of Heterogeneous Catalysts
Period: 11 Jul 2017
Christian Danvad Damsgaard (Invited speaker)
Department of Physics
Center for Electron Nanoscopy
DTU Danchip
Experimental Surface and Nanomaterials Physics

Description
Invited talk
Degree of recognition: International
Documents:
conference abstract for conference. Fimpart2017
Links:
http://www.fimpart.org/2017/wp/

**Related event**

**Frontiers in Materials Processing Applications, Research and Technology: Enabling innovation**

*09/07/2017 → 12/07/2017*

Bordeaux, France

Activity: Talks and presentations › Conference presentations

**Microbial Population Biology**

Period: 11 Jul 2017

Morten Otto Alexander Sommer (Invited speaker)

Novo Nordisk Foundation Center for Biosustainability

Bacterial Synthetic Biology

**Description**

Collateral Sensitivity and Evolution of Antibiotic Resistance

Degree of recognition: International

**Related event**

**Microbial Population Biology: Gordon Research Conference**

*09/07/2017 → 14/07/2017*

Andover, NH, United States

Activity: Talks and presentations › Conference presentations

**Friedrich-Schiller-Universität Jena (External organisation)**

Period: 10 Jul 2017

Tilmann Weber (Member)

Novo Nordisk Foundation Center for Biosustainability

New Bioactive Compounds

**Description**

External reviewer of PhD thesis at the Faculty of Biology and Pharmacy / Hans Knöll Institute

**Related external organisation**

**Friedrich-Schiller-Universität Jena**

Germany

Activity: Membership › Membership in review committee

**Diversity, structure, and novel physiologies in microbial communities in rapid sand filters**

Period: 9 Jul 2017 → 13 Jul 2017

Barth F. Smets (Invited speaker)

Arda Gülay (Other)

Alejandro Palomo (Other)

Jane Fowler (Other)

Thomas Sicheritz-Pontén (Other)

Department of Environmental Engineering

Water Technologies

Department of Bio and Health Informatics

Metagenomics

Degree of recognition: International

**Related event**
FEMS 2017
Period: 9 Jul 2017 → 13 Jul 2017
Lumeng Ye (Other)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Degree of recognition: International
Links:
http://www.fems-microbiology2017.kenes.com/

Related event

FEMS 2017
Period: 9 Jul 2017 → 13 Jul 2017
Katrine Alling Andreassen (Speaker)
Department of Civil Engineering
Section for Geotechnics and Geology
Center for Energy Resources Engineering
Degree of recognition: International

Related event

6th Biot Conference on Poromechanics
Period: 9 Jul 2017 → 13 Jul 2017
Paris, France

Functional diblock copolymers and ABC stars: synthesis, properties and potential applicability
Period: 7 Jul 2017
Kristoffer Almdal (Speaker)
Sergey Chernyy (Other)
Lars Schulte (Other)
Jacob Judas Kain Kirkensgaard (Other)
Kell Mortensen (Other)
Center for Nanostructured Graphene
Department of Micro- and Nanotechnology
Amphiphilic Polymers in Biological Sensing
Self-Organized Nanoporous Materials
Degree of recognition: International
Documents:
kral_Abstract_EPF_2017_2

Related event

European Polymer Federation Congress 2017
Period: 2 Jul 2017 → 2 Jul 2017
Lyon, France
Proposing a Central AEC Ontology That Allows for Domain Specific Extensions
Period: 5 Jul 2017
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design

Description
A minimal ontology describing building topology.
Degree of recognition: International
Documents:
Slides

Related event
The 34th CIB W78 Information Technology for Construction Conference: JC3 - The Joint Conference on Computing in Construction
04/07/2017 → 07/07/2017
Heraklion, Greece
Activity: Talks and presentations › Conference presentations

Change or be changed: Resilience in socio-technical systems (Event)
Period: 4 Jul 2017
Anja Maier (External examiner)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology

Description
University of Cambridge, Department of Engineering, Engineering Design Centre
Censor for PhD project

Body type: PhD Assessment Committee
Degree of recognition: International
Activity: Examinations and supervision › External examination

IAM 2017 Summer Conference
Period: 4 Jul 2017 → 7 Jul 2017
Evita Milana (Speaker)
Department of Management Engineering
Technology and Innovation Management

Description
Paper presentation

Related event
IAM 2017 Summer: International Conference on Innovation and Management
04/07/2017 → 07/07/2017
Activity: Talks and presentations › Conference presentations

INRA Institut National de La Recherche Agronomique (External organisation)
Period: 4 Jul 2017
Maarten Nauta (Participant)
National Food Institute
Research Group for Risk-Benefit

Description
Jury Member PhD examination committee (rapporteur) Geraldine Boue, Nantes, France. Thesis "Public Health Risk-Benefit Assessments of Foods"
Degree of recognition: International

Related external organisation
INRA Institut National de La Recherche Agronomique
France
Activity: Membership › Membership in review committee

The 34th CIB W78 Information Technology for Construction Conference
Period: 4 Jul 2017 → 12 Jul 2017
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design
Degree of recognition: International

Related event
The 34th CIB W78 Information Technology for Construction Conference: JC3 - The Joint Conference on Computing in Construction
04/07/2017 → 07/07/2017
Heraklion, Greece
Activity: Talks and presentations › Conference presentations

Electrochemical Catalysis of Inorganic Complex K₄[Fe(CN)₆] by Shewanella oneidensis MR-1
Period: 2 Jul 2017 → 5 Jul 2017
Zhiyong Zheng (Other)
Department of Chemistry
NanoChemistry

Description
The interaction between metal and bacteria is a universal and important biogeochemical process in environment. As a dissimilatory metal reduction bacteria, the electrochemical active bacteria Shewanella oneidensis MR-1 can transfer intracellular electrons to minerals. This ability is attributed to the redox proteins localized to the outer-membrane, for example, the MtrC, MtrB, MtrA and CymA. Here we investigate its electrochemical properties towards redox inorganic redox compounds. It shows strong electrocatalysis toward electrochemical oxidation of K₄[Fe(CN)₆]. As a redox molecule, K₄[Fe(CN)₆] gives a pair of redox peaks on voltammetry on bare glassy carbon electrode (GCE), symmetric with ideal peak-peak separation of about 60 mV, indicating of a reversible one-electron transfer process (blue curve, Figure 1). Surprisingly, the presence of Shewanella oneidensis MR-1 on GCE results an asymmetric redox peak, with almost disappearance of the cathodic peak and strengthen of the anodic peak, which is a typical catalysis feature of electrochemical oxidation. Further experiments show that Shewanella oneidensis MR-1 does not give such electrocatalysis to redox compounds such as Ru[Cl(NH₃)₆]Cl₂ and Resorufin. Systematic study on the selectivity and electrocatalysis mechanisms of Shewanella oneidensis MR-1 are under investigation. The ability of Shewanella oneidensis MR-1 to catalyze redox action of inorganic metal complex compounds will provide an insight on metal cycles in nature
Links:
http://www.eicc-4.dk/home.html

Related event
Forth EuCheMS Inorganic Chemistry Conference (EICC-4)
02/07/2017 → 05/07/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations
Electrochemical Catalysis of Inorganic Complex $K_4[Fe(CN)_6]$ by *Shewanella oneidensis* MR-1

The interaction between metal and bacteria is a universal and important biogeochemical process in environment. As a dissimilatory metal reduction bacteria, the electrochemical active bacteria *Shewanella oneidensis* MR-1 can transfer intracellular electrons to minerals. This ability is attributed to the redox proteins localized to the outer-membrane, for example, the MtrC, MtrB, MtrA and CymA. Here we investigate its electrochemical properties towards redox inorganic redox compounds. It shows strong electrocatalysis toward electrochemical oxidation of $K_4[Fe(CN)_6]$. As a redox molecule, $K_4[Fe(CN)_6]$ gives a pair of redox peaks on voltammetry on bare glassy carbon electrode (GCE), symmetric with ideal peak-peak separation of about 60 mV, indicating of a reversible one-electron transfer process (blue curve, Figure 1). Surprisingly, the presence of *Shewanella oneidensis* MR-1 on GCE results an asymmetric redox peak, with almost disappearance of the cathodic peak and strengthen of the anodic peak, which is a typical catalysis feature of electrochemical oxidation.

Further experiments show that *Shewanella oneidensis* MR-1 does not give such electrocatalysis to redox compounds such as Ru$[(NH_3)_6]Cl_3$ and Resorufin. Systematic study on the selectivity and electrocatalysis mechanisms of *Shewanella oneidensis* MR-1 are under investigation. The ability of *Shewanella oneidensis* MR-1 to catalyze redox action of inorganic metal complex compounds will provide an insight on metal cycles in nature.

Links:
- [http://www.eicc-4.dk/home.html](http://www.eicc-4.dk/home.html)
Poster Presentation
Period: 2 Jul 2017 → 6 Jul 2017
Ronja Maja Malinowski (Speaker)
Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance
Degree of recognition: International
Documents: EUROMAR2017RonjaMalinowski

Related event
Euromar 2017
02/07/2017 → 06/07/2017
Warsaw, Poland
Activity: Talks and presentations › Conference presentations

Department of Mechanical Engineering (Organisational unit)
Period: 1 Jul 2017 → 26 Sep 2017
Mogens Blanke (Chairman)
Department of Electrical Engineering
Automation and Control

Description
Chairman for PhD evaluation Committee for Jonas Lauridsen
Degree of recognition: National

Related organisation
Department of Mechanical Engineering (Organisational unit)
Blanke, M. (Chairman)
1 Jul 2017 → 26 Sep 2017
Activity: Membership › Membership in review committee

Management Team Copenhagen Center for Health Technology (Event)
Period: 1 Jul 2017 → …
Anja Maier (Member)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology

Description
Member Management Team for Copenhagen Center for Health Technology
Degree of recognition: International

Related event
Management Team Copenhagen Center for Health Technology
01/07/2017 → …
Copenhagen, Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Repportering af nationale overvågningsdata til den Europæiske Fødevaresikkerhedsautoritet, EFSA
Period: 1 Jul 2017
Julia Christensen (Other)
National Food Institute
Division of Risk Assessment and Nutrition

**Description**

**Editor**
Degree of recognition: International
Activity: Other

**23836 Quantitative Microbiological Risk Assessment**

Period: Jun 2017
Ana Sofia Ribeiro Duarte (Participant)
National Food Institute
Research Group for Genomic Epidemiology

**Description**
Course Lecturer

**Related event**

**23836 Quantitative Microbiological Risk Assessment 2017**
01/06/2017 → 30/06/2017
Denmark
Activity: Other

**Konstantin Klemm**

Start date: Jun 2017 → Aug 2017
Erik Andreas Martens (Host)
Department of Applied Mathematics and Computer Science
Dynamical Systems
Department of Electrical Engineering
Degree of recognition: International
Activity: Hosting a guest lecturer

**New approach for validating the segmentation of 3D data applied to individual fibre extraction**

Period: 30 Jun 2017
Monica Jane Emerson (Speaker)
Department of Applied Mathematics and Computer Science
Image Analysis & Computer Graphics

Documents: ICTMS2017_300617_monj presentation
Links: https://www.dropbox.com/s/eq5528lplxomjqi/20170630_105434.mp4?dl=0 (Recorded talk)

**Related event**

**3rd International Conference on Tomography of 3D Materials and Structures**
26/06/2017 → 30/06/2017
Lund, Sweden
Activity: Talks and presentations › Conference presentations

**Annual Report on Zoonoses in Denmark (Journal)**

Period: 29 Jun 2017
Julia Christensen (Editor)
National Food Institute
High Current Full Scale Testing as Fundamental Element to Ensure Wind Turbine Reliability

Period: 29 Jun 2017
Stephan Vogel (Speaker)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power components

Description
Testing of lightning protection measures on wind turbine components provides fundamental improvements to wind turbine reliability. Full-scale testing of blades and nacelles is regarded as the most exhaustive mean to evaluate lightning performance, identify weak-points, and improve the lightning protection design. The continuous increase of dimensions of the test objects also increases the effective stray inductance, leading to a practical challenge of injecting the full lightning current into the test object, as is defined in in IEC 61400-24 Ed.1.0 Wind turbines – Part 24: Lightning protection. This circumstance led to the formation of the project "Enhanced Lightning effect Testing (ELITE)" under which was designed, constructed and prototype tested a novel extendable high-current crowbar impulse generator.

In this work, the concept of the generator is introduced, the components are described and performance is evaluated for single modules. The extendibility of the generator is achieved by modularity of 12 individual high-current impulse generators cuboids, each equipped with an intrinsic capacitor bank, spark-gap, and a crowbar consisting of 45 series-connected rectifier diodes. Each module has a charging voltage of up to ±100 kV and a discharge current of 125 kA and can be used as an independent unit. By series and parallel connections of the modules, the capabilities of the resulting generator can be modified and tuned to the specific test item. During testing, the modules are arranged around the device under test which effectively minimizes the stray inductance of the circuit.

The audience will be introduced to the principles of high current full scale testing according to IEC 61400-24 and special focus will be placed on the limitations due to the increased size of full-scale test objects. Furthermore, test results from a prototype high current impulse are used to verify the principles of lightning current injection to test samples.

Degree of recognition: International

Related external organisation
European Academy of Wind Energy
Küppersweg 70, 26129 , Oldenburg, Germany
Activity: Talks and presentations › Conference presentations

inVALUABLE project meeting
Period: 29 Jun 2017 → 30 Jun 2017
Annette Nygaard Jensen (Speaker)
National Food Institute
Research Group for Microbial Food Safety

Related event
inVALUABLE project meeting
29/06/2017 → 30/06/2017
Aarhusd, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Summary of oral and poster presentations
Period: 29 Jun 2017
Sven-Erik Gryning (Speaker)
The speech-based envelope power spectrum model (sEPSM) family: Development, achievements, and current challenges

Period: 29 Jun 2017

Helia Relano Iborra (Guest lecturer)
Department of Electrical Engineering

Hearing Systems

Description

Intelligibility models provide insights regarding the effects of target speech characteristics, transmission channels and/or auditory processing on the speech perception performance of listeners. In 2011, Jørgensen and Dau proposed the speech-based envelope power spectrum model [sEPSM, Jørgensen and Dau (2011). J. Acoust. Soc. Am. 130(3), 1475-1487]. It uses the signal-to-noise ratio in the modulation domain (SNRenv) as a decision metric and was shown to accurately predict the intelligibility of processed noisy speech. The sEPSM concept has since been applied in various subsequent models, which have extended the predictive power of the original model to a broad range of conditions. This contribution presents the most recent developments within the sEPSM “family:” (i) A binaural extension, the B-sEPSM [Chabot-Leclerc et al. (2016). J. Acoust. Soc. Am. 140(1), 192-205] which combines better-ear and binaural unmasking processes and accounts for a large variety of spatial phenomena in speech perception; (ii) a correlation-based version [Relaño-Iborra et al. (2016). J. Acoust. Soc. Am. 140(4), 2670-2679] which extends the predictions of the early model to non-linear distortions, such as phase jitter and binary mask-processing; and (iii) a recent physiologically inspired extension, which allows to functionally account for effects of individual hearing impairment on speech perception.

Links:

http://dx.doi.org/10.1121/1.4989047

Related event

173rd Meeting of the Acoustical Society of America and the 8th Forum Acusticum
25/06/2017 → 29/06/2017
Boston, United States

Activity: Talks and presentations › Conference presentations

WRF model evaluation based on wind lidar measurements

Period: 29 Jun 2017

Sven-Erik Gryning (Speaker)
Ekaterina Batchvarova (Other)

Department of Wind Energy

Degree of recognition: International

Links:

http://www.wemcouncil.org/wp/icem2017/

Related event

International Conference on Energy & Meteorology
27/06/2017 → 29/06/2017
Bari, Italy

Activity: Talks and presentations › Conference presentations

Zoonoseseminar i forbindelse med publicering af Annual Report on Zoonoses in Denmark 2016

Period: 29 Jun 2017

Julia Christensen (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related event

Zoonoseseminar i forbindelse med publicering af Annual Report on Zoonoses in Denmark 2016
29/06/2017 → 29/06/2017
København
Activity: Attending an event › Participating in or organising a conference

‘Evaluation and management of microbial spoilage in the aquatic food industry’ at Microbial Spoilers in Food 2017, Quimper, France.
Period: 28 Jun 2017 → 30 Jun 2017
Paw Dalgaard (Keynote speaker)
National Food Institute
Research Group for Analytical and Predictive Microbiology

Description
Degree of recognition: International

Related event

Microbial Spoilers in Food 2017
28/06/2017 → 30/06/2017
Quimper, France
Activity: Talks and presentations › Conference presentations

Interessent møde i FVST
Period: 28 Jun 2017
Dorte Lau Baggesen (Speaker)
National Food Institute

Description
Fødevarestyrelsens Strategiske Interessentudvalg
Interessentnetværk for fødevarer, produkter og forbruger
Degree of recognition: National
Documents:
FVSTs interessentmøde d. 28.6.2017_version 2

Related event

Interessent møde i FVST
28/06/2017 → 28/06/2017
Glostrup, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Regimes of self-pulsing in photonic crystal Fano lasers
Period: 28 Jun 2017
Thorsten Svend Rasmussen (Guest lecturer)
Department of Photonics Engineering
Nanophotonics Theory and Signal Processing

Description
Talk given at CLEO Europe 2017
Related event

25/06/2017 → 29/06/2017
Munich, Germany
Activity: Talks and presentations › Conference presentations

Structural aspects of hydrates – insight into phase transformations using nanomechanical sensors
Period: 28 Jun 2017 → 30 Jun 2017
Peter Ouma Okeyo (Guest lecturer)
Peter Emil Larsen (Guest lecturer)
Oleksii Ilchenko (Guest lecturer)
Tomas Rindzvicius (Guest lecturer)
Roman Slipets (Guest lecturer)
Anja Boisen (Guest lecturer)
Thomas Rades (Guest lecturer)
Jukka Rantanen (Guest lecturer)

Department of Micro- and Nanotechnology
Nanoprobes
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics
Degree of recognition: International

Related event

11th annual meeting of the Pharmaceutical Solid State Research Cluster
28/06/2017 → 30/06/2017
Graz, Austria
Activity: Talks and presentations › Conference presentations

The Østerild Balconies Experiment
Period: 28 Jun 2017
Ioanna Karagali (Speaker)
Ebba Dellwik (Other)
Guillaume Lea (Other)
Elliot Simon (Other)
Nikola Vasiljevic (Other)
Jakob Mann (Other)

Department of Wind Energy
Meteorology & Remote Sensing

Description
Mini Symposia “Exp. Investigations of Wind Resourced and Siting Parameters”

Related event

Wind Energy Science Conference 2017
26/06/2017 → 29/06/2017
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

A local freshwater impact – proposing a groundwater indicator AGWaRe
Period: 27 Jun 2017
Ryle Nørskov Gejl (Speaker)

Department of Environmental Engineering
Urban Water Systems

Related event

**ISIE 2017: Science for Sustainable and Resilient Communities**
25/06/2017 → 29/06/2017
Chicago, United States
Activity: Talks and presentations › Conference presentations

Chairing session on Forecasting for power-system applications - wind models
Period: 27 Jun 2017
Sven-Erik Gryning (Speaker)
Department of Wind Energy
Degree of recognition: International

Related event

**International Conference on Energy & Meteorology**
27/06/2017 → 29/06/2017
Bari, Italy
Activity: Talks and presentations › Conference presentations

**International Conference on Energy & Meteorology (Event)**
Period: 27 Jun 2017
Sven-Erik Gryning (Participant)
Department of Wind Energy

Description
Chair of abstract selection committee
Degree of recognition: International

Related event

**International Conference on Energy & Meteorology**
27/06/2017 → 29/06/2017
Bari, Italy
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Stability of Salmonella and Campylobacter DNA in human and veterinary fecal samples preserved and stored at different conditions (Journal)
Period: 27 Jun 2017
Julia Christensen (Editor)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International

Related journal

Stability of Salmonella and Campylobacter DNA in human and veterinary fecal samples preserved and stored at different conditions
Local database
Activity: Research › Peer review of manuscripts

13th Coating Science International 2017
Period: 26 Jun 2017 → 30 Jun 2017
Ting Wang (Participant)
Department of Chemical and Biochemical Engineering
Drag resistance measurements for newly applied antifouling coatings and welding seams on ship hull surface
Period: 26 Jun 2017 → 30 Jun 2017
Xueting Wang (Guest lecturer)
Department of Chemical and Biochemical Engineering
CHEC Research Centre
The Hempel Foundation Coatings Science and Technology Centre (CoaST)
Degree of recognition: International

Essential Societal Service Functions and Planetary Boundaries: The Case of Sustainable Urban Water Management
Period: 26 Jun 2017
Hjalte Jomo Danielsen Sørup (Speaker)
Department of Environmental Engineering
Urban Water Systems

Integrating environmental impacts into cost-benefit analysis- The value of environmental pollutants
Period: 26 Jun 2017
Yan Dong (Speaker)
Stefano Manzo (Other)
Michael Zwicky Hauschild (Other)
Department of Management Engineering
Quantitative Sustainability Assessment
Transport DTU
Transport Modelling
Degree of recognition: International
Documents:
Abstract_Final version
Links:
http://programme.exordo.com/isie2017/delegates/presentation/13/
Power curve measurement using V∞ estimates from nacelle lidars and its uncertainty
Period: 26 Jun 2017 → 29 Jun 2017
Antoine Borraccino (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing
Degree of recognition: International
Documents:
AntoineBorraccino_WESC17_presentation_PowerPerf_nacelle_lidars

Quantitative analysis of pigment dispersion taking into account the full agglomerate size distribution
Period: 26 Jun 2017 → 30 Jun 2017
Søren Kiil (Lecturer)
Department of Chemical and Biochemical Engineering
CHEC Research Centre
The Hempel Foundation Coatings Science and Technology Centre (CoaST)
Degree of recognition: International
Documents:
Abstract COSI 2017 (Søren Kiil)

The wind speed signature of varying sea surface temperature in the meso-scale model WRF
Period: 26 Jun 2017
Ioanna Karagali (Speaker)
Andrea N. Hahmann (Other)
Department of Wind Energy
Meteorology & Remote Sensing
Resource Assessment Modelling

Wind Energy Science Conference 2017
26/06/2017 → 29/06/2017
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations
Adsorption of microplastics to the edible Fucus vesiculosus and possible wash off before food application

Period: 22 Jun 2017

Nanna B. Hartmann (Speaker)
Clara G. Villaro (Speaker)
Ida D.W. Koch (Speaker)
Kasper B. Sundbæk (Speaker)
Niclas S. Rasmussen (Speaker)
Susan Løvstad Holdt (Speaker)

National Food Institute
Research Group for Bioactives – Analysis and Application
Department of Environmental Engineering
Environmental Chemistry

Description
The growing demand for food accessibility, due to rapidly growing population of the world, has raised the interest of macroalgae as a food source also in the Western world. However, this combined with increased food awareness trigger a concern that accumulated microplastics in the oceans might pollute the seaweed and influence food safety and thereby applicability. One of the most common types of seaweed in Denmark is bladder wrack, Fucus vesiculosus (FC), and this specimen is also popular for the use in e.g. pesto and flour in Denmark. This study investigated if fluorescent polystyrene (PS) microplastic particles (diameter: 20 μm) adsorb to the macroalga FC and if they can be washed off afterwards with filtered seawater.

Degree of recognition: International

Documents:
ISAP_2017_abstract_Hartmann et al-Microplastic on Fucus

Related external organisation
University of Nantes
France
Activity: Talks and presentations › Conference presentations

2nd International Conference on New Business Models
Period: 21 Jun 2017 → 22 Jun 2017
Francesco Rosati (Speaker)
Department of Management Engineering
Technology and Innovation Management
Degree of recognition: International
Links:
https://new-business-models.uni-graz.at/en/

Related event
2nd International Conference on New Business Models
21/06/2017 → 22/06/2017
Graz, Austria
Activity: Talks and presentations › Conference presentations

Applied Optics (Journal)
Period: 21 Jun 2017 → …
Anders Thorseth (Reviewer)
Department of Photonics Engineering
Diode Lasers and LED Systems
Degree of recognition: International

Related journal
Applied Optics
1559-128X
Central database
Activity: Research › Peer review of manuscripts

Consumer’s Attitude Towards Investments in Residential Energy Efficient Appliances: how End-user Choices Contribute to Change Future Energy Systems
Period: 21 Jun 2017
Mattia Baldini (Speaker)
Alessio Trivella (Other)
Jordan William Halverson Wente (Other)
Department of Management Engineering
Systems Analysis
Management Science
Operations Research
Degree of recognition: International
Documents:
Mattia Baldini
Links:

Related event
The 40 th IAEE International Conference: Meeting the Energy Demands of Emerging Economies - Implications for Energy and Environmental Markets
18/06/2017 → 21/06/2017
Seaweed at stake
Period: 21 Jun 2017
Susan Løvstad Holdt (Organizer)
National Food Institute
Research Group for Bioactives – Analysis and Application
Degree of recognition: International

Related event
Seaweed at stake: Seaweed stakeholder meeting
21/06/2017 → 21/06/2017
Nantes, France
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

A Probabilistic Approach to CFD Model Validation with Field Measurements in Wind Energy
Period: 20 Jun 2017
Alexander Raul Meyer Forsting (Speaker)
Department of Wind Energy
Aerodynamic design
Degree of recognition: International
Documents:
Presentation
Links:
https://www.youtube.com/watch?v=YrT7Hy_eGWg (WindScanner & UniTTe | 3D inflow measurement)

Related event
IEA Wind Task 32 (Lidar): Workshop on Elaboration of use cases in wake and complex flow measurements
19/06/2017 → 20/06/2017
Glasgow, United Kingdom
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Disturbance Attenuation of DC Voltage Droop Control Structures in a Multi-Terminal HVDC- Grid
Period: 20 Jun 2017
Florian Thams (Guest lecturer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Presentation of the accepted paper
Degree of recognition: International

Related event
18/06/2017 → 22/06/2017
Manchester, United Kingdom
Activity: Talks and presentations › Conference presentations

Antioxidant composition and activity of seaweed Saccharina latissima: a seasonal perspective
Period: 19 Jun 2017
Goncalo Silva Marinho (Speaker)
Ann-Dorit Moitke Sørensen (Speaker)
Safety concerns regarding reported toxicity of artificial antioxidants lead the search for novel natural antioxidants. In this context, seaweeds have been receiving increasing attention as a promising source of antioxidants such as phenolic compounds (e.g. phenolic acids and flavonoids), carotenoids (e.g. fucoxanthin and β-carotene), and phycobiliproteins. Nevertheless, seaweed composition generally presents marked seasonal variations. The present study aimed at evaluating seasonal variations in the antioxidant composition and activity of sugar kelp, Saccharina latissima, cultivated at two different sites; in close proximity to a blue mussel and rainbow trout farm (IMTA), and at a reference/control site (REF), outside Horsens fjord, Denmark.

Related event
15th Scandinavian Symposium on Chemometrics
19/06/2017 → 22/06/2017
Naantali, Finland
Activity: Talks and presentations › Conference presentations

Global opvarmning for 56 millioner år siden – og i dag
Period: 19 Jun 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy
Degree of recognition: Regional
Links:
https://www.facebook.com/events/1688366071459512/?acontext=%7B%22ref%22%3A%223A%22%23%22%2C%22ref_newsfeed_story_type%22%3A%22regular%22%2C%22action_history%22%3A%22null%22%7D

Related event
Møde i Selskabet for Naturlærens Udbredelse
13/05/2002 → …
København, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations
Is nitrogen-to-protein conversion factor for seaweed dependent on season?
Period: 19 Jun 2017
Goncalo Silva Marinho (Speaker)
Susan Løvstad Holdt (Speaker)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
Recently an effort has been made to establish nitrogen-to-protein conversion factors specific for seaweeds, as the tradition conversion factor of 6.25 overestimates their protein content. Nevertheless, potential seasonal variation of this conversion factor has not yet been considered. This paper evaluates the seasonal nitrogen budget of Saccharina latissima and discusses the importance of more specific nitrogen-to-protein conversion factors, also taking season into account.
Degree of recognition: International
Documents:
Abstract_ISAP 2017-Marinho and Holdt-Nitrogen-to-protein-factor

Related external organisation

University of Nantes
France
Activity: Talks and presentations › Conference presentations

12th IEEE Power and Energy Society PowerTech Conference
Period: 18 Jun 2017 → 22 Jun 2017
Theis Bo Rasmussen (Organizer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Oral presentation of conference paper

Related event

18/06/2017 → 22/06/2017
Manchester, United Kingdom
Activity: Attending an event › Participating in or organising a conference

21st International Conference on Solid State Ionics
Period: 18 Jun 2017 → 23 Jun 2017
Vincenzo Esposito (Organizer)
Department of Energy Conversion and Storage
Ceramic Engineering & Science

Description
Low-dimensional ionic and mixed ionic/electronic conductor nanostructures
Links:
http://www.chimica.unipd.it/ssi21/Symposium_II_1.html

Related event

21st International Conference on Solid State Ionics
18/06/2017 → 23/06/2017
Padova, Italy
Activity: Attending an event › Participating in or organising a conference
**GODSEM Project: Final Dissemination Workshop**  
Period: 16 Jun 2017  
Francesco Rosati (Speaker)  
Department of Management Engineering  
Technology and Innovation Management

**Related event**  
**GODSEM Project: Final Dissemination Workshop**  
16/06/2017 → 16/06/2017  
Lyngby, Denmark  
Activity: Talks and presentations › Conference presentations

**Grid tariffs to support flexibility in decarbonised energy systems**  
Period: 16 Jun 2017  
Claire Bergaentzlé (Speaker)  
Department of Management Engineering  
Systems Analysis  
Energy Economics and Regulation  
Degree of recognition: International  
Documents:  
Presentation FSR_grid_tariffs_120617

**Related event**  
**6th Florence Conference on the Regulation of Infrastructures: Regulatory challenges for smart cities**  
16/06/2017 → 16/06/2017  
Florence, Italy  
Activity: Talks and presentations › Conference presentations

**Statistical modelling of space-time processes with application to wind power**  
Period: 16 Jun 2017  
Anders Stockmarr (Internal examiner)  
Thordis Thorarinsdottir (External examiner)  
Robin Girard (External examiner)  
Department of Applied Mathematics and Computer Science  
Statistics and Data Analysis  
Description  
Chairman of Phd defense  
Degree of recognition: Local  
Documents:  
Announcement PhD defence Amanda Lenzi  
Popular Science Summary Amanda Lenzi  
Activity: Examinations and supervision › Internal examination

**Velocity space tomography: Methods and results**  
Period: 16 Jun 2017  
Jesper Rasmussen (Speaker)  
Department of Physics  
Plasma Physics and Fusion Energy

**Related event**  
**2nd Joint Nordic Fusion Energy Seminar**  
15/06/2017 → 16/06/2017
**A Probabilistic Approach to CFD Validation with Field Measurements in Wind Energy**

*Period: 15 Jun 2017*

*Alexander Raul Meyer Forsting (Speaker)*

*Department of Wind Energy*

*Aerodynamic design*

*Degree of recognition: International*

*Documents: doc_dtubeamer*

**Related event**

**UNCECOMP 2017: 2nd International Conference on Uncertainty Quantification in Computational Sciences and Engineering**

*15/06/2017 → 17/06/2017*

*Rhodes, Greece*

*Activity: Talks and presentations › Conference presentations*

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**DALI Designer 5 programming**

*Period: 15 Jun 2017*

*Anders Thorseth (Participant)*

*Finn Aage Christensen Pedersen (Participant)*

*Department of Photonics Engineering*

*Diode Lasers and LED Systems*

*Optical Sensor Technology*

*Degree of recognition: Local*

**Related event**

**DALI Designer 5 programming: Starter**

*15/06/2017 → …*

*Brøndby, Denmark*

*Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.*

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**Kongsberg Systems Engineering Event**

*Period: 15 Jun 2017*

*Josef Oehmen (Keynote speaker)*

*Department of Management Engineering*

*Engineering Systems*

**Description**

*Invited keynote: Value-Driven Risk Management - Supporting Systems Engineering Innovation*

*Degree of recognition: International*

**Related event**

**Kongsberg Systems Engineering Event**

*15/06/2017 → 16/06/2017*

*Kongsberg, Norway*

*Activity: Talks and presentations › Conference presentations*

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**MADE Danish Manufacturing Association Conference**

*Period: 15 Jun 2017*

*Daniel Alberto Sepúlveda Estay (Speaker)*

*Department of Management Engineering*
Supply Chain Cyber resilience - The New Normal

**Documents:**
170515b_MADE_Final

**Related event**
MADE Danish Manufacturing Association Conference
15/06/2017 → 15/06/2017
Activity: Talks and presentations › Conference presentations

**Big Data: Rethink everything, but mind the mental Gap**
Period: 14 Jun 2017
Pernille Rydén (Guest lecturer)
Center for Bachelor of Engineering Studies
Afdelingen for Forretningsudvikling
Degree of recognition: National
Links:
http://managementevents.dk/events/Conference-Industrial-Internet

**Related event**
Internet of Things conference: Management Event
14/06/2017 → 14/06/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

**Characterization of nanoparticles in food and biological samples by single particle ICP-MS**
Period: 14 Jun 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science
Degree of recognition: International

**Related event**
European Workshop on Nanoparticle Analysis: Thermo Fisher Scientific
14/06/2017 → 14/06/2017
Hemel Hempstead, United Kingdom
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**Lectures on antibiotics biosynthesis: polyketides, aminoglycosides, RiPPs and others**
Period: 13 Jun 2017
Tilmann Weber (Guest lecturer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

**Description**
Lecture in the MSc module: Engineering of Antibiotics Biosynthesis at University of Tübingen

**Related event**
Antibiotika - Engineering der Antibiotika-Biosynthese
**Netværksmøde i Dansk Insektnetværk**  
**Period:** 13 Jun 2017  
Annette Nygaard Jensen (Participant)  
National Food Institute  
Research Group for Microbial Food Safety  

**Related event**  
**Netværksmøde i Dansk Insektnetværk**  
13/06/2017 → …  
Copenhagen, Denmark  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**SB7.0**  
**Period:** 13 Jun 2017 → 16 Jun 2017  
Eric van der Helm (Participant)  
Novo Nordisk Foundation Center for Biosustainability  
Bacterial Synthetic Biology  

**Description**  
The goal of SB7.0 is to unite again the international synthetic biology communities to take a fresh look at the key topics and challenges that our field faces. Synthetic biology cannot advance without exploring and embracing the changes that it brings. As practitioners, scholars, and citizens we need to work together to explore the possibilities and plan strategically for collective growth of our science, its beneficial applications, and responsible practices.

Synthetic biology can be used to advance so many facets of the world today, from agriculture and biomanufacturing, to groundbreaking cancer treatments and medicines, to even fashion and information technology. As the science continues to evolve, the scientists, engineers, and designers themselves need to focus our efforts on creating local biological solutions to meet global needs. But what we can’t forget is to take a step back and look at the world as a whole. Not just how does any one latest advancements better human life, but what are the footprints we are leaving behind? How does what we develop ultimately affect the world, from insects and plants to animals and aquatic life? While the full potential of synthetic biology continues to develop, we as a community must join together to make sure we don’t lose focus on the global impacts of our collective capacities. How can we best help not only humans but also the rest of the planet?  
Degree of recognition: International

**Related event**  
**SB7.0: The seventh international meeting on Synthetic Biology**  
13/06/2017 → 16/09/2017  
Singapore , Singapore  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Technological Advances and Opportunities for the Development of Sustainable Biorefineries**  
**Period:** 13 Jun 2017  
Solange I. Mussatto (Invited speaker)  
Novo Nordisk Foundation Center for Biosustainability  
Research Groups  
Biomass Conversion and Bioprocess Technology  
Degree of recognition: International  
Documents:  
EUBCE 2017 - Abstract - oral presentation Solange Mussatto

**Related event**  
**25th European Biomass Conference and Exhibition**
12/06/2017 → 15/06/2017
Stockholm, Sweden
Activity: Talks and presentations › Conference presentations

**Workshop on establishing an infrastructure for the harmonisation of food allergen measurements**
**Period:** 13 Jun 2017 → 14 Jun 2017
**Charlotte Bernhard Madsen** (Participant)

National Food Institute
Research Group for Gut Microbiology and Immunology

**Related event**

**Workshop on establishing an infrastructure for the harmonisation of food allergen measurements**
**13/06/2017 → 14/06/2017**
**Geel, Belgium**
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**25th European Biomass Conference and Exhibition**
**Period:** 12 Jun 2017 → 15 Jun 2017
**Solangue I. Mussatto** (Organizer)

Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

**Description**
Member of Scientific Committee / Topic Organizer / Reviewer of works / Poster Awards Committee / Chairperson - oral and visual sessions.
Degree of recognition: International

**Related event**

**25th European Biomass Conference and Exhibition**
**12/06/2017 → 15/06/2017**
Stockholm, Sweden
Activity: Attending an event › Participating in or organising a conference

**Alkaline membrane electrolysis with PEM-level electrochemical performance**
**Period:** 12 Jun 2017
**Mikkel Rykær Kraglund** (Guest lecturer)

Department of Energy Conversion and Storage
Proton conductors
Degree of recognition: International
Documents:
ICE2017_KraglundMR_Alkaline membrane electrolysis with PEM-level electrochemical performance

**Related event**

**International Conference on Electrolysis**
**12/06/2017 → 15/06/2017**
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

**DTU Summer School 2017: Modern Challenges in Power System Operation and Electricity Markets: An Optimization Perspective**
**Period:** 12 Jun 2017 → 16 Jun 2017
**Jalal Kazempour** (Organizer)

Department of Electrical Engineering
Center for Electric Power and Energy
Electricity markets and energy analytics
Degree of recognition: International

Related event

DTU Summer School 2017: Modern Challenges in Power System Operation and Electricity Markets: An Optimization Perspective
12/06/2017 → 16/06/2017
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Strain Development for Diacid Production
Period: 12 Jun 2017
Vratislav Stovicek (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering
Degree of recognition: International

Related event

BioREFINE-2G: Utilisation of Waste Streams for Bioproducts and Bioenergy: workshop within the 25th European Biomass Conference and Exhibition
12/06/2017 → 12/06/2017
Stockholm, Sweden
Activity: Talks and presentations › Conference presentations

9th International Conference on Advanced Vibrational Spectroscopy
Period: 11 Jun 2017 → 17 Jun 2017
René Wugt Larsen (Participant)
Department of Chemistry
Degree of recognition: International
Links:
http://www.icavs.org/

Related event

9th International Conference on Advanced Vibrational Spectroscopy
11/06/2017 → 17/06/2017
Victoria, Canada
Activity: Attending an event › Participating in or organising a conference

Integration of Nanopillar SERS Substrates in a Microfluidic Platform for Analyte Separation and Quantitative Sensing
Period: 11 Jun 2017 → 17 Jun 2017
Onur Durucan (Guest lecturer)
Lidia Morelli (Guest lecturer)
Kaiyu Wu (Guest lecturer)
Marlitt Viehrig (Guest lecturer)
Oleksii Ilichenko (Guest lecturer)
Kinga Zor (Guest lecturer)
Marco Matteucci (Guest lecturer)
Tommy Sonne Alstrøm (Guest lecturer)
Tomas Rindzевичius (Guest lecturer)
Michael Stenbæk Schmidt (Guest lecturer)
Anja Boisen (Guest lecturer)
Related event

9th International Conference on Advanced Vibrational Spectroscopy
11/06/2017 → 17/06/2017
Victoria, Canada
Activity: Talks and presentations › Conference presentations

SERS combiner for high-speed and high-sensitive quantitative analysis
Period: 11 Jun 2017 → 17 Jun 2017
Oleksii Ilchenko (Guest lecturer)
Tomas Rindzevicius (Guest lecturer)
Onur Durucan (Guest lecturer)
Michael Stenbæk Schmidt (Guest lecturer)
Roman Slipets (Other)
Lidia Morelli (Guest lecturer)
Anja Boisen (Guest lecturer)
Department of Micro- and Nanotechnology
Nanoprobes
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics

Related event

9th International Conference on Advanced Vibrational Spectroscopy
11/06/2017 → 17/06/2017
Victoria, Canada
Activity: Talks and presentations › Conference presentations

SERS combiner for high-speed and high-sensitive quantitative analysis
Period: 11 Jun 2017 → 17 Jun 2017
Oleksii Ilchenko (Guest lecturer)
Tomas Rindzevicius (Guest lecturer)
Michael Stenbæk Schmidt (Guest lecturer)
Roman Slipets (Guest lecturer)
Onur Durucan (Guest lecturer)
Lidia Morelli (Guest lecturer)
Anja Boisen (Guest lecturer)
Department of Micro- and Nanotechnology
Nanoprobes
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics

Related event

9th International Conference on Advanced Vibrational Spectroscopy
11/06/2017 → 17/06/2017
Victoria, Canada
Activity: Talks and presentations › Conference presentations
7th International SpectroRadiometer Comparison (ISRC 2017)
Period: 10 Jun 2017 → 14 Jun 2017
Anders Thorseth (Participant)
Nicholas Riedel (Participant)
Peter Behrensdorff Poulsen (Participant)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Instrument comparison of outdoor spectroradiometers
Degree of recognition: International
Links:

Related event
7th International SpectroRadiometer Comparison (ISRC 2017)
12/06/2017 → 16/06/2017
Catania, Italy
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Biophotonics 17: International Graduate Summer School on Biophotonics
Period: 10 Jun 2017 → 17 Jun 2017
Dominik Marti (Organizer)
Peter E. Andersen (Organizer)
Stefan Anderson-Engels (Organizer)
Department of Photonics Engineering
Diode Lasers and LED Systems
Degree of recognition: International
Links:
http://www.biop.dk/Biophotonics17/

Related event
Biophotonics 17: International Graduate Summer School on Biophotonics
10/06/2017 → 17/06/2017
Ven, Sweden
Activity: Attending an event › Participating in or organising a conference

Biophotonics 17: International Graduate Summer School on Biophotonics
Period: 10 Jun 2017 → 17 Jun 2017
Richard Levenson (Keynote speaker)
Jes Broeng (Keynote speaker)
Kishan Dholakia (Lecturer)
Wolfgang Drexler (Lecturer)
Emilia Entcheva (Lecturer)
Steven Jacques (Lecturer)
Juergen Popp (Lecturer)
Eric Potma (Lecturer)
Katarina Svanberg (Lecturer)
Sune Svanberg (Keynote speaker)
Roy Taylor (Lecturer)
Lihong Wang (Lecturer)
Department of Photonics Engineering
Degree of recognition: International
Links:
Biophotonics 17: International Graduate Summer School on Biophotonics
10/06/2017 → 17/06/2017
Ven, Sweden
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Acting With Consideration for Level of Influence
Period: 9 Jun 2017
Christine Ipsen (Speaker)
Kasper Edwards (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: International
Documents:
Principle 8 Ipsen and Edwards

12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities
07/06/2017 → 10/06/2017
Minneapolis, United States
Activity: Talks and presentations › Conference presentations

Food production and exports in the Arctic island operated society - Qaanaaq an example
Period: 9 Jun 2017
Kåre Hendriksen (Speaker)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

International Conference on Arctic Social Sciences
07/06/2017 → 12/06/2017
Umeå, Sweden
Activity: Talks and presentations › Conference presentations
Introduction to Applied Statistics with R for PhD Students
Period: 9 Jun 2017 → 30 Jun 2017
Anders Stockmarr (Lecturer)
Bjarne Kjær Erbsøll (Lecturer)
Elisabeth Wreford Andersen (Guest lecturer)
Murat Kulahci (Lecturer)
Andreas Baum (Lecturer)
Camilla Thyregod (Other)
Jesper Fink Andersen (Other)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

Related organisation

Introduction to Applied Statistics with R for PhD Students
Stockmarr, A. (Lecturer), Erbsøll, B. K. (Lecturer), Andersen, E. W. (Guest lecturer), Kulahci, M. (Lecturer), Baum, A. (Lecturer), Thyregod, C. (Other), Andersen, J. F. (Other)
9 Jun 2017 → 30 Jun 2017
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

KOMET-projektet (Test af energiforbrug og måling af kostindtag med to metoder)
Period: 9 Jun 2017 → 15 Oct 2017
Julia Christensen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International
Activity: Other

Ten Recommendations for the Design, Implementation and Evaluation of Improvements in Organizations
Period: 9 Jun 2017
Ulrica von Thiele Schwarz (Speaker)
Kasper Edwards (Speaker)
Christine Ipsen (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: International

Related event

12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities
07/06/2017 → 10/06/2017
Minneapolis, United States
Activity: Talks and presentations › Conference presentations

Ten Recommendations for the Design, Implementation and Evaluation of Improvements in Organizations
Period: 9 Jun 2017
Kasper Edwards (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Related event

12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities  
07/06/2017 → 10/06/2017  
Minneapolis, United States  
Activity: Talks and presentations › Conference presentations

Understanding the potentials and development dynamics of Arctic island-economies as pre-conditions for sustainable regional and societal planning  
Period: 9 Jun 2017  
Kåre Hendriksen (Speaker)  
Department of Civil Engineering  
ARTEK, Section for Arctic Engineering and Sustainable Solutions

Related event

International Congress on Arctic Social Sciences  
07/06/2017 → 12/06/2017  
Activity: Talks and presentations › Conference presentations

12th World Congress on Structural and Multidisciplinary Optimization  
Period: 8 Jun 2017  
Kristian Ejlebjærg Jensen (Speaker)  
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics  
Department of Micro- and Nanotechnology  
Nanoprobes  
Documents:  
paperID62_KristianE  
Links:  
http://wcsmo12.org/

Related organisation

12th World Congress on Structural and Multidisciplinary Optimization  
Jensen, K. E. (Speaker)  
8 Jun 2017  
Activity: Talks and presentations › Conference presentations

Can you design for Fidelity? How your intervention framework describes intended actions, participation and behavior  
Period: 8 Jun 2017  
Signe Poulsen (Speaker)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  
Degree of recognition: International

Related event

12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities  
07/06/2017 → 10/06/2017  
Minneapolis, United States  
Activity: Talks and presentations › Conference presentations

Implementation of Preventive Interventions - What are the contextual co-players and opponents?  
Period: 8 Jun 2017
Integrating Work Environment Considerations Into Lean and Value Stream Mapping
Period: 8 Jun 2017
Kasper Edwards (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: International

Related event
12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities
07/06/2017 → 10/06/2017
Minneapolis, United States
Activity: Talks and presentations › Conference presentations

Metabolic Engineering of Yeast for production of fuels and chemicals
Period: 8 Jun 2017
Jens Nielsen (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Yeast Cell Factories

Description
Plenary lecture

Related event
RRB-13: Renewable Resources and Biorefineries
07/06/2017 → 09/06/2017
Wroclaw, Poland
Activity: Talks and presentations › Conference presentations

Protecting the built environment without killing the idea
Period: 8 Jun 2017
Laila Zwisler (Speaker)
Department of Physics

Description
Often conservation strategies for the built environment advocate focus on architecture and originality and these are interesting features of many university campuses. But this focus could also fossilize the buildings to such an extent, that they cannot support the main activities of a university. If this happens, what have we really kept for the future? A university must live and evolve and the built environment must often change with it. Can we preserve the atmospheres, the lives lived and the purposes of universities as integrated into the built environment. Should conservation focus mainly on the mundane as well as the signs of use and change? Integrating traces of the past into refurbishments and new buildings can be a way forward. But we need to be very vigilant about our choices and the effects of them. There is more at stake than practicalities. The preserved becomes symbolic, often idealized, and affect identities. If houses as Bourdieu claims can
make us reproduce patterns of behavior, our conservation strategies carries very deep messages. One message could be that the past and the future are connected at a university.

Degree of recognition: International
Links:
http://www.universeum2017.rect.bg.ac.rs/preliminaryprogram.php (Conference website)

**Related event**

**Universeum Network Meeting: Mobility of University Heritage**
08/06/2017 → 10/06/2017
Belgrade, Serbia
Activity: Talks and presentations › Conference presentations

**12th World Congress of Structural and Multidisciplinary Optimisation**
Period: 7 Jun 2017
Kasper Sandal (Participant)
Susana Rojas Labanda (Participant)
Mathias Stolpe (Participant)
Department of Wind Energy

Description
Sizing optimization of an offshore wind turbine jacket under dynamic loads considering stress and eigenfrequency constraints

**Related event**

**12th World Congress of Structural and Multidisciplinary Optimisation**
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Attending an event › Participating in or organising a conference

Asger Bech Abrahamsen (Participant)
Mathias Stolpe (Participant)
Department of Wind Energy

Description
Optimal design of a galvanic corrosion protection systems for offshore wind turbine support structures

Degree of recognition: International
Links:
http://www.wcsmo12.org/

**Related event**

**Eurelectric - Florence School of Regulation**
Period: 7 Jun 2017
Claire Bergaentzlé (Participant)
Energy Economics and Regulation
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
Agenda - The electricity market design of the future - 7 June
Related event

Eurelectric - Florence School of Regulation: What market design for a decarbonized electricity market?
07/06/2017 → 07/06/2017
Brussels, Belgium
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

FlexEm 2050 - Flexible Electricity Markets for Decarbonized Systems
Period: 7 Jun 2017
Klaus Skytte (Speaker)
Department of Management Engineering
Systems Analysis

Description
Conference: The electricity market design of the future
Euroelectric and Florence School of Regulation, Brussels
Degree of recognition: International
Documents:
FlexEm 2050_slides070617_a

Related event

The electricity market design of the future: Euroelectric and Florence School of Regulation
07/06/2017 → 07/06/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

International Congres on Arctic Social Sciences
Period: 7 Jun 2017 → 12 Jun 2017
Kåre Hendriksen (Organizer)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

Description
Organizer and chair of session: Island operations - a driver in the urbanization?
Degree of recognition: International

Related event

International Congres on Arctic Social Sciences : ICASS IX
07/06/2017 → 12/06/2017
Umeå, Sweden
Activity: Attending an event › Participating in or organising a conference

Mapping offshore winds in the New European Wind Atlas (NEWA)
Period: 7 Jun 2017
Ioanna Karagali (Invited speaker)
Charlotte Bay Hasager (Other)
Merete Badger (Other)
Andrea N. Hahmann (Other)
Patrick Volker (Other)
Alfredo Peña (Guest lecturer)
Julia Gottschall (Other)
Eleonora Catalano (Other)
Jakob Mann (Other)
Department of Wind Energy
Meteorology & Remote Sensing
Resource Assessment Modelling

Related event

Offshore Wind Energy 2017
06/06/2017 → 08/06/2017
London, United Kingdom
Activity: Talks and presentations › Conference presentations

Nordic Dairy Congress, 7-9 June 2017, Copenhagen, Denmark
Period: 7 Jun 2017 → 9 Jun 2017
Veronica Martinez Rios (Participant)
National Food Institute
Research Group for Analytical and Predictive Microbiology

Description
‘Predictive modelling to improve and document safety of dairy products’ at Nordic Dairy Congress, Copenhagen, Denmark.


Degree of recognition: International

Related event

Nordic Dairy Congress, 7-9 June 2017, Copenhagen, Denmark: Adding value
07/06/2017 → 09/06/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising a conference

Optimal design of a galvanic corrosion protection systems for offshore wind turbine support structures
Period: 7 Jun 2017
Ali Sarhadi (Speaker)
Department of Wind Energy
Degree of recognition: International
Links:
http://www.wcsmo12.org/

Related event

12th World Congress of Structural and Multidisciplinary Optimization
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Talks and presentations › Conference presentations

‘Predictive modelling to improve and document safety of dairy products’ at Nordic Dairy Congress, Copenhagen, Denmark.
Period: 7 Jun 2017 → 9 Jun 2017
Paw Dalgaard (Invited speaker)
Ioulia Koukou (Other)
National Food Institute
Research Group for Analytical and Predictive Microbiology

Description

Degree of recognition: International

Related event

Nordic Dairy Congress, 7-9 June 2017, Copenhagen, Denmark: Adding value
Prevalence of Listeria monocytogenes in European cheeses: A systematic review and meta-analysis
Period: 7 Jun 2017 → 9 Jun 2017
Veronica Martinez Rios (Speaker)
Paw Dalgaard (Speaker)

National Food Institute
Research Group for Analytical and Predictive Microbiology

Description
Degree of recognition: International

Related event
Nordic Dairy Congress 2017
07/06/2017 → 09/06/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Sizing optimization of an offshore wind turbine jacket under dynamic loads considering stress and eigenfrequency constraints
Period: 7 Jun 2017
Alexander Verbart (Speaker)

Department of Wind Energy

Related event
12th World Congress of Structural and Multidisciplinary Optimisation
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Talks and presentations › Conference presentations

University Industry Interaction Conference 2017, Dublin
Period: 7 Jun 2017 → 9 Jun 2017
Ian Bridgwood (Speaker)

Center for Bachelor of Engineering Studies
Afdelingen for Informatik

Description
From innovation to implementation - SME collaboration in student projects.

Related external organisation
University Industry Innovation Network
Science Park 400, 098XH Amsterdam, Amsterdam, Netherlands
Activity: Talks and presentations › Conference presentations

WORK, STRESS and HEALTH
Period: 7 Jun 2017 → 10 Jun 2017
Kasper Edwards (Speaker)

Department of Management Engineering
Management Science
Flexibility-friendly support policies: A Nordic and Baltic Perspective
Period: 6 Jun 2017
Luis Rafael Boscán Flores (Speaker)
Department of Management Engineering
Systems Analysis

Inclusive planning in transport and energy STI-policies
Period: 6 Jun 2017 → 9 Jun 2017
Per Dannemand Andersen (Speaker)
Meiken Hansen (Other)
Department of Management Engineering
Technology and Innovation Management

Regulatory barriers for activating flexibility in the Nordic-Baltic electricity market
Period: 6 Jun 2017 → 9 Jun 2017
Claire Bergaentzlé (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
EEM17 - presentation - Regulatory barriers for activating flexibility in the Nordic-Baltic Conference proceeding-Regulatory barriers to flexibility in the nordic baltic electricity market - EEM17 (2)

Related event
International Conference on the European Energy Market
06/06/2017 → 09/06/2017
Dresden, Germany
Activity: Talks and presentations › Conference presentations

12th World Congress of Structural and Multidisciplinary Optimisation
Period: 5 Jun 2017
Mathias Stolpe (Participant)
Susana Rojas Labanda (Participant)
José Pedro Albergaria Amaral Blasques (Participant)
Department of Wind Energy
Description
3D structural topology optimization of wind turbine blades with stiffness and frequency constraints
Degree of recognition: International

Related event
12th World Congress of Structural and Multidisciplinary Optimisation
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Attending an event › Participating in or organising a conference

3D structural topology optimization of wind turbine blades with stiffness and frequency constraints
Period: 5 Jun 2017
Christian Carstensen (Speaker)
Department of Wind Energy
Degree of recognition: International

Related event
12th World Congress of Structural and Multidisciplinary Optimisation
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Talks and presentations › Conference presentations

Dynamics Days Europe 2017
Period: 5 Jun 2017
Erik Andreas Martens (Speaker)
Department of Applied Mathematics and Computer Science
Dynamical Systems
Department of Electrical Engineering
Description
Organization of minisymposium "Complex patterns on networks"
Degree of recognition: International

Related event
Dynamics Days Europe 2017
05/06/2017 → …
Szeged, Hungary
Activity: Talks and presentations › Conference presentations

**High Throughput Engineering of CHO Cells**
Period: 5 Jun 2017
Bjørn Gunnar Voldborg (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core
Degree of recognition: International

**Related event**

**KNECT365 Cell Line Development and Engineering**
05/06/2017 → 07/06/2017
San Diego, United States
Activity: Talks and presentations › Conference presentations

**Modelling of disease spread**
Period: 5 Jun 2017 → 23 Jun 2017
Ana Carolina Lopes Antunes (Participant)
National Veterinary Institute
Epidemiology

**Related event**

**Modelling of disease spread**
05/06/2017 → 23/06/2017
Lyngby, Denmark
Activity: Other

**Optimal modular design of jacket structures for offshore wind turbines**
Period: 5 Jun 2017 → 9 Jun 2017
Mathias Stolpe (Speaker)
Kasper Sandal (Speaker)
Department of Wind Energy
Degree of recognition: International

**Related event**

**12th World Congress of Structural and Multidisciplinary Optimisation**
05/06/2017 → 09/06/2017
Braunschweig, Germany
Activity: Talks and presentations › Conference presentations

**European Renal Association – European Dialysis and Transplantation Association**
Period: 3 Jun 2017 → 6 Jun 2017
Signe Holm Nielsen (Organizer)
Department of Biotechnology and Biomedicine
Disease Systems Immunology

**Related event**

**European Renal Association – European Dialysis and Transplantation Association: 54th congress**
03/06/2017 → 06/06/2017
Madrid, Spain
Activity: Attending an event › Participating in or organising a conference
Estimating the burden of foodborne diseases: an integrated approach
Period: 2 Jun 2017
Sara Monteiro Pires (Speaker)
National Food Institute
Research Group for Risk-Benefit

Related event
GoFood 2017
31/05/2017 → 02/06/2017
Lund, Sweden
Activity: Talks and presentations › Conference presentations

Genome engineering of CHO cell factories. 12th Danish Conference on Biotechnology and Molecular Biology, Vejle, Denmark.
Period: 2 Jun 2017
Helene Faustrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Degree of recognition: International

Related event
12th Danish Conference on Biotechnology and Molecular Biology
01/06/2017 → 02/06/2017
Activity: Talks and presentations › Conference presentations

Marine fish traits follow environmental gradients across European shelf seas
Period: 2 Jun 2017
Esther Beukhof (Speaker)
National Institute of Aquatic Resources
Centre for Ocean Life

Description
One of the major goals in biogeography is describing and understanding species distributions. However, when focusing on taxonomy one may miss the mechanistic understanding of what underlies these distributions. Trait-based ecologists argue that traits are useful in explaining where species occur, since it is the traits that determine how species respond to the environment. In this study, we applied this approach to Europe’s marine fish communities using a unique dataset containing the spatial occurrence of over 300 marine fish species across Europe’s continental shelf seas – ranging from Iceland and southern Greenland to Portugal with a high spatial resolution of ¼ degree. The main aims were to identify key traits for marine fish that explain fish species distributions and to identify the most important relationships between marine fish traits and the environment. Three-matrix approaches (RLQ and fourth-corner analysis) were used to investigate the relationships between species traits and environmental variables through the information on species occurrences. We compared our results with a more community-based approach: we modelled community weighted means of traits by the environmental variables using random forests. Our first approach demonstrated that marine fish species can be characterized according to their traits along a fast-slow continuum mainly characterized by age at maturity, life span and growth. This is continuum is then determined by a coastal to offshore gradient. When scaling up to the community level, the main relationships between traits and environment seemed to hold. They implied that depth, temperature, productivity and seasonality are important factors for structuring marine fish communities.
Degree of recognition: International

Related event
3rd PICES/ICES Early Career Scientist Conference
30/05/2017 → 02/06/2017
Busan, Korea, Republic of
Activity: Talks and presentations › Conference presentations
PhD Assessment Committee Aalborg University (External organisation)
Period: 2 Jun 2017
Ole Broberg (Participant)

Copenhagen Center for Health Technology
Department of Management Engineering
Engineering Systems

Description
Member of assessment committee for PhD thesis by Anne Helbo Jespersen "OHS management systems audits as a regulatory instrument of psychosocial risks - principles and practice"
Degree of recognition: International

Related external organisation

PhD Assessment Committee Aalborg University
Activity: Membership › Membership in review committee

12th DANISH CONFERENCE ON BIOTECHNOLOGY AND MOLECULAR BIOLOGY (DCB12)
Period: 1 Jun 2017 → 2 Jun 2017
Carola Elisa Heesemann Rosenkilde (Organizer)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Degree of recognition: International
Links:
http://danishbiotechsociety.org/conferences-events/

Related event

12th DANISH CONFERENCE ON BIOTECHNOLOGY AND MOLECULAR BIOLOGY (DCB12): CRISPR-based technologies and Bio-products
01/06/2017 → 02/06/2017
Vejle, Denmark
Activity: Attending an event › Participating in or organising a conference

12th DANISH CONFERENCE ON BIOTECHNOLOGY AND MOLECULAR BIOLOGY (DCB12)
Period: 1 Jun 2017 → 2 Jun 2017
Sara Pereira (Speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design

Description
CRISPR-based technologies and Bio-products
Participation with a poster.
Degree of recognition: National

Related event

12th DANISH CONFERENCE ON BIOTECHNOLOGY AND MOLECULAR BIOLOGY (DCB12): CRISPR-based technologies and Bio-products
01/06/2017 → 02/06/2017
Vejle, Denmark
Activity: Talks and presentations › Conference presentations

A Critical and in-depth analysis of the environmental aspect of the OECD SP dossiers
Period: 1 Jun 2017
Steffen Foss Hansen (Speaker)
Anders Baun (Other)
Rune Hjorth (Other)
Lars Michael Skjolding (Other)

Department of Environmental Engineering
Environmental Chemistry

Description
Degree of recognition: International

Related external organisation
National Research Center for Working Environment
Denmark

Activity: Talks and presentations › Conference presentations

ASM Microbe
Period: 1 Jun 2017
Lejla Imamovic (Organizer)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Description
Workshop: Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling

Related event
American Society for Microbiology 2017: ASM Microbe
01/06/2017 → 05/06/2017
New Orleans, United States
Activity: Attending an event › Participating in or organising a conference

ASM Microme 2017
Period: 1 Jun 2017
Morten Otto Alexander Sommer (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Description
Organising a workshop "Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling"

Related event
ASM Microme 2017: ASM Microme
01/06/2017 → 05/06/2017
New Orleans, United States
Activity: Talks and presentations › Conference presentations

Engineering CHO cell's amino acid metabolism using CRISPR/Cas9 towards optimal by-product and cell growth phenotypes
Period: 1 Jun 2017 → 2 Jun 2017
Sara Pereira (Speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Description
Poster award (2nd place) and oral presentation
Degree of recognition: National

Related event

12th DANISH CONFERENCE ON BIOTECHNOLOGY AND MOLECULAR BIOLOGY (DCB12): CRISPR-based technologies and Bio-products
01/06/2017 → 02/06/2017
Vejle, Denmark
Activity: Talks and presentations › Conference presentations

Exploring the potential for improved satellite coverage in the High North
Period: 1 Jun 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy
Degree of recognition: International

Related event

Arctic Patrol and Reconnaissance 2017
31/05/2017 → 01/06/2017
Copenhagen, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling
Period: 1 Jun 2017
Eric van der Helm (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Description
see https://evdh0.github.io/ASMworkshop/

Enhance your antibiotic resistance gene research by attending this hands-on workshop! This course will enable you to: Functional metagenomic selections are non-culture based method for resistome profiling from specimens that might be difficult or impossible to culture. This workshop will introduce the functional metagenomic selections as a tool to identify known and novel antibiotic resistance gene from complex clinical and environmental communities. Hands-on instructions will be provided on free analysis resources, which attendees will use to run on their computer. We will explore the options for antibiotic resistance gene annotations, showing participant how they can broadly annotate hundreds of antibiotic resistance genes from different data input and preform detailed BLAST analysis in CARD, Resfam and Pfam. Such skills are of interest to ASM attendees who wish to understand clinical and environmental reservoirs of antibiotic resistance genes.
Degree of recognition: International

Related event

American Society for Microbiology 2017: ASM Microbe
01/06/2017 → 05/06/2017
New Orleans, United States
Activity: Talks and presentations › Conference presentations

Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling
Period: 1 Jun 2017
Mostafa M Hashim Ellabaan (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Research Groups

**Description**
Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling

Links:
https://evdh0.github.io/ASMworkshop/ (This workshop introduces the functional metagenomic selections as a tool to identify known and novel antibiotic resistance gene from complex clinical and environmental communities. Hands-on instructions will be provided on free analysis resources which attendees will use to run on their computer. We will explore the options for antibiotic resistance gene annotations, showing participant how they can broadly annotate hundreds of antibiotic resistance genes from different data input and perform detailed BLAST analysis in CARD, Resfam and Pfam.)

**Related event**

**Functional Metagenomic Selections for Antibiotic Resistance Gene Profiling**
01/06/2017 → 05/06/2017
New Orleans, United States
Activity: Talks and presentations › Conference presentations

**Outsourcing seen in perspective of Industry 4.0**
Period: 1 Jun 2017

Zaza Nadja Lee Herbert-Hansen (Speaker)
Department of Management Engineering
Management Science
Operations Management

**Description**
Presentation for DFK conference: "Hvordan Sikrer Du Kvalitet i Leverancer"
Degree of recognition: National

**Related event**

**DFK Conference: Hvordan Sikrer Du Kvalitet i Leverancer**
01/06/2017 → 01/06/2017
Denmark
Activity: Talks and presentations › Conference presentations

**Wind farm efficiency assessed by WRF with a statistical-dynamical approach**
Period: 1 Jun 2017

Patrick Volker (Speaker)
Jake Badger (Speaker)
Andrea N. Hahmann (Speaker)
Hans Ejssing Jørgensen (Speaker)

Department of Wind Energy
Resource Assessment Modelling
Meteorology & Remote Sensing

**Description**
Discussion about large wind farms and their efficiency
Degree of recognition: International

**Related event**

**WindFarms 2017, Madrid**
31/05/2017 → 02/06/2017
Madrid, Spain
Activity: Talks and presentations › Conference presentations
Climate change mitigation potential of hydrochars
Period: 31 May 2017
Mikolaj Owsianiak (Speaker)
Department of Management Engineering
Quantitative Sustainability Assessment

Related event
Climate change mitigation potential of hydrochars
31/05/2017 → 31/05/2017
Valencia, Spain
Activity: Talks and presentations › Conference presentations

Consumers as risk managers: The benefit of quantification of food related health effects.
Period: 31 May 2017
Maarten Nauta (Speaker)
National Food Institute
Research Group for Risk-Benefit
Degree of recognition: International

Related event
GoFood 2017
31/05/2017 → 02/06/2017
Lund, Sweden
Activity: Talks and presentations › Conference presentations

Vejbelysningsdagen 2017
Period: 31 May 2017
Anders Thorseth (Organizer)
Dennis Dan Corell (Organizer)
Johannes Lindén (Organizer)
Department of Photonics Engineering
Diode Lasers and LED Systems
Description
DOLL exhibition of measurement facilities
Degree of recognition: National

Related event
Vejbelysningsdagen 2017
31/05/2017 → 31/05/2017
Odense, Denmark
Activity: Attending an event › Participating in or organising a conference

Classification of electricity consumption using smart meter data
Period: 30 May 2017
Alexander Martin Tureczek (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
Electricity Smart Meter Consumption Analytics_orbit
Modelling lidar volume-averaging and its effect on wake measurements
Period: 30 May 2017 → 1 Jun 2017
Alexander Raul Meyer Forsting (Speaker)
Department of Wind Energy
Aerodynamic design

Description
Wake conference 2017
Degree of recognition: International
Documents:
AMeyerForsting

Structured Literature Review of Electricity Consumption Classification Using Smart Meter Data
Period: 30 May 2017 → 31 May 2017
Alexander Martin Tureczek (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
poster_cities_consortium_2017_århus

Studenterinvolvering via ressourcemæssig effektiv peer review i et obligatorisk kursus i fysikken i medicinsk billeddannelse
Period: 30 May 2017
Jens E. Wilhjelm (Speaker)
Sidsel-Marie Winther Prag (Guest lecturer)
Department of Electrical Engineering
Biomedical Engineering
LearningLab DTU
Office for Study Programmes and Student Affairs
Degree of recognition: International
Links:
http://dun-net.dk/aktiviteter/2017/dun-conference-2017/program-sessions/ (Link to program)
**DUN konference 2017**
30/05/2017 → 31/05/2017
Vingsted, Denmark
Activity: Talks and presentations › Conference presentations

**Udviklingskonference for mindre bosteder**
Period: 30 May 2017 → 31 May 2017
Kåre Hendriksen (Keynote speaker)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

**Description**
Erhvervsudvikling i mindre bosteder - Qaanaaq og Qeqertat - et eksempel
Inoqarfinni minnerusuni inuutissarsiornermik inerisaaneq - Qaanaaq aamma Qeqertat – assersuut

**Related event**
Udviklingskonference for mindre bosteder
30/05/2017 → 31/05/2017
Nuuk, Greenland
Activity: Talks and presentations › Conference presentations

**EUROLAB**
Period: 29 May 2017
Heidi Huus Petersen (Organizer)
National Veterinary Institute
Bacteriology & Parasitology
Degree of recognition: Local

**Related event**
EUROLAB: Netværksmøde
29/05/2017 → 29/05/2017
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Systems Engineering Risk Management**
Period: 29 May 2017 → 2 Jun 2017
Josef Oehmen (Keynote speaker)
Department of Management Engineering
Engineering Systems

**Description**
Keynote speaker and co-organizer of IS3E 2017
Degree of recognition: International

**Related event**
5th International Spring School on Systems Engineering
29/05/2017 → 02/06/2017
Enschede, Netherlands
Activity: Talks and presentations › Conference presentations

**Tutorial on high-throughput computations**
Period: 29 May 2017 → 31 May 2017
Simon Loftager (Participant)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

**Description**
MARVEL/MaX/Psi-k tutorial on high-throughput computations: General methods and applications using AiiDA
Degree of recognition: International

**Related event**

**Tutorial on high-throughput computations: General methods and applications using AiiDA**
29/05/2017 → 31/05/2017
Lausanne, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Praksifællesskaber og procesensartethed
Period: 28 May 2017
Rasmus Jørgensen (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Præsentation af min forskning samt invitation til muligt samarbejde

**Related external organisation**

Berendsen Textil Service A/S
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

I E E E Transactions on Industrial Electronics (Journal)
Period: 26 May 2017 → …
Anders Thorseth (Reviewer)
Department of Photonics Engineering
Diode Lasers and LED Systems
Degree of recognition: International

**Related journal**

I E E E Transactions on Industrial Electronics
0278-0046
Central database
Activity: Research › Peer review of manuscripts

Nature Conference
Period: 26 May 2017 → 29 May 2017
Thomas Willum Hansen (Participant)
Center for Electron Nanoscopy
Center for Nanostructured Graphene
DTU Danchip
Degree of recognition: International

**Related event**

26/05/2017 → 29/05/2017
Hangzhou, China
2nd International workshop for in situ TEM
Period: 25 May 2017 → 26 May 2017
Thomas Willum Hansen (Invited speaker)
Center for Electron Nanoscopy
Center for Nanostructured Graphene
DTU Danchip
Degree of recognition: International

Related external organisation
Zhejiang University
China
Activity: Talks and presentations › Conference presentations

In silico and experimental tools for natural products genome mining and engineering
Period: 24 May 2017
Tilmann Weber (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International

Related event
18th International Symposium on the Biology of Actinomycetes
23/05/2017 → 27/05/2017
Jeju, Korea, Republic of
Activity: Talks and presentations › Conference presentations

Tidlig kolonisering af mikrobiota og betydningen af overgangskost hos småbørn
Period: 24 May 2017
Martin Iain Bahl (Speaker)
National Food Institute
Research Group for Gut Microbiology and Immunology

Related event
Det årlige videnskabelige temamøde i Selskab for Ernæringsforskning
24/05/2017 → 24/05/2017
Valby, Denmark
Activity: Talks and presentations › Conference presentations

18th International Symposium on the Biology of Actinomycetes
Period: 23 May 2017 → 27 May 2017
Tilmann Weber (Participant)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International

Related event
18th International Symposium on the Biology of Actinomycetes
23/05/2017 → 27/05/2017
Jeju, Korea, Republic of
Activity: Attending an event › Participating in or organising a conference
18th International Symposium on the Biology of Actinomycetes
Period: 23 May 2017 → 27 May 2017
Helene Lunde Robertsen (Participant)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International
Documents:
ISBA abstract

Related event

18th International Symposium on the Biology of Actinomycetes
23/05/2017 → 27/05/2017
Jeju, Korea, Republic of
Activity: Attending an event › Participating in or organising a conference

ETALEE 2017
Period: 23 May 2017 → 24 May 2017
Carsten Thure Kirkeby (Participant)
National Veterinary Institute
Epidemiology

Description

The aim of the conference is to shine the spot light on forms of teaching and learning that motivate, activate and engage students. The conference aims to provide a meeting place where you can interact and exchange experiences with colleagues from other engineering education institutions. Thus, you are encouraged to bring good examples from your teaching practice on the use of active learning (article in danish - english) in engineering education.

The conference will be a mixture of active keynotes, practical Hands-on sessions, Explore sessions, an active Poster session and social arrangements.
Degree of recognition: International
Links:
http://www.etalee.dk

Related event

ETALEE 2017: Exploring Teaching for Active Learning in Engineering Education 2017
23/05/2017 → 24/05/2017
Odense, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

INNOVATION PILOT – TO IMPROVE INNOVATION COMPETENCES OF ENGINEERING STUDENTS
Period: 23 May 2017 → 24 May 2017
Hanne Løje (Speaker)
Sara Grex (Speaker)
Center for Bachelor of Engineering Studies
Afdelingen for Produktionsudvikling
Degree of recognition: National
Documents:
abstract_Innovation Pilot_etalee2017_update March

Related event
TEACH FOOD - Developing a teacher's community of practice
Period: 23 May 2017 → 24 May 2017
Lene Duedahl-Olesen (Speaker)
Håkan Vigre (Other)
Lars Boge Jensen (Other)
Pernille Hammar Andersson (Other)

National Food Institute
Research Group for Analytical Food Chemistry
Research Group for Genomic Epidemiology
Research Group for Microbial Food Safety
Office for Study Programmes and Student Affairs

Description
Oral Presentation and paper
Degree of recognition: International
Documents:
TEACH FOOD abstract

Related event
ETALEE 2017: Exploring Teaching for Active Learning in Engineering Education 2017
23/05/2017 → 24/05/2017
Odense, Denmark
Activity: Talks and presentations › Conference presentations

Tools for improved genome engineering of CHO cell factories. 2nd International Advanced Biomanufacturing Conference. Sheffield, UK.
Period: 23 May 2017
Helene Fastrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design

Related event
2nd International Advanced Biomanufacturing Conference
22/05/2017 → 23/05/2017
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Animal Parasitology
Period: 22 May 2017
Heidi Huus Petersen (Guest lecturer)
National Veterinary Institute

Related external organisation
University of Copenhagen
Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Canards in Stiction: On Solutions of a Friction Oscillator by Regularization
Period: 22 May 2017
Description
We consider the problem of the friction oscillator using the stiction model of friction. This friction law has a discontinuity between the dynamic and the static regime. The discontinuity set has a sticking region in which the forward solution is non-unique. In particular, there are special points along these segments where the solution is tangent to the boundary of the discontinuity set. In order to resolve this uncertainty, we introduce a regularization of the vector field and we obtain a multiple-time scale problem. Here the special points of the piecewise-smooth problem become folded saddles and a canard solution appears. We study the interaction of periodic orbits with the canard and we find that the the regularized problem has solutions that do not appear in the original problem.

Degree of recognition: International

Links:
http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=61861 (Minisymposium description)

Related event
SIAM Conference on Applications of Dynamical Systems 2017
21/05/2017 → 26/05/2017
Snowbird, United States
Activity: Talks and presentations › Conference presentations

Developing Active Sulfide- and Phosphide-based Catalysts for Sustainable Electrochemical Hydrogen Production
Period: 22 May 2017 → 23 May 2017
Jakob Kibsgaard (Speaker)

Related event
Dansk Fysisk Selskab annual meeting
22/05/2017 → 23/05/2017
Denmark
Activity: Talks and presentations › Conference presentations

DTU Project Risk Forum
Period: 22 May 2017
Josef Oehmen (Chairman)
Pelle Lundquist Willumsen (Organizer)
Department of Management Engineering

Description
Industry-university event to discover and exchange best practice regarding engineering project risk management. Part of a Nordic 5 Tech Initiative.

Degree of recognition: National

Related event
DTU Project Risk Forum
22/05/2017 → 22/05/2017
Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

DTU Project Risk Forum
Period: 22 May 2017
Miroslava Tegeltija (Keynote speaker)
Department of Management Engineering

Engineering Systems

Description
Industry-university event to discover and exchange best practice regarding engineering project risk management. Part of a Nordic 5 Tech Initiative.
Degree of recognition: National

Related event

DTU Project Risk Forum
22/05/2017 → 22/05/2017
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Introduction to R
Period: 22 May 2017
Anders Stockmarr (Speaker)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Department of Management Engineering

Description
Invited seminar talk
Degree of recognition: Local
Documents:
Intro R DTU Management Engineering
Intro R DTU Management Engineering

Related organisation

Introduction to R
Stockmarr, A. (Speaker)
22 May 2017
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

NORA Workshop Vand i Arktiske ø-driftssamfund Vandindvindingssystemer i Suðureyri og Flateyri
Period: 22 May 2017 → 24 May 2017
Kåre Hendriksen (Organizer)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

Related event

NORA Workshop Vand i Arktiske ø-driftssamfund Vandindvindingssystemer i Suðureyri og Flateyri
22/05/2017 → 24/05/2017
Isafjordur, Iceland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

SIAM Conference on Applications of Dynamical Systems 2017
Period: 22 May 2017
Morten Brøns (Participant)
Kristian Uldall Kristiansen (Participant)
Alan R. Champneys (Chairman)
John Hogan (Chairman)
Department of Applied Mathematics and Computer Science
Mathematics

**Description**
Canards in Stiction: On Solutions of a Friction Oscillator by Regularization

We consider the problem of the friction oscillator using the stiction model of friction. This friction law has a discontinuity between the dynamic and the static regime. The discontinuity set has a sticking region in which the forward solution is non-unique. In particular, there are special points along these segments where the solution is tangent to the boundary of the discontinuity set. In order to resolve this uncertainty, we introduce a regularization of the vector field and we obtain a multiple-time scale problem. Here the special points of the piecewise-smooth problem become folded saddles and a canard solution appears. We study the interaction of periodic orbits with the canard and we find that the the regularized problem has solutions that do not appear in the original problem.

Degree of recognition: International

Links:
http://meetings.siam.org/sess/dsp_programsess.cfm?SESSIONCODE=61861 (Minisymposium description)

**Related event**

**SIAM Conference on Applications of Dynamical Systems 2017**

21/05/2017 → 26/05/2017
Snowbird, United States

Activity: Attending an event › Participating in or organising a conference

**Silent vanA in Enterococcus faecium from Danish pigs**

Period: 22 May 2017 → 2 Jun 2017

Valeria Bortolaia (Main supervisor)

National Food Institute

Research Group for Genomic Epidemiology

**Description**
Internship of Hans Murillo in relation to the One Health course held at University of Copenhagen, Denmark

Degree of recognition: National

Activity: Examinations and supervision › Supervisor activities

**The 16th Protein.DTU Workshop : Networking for Young Researchers**

Period: 22 May 2017

Henning Gram Hansen (Speaker)

Novo Nordisk Foundation Center for Biosustainability

CHO Cell Line Engineering and Design

**Description**
Recombinant therapeutic glycoproteins: Improving the productivity in Chinese hamster ovary cells

Degree of recognition: National

**Related event**

**The 16th Protein.DTU Workshop : Networking for Young Researchers**

22/05/2017 → 22/05/2017
Kgs. Lyngby, Denmark

Activity: Talks and presentations › Conference presentations

**The DTU fusor – Fusion power at your fingertips**

Period: 22 May 2017

Jesper Rasmussen (Speaker)

Department of Physics

Plasma Physics and Fusion Energy

**Related event**
Danish Physical Society Annual Meeting 2017  
22/05/2017 → 23/05/2017  
Activity: Talks and presentations › Conference presentations

Frontiers International Conference on Wastewater Treatment (FICWTM2017)  
Period: 21 May 2017 → 24 May 2017  
Carlos Domingo-Felez (Participant)  
Department of Environmental Engineering  
Water Technologies  
Related event

Low nitrous oxide production in intermittent-feed high performance nitritating reactors  
Period: 21 May 2017 → 24 May 2017  
Qingxian Su (Keynote speaker)  
Department of Environmental Engineering  
Water Technologies  
Description  
Flash presentation  
Degree of recognition: International  
Related event

Position Dependence of Fractional Derivative Models for Loudspeaker Voice Coils with Lossy Inductance  
Period: 20 May 2017  
Alexander Weider King (Speaker)  
Department of Electrical Engineering  
Acoustic Technology  
Description  
Commonly used models of moving-coil loudspeaker voice coils, which include effects from eddy current losses, are either inaccurate or contain an abundance of parameters and are difficult to extend to the nonlinear domain. On the contrary, fractional derivative models accurately describe the frequency and position dependence of the lossy inductance, with meaningful connections to the underlying physics, while keeping the number of parameters low. These fractional derivatives are also compatible with state-space polynomial methods of modeling nonlinear behavior. It is shown that the fractional order derivative approaches a value of 1, corresponding to an ideal inductance, when the voice coil is completely outside the magnetic system. Finally, the developed model reveals details about the effect of conductive voice coil formers.  
Degree of recognition: International  
Related event

142nd International Audio Engineering Society (AES) Convention  
20/05/2017 → 23/05/2017  
Berlin, Germany  
Activity: Talks and presentations › Conference presentations
Creating bio-based solutions for a sustainable economy: technological developments and case studies
Period: 19 May 2017
Solange I. Mussatto (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability

Biomass Conversion and Bioprocess Technology
Degree of recognition: International

Related event
HYBER Symposium 2017
18/05/2017 → 19/05/2017
Helsinki, Finland
Activity: Talks and presentations › Conference presentations

Smart regulatory framework conditions for smart energy systems? Incentives for flexible district heating in the Nordic countries
Period: 19 May 2017
Daniel Møller Sneum (Guest lecturer)
Department of Management Engineering

Systems Analysis

Description
Analyses of the impact of taxes, subsidies and grid tariffs, on the investment in - and operation of - renewables-based district heating plants in the Nordic countries.
Degree of recognition: International
Documents:
Smart regulatory framework conditions for smart energy systems?

Related event
2nd HAEE INTERNATIONAL CONFERENCE : The landscape in the new era of energy transition: Challenges, investment opportunities and technological innovations
18/05/2017 → 20/05/2017
Athens, Greece
Activity: Talks and presentations › Conference presentations

A Method For Effect Modifier Assessment In Intervention Research – The EMA Method
Period: 18 May 2017
Kasper Edwards (Speaker)
Jørgen Winkel (Speaker)
Department of Management Engineering
Management Science

Implementation and Performance Management
Degree of recognition: International

Related event
European Association of Work and Organizational Psychology: Enabling Change through Work and Organizational Psychology
17/05/2017 → 20/05/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

Assessing environmental impacts of future energy systems: A holistic LCA model for Europe in 2015-2050
Period: 18 May 2017
Serena Fabbri (Speaker)
Florence Alexia Bohnes (Other)
Department of Management Engineering
Quantitative Sustainability Assessment

Related event

Energy Modelling Platform for Europe (EMP-E) 2017
17/05/2017 → 18/05/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Danish Sound Day Research Talent Pitch Battle
Period: 18 May 2017
Alexander Weider King (Speaker)
Department of Electrical Engineering
Acoustic Technology
Degree of recognition: National

Related event

Danish Sound Day 2017
18/05/2017 → …
Struer, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Electricity Grid Tariffs To Increase The Flexibility Of Power-To-Heat In District Heating
Period: 18 May 2017 → 20 May 2017
Claire Bergaentzlé (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
Presentation HAEE

Related event

2nd HAEE INTERNATIONAL CONFERENCE : The landscape in the new era of energy transition: Challenges, investment opportunities and technological innovations
18/05/2017 → 20/05/2017
Athens, Greece
Activity: Talks and presentations › Conference presentations

Energy Modelling Platform for Europe (EMP-E) 2017
Period: 18 May 2017
Alexis Laurent (Participant)
Department of Management Engineering
Quantitative Sustainability Assessment

Description
Assessing environmental impacts of future energy systems: A holistic LCA model for Europe in 2015-2050

Related event

Energy Modelling Platform for Europe (EMP-E) 2017
17/05/2017 → 18/05/2017
Brussels, Belgium
Activity: Attending an event › Participating in or organising a conference
**European Association of Work and Organizational Psychology**  
*Period:* 18 May 2017 → 19 May 2017  
Christine Ipsen (Participant)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  

**Description**  
Poster presentation and symposium participant/organizer  
Documents:  
EAWOP Poster (16.05.17)  

**Related event**  
**European Association of Work and Organizational Psychology: Enabling Change through Work and Organizational Psychology**  
17/05/2017 → 20/05/2017  
Dublin, Ireland  
Activity: Attending an event › Participating in or organising a conference

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**HEADS & HANDS TO FOOD 4.0**  
*Period:* 18 May 2017  
Dorte Lau Baggesen (Speaker)  
National Food Institute  

**Description**  
Hvordan kan virksomhederne rekruttere ingeniører og kandidater fra de videregående uddannelser og samarbejde om praktik og projekter?  
Documents:  
Præsentation DTU Dorte Lau Baggesen 01  

**Related event**  
**HEADS & HANDS TO FOOD 4.0: Kloge hænder og hoveder til**  
18/05/2017 → 18/05/2017  
Fredericia, Denmark  
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

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**Optimal modular design of offshore support structures - modelling and methods**  
*Period:* 18 May 2017  
Mathias Stolpe (Invited speaker)  
Department of Wind Energy  
Degree of recognition: International  

**Related event**  
**Support Structure Optimization - Science or Art?**  
18/05/2017 → 19/05/2017  
Delmenhorst, Germany  
Activity: Talks and presentations › Conference presentations

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**Support Structure Optimization - Science or Art?**  
*Period:* 18 May 2017 → 19 May 2017  
Mathias Stolpe (Organizer)  
Department of Wind Energy  
Degree of recognition: International
Related event

Support Structure Optimization - Science or Art?
18/05/2017 → 19/05/2017
Delmenhorst, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Topics in Mining, Metallurgy and Materials Engineering (Journal)
Period: 18 May 2017
Vincenzo Esposito (Editor)
Ceramic Engineering & Science
Department of Energy Conversion and Storage
Description
Topics in Mining, Metallurgy and Materials Engineering

Related journal

Topics in Mining, Metallurgy and Materials Engineering
2364-3293
Local database
Activity: Research › Journal editor

Twelfth Workshop of National Reference Laboratories for Parasites
Period: 18 May 2017 → 19 May 2017
Heidi Huus Petersen (Speaker)
National Veterinary Institute
Bacteriology & Parasitology
Degree of recognition: International

Related event

Twelfth Workshop of National Reference Laboratories for Parasites
18/05/2017 → 19/05/2017
Rom, Italy
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Applied Bioinformatics & Public Health Microbiology
Period: 17 May 2017 → 19 May 2017
Valeria Bortolaia (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Related event

Applied Bioinformatics & Public Health Microbiology
17/05/2017 → 19/05/2017
Cambridge, United Kingdom
Activity: Attending an event › Participating in or organising a conference

Nordic Systems Engineering Tour 2017
Period: 17 May 2017
Josef Oehmen (Organizer)
Department of Management Engineering
Engineering Systems
Description
Co-organizer
Degree of recognition: International

Related event

Nordic Systems Engineering Tour 2017
17/05/2017 → …
Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

OB-17: Symposium on Occupant Behaviour and Adaptive Thermal Comfort
Period: 17 May 2017
Rune Korsholm Andersen (Organizer)
Department of Civil Engineering
Section for Indoor Climate and Building Physics
Degree of recognition: International

Related event

OB-17: Symposium on Occupant Behaviour and Adaptive Thermal Comfort: Joint IEA EBC Annex 66 and 69 Symposium
17/05/2017 → 17/05/2017
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Principle for studying the potency of the different vitamin D active compounds - usable for the vitamin B community?
Period: 17 May 2017
Jette Jakobsen (Invited speaker)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
Invited speaker
Degree of recognition: International

Related event

International Conference on Homocysteine and One-Carbon Metabolism 2017: “Taking science to the next level – challenging paradigms and conventions”
14/05/2017 → 18/05/2017
Århus, Denmark
Activity: Talks and presentations › Conference presentations

Det Robuste Projekt Team
Period: 16 May 2017
Julia Christensen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Related event

Det Robuste Projekt Team
16/05/2017 → 16/05/2017
København
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Tar-Eating Bacterial Duo may Transform Toxic Compounds into New Usable Materials
Period: 16 May 2017
Sünje Johanna Pamp (Participant)
Danish researchers have sequenced and analyzed the genome of a bacterium that can feed off coal tar. It lives in symbiosis with another bacterium that can recycle its partner’s waste. Researchers hope that this sustainable bacterial duo can transform toxic substances into useful materials. Nevertheless, mapping the genome also led to an unpleasant surprise.

**Use of an antioxidant to improve monoclonal antibody production and quality in CHO cells**

**Period:** 16 May 2017

Tae Kwang Ha (Speaker)

Novo Nordisk Foundation Center for Biosustainability

CHO Cell Line Engineering and Design

**Related event**

25th ESACT Meeting: Cell technologies for innovative therapies

14/05/2017 → 17/05/2017

Lausanne, Switzerland

Activity: Talks and presentations › Conference presentations

**Sikker fremstilling af fermenterede fødevarer - pølser og kål som cases**

**Period:** 15 May 2017

Tina Beck Hansen (Invited speaker)

National Food Institute

Research Group for Microbial Food Safety

**Related event**

Fødevare Sjælland Fyn Temadag

16/05/2017 → …

Korsør, Denmark

Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**Oversvømmelsessimulering vs. detaljegrad i 1D modeller**

**Period:** 11 May 2017

Roland Löwe (Speaker)

Department of Environmental Engineering

Urban Water Systems

**Description**

Invited speech on EVA temadag

Degree of recognition: National
Related event

Er modellerne for tynde: EVA temadag
11/05/2017 → 11/05/2017
Nyborg, Denmark
Activity: Talks and presentations › Conference presentations

Applying LCA in decision making- the need and the future perspective
Period: 10 May 2017
Yan Dong (Speaker)
Simona Miraglia (Other)
Stefano Manzo (Other)
Stylianos Georgiadis (Other)
Hjalte Jomo Danielsen Sørup (Other)
Elena Boriani (Other)
Tine Hald (Other)
Sebastian Thöns (Other)
Michael Zwicky Hauschild (Other)
Department of Management Engineering
Quantitative Sustainability Assessment
Centre for oil and gas – DTU
Transport DTU
Transport Modelling
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Department of Environmental Engineering
Urban Water Systems
National Food Institute
Research Group for Genomic Epidemiology
Department of Civil Engineering
Section for Structural Engineering
Documents:
AbstraApplying LCA in policy deciison making_Final
Links:
https://brussels.setac.org/welcome/

Related event

SETAC Europe 27th Annual Meeting
07/05/2017 → 11/05/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Intermittent aeration regimes are effective tools to manage size of bio-granules and microbial communities in PN/A SBRs.
Period: 10 May 2017
Jan-Michael Blum (Speaker)
Department of Environmental Engineering
Water Technologies

Description
The presentation was given at the 10th International Conference on Biofilm Reactors at University College Dublin, Ireland.
Degree of recognition: International
Related event

10th International Conference on Biofilm Reactors
09/05/2017 → 12/05/2017
Dublin, Ireland
Activity: Talks and presentations › Conference presentations

Balancing complexity and uncertainty in model-based estimation of micropollutant fluxes in integrated urban drainage-wastewater systems
Period: 9 May 2017
Luca Vezzaro (Invited speaker)
Department of Environmental Engineering
Urban Water Systems

Description
Presentation held at the SETAC 2017 conference (special session on "Looking across organizational boundaries: exchanging ideas on mechanistic modelling between SETAC and the International Water Association (IWA)"
Degree of recognition: International
Documents:
20170509_MPmodelComplexity_SETAC_LUVE

Related event

SETAC Europe 27th Annual Meeting
07/05/2017 → 11/05/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Data-driven Biotechnology
Period: 9 May 2017 → 10 May 2017
Joao Cardoso (Participant)
Ahmad A. Zeidan (Participant)
Markus Herrgard (Participant)
Nikolaus Sonnenschein (Participant)
Novo Nordisk Foundation Center for Biosustainability
iLoop
Research Groups
Global Econometric Modeling

Description
In silico Identification of metabolite analogues for rational strain Improvement

Related event

Data-driven Biotechnology: Bench, Bioreactor and Bedside
07/05/2017 → 11/05/2017
Hillerød, Denmark
Activity: Attending an event › Participating in or organising a conference

Developments in Integrated Urban Drainage
Period: 9 May 2017
Luca Vezzaro (Invited speaker)
Lorenzo Benedetti (Other)
Wolfgang Rauch (Other)
Peter M. Bach (Other)
Department of Environmental Engineering
Urban Water Systems

**Description**
Presentation held at the SETAC 2017 conference (special session on "Looking across organizational boundaries: exchanging ideas on mechanistic modelling between SETAC and the International Water Association (IWA)")

Degree of recognition: International

Documents:
20170509_integratedModels_SETAC_LUVE

**Related event**

**SETAC Europe 27th Annual Meeting**
07/05/2017 → 11/05/2017
Brussels, Belgium

Activity: Talks and presentations › Conference presentations

**Differential adhesion and the spatial positioning effect on early stage microbial aggregation**
Period: 9 May 2017 → 12 May 2017
Bastiaan Cockx (Other)
Jan-Ulrich Kreft (Other)
Barth F. Smets (Other)

Department of Environmental Engineering

Water Technologies

Degree of recognition: International

**Related event**

**10th International Conference on Biofilm Reactors**
09/05/2017 → 12/05/2017
Dublin, Ireland

Activity: Talks and presentations › Conference presentations

**DTU OM Forum**
Period: 9 May 2017
Kasper Edwards (Organizer)
Rasmus Jørgensen (Organizer)

Department of Management Engineering

Management Science

Implementation and Performance Management

**Description**
Erfaringer med Lean Tavlemøder

Degree of recognition: National

**Related event**

**DTU OM Forum: Erfaringer med Lean Tavlemøder**
09/05/2017 → 09/05/2017
Lyngby, Denmark

Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Estimating soil emissions and toxicity impacts from the application of livestock manure: application to heavy metals at national scale**
Period: 9 May 2017
Alexandra Segolene Corinne Leclerc (Speaker)

Department of Management Engineering

Quantitative Sustainability Assessment
Replication and analysis of polymer micro structured functional surfaces for contrast generation
Period: 9 May 2017
Francesco Regi (Speaker)
Department of Mechanical Engineering
Manufacturing Engineering

Polymer Replication on Nanoscale 2017
08/05/2017 → 09/05/2017
Aachen, Germany
Activity: Talks and presentations › Conference presentations

SETAC Europe 27th Annual Meeting
07/05/2017 → 11/05/2017
Brussels, Belgium
Activity: Attending an event › Participating in or organising a conference

Species-specific vulnerability of Arctic copepods to oil contamination and global warming
Period: 9 May 2017
Khuong Van Dinh (Speaker)
Torkel Gissel Nielsen (Other)
National Institute of Aquatic Resources
Section for Oceans and Arctic

Biodegradation of hydrophobic chemicals in mixtures at low concentrations - Covering the chemical space of petroleum hydrocarbons
Period: 8 May 2017
Heidi Birch (Speaker)
Department of Environmental Engineering
Environmental Chemistry
Degree of recognition: International

Related event
SETAC Europe 27th Annual Meeting
07/05/2017 → 11/05/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

BTSF course in Microbiological Risk Assessment
Period: 8 May 2017 → 12 May 2017
Maarten Nauta (Lecturer)
National Food Institute
Research Group for Risk-Benefit

Description
One week training course in the EU program better training for safer food

Training coordinator
Degree of recognition: International

Related event
Better Training for Safer Food (BTSF): Microbiological Risk Assessment
08/05/2017 → 12/05/2017
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

CIE Tutorial and Practical Workshop on LED Lamp and Luminaire Testing to CIE S 025
Period: 8 May 2017 → 11 May 2017
Anders Thorseth (Participant)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
CIE Tutorial and Practical Workshop on LED Lamp and Luminaire Testing to CIE S 025

May 08 – 11, 2017, METAS Bern-Wabern, Switzerland

Related event
CIE Tutorial and Practical Workshop on LED Lamp and Luminaire Testing to CIE S 025
08/05/2017 → 11/05/2017
Bern, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Globally-differentiated land use flow inventories for life cycle impact assessment
Period: 8 May 2017
Alexis Laurent (Speaker)
Maria Faragò (Other)
Lorenzo Benini (Other)
Michela Secchi (Other)
Serenella Sala (Other)
Department of Management Engineering
Quantitative Sustainability Assessment
Related event

SETAC Europe: 27th Annual Meeting – Environmental Quality Through Transdisciplinary Collaboration
07/05/2017 → 13/07/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Mikrobiologisk kvalitet af fisk og fiskeprodukter. Forelæsning ved KU-SUND
Period: 8 May 2017
Paw Dalgaard (Lecturer)
National Food Institute
Research Group for Analytical and Predictive Microbiology

Description
Mikrobiologisk kvalitet af fisk og fiskeprodukter (2 x 35 min.). Fødevaremikrobiologi (270009), KU-SUND, maj 2017, 150 studerende.

Related event

Kursus i Fødevaremikrobiologi
08/05/2017 → 08/05/2017
Frederiksberg, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

One Health International Summer Course 2017
Period: 8 May 2017 → 18 Aug 2017
Tine Hald (Organizer)
Maria Vang Johansen (Organizer)
Liza Rosenbaum Nielsen (Panel member)
Lars Erik Larsen (Organizer)
Anders Dalsgaard (Organizer)
National Food Institute
Research Group for Genomic Epidemiology
National Veterinary Institute
Virology

Description
One Health International Summer Course 2017

5-week elearning part + 1-week on campus paert, a total of 5 ECTS
Degree of recognition: International

Related event

One Health International Summer Course 2017
08/05/2017 → 18/08/2017
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Position of existing footprints in the environmental sustainability landscape
Period: 8 May 2017
Alexis Laurent (Speaker)
Department of Management Engineering
Quantitative Sustainability Assessment
Degree of recognition: International

Related event
SETAC Europe: 27th Annual Meeting – Environmental Quality Through Transdisciplinary Collaboration
07/05/2017 → 13/07/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

SETAC Europe: 27th Annual Meeting – Environmental Quality Through Transdisciplinary Collaboration
Period: 8 May 2017
Mikolaj Owsianniak (Participant)
Department of Management Engineering
Quantitative Sustainability Assessment

Description
Position of existing footprints in the environmental sustainability landscape
Degree of recognition: International

Related event

SETAC Europe: 27th Annual Meeting – Environmental Quality Through Transdisciplinary Collaboration
07/05/2017 → 13/07/2017
Brussels, Belgium
Activity: Attending an event › Participating in or organising a conference

Teaching Quantitative Microbial Risk Assessment - Better Training for Safer Food (BTSF)
Period: 8 May 2017 → 12 May 2017
Ana Sofia Ribeiro Duarte (Guest lecturer)
National Food Institute
Research Group for Genomic Epidemiology

Related event

Teaching Quantitative Microbial Risk Assessment - Better Training for Safer Food (BTSF)
08/05/2017 → 12/05/2017
Czech Republic
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

The antiSMASH platform: A comprehensive framework for genome mining for secondary metabolites
Period: 8 May 2017
Tilmann Weber (Speaker)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International

Related event

Copenhagen Bioscience Conference 2017: Data-Driven Biotechnology - Bench, Bioreactor and Bedside
07/05/2017 → 10/05/2017
Hillerød, Denmark
Activity: Talks and presentations › Conference presentations

US-Danish Electricity Future Markets
Period: 8 May 2017 → 9 May 2017
Claire Bergaentzlé (Participant)
Energy Economics and Regulation
Department of Management Engineering
Systems Analysis
Degree of recognition: International
Documents:
Agenda US-Danish Electricity Future Markets

Related event

US-Danish Electricity Future Markets
08/05/2017 → 09/05/2017
Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

Copenhagen Bioscience Conference
Period: 7 May 2017 → 10 May 2017
Tilmann Weber (Organizer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Description
Member of the Scientific Organization Committee for the Copenhagen Bioscience Conference: Data-Driven Biotechnology - Bench, Bioreactor and Bedside
Degree of recognition: International

Related event

Copenhagen Bioscience Conference 2017: Data-Driven Biotechnology - Bench, Bioreactor and Bedside
07/05/2017 → 10/05/2017
Hillerød, Denmark
Activity: Attending an event › Participating in or organising a conference

International Congress of Andrology
Period: 6 May 2017
Marta Axelstad Petersen (Organizer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology
Description
Pre-congress course: Endocrine disrupters and male reproductive health. I gave a talk called "Disruption of reproduction in animal models"

Related event

International Congress of Andrology
06/05/2017 → 09/05/2017
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

EER - ELMA Seminar
Period: 5 May 2017 → …
Claire Bergaentzle (Organizer)
Energy Economics and Regulation
Department of Management Engineering
Systems Analysis
Degree of recognition: Local

Related event

EER - ELMA Seminar: Energy Economics and Regulation - Energy Analytics & Markets
05/05/2017 → …
Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Human factors and ergonomics in manufacturing and service industries (Journal)
Period: 5 May 2017 → 5 Jun 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Review of submitted paper.
Degree of recognition: International

Related journal
Human factors and ergonomics in manufacturing and service industries

Local database
Activity: Research › Peer review of manuscripts

Innovation through Risk Management: More Success by Failing Well
Period: 5 May 2017
Josef Oehmen (Keynote speaker)
Department of Management Engineering
Engineering Systems

Description
Invited talk at event “Failure in Innovation – is it the rule? Examples and strategies from industry and academic research”, organized by the German National Academy of Science and Engineering, Stuttgart
Degree of recognition: International

Related external organisation
German National Academy of Science and Engineering - acatech
Berlin, Germany
Activity: Talks and presentations › Conference presentations

Engineering the CHO Cell
Period: 4 May 2017
Bjørn Gunnar Voldborg (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core
Degree of recognition: International

Related event
PEGS Boston: The Essential Protein Engineering Summit
01/05/2017 → 05/05/2017
Boston, United States
Activity: Talks and presentations › Conference presentations

Guest lecture at Ecole des Mines de Saint-Etienne
Period: 4 May 2017
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design

Description
Use of the SEAS-ontologies (Smart Energy Aware Systems) for modeling flow systems
Practical experiences with validation of analytical methods for NM at the National Food Institute in Denmark
Period: 4 May 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science
Degree of recognition: International

Related event
Joint JRC-SANTE Symposium "Nanomaterials in Food: reliability of measurement results"
03/05/2017 → 04/05/2017
Ispra, Italy
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Rapid resistome mapping using Nanopore sequencing
Period: 4 May 2017 → 5 May 2017
Lejla Imamovic (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology
Degree of recognition: International

Related event
04/05/2017 → 05/06/2017
London, United Kingdom
Activity: Talks and presentations › Conference presentations

Reflections on a case study, an RBA on nuts
Period: 4 May 2017
Maarten Nauta (Speaker)
National Food Institute
Research Group for Risk-Benefit
Degree of recognition: International

Related event

expert workshop on risk benefit assessment
03/05/2017 → 05/05/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Ecole des Mines de Saint-Etienne
Period: 3 May 2017 → 5 May 2017
Mads Holten Rasmussen (Visiting researcher)
Department of Civil Engineering
Section for Building Design

Description
Research visit at Ecole de Mines de Saint-Etienne, France
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

2017 GEMS Spring Meeting
Period: 2 May 2017
Steffen Foss Hansen (Participant)
Department of Environmental Engineering
Environmental Chemistry
Degree of recognition: International
Documents:
Nanomaterial consumer products in a consolidated database wb comments

Related event

2017 GEMS Spring Meeting: Nanomaterials and Consumer Product Safety
02/05/2017 → 02/05/2017
Durham, United States
Activity: Attending an event › Participating in or organising a conference

7th International Conference
Period: 2 May 2017 → 5 May 2017
Kamilla Marie Speht Kaarsholm (Participant)
Henrik Rasmus Andersen (Chairman)
Traek Manasfi (Participant)
Jean-Luc Boudenne (Participant)
Department of Environmental Engineering
Water Technologies

Description
Effect of UV treatment on DBPs formation in chlorinated seawater swimming pools - a laboratory study

The study aim was to investigate the effect of UV treatment followed by chlorination on DBP formation was studied using laboratory experiments. Three groups of DBPs were investigated including THMs, HANs and HAAs. DBP level measured after post-UV chlorination was compared to dark control sample which was not subjected to UV exposure. Bromine substitution was investigated to analyse its effects on the formation of DBPs. Finally, overall cytotoxicity and genotoxicity were estimated for the toxic potency of compounds before and after treatment.

Degree of recognition: International
Documents:
UV for seawater pools
Destruction of DBPs and their precursors in swimming pool water by combined UV-treatment and ozonation

The study aim was to investigate the effect of a combined treatment system on DBP formation. As both ozone and chlorine preferably react with electrophilic groups in compounds, we hypothesise that reactivity to chlorine, created by the UV treatment of dissolved organic matter in pool water, might also mean that there is increased reactivity to ozone and that ozonation might remove the chlorine reactivity created by UV treatment. Therefore, we first performed an experiment to range-find the effect of swimming pool water UV activation on chlorine reactivity. Secondly, an experiment was carried out to characterise the effect of adding various doses of ozone to pool water, with or without UV pre-treatment, before chlorination to study the effect on chlorine reactivity and the formation of chlorination by-products. Finally, the possible effect on chlorination by-product formation was investigated by a repeated, combined UV-ozone treatment interchanged with chlorination (repeated cycles of UV followed by ozone with subsequent chlorination). Toxicity estimation was used to evaluate water quality.

Degree of recognition: International

Documents:
combined UV and ozone treatment for swimming pool water
The study aim was to investigate the effect of a combined treatment system on DBP formation. As both ozone and chlorine preferably react with electrophilic groups in compounds, we hypothesise that reactivity to chlorine, created by the UV treatment of dissolved organic matter in pool water, might also mean that there is increased reactivity to ozone and that ozonation might remove the chlorine reactivity created by UV treatment. Therefore, we first performed an experiment to range-find the effect of swimming pool water UV activation on chlorine reactivity. Secondly, an experiment was carried out to characterise the effect of adding various doses of ozone to pool water, with or without UV pre-treatment, before chlorination to study the effect on chlorine reactivity and the formation of chlorination by-products. Finally, the possible effect on chlorination by-product formation was investigated by a repeated, combined UV-ozone treatment interchanged with chlorination (repeated cycles of UV followed by ozone with subsequent chlorination). Toxicity estimation was used to evaluate water quality.

**Degree of recognition:** International

**Documents:**
combined UV and ozone treatment for swimming pool water

**Related event**

*7th International Conference: Swimming Pool and Spa*
02/05/2017 → 05/05/2017
Kos, Greece
Activity: Talks and presentations › Conference presentations

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**Effect of UV treatment on DBPs formation in chlorinated seawater swimming pools- a laboratory study**

Period: 2 May 2017 → 5 May 2017

Waqas Akram Cheema (Speaker)

Department of Environmental Engineering

Water Technologies

**Description**
The study aim was to investigate the effect of UV treatment followed by chlorination on DBP formation was studied using laboratory experiments. Three groups of DBPs were investigated including THMs, HANs and HAAs. DBP level measured after post-UV chlorination was compared to dark control sample which was not subjected to UV exposure. Bromine substitution was investigated to analyse its effects on the formation of DBPs. Finally, overall cytotoxicity and genotoxicity were estimated for the toxic potency of compounds before and after treatment.

**Degree of recognition:** International

**Documents:**
UV for seawater pools

**Related event**

*7th International Conference: Swimming Pool and Spa*
02/05/2017 → 05/05/2017
Kos, Greece
Activity: Talks and presentations › Conference presentations

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**Foredrag: Cell er som medicinproducent. Ungdommens Naturvidenskabelige Forening (UNF), Lyngby, Danmark.**

Period: 2 May 2017

Helene Fastrup Kildegaard (Invited speaker)

Novo Nordisk Foundation Center for Biosustainability

CHO Cell Line Engineering and Design

**Degree of recognition:** National

**Related event**

*Ungdommens Naturvidenskabelige Forening (UNF)*
02/05/2017 → 02/05/2017
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

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**Mixture effects of anti-androgens and oestrogens on reproductive development of male rats**

Period: 2 May 2017 → 5 May 2017

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Sofie Christiansen (Speaker)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Description
Invited speaker abstract
Degree of recognition: International

Related event
9th Copenhagen Workshop on Endocrine Disrupters - COW2017
02/05/2017 → 05/05/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Smart Cities Day Vienna
Period: 2 May 2017 → 3 May 2017
Alfred Heller (Speaker)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities

Description
International expert for international and national smart cities projects.
Presenter for the lab to living lab to business - value chain.
Degree of recognition: International

Related event
Smart Cities Day Vienna
02/05/2017 → 03/05/2017
Vienna, Austria
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

39th Symposium on Biotechnology for Fuels and Chemicals
Period: 1 May 2017 → 4 May 2017
Solange I. Mussatto (Organizer)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

Description
Poster Judge
Degree of recognition: International

Related event
39th Symposium on Biotechnology for Fuels and Chemicals
01/05/2017 → 04/05/2017
San Francisco, United States
Activity: Attending an event › Participating in or organising a conference

39th Symposium on Biotechnology for Fuels and Chemicals
Period: 1 May 2017 → 4 May 2017
Solange I. Mussatto (Participant)
Rafael C.A. Castro (Participant)
Inês C. Roberto (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

**Description**
Enzymatic hydrolysis of rice straw and glucose fermentation using a Vertical Ball Mill Bioreactor (VBMB): Impact of operational conditions
Degree of recognition: International
Documents:
Abstract SBFC Rafael published complete

**Related event**
**39th Symposium on Biotechnology for Fuels and Chemicals**
01/05/2017 → 04/05/2017
San Francisco, United States
Activity: Attending an event › Participating in or organising a conference

39th Symposium on Biotechnology for Fuels and Chemicals
Period: 1 May 2017 → 4 May 2017
Solange I. Mussatto (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

**Description**
Pretreatment and fermentation strategies to overcome the toxicity of acetic acid in hemicellulosic hydrolysates
Degree of recognition: International
Documents:
Abstract SBFC Solange published complete

**Related event**
**39th Symposium on Biotechnology for Fuels and Chemicals**
01/05/2017 → 04/05/2017
San Francisco, United States
Activity: Attending an event › Participating in or organising a conference

IEA Bioenergy Task 42 – Biorefining (External organisation)
Period: 1 May 2017 → …
Solange I. Mussatto (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

**Description**
Country representative in IEA Bioenergy Task 42 – Biorefining
Degree of recognition: International

**Related external organisation**
IEA Bioenergy Task 42 – Biorefining
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

IEEE Globecom (Publisher)
Period: 1 May 2017
José Soler (Reviewer)
Surface properties and chemistry correlate to the digestibility of biomass following hydrothermal pretreatment at different severities
Period: 1 May 2017 → 4 May 2017
Demi Tristan Djajadi (Guest lecturer)
Aleksander R. Hansen (Guest lecturer)
Anders Jensen (Guest lecturer)
Lisbeth G. Thygesen (Guest lecturer)
Manuel Pinelo (Guest lecturer)
Anne S. Meyer (Guest lecturer)
Henning Jørgensen (Guest lecturer)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering

What tools are useful for monitoring endemic diseases? A simulation study based on different time-series components.
Period: 1 May 2017 → 4 May 2017
Ana Carolina Lopes Antunes (Speaker)
National Veterinary Institute
Epidemiology
Degree of recognition: International

Related event

International Conference in Animal Health Surveillance 3
01/05/2017 → 04/05/2017
Rotorua, New Zealand
Activity: Talks and presentations › Conference presentations

Paul Scherrer Institut (External organisation)
Period: Apr 2017
Martin Meedom Nielsen (Participant)
Department of Physics
Neutrons and X-rays for Materials Physics

Description
Swiss Light Source Proposal panel
Degree of recognition: International

Related external organisation

Paul Scherrer Institut
Switzerland
Activity: Membership › Membership in review committee

PICO 2017
Period: 30 Apr 2017 → 4 May 2017
Jakob Birkedal Wagner (Participant)
Center for Electron Nanoscopy
DTU Danchip
Degree of recognition: International

Related event

PICO 2017
30/04/2017 → 04/05/2017
Vaals, Netherlands
Activity: Attending an event › Participating in or organising a conference

PICO 2017
Period: 30 Apr 2017 → 4 May 2017
Thomas Willum Hansen (Participant)
Center for Electron Nanoscopy
Center for Nanostructured Graphene
DTU Danchip

Description
Fourth conference on frontiers of aberration corrected electron microscopy
Degree of recognition: International

Related event

PICO 2017
30/04/2017 → 04/05/2017
Vaals, Netherlands
Activity: Attending an event › Participating in or organising a conference
**Forskningens døgn 2017 - Hvordan bygger og renoverer vi grønt?**

Period: 28 Apr 2017

Jakob Brinke Berg (Speaker)

Department of Management Engineering

Management Science

Implementation and Performance Management

Degree of recognition: Regional

Links:

http://forsk.dk/indbakke/hvordan-bygger-og-renovere-vi-gront#cookieoptin

**Related external organisation**

Erhvervsakademi Sjælland

Denmark

Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**Aarhus Universitet (External organisation)**

Period: 27 Apr 2017

Per Dannemand Andersen (Chairman)

Department of Management Engineering

Technology and Innovation Management

Transport DTU

**Description**

Member of the assessment committee of the PhD thesis of Tymen Jissink. Department of Management, School of Business and Social Sciences, Aarhus University, Denmark.

**Related external organisation**

Aarhus Universitet

Denmark

Activity: Membership › Membership in review committee

**EGU 2017**

Period: 27 Apr 2017

Urban Wünsch (Speaker)

Colin Stedmon (Speaker)

National Institute of Aquatic Resources

Section for Oceans and Arctic

**Description**

General assembly of the European Geosciences Union 2017

Degree of recognition: International

Links:


**Related event**

**EGU General Assembly 2017: European GEosciences Union 2017**

24/04/2017 → 28/04/2017

Vienna, Austria

Activity: Talks and presentations › Conference presentations

**EGU General Assembly 2017**

Period: 27 Apr 2017
Teis Nørgaard Mikkelsen (Speaker)
Department of Environmental Engineering
Atmospheric Environment

Description
N2O emission from plant surfaces – light stimulated and a global phenomenon PICO Presentation. Teis N. Mikkelsen, Dan Bruhn, Kim Pilegaard & Per Ambus
Degree of recognition: International
Documents:
PICO presentation EGU 2017

Related event
EGU General Assembly 2017: European GEosciences Union 2017
24/04/2017 → 28/04/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

Ionospheric magnetic signals during conjunctions between ground based and Swarm satellite observations
Period: 27 Apr 2017
Diana Saturnino (Speaker)
National Space Institute
Geomagnetism

Description
High-precision magnetic measurements collected by satellites such as Swarm or CHAMP, flying at altitudes between 300 and 800km, allow for improved geomagnetic field modelling. An accurate description of the internal (core and crust) field must account for contributions from other sources, such as the ionosphere and magnetosphere. However, the description of the rapidly changing external field contributions, particularly during the quiet times from which the data are selected, constitutes a major challenge of the construction of such models. Our study attempts to obtain improved knowledge on ionospheric field contributions during quiet times conditions, in particular during night local times. We use two different datasets: ground magnetic observatories time series (obtained below the ionospheric E-layer currents), and Swarm satellites measurements acquired above these currents. First, we remove from the data estimates of the core, lithospheric and large-scale magnetospheric magnetic contributions as given by the CHAOS-6 model, to obtain corrected time series. Then, we focus on the differences of the corrected time series: for a pair of ground magnetic observatories, we determine the time series of the difference, and similarly we determine time series differences at satellite altitude, given by the difference between the Swarm Alpha and Charlie satellites taken in the vicinity of the ground observatory locations. The obtained differences time series are analysed regarding their temporal and spatial scales variations, with emphasis on measurements during night local times.
Degree of recognition: International
Links:

Related event
EGU General Assembly 2017: European GEosciences Union 2017
24/04/2017 → 28/04/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

LEARN-TEACH: a pilot to boost Ocean Literacy in High Schools
Period: 27 Apr 2017
Ivo Grigorov (Speaker)
Diana Payne (Speaker)
Bynna Vogt (Other)
Charlotte Knappe (Other)
Werner Riedel (Other)
National Institute of Aquatic Resources
Research Secretariat

Description
Raising the Ocean Literacy of all levels of society is now a policy priority for the European Commission. The long-term objective is better appreciation of the socio-economic benefits and ecosystem services that the marine environment provides, and encourage better stewardship of the seas.

One long-term, and potentially self-sustainable, concept is to put sufficient mutual incentives in place so that researchers, teachers and students in high-schools science and mathematics classes accessorize school curricula with the latest marine research results and knowledge.

Summary of preliminary teachers consultations at Copenhagen International School suggest that teachers are prepared and willing to include recent marine research, research data and knowledge in high school science classes and carry over the research data to mathematics/statistics classes and exercises. However the active participation of researchers is sought to provide guidance and translation of latest research findings, and point to real data sources.

LEARN-TEACH Pilot’s main objective is to test a long-term scalable and locally applicable solution for engaging young people in marine environment issues and challenges.

LEARN-TEACH sustainability of concept relies on mutual training and clear mutual incentives. For the teachers, it allows an opportunity to understand and inject recent research in the school curriculum in order to “increase the level of knowledge among the population of the marine environment”.

For the researchers, LEARN-TEACH is tailored as a tool for outreach and dissemination, as well as exposing young marine researchers to the challenges of translating and communicating research to non-academic audiences, and potentially an alternative career.

The presentation will demonstrate how LEARN-TEACH can be embedded in every research grant in any EU region, and how it can add a competitive edge at research grant proposal evaluation.

The content is based on the “Blue Schools” initiative of Horizon 2020 SeaChange Consortium, an EC Ocean Literacy project (www.seachangeproject.eu)

Degree of recognition: International

Documents:
EGU2017-18398-2

Links:

Related event

EGU General Assembly 2017: European GEosciences Union 2017
24/04/2017 → 28/04/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

VO-ESD: a virtual observatory approach to describe the geomagnetic field temporal variations with application to Swarm data
Period: 27 Apr 2017
Diana Saturnino (Speaker)
National Space Institute
Geomagnetism

Description
A complete description of the main geomagnetic field temporal variation is crucial to understand dynamics in the core. This variation, termed secular variation (SV), is known with high accuracy at ground magnetic observatory locations. However the description of its spatial variability is hampered by the globally uneven distribution of the observatories. For the past two decades a global coverage of the field changes has been allowed by satellites. Their surveys of the geomagnetic field have been used to derive and improve global spherical harmonic (SH) models through some strict data selection schemes to minimise external field contributions. But discrepancies remain between ground measurements and field predictions by these models. Indeed, the global models do not reproduce small spatial scales of the field temporal variations. To overcome this problem we propose a modified Virtual Observatory (VO) approach by defining a globally homogeneous mesh of VOs at satellite altitude. With this approach we directly extract time series of the field and its temporal variation from satellite measurements as it is done at observatory locations. As satellite measurements are acquired at different altitudes a correction for the altitude is needed.
Therefore, we apply an Equivalent Source Dipole (ESD) technique for each VO and each given time interval to reduce all measurements to a unique location, leading to time series similar to those available at ground magnetic observatories. Synthetic data is first used to validate the new VO-ESD approach. Then, we apply our scheme to measurements from the Swarm mission. For the first time, a 2.5 degrees resolution global mesh of VO times series is built. The VO-ESD derived time series are locally compared to ground observations as well as to satellite-based model predictions. The approach is able to describe detailed temporal variations of the field at local scales. The VO-ESD time series are also used to derive global SH models. Without regularization these models describe well the secular trend of the magnetic field. The derivation of longer VO-ESD time series, as more data will be made available, will allow the study of field temporal variations features such as geomagnetic jerks.

Degree of recognition: International

Links:

Related event

EGU General Assembly 2017: European GEosciences Union 2017
24/04/2017 → 28/04/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

17th Annual Executive Seminar in Analytical Chemistry
Period: 26 Apr 2017
Anders Holmgaard Hansen (Participant)
CHO Cell Line Engineering and Design
CFB - Core Flow
Novo Nordisk Foundation Center for Biosustainability
CHO in Silico Engineering of Glycosylation and Protein Quality (CiSe)
CHO Core
iLoop
Degree of recognition: National

Related event

17th Annual Executive Seminar in Analytical Chemistry
26/04/2017 → 26/04/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising a conference

BD FACS User Meeting 2017
Period: 26 Apr 2017 → 27 Apr 2017
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

BD FACS User Meeting 2017: The Nordic BD FACS User meeting
26/04/2017 → 27/04/2017
Gothenburg, Sweden
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

EU workshop with EMA
Period: 26 Apr 2017
Lina Cavaco (Participant)
National Food Institute

Related event
EU workshop with EMA: EC workshop in Brussels with EMA  
26/04/2017 → 26/04/2017  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Evolution Constrains Large-Scale Bioproduction**  
Period: 26 Apr 2017  
Peter Rugbjerg (Speaker)  
Novo Nordisk Foundation Center for Biosustainability  
Bacterial Synthetic Biology  
Degree of recognition: International  

**Related event**  
**Synthetic Biology for Bioprocessing of Next Generation Biologics**  
26/04/2017 → 26/04/2017  
Manchester, United Kingdom  
Activity: Talks and presentations › Conference presentations

**FM Innovations - Can touchpoints stand alone?**  
Period: 26 Apr 2017  
Giulia Nardelli (Speaker)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  

**Description**  
In the FM industry, clients, customers and end users are crucial inspirators for innovators. But do FM innovators truly understand their customers‘ ”jobs”, and not just their touchpoints throughout the day? And if they do, how do their integrate such understanding when driving and implementing innovation?  
Degree of recognition: International  

**Related event**  
**European Facilities Management Conference 2017**  
25/04/2017 → 28/04/2017  
Madrid, Spain  
Activity: Talks and presentations › Conference presentations

**Forskning og projekter inden for klimatilpasning**  
Period: 26 Apr 2017  
Hjalte Jomo Danielsen Sørup (Speaker)  
Department of Environmental Engineering  
Urban Water Systems  

**Related external organisation**  
The Danish Society of Engineers, IDA  
Kalvebod Brygge 31-33, DK-1780, Copenhagen V, Denmark  
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**Mary had a little Lamb: Scanner-recorded speech during MRI without gradient- induced sound**  
Period: 26 Apr 2017  
Jan Ole Pedersen (Speaker)  
Department of Electrical Engineering  
Center for Magnetic Resonance
Related event

**ISM RM 25th Annual Meeting & Exhibition**
22/04/2017 → 27/04/2017
Honolulu, United States
Activity: Talks and presentations › Conference presentations

**Vidensmodeller - BIM er meget mere end 3D-geometri**
Period: 26 Apr 2017
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design
Degree of recognition: Regional
Documents:
170426 Modellering af viden

**Related external organisation**

**NIRAS A/S**
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**CRISPR-mediated genome engineering tools towards improved CHO cell factories. Cell Line Development and Engineering. Amsterdam, Holland.**
Period: 25 Apr 2017
Helene Fastrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Degree of recognition: International

**Related event**

**Cell Line Development and Engineering**
24/04/2017 → 26/04/2017
Activity: Talks and presentations › Conference presentations

**Encoding of Inductively Measured k-Space Trajectories in MR Raw Data**
Period: 25 Apr 2017
Jan Ole Pedersen (Speaker)
Department of Electrical Engineering
Center for Magnetic Resonance
Degree of recognition: International
Documents:
abstract_001

**Related event**

**ISM RM 25th Annual Meeting & Exhibition**
22/04/2017 → 27/04/2017
Honolulu, United States
Activity: Talks and presentations › Conference presentations

**Proteins Congress**
Period: 25 Apr 2017
Research funders are increasingly concerned with measurable socio-economic impact of investment in research, and on increasingly shorter timescales. Innovation, and “open innovation” are the policy priorities of the moment and optimising the flow of ideas along the lab-to-market spectrum is essential for re-use of results, fuelling open innovation, and boosting socio-economic impact or public funded research.

The presentation showcases two complimentary strategies that Project Managers can employ pre- and/or post-award in order to optimise the exploitation and impact of research project: passive and active knowledge transfer.

Passive Knowledge Transfer relies on maximum disclosure of research output (other than commercially exploitable research via patents and other IPR) in the interest of optimal reproducibility, independent validation and re-use by both academic and non-academic users, without necessarily targeting specific users. Tools of the trade include standard public & academic dissemination means (research articles, online media publications, newsletters, generic policy briefs). Additional transparency of the research workflow can be achieved by integrating “open science” (open notebooks, open data, open research software and open access to research publications) as well as Virtual Research Environments (VREs) in the methodology of the proposed work. Ensuring that the proposal partners are suitably trained in best practices of open science, makes proposal grant more competitive at evaluation and the resulting maximum access to research outputs does contribute to better return on investment for funders (Beagrie 2016) and economic growth objectives of public s e.g. Blue Growth (Houghton & Swan 2011, Marine Knowledge 2020 Roadmap). Active Knowledge Transfer, or the pro-active translation of research into policy or commercial context, is the more classical and better known approach (also referred to as extension services, or researchers providing advice e.g. to fisheries and aquaculture governance bodies and private sector). Horizon2020 COLUMBUS Consortium proposes and tests a methodology for categorizing the diverse output of
research into verifiable “knowledge outputs”, and documenting the execution of an transfer plan to very specific and identified potential users, in order to transfer knowledge along the lab-2-market spectrum. The presentation will demonstrate how Open Science and detailed knowledge transfer plans complement each other, enhance grant proposal evaluation pre- and post-award, and can address Blue Growth policy objectives. Concepts presented are developed by FP7/H2020 FOSTER (www.fosteropenscience.eu), H2020 COLUMBUS (www.columbusproject.eu).

Degree of recognition: International

Documents:
EGU2017-18355-2
Links:
https://www.fosteropenscience.eu/event/ipr-open-science-and-technology-transfer

Related event

EGU General Assembly 2017: European GEosciences Union 2017
24/04/2017 → 28/04/2017
Vienna, Austria
Activity: Talks and presentations › Conference presentations

Forskningens døgn 2017 - Hvordan bygger og renoverer vi grønt?
Period: 24 Apr 2017
Jakob Brinkø Berg (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: Regional
Links:
http://forsk.dk/indbakke/hvordan-bygger-og-renovere-vi-gront

Related external organisation

Erhvervsakademi Sjælland
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Related external organisation

Klima- og Energigruppen Stevns
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Supervision of larger projects at DTU
Period: 24 Apr 2017
Giulia Nardelli (Participant)
Department of Management Engineering
Management Science
Implementation and Performance Management
Description
Supervision of larger projects at DTU
Degree of recognition: Local

Related event
Supervision of larger projects at DTU
02/03/2010 → …
Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Finding the high-producers: Efficient selection of CHO cell lines (RPP9)
Period: 23 Apr 2017
Nusa Pristovsek (Speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Degree of recognition: International

Related event
9th Recombinant Protein Production (RPP9)
23/04/2017 → 25/04/2017
Dubrovnik, Croatia
Activity: Talks and presentations › Conference presentations

ISMRM 25th Annual Meeting & Exhibition
Period: 22 Apr 2017 → 27 Apr 2017
Jan Ole Pedersen (Speaker)
Department of Electrical Engineering
Center for Magnetic Resonance
Degree of recognition: International

Related event
ISMRM 25th Annual Meeting & Exhibition
22/04/2017 → 27/04/2017
Honolulu, United States
Activity: Talks and presentations › Conference presentations

Microbial multi modular xylanolytic enzymes in mesophilic anaerobic digesters fed with wastewater treatment sludge
Period: 21 Apr 2017
Casper Wilkens (Invited speaker)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering
Degree of recognition: International

Related event
Satellite Meeting of CBM12
20/04/2017 → 21/04/2017
Kongens Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Digital dermatitis hos storfe – Identifikation og karakterisering av Treponema spp og andre mikrobiota
Period: 20 Apr 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited lecture.

**Documents:**
Digital dermatitis hos storfe – Identifikation og karakterisering

**Related external organisation**

**Norwegian University of Life Sciences**
Norway
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**NNF Copenhagen bioscience lectures**
Period: 20 Apr 2017
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

**Related event**

**NNF Copenhagen bioscience lectures: Translational medicine in drug discovery for psychiatrics**
20/04/2017 → 20/04/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Recent Advances in Biomass Conversion Technologies and Biorefinery Opportunities**
Period: 20 Apr 2017
Solange I. Mussatto (Speaker)
Novo Nordisk Foundation Center for Biosustainability

**Research Groups**
Biomass Conversion and Bioprocess Technology
Degree of recognition: International

**Related event**

**International Bioenergy (Shanghai) Conference and Exhibition**
19/04/2017 → 21/04/2017
Shanghai, China
Activity: Talks and presentations › Conference presentations

**Techno-economic assessment of biorefinery strategies for rice straw conversion into ethanol and co-products**
Period: 20 Apr 2017
Solange I. Mussatto (Speaker)
Rafael C.A. Castro (Other)
Inês C. Roberto (Other)
Novo Nordisk Foundation Center for Biosustainability

**Research Groups**
Biomass Conversion and Bioprocess Technology
Degree of recognition: International

**Related event**

**International Bioenergy (Shanghai) Conference and Exhibition**
19/04/2017 → 21/04/2017
Shanghai, China
Activity: Talks and presentations › Conference presentations
**Undersøgelser af tarmmikrobiota hos "nyremink"**
Period: 20 Apr 2017
Martin Iain Bahl (Invited speaker)
National Food Institute
Research Group for Gut Microbiology and Immunology
Degree of recognition: National

**Related event**

**CPH Mink seminar**
20/04/2017 → 20/04/2017
Frederiksberg C, Denmark
Activity: Talks and presentations › Conference presentations

**International Bioenergy (Shanghai) Conference and Exhibition**
Period: 19 Apr 2017 → 21 Apr 2017
Solange I. Mussatto (Organizer)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Biomass Conversion and Bioprocess Technology

**Description**
Member of Program Committee, Topic Organizer, Chairperson, Guest Editor - Special Issue dedicated to the conference
Degree of recognition: International

**Related event**

**International Bioenergy (Shanghai) Conference and Exhibition**
19/04/2017 → 21/04/2017
Shanghai, China
Activity: Attending an event › Participating in or organising a conference

**Human factors and ergonomics in manufacturing and service industries (Journal)**
Period: 18 Apr 2017 → …
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Member of the Editorial Board of Human Factors and Ergonomics in Manufacturing & Service Industries
Degree of recognition: International

**Related journal**

**Human factors and ergonomics in manufacturing and service industries**
Local database
Activity: Research › Journal editor

**Interface engineering to boost the open circuit voltage of Cu2ZnSnS4 solar cells**
Period: 18 Apr 2017
Andrea Crovetto (Speaker)
Department of Physics
Experimental Surface and Nanomaterials Physics
Silicon Microtechnology

Related event

2017 MRS Spring Meeting
17/04/2017 → 21/04/2017
Phoenix, United States
Activity: Talks and presentations › Conference presentations

Ultrafast electronic and nuclear dynamics in photo-excited transition-metal complexes
Period: 18 Apr 2017 → 21 Apr 2017
Klaus Braagaard Møller (Invited speaker)
Department of Chemistry

Description
CMST COST Action CM1405
Degree of recognition: International

Related event

International Workshop on Molecular Quantum Dynamics and Kinetics
18/04/2017 → 21/04/2017
Zürich, Switzerland
Activity: Talks and presentations › Conference presentations

2017 MRS Spring Meeting
Period: 17 Apr 2017 → 21 Apr 2017
Andrea Crovetto (Speaker)
Department of Physics
Experimental Surface and Nanomaterials Physics
Silicon Microtechnology

Related event

2017 MRS Spring Meeting
17/04/2017 → 21/04/2017
Phoenix, United States
Activity: Talks and presentations › Conference presentations

Teaching Assistant for course 15.872 System Dynamics II
Period: 15 Apr 2017 → 2 Jun 2017
Daniel Alberto Sepúlveda Estay (Guest lecturer)
Bradley Morrison (Lecturer)
Department of Management Engineering
Management Science
Transport DTU

Description
15.871 and 872 introduce you to system dynamics modeling for the analysis of business policy and strategy. You will learn to visualize a business organization in terms of the structures and policies that create dynamics and regulate performance. System dynamics allows us to create ‘microworlds,’ management flight simulators where space and time can be compressed, slowed, and stopped so we can experience the long-term side effects of decisions, systematically explore new strategies, and develop our understanding of complex systems. In these system dynamics courses we use simulation models, case studies, and management flight simulators to develop principles of policy design for successful management of complex strategies. Case studies of successful strategy design and implementation using system dynamics will be stressed. We consider the use of systems thinking to promote effective organizational learning. The principal purpose of modeling is to improve our understanding of the ways in which an organization’s performance is related to its internal structure and operating policies as well as those of customers, competitors, suppliers, and other stakeholders.
During the course students use several simulation models to explore such strategic issues as fluctuating sales, production and earnings; market growth and stagnation; the diffusion of new technologies; the use and reliability of forecasts; the rationality of business decision making; and applications in health care, energy policy, environmental sustainability, and other topics.

Students learn to recognize and deal with situations where policy interventions are likely to be delayed, diluted, or defeated by unanticipated reactions and side effects. You will have a chance to use state of the art software for computer simulation and gaming. Assignments give hands-on experience in developing and testing computer simulation models in diverse settings.

Degree of recognition: National

Documents:
Syllabus for course 15.872 System Dynamics II

Related event
15.872 System Dynamics II
15/04/2017 → 02/06/2017
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Process development and strategies to move towards a biobased economy
Period: 14 Apr 2017
Solange I. Mussatto (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability

Research Groups
Biomass Conversion and Bioprocess Technology

Description
Special Lecture (by invitation) at Tokyo Institute of Technology, Department of Chemical Science and Engineering, School of Materials and Chemical Technology.

Degree of recognition: Local

Documents:
Prof. Mussatto Lecture

Related event
Lecture at Tokyo Institute of Technology
14/04/2017 → 14/04/2017
Tokyo, Japan
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

52nd International Universities' Power Engineering Conference (Event)
Period: 11 Apr 2017
Mattia Marinelli (Participant)

Department of Electrical Engineering
Center for Electric Power and Energy
Energy resources, services and control

Description
UPEC (University Power Engineering Conference) Steering Committee participation

Degree of recognition: International

Links:

Related event
52nd International Universities' Power Engineering Conference
29/08/2017 → 01/09/2017
Greece
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
Phosphoric Acid Anion Migration through Polybenzimidazole Membrane
Period: 9 Apr 2017
Hans Becker (Speaker)
Department of Energy Conversion and Storage
Proton conductors
Degree of recognition: International

Related event
CARISMA Conference 2017
09/04/2017 → 12/07/2017
Newcastle, United Kingdom
Activity: Talks and presentations › Conference presentations

Systems Analysis (Organisational unit)
Period: 7 Apr 2017
Henrik Klinge Jacobsen (Chairman)
Department of Management Engineering
Systems Analysis

Description
Senior researcher assessment committee (chair)

Related organisation
Systems Analysis (Organisational unit)
Klinge Jacobsen, H. (Chairman)
7 Apr 2017
Activity: Membership › Membership in review committee

EURL -AR workshop
Period: 6 Apr 2017 → 7 Apr 2017
Helle Bisgaard Korsgaard (Speaker)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International

Related event
EURL -AR workshop
06/04/2017 → 07/04/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

EURL Workshop 2017
Period: 6 Apr 2017 → 7 Apr 2017
Lina Cavaco (Organizer)
National Food Institute

Description
participate as speaker and part of organization

Related event
EURL Workshop 2017
06/04/2017 → 07/04/2017
Activity: Attending an event › Participating in or organising a conference
**EURL Workshop 2017**  
**Period:** 6 Apr 2017 → 7 Apr 2017  
Lina Cavaco (Speaker)  
National Food Institute  

**Description**  
participate as speaker and part of organization  

**Related event**  
**EURL Workshop 2017**  
06/04/2017 → 07/04/2017  
Activity: Talks and presentations › Conference presentations

**Theriogenology (Journal)**  
**Period:** 6 Apr 2017  
Anders Stockmarr (Reviewer)  
Department of Applied Mathematics and Computer Science  
Statistics and Data Analysis  
Degree of recognition: International  

**Related journal**  
Theriogenology  
0093-691X  
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 1.99 SJR 0.766 SNIP 1.188, ISI indexed (2013): ISI indexed yes,  
Web of Science (2017): Indexed yes  
Central database  
Activity: Research › Peer review of manuscripts

**Emergence of Engineering Academia and the Teaching Pratices at DTU**  
**Period:** 5 Apr 2017  
Laila Zwisler (Speaker)  
Department of Physics  

**Description**  
When the Danish polytechnical school opened in 1829 under University of Copenhagen basic sciences were given a dominant role. There was an uneasy and debated relationship between basic sciences and technical subjects. In this talk I will look into how the school dealt with this relationship and the practical executive issues up to 1929. Teachers invoked both the theoretical bodies and the methodology of the natural sciences in the creation of engineering knowledge systems reaching beyond fundamental sciences.  
Degree of recognition: National  

**Related external organisation**  
IMFUFA course, Roskilde (DK)  
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Klimatilpasning af vandinfrastruktur**  
**Period:** 5 Apr 2017  
Hjalte Jomo Danielsen Sørup (Speaker)  
Department of Environmental Engineering  
Urban Water Systems  

**Related organisation**  
Klimatilpasning af vandinfrastruktur  
Sørup, H. J. D. (Speaker)
Modelling open nanophotonic structures using the Fourier modal method in infinite domains
Period: 5 Apr 2017
Andreas Dyhl Østerkryger (Speaker)
Department of Photonics Engineering
Nanophotonics Theory and Signal Processing
Degree of recognition: International

Related event
25th International Workshop on Optical Waveguide Theory and Numerical Modelling
05/04/2017 → 06/04/2017
Eindhoven, Netherlands
Activity: Talks and presentations › Conference presentations

Systems Biology of Metabolism
Period: 5 Apr 2017
Jens Nielsen (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Yeast Cell Factories

Description
Plenary lecture at BioSB, Lunteren, The Netherlands
Degree of recognition: International

Related event
BioSB 2017: Dutch Bioinformatics & Systems Biology Conference
04/04/2017 → 05/04/2017
Lunteren, Netherlands
Activity: Talks and presentations › Conference presentations

Training in luminance imaging
Period: 5 Apr 2017 → 6 Apr 2017
Anders Thorseth (Organizer)
Dennis Dan Corell (Participant)
Mekbib Wubishet Amdemeskel (Participant)
Johannes Lindén (Participant)
Thierry Silvio Claude Soreze (Participant)
Carsten Dam-Hansen (Participant)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Course lecturer: Tobias Porsch
Degree of recognition: Local

Related event
Training in luminance imaging
05/04/2017 → 06/04/2017
Roskilde, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Nanoworld Conference
Period: 4 Apr 2017
Steffen Foss Hansen (Chairman)
Department of Environmental Engineering
Environmental Chemistry

Related event
Nanoworld Conference
03/04/2017 → 05/04/2017
Newton, United States
Activity: Attending an event › Participating in or organising a conference

Nanoworld Conference
Period: 4 Apr 2017
Steffen Foss Hansen (Speaker)
Department of Environmental Engineering
Environmental Chemistry
Links:

Related event
Nanoworld Conference
03/04/2017 → 05/04/2017
Newton, United States
Activity: Talks and presentations › Conference presentations

The African Diaspora Biotech Summit
Period: 4 Apr 2017
Eugene Fletcher (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event
The African Diaspora Biotech Summit
04/04/2017 → 04/04/2017
Cambridge, United Kingdom
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Gravitationsbølger
Period: 3 Apr 2017 → 7 Apr 2017
Søren Brandt (Speaker)
National Space Institute
Astrophysics and Atmospheric Physics
Degree of recognition: Regional

Related external organisation
Folkeuniversitetet i Aarhus
Ny Munkegade 118, 8000, Aarhus, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Harmonic Polynomial Cell method with Immersed Boundaries
Period: 3 Apr 2017 → 7 Apr 2017
Yanlin Shao (Speaker)
Related event

**BCAM WORKSHOP HYDRODYNAMICS OF WAVE ENERGY CONVERTERS**
03/04/2017 → 07/04/2017
Basque, Spain
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Joint FutureGas-CITIES-InnoSE Gas Workshop**
Period: 3 Apr 2017
Tara Sabbagh Amirkhizi (Speaker)
Department of Management Engineering
Systems Analysis

**Description**
Presentation

**Related organisation**

**Joint FutureGas-CITIES-InnoSE Gas Workshop**
Amirkhizi, T. S. (Speaker)
3 Apr 2017
Activity: Talks and presentations › Conference presentations

**Optical and Hydrodynamic Stretching of Single Cells from Blood**
Period: 3 Apr 2017
Kirstine Berg-Sørensen (Speaker)
Department of Physics
Quantum Physics and Information Technology
Degree of recognition: International
Documents:
3pagesummary

**Related event**

**OSA Biophotonics Congress: Optical Trapping Applications 2017: Optics in the Life Sciences**
02/04/2017 → 05/04/2017
San Diego, United States
Activity: Talks and presentations › Conference presentations

**Dansk Universitetspaedagogisk Tidsskrift (Journal)**
Period: 1 Apr 2017 → 7 Apr 2017
José Soler (Reviewer)
Department of Photonics Engineering
Networks Technology and Service Platforms

**Related journal**

**Dansk Universitetspaedagogisk Tidsskrift**
1901-5089
BFI (2017): BFI-level 1
Indexed in DOAJ
Central database
Activity: Research › Peer review of manuscripts

**International Journal of Workplace Health Management (Journal)**
Period: 1 Apr 2017 → …
Signe Poulsen (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Related journal**
International Journal of Workplace Health Management
1753-8351
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 1.24 SJR 0.485 SNIP 1.324, ISI indexed (2013): ISI indexed no
Central database
Activity: Research › Peer review of manuscripts

**Journal of Intelligent Transportation Systems (Journal)**
Period: 1 Apr 2017 → 7 Apr 2017
José Soler (Reviewer)
Department of Photonics Engineering
Networks Technology and Service Platforms

**Related journal**
Journal of Intelligent Transportation Systems
1547-2450
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 1.69 SJR 0.884 SNIP 1.264, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

**Member of Panel on Work Environment at DTU Environment (External organisation)**
Period: 1 Apr 2017
Steffen Foss Hansen (Participant)
Department of Environmental Engineering
Environmental Chemistry

**Description**
Member of Panel on Work Environment at DTU Environment
Degree of recognition: Local

**Related external organisation**
**Member of Panel on Work Environment at DTU Environment**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**The Deans Lecture Hall Technology Committee (Event)**
Period: 1 Apr 2017 → …
Christine Ipsen (Participant)
Department of Management Engineering
Management Science
Implementation and Performance Management
Description
Member of DTUs Lecture Hall Technology committee

Related event

The Deans Lecture Hall Technology Committee
03/04/2017 → …
Kgs. Lyngby, Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Energy Efficiency (Journal)
Period: Mar 2017
Toke Rammer Nielsen (Reviewer)
Department of Civil Engineering
Section for Building Energy

Description
Review of journal article
Degree of recognition: International

Related journal
Energy Efficiency
1570-646X
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 1.43 SJR 0.74 SNIP 0.816, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

IET Renewable Power Generation (Journal)
Period: Mar 2017 → …
Theis Bo Rasmussen (Reviewer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Reviewer

Related journal
IET Renewable Power Generation
1752-1416
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 3.55 SJR 0.988 SNIP 1.379, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

Sikre Fødevarekontaktmaterialer - en kemisk udfordring
Period: Mar 2017
Gitte Alsing Pedersen (Speaker)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Møde i IDA Levnedsmiddelselskabet

Related event
IDA møde om fødevarekontaktmaterialer  
21/03/2017 → 21/03/2017  
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**The Ph.D. Supervision Process: Methods and Tools**  
Period: Mar 2017 → May 2017  
Giulia Nardelli (Participant)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  
Degree of recognition: Local  
Documents:  
PhD supervision course-Diploma

**Related event**

**The Ph.D. Supervision Process: Methods and Tools**  
07/03/2017 → 09/05/2017  
Kgs. Lyngby, Denmark  
Activity: Other

**Electricity grid tariffs to support flexibility from district heating: The case of Denmark**  
Period: 31 Mar 2017  
Claire Bergaentzlé (Speaker)  
Department of Management Engineering  
Systems Analysis  
Degree of recognition: Local

**Related event**

**ELMA - EER Common Seminar: ELMA (DTU Elektro) EER (DTU MAN)**  
31/03/2017 → 31/03/2017  
Lyngby, Denmark  
Activity: Talks and presentations › Conference presentations

**Intraday Market Asymmetries**  
Period: 31 Mar 2017  
Emilie Rosenlund Soysal (Speaker)  
Department of Management Engineering  
Systems Analysis  
Degree of recognition: Local  
Documents:  
Intraday Market Asymmetries PRESENTATION MARCH 2017

**Related event**

**ELMA - EER Common Seminar: ELMA (DTU Elektro) EER (DTU MAN)**  
31/03/2017 → 31/03/2017  
Lyngby, Denmark  
Activity: Talks and presentations › Conference presentations

**Joint Spring Symposium 2017: Danish Society for Parasitology and Danish Society for Tropical Medicine and International Health**  
Period: 31 Mar 2017  
Heidi Huus Petersen (Participant)  
National Veterinary Institute
Section for Public sector service and commercial diagnostics

Bacteriology & Parasitology
Degree of recognition: National
Documents:
Coccidia infection in Danish farmed mink
Links:
http://parasitology.dk/web/

Related event

Joint Spring Symposium 2017: Danish Society for Parasitology and Danish Society for Tropical Medicine and International Health
31/03/2017 → 31/03/2017
Frederiksberg, Denmark
Activity: Attending an event › Participating in or organising a conference

Temaaften om tang for Tokai University Alumneforening
Period: 31 Mar 2017
Ditte Baun Hermund (Guest lecturer)
National Food Institute
Research Group for Bioactives – Analysis and Application

Related external organisation

Tokai Centret
Vedbæk Strandvej 476, 2950, Vedbæk, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Biomedical Microdevices (Journal)
Period: 30 Mar 2017 → 31 Dec 2017
Govindan Puthumana (Reviewer)
Department of Mechanical Engineering

Description
Biomedical Microdevices
Degree of recognition: International
Links:
https://link.springer.com/journal/10544

Related journal

Biomedical Microdevices
1387-2176
BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 2.29 SJR 0.595 SNIP 0.752, ISI indexed (2013): ISI indexed yes, Web of Science (2017): Indexed Yes
Central database
Activity: Research › Journal editor

Kick off Coast to Coast Climate Challenge
Period: 30 Mar 2017
Carlo Sass Sørensen (Participant)
National Space Institute
Geodesy

Description
Contribution to event, e.g. in the preparation of exhibition stand about subprojects C9, C17, and C21 of c2c cc.
Degree of recognition: Regional
Documents:
Related event

**Kick off Coast to Coast Climate Challenge**
30/03/2017 → 30/03/2017
Herning, Denmark
Activity: Attending an event › Participating in or organising a conference

**Mechanisms of action involved in chemically induced effects on male reproductive health**
Period: 30 Mar 2017 → 31 Mar 2017
Camilla Victoria Lindgren Schwartz (Speaker)
Sofie Christiansen (Other)
Anne Marie Vinggaard (Other)
Terje Svingen (Other)
National Food Institute
Research Group for Molecular and Reproductive Toxicology
Copenhagen Center for Health Technology
Degree of recognition: Regional

Related event

**3rd ReproYoung Conference**
30/03/2017 → 31/03/2017
Båstad, Sweden
Activity: Talks and presentations › Conference presentations

**Indvendig ydervægsisolering – Findes der en sikker metode ?**
Period: 29 Mar 2017
Tommy Odgaard (Speaker)
Søren Peter Bjarføv (Speaker)
Department of Civil Engineering
Section for Building Design
Degree of recognition: National

Related event

**Ejendomsmessen**
29/03/2017 → 30/03/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

**Konstruktion og test af kunstige regnsæt**
Period: 29 Mar 2017
Hjalte Jomo Danielsen Sørup (Speaker)
Department of Environmental Engineering
Urban Water Systems

Related external organisation

**The Danish Society of Engineers, IDA**
Kalvebod Brygge 31-33, DK-1780, Copenhagen V, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations
Low Carbon Economy Territory (ESPON - LOCATE) workshop
Period: 29 Mar 2017
Angreine Kewo (Speaker)
Per Sieverts Nielsen (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: International

Related event
Low Carbon Economy Territory (ESPON - LOCATE) workshop
29/03/2017 → …
Vienna, Austria
Activity: Talks and presentations › Conference presentations

Source attribution: Translating science into public health action
Period: 29 Mar 2017 → 31 Mar 2017
Tine Hald (Keynote speaker)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related event
2017 Annual Meeting of SVEPM 2017, 29-31 March, Inverness, Scotland
29/03/2017 → 31/03/2017
Scotland, United Kingdom
Activity: Talks and presentations › Conference presentations

2017 STAMP Workshop
Period: 27 Mar 2017 → 30 Mar 2017
Daniel Alberto Sepúlveda Estay (Speaker)
Nancy Leveson (Speaker)
John Thomas (Lecturer)
Department of Management Engineering
Management Science
Transport DTU

Description
MIT STAMP/STPA Workshop took place during March 27-30, 2017.

STAMP is an accident causality model based on systems theory and systems thinking. STAMP integrates into engineering analysis the causal factors in our increasingly complex systems such as software, human-decision making and human factors, new technology, social and organizational design, and safety culture.

STPA is a powerful new hazard analysis technique based on STAMP while CAST is the equivalent for accident/incident analysis. These tools are now used globally in almost every industry. Newer tools, such of those for doing early concept analysis (STECA) security analysis (STPA-Sec) and leading indicators have been developed. This free workshop will provide attendees with the opportunity to learn how to use these new tools, to meet with users and to hear about applications, evaluations, and the latest developments in this powerful new approach to system safety engineering and to cyber security.

Degree of recognition: International
Documents:
170330_Workshop_presentation_Sepulveda

Related external organisation
High Frequency Planar Magnetics for Power Conversion
Period: 27 Mar 2017
Ziwei Ouyang (Speaker)
William Gerard Hurley (Speaker)
Department of Electrical Engineering
Electronics

Description
Degree of recognition: International
Documents:
APEC_2017 Presentation

Related event

27/03/2017 → …
Tampa, United States
Activity: Talks and presentations › Conference presentations

Goddag - og farvel - til broer
Period: 26 Mar 2017
Laila Zwisler (Speaker)
Jørgen Burchardt (Speaker)
Magnus Heunicke (Speaker)
Department of Physics

Description
Kan historien lære os om hvordan vi skal planlægge store infrastrukturer som forbindelserne over Femern og Kattegat? Jørgen Burchardt, forsker ved Danmarks Tekniske Museum, fortæller om skæbnen for Tscherning’s forslag i 1855 i Folketinget om bro over Lillebælt og tunnel under Storebælt. Laila Zwisler fra Teknologihistorie, DTU, diskuterer, hvordan en ingeniørværdskab har udviklet sig for at holde styr på den moderne verden, hvor teknologiske systemer er blevet vores anden natur. Tidligere trafikminister Magnus Heunicke kommenterer og styrer debat fra publikum.
Degree of recognition: National

Related external organisation

Historiske Dage
Store Kirkestræde 1, 4, 1073, København K, Denmark
Activity: Other

APEC2017 Professional Education Seminar: Bidirectional DC-DC Converters: Fundamentals and Advances
Period: 25 Mar 2017
Zhe Zhang (Speaker)
Department of Electrical Engineering
Electronics

Description
Professional Education Seminar at the 2017 IEEE Applied Power Electronics Conference and Exposition (APEC 2017), Tampa, FL, USA

Related event
Animal health surveillance in Denmark
Period: 23 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited guest lecture
Degree of recognition: National
Documents:
Animal health surveillance in Denmark

**Related external organisation**
Universidade Federal de Minas Gerais
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Bovine endometritis and abortions revisited
Period: 23 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited guest lecture
Degree of recognition: National

**Related external organisation**
Universidade Federal de Minas Gerais
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Bovine neurological diseases and BSE in Denmark
Period: 23 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited guest lecture
Degree of recognition: National
Documents:
National Veterinary Institute, Technical University of Denmark

**Related external organisation**
Universidade Federal de Minas Gerais
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities
Microbiological applications of mass spectrometry in clinical and environmental microbiology
Period: 23 Mar 2017
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

Microbiological applications of mass spectrometry in clinical and environmental microbiology
23/03/2017 → 23/03/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Ruminfrastruktur - Arktis
Period: 23 Mar 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy

Description

Rumindustrien bliver præsenteret bredt og forretningsmulighederne synliggjort. Det gælder både for up-stream og down-stream forretning og ikke mindst de mange afledte muligheder, som datastrømme giver for produkt- og serviceudvikling på stadig flere teknisk- og samfundsmodne områder.

Degree of recognition: National
Links:
http://censec.dk/Files/Billeder/CenSec/rumin industri/Pepke-Pedersen-Arktis.ppt

Related event

Forretningsmuligheder i rumindustrien
23/03/2017 → …
Copenhagen, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Trends i byggeriet – IoT, Big data - Inspiration fra DTU, CITIES og Vidensbyen
Period: 23 Mar 2017
Alfred Heller (Speaker)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities

Description
Inviteret præsentation af de erfaringer der er lavet i CITIES og Vidensbyen omkring Internet of Things, Science Cloud for Cities og mere

Documents:
Bygnetværk - Alfred Heller - marts 2017

Related external organisation

Byggeriets netværk
København
Activity: Talks and presentations › Conference presentations

Bovine digital dermatitis, the pathology and the association with Treponema species
Period: 22 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited guest lecture
Degree of recognition: National
Documents:
Bovine digital dermatitis, the pathology and the

**Related external organisation**

*Universidade Federal de Minas Gerais*
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Dartmouth College (External organisation)**
Period: 22 Mar 2017
Michael A. E. Andersen (Participant)
Department of Electrical Engineering
Electronics

**Description**
Tenure Track Review Evaluation (Associate Professor with tenure)

**Related external organisation**

*Dartmouth College*
United States
Activity: Membership › Membership in review committee

**Diagnostic application of FISH for Identification of bacterial pathogens**
Period: 22 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

**Description**
Invited guest lecture
Degree of recognition: National
Documents:
Diagnostic application of FISH for Identification of

**Related external organisation**

*Universidade Federal de Minas Gerais*
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Safe production of mealworms**
Period: 22 Mar 2017
Annette Nygaard Jensen (Invited speaker)
National Food Institute
Research Group for Microbial Food Safety

**Description**
Food and feed safety in relation to farmed insects
Documents:
FoodTalkBio 2203 2017
Related event

Food Talk - Insects
22/03/2017 → 22/03/2017
Lyngby, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Wind power in the future energy system
Period: 22 Mar 2017
Klaus Skytte (Speaker)
Department of Management Engineering
Systems Analysis

Description
AER Seminar 22nd March 2017, Comwell Campus Klarskovgaard, Korsør
Degree of recognition: National
Documents:
Flex4RES_Presentation_AER_seminar_220317

Related organisation

Wind power in the future energy system
Skytte, K. (Speaker)
22 Mar 2017
Activity: Talks and presentations › Conference presentations

5th Scandinavian Academy of Industrial Engineering and Management
Period: 21 Mar 2017
Christine Ipsen (Organizer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Board meeting

Related event

5th Scandinavian Academy of Industrial Engineering and Management
27/11/2017 → 29/11/2017
Trondhjem, Norway
Activity: Attending an event › Participating in or organising a conference

Detection and characterization of nanoparticles in food and biological materials by single particle ICP-MS
Period: 21 Mar 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science
Degree of recognition: Regional

Related event

1st Joint Nordic Trace Elemental Analysis & Ion Chromatography User Meeting
21/03/2017 → 22/03/2017
Copenhagen, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations
Flexibility-Enabling Contracts in electricity markets  
**Period:** 21 Mar 2017  
Luis Rafael Boscán Flores (Speaker)  
Department of Management Engineering  
Systems Analysis  

**Description**  
We investigate the problem of incentivising flexibility in electricity markets. As the share of intermittent renewable energy increases in the generation mix, power systems are exposed to greater levels of uncertainty and risk, which requires planners, policy and business decision makers to incentivise flexibility, that is: their adaptability to unforeseen variations in generation and demand. The greater need for flexibility, along with the fact that its provision is costly, highlights the importance of efficient procurement. As a commodity, flexibility has multiple attributes such as capacity, ramp rate, duration and lead time among which there are complementarities. Additionally, along with traditional sources, which already enable flexibility, a number of business models, such as thermostat-based demand response, aggregators and small storage providers, are emerging in electricity markets and expected to constitute important sources of flexibility in future decentralised power systems. However, due to presence of high transaction costs, relative to the size of resource, the emerging small resources cannot directly participate in an organised electricity market and/or compete. Therefore we ask the fundamental question of how should the provision of flexibility, as a multi-dimensional commodity, be incentivised in this context? We model the procurement of flexibility services from emerging small resources through bilateral contracts in a multidimensional adverse selection setting. We take a normative perspective and show how efficient contracts for flexibility services can be designed given its peculiarity as an economic commodity. Through a simulation analysis we elucidate the applicability of the proposed model and demonstrate the way it can be utilised in, for example, a thermostat based demand response programme.  

**Degree of recognition:** National  
**Documents:**  
Flexibility Enabling Contracts in Electricity Markets  

**Related event**  
Seminar at Department of Sociology, Environmental and Business Economics  
21/03/2017 → ...  
Esbjerg, Denmark  
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities
Related event

Visit from Antwerp Management School to DTU Business
20/03/2017 → 22/03/2017
Activity: Talks and presentations › Conference presentations

Identification of bacterial pathogens using Fluorescent In Situ Hybridisation
Period: 21 Mar 2017
Tim Kåre Jensen (Speaker)
National Veterinary Institute
Pathology

Description
Invited guest lecture
Documents:
Identification of bacteria by FISH

Related external organisation

Universidade Federal de Minas Gerais 
Brazil
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Kick off workshop om dansk insektindustri
Period: 21 Mar 2017
Dorte Lau Baggesen (Organizer)
National Food Institute

Description
Joined workshop arranged by the National Food Institute DTU, University of Copenhagen, Danish Technological Institute together with the Ministry of Environment and Food of Denmark
Degree of recognition: National
Documents:
Kick_off_workshop_program_mm_21_03_2017

Related event

Kick off workshop om dansk insektindustri
21/03/2017 → 21/03/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Kick off workshop om dansk insektindustri
Period: 21 Mar 2017
Annette Nygaard Jensen (Chairman)
National Food Institute
Research Group for Microbial Food Safety

Description
Forarbejdning af insekter

Joined workshop arranged by the National Food Institute DTU, University of Copenhagen, Danish Technological Institute together with the Ministry of Environment and Food of Denmark
Degree of recognition: National
Documents:
Kick off workshop program mm 21_03 2017

Related event

Kick off workshop om dansk insektindustri
A space infrastructure for the Arctic
Period: 20 Mar 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy
Description
Ships and other methods for surveillance of the Arctic regions.
Degree of recognition: National
Related event
Skibsteknisk Selskab: Ships and other methods for surveillance of the Arctic regions
20/03/2017 → 20/03/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Fremtidens katalyse
Period: 20 Mar 2017
Jakob Kibsgaard (Speaker)
Jane Hvoldbæk Nielsen (Speaker)
Department of Physics
Experimental Surface and Nanomaterials Physics
Documents:
SCIENCE_FILM FORUM_2017PROGRAM
Related event
CPH:DOX - SCIENCE:FILM FORUM
20/03/2017 → ...
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

National Veterinary Research Institute
Period: 20 Mar 2017 → 14 Apr 2017
Ann Sofie Olesen (Visiting researcher)
National Veterinary Institute
Virology
Activity: Visiting an external institution › Visiting another research institution

Burden of disease and source attribution
Period: 16 Mar 2017
Tine Hald (Lecturer)
National Food Institute
Research Group for Genomic Epidemiology
Description
Teaching vet students at the One Health differentiation
Degree of recognition: Local
Related external organisation
University of Copenhagen
Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Copenhagen Bioscience Lectures 2017 - March**
Period: 16 Mar 2017
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

*Related event*

**Copenhagen Bioscience Lectures 2017 - March: Personalized medicine**
16/03/2017 → 16/03/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Copenhagen Bioscience Lectures 2017 - March**
Period: 16 Mar 2017
Eric van der Helm (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

*Related event*

**Copenhagen Bioscience Lectures 2017 - March: Personalized medicine**
16/03/2017 → 16/03/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Copenhagen Bioscience Lectures 2017 - March**
Period: 16 Mar 2017
Mari Cristina Rodriguez de Evgrafov (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Links:

*Related event*

**Copenhagen Bioscience Lectures 2017 - March: Personalized medicine**
16/03/2017 → 16/03/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Levedygtige økologiske kalve**
Period: 15 Mar 2017
Heidi Huus Petersen (Participant)
National Veterinary Institute

*Related event*

**Levedygtige økologiske kalve**
15/03/2017 → 15/03/2017
Tjele, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Member of Evaluation Tribunal. (Event)
Period: 15 Mar 2017 → 15 Jul 2017
José Soler (Participant)
Department of Photonics Engineering
Networks Technology and Service Platforms

Description

Related event
Member of Evaluation Tribunal. : PhD Thesis
15/03/2017 → 15/07/2017
Madrid, Spain
Activity: Membership › Membership in review committee

Mod det uendelige Univers / Kosmisk stråling
Period: 15 Mar 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy

Description
Foredrag på Folkeuniversitetet
Degree of recognition: Regional
Documents:
Kosmiske stråler FU 2017

Related event
Mod det uendelige Univers: Kosmist Stråling
15/03/2017 → 15/03/2017
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Webinar: Recovery of Operations from Cyberattacks - a structure for response
Period: 15 Mar 2017
Daniel Alberto Sepúlveda Estay (Speaker)
Department of Management Engineering
Management Science
Transport DTU

Description
Cyber attacks on supply chains are a constant threat to organizations. News media are regularly reporting cyber attacks to supply chains that result in data theft or denial of service. Examples abound, such as the theft of credit card data for 70 million customers from Target in 2013, and a sophisticated distributed attack that blocked the websites of major companies in the east-US such as Amazon, Starbucks and PayPal, during most the 21st of October 2016. Although relevant, this coverage often overshadows cyber-attacks that affect supply chain operations, which continue to occur without media attention. This is giving hackers free range to refine and practice their techniques for increased penetration and damage, resulting in a whole different range of disruptions such as container theft, intervention of plant operation, or misallocation of payments, for example. The MIT Center for Transportation & Logistics (CTL) will host a webinar to address hacker-related vulnerabilities in supply chain operations. At the root of this problem lies the structure of data exchanges between supply chain partners. Key questions for supply chain managers include: How does your supply chain manage these data exchanges? How much are you assigning these problems to IT even though they have direct impact on operations? How does your supply chain prevent these attacks, or react when these attacks happen? Is your supply chain merely relying on external insurance, or do you understand how these exchanges can be designed and controlled in cases of attack for improved recovery? Dr. Jim Rice and Daniel Sepulveda, PhD student, will address these questions, and talk about research findings that offer a deeper understanding of the structures that supply chains can use to improve their response from hacker attacks so as to minimize operational disruption and allow a more efficient recovery.
Chairman: James Blanley Rice. Center for Transportation and Logistics at the Massachusetts Institute of Technology
News media are regularly reporting cyber attacks to supply chains that result in data theft or denial of service. Examples abound, such as the theft of credit card data for 70 million customers from Target in 2013, and a sophisticated distributed attack that blocked the websites of major companies in the east-US such as Amazon, Starbucks and PayPal, during most the 21st of October 2016. Although relevant, this coverage often overshadows cyber-attacks that affect supply chain operations, which continue to occur without media attention. This is giving hackers free range to refine and practice their techniques for increased penetration and damage, resulting in a whole different range of disruptions such as container theft, intervention of plant operation, or misallocation of payments, for example. The MIT Center for Transportation & Logistics (CTL) will host a webinar to address hacker-related vulnerabilities in supply chain operations. At the root of this problem lies the structure of data exchanges between supply chain partners. Key questions for supply chain managers include: How does your supply chain manage these data exchanges? How much are you assigning these problems to IT even though they have direct impact on operations? How does your supply chain prevent these attacks, or react when these attacks happen? Is your supply chain merely relying on external insurance, or do you understand how these exchanges can be designed and controlled in cases of attack for improved recovery? Dr. Jim Rice and Daniel Sepulveda, PhD student, will address these questions, and talk about research findings that offer a deeper understanding of the structures that supply chains can use to improve their response from hacker attacks so as to minimize operational disruption and allow a more efficient recovery.

Related event

[Webinar: Recovery of Operations from Cyberattacks - a structure for response](https://www.youtube.com/watch?v=zsmpjNRcIfI)  
15/03/2017 → …  
Cambridge, United States  
Activity: Talks and presentations › Conference presentations

**29th Fungal Genetics Conference**  
Period: 14 Mar 2017 → 19 Mar 2017  
Jane Lind Nybo Rasmussen (Speaker)  
Department of Biotechnology and Biomedicine  
Network Engineering of Eukaryotic Cell factories  
Degree of recognition: International  
Documents:  
29FGC_Abstract_Book  
Links:  
http://www.genetics-gsa.org/fungal/2017/

Related event

**29th Fungal Genetics Conference**  
14/03/2017 → 19/03/2017  
Pacific Grove, United States  
Activity: Talks and presentations › Conference presentations

**A DTU researcher's experiences**  
Period: 14 Mar 2017  
Christine Ipsen (Speaker)  
Department of Management Engineering  
Management Science  
Implementation and Performance Management  

Related event
Introduction to DTU - Welcome seminar
14/03/2017 → 14/03/2017
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Annual Design Society Board of Management and Advisory Board Meeting (Event)
Period: 13 Mar 2017 → 17 Mar 2017
Anja Maier (Participant)
Copenhagen Center for Health Technology
Department of Management Engineering
Engineering Systems

Description
Annual Design Society Board of Management and Advisory Board Meeting
Degree of recognition: International
Links:
http://www.designsociety.org (Design Society)

Related event
Annual Design Society Board of Management and Advisory Board Meeting
13/03/2017 → 17/03/2017
Montreal, Canada
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

DCAMM 16th Internal Symposium
Period: 13 Mar 2017 → 15 Mar 2017
Christian Kim Christiansen (Participant)
Department of Mechanical Engineering
Center for Bachelor of Engineering Studies
Afdelingen for Maskin og Design

Related event
DCAMM 16th Internal Symposium
13/03/2017 → 15/03/2017
Middelfart, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Gravitationsbølger
Period: 13 Mar 2017
Søren Brandt (Speaker)
National Space Institute
Astrophysics and Atmospheric Physics
Degree of recognition: Regional

Related external organisation
Folkeuniversitetet i København
Læderstræde 34, 2, 1201, København, Denmark
Activity: Talks and presentations › Conference presentations

Zoonoseinteresengruppmøde
Period: 13 Mar 2017
Julia Christensen (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related event

Zoonoseinteresseringsgruppemøde
13/03/2017 → 13/03/2017
København
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Bloch simulation and MR fundamentals visualized
Period: 11 Mar 2017
Lars G. Hanson (Speaker)

Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance

Description
Invited talk
Degree of recognition: International
Documents:
MMCE2017_visualization
Links:
http://drcmr.dk/MR (Related content)

Related event

Magnetic Moments in Central Europe 2017
08/03/2017 → 12/03/2017
Budapest, Hungary
Activity: Talks and presentations › Conference presentations

Danish OIKOS Annual Meeting
Period: 10 Mar 2017 → 11 Mar 2017
Najmul Haider (Speaker)

National Veterinary Institute
Epidemiology

Description
Oral Presentation in The Danish OIKOS Annual Meeting 2017
Title: Vector-borne diseases transmission and microclimate
Authors: Najmul Haider, Carsten Kirkeby, Birgit Kristensen, Lene Jung Kjær, Jens Havskov Sørensen, Rene Bedker
Degree of recognition: Regional
Documents:
OIKOS2017_ScientificProgramme_ver2

Related event

Danish OIKOS Annual Meeting
10/03/2017 → 11/03/2017
Frederiksberg, Denmark
Activity: Talks and presentations › Conference presentations

IEEE Transactions on Dependable and Secure Computing (Journal)
Period: 10 Mar 2017 → 20 Mar 2017
José Soler (Reviewer)
Climate Adaptations
Period: 9 Mar 2017
Carlo Sass Sørensen (Speaker)
National Space Institute
Geodesy

Description
Invited speaker
Degree of recognition: National
Documents:
6_climate_adaptation_carlo_sass
Links:
http://workshop.copernicus.eu/denmark-info/session (Workshop homepage)
https://www.youtube.com/watch?v=VumSug7Yrws&feature=youtu.be (Talk)

Related event
Copernicus Training and Information Session in Denmark, Aarhus, 9 Mar 2017
09/03/2017 → 09/03/2017
Activity: Talks and presentations › Conference presentations

Forsyning 2020: Fremtid og forandring i forsyningssektoren
Period: 9 Mar 2017
Martin Rygaard (Invited speaker)
Department of Environmental Engineering
Urban Water Systems
Degree of recognition: National

Related event
Forsyning 2020: Fremtid og forandring i forsyningssektoren
09/03/2017 → 09/03/2017
Kolding, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Workshop for electromechanical and dielectric materials and devices
Period: 9 Mar 2017
Astri Bjørnetun Haugen (Organizer)
Hugh Simons (Organizer)
Department of Energy Conversion and Storage
Listening to music with a cochlear implant: Limitations and possible solutions
Period: 8 Mar 2017
Jeremy Marozeau (Invited speaker)
Sébastien Santurette (Invited speaker)
Department of Electrical Engineering
Hearing Systems

Description
Although the cochlear implant can restore the perception of speech in quiet environments remarkably well, CI users are still facing many challenges in order to perceive music. In this talk, we describe how musical dimensions (pitch, tempo, timbre,...) are affected by the sound processor and a few solutions that could be used to improve the enjoyment of music by CI users.

Links:
http://cfh.dk/6.-nordiske.html

Microbial processes in rapid sandfilters - removal of ammonium and organic micropollutants (pesticides)
Period: 8 Mar 2017
Hans-Jørgen Albrechtsen (Invited speaker)
Department of Environmental Engineering
Urban Water Systems
Degree of recognition: International

New Technologies and Innovative Solutions in the Danish Water Sector
07/03/2017 → 08/03/2017
Tallinn, Estonia
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Nordiske Konference - Hørelse, kognition, kommunikation
Period: 8 Mar 2017
Wiebke Lamping (Participant)
Steffen Spangmose Pedersen (Participant)
Department of Electrical Engineering
Hearing Systems

Description
Listening to music with a cochlear implant: Limitations and possible solutions
Although the cochlear implant can restore the perception of speech in quiet environments remarkably well, CI users are still facing many challenges in order to perceive music. In this talk, we describe how musical dimensions (pitch, tempo, timbre,...) are affected by the sound processor and a few solutions that could be used to improve the enjoyment of music by CI users.

Links:
http://cfh.dk/6.-nordiske.html

**Related event**

**Nordiske Konference - Høreise, kognition, kommunikation**
18/03/2015 → …
Fredericia, Denmark
Activity: Attending an event › Participating in or organising a conference

**Climate proofing our cities**
Period: 7 Mar 2017
Carlo Sass Sørensen (Speaker)
National Space Institute
Geodesy
Degree of recognition: Local
Links:
http://holstebrofolkeuniversitet.dk/

**Related external organisation**

**Holstebro, Danmark**
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Detection and characterization of nanoparticles in food**
Period: 7 Mar 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science
Description
Seminar
Degree of recognition: National

**Related external organisation**

**Sveriges Livsmedelsverk**
Sweden
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

**Zoonosestormøde**
Period: 7 Mar 2017
Julia Christensen (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition
Division of Food Microbiology
Division of Food Production Engineering
Section for Diagnostics and Scientific Advice
Degree of recognition: National

**Related event**

**Zoonosestormøde**
Cities research for District Heating Innovation
Period: 6 Mar 2017
Alfred Heller (Speaker)
Henrik Madsen (Speaker)
Centre for IT-Intelligent Energy Systems in Cities
Department of Civil Engineering
Department of Applied Mathematics and Computer Science

Description
Workshop on further development of district heatings after 4DH.
Henrik presented mathematical tools for district heating, and Alfred presented the Science Cloud for District Heating Innovation.
Documents:
Data Infrastruktur - Niras møde Århus marts 2017 - Alfred Heller

Related external organisation
NIRAS A/S
Denmark
Activity: Talks and presentations › Conference presentations

State of the art in Energy Informatics – opportunities and barriers
Period: 6 Mar 2017
Alexander Martin Tureczek (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: Local
Documents:
Presentation Vejle 6_3_17 - Alex-Final

Related event
Scale UP Denmark Camp
06/03/2017 → 06/03/2017
Vejle, Denmark
Activity: Talks and presentations › Conference presentations

Waldemir Santiago Neto
Start date: 3 Mar 2017 → 15 Sep 2017
Tine Hald (Host)
National Food Institute
Research Group for Genomic Epidemiology

Description
External research stay for PhD study
Degree of recognition: International
Activity: Hosting a guest lecturer

ESVAC annual network meeting
Period: 2 Mar 2017 → 3 Mar 2017
Valeria Bortolaia (Participant)
National Food Institute
Research Group for Genomic Epidemiology
Degree of recognition: International

Related event

ESVAC annual network meeting
01/03/2016 → 02/03/2016
London, United Kingdom
Activity: Attending an event › Participating in or organising a conference

Pathogenic organisms - no thanks: Use of next generation sequencing techniques in risk assessment and HACCP
Period: 2 Mar 2017
Lisbeth Truelstrup Hansen (Speaker)
National Food Institute
Research Group for Analytical and Predictive Microbiology
Degree of recognition: National

Related event

Mejeriforskningens Dag 2017: Mælk Ny viden og muligheder
02/03/2017 → 02/03/2017
Billund, Denmark
Activity: Talks and presentations › Conference presentations

Quality Risk Management, food safety & HACCP
Period: 2 Mar 2017
Tina Beck Hansen (Lecturer)
National Food Institute
Research Group for Microbial Food Safety

Description
gæsteundervisning

Related event

Course 28855 GMP and quality in pharmaceutical, biotech and food industry F17
02/02/2017 → 04/05/2017
Kgs. Lyngby, Denmark
Activity: Other

SRA Policy Forum: Risk Governance for Key Enabling Technologies
Period: 2 Mar 2017
Steffen Foss Hansen (Organizer)
Department of Environmental Engineering
Environmental Chemistry

Description
Chairman. Synthetic Biology Applications and State of Science. Risk Governance of Key Emerging Technologies. Venice, Italy, 1-3 March 2017
Degree of recognition: International

Related event

SRA Policy Forum: Risk Governance for Key Enabling Technologies
01/03/2017 → 03/03/2017
Venice, Italy
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Sustainable production of monomers via fermentation
Period: 2 Mar 2017
Vratislav Stovicek (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering

Description
invited talk
Degree of recognition: International

Related event
International Seminar on Biopolymers and Sustainable Composites
01/03/2017 → 02/03/2017
Valencia, Spain
Activity: Talks and presentations › Conference presentations

35th International Conference on the System Dynamics Society (Event)
Period: 1 Mar 2017 → 30 Apr 2017
Daniel Alberto Sepúlveda Estay (Reviewer)
Department of Management Engineering
Management Science

Description
2017 marks the 60th anniversary of the founding of the field of System Dynamics. It is thus fitting that we hold the 60th anniversary conference in Cambridge, next to the MIT campus where Jay Forrester developed the field. Today, System Dynamics is used around the world, from K-12 classrooms through doctoral programs, in scholarly research across many disciplines, and in applications from organizational change to climate change, from medicine to management. We will celebrate the accomplishments of the past six decades and explore future directions by showcasing the best work in dynamic modeling being done today.

There will be plenary presentations showcasing important work in the field, along with parallel and poster sessions, making available the most current research, applications, and work in progress. There is a full day of skill-building workshops covering a range of topics from basic software use to advanced analysis techniques. In addition, there will be interest group sessions, student colloquia, the modeling assistance workshop, vendor displays, demonstrations, and more. The conference schedule will provide time for social and professional interaction.

The Society’s annual international conference is held alternately in North America and Europe, with occasional appearances in Asia and the Pacific Rim. These conferences, and the meetings of local chapters and interest groups, introduce newcomers to the field, keep practitioners aware of current developments, and provide unparalleled networking opportunities.
Degree of recognition: International

Related event
35th International Conference on the System Dynamics Society
16/07/2017 → 20/07/2017
Cambridge, United States
Activity: Research › Peer review of manuscripts

ANSES - French Agency for Food, Environmental and Occupational Health & Safety (External organisation)
Period: 1 Mar 2017 → 1 Mar 2018
Maarten Nauta (Participant)
National Food Institute
Research Group for Risk-Benefit

Description
Member ANSES working group On Campylobacter Risk Assessment
Degree of recognition: National
Related external organisation

ANSES - French Agency for Food, Environmental and Occupational Health & Safety
France
Activity: Membership › Membership of research networks or expert groups

A pumping and tracer test in limestone with modeling interpretation – experiences and results
Period: 1 Mar 2017
Klaus Mosthaf (Speaker)
Bentje Brauns (Other)
Annika Sidelmann Fjordbøge (Other)
Jens Schaarup Sørensen (Other)
Bent Henning Skov (Other)
Flemming Møller (Other)
Mette Martina Broholm (Other)
Poul Løgstrup Bjerg (Other)
Philip John Binning (Other)
Niels D. Overheu (Other)
Anna Toft (Other)
Henriette Kerrn-Jespersen (Other)
Magnus Marius Rohde (Other)
Christian Helweg (Other)
John U. Bastrup (Other)

Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

Fagmøde: Forurening af kalkmagasiner
Period: 1 Mar 2017
Niels D. Overheu (Organizer)
Henriette Kerrn-Jespersen (Organizer)
Philip John Binning (Organizer)
Klaus Mosthaf (Organizer)
Annika Sidelmann Fjordbøge (Organizer)
Mette Martina Broholm (Organizer)
Poul Løgstrup Bjerg (Organizer)

Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Formidling af "kalkprojektet" & Introduction of the Limestone Wiki
Period: 1 Mar 2017
Klaus Mosthaf (Speaker)
Poul Løgstrup Bjerg (Speaker)
Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

Geopolitik i Arktis – konflikt eller samarbejde?
Period: 1 Mar 2017 → 8 Mar 2017
Jens Olaf Pepke Pedersen (Speaker)
National Space Institute
Innovation and Research-based consultancy

Description
Forelæsningsrække i Folkeuniversitetet Emdrup
Degree of recognition: Regional
Links:

Related external organisation

Folkeuniversitetet i Emdrup
Aarhus Universitet, Campus Emdrup, Tuborgvej 164, 2400, København NV, Denmark
Activity: Talks and presentations › Conference presentations

Hvor finder man forureningen ved Akacievej?
Period: 1 Mar 2017
Annika Sidelmann Fjordbøge (Speaker)
Klaus Mosthaf (Other)
Bentje Brauns (Other)
Poul Løgstrup Bjerg (Other)
Philip John Binning (Other)
Mette Martina Broholm (Other)
Henriette Kern-Jespersen (Other)
Anna Toft (Other)
Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

IEEE Communications Magazine (Journal)
Period: 1 Mar 2017 → 14 Mar 2017
José Soler (Reviewer)
Department of Photonics Engineering
**Networks Technology and Service Platforms**

**Description**
Peer Review. (Network Testing and Analytics Series)

**Related journal**

**IEEE Communications Magazine**
0163-6804
Central database
Activity: Research › Peer review of manuscripts

Period: 1 Mar 2017 → …
Jacob Østergaard (Reviewer)
Department of Electrical Engineering
Center for Electric Power and Energy
Degree of recognition: International

**Related journal**

**International Journal of Electrical Power & Energy Systems**
0142-0615
Central database
Activity: Research › Journal editor

**Journal of Intelligent Transportation Systems (Journal)**
Period: 1 Mar 2017 → 30 Mar 2017
José Soler (Reviewer)
Department of Photonics Engineering
Networks Technology and Service Platforms
Degree of recognition: International

**Related journal**

**Journal of Intelligent Transportation Systems**
1547-2450
Central database
Activity: Research › Peer review of manuscripts

**Kalkgeologi og transportprocesser samt intro til Akacievej**
Period: 1 Mar 2017
Mette Martina Broholm (Speaker)
Annika Sidelmann Fjordbøge (Other)
Klaus Mosthaf (Other)
Poul Løgstrup Bjerg (Other)
Peter Roll Jakobsen (Other)
Rasmus Jakobsen (Other)
Jens Galsgaard (Other)
Magnus Marius Rohde (Other)
Henriette Kern-Jespersen (Other)
Anna Toft (Other)
Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

Lyd - trådløs kommunikation i intelligent brugertilpasset design
Period: 1 Mar 2017 → 26 Apr 2017
Kaj Bjarne Jakobsen (Participant)
Department of Electrical Engineering
Electromagnetic Systems

Description

Lyd - trådløs kommunikation i intelligent brugertilpasset design

At være til gavn for samfundet er et af DTU’s mål og motto, og det virker højaktuelt, når det handler om teknologiudviklingen indenfor feltet trådløs kommunikation og moderne høreforskning. Ikke mindst set i lyset af at hver 6. person anslås at have et høretab i Danmark (og 37 mio. i Europa). Det er jo en størrelse som er til at forholde sig til.

Trådløs kommunikation og antenneudvikling og -specialisering indgår som vigtige elementer i moderne høreapparater og på DTU Elektro arbejdes der tæt med de danske høreapparatvirksomheder, som står for ca. 30 % af alle høreapparater i verden. Her kan man tale om high-end teknologier som tjener et reelt og nyttigt formål.


Kom og oplev udstillingen som spænder bredt; fra teoretiske illustrationer af hvad trådløs kommunikation kan i dag, fraktal antenner, smart phones teknologiers bidrag til høreapparater, m.m.

Interview person.
Degree of recognition: International
Links:
http://www.elektro.dtu.dk/Kalender/Arrangement?id=5651b779-d32b-41cd-838f-308ab6a7b7d5

Related event

Lyd - trådløs kommunikation i intelligent brugertilpasset design
01/03/2017 → 26/04/2017
Kgs. Lyngby, Denmark
Activity: Other

Modeller til strømning og stoftransport i kalk
Period: 1 Mar 2017
Poul Legstrup Bjerg (Speaker)
Klaus Mosthaf (Other)
Annika Sidelmann Fjordbøge (Other)
Mette Martina Broholm (Other)
Philip John Binning (Other)
Department of Environmental Engineering
Water Resources Engineering
Related event

**Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering**
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

**PhD assessment (Candidate from Deakin University, Australia)**
Period: 1 Mar 2017 → 28 Apr 2017
Christine Ipsen (External examiner)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Examiner
Degree of recognition: International
Activity: Examinations and supervision › Internal examination

**Riskovurdering af Akacievej**
Period: 1 Mar 2017
Poul Legendrup Bjerg (Speaker)
Klaus Mosthaf (Other)
Annika Sidellmann Fjordbøge (Other)
Philip John Binning (Other)
Mette Martina Broholm (Other)
Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

**Related event**

**Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering**
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

**Which data is most useful for the assessment of a contaminated limestone site? How can it be obtained?**
Period: 1 Mar 2017
Klaus Mosthaf (Speaker)
Bentje Brauns (Other)
Annika Sidellmann Fjordbøge (Other)
Jens Schaarup Sørrensen (Other)
Bent Henning Skov (Other)
Flemming Møller (Other)
Mette Martina Broholm (Other)
Poul Legendrup Bjerg (Other)
Philip John Binning (Other)
Niels D. Overheu (Other)
Anna Toft (Other)
Henriette Kern-Jespersen (Other)
Magnus Marius Rohde (Other)
Christian Helweg (Other)
John U. Bastrup (Other)
Department of Environmental Engineering
Water Resources Engineering
Degree of recognition: National

Related event

Fagmøde: Forurening af kalkmagasiner: Konceptuelle modeller, transport, spredningsprocesser og modellering
01/03/2017 → 01/03/2017
København, Denmark
Activity: Talks and presentations › Conference presentations

World Sustainable Energy Days 2017
Period: 1 Mar 2017 → 3 Mar 2017
Aristeidis Tsakiris (Speaker)
Department of Management Engineering
UNEP DTU Partnership
Documents:
Conference Programme WSED 2017
Conference Review WSED17

Related event

World Sustainable Energy Days 2017: Young Researchers Conference: Energy Efficiency
28/02/2017 → 03/03/2017
Wels, Austria
Activity: Talks and presentations › Conference presentations

Risikovurdering af fluorerede stoffer i fødevarekontaktmaterialer
Period: Feb 2017
Gitte Alsing Pedersen (Consultant)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Notat til Fødevarestyrelsen

Related external organisation

Fødevarestyrelsen (FVST)
Glostrup, Denmark
Activity: Public and private sector consultancy › Consultancy

INSEKTKBH - Community møde
Period: 28 Feb 2017
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety

Description
Future food - edible insects

Related event

INSEKTKBH - Community møde
28/02/2017 → …
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
**Lighting Research and Technology (Journal)**

Period: 28 Feb 2017 → …

Anders Thorseth (Reviewer)

Department of Photonics Engineering

Diode Lasers and LED Systems

Degree of recognition: International

**Related journal**

**Lighting Research and Technology**

1477-1535

BFI (2017): BFI-level 1, Scopus rating (2016): CiteScore 1.05 SJR 0.51 SNIP 1.373, ISI indexed (2013): ISI indexed yes, Web of Science (2017): Indexed yes

Central database

Activity: Research › Peer review of manuscripts

**Personlig power for AC'ør og ledere**

Period: 28 Feb 2017 → 28 Apr 2017

Heidi Huus Petersen (Participant)

National Veterinary Institute

Office for HR

**Related event**

**Personlig power for AC'ør og ledere**

28/02/2017 → 26/04/2017

Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Prediction of antibiotic resistance phenotypes from whole genome sequence data of clinically relevant bacteria**

Period: 27 Feb 2017 → 10 Jul 2017

Valeria Bortolaia (Main supervisor)

National Food Institute

Research Group for Genomic Epidemiology

**Description**

Bachelor project by Mohammed Nateqi

Degree of recognition: International

Activity: Examinations and supervision › Supervisor activities

**ASLO Aquatic Sciences Meeting 2017**

Period: 26 Feb 2017 → 3 Mar 2017

Urban Wünsch (Speaker)

National Institute of Aquatic Resources

Section for Marine Ecology and Oceanography

**Description**

AQUATIC SCIENCES MEETING

Degree of recognition: International

Links:


**Related event**

**ASLO Aquatic Sciences Meeting 2017: Mountains to the Sea**

26/02/2017 → 03/03/2017

Honolulu, United States
Coupled Cluster Strategies for Core Spectroscopies of Ground and Excited States
Period: 24 Feb 2017
Sonia Coriani (Speaker)
Department of Chemistry
Degree of recognition: International

Related event
The 57th Sanibel Meeting: The Theory Meeting for Theoreticians
19/02/2017 → 24/02/2017
St. St. Simons Island, GA, United States
Activity: Talks and presentations › Conference presentations

Epidemiology and control of Taenia solium in Africa
Period: 24 Feb 2017
Tine Hald (External examiner)
National Food Institute
Research Group for Genomic Epidemiology

Description
PhD thesis
Degree of recognition: International
Activity: Examinations and supervision › Internal examination

Social kapital netværksmøde 1 2017
Period: 24 Feb 2017
Kasper Edwards (Participant)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: National

Related event
Social kapital netværksmøde 1 2017: vad hedder social kapital andre steder? Og hvad kan vi lære af det?
24/02/2017 → …
Høje Taastrup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

First meeting of the One Health Network on Antimicrobial Resistance
Period: 23 Feb 2017
Valeria Bortolaia (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Related event
First meeting of the One Health Network on Antimicrobial Resistance
23/02/2017 → 23/02/2017
Activity: Attending an event › Participating in or organising a conference

Single particle ICP-MS for the detection of inorganic nanoparticles in food and biological samples
Period: 23 Feb 2017
Katrin Löschner (Speaker)
National Food Institute
Research Group for Nano-Bio Science

Description
Inductively coupled plasma-mass spectrometry in single particle mode (single particle ICP-MS) has become a frequently used method for the detection and characterization of inorganic nanoparticles. The technique has been applied in our laboratory for studying inorganic nanoparticles in a variety of biological samples, including rat lung and liver tissue (gold and cerium oxide NPs), whale brain and liver tissue (mercury selenide NPs), human synovial fluid (cobalt and chromium-containing NPs) and human placenta tissue (silver NPs). Furthermore, food-related samples were investigated including lean chicken meat (silver NPs), game meat (lead NPs), food simulants (silver NPs), and noodles (aluminum-containing NPs).

We identified sample preparation as the most crucial step, especially in the case of solid / semi-solid matrices where simple dilution is not sufficient. As single particle ICP-MS analysis is not as sensitive as other analytical techniques, like field flow fractionation, to eventually remaining matrix residues, complete digestion of the matrix is usually not required. The main challenge is to minimize changes of the NPs during sample preparation mainly due to dissolution. For the majority of examples, we identified enzymatic digestion as the most suitable sample preparation method.

Our experiences show that single particle ICP-MS is a powerful screen method for the presence of NPs, but that care has to be taken with regards to false-positive-results and the obtained quantitative information in terms of particle size distribution and number / mass concentration. False positive results were obtained for two reasons: 1) Induced particle formation during sample preparation, e.g. from ionic species and 2) carry-over. For the latter case, we observed that analysis of ultrapure water between samples was not sufficient for evaluating carry-over, but that a realistic reagent or blank sample needs to be analyzed. Matrix-matching of calibration solutions was not possible in every case due to instability of the ionic species. In these cases, ionic standards had to be analyzed in ultrapure water or diluted acidic acid. Based on our experiences, the talk will highlight the challenges and the “lessons learned” in relation to sample preparation for single particle ICP-MS, determination of transport efficiency, calibration, and data interpretation, and the next steps in the current and future work described.

Degree of recognition: International

Related event
European Winter Conference on Plasma Spectrochemistry
19/02/2017 → 24/02/2017
Sankt Anton am Arlberg, Austria
Activity: Talks and presentations › Conference presentations

29. Irseer Naturstofftage
Period: 22 Feb 2017 → 24 Feb 2017
Tilmann Weber (Participant)
Kai Blin (Participant)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: National

Related event
29. Irseer Naturstofftage: Aktuelle Entwicklungen in der Naturstoff-Forschung
22/02/2017 → 24/02/2017
Irsee, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

CHO cell factory engineering, for working towards improved production of therapeutic proteins. 7th Cell Culture World Congress. Munich, Germany.
Period: 22 Feb 2017
Helene Fastrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
Degree of recognition: International

Related event
Minikursus: Brug af ComBase i brødindustrien
Period: 22 Feb 2017
Tina Beck Hansen (Lecturer)
National Food Institute
Research Group for Microbial Food Safety
Related external organisation
Lantmännen Unibake Denmark A/S
Oensvej 28, Hatting, 8700, Horsens, Denmark
Activity: Talks and presentations › Conference presentations

Descriptive study of antibiotic resistance and resistance determinants in indicator E. coli from Danish and imported meat and Danish animals using whole genome sequencing (WGS) and phenotypic resistance determination
Period: 21 Feb 2017
Tine Hald (Supervisor)
National Food Institute
Research Group for Genomic Epidemiology
Description
Supervisor and co-examiner of Master thesis, Master in Food Quality and Safety
Degree of recognition: National
Activity: Examinations and supervision › Supervisor activities

Er der en sammenhæng mellem opfyldelse af Måltidsmærkets krav og kundernes indtag? Fremlæggelse ved Fødevarestyrelsens samarbejdsgruppe
Period: 21 Feb 2017
Anne Dahl Lassen (Consultant)
National Food Institute
Division of Risk Assessment and Nutrition
Related external organisation
Fødevarestyrelsen
Vejle, Denmark
Activity: Public and private sector consultancy › Consultancy

Application of microbial cell factories for the production and modification of bioactive compounds
Period: 17 Feb 2017
Sailesh Malla (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
iLoop
Degree of recognition: Local
Related event
Application of microbial cell factories for the production and modification of bioactive compounds
17/02/2017 → …
Nepal
Activity: Talks and presentations › Conference presentations
Time Series Analysis (02417)
Period: 17 Feb 2017
Anders Stockmarr (Speaker)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

Related organisation

Time Series Analysis (02417)
Stockmarr, A. (Speaker)
17 Feb 2017
Activity: Talks and presentations › Conference presentations

R for begyndere
Period: 14 Feb 2017
Julia Christensen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Related event

R for begyndere
14/02/2017 → 14/02/2017
København
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Deakin University
Period: 13 Feb 2017 → 3 Mar 2017
Susanne Brix Pedersen (Visiting researcher)
Department of Biotechnology and Biomedicine
Disease Systems Immunology
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

Regulation and Policies on Electricity Markets
Period: 13 Feb 2017
Klaus Skytte (Speaker)
Department of Management Engineering
Systems Analysis

Description
Lecture 3 in "31761 - Renewables in Electricity Markets"
13 February 2017, DTU Elektro
Documents:
Lecture3_Regulation-policy-2017

Related organisation

Regulation and Policies on Electricity Markets
Skytte, K. (Speaker)
13 Feb 2017
Activity: Talks and presentations › Conference presentations

The production and modification(s) of natural products or secondary metabolites: A sustainable approach using microbial cell factories.
Period: 11 Feb 2017
Sailesh Malla (Participant)
Novo Nordisk Foundation Center for Biosustainability

iLoop
Degree of recognition: National

Related event

The production and modification(s) of natural products or secondary metabolites: A sustainable approach using microbial cell factories. : Natural product and Drug Discovery
11/02/2017 → 11/02/2017
Kirtipur, Nepal
Activity: Attending an event › Participating in or organising a conference

Plandage 2017
Period: 10 Feb 2017
Kåre Hendriksen (Invited speaker)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

Description
Samfundsmæssige vækstpotentialer
Degree of recognition: National

Related event

Plandage 2017
09/02/2017 → 12/02/2017
Nuuk, Greenland
Activity: Talks and presentations › Conference presentations

DTU CEN - Elektronnanoskopi i verdensklasse
Period: 9 Feb 2017
Christian Danvad Damsgaard (Lecturer)
Jakob Birkedal Wagner (Lecturer)
Department of Physics
Center for Electron Nanoscopy
DTU Danchip
Experimental Surface and Nanomaterials Physics

Description
Kom med IDA Mechanical København på besøg hos Center for Elektronnanoskopi (CEN) på DTU og hør hvordan verdens mest avancerede mikroskoper fungerer, og hvordan man kan se noget, der er mindre end lysets bølgelængde.

CEN blev indviet i december 2007 og er et af verdens mest avancerede laboratorier for elektronmikroskopi. Centeret råder over både skanning elektron mikroskoper (SEM) og transmission elektron mikroskoper (TEM), og mikroskoperne er hver i sær udstyret med yderligere udstyr der fx gør det muligt at bearbejde prøverne med en ion stråle eller nedfrosset kryogen tilstand.

Program:
IDA Mechanical, København, inviterer til en spændende aften hos Center for Elektronnanoskopi (CEN) på DTU, hvor vi får:
•En introduktion til centeret og dets historie
•En beskrivelse af de otte elektronmikroskoper, og hvad de hver især kan benyttes til
•Et overblik over hvilken forskning centeret arbejde med, og hvorfor det er så vigtigt, at kunne undersøge prøver på nanoskala.
•En rundvisning på faciliteterne.
Degree of recognition: Local

Related external organisation

The Danish Society of Engineers, IDA
Kalvebod Brygge 31-33, DK-1780, Copenhagen V, Denmark
**Vurdering af den evidens Graudal fremmægger i Ugeskrift for læger i januar 2017, fremmægelse ved Saltpartnerskabsmøde**

Period: 9 Feb 2017  
Anne Dahl Lassen (Consultant)  
National Food Institute  
Division of Risk Assessment and Nutrition  
Degree of recognition: National  

**Related external organisation**  
Fødevarestyrelsen  
Denmark  

**Solutions to Practical Challenges in Developing Procedures for Nanoparticle Characterization and Toxicological Testing**  
Period: 8 Feb 2017  
Katrin Löschner (Lecturer)  
National Food Institute  
Research Group for Nano-Bio Science  

**Description**  
In large-scale scientific projects where nanomaterials need to be investigated by a number of research groups with different scientific background it is necessary to assure that all preparation and subsequent characterization procedures are as harmonized and inter-calibrated as possible. One major challenge is the preparation of stock dispersions from nanomaterials provided as powders as distinct dispersion procedures may introduce variability in the toxicity or characteristics that are measured. Stock dispersions are used in a variety of toxicological tests where aliquots of the stock suspension are typically added to the relevant test medium, e.g. cell culture medium. Furthermore, stock dispersions are required for particle characterization, as many techniques, like dynamic light scattering, laser diffraction, analytical ultracentrifugation, nanoparticle tracking analysis, are only able to measure aqueous samples. In order to obtain meaningful results and to allow cross-comparison of different toxicity and characterization tests and assays, it is therefore crucial to develop efficient and reproducible dispersion procedures. These harmonized and standardized protocols have not only to be efficient, but also be feasible in the majority of test laboratories. Common limitations include the availability of dispersion equipment in the involved laboratories and the access to analytical equipment for characterizing and checking the quality of the dispersions. Further a compromise has to be found regarding, the (maximum) concentration of the stock dispersion, the resulting stock dispersion volume, and the composition of the dispersion medium, because of the variety of (eco)toxicology tests with each having specific requirements. The presentation will summarize the major challenges and the corresponding solutions of the NANOSOLUTIONS project with regards to stock dispersion preparation. As a specific example the development of a common dispersion procedure for copper oxide nanoparticles with different surface functionalization (ammonium, carboxylate, or polyethylene glycol) will be presented. For this nanomaterial, a dispersion SOP was developed which included a calorimetric method for calibration of the delivered acoustic energy by adjustment of the probe-sonicator amplitude. Additionally, an SOP was established that described the conduction of dynamic light scattering (DLS) measurements for determination of hydrodynamic size and size-distribution of the nanoparticles in the final stock dispersion. The SOPs were tested by ten laboratories. In most cases deviations of the determined sizes could be explained with deviations from the procedure described in the SOP. The performed work showed that it is possible to obtain comparable stock dispersions in different laboratories if carefully prepared SOPs are provided which consider the most important parameters that influence the dispersion process and the following characterization step. Acknowledgements: The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 309329.

**Related event**  
**New tools and approaches for nanomaterial safety assessment 2017**  
07/02/2017 → 09/02/2017  
Málaga, Spain  
Activity: Talks and presentations › Conference presentations  

**Tværoffentligt Seminar 2017 - om balanceret vækst**  
Period: 8 Feb 2017  
Kåre Hendriksen (Keynote speaker)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

Description
Parametre for landsplanarbejde
Degree of recognition: National

Related event
Tværoffentligt Seminar 2017 - om balanceret vækst
07/02/2017 → 08/02/2017
Nuuk, Greenland
Activity: Talks and presentations › Conference presentations

Smart City workshop between TUBerlin, NTNU and DTU
Period: 7 Feb 2017
Alfred Heller (Speaker)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities

Description
Science Hub for Cities - a common platform for city research (presentation)
Documents:
Alfred Heller et al.- NTNU-MTU-DTU, Nov 2015 (at DTU)

Related event
Smart City workshop between TUBerlin, NTNU and DTU
06/02/2017 → 07/02/2017
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Better Training for Safer Foods
Period: 6 Feb 2017 → 10 Feb 2017
Heddie Mejborn (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Training coordinator and tutor
Degree of recognition: International

Related event
Better Training for Safer Foods
06/02/2017 → 10/02/2017
Rome, Italy
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

High-throughput X-ray Astronomy in the eXTP era
Period: 6 Feb 2017 → 8 Feb 2017
Søren Brandt (Organizer)
National Space Institute
Astrophysics and Atmospheric Physics

Description
Member of the Scientific Organizing Committee
First Science Meeting dedicated to the high-throughput X-ray Astronomy and the eXTP mission.
Degree of recognition: International

Related event

High-throughput X-ray Astronomy in the eXTP era
06/02/2017 → 08/02/2017
Rome, Italy
Activity: Attending an event › Participating in or organising a conference

MODELING OF LI-ION BATTERY PACKS AS BASIS FOR DESIGN OF BATTERY THERMAL MANAGEMENT SYSTEMS
Period: 6 Feb 2017
Kurt Engelbrecht (External examiner)
Department of Energy Conversion and Storage

Electrofunctional materials

Description
External opponent on PhD thesis
Degree of recognition: National
Activity: Examinations and supervision › External examination

STECF Expert Working Group EWG-16-14 on Technical Measures
Period: 6 Feb 2017 → 10 Feb 2017
Lars O. Mortensen (Participant)
National Institute of Aquatic Resources
Section for Ecosystem based Marine Management

Description
STECF Expert Working Group EWG-16-14 on Technical Measures

Related event

STECF Expert Working Group EWG-16-14 on Technical Measures
06/02/2017 → 10/02/2017
Brussels
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

2017 IUVA Americas Conference
Period: 5 Feb 2017 → 8 Feb 2017
Waqas Akram Cheema (Speaker)
Department of Environmental Engineering

Water Technologies

Description
presented topic "Effect of UV treatment on formation of disinfection by-products in chlorinated seawater swimming pools"
Degree of recognition: International

Related event

2017 IUVA Americas Conference
05/02/2017 → 08/02/2017
Austin, United States
Activity: Talks and presentations › Conference presentations

Metrology for additively manufactured medical implants
Period: 3 Feb 2017 → 30 Apr 2017
Alessandro Stolfi (Participant)
Department of Mechanical Engineering
Manufacturing Engineering
Activity: Other

Miljøteknisk Topmøde
Period: 2 Feb 2017
Hans-Jørgen Albrechtsen (Participant)
Department of Environmental Engineering

Description
Miljøteknisk Topmøde

Related event
Miljøteknisk Topmøde: Vintermøde (Branchezorening Dansk Miljøteknologi)
02/02/2017 → 02/02/2017
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Miljøteknisk Topmøde
Period: 2 Feb 2017
Hans-Jørgen Albrechtsen (Participant)
Department of Environmental Engineering
Urban Water Systems

Description
Drikkevand - er den danske holdning til vandbehandling tidssvarende?

Related event
Miljøteknisk Topmøde: Vintermøde (Branchezorening Dansk Miljøteknologi)
02/02/2017 → 02/02/2017
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

European Conference on Networks & Communications (EuCNC 2017) (Publisher)
Period: 1 Feb 2017 → 20 Feb 2017
José Soler (Reviewer)
Department of Photonics Engineering
Networks Technology and Service Platforms

Description
Peer Review

Related Publisher
European Conference on Networks & Communications (EuCNC 2017)
Local database
Activity: Research › Peer review of manuscripts

Linköping University (External organisation)
Period: 1 Feb 2017 → 8 Mar 2017
Mogens Blanke (Member)
Department of Electrical Engineering
Automation and Control

Description
Member of evaluation committee, Dr. Ing. degree Jonas Linder,
Linköping University, Sweden
Evaluering af ernæringsanbefalinger til kantiner på arbejdspladser og ungdomssuddannelser 2016-2017 – Kvantitative data: Udbud, portions-størrelser, tallerkenspild og tilfredshed
Period: Jan 2017
Anne Dahl Lassen (Participant)
Lene Møller Christensen (Participant)
Anne Vibeke Thorsen (Participant)
Global pesticide application scenarios for use in life cycle assessment and in chemical substitution
Period: Jan 2017 → Jul 2017
Annette Petersen (Participant)

Global pesticide application scenarios for use in life cycle assessment and in chemical substitution
Period: Jan 2017 → Jul 2017
Peter Fantke (Participant)

ICED17: 21st International Conference on Engineering Design (Event)
Period: Jan 2017 → Aug 2017
Ole Broberg (Participant)

Implementation and Performance Management (IPM) Research Seminar
Period: Jan 2017
Giulia Nardelli (Organizer)

Related event
ICED17: 21st International Conference on Engineering Design
21/08/2017 → 25/08/2017
Vancouver, Canada
Activity: Membership › Membership in review committee

Links:
https://www.youtube.com/channel/UCkeqpi0GtS63MiiBLBWrEFg (Youtube channel of the IPM Research Seminar)
Related event

Implementation and Performance Management (IPM) Research Seminar
26/01/2017 → …
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

National Institute of Information and Communications Technology
Period: Jan 2017 → Jul 2017
Simon Rommel (Visiting researcher)
Department of Photonics Engineering
Metro-Access and Short Range Systems
Networks Technology and Service Platforms

Description
External research stay as part of the PhD at NICT's Photonic Network System Laboratory in Koganei, Tokyo, Japan.
Activity: Visiting an external institution › Visiting another research institution

Økologisk omstilling af offentlige køkkener under Økologisk Handlingsplan 2020 - Fastholdelse af økologiprocenter og brug af det økologiske spisemærke 1 år efter afslutningen af projekterne: Resultater fra den kvalitativ analyse
Period: Jan 2017
Anne Dahl Lassen (Participant)
Ellen Trolle (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Head: Anne Dahl Lassen
Degree of recognition: National
Activity: Other

Økologisk omstilling af offentlige køkkener under Økologisk Handlingsplan 2020 - Fastholdelse af økologiprocenter og brug af det økologiske spisemærke 1 år efter afslutningen af projekterne: Resultater fra den kvantitative analyse
Period: Jan 2017
Anne Dahl Lassen (Participant)
Ellen Trolle (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Head: Anne Dahl Lassen
Activity: Other

3D WindScanner - målinger af vind og turbulens omkring vindmøller, bygninger og broer
Period: 31 Jan 2017
Torben Krogh Mikkelsen (Invited speaker)
Department of Wind Energy
Meteorology & Remote Sensing

Description
Dansk Selskab for Bygningsstatik - medlemsmøde
Tirsdag d. 31. januar 2017, kl. 17:00 – ca. 18:30

Dansk Selskab for Bygningsstatik
**Related external organisation**

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations

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**Master i Fødevarekvalitet og - sikkerhed**

**Period:** 31 Jan 2017 → 28 Apr 2017

**Tine Hald (Lecturer)**

National Food Institute

Research Group for Genomic Epidemiology

**Description**

Tine Hald responsible for a module on Risk Assessment of Foodborne Hazards (9 ECTS)

Degree of recognition: National

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**University of Copenhagen**

Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

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**PhD Cup 2017**

**Period:** 31 Jan 2017

**Henrik Munch Roager (Participant)**

National Food Institute

Research Group for Gut Microbiology and Immunology

**Description**

PhD Cup er en formidlingskonkurrence

Documents:
Formidlingstekst

Links:
http://www.phdcup.dk/ph-d-cup-2017/deltagere/

Activity: Other

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**11th annual Danish Water Forum (DWF) 2017**

**Period:** 30 Jan 2017

**Camilla Tang (Speaker)**

Department of Environmental Engineering

Urban Water Systems

**Related event**

**11th annual Danish Water Forum (DWF) 2017**
30/01/2017 → 30/01/2017
Frederiksberg, Denmark
Activity: Talks and presentations › Conference presentations

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**31761 Renewables in Electricity Markets**

**Period:** 30 Jan 2017 → 8 May 2017

**Elliot Simon (Course lecturer)**

Department of Wind Energy

Meteorology & Remote Sensing

**Description**

Graduate Teaching Assistant with Professor Pierre Pinson

Degree of recognition: National
Bacterial factors determining changes in epidemiology of cephalosporin-resistant Escherichia coli in Danish poultry

Period: 30 Jan 2017 → 14 Jun 2017
Valeria Bortolaia (Main supervisor)
National Food Institute
Research Group for Genomic Epidemiology

Description
Bachelor project by Anna Mortensen
Degree of recognition: International
Activity: Examinations and supervision › Supervisor activities

Gæsteforelæsning ved Technion

Period: 27 Jan 2017
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design
Degree of recognition: International
Documents:
Slides

Related external organisation

Technion-Israel Institute of Technology
Israel
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Effects of industrial processing on regulated and emerging contaminant levels in seafood

Period: 26 Jan 2017
Rie Romme Rasmussen (Speaker)
National Food Institute
Research Group for Nano-Bio Science

Description
Abstract:

Contamination of food generally has a negative impact on the quality and may imply a risk to human health. Mercury (Hg) is one of the most hazardous compounds in our environment and is released from the earth’s crust by both natural and anthropogenic processes. The mercury species ‘methylmercury’ is highly toxic, because affects the function of enzymes, easily crosses the blood-brain and the placenta barriers and is toxic to the nervous system (especially the developing brain). It bioaccumulates and biomagnifies through the aquatic food chain. Methylmercury is the most common mercury species in fish and humans are also mainly exposed to methylmercury from consumption of fish and other seafood.

The aims of the present controlled fish feeding trials were to study the carryover from feed to fish fillets (at low spike levels (1x background level of methylmercury) and to determine toxicokinetic parameters.

The study included Atlantic salmon (Salmo salar), which is one of the main farmed seafood product consumed in Europe and with production in Northern Europe as well as European seabass (Dicentrarchus labrax) produced in Southern Europe, where it is a highly consumed seafood product.

The weight gain of the fish, their feed intake, feed and fish fillet contaminant level were determined to model the uptake
and elimination of methylmercury. The toxicokinetics for feed with low levels of methylmercury (41-75 ng/g) showed high assimilation and low elimination.

Acknowledgments: The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under the ECsafeSEAFOOD project (grant agreement n° 311820).

Keywords: Season, Toxic elements, Halogenated organic contaminants, Cold smoking, Cooking, Peeling

coauthors: Weronica Häland(1); Bodil Katrine Larsen(2); Michiel Kotterman(3); Jens-Jørgen Sloth(1); António Marques(4); Kit Granby (1) (1) Technical University of Denmark (DTU), National Food Institute (2) Technical University of Denmark (DTU), National Institute of Aquatic Resources, Section for Aquaculture (3) Wageningen Marine Research (4) Portuguese Institute for the Sea and Atmosphere (IPMA), Division of Aquaculture and Upgrading.

Documents:
Rasmussen RR_Mitigation_ECsafeSEAFOOD presented 20170126 - campusnet

Related event
Seafood Safety: New Findings & Innovation Challenges
25/01/2017 → 26/01/2017
Brussels, Belgium
Activity: Talks and presentations › Conference presentations

Venture Cup Denmark
Period: 26 Jan 2017
Angreine Kewo (Participant)
Department of Management Engineering
Systems Analysis

Description
http://venturecup.dk/venture-cup-challenge-finalists/

Green Tech category: EnergyVision Team

Related external organisation
Venture Cup Denmark
Porcelænshaven 7, 2000, Copenhagen, Denmark
Activity: Other

inVALUABLE kick-off meeting
Period: 25 Jan 2017 → 26 Jan 2017
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety

Description
INsect VALUe Chain in CircuLAr BioEconomy

Related event
inVALUABLE kick-off meeting
25/01/2017 → 26/01/2017
Aarhus, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Nordic zoonoses meeting Helsinki 2017
Period: 25 Jan 2017 → 26 Jan 2017
Birgitte Helwigh (Speaker)
Johanne Ellis-Iversen (Speaker)
National Food Institute
Related event

Nordic zoonoses meeting Helsinki 2017
25/01/2017 → 26/01/2017
Helsinki, Iceland
Activity: Talks and presentations › Conference presentations

Seafood Safety
Period: 25 Jan 2017 → 26 Jan 2017
Rie Romme Rasmussen (Participant)
National Food Institute
Research Group for Nano-Bio Science

Description
Final conference of the ECSafeSeaFood EU funded project.

Documents:
Seafood safety conference_Abstract book

Links:
http://www.ecsafeseafoodconference.com/

Related event

Seafood Safety: New Findings & Innovation Challenges
25/01/2017 → 26/01/2017
Brussels, Belgium
Activity: Attending an event › Participating in or organising a conference

Statistics
Period: 25 Jan 2017 → 26 Jan 2100
Anders Stockmarr (External examiner)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

Description
Exam in statistics at the publich health education programme, KU
Activity: Examinations and supervision › External examination

3rd Engineering Systems Design & Data Science: EuroTech Alliance DTU-TUM Workshop in Copenhagen
Period: 24 Jan 2017
Anja Maier (Organizer)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology

Description
3rd Engineering Systems Design & Data Science: EuroTech Alliance DTU-TUM Workshop in Copenhagen

Related event

3rd Engineering Systems Design & Data Science: EuroTech Alliance DTU-TUM Workshop in Copenhagen
24/01/2017 → 24/10/2017
Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Smart Meter Data Analyse - klassificering af elforbrugere, et review
Period: 24 Jan 2017
Alexander Martin Tureczek (Speaker)
Department of Management Engineering
Systems Analysis
Degree of recognition: National
Documents: symposium_i_anvendt_statistik_2017_orbit

Related event
Symposium i Anvendt Statistik 2017
23/01/2017 → 24/01/2017
Odense, Denmark
Activity: Talks and presentations › Conference presentations

Cochlear
Period: 23 Jan 2017 → 13 May 2017
Thomas Bentsen (Visiting researcher)
Department of Electrical Engineering
Hearing Systems
Description
Visiting Cochlear House, Melbourne during my external research stay
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

Colombiansk delegation
Start date: 23 Jan 2017 → 27 Jan 2017
Heidi Huus Petersen (Host)
National Veterinary Institute
Bacteriology & Parasitology
Degree of recognition: International
Activity: Hosting a guest lecturer

ENGAGE Interim meeting 2017
Period: 23 Jan 2017
Rene S. Hendriksen (Organizer)
National Food Institute
Research Group for Genomic Epidemiology
Description
ENGAGE Interim meeting 2017
Related event
ENGAGE Interim meeting 2017
23/01/2017 → 23/01/2017
Parma, Italy
Activity: Attending an event › Participating in or organising a conference

41st International Conference and Expo on Advanced Ceramics and Composites
Period: 22 Jan 2017 → 27 Jan 2017
Vincenzo Esposito (Organizer)
Department of Energy Conversion and Storage
Ceramic Engineering & Science

Description
14th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology
Links:
http://ceramics.org/icacc17-s3

Related event
41st International Conference and Expo on Advanced Ceramics and Composites
22/01/2017 → 27/01/2017
Florida, United States
Activity: Attending an event › Participating in or organising a conference

AMS 97th Annual Meeting
Period: 22 Jan 2017 → 28 Jan 2017
Elliot Simon (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing

Description
AMS2017: Lidar Applications to the Energy Sector
Documents:
AMS-presentation-elliot-simon-final
Elliot-AMS-Presentation-Recording
Links:
https://ams.confex.com/ams/97Annual/webprogram/Paper314118.html (Abstract and recorded presentation)

Related event
AMS 97th Annual Meeting: Eighth Conference on Weather, Climate, Water and the New Energy Economy
22/01/2017 → 27/01/2017
Seattle, United States
Activity: Talks and presentations › Conference presentations

AMS Renewable Energy Committee (External organisation)
Period: 22 Jan 2017 → …
Elliot Simon (Participant)
Department of Wind Energy
Meteorology & Remote Sensing
Degree of recognition: International

Related external organisation
AMS Renewable Energy Committee
45 Beacon Street, 02108, Boston, United States
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Ceramic processing of tubular, multilayered oxygen transport membranes (invited)
Period: 22 Jan 2017 → 27 Jan 2017
Astri Bjørnetun Haugen (Invited speaker)
Department of Energy Conversion and Storage
Ceramic Engineering & Science

Description
Pure oxygen gas supplied by ceramic oxygen transport membranes (OTMs) can facilitate reduced CO2 emissions through more efficient
gasification or combustion processes and easier CO2 capture and storage. For maximum oxygen flux and 100% selectivity, the active OTM layer should be thin and dense, and have a large and catalytically activated surface area. These requirements call for an asymmetric OTM design with a thin, dense OTM layer (~15 μm) sandwiched between two porous catalyst layers (~15 μm) and mechanically supported on a porous ceramic substrate (~1 mm). This talk pertains to our work at the Technical University of Denmark (DTU) related to processing such multilayered ceramic components with a tubular geometry, focusing on scalable process technologies. This includes thermoplastic extrusion to shape the porous, tubular support, deposition of thin dense and porous layers by dip coating, co-sintering of these layers, and infiltration of electrocatalysts. Material and processing considerations for two different combinations of materials in the multilayered components will be discussed, and performance of these components under laboratory testing and integrated in pilot-scale biomass gasifiers will be presented.

Degree of recognition: International
Documents:
Abstract_ICACC217

Related event

41st International Conference and Expo on Advanced Ceramics and Composites
22/01/2017 → 27/01/2017
Florida, United States
Activity: Talks and presentations › Conference presentations

Meeting in Samsø
Period: 22 Jan 2017
Tara Sabbagh Amirkhizi (Speaker)
Systems Analysis

Related organisation

Meeting in Samsø
Amirkhizi, T. S. (Speaker)
22 Jan 2017
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Thermo-mechanical properties of Metal-supported Solid Oxide Fuel Cells components
Period: 22 Jan 2017 → 27 Jan 2017
Francesca Teocoli (Speaker)
Department of Energy Conversion and Storage
Ceramic Engineering & Science

Description
41st Intl Conf & Expo on Advanced Ceramics & Composites (ICACC 2017)
Degree of recognition: International

Related external organisation

The American Ceramic Society
United States
Activity: Talks and presentations › Conference presentations

Molecular Microbial Community Interaction
Period: 20 Jan 2017 → 21 Jan 2017
Tilmann Weber (Participant)
Novo Nordisk Foundation Center for Biosustainability

New Bioactive Compounds

Related event

Molecular Microbial Community Interaction
20/01/2017 → 21/01/2017
Tübingen, Germany
Activity: Attending an event › Participating in or organising a conference

Predictive Food Microbiology
Period: 20 Jan 2017
Tina Beck Hansen (Internal examiner)
National Food Institute
Division of Food Microbiology

Description
Intern bedømmelse af 2 rapporter samt bedømmelse af projektpræsentation og 2 eksamensspørgsmål for 6 studerende.
Activity: Examinations and supervision › Internal examination

The next generation of 'omics-based natural products discovery
Period: 20 Jan 2017
Tilmann Weber (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

Related event

Molecular Microbial Community Interaction
20/01/2017 → 21/01/2017
Tübingen, Germany
Activity: Talks and presentations › Conference presentations

Kompetence projekt for rådgivere ved fødevareinstituttet
Period: 19 Jan 2017 → 20 Jan 2017
Birgitte Helwigh (Participant)
Birgitte Borck Høg (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International

Related event

Kompetence projekt for rådgivere ved fødevareinstituttet
01/11/2016 → 27/03/2017
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Kompetence projekt for rådgivere ved fødevareinstituttet
Period: 19 Jan 2017 → 27 Mar 2017
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety
NNF Centers Tenure Track Faculty meeting
Period: 19 Jan 2017
Tilmann Weber (Organizer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: Local
Related event
NNF Centers Tenure Track Faculty meeting
19/01/2017 → 19/01/2017
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Kampen om Arktis: Foredrag sammen med Kate Pepke Pedersen
Period: 18 Jan 2017
Jens Olaf Pepke Pedersen (Lecturer)
National Space Institute
Innovation and Research-based consultancy
Description
Arktis er kommet i fokus både internationalt og i Danmark. Vi vil se nærmere på de klimaændringer, der er sket og hvilke ressourcer, der er i Arktis. Dernæst vil vi se på de centrale aktører og hvad kampen om Arktis drejer sig om. Hvordan er mulighederne for konflikt eller samarbejde og hvad er Danmarks rolle heri?
Foredrag i Selskabet for Arktisk Forskning og Teknologi
Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Steering Committee meeting Water DTU
Period: 17 Jan 2017
Alfred Heller (Participant)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities
Description
Presentation of Science Cloud for Water DTU Steering Committee
Related event
Steering Committee meeting Water DTU
17/01/2017 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

V-SUSTAIN
Period: 17 Jan 2017
Jakob Kibsgaard (Participant)
Claudie Roy (Participant)
Ib Chorkendorff (Participant)
Department of Physics
Experimental Surface and Nanomaterials Physics

**Description**
Interview on The Villum Center for the Science of Sustainable Fuels and Chemicals (V-SUSTAIN)

**Related external organisation**
film bureauet ApS
c/o Freezone, Rosenborggade 17, 1130, København K., Denmark
Activity: Other

**ETH Zurich**
Period: 15 Jan 2017 → 31 May 2017
Florian Thams (Visiting researcher)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

**Description**
Academic Guest at the Power System Laboratory (PSL) working with Professor Hug.
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

**Technion-Israel Institute of Technology**
Period: 15 Jan 2017 → 21 Jan 2017
Mads Holten Rasmussen (Visiting researcher)
Department of Civil Engineering
Section for Building Design
Degree of recognition: International
Activity: Visiting an external institution › Visiting another research institution

**Collateral Resistance and Sensitivity Modulate Evolution of High-Level Resistance to Drug Combinations**
Period: 12 Jan 2017
Mari Cristina Rodriguez de Evgrafov (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

**Related external organisation**

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations

**Engineering Systems Design - International Research Seminar at DTU**
Period: 12 Jan 2017
Josef Oehmen (Organizer)
Anja Maier (Organizer)
Department of Management Engineering
Engineering Systems
Copenhagen Center for Health Technology

**Description**
Engineering Systems Design - International Research Seminar at DTU

Filippo Salustri (Ryerson University, Canada): “Three Monsters in design research: defining, formalizing, and visualizing -
an overview of 3 very difficult problems that still task us" Despite tremendous headway in developing a robust science of design, some aspects of “designing” remain beyond our grasp, especially insofar as those aspects overlap significantly with non-engineering design disciplines. This talk will review some of Fil Salustri’s efforts to clarify three of these aspects.

Michael Kokkolaras (McGill, Canada): “Rigorous practical optimization for simulation-based engineering design” Computational models have accelerated the engineering design optimization process. Simulation-related challenges have been mostly addressed by heuristics-based methods. This talk presents alternatives that are supported by convergence properties.

Georges Fadel (Clemson University, United States of America): “Evolving Designs using Affordances” The talk focusses on the adaptation of the theory of “affordances” from the field of perceptual psychology to better capture the perceived positive and negative interactions between the user and the artifact and use optimization to evolve designs.

Degree of recognition: International
Documents:
Research Seminar on Engineering Systems Design - Flyer
Links:
http://www.dtu.dk/english/service/calendar/2017/01/engineering-systems-design-international-research-seminar?id=e364fe90-47c5-4d80-88fc-07f70dc8b733

Related event

Engineering Systems Design - International Research Seminar at DTU
12/01/2017 → 12/01/2017
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Innovation System Foresight
Period: 12 Jan 2017
Per Dannemand Andersen (Speaker)
Technology and Innovation Management
Department of Management Engineering

Description
For several decades foresight has been a field of practice providing decision support for science, technology and innovation (STI) policy. Only recently has foresight begun to emerge as an academic field with contributions and contributors from many different traditional academic disciplines. The seminar will focus on the foundations of innovation system foresight, the practical challenges related to conducting innovation system foresight, and its possible policy implications. Professor Per Dannemand Andersen will draw on recent cases such as North Sea offshore wind services. He will also explore the difficulties scholars face when striving to contribute to both the academic development of the field and to STI policy practice.

CSTI Seminar Series IfM, Cambridge University

Related external organisation

Unknown external organisation
Activity: Talks and presentations › Conference presentations

Science for Environment Policy, Issue 480: A service from the European Commission (Journal)
Period: 12 Jan 2017
Ursula S. McKnight (Reviewer)
Department of Environmental Engineering
Water Resources Engineering
Documents:
Banned pesticides continue to affect toxicity in streams

Related journal

Science for Environment Policy, Issue 480: A service from the European Commission
Local database
Activity: Research › Journal editor
WP3 CITIES Workshop on 'Value creation by use of city data'
Period: 12 Jan 2017
Alfred Heller (Participant)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities
Description
Presentation of Science Cloud for Cities

Related event
WP3 CITIES Workshop on 'Value creation by use of city data'
12/01/2017 → …
Aarhus, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

WHO/PAHO Meeting on the Application of WHO Whole Genome Sequencing as a Tool to Strengthen FBD Surveillance and Response in Developing Countries
Period: 10 Jan 2017 → 13 Jan 2017
Rene S. Hendriksen (Participant)
National Food Institute
Research Group for Genomic Epidemiology
Description
WHO/PAHO Meeting on the Application of WHO Whole Genome Sequencing as a Tool to Strengthen FBD Surveillance and Response in Developing Countries
Washington DC, USA, 10-13 January 2017

Related event
WHO/PAHO Meeting on the Application of WHO Whole Genome Sequencing as a Tool to Strengthen FBD Surveillance and Response in Developing Countries
10/01/2017 → 13/01/2017
Washington DC, United States
Activity: Attending an event › Participating in or organising a conference

Applied Ergonomics (Journal)
Period: 9 Jan 2017 → 5 Feb 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management
Description
Review of Manuscript

Related journal
Applied Ergonomics
0003-6870
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 2.18 SJR 0.875 SNIP 1.662, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

National Research Council of Italy
Period: 9 Jan 2017 → 9 Mar 2017
Raphael Schneider (Visiting researcher)
Department of Environmental Engineering
Water Resources Engineering

Description
external research stay during PhD studies

External stay at the Hydrology Research Group of CNR IRPI in Perugia, Italy: http://hydrology.irpi.cnr.it/
Activity: Visiting an external institution › Visiting another research institution

PepTalk - The Protein Science Week
Period: 9 Jan 2017
Bjørn Gunnar Voldborg (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core
Degree of recognition: International

Related event
PepTalk - The Protein Science Week 2017
09/01/2017 → 13/01/2017
San Diego, United States
Activity: Talks and presentations › Conference presentations

Protein Purification at the CHO Cell Line Engineering and Design Department
Period: 8 Jan 2017
Stefan Kol (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core

Related event
Protein Purification at the CHO Cell Line Engineering and Design Department
09/01/2017 → 13/01/2017
San Diego, United States
Activity: Talks and presentations › Conference presentations

Teaching Assistant for course 15.871 Introduction to System Dynamics
Period: 7 Jan 2017 → 15 Apr 2017
Daniel Alberto Sepúlveda Estay (Participant)
Department of Management Engineering
Management Science
Transport DTU

Description
15.871 and 872 introduce you to system dynamics modeling for the analysis of business policy and strategy. You will learn to visualize a business organization in terms of the structures and policies that create dynamics and regulate performance. System dynamics allows us to create ‘microworlds,’ management flight simulators where space and time can be compressed, slowed, and stopped so we can experience the long-term side effects of decisions, systematically explore new strategies, and develop our understanding of complex systems. In these system dynamics courses we use simulation models, case studies, and management flight simulators to develop principles of policy design for successful management of complex strategies. Case studies of successful strategy design and implementation using system dynamics will be stressed. We consider the use of systems thinking to promote effective organizational learning. The principal purpose of modeling is to improve our understanding of the ways in which an organization’s performance is related to its internal structure and operating policies as well as those of customers, competitors, suppliers, and other stakeholders.

During the course students use several simulation models to explore such strategic issues as fluctuating sales, production
and earnings; market growth and stagnation; the diffusion of new technologies; the use and reliability of forecasts; the rationality of business decision making; and applications in health care, energy policy, environmental sustainability, and other topics.

Students learn to recognize and deal with situations where policy interventions are likely to be delayed, diluted, or defeated by unanticipated reactions and side effects. You will have a chance to use state of the art software for computer simulation and gaming. Assignments give hands-on experience in developing and testing computer simulation models in diverse settings.

Degree of recognition: National
Documents:
Syllabus for course 15.871 Introduction to System Dynamics
Activity: Other

Teaching Assistant for course 15.871 Introduction to System Dynamics
Period: 7 Jan 2017 → 15 Apr 2017
Daniel Alberto Sepúlveda Estay (Lecturer)
Bradley Morrison (Lecturer)
Department of Management Engineering
Management Science
Transport DTU

Description
15.871 and 872 introduce you to system dynamics modeling for the analysis of business policy and strategy. You will learn to visualize a business organization in terms of the structures and policies that create dynamics and regulate performance. System dynamics allows us to create ‘microworlds,’ management flight simulators where space and time can be compressed, slowed, and stopped so we can experience the long-term side effects of decisions, systematically explore new strategies, and develop our understanding of complex systems. In these system dynamics courses we use simulation models, case studies, and management flight simulators to develop principles of policy design for successful management of complex strategies. Case studies of successful strategy design and implementation using system dynamics will be stressed. We consider the use of systems thinking to promote effective organizational learning. The principal purpose of modeling is to improve our understanding of the ways in which an organization’s performance is related to its internal structure and operating policies as well as those of customers, competitors, suppliers, and other stakeholders.

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Students learn to recognize and deal with situations where policy interventions are likely to be delayed, diluted, or defeated by unanticipated reactions and side effects. You will have a chance to use state of the art software for computer simulation and gaming. Assignments give hands-on experience in developing and testing computer simulation models in diverse settings.

Degree of recognition: National
Documents:
Syllabus for course 15.871 Introduction to System Dynamics

Related external organisation
Massachusetts Institute of Technology
Cambridge, United States
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Vidensby Netværk for Klima og grøn teknologi
Period: 7 Jan 2017
Alfred Heller (Participant)
Department of Civil Engineering
Section for Building Energy

Description
IT infrastruktur for byer - Cloud, IoT i Lyngby, Vidensby Hub
Præsentation ved Vidensby Netværk for Klima og grøn teknologi

Related event

Vidensby Netværk for Klima og grøn teknologi
07/02/2017 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Statistical Genetics (02938)
Period: 6 Jan 2017 → 27 Jan 2017
Anders Stockmarr (Lecturer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

Description
Lected by Anders Stockmarr

Related event

Statistical Genetics
06/01/2017 → 27/01/2017
Kgs. Lyngby, Denmark
Activity: Other

Statistical Genetics (02950)
Period: 6 Jan 2017 → 14 Jan 2017
Anders Stockmarr (Lecturer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis

Related event

Statistical Genetics
06/01/2017 → 14/01/2017
Kgs. Lyngby, Denmark
Activity: Other

Det Nationale Forskningscenter for Arbejdsmiljø (Publisher)
Period: 5 Jan 2017 → 15 Apr 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management
Degree of recognition: National

Related Publisher

Det Nationale Forskningscenter for Arbejdsmiljø
Local database
Activity: Research › Peer review of manuscripts

Det Nationale Forskningscenter for Arbejdsmiljø (Publisher)
Period: 5 Jan 2017 → 15 Apr 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Review af rapport om Social kapital mellem teams
Degree of recognition: National

**Related Publisher**
Det Nationale Forskningscenter for Arbejdsmiljø
Local database
Activity: Research › Peer review of manuscripts

**Det Nationale Forskningscenter for Arbejdsmiljø (Publisher)**
Period: 5 Jan 2017 → 15 Apr 2017
Kasper Edwards (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Review af rapport om Forbindende social kapital
Degree of recognition: National

**Related Publisher**
Det Nationale Forskningscenter for Arbejdsmiljø
Local database
Activity: Research › Peer review of manuscripts

**LED possibilities and challenges**
Period: 2 Jan 2017
Anders Thorseth (Lecturer)
Department of Photonics Engineering
Diode Lasers and LED Systems

**Related event**
33480 High-Tech Entrepreneurship
02/01/2017 → 21/01/2017
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

**BLOXHUB (External organisation)**
Period: 1 Jan 2017
Christian Thuesen (Member)
Department of Management Engineering

**Description**
BLOXHUB scientific advisory board

**Related external organisation**
BLOXHUB
Fæstningens Materialgård, Frederikholms Kanal 30, 1220, København V, Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
Design Science Journal
Local database
Activity: Research › Journal editor

International Transactions on Electrical Energy System (Journal)
Period: 1 Jan 2017 → …
Jalal Kazempour (Editor)
Department of Electrical Engineering
Center for Electric Power and Energy
Electricity markets and energy analytics

Description
Member of Editorial Board

Related journal
International Transactions on Electrical Energy System
2050-7038
Scopus rating (2016): CiteScore 1.16 SJR 0.435 SNIP 0.709, Web of Science (2017): Indexed Yes

Central database
Activity: Research › Journal editor

Journal of Modern Power Systems and Clean Energy (Journal)
Period: 1 Jan 2017
Guangya Yang (Reviewer)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems
Degree of recognition: International

Related journal
Journal of Modern Power Systems and Clean Energy
2196-5625

Central database
Activity: Research › Journal editor

Molecular epidemiological studies of Campylobacter isolated from different sources in New Zealand between 2005 and 2015.
Period: 1 Jan 2017 → 4 Mar 2017
Tine Hald (External examiner)
National Food Institute
Research Group for Genomic Epidemiology

Description
PhD thesis
Degree of recognition: International
Activity: Examinations and supervision › Internal examination

Videreudvikling af Campylobacter smittekilderegnskabet
Period: 1 Jan 2017 → …
Julia Christensen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
11th ITEA Summer School. Universidad de Chile, Santiago
Period: 2016
Mogens Fosgerau (Lecturer)
Transport policy and behaviour
Department of Management Engineering

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

13th Deep Sea Offshore Wind R&D Conference
Period: 2016
Kasper Sandal (Participant)
Department of Wind Energy

Description
Poster presentation
Documents:
Deepwind2016_poster

Related event
13th Deep Sea Offshore Wind R&D Conference
20/01/2016 → 22/01/2016
Trondheim, Norway
Activity: Attending an event › Participating in or organising a conference

Period: 2016
David Aili (Speaker)
Department of Energy Conversion and Storage
Proton conductors

Description
Ternary alkaline polybenzimidazole-based electrolytes

Related event
13/06/2016 → 16/06/2016
Zaragoza, Spain
Activity: Talks and presentations › Conference presentations

25th European Conference of Information Systems (Event)
Period: 2016 → 2017
Giulia Nardelli (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Review of research papers
Degree of recognition: International
Related event

25th European Conference of Information Systems
05/06/2017 → 10/06/2017
Guimarães, Portugal
Activity: Research › Peer review of manuscripts

27th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) (Event)
Period: 2016 → …
Valeria Bortolaia (Member)
National Food Institute
Research Group for Genomic Epidemiology

Related event

27th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID)
22/04/2017 → 25/04/2017
Vienna, Austria
Activity: Membership › Membership in review committee

67th Annual Meeting of the International Society of Electrochemistry
Period: 2016 → …
Brian Seger (Organizer)
Department of Physics
Experimental Surface and Nanomaterials Physics

Description
Symposium Organizer (Symposium #18)

Related event

67th Annual Meeting of the International Society of Electrochemistry: Electrochemistry: from Sense to Sustainability
21/08/2016 → 26/08/2016
The Hague, Netherlands
Activity: Attending an event › Participating in or organising a conference

Advanced Microbiome and Metabolome Data Analysis (using QIIME and GNPS)
Period: 2016 → …
Lejla Imamovic (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Related event

Advanced Microbiome and Metabolome Data Analysis (using QIIME and GNPS)
16/06/2016 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Antibiotic induced transmission of antibiotic resistance in Escherichia coli
Period: 2016 → …
Valeria Bortolaia (Supervisor)
National Food Institute
Research Group for Genomic Epidemiology

Description
Co-supervision of PhD student Gang Liu, University of Copenhagen, Denmark
Degree of recognition: International
Activity: Examinations and supervision › Supervisor activities

**ASM Microbe 2016**
Period: 2016 → …
Lejla Imamovic (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

**Description**
ASM Microbe 2016

**Related event**
**ASM Microbe 2016**
16/06/2016 → …
Boston
Activity: Attending an event › Participating in or organising a conference

**Assessment committee PhD student Kira Janstrup (External organisation)**
Period: 2016
Mette Møller (Chairman)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

**Related external organisation**
**Assessment committee PhD student Kira Janstrup**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**Behavioral Science (Journal)**
Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

**Related journal**
**Behavioral Science**
Local database
Activity: Research › Peer review of manuscripts

**Biochemistry and Biophysics Reports (Journal)**
Period: 2016 → …
Silvia Bonomo (Reviewer)
National Food Institute

**Related journal**
**Biochemistry and Biophysics Reports**
Local database
Activity: Research › Peer review of manuscripts
**Chemical Processes and Materials (Journal)**
Period: 2016 → …
Steffen Foss Hansen (Reviewer)
Department of Environmental Engineering
Environmental Chemistry

**Description**
Associate Editor
Degree of recognition: International
Links:
http://chempm.org/ (Homepage of Chemical Processes and Materials)

**Related journal**

**Chemical Processes and Materials**
Local database
Activity: Research › Journal editor

**Continuing education coordinator at DTU Environment**
Period: 2016 → …
Steffen Foss Hansen (Lecturer)
Department of Environmental Engineering
Environmental Chemistry
Degree of recognition: Local
Links:
http://www.env.dtu.dk/english/Teaching/Continuing-Education (DTU Environment's Continuing education website)
Activity: Other

**Contribution to Trap Danmark**
Period: 2016 → 2017
Carlo Sass Sørensen (Lecturer)
National Space Institute
Geodesy

**Description**
Written contribution to Trap Danmark on coasts as expert in the subject in volumes 3, 4, 5 & 6.
Degree of recognition: National
Links:
https://trap.dk/ (Homepage for 6th edition of Trap Danmark)

**Related external organisation**

**Trap Danmark**
Agern Allé 13, 2970, Hørsholm, Denmark
Activity: Other

**Cost efficient Quality Management in Microbreweries**
Period: 2016
Axel Grøndahl Kristiansen (Invited speaker)
Center for Bachelor of Engineering Studies
Afdelingen for Byggeri og Infrastruktur
Afdelingen for El-teknologi
Afdelingen for Forretningsudvikling
Afdelingen for Informatik
Afdelingen for Maskin og Design
Afdelingen for Produktionsudvikling

Description
A guide is offered how to provide basic Quality Assurance and - Management even for the smallest Breweries with limited economic resources.
Documents:
21 Cost efficient QM in microbreweries agk

Related event
Nordic Meeting on Brewing Technology
19/05/2016 → 21/05/2016
Finland
Activity: Talks and presentations › Conference presentations

Creating novel chemical-producing yeast cell factories via synthetic biology
Period: 2016
Irina Borodina (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering

Related event
ICY2016 - 14th International Congress on Yeasts
Hyogo, Japan
Activity: Talks and presentations › Conference presentations

Creating yeast cell factories for bio-based chemicals via synthetic biology
Period: 2016
Irina Borodina (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering

Related event
Genetics of Industrial Microorganisms 2016: The 1st Conference of Chinese Key Laboratories for Microbiology and Biotechnology
16/10/2016 → 20/10/2016
Wuhan, China
Activity: Talks and presentations › Conference presentations

Cyklist sikkerhed
Period: 2016
Mette Møller (Organizer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Description
Sessionsleder
Related event

**Cyklist sikkerhed**
23/08/2016 → 23/08/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Dansk Standard (External organisation)**
Period: 2016 → …
Guangya Yang (Participant)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

**Description**
Committee S-508: System aspects of electrical energy supply

**Related external organisation**

**Dansk Standard**
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**Departementet for Kommuner, Bygder, Yderdistrikter, Infrastruktur og Boliger, Grønlands Selvstyre (External organisation)**
Period: 2016 → …
Kåre Hendriksen (Chairman)
Department of Civil Engineering
ARTEK, Section for Arctic Engineering and Sustainable Solutions

**Description**
Nautisk udvalg, Departementet for Kommuner, Bygder, Yderdistrikter, Infrastruktur og Boliger, Grønlands Selvstyre
Degree of recognition: National
Documents: 
Nautisk Udvalg - kontaktpersoner -aug 2017

**Related external organisation**

**Departementet for Kommuner, Bygder, Yderdistrikter, Infrastruktur og Boliger, Grønlands Selvstyre**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

**Design of large composite structures**
Period: 2016
Philipp Ulrich Haselbach (Lecturer)
Department of Wind Energy

**Related external organisation**

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations

**Dietary habits in Denmark now and in the future (In Danish)**
Period: 2016
Jeppe Matthiessen (Speaker)
National Food Institute
Division of Risk Assessment and Nutrition

**Description**
Nutrition focus meeting. Danish Agriculture & Food Council, Copenhagen, Denmark
Degree of recognition: National

Related external organisation

Danish Agriculture and Food Council
Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Direct use of biogas in SOFC
Period: 2016
Anke Hagen (Other)
Department of Energy Conversion and Storage
Applied Electrochemistry

Description
Kandidatspeciale
Coordinated by Anke Hagen
Activity: Other

EBSD 2016 Dresden
Period: 2016
Annika Martina Diederichs (Speaker)
Department of Mechanical Engineering
Materials and Surface Engineering

Description
study of microstructure heterogenization in rolling contact fatigue of 100Cr6 bearings

Related event

EBSD 2016 Dresden
30/03/2016 → ...
Activity: Talks and presentations › Conference presentations

Editorial Advisory Board - Preventive Veterinary Medicine, Elsevier (External organisation)
Period: 2016 → ...
Johanne Ellis-Iversen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International

Related external organisation

Editorial Advisory Board - Preventive Veterinary Medicine, Elsevier
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

EFSA Nanotechnology Network (External organisation)
Period: 2016 → 2018
Katrin Löschner (Participant)
National Food Institute
Research Group for Nano-Bio Science
Degree of recognition: International

Related external organisation

EFSA Nanotechnology Network
Activity: Membership › Membership of research networks or expert groups
ELLEA1: Isotropic Layered Elasticity in Excel: Pavement analysis tool for students and engineers
Period: 2016
Eyal Levenberg (Other)
Department of Civil Engineering
Section for Geotechnics and Geology

Description
ELLEA1 (ver. 0.96) performs real time computation of stresses, strains and displacements in a layered elastic half-space due to two uniformly loaded circular areas applied at the surface (Excel 2016 spreadsheet). Five fully bonded layers are considered, each weightless, homogenous, and isotropic.
Documents:
ELLEA1(ver0.96)

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

ELLVA1: Isotropic Layered Viscoelasticity in Excel (moving load): Advanced pavement analysis tool for students and engineers
Period: 2016
Eyal Levenberg (Other)
Department of Civil Engineering
Section for Geotechnics and Geology

Description
ELLVA1 (Ver 0.83) computes stresses, strains and displacements in a layered viscoelastic half-space due to a single, uniformly loaded, circular area that is moving with constant speed along a straight line. Five fully bonded weightless, homogeneous, and isotropic layers are considered. Developed by Dr. Eyal Levenberg, Technion-DTU, July 2016.
Documents:
ELLVA1(ver 0.83)

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

ELSEVIER (Publisher)
Period: 2016
Vincenzo Esposito (Editor)
Ceramic Engineering & Science
Department of Energy Conversion and Storage

Description
Metal Oxide-Based Thin Film Structures
Degree of recognition: International
Links:
https://www.elsevier.com/books/metal-oxide-based-thin-film-structures/pryds/978-0-12-810418-7

Related Publisher
ELSEVIER
Local database
Activity: Research › Series editor

EU COST Association (External organisation)
Period: 2016 → …
Susan Løvstad Holdt (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
External Expert in the remote evaluation, EU COST Association
Degree of recognition: International

Related external organisation
EU COST Association
Activity: Membership › Membership of research networks or expert groups

EuroFM (External organisation)
Period: 2016 → …
Giulia Nardelli (Participant)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Jury member for the Partner for Innovation (P4I) Award, European Facilities Management Network
Degree of recognition: International
Links:
http://www.eurofm.org/index.php/eurofm-awards/partners-for-innovation-award (Partner for Innovation Award, EuroFM Network)

Related external organisation
EuroFM
Activity: Membership › Membership in review committee

European Committee on Antimicrobial Susceptibility Testing (External organisation)
Period: 2016 → …
Valeria Bortolaia (Member)
National Food Institute
Research Group for Genomic Epidemiology

Description
EUCAST Subcommittee on MIC distributions and ECOFFs. European Committee on Antimicrobial Susceptibility Testing (EU)

Related external organisation
European Committee on Antimicrobial Susceptibility Testing
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

European *Journal of Transport and Infrastructure Research (Journal)
Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related journal
European Journal of Transport and Infrastructure Research
Local database
Activity: Research › Peer review of manuscripts

Genome-wide Association Studies and Comparative Genomics for Tracking Multi-resistant and Hypervirulent Bacterial Clones
Period: 2016 → …
Lejla Imamovic (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Related event
Genome-wide Association Studies and Comparative Genomics for Tracking Multi-resistant and Hypervirulent Bacterial Clones
17/06/2016 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Human Factors and Ergonomics in Manufacturing (Journal)
Period: 2016 → …
Ole Broberg (Editor)
Department of Management Engineering
Production and Service Management
Engineering Systems Group

Description
Human Factors and Ergonomics in Manufacturing & Service Industries
Associate Editor

Related journal
Human Factors and Ergonomics in Manufacturing
1090-8471
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 1.13 SJR 0.344 SNIP 0.744, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Journal editor

ICES - Herring Assessment Working Group - HAWG (External organisation)
Period: 2016
Lars O. Mortensen (Participant)
National Institute of Aquatic Resources
Section for Ecosystem based Marine Management

Related external organisation
ICES - Herring Assessment Working Group - HAWG
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

IFRO Seminar Series 2016
Period: 2016
Catharina Wolff von Bülow (Invited speaker)
Department of Management Engineering
Related event

IFRO Seminar Series 2016: Behavioral Economics Seminar
13/12/2016 → …
Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Inno-SE Integrated Energy Systems (External organisation)
Period: 2016 → …
Alfred Heller (Chairman)
Department of Civil Engineering
Section for Building Energy

Description
Head of Advisory Board

Body type: National Innovation Cluster

Related external organisation

Inno-SE Integrated Energy Systems
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

International Electrotechnology Commission (IEC), Technical Committee 8/Working Group 7 (External organisation)
Period: 2016 → …
Guangya Yang (Participant)
Department of Electrical Engineering
Center for Electric Power and Energy
Electric power systems

Description
Project: IEC/TS 62898-3-1, Microgrids - Technical Requirements - Protection requirements in microgrids
Degree of recognition: International

Related external organisation

International Electrotechnology Commission (IEC), Technical Committee 8/Working Group 7
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

International Journal of Drug Policy (Journal)
Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related journal

International Journal of Drug Policy
Local database
Activity: Research › Peer review of manuscripts
International Journal of Sustainable Transportation (Journal)
Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU
Related journal
International Journal of Sustainable Transportation
1556-8318
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 1.91 SJR 0.957 SNIP 1.419, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

International RILEM Conference on Materials, Systems and Structures in Civil Engineering
Period: 2016
Per Goltermann (Chairman)
Department of Civil Engineering
Section for Structural Engineering
Description
Innovation in Teaching
Related event
International RILEM Conference on Materials, Systems and Structures in Civil Engineering
15/08/2016 → 29/08/2016
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

Introduction to Microbiome and Metabolome Data Analysis (using QIIME and GNPS)
Period: 2016 → …
Lejla Imamovic (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology
Related event
Introduction to Microbiome and Metabolome Data Analysis (using QIIME and GNPS)
16/06/2016 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Journal of Exposure Science and Environmental Epidemiology (Journal)
Period: 2016 → …
Gabriel Bekö (Reviewer)
Department of Civil Engineering
Section for Indoor Climate and Building Physics
Related journal
Journal of Exposure Science and Environmental Epidemiology
1559-0631
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 2.8 SJR 1.174 SNIP 1.08, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed yes
Central database
Activity: Research › Peer review of manuscripts

**kompetenceprojekt for rådgivere ved fødevareinstituttet**
*Period: 2016 → 2017*
*Karin Kristiane Nørby (Lecturer)*

National Food Institute
Division of Risk Assessment and Nutrition

**Related event**

**Kompetence projekt for rådgivere ved fødevareinstituttet**
*01/11/2016 → 27/03/2017*
*Denmark*
*Activity: Other*

**Kompetence projekt for rådgivere ved fødevareinstituttet**
*Period: 2016 → 2017*
*Gitte Alsing Pedersen (Organizer)*
*Vibe Meister Beltoft (Organizer)*

National Food Institute
Division of Risk Assessment and Nutrition

**Description**
Projektets formål er at arbejde med strategisk kompetenceudvikling af DTU Fødevareinstituttets forskere, rådgivere og laboranter ved at kortlægge de fremtidige kerneopgaver og de kompetencekrav, der stilles til løsning af fremtidens kerneopgaver.

**Related event**

**Kompetence projekt for rådgivere ved fødevareinstituttet**
*01/11/2016 → 27/03/2017*
*Denmark*
*Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.*

**Kompetenceudvikling i forskningsbaseret myndighedsbetjening**
*Period: 2016 → 2017*
*Annette Petersen (Organizer)*

National Food Institute
Division of Risk Assessment and Nutrition

**Related event**

**Kompetenceudvikling i forskningsbaseret myndighedsbetjening**
*06/04/2016 → 08/04/2016*
*Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.*

**Management Science (Journal)**
*Period: 2016*
*Mogens Fosgerau (Reviewer)*

Transport policy and behaviour
Department of Management Engineering

**Related journal**

**Management Science**
*0025-1909*
Master thesis: Trængselsomkostninger i kollektiv trafik
Period: 2016
Mogens Fosgerau (Supervisor)
Department of Management Engineering
Transport policy and behaviour
Activity: Examinations and supervision › External examination

Measnet Site Assessment Working Group (External organisation)
Period: 2016 → 2017
Niels Gylling Mortensen (Participant)
Department of Wind Energy
Resource Assessment Modelling

Description
Working group has produced the following publications in 2016:
Degree of recognition: International
Links:

Related external organisation
Measnet Site Assessment Working Group
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Member of the Editorial Board of Cell Chemical Biology (External organisation)
Period: 2016 → …
Tilmann Weber (Participant)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Degree of recognition: International
Links:
http://www.cell.com/cell-chemical-biology/home

Related external organisation
Member of the Editorial Board of Cell Chemical Biology
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Member of the PhD Assesment Committee, DTU Representative. (External organisation)
Period: 2016 → …
Lotte Bjerregaard Jensen (Participant)
Department of Civil Engineering
Section for Building Design

Description
Member of the PhD Assesment Committee, DTU Representative, Malene Hagen Eriksen's PhD
Member of the PhD Assesment Committee, DTU Representative, Malene Hagen Eriksen's PhD
Degree of recognition: International
Related external organisation

**Member of the PhD Assessment Committee, DTU Representative.**

*Activity: Membership › Membership in review committee*

**Metabolic engineering of yeast cell factories for production of bio-based chemicals**

*Period: 2016*

Irina Borodina (Invited speaker)

Novo Nordisk Foundation Center for Biosustainability

**Research Groups**

Yeast Metabolic Engineering

**Related event**

**Novozymes Prize Symposium: Analyzing and engineering the metabolism of cells**

*21/11/2016 → 21/11/2016*

Hellerup, Denmark

*Activity: Talks and presentations › Conference presentations*

**Microbial Risk Analysis 2-3 2016 (Journal)**

*Period: 2016*

Maarten Nauta (Editor)

National Food Institute

**Research Group for Risk-Benefit**

**Description**

Special issue Campylobacter

*Links:*


**Related journal**

**Microbial Risk Analysis 2-3 2016**

Local database

*Activity: Research › Journal editor*

**NanImpact (Journal)**

*Period: 2016 → …*

Steffen Foss Hansen (Reviewer)

Department of Environmental Engineering

**Environmental Chemistry**

**Description**

Associate Editor

*Degree of recognition: International*

*Links:*

https://www.journals.elsevier.com/nanoimpact (Homepage of NanImpact)

**Related journal**

**NanImpact**

2452-0748

*Web of Science (2017): Indexed yes*

*Central database*

*Activity: Research › Journal editor*
**National Science Centre (NCN) (External organisation)**
Period: 2016
Vitaliy Zhurbenko (Member)

Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance
Electromagnetic Systems

**Description**
Poland
Degree of recognition: International

**Related external organisation**
National Science Centre (NCN)
Activity: Membership › Membership in review committee

**Nordic monitoring of diet, physical activity and overweight (and smoking and alcohol). Status and development 2011-2014. (in Danish)**
Period: 2016
Jeppe Matthiessen (Participant)

National Food Institute
Division of Risk Assessment and Nutrition

**Description**
Meeting, Danish Veterinary and Food Administration, Copenhagen, Denmark.
Degree of recognition: Local

**Related external organisation**
Danish Veterinary and Food Administration
Mørkhøj Bygade 19, 2860, Søborg, Denmark
Activity: Other

**Norwegian project MACROSEA (External organisation)**
Period: 2016 → …
Susan Løvstad Holdt (Chairman)

National Food Institute
Research Group for Bioactives – Analysis and Application

**Description**
External scientific board member of the national Norwegian project MACROSEA
Degree of recognition: International

**Related external organisation**
Norwegian project MACROSEA
Activity: Membership › Membership of research networks or expert groups

**Norwegian Research Council, panel (External organisation)**
Period: 2016
Mogens Fosgerau (Participant)

Transport policy and behaviour
Department of Management Engineering
Degree of recognition: International

**Related external organisation**
Norwegian Research Council, panel
Activity: Membership › Membership in review committee

Operations Research (Journal)
Period: 2016
Mogens Fosgerau (Reviewer)
Transport policy and behaviour
Department of Management Engineering

Related journal
Operations Research
0030-364X
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 2.53 SJR 2.94 SNIP 2.059, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed Yes
Central database
Activity: Research › Peer review of manuscripts

Passageradfærd og sikkerhed på jernbanen
Period: 2016
Mette Møller (Speaker)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related event
Passageradfærd og sikkerhed på jernbanen
03/11/2016 → 03/11/2016
Activity: Talks and presentations › Conference presentations

Pedagogical teaching coordinator at DTU Environment
Period: 2016 → ...
Steffen Foss Hansen (Other)
Department of Environmental Engineering
Environmental Chemistry
Degree of recognition: Local
Activity: Other

PhD course in Advanced Finite Element Simulations using Abaqus
Period: 2016
Philipp Ulrich Haselbach (Lecturer)
Department of Wind Energy

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

PhD representative in DTU Steering Committee for gender equality and diversity (External organisation)
Period: 2016 → 2017
Kasper Sandal (Participant)
Department of Wind Energy
Office for HR
Description
Appointed member by the PhD association at DTU.
Degree of recognition: International
Links:
http://www.dtu.dk/english/About/OFFICE-of-the-PRESIDENT/Editorials/2016-June (DTU editorial describing our gender equality and diversity policy)

Related external organisation

PhD representative in DTU Steering Committee for gender equality and diversity
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

PhD Thesis Kristian B. Knudsen: Censor
Period: 2016
Anke Hagen (Internal examiner)
Department of Energy Conversion and Storage
Applied Electrochemistry

Description
Censor
Activity: Examinations and supervision › Internal examination

Precision Engineering (Journal)
Period: 2016 → …
Alessandro Stolfi (Reviewer)
Department of Applied Mathematics and Computer Science
Department of Mechanical Engineering
Manufacturing Engineering
Degree of recognition: International

Related journal

Precision Engineering
0141-6359
Central database
Activity: Research › Peer review of manuscripts

Program committee RSS17 Road Safety & Simulation International conference (External organisation)
Period: 2016 → 2017
Mette Møller (Participant)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related external organisation

Program committee RSS17 Road Safety & Simulation International conference
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Program committee Trafikdage (External organisation)
Period: 2016 → …
Mette Møller (Participant)
Department of Management Engineering
Public health risks linked to antimicrobial-resistant enterococci in meat
Period: 2016 → …
Valeria Bortolaia (Supervisor)
National Food Institute

Description
Co-supervisor of PhD student Sulaiman Mohammed I Aloiti, University of Copenhagen, Denmark
Degree of recognition: International
Activity: Examinations and supervision › Supervisor activities

Related event
RDTU – kompetenceudvikling i forskningsbaseret rådgivning
Period: 2016 → …
Gitte Alsing Pedersen (Participant)
National Food Institute

Related event
RDTU – kompetenceudvikling i forskningsbaseret rådgivning
26/09/2016 → 07/11/2016
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Related event
RDTU – kompetenceudvikling i forskningsbaseret rådgivning
26/09/2016 → 07/11/2016
Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

RSS17 Roads Safety & Simulation international conference (Journal)
Period: 2016 → 2017
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related journal
RSS17 Roads Safety & Simulation international conference
Local database
Activity: Research › Peer review of manuscripts

Sådan kan man regne på husstandsmøller
Period: 2016
Andreas Bechmann (Invited speaker)
Department of Wind Energy
Resource Assessment Modelling
Documents:
Temadag 20160909 Sådan kan man regne på husstandsmøller

Related event
Husstandsmøller - Temadag: Danmarks Vindmølleforening
09/09/2016 → …
Fredericia, Denmark
Activity: Talks and presentations › Conference presentations

Safety (Journal)
Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related journal
Safety
Local database
Activity: Research › Peer review of manuscripts

Period: 2016 → …
Mette Møller (Reviewer)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related journal
Local database
Activity: Research › Peer review of manuscripts

Scientific Committee of ICAHS 3 (External organisation)
Period: 2016 → …
Johanne Ellis-Iversen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: International

Related external organisation
Scientific Committee of ICAHS 3
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
Sensors (Journal)
Period: 2016 → …
Alessandro Stolfi (Reviewer)
Department of Applied Mathematics and Computer Science
Department of Mechanical Engineering
Manufacturing Engineering

Related journal
Sensors
1424-8220
BFI (2017): BFI-level 2, Scopus rating (2016): CiteScore 2.78 SJR 0.576 SNIP 1.393, ISI indexed (2013): ISI indexed yes,
Web of Science (2017): Indexed yes
Indexed in DOAJ
Central database
Activity: Research › Peer review of manuscripts

Solid State Protonic Conductors 18
Period: 2016
David Aili (Participant)
Department of Energy Conversion and Storage
Proton conductors

Description
Acid-base chemistry and proton conductivity of solid acids and their mixtures with N-heterocycles

Related event
Solid State Protonic Conductors 18
18/09/2016 → …
Oslo, Norway
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Steering group member of the project “Plastfri Roskilde Fjord” (Event)
Period: 2016 → 2018
Steffen Foss Hansen (Chairman)
Department of Environmental Engineering
Environmental Chemistry
Degree of recognition: National
Links:
http://plasticchange.dk/vores-loesninger/plastfri-roskilde-fjord/

Related event
Steering group member of the project “Plastfri Roskilde Fjord”
01/09/2016 → …
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Student Info Meeting
Period: 2016
Marcel Tutor Ale (Participant)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering

Description
Student Info Meeting

Related event

Student Info Meeting
01/01/2016 → 01/01/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Summer School- DTU CINF 2016
Period: 2016
Brian Seger (Organizer)
Department of Physics
Experimental Surface and Nanomaterials Physics

Description
Organizing Committee Member

Related event

Summer School- DTU CINF 2016: Reactivity of nanoparticles for more efficient and sustainable energy conversion: Rising technologies
07/08/2016 → 12/12/2016
Gilleleje, Denmark
Activity: Attending an event › Participating in or organising a conference

Technical Advisory Group (TAG) on Livestock Environmental Assessment and Performance (LEAP) Partnership (External organisation)
Period: 2016
Nuno Miguel Dias Cosme (Participant)
Department of Management Engineering
Quantitative Sustainability Assessment

Description
The Partnership on Livestock Environmental Assessment and Performance (LEAP) is a multi-stakeholder initiative hosted and managed by the Food and Agriculture Organization of the United Nations (FAO). The goal of the Partnership is to improve the environmental performance of livestock supply chains through the development of robust international guidance and methodologies on environmental assessment.

Contributing to the Life Cycle Environmental Impact Assessment Technical Advisory Group (TAG)
Degree of recognition: International

Related external organisation

Technical Advisory Group (TAG) on Livestock Environmental Assessment and Performance (LEAP) Partnership
Activity: Membership › Membership of research networks or expert groups

Technical Working Group for National Salmonella Actionplan in Pigs (External organisation)
Period: 2016 → …
Johanne Ellis-Iversen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related external organisation

Technical Working Group for National Salmonella Actionplan in Pigs
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar
Technical Working Group for National Salmonella Dublin Action plan (External organisation)
Period: 2016 → …
Johanne Ellis-Iversen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related external organisation
Technical Working Group for National Salmonella Dublin Action plan
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Technical Working Group for the National Campylobacter Action plan (External organisation)
Period: 2016 → …
Johanne Ellis-Iversen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related external organisation
Technical Working Group for the National Campylobacter Action plan
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Ternary polybenzimidazole-based alkaline electrolytes
Period: 2016
David Aili (Invited speaker)
Department of Energy Conversion and Storage
Proton conductors

Related event
Workshop on Ion Exchange Membrane for Energy Applications
27/06/2016 → …
Bad Zwischenahn, Germany
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

The United States - Israel Binational Agricultural Research and Development Fund (External organisation)
Period: 2016
Susan Levstad Holdt (Chairman)
National Food Institute
Research Group for Bioactives – Analysis and Application

Description
External reviewer of The United States - Israel Binational Agricultural Research and Development Fund
Degree of recognition: International

Related external organisation
The United States - Israel Binational Agricultural Research and Development Fund
Activity: Membership › Membership in review committee

TrygFondens Unge-forskningsnetværk (External organisation)
Period: 2016 → …
Mette Møller (Participant)
Department of Management Engineering
Technology and Innovation Management
Transport DTU

Related external organisation

TrygFondens Unge-forskningsnetværk
Activity: Membership › Membership of research networks or expert groups

Udvidet Excel
Period: 2016 → …
Julia Christensen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Related event

Udvidet Excel
26/01/2016 → …
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Version2 Conference and Exhibition
Period: 2016
Angreine Kewo (Participant)
Department of Management Engineering
Systems Analysis
DTU Climate Centre

Description
Version2 Conference and Exhibition

Related event

Version2 Conference and Exhibition
03/05/2016 → 04/05/2016
København, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Vice-Chair, ISMRM study group on Detection & Correction of Motion in MRI & MRS (External organisation)
Period: 2016 → 2017
Lars G. Hanson (Participant)
Copenhagen Center for Health Technology
Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance

Description
Research Network of the International Society for Magnetic Resonance in Medicine
Degree of recognition: International

Related external organisation

Vice-Chair, ISMRM study group on Detection & Correction of Motion in MRI & MRS
Activity: Membership › Membership of research networks or expert groups
Visualizations for decisions in collaboration
Period: 2016
Joana Geraldi (Speaker)
Department of Management Engineering
Engineering Systems

Description
Invited speaker on visualizations for decisions in collaboration with Dr Melanie Kreye
European Decision Professionals Network

Related event
European Decision Professionals Network
28/09/2016 → …
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Wind Energy Denmark 2016
Period: 2016 → …
Kasper Sandal (Speaker)
Department of Wind Energy

Description
Poster and oral presentation at Wind Energy Denmark 2016
Documents:
WED2016_KasperSandal_poster
WED2016_KasperSandal_pp

Related event
Wind Energy Denmark 2016
26/10/2016 → 27/10/2016
Odense, Denmark
Activity: Talks and presentations › Conference presentations

Yeast cell factories for production of bulk and fine chemicals
Period: 2016 → …
Irina Borodina (Keynote speaker)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Yeast Metabolic Engineering

Related event
PYFF6 - 6th Conference on Physiology of Yeasts and Filamentous Fungi
11/07/2016 → 14/07/2016
Lisbon, Portugal
Activity: Talks and presentations › Conference presentations

Young Researchers Seminar 2017 (Event)
Period: 2016 → 2017
Mette Møller (Member)
Department of Management Engineering
Technology and Innovation Management
Transport DTU
Degree of recognition: International

Related event
Young Researchers Seminar 2017
16/05/2017 → 18/05/2017
Berlin, Germany
Activity: Membership › Membership in review committee

CEHOS infodag 2016
Period: Dec 2016
Marta Axelstad Petersen (Guest lecturer)
National Food Institute
Research Group for Molecular and Reproductive Toxicology

Description
Invited speaker, giving the talk "Er butylparaben hormonforstyrrende?"

Related event
Ceter for Hormonforstyrrende Stoffers Informationsdag: CeHoS information day
07/12/2016 → ...
Activity: Talks and presentations › Conference presentations

Period: Dec 2016
Anne Dahl Lassen (Participant)
Anne Vibeke Thorsen (Participant)
National Food Institute
Division of Risk Assessment and Nutrition

Description
Head: Anne Dahl Lassen
Degree of recognition: National
Activity: Other

Sustain-ATV Conference 2016
Period: 30 Dec 2016
Anders Brostrøm Bluhme (Speaker)
Department of Micro- and Nanotechnology
Molecular Windows

Description
Gav en mundtlig præsentation om "Automated Scanning Electron Microscopy Analysis of Sampled Aerosol"
Documents:
Sustain Abstract

Related event
Sustain-ATV Conference 2016
30/11/2016 → 30/11/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations
Photosynthetic active radiation: Visit from KU
Period: 19 Dec 2016
Carsten Dam-Hansen (Lecturer)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Lecture and laboratory demonstration for 20 students from Copenhagen University,

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Metroselskabet. Planning of light rail stations in CPH Metropolitan area.: Perceived safety in public transport environments. The influence on customers and revenue
Period: 16 Dec 2016
Sofie Kirt Strandbygaard (Lecturer)
Department of Civil Engineering
Section for Building Design

Description
Consultant: Presentation and discussion at Metroselskabet. Contribution to the design and planning process in relation to the new light rail stations in Copenhagen

Contribution to a Work Group : planning and designing metrostations and light rail stations. Participants were executive members of the Copenhagen Municipality Counsell economic department and the Metroselskabet.

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Potentialer og udfordringer med målerdata i vandforsyningen
Period: 16 Dec 2016
Jonas Kjeld Kirstein (Speaker)
Department of Environmental Engineering
Urban Water Systems

Description
Presentation given at DTU challenge "Water supply" with 3Vand (VCS, HOFOR and Aarhus Vand)

Participation and presentation at DTU Challenge "Water Supply"

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Zoonosestør møde
Period: 16 Dec 2016
Julia Christensen (Organizer)
Division of Food Microbiology
Division of Food Production Engineering
Section for Diagnostics and Scientific Advice

National Food Institute

Division of Risk Assessment and Nutrition
Degree of recognition: National

Related event

Zoonosestorf møde
16/12/2016 → 16/12/2016
København
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

2nd Meeting of the Global AMR Surveillance System (GLASS) Collaborating Platform,
Period: 15 Dec 2016 → 16 Dec 2016
Rene S. Hendriksen (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Description
2nd Meeting of the Global AMR Surveillance System (GLASS) Collaborating Platform,

Related event

2nd Meeting of the Global AMR Surveillance System (GLASS) Collaborating Platform,
15/12/2016 → 16/12/2016
Geneva, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Mikrobiologisk kvalitet af fisk og fiskeprodukter. Forelæsning ved KU-SUND
Period: 15 Dec 2016
Paw Dalgaard (Lecturer)
National Food Institute
Research Group for Analytical and Predictive Microbiology

Description
Mikrobiologisk kvalitet af fisk og fiskeprodukter (2 x 35 min.). Mikrobiel fødevaresikkerhed, course 300007 (KU-SUND), 15 december 2016, 40 studerende
Degree of recognition: Regional

Related event

Kursus i Mikrobiel Fødevaresikkerhed
15/12/2016 → 15/12/2016
Frederiksberg, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Zoonoseinteresesgruppemøde
Period: 15 Dec 2016
Julia Christensen (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: National

Related event

Zoonoseinteresesgruppemøde
15/12/2016 → 15/12/2016
København
12th International Conference on Occupational Stress and Health (Event)
Period: 14 Dec 2016 → 22 Dec 2016
Signe Poulsen (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Review of conference abstracts

Related event
12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities
07/06/2017 → 10/06/2017
Minneapolis, United States
Activity: Research › Peer review of manuscripts

Finanforbundet University: Ledelse – den væsentligste faktor for en produktivet og social kapital
Period: 14 Dec 2016
Kasper Edwards (Keynote speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Galathea 3-ekspeditionen fejer 10 års jubilæum: VirtuelGalathea3 e-learning
Period: 14 Dec 2016
Charlotte Bay Hasager (Participant)
Department of Wind Energy
Meteorology & Remote Sensing

Description
Ekspeditionen, som har bidraget til forskningsprojekter og undervisningsmateriale til en lang række områder, fejer 10 års jubilæum.

Det Kongelige Danske Geografiske Selskab Galathea3 Jubilæumskonference 10 år http://rdgs.dk/galathea-3-jubilaeumskonference/

Activity: Other

The next big thing in project risk management
Period: 14 Dec 2016
Josef Oehmen (Keynote speaker)
Department of Management Engineering
Engineering Systems

Description
Invited keynote talk at DTU-PMI industry event
Keynote talk on current research and industry developments on project risk management.

Related event

DTU ProjectLab - PMI Industry Event: Where Science Meets Practice: Is Your Project Risk Savvy?
14/12/2016 → …
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Meeting of the WHO Collaborating Centres to support AMR activities globally
Period: 13 Dec 2016 → 14 Dec 2016
Rene S. Hendriksen (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Description
Meeting of the WHO Collaborating Centres to support AMR activities globally

Related event

Meeting of the WHO Collaborating Centres to support AMR activities globally
13/12/2016 → 14/12/2016
Geneva, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Power and Energy Research – a Danish Perspective
Period: 13 Dec 2016
Jacob Østergaard (Speaker)
Department of Electrical Engineering
Center for Electric Power and Energy
Documents:
CEE presentation at Chalmars

Related event

Power system workshop at CHALMERS
13/12/2016 → 13/12/2016
Göteborg, Sweden
Activity: Talks and presentations › Conference presentations

2nd international symposium on alternatives to antibiotics (ATA)
Period: 12 Dec 2016 → 15 Dec 2016
Chris Juul Hedegaard (Speaker)
National Veterinary Institute
Section for Immunology and Vaccinology

Description
Oral presentation: "Swine plasma immunoglobulins for treatment of post-weaning diarrhoea"

Related event

2nd international symposium on alternatives to antibiotics (ATA)
12/12/2016 → 15/12/2016
Paris, France
Activity: Talks and presentations › Conference presentations

American Geophysical Union Fall meeting
Period: 12 Dec 2016 → 16 Dec 2016
Teis Nørgaard Mikkelsen (Participant)
Department of Environmental Engineering
Atmospheric Environment

Description
Abstract ID and Title: 177175: Solar UV irradiation-induced production of N2O from plant surfaces - low emissions rates but all over the world. Final Paper Number: B11E-0509 Presentation Type: Poster Session Date and Time: Monday, 12 December 2016; 08:00 - 12:20 Session Number and Title: B11E: Global Nitrous Oxide Budget: Magnitude, Sources, and Drivers - Posters Location: Moscone South; Poster Hall

American Geophysical Union Fall meeting

Related event
American Geophysical Union Fall meeting
12/12/2016 → 16/12/2016
San Francisco, United States
Activity: Attending an event › Participating in or organising a conference

Compression Fatigue Testing and Damage in UD Glass Fibre Composites
Period: 12 Dec 2016
Anthony Fraisse (Other)
Povl Brøndsted (Speaker)
Department of Wind Energy
Composites and Materials Mechanics

Description
The objective of this project was to optimize the geometry of compression compression fatigue specimens. FEM, and experimental parametrical study have been performed in order to define a possible geometry. Repeatable and representative results were achieved and damage mechanisms were identified by performing 3D Tomography ex situ study.
Degree of recognition: International
Documents:
3.2.+DTU+Wind+Energy

Related event
Wind Turbine Blade Manufacturer
12/09/2016 → 14/09/2016
Düsseldorf, Germany
Activity: Talks and presentations › Conference presentations

Immediate and delayed interactions of global warming and contaminants on aquatic invertebrates
Period: 10 Dec 2016 → 14 Dec 2016
Khuong Van Dinh (Speaker)
National Institute of Aquatic Resources
Section for Oceans and Arctic

Description
Annual Meeting of the British Ecological Society - Liverpool, United Kingdom

Related external organisation
British Ecological Society
London, United Kingdom
Activity: Talks and presentations › Conference presentations

BIM in the industry
Period: 9 Dec 2016
Mads Holten Rasmussen (Speaker)
Department of Civil Engineering
Section for Building Design

**Description**
Experiences from my job as HVAC-engineer at Alectia.
Documents:
Slides

**Related external organisation**
Ghent University
Belgium
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Integrated computational and experimental design of next-generation battery materials**
Period: 9 Dec 2016
Tejs Vegge (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

**Related event**
SDU Energy Club
09/12/2016 → 09/12/2016
Odense, Denmark
Activity: Talks and presentations › Conference presentations

**Predictive food microbiology**
Period: 9 Dec 2016
Tina Beck Hansen (Lecturer)
National Food Institute
Research Group for Microbial Food Safety

**Description**
Forelæsning og øvelser om prædiktiv mikrobiologi for KU-studerende (3 timer)

Gæsteforelæser
Documents:
predictive_micro_091216_Tina Beck

**Related external organisation**
University of Copenhagen
Copenhagen, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**Atomic Scale Modeling of Electrocatalytic Reactions**
Period: 8 Dec 2016
Heine Anton Hansen (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials
Theoretical Atomic-scale Physics

**Description**
Seminar titled "Atomic Scale Modeling of Electrocatalytic Reactions" at the Scott Institute, Carnegie Mellon University, Pittsburgh.
Related event

**Atomic Scale Modeling of Electrocatalytic Reactions**
12/08/2016 → …
Pittsburgh, United States
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**World Energy Council - Denmark discussion**
Period: 8 Dec 2016
Angreine Kewo (Other)
Department of Management Engineering
Systems Analysis

**Description**
Presentation and discussion of Denmark ranked as world's #1 in energy sustainability

**Related external organisation**
World Energy Council Denmark
c/o DTU Energi Bygning 775 Frederiksborgvej 399, 4000, Roskilde, Denmark
Activity: Talks and presentations › Conference presentations

**EMBL course 'Microbial Communities: Modelling Meets Experiments’**
Period: 7 Dec 2016 → 11 Dec 2016
Eva Sonnenschein (Participant)
Department of Systems Biology
Bacterial Ecophysiology and Biotechnology

**Related event**
**EMBL course 'Microbial Communities: Modelling Meets Experiments’**
07/12/2016 → 11/12/2016
Heidelberg, Germany
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**EURL-AR Training Course: Methods required by The EU Legislation (2013/652/Eu)**
Period: 7 Dec 2016 → 9 Dec 2016
Rene S. Hendriksen (Lecturer)
National Food Institute
Research Group for Genomic Epidemiology

**Description**
Selective isolation, quantification, identification and susceptibility testing of ESBL-, Ampc- and carbapenemase-producing E. coli 7 - 9 December 2016

7 - 9 December 2016

**Related event**
**EURL-AR Training Course: Methods required by The EU Legislation (2013/652/Eu)**
07/12/2016 → 09/12/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

**Global surveillance of antimicrobial resistance in sewage**
Period: 7 Dec 2016
Rene S. Hendriksen (Invited speaker)
National Food Institute
Research Group for Genomic Epidemiology

**Description**
Symposium:"AMR IN Pakistan: Current Situation and Future Approaches", scheduled for the 7-8th December, 2016. Karachi, Pakistan

by videolink

**Related event**
Symposium:"AMR IN Pakistan: Current Situation and Future Approaches"  
07/12/2016 → 08/12/2016  
Karachi,, Pakistan  
Activity: Talks and presentations › Conference presentations

**Greenland island infrastructures**
Period: 7 Dec 2016 → 10 Dec 2016  
Kåre Hendriksen (Invited speaker)  
Department of Civil Engineering  
ARTEK, Section for Arctic Engineering and Sustainable Solutions

**Related event**
Sustainable Arctic Resources and Social Responsibility: University of the Arctic Thematic Network  
07/12/2016 → 10/12/2016  
Syktyvkar, Russian Federation  
Activity: Talks and presentations › Conference presentations

**Introduction to LabVIEW and computer-based measurements hands-on**
Period: 7 Dec 2016  
Mikkel Rønne Lotz (Participant)  
Department of Micro- and Nanotechnology  
Polymer Micro & Nano Engineering

**Related event**
Introduction to LabVIEW and computer-based measurements hands-on: Acquiring Measurements With LabVIEW & DAQ  
HO  
07/12/2016 → 07/12/2016  
2800 Kongens Lyngby, Denmark  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Oslo BIM Symposium**
Period: 7 Dec 2016 → 8 Dec 2016  
Jan Karlshej (Participant)  
Department of Civil Engineering  
Section for Building Design

**Description**
Participant as supervisor for PhD student from Oslo and Ankershus University College of Applied Sciences

**Oslo BIM Symposium**

**Related event**
Oslo BIM Symposium  
07/12/2016 → 08/12/2016  
Oslo, Norway  
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
Wireline Technology Enablers for 5G
Period: 7 Dec 2016
Angelos Mimidis Kentis (Participant)
Department of Photonics Engineering
Networks Technology and Service Platforms

Description

FG IMT-2020 Workshop and Demo Day: Wireline Technology Enablers for 5G
Geneva, Switzerland, 7 December 2016

Related event

Wireline Technology Enablers for 5G: FG IMT-2020 Workshop and Demo Day:
07/12/2016 → 07/12/2016
Geneva, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Escherichia cell factory for sustainable production of bioactive compounds.
Period: 6 Dec 2016 → 9 Dec 2016
Sailesh Malla (Participant)
Novo Nordisk Foundation Center for Biosustainability
iLoop
Links:

Related event

Escherichia cell factory for sustainable production of bioactive compounds: The 1st International Conference on Applied Microbiology,
06/12/2016 → 09/12/2016
Ho Chi Minh, Viet Nam
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

PhD opponent Chalmers University of Technology (External organisation)
Period: 6 Dec 2016
Ole Broberg (External examiner)
Copenhagen Center for Health Technology
Department of Management Engineering
Engineering Systems

Description
PhD opponent on the thesis by Steven Mallam "Distributed Participatory Design in Multidisciplinary Engineering Projects"
Degree of recognition: International
Activity: Examinations and supervision › External examination

9th International membrane science and technology conference (IMSTEC)
Period: 5 Dec 2016 → 8 Dec 2016
Agata Zarebska (Speaker)
Department of Environmental Engineering
Water Technologies

Description
Influence of mechanical wastewater pretreatment on membrane fouling during municipal wastewater treatment by forward osmosis
Oral presentation

Related event

9th International Membrane Science & Technology Conference
05/12/2016 → 08/12/2016
Adelaide, Australia
Activity: Talks and presentations › Conference presentations

Batterier: Status quo og i fremtiden - Fundamentale aspekter og perspektiver
Period: 5 Dec 2016
Tejs Vegge (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

Related event

ATV Energy Storage - Batteries
05/12/2016 → 05/12/2016
Kgs Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Intermediate Temperature Proton Conductors – Why and How
Period: 5 Dec 2016 → 7 Dec 2016
Qingfeng Li (Invited speaker)
Proton conductors
Department of Energy Conversion and Storage
Documents:
IT proton conductors - abstract to Workshop on Ethanol Electrooxidation 5-7 Dec 2016 Florence.pdf

Related event

International Workshop on Ethanol Electro-Oxidation
05/12/2016 → 07/12/2016
Florence, Italy
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Who cares for the sustainability perspective?: - Deliberate efforts of holistic and long term thinking in Danish building processes
Period: 5 Dec 2016
Susanne Balslev Nielsen (Invited speaker)
Department of Management Engineering
Systems Analysis
Centre for Facilities Management
Documents:
05122016_whocares_NTNU_3_1

Related event

MINDER Research Seminar: Existing buildings: Day-to-day and long-term perspectives on realizing sustainability potentials in the built environment
05/12/2016 → 06/12/2016
Trondheim, Norway
Activity: Talks and presentations › Conference presentations

Who cares for the sustainability perspective?: Deliberate efforts of holistic and long term thinking in Danish building processes
Period: 5 Dec 2016
Helle Lohmann Rasmussen (Speaker)
Department of Management Engineering
Systems Analysis
Documents:
24112016_whocares_NTNU_3

Related event

MINDER Research Seminar: Existing buildings: Day-to-day and long-term perspectives on realizing sustainability potentials in the built environment
05/12/2016 → 06/12/2016
Trondheim, Norway
Activity: Talks and presentations › Conference presentations

CREATESEvent
Period: 4 Dec 2016
Mogens Fosgerau (Invited speaker)
Transport policy and behaviour
Department of Management Engineering

Description
Seminar CREATESEvent

COST Action TOPROF Workshop
Period: 2 Dec 2016
Sven-Erik Gryning (Speaker)
Ekaterina Batchvarova (Other)
Department of Wind Energy
Resource Assessment Modelling

Description
WRF model evaluation based on wind lidar profiles (Sven-Erik Gryning and Ekaterina Batchvarova)

Related event

COST Action TOPROF Workshop: Evaluation and Data Assimilation in Atmospheric Models using Automatic-Lidar-and-Ceilometer Measurements
01/12/2016 → 02/12/2016
Paris, France
Activity: Talks and presentations › Conference presentations

COST Action TOPROF Workshop
Period: 2 Dec 2016
Sven-Erik Gryning (Speaker)
Department of Wind Energy
Resource Assessment Modelling

Description
WRF model evaluation based on wind lidar profiles (Sven-Erik Gryning and Ekaterina Batchvarova)

Related event
Kemi og akademisk innovation
Period: 2 Dec 2016
Laila Zwisler (Speaker)
Department of Physics

Description

Filmen er en del af et undervisningsmateriale fra Teknologihistorie DTU til gymnasiet om kemi, historie og etik: http://www.historie.dtu.dk/formidling,...

Projektet er støttet af Uddannelses- og Forskningsministeriets Udlodningsmidler.
Degree of recognition: Local
Links:
https://www.youtube.com/watch?v=MNZGvI8koaQ

Related organisation
Kemi og akademisk innovation
Zwisler, L. (Speaker)
2 Dec 2016
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

The EURLs directors meeting
Period: 2 Dec 2016
Rene S. Hendriksen (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Description
The EURLs directors meeting

Related event
The EURLs directors meeting
02/12/2016 → 02/12/2016
Brussels, Belgium
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Tro og Videnskab: Sogneaften i Christianskirken, Lyngby
Period: 2 Dec 2016
Jens Olaf Pepke Pedersen (Lecturer)
National Space Institute
Innovation and Research-based consultancy

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations
12th International Conference on Occupational Stress and Health (Event)
Period: 1 Dec 2016 → 22 Dec 2016
Christine Ipsen (Reviewer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Review of conference abstracts

Related event
12th International Conference on Occupational Stress and Health: Contemporary Challenges and Opportunities
07/06/2017 → 10/06/2017
Minneapolis, United States
Activity: Research › Peer review of manuscripts

Antimicrobial resistance as a global threat
Period: 1 Dec 2016
Valeria Bortolaia (Guest lecturer)
National Food Institute
Research Group for Genomic Epidemiology

Description
The Annual Finnish Veterinary Congress 2017

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

IET Communications Journal (Journal)
Period: 1 Dec 2016 → 19 Dec 2016
José Soler (Reviewer)
Department of Photonics Engineering
Networks Technology and Service Platforms

Description
http://digital-library.theiet.org/content/journals/iet-com

Related journal
IET Communications Journal
Local database
Activity: Research › Peer review of manuscripts

Indicators, frameworks, and instruments to evaluate impacts and costs of chemicals in articles in the circular economy
Period: 1 Dec 2016 → 2 Dec 2016
Peter Fantke (Invited speaker)
Department of Management Engineering
Quantitative Sustainability Assessment
Documents:
Fantke_2016n.pdf

Related event
European Environment Agency (EEA) Expert Workshop on Groups of Chemicals in the Circular Economy
Mechanics of Advanced Materials and Modern Processes (Journal)
Period: 1 Dec 2016 → …
Govindan Puthumana (Reviewer)
Department of Mechanical Engineering
Manufacturing Engineering

Related journal
Mechanics of Advanced Materials and Modern Processes
2198-7874
Indexed in DOAJ
Local database
Activity: Research › Peer review of manuscripts

Nanyang Technological University
Period: 1 Dec 2016 → 31 Mar 2017
Dominik Franjo Dominkovic (Visiting researcher)
Department of Energy Conversion and Storage
Centre for IT-Intelligent Energy Systems in Cities

Description
As a part of my stay at NTU in collaboration with Energy Research Institute at NTU, I was developing models for assessment of district cooling (DC) potential in Singapore. The work consisted of mapping the energy resources and potential DC demand, analyzing demand patterns, conducting pre-feasibility studies and evaluating the possibility of developing DC system on a large scale.

In the second part of the project integration of DC with the energy system was assessed. Synergies between different energy sectors were detected and the potential for utilizing them was evaluated. It was found that the DC should contribute to the overall goal of reducing GHG emissions, established by the government of Singapore, as well as to increase energy security of the country.

Results will be presented at IAEE2017 conference in Singapore in June 2017.

Links:
http://erian.ntu.edu.sg/Pages/Home.aspx

Activity: Visiting an external institution › Visiting another research institution

O-B analysis for ceilometers
Period: 1 Dec 2016 → 2 Dec 2016
Sven-Erik Gryning (Speaker)
Department of Wind Energy
Resource Assessment Modelling

Description
WRF model evaluation based on wind-lidar profiles

http://www.toprof.imaa.cnr.it/index.php/sub-working-group/56-2016-12-01-swg-1-4-o-b-analysis-for-ceilometers

TOPROF (COST Action ES1303)
Workshop 1-2 December
O-B analysis for ceilometers
Place: IPSL, Paris, France

Related event
O-B analysis for ceilometers
01/12/2016 → 02/12/2016
Paris, France
**Online Educa Berlin 2016**  
*Period: 1 Dec 2016*  
*Helle Rootzén (Speaker)*  

Department of Applied Mathematics and Computer Science  
Statistics and Data Analysis  

**Related event**  
*Online Educa Berlin 2016*  
30/11/2016 → 02/12/2016  
Berlin, Germany  

**W3C Linked Building Data Community Group (External organisation)**  
*Period: 1 Dec 2016 → 1 Jan 2025*  
*Mads Holten Rasmussen (Participant)*  

Department of Civil Engineering  
Section for Building Design  

**Description**  
Forum for discussion about and development of standards and best practices for exchange of building data on the web. On biweekly online meetings researchers and industry stakeholders participate.  

Degree of recognition: International  

Links:  
https://www.w3.org/community/lbd/ (Community Group Homepage)  
https://github.com/w3c-lbd-cg (W3C Linked Building Data CG - Github page)  

**Related external organisation**  
*W3C Linked Building Data Community Group*  
Activity: Membership › Membership of research networks or expert groups  

**Academy of Management. Academy of Management (Event)**  
*Period: Nov 2016*  
*Pernille Rydén (Reviewer)*  

Center for Bachelor of Engineering Studies  
Afdelingen for Forretningsudvikling  

Degree of recognition: International  

Links:  
http://moc.aom.org/moc-awards/outstanding-reviewer-awards/  

**Related event**  
*Academy of Management. Academy of Management*  
05/08/2016 → 09/08/2016  
New York, United States  
Activity: Research › Peer review of manuscripts  

**Group & Organization Management (Journal)**  
*Period: Nov 2016*  
*Kasper Edwards (Reviewer)*  

Department of Management Engineering  
Management Science
Implementation and Performance Management

Description
Review of manuscript
Degree of recognition: International

Related journal
Group & Organization Management
1059-6011
Scopus rating (2016): CiteScore 1.94 SJR 0.889 SNIP 0.948
Local database
Activity: Research › Peer review of manuscripts

Kulturstudier (Journal)
Period: Nov 2016 → …
Louise Karlskov Skyggebjerg (Editor)
Department of Physics

Description
Dansk tidsskrift for kulturhistorie, etnologi, folkloristik og lokalhistorie
Medlem af redaktionen

Related journal
Kulturstudier
Indexed in DOAJ
Local database
Activity: Research › Journal editor

4th scandinavian academy of Industrial Engineering and Management
Period: 30 Nov 2016
Christine Ipsen (Organizer)
Pernilla Ulfvengren (Organizer)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Human factors and sustainability

Related event
4th scandinavian academy of Industrial Engineering and Management
28/11/2016 → 30/11/2016
Luleå, Sweden
Activity: Attending an event › Participating in or organising a conference

63rd LCA Discussion Forum
Period: 30 Nov 2016
Monia Niero (Participant)
Department of Management Engineering
Quantitative Sustainability Assessment

Description
Oral presentation titled: "Challenges in LCA modelling of multiple loops for aluminium cans"
Documents:
Niero_LCA DF_Zurich_2016 11 30
Related event

63rd LCA Discussion Forum: How can LCA support the circular economy?
30/11/2016 → 30/11/2016
Zürich, Switzerland
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Annual Report on Zoonoses in Denmark (Journal)
Period: 30 Nov 2016
Julia Christensen (Editor)
National Food Institute
Division of Risk Assessment and Nutrition

Related journal

Annual Report on Zoonoses in Denmark
1600-3837
Local database
Activity: Communication › Journal editor

ATV Sustain conference
Period: 30 Nov 2016
Govindan Puthumana (Speaker)
Department of Mechanical Engineering
Manufacturing Engineering

Description
ATV Sustain conference

Related event

ATV Sustain conference
30/11/2016 → 30/11/2016
Activity: Talks and presentations › Conference presentations

ATV Sustain conference
Period: 30 Nov 2016
Søren Bang Korsholm (Speaker)
Department of Physics
Plasma Physics and Fusion Energy

Description
Poster and poster pitch talk: Developing diagnostic systems for ITER – the next step fusion energy experiment
Poster presentation of "Developing diagnostic systems for ITER – the next step fusion energy experiment"
Links:
http://www.sustain.dtu.dk/ (Conference website)

Related event

ATV Sustain conference
30/11/2016 → 30/11/2016
Activity: Talks and presentations › Conference presentations
**Contributed Talk: 2D materials as protective coatings**

**Period:** 30 Nov 2016  
Adam Carsten Stoot (Speaker)

Department of Micro- and Nanotechnology

Nanocarbon  
Documents:
Sustain2016abstract

**Related event**

**Sustain-ATV Conference 2016**  
30/11/2016 → 30/11/2016  
Kgs. Lyngby, Denmark  
Activity: Talks and presentations › Conference presentations

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**Discovering Challenges in Fabrication of Nanostructured c-Si Solar Cells with Metal Oxides Carrier Selective Contacts**

**Period:** 30 Nov 2016  
Maksym Plakhotnyuk (Speaker)

Department of Micro- and Nanotechnology

**Description**

A photovoltaic cell provides direct conversion of solar into electrical energy. Most modern solar cells are based on silicon due to well-developed technology, high efficiency, and high reliability and relatively low cost. In this research, our approach is based on nano-texturing of the crystalline silicon (black c-Si) with reactive ion etching (RIE) and KOH techniques, ALD deposition of titanium oxide (TiO2) and RF magnetron sputtering of nickel oxide (NiO) films as carrier selective contacts

**Related event**

**ATV Sustain conference**  
30/11/2016 → 30/11/2016  
Activity: Talks and presentations › Conference presentations

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**DTU Sustain 2016**

**Period:** 30 Nov 2016  
Steffen Foss Hansen (Organizer)  
Kristian Mølhave (Organizer)

Department of Environmental Engineering  
Environmental Chemistry  
Department of Micro- and Nanotechnology  
Molecular Windows  
Documents:
SustainAbstracts2016-20161130-1  
Links:
http://www.sustain.dtu.dk/

**Related event**

**DTU Sustain 2016**  
30/11/2016 → …

Activity: Attending an event › Participating in or organising a conference

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**DTU Sustain Conference**

**Period:** 30 Nov 2016  
Jens Olaf Pepke Pedersen (Organizer)

National Space Institute
Innovation and Research-based consultancy

Description
Member og organizing committee, DTU Sustain Conference 2016

Related event

DTU Sustain Conference
30/11/2016 → …
Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

Effect of Antibiotic Treatment on the gut microbiome
Period: 30 Nov 2016
Morten Otto Alexander Sommer (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

European Microbiome Congress 2016
30/11/2016 → 01/12/2016
London, United Kingdom
Activity: Talks and presentations › Conference presentations

Evaluering af ernæringsanbefalinger til kantiner på arbejdspladser og erhvervsskoler 2016-17.
Period: 30 Nov 2016
Anne Dahl Lassen (Consultant)
National Food Institute
Division of Risk Assessment and Nutrition

Related external organisation
Fødevarestyrelsen
Denmark
Activity: Public and private sector consultancy › Consultancy

External examiner on PhD defense by PhD student Mark Caris
Period: 30 Nov 2016
Michael A. E. Andersen (External examiner)
Department of Electrical Engineering
Electronics
Activity: Examinations and supervision › External examination

Stressforebyggelse og -håndtering
Period: 30 Nov 2016
Julia Christensen (Participant)
Research Group for Diagnostic Engineering
Division of Food Microbiology
National Food Institute
Division of Risk Assessment and Nutrition
Degree of recognition: Local

Related event
Sustainable Electrochemical Hydrogen Production
Period: 30 Nov 2016
Jakob Kibsgaard (Speaker)

Department of Physics
Experimental Surface and Nanomaterials Physics
Documents: Sustain2016abstract_JakobKibsgaard
Links: http://www.sustain.dtu.dk/

Related event
Sustain-ATV Conference 2016
30/11/2016 → 30/11/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Sustain-ATV Conference 2016
Period: 30 Nov 2016
Alfred Heller (Participant)

Department of Civil Engineering
Section for Building Energy
Centre for IT-Intelligent Energy Systems in Cities

Description
Living Labs – From scientific labs to the smart city
Documents: City of Knowledge - Alfred Heller - Sustain2016 - Nov 2016

Related event
Sustain-ATV Conference 2016
30/11/2016 → 30/11/2016
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Sustain-ATV Conference 2016
Period: 30 Nov 2016
Sheila Ingemann Jensen (Speaker)

Novo Nordisk Foundation Center for Biosustainability
Bacterial Cell Factory Optimization

Description
Consortia based production of biochemicals

Related event
Sustain-ATV Conference 2016
30/11/2016 → 30/11/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations
What does it take to practice sustainable flood risk management?
Period: 30 Nov 2016
Hjalte Jomo Danielsen Sørup (Speaker)
Department of Environmental Engineering
Urban Water Systems

Related event
DTU Sustain 2016
30/11/2016 → …
Activity: Talks and presentations › Conference presentations

Bias in academia
Period: 29 Nov 2016
Christine Ipsen (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

Related event
4th scandinavian academy of Industrial Engineering and Management
28/11/2016 → 30/11/2016
Luleå, Sweden
Activity: Talks and presentations › Conference presentations

How to Get Published in an International Journal
Period: 29 Nov 2016
Govindan Puthumana (Participant)
Department of Mechanical Engineering
Manufacturing Engineering

Description
How to Get Published in an International Journal

Related event
How to Get Published in an International Journal
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

iea hia task 37
Period: 29 Nov 2016
Frank Markert (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Risk modelling of H2 supply chains including human aspects
Documents:
IEA HIA task37 presentation Bethesda meeting

Related event
iea hia task 37: hydrogen safety
**Participatory Simulation in Hospital Work System Design (External organisation)**  
*Period: 29 Nov 2016*  
*Anja Maier (Chairman)*  
*Department of Management Engineering*  
*Engineering Systems*  
*Copenhagen Center for Health Technology*  

**Description**  
*PhD thesis at Technical University of Denmark*  
*PhD Assessment Committee*  
*Body type: PhD Assessment Committee*  
*Degree of recognition: International*  

**Related external organisation**  
**Participatory Simulation in Hospital Work System Design**  
*Activity: Membership › Membership in review committee*  

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**Satellite data used in the New European Wind Atlas**  
*Period: 29 Nov 2016*  
*Charlotte Bay Hasager (Lecturer)*  
*Department of Wind Energy*  
*Meteorology & Remote Sensing*  

**Description**  
*Authors: Charlotte Hasager, Merete Badger, Ioanna Karagali, Tobias Ahsbahs, Poul Astrup, Andrea Hahmann, Patrick Volker, Xiaoli Guo Larsén, Jakob Mann*  

**Related event**  
**VindkraftNet: November 2016**  
*29/11/2016 → 29/11/2016*  
*Malmö, Sweden*  
*Activity: Talks and presentations › Conference presentations*  

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**4th scandinavian academy of Industrial Engineering and Management**  
*Period: 28 Nov 2016 – 30 Nov 2016*  
*Christine Ipsen (Speaker)*  
*Department of Management Engineering*  
*Management Science*  
*Implementation and Performance Management*  

**Related event**  
**4th scandinavian academy of Industrial Engineering and Management**  
*28/11/2016 → 30/11/2016*
Luleå, Sweden
Activity: Talks and presentations › Conference presentations

4th scandinavian academy of Industrial Engineering and Management
Christine Ipsen (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

Description
Participant, organizer and speaker

Related event
4th scandinavian academy of Industrial Engineering and Management
28/11/2016 → 30/11/2016
Luleå, Sweden
Activity: Talks and presentations › Conference presentations

Open Data: Maximizing the societal value of research
Period: 28 Nov 2016
Henrik Caspar Wegener (Invited speaker)
Rector’s office

Description
Keynote lecture at European Scientific Conference on Applied Infectious Disease Epidemiology, 28-30 Nov. 2017, Stockholm, Sweden
Documents:
IMG_0911
Links:
http://www.escaide.eu

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Oral examinations, including group examination
Period: 28 Nov 2016
Govindan Puthumana (Participant)
Department of Mechanical Engineering
Manufacturing Engineering

Description
Oral examinations, including group examination

Related event
Oral examinations, including group examination
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

PhD workshop - reviewing IEM PhD projects (Event)
Period: 28 Nov 2016
Christine Ipsen (Reviewer)
Department of Management Engineering
Management Science

Implementation and Performance Management

Description
PhD workshop - reviewing PhD projects

Related event
PhD workshop - reviewing IEM PhD projects
Luleå, Sweden
Activity: Research › Peer review of manuscripts

Danske Vandværker, Temalørdag, Hotel Falster, Nykøbing F
Period: 26 Nov 2016
Hans-Jørgen Albrechtsen (Participant)
Department of Environmental Engineering
Urban Water Systems

Related event
Danske Vandværker, Temalørdag, Hotel Falster, Nykøbing F
Nykøbing F, Denmark
Activity: Attending an event › Participating in or organising a conference

Designing new processes for a bio-based economy
Period: 25 Nov 2016
Solangi I. Mussatto (Invited speaker)
Biomass Conversion and Bioprocess Technology
Novo Nordisk Foundation Center for Biosustainability

Related event
Workshop on Insights and Strategies Towards a Bio-Based Economy
Montevideo, Uruguay
Activity: Talks and presentations › Conference presentations

Cost tu 1203
Sofie Kirt Strandbygaard (Participant)
Department of Civil Engineering
Section for Building Design

Description
COST is an intergovernmental framework for European Cooperation in Science and Technology, allowing the coordination of nationally-funded research on a European level. The objective of this Action is to contribute to structuring existing knowledge and to developing innovative approaches on how to build more secure and safe cities. Studies have shown that there is a correlation between the structure and organization of urban space and crime: new criminological theory supports this point of view. The Justice and Home Affairs Council of the EU has underlined that crime prevention through design is a successful and effective strategy for crime prevention and needs to be supported. Despite this, new projects are being implemented all over Europe without considering safety criteria, creating urban areas where crime or fear of crime can make life difficult. The Action develops new knowledge and innovative approaches, putting together theoretical thinking and practical experience. The scientific programme works simultaneously on one hand on innovative approaches deriving from research and experts and on the other hand on the know-how acquired through best practical experience of participating countries. The above is done through lectures, seminars, focused working groups as well as a workshop. Dissemination of awareness is an important aspect for working in the field of CP-UDP field and the Action devotes much effort to this issue.
COST TU 1203 (European Cooperation in Science and Technology)

Links:
http://costtu1203.eu/ (COST TU 1203)

Related event

cost tu 1203: Crime Prevention
Athens, Greece
Activity: Attending an event › Participating in or organising a conference

DOPS Annual Conference
Period: 24 Nov 2016
Ole Bjarlin Jensen (Organizer)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Organisation of the Annual Conference of the Danish Optical Society

Related event

DOPS Annual Conference
Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

EERA Conference 2016
Alfred Heller (Speaker)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities

Description
Triple Helix Cooperation in Research
Documents:

Related event

EERA Conference 2016
24/10/2016 → 25/10/2016
Birmingham, United Kingdom
Activity: Talks and presentations › Conference presentations

How to prepare a successful proposal for Horizon 2020
Period: 24 Nov 2016
Govindan Puthumana (Participant)
Department of Mechanical Engineering
Manufacturing Engineering

Description
How to prepare a successful proposal for Horizon 2020

Related event

How to prepare a successful proposal for Horizon 2020
24/11/2016 → 24/11/2016
**Offshore Wind in the Baltic Sea: Legal and Policy Perspectives on a Regional Meshed Grid**
Claire Bergaentzlé (Speaker)
Department of Management Engineering
Systems Analysis

**Description**
Baltic InteGrid Project meeting

**Documents:**
Denmark – Transmission system and offshore wind connection

**Related event**

**Symposium on Gut Microbiota and Metabolic Health**
Carola Elisa Heesemann Rosenkilde (Participant)
Novo Nordisk Foundation Center for Biosustainability

**Related event**

**Symposium on Gut Microbiota and Metabolic Health**
Period: 24 Nov 2016
Henrik Munch Roager (Invited speaker)
National Food Institute
Research Group for Gut Microbiology and Immunology

**Description**
Colonic transit time - an important factor to consider

**Links:**
http://novonordiskfonden.dk/da/content/symposium-gut-microbiota-and-metabolic-health

**Related external organisation**

**Unknown external organisation**

**International Conference of Low Carbon Asia**
Subash Dhar (Speaker)
Department of Management Engineering
UNEP DTU Partnership

**Description**
India's INDC for transport and the 2 degree C stabilization target

**Documents:**
Transport INDC India

Related event

International Conference of Low Carbon Asia
Kuala Lumpur, Malaysia
Activity: Talks and presentations › Conference presentations

Remote manipulation of intracellular magnetic nanoparticles for biomedical applications
Period: 23 Nov 2016
Marco Beleggia (Invited speaker)
Center for Electron Nanoscopy
DTU Danchip

Related event

IMFUFA Seminar. Roskilde University
Activity: Talks and presentations › Conference presentations

1st CFB-KAIST Workshop on the Systems Biology of Streptomycetes
Period: 22 Nov 2016
Tilmann Weber (Organizer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds
Description
1st CFB-KAIST workshop on the Systems Biology of actinomycetes

Related event

1st CFB-KAIST Workshop on the Systems Biology of Streptomycetes
22/11/2016 → 22/11/2016
Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

EEERA Workshop
Period: 22 Nov 2016
Sven-Erik Gryning (Speaker)
Department of Wind Energy
Resource Assessment Modelling
Description
Offshore and coastal Weibull distributions measured with lidars, lesson learnt

Related event

EEERA Workshop: Joint Program Wind Energy - Sub-program Wind Conditions
Roskilde, Denmark
Activity: Talks and presentations › Conference presentations

Genome Mining, antiSMASH & Co.
Period: 22 Nov 2016
Kai Blin (Speaker)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

Related event

1st CFB-KAIST Workshop on the Systems Biology of Streptomycetes
22/11/2016 → 22/11/2016
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

NNF Cluster Days 2016 - for Junior Staff
Period: 22 Nov 2016
Rachel Amanda Hickman (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Related event

NNF Cluster Days 2016 - for Junior Staff
22/11/2016 → 22/11/2016
Hellerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

NNF Cluster Days 2016 - for Junior Staff
Period: 22 Nov 2016
Carola Elisa Heesemann Rosenkilde (Participant)
Novo Nordisk Foundation Center for Biosustainability

Related event

NNF Cluster Days 2016 - for Junior Staff
22/11/2016 → 22/11/2016
Hellerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

NNF Cluster Days 2016 - for Junior Staff
Period: 22 Nov 2016
Christian Munck (Participant)
Novo Nordisk Foundation Center for Biosustainability

Description
NNF Cluster days

Related event

NNF Cluster Days 2016 - for Junior Staff
22/11/2016 → 22/11/2016
Hellerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

NNF Cluster Days 2016 - for Junior Staff
Period: 22 Nov 2016
Eugene Fletcher (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology
Related event

**NNF Cluster Days 2016 - for Junior Staff**
22/11/2016 → 22/11/2016
Hellerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

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**novo nordisk foundation cluster days**
Period: 22 Nov 2016
Felipe Senne de Oliveira Lino (Participant)
Novo Nordisk Foundation Center for Biosustainability

**Description**
Participated and presented poster at poster session.

Participation on the Novo Nordisk Foundation Cluster Days for Junior staff, with poster presentation regarding my PhD project.

Documents:
NN Fonden cluster days 2016

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**Novo Nordisk Foundation Cluster Days 2016: for Junior Staff**
Hellerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

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**novo nordisk foundation cluster days**
Period: 22 Nov 2016
Mareike Bongers (Participant)

Novo Nordisk Foundation Center for Biosustainability

**Bacterial Synthetic Biology**

**Description**
Novo Nordisk Foundation Cluster Days 2016

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**Novo Nordisk Foundation Cluster Days 2016: for Junior Staff**
Hellerup, Denmark
Activity: Attending an event › Participating in or organising a conference

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**Novo Nordisk Foundation Cluster Days**
Period: 22 Nov 2016
Morten Otto Alexander Sommer (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability

**Bacterial Synthetic Biology**

**Related event**

**Novo Nordisk Foundation Cluster Days 2016: for Junior Staff**
Hellerup, Denmark
Activity: Talks and presentations › Conference presentations
Novo Nordisk Foundation cluster day
Period: 22 Nov 2016
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

Novo Nordisk Foundation cluster day
22/11/2016 → 22/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Novo Nordisk Foundation cluster day
Period: 22 Nov 2016
Peter Rugbjerg (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Description
Novo Nordisk Foundation Cluster Day 2016 - Early Innovation

Related event

Novo Nordisk Foundation cluster day
22/11/2016 → 22/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Novo Nordisk Foundation cluster day
Period: 22 Nov 2016
Eric van der Helm (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

Novo Nordisk Foundation cluster day
22/11/2016 → 22/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Sundhedsmæssig helhedsvurdering af nædder
Period: 22 Nov 2016
Heddie Mejborn (Speaker)
National Food Institute
Division of Risk Assessment and Nutrition

Related external organisation

IDA Levnedsmiddelselskabet
Denmark
Activity: Talks and presentations › Conference presentations

ARCHES/ICANHEAR 2016
Andreu Paredes Gallardo (Participant)
Department of Electrical Engineering

Hearing Systems

Description
Poster contribution

Participation in the combined ARCHES/ICANHEAR conferences

Related event

ARCHES/ICANHEAR 2016: Audiological Research Cores in Europe (ARCHES) meeting and Improved Communication through Applied Hearing Research (ICanHear) conference
Zurich, Switzerland
Activity: Attending an event › Participating in or organising a conference

Hydrodynamics of Microbial Filter-Feeding
Period: 21 Nov 2016
Anders Peter Andersen (Lecturer)
Department of Physics
Biophysics and Fluids
Links:
http://meetings.aps.org/Meeting/DFD16/Session/H39.7

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

13th European Workshop on Advanced Control and Diagnosis
Period: 19 Nov 2016
Denis Kirchhübel (Speaker)
Department of Electrical Engineering
Automation and Control

Description
Presentation on “Representing Operational Modes for Situation Awareness”

Workshop participation at ACD2016

Related event

13th European Workshop on Advanced Control and Diagnosis
17/11/2016 → 19/11/2016
Lille, France
Activity: Talks and presentations › Conference presentations

Resistens – en global udfordring
Period: 18 Nov 2016
Morten Otto Alexander Sommer (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

Related event

Fagligt symposium om antibiotika forbrug og resistens i almen praksis og på hospitalerne
18/11/2016 – 18/11/2016
Herlev, Denmark
Single center reactivity of Cu(II) sites in copper substituted CHA zeolite followed by in-situ electron paramagnetic resonance spectroscopy  
Period: 18 Nov 2016  
Susanne Mossin (Speaker)  
Center for Hyperpolarization in Magnetic Resonance  
Department of Chemistry  
Centre for Catalysis and Sustainable Chemistry  
Organic Chemistry  
Documents:  
Mossin_aiche_2016

Related event

2016 AIChE Annual Meeting  
13/11/2016 → 19/11/2016  
San Francisco, CA, United States  
Activity: Talks and presentations › Conference presentations

SPICE Edition 1 - Presentation, Analysis and Perspectives  
Period: 18 Nov 2016  
Franck Bertagnolio (Invited speaker)  
Department of Wind Energy  
Aerodynamic design

Description
The Sound Propagation International Comparison Exercise aims at comparing various wind turbine noise propagation models. It takes the form of a benchmark for which a pre-defined test case is proposed to the participants. Results are compiled, analysed and presented at the Wind Turbine Sound 2016 technical workshop organized by WindEurope.

DTU Energy was responsible for the analysis of the results and F. Bertagnolio presented the results at the workshop

Related event

Wind Turbine Sound Technology Workshop 2016  
17/11/2016 → 18/11/2016  
Gdansk, Poland  
Activity: Talks and presentations › Conference presentations

Tidligere uheld på biogas- og renseanlæg, herunder danske  
Period: 18 Nov 2016  
Frank Huess Hedlund (Speaker)  
Department of Applied Mathematics and Computer Science  
Dynamical Systems  
Statistics and Data Analysis

Related event

SEVESO-direktivet og sikkerhedsdokumenter til biogasanlæg  
18/11/2016 → …  
København, Denmark  
Activity: Talks and presentations › Conference presentations

7th European Kesterite Workshop  
Period: 17 Nov 2016 → 18 Nov 2016
Christian Rein (Participant)
Imaging and Structural Analysis
Department of Energy Conversion and Storage

Description
CZTS synthesis using deep eutectic solvents.

Related event
7th European Kesterite Workshop
16/11/2016 → 18/11/2016
Leuven, Belgium
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.


Period: 17 Nov 2016
Jens Olaf Pepke Pedersen (Lecturer)
National Space Institute
Innovation and Research-based consultancy

Description
Forsvarsministeren og Forsvarsministeriet vil præsentere analysen under høringen, hvor Forsvarsudvalget også har inviteret række fagkyndige oplægsholdere, som vil bidrage med spændende indlæg til en efterfølgende paneldebatt. Høringen modereres af ordstyrer Martin Breum.

Satellitter og droner i Arktis – perspektiverne ved opgaveløsning i Arktis, v/ Jens Olaf Pepke Pedersen, Ph. D. og seniorforsker ved DTU Space

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

DTU's 5. undervisningsbiennale: God undervisningspraksis i ingeniøruddannelserne
Period: 17 Nov 2016
Govindan Puthumana (Participant)
LearningLab DTU
Department of Mechanical Engineering

Description
DTU's 5. undervisningsbiennale: God undervisningspraksis i ingeniøruddannelserne

Related event
DTU's 5. undervisningsbiennale: God undervisningspraksis i ingeniøruddannelserne
17/11/2016 → 17/11/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Improving conceptual understanding by inductive teaching: An example of its success
Period: 17 Nov 2016
Maarten Nauta (Speaker)
National Food Institute
Related event

5th DTU Biennial for Teaching and Learning: Good Teaching Practice in Engineering Education
17/11/2016 → 17/11/2016
Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Lattice-matched Cu2ZnSnS4/CeO2 solar cell with open circuit voltage boost
Period: 17 Nov 2016
Andrea Crovetto (Speaker)
Department of Micro- and Nanotechnology
Silicon Microtechnology

Related event

7th European Kesterite Workshop
16/11/2016 → 18/11/2016
Leuven, Belgium
Activity: Talks and presentations › Conference presentations

Making sense of big data for Produced Water Treatment
Period: 17 Nov 2016
Thomas Martini Jørgensen (Invited speaker)
Centre for oil and gas – DTU
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Documents:
DHRTC-Technology-Conference.

Related event

DHRTC Technology Conference 2016
16/11/2016 → 17/12/2016
Helsingør, Denmark
Activity: Talks and presentations › Conference presentations

Solid-State Li-S Batteries based on Borohydride Solid Electrolyte
Period: 17 Nov 2016
Didier Blanchard (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

Related event

Materials Research Society of Korea: MRS-K 2016 Fall meeting
16/11/2016 → 18/11/2016
Gyeongju, Korea, Republic of
Activity: Talks and presentations › Conference presentations

Universet - et hav af fortid
Period: 17 Nov 2016
Carol Anne Oxborrow (Invited speaker)
National Space Institute
Astrophysics and Atmospheric Physics

Description
Foredrag for skoleelever i forbindelse med den nationale matematiske temadag om Universet

A lecture for school children from ages 6 to 15 about the universe and Ole Rømer's discovery of the finite speed of light and how it affects everything we see in the universe

Related event
Matematiske temadag på Endrupskolen om universet
17/11/2016 → 17/11/2016
Fredensborg, Denmark
Activity: Talks and presentations › Conference presentations

Wind-wave coupled mesoscale modelling systems for coastal extreme wind and wave conditions
Period: 17 Nov 2016
Merete Badger (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing

Description
Oral presentation given on behalf of Jianiting Du

Related event
International workshop on measuring high wind speeds over the ocean
15/11/2016 → 17/11/2016
Exeter, United Kingdom
Activity: Talks and presentations › Conference presentations

7th European Kesterite Workshop
Period: 16 Nov 2016 → 18 Nov 2016
Andrea Crovetto (Speaker)
Department of Micro- and Nanotechnology
Silicon Microtechnology

Related event
7th European Kesterite Workshop
16/11/2016 → 18/11/2016
Leuven, Belgium
Activity: Talks and presentations › Conference presentations

COMPARE WP2 meeting
Period: 16 Nov 2016
Rene S. Hendriksen (Participant)
National Food Institute
Research Group for Genomic Epidemiology

Description
COMPARE WP2 meeting, November 16 2016, RKI, Berlin, Germany.

Related event
COMPARE WP2 meeting
16/11/2016 → 16/11/2016
Grøn Open Access i Praksis
Period: 16 Nov 2016
Ane Ahrenkiel Sand (Invited speaker)
Office for Innovation & Sector Services
Technical Information Center of Denmark

Description
Open Access indikatoren påviste et uudnyttet potentiale på ca 60%, men hvorfor er der så ikke mere Open Access indhold?. I det konkrete arbejde med forskningsregistrering og registrering af post-prints støder bibliotekerne på en række udfordringer, som vanskeliggør institutionernes muligheder for at nå de nationale OA-mål. Det er for eksempel inden for områderne rettigheder og licenser, tilladte Open Access versioner, embargoperioder m.m., at vi støder på problemer. Det er disse meget konkrete udfordringer, der arbejdes med i det mulige kommende DEFF projekt "Grøn Open Access i praksis".

Related event
Pure Brugerdag 2016
16/11/2016 → 16/11/2016
Aarhus, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

How can servant leadership be useful for Nordic leaders?
Period: 16 Nov 2016
Kasper Edwards (Other)
Department of Management Engineering
Management Science
Implementation and Performance Management

Related event
Nordic Colors of leadership
16/11/2016 → 16/11/2016
Reykavik, Iceland
Activity: Talks and presentations › Conference presentations

Improving CHO cell factories with CRISPR. European Summit of Industrial Biotechnology. Graz, Austria.
Period: 16 Nov 2016
Helene Fastrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
CHO Core

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Safeprops: A Software for Fast and Reliable Estimation of Safety and Environmental Properties for Organic Compounds
Period: 16 Nov 2016
Mark Nicholas Jones (Lecturer)
Department of Chemical and Biochemical Engineering
CAPEC-PROCESS
Satellitovervågning i Arktis: Søværnets Officersskole
Period: 16 Nov 2016
Jens Olaf Pepke Pedersen (Lecturer)
National Space Institute
Innovation and Research-based consultancy

Solid-State Li-S Batteries based on Borohydride Solid Electrolyte
Period: 16 Nov 2016
Didier Blanchard (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

9th International Workshop on EEWS
15/11/2016 → 16/11/2016
Daejeon, Korea, Republic of
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

DANmap seminar
Period: 15 Nov 2016
Julia Christensen (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition

DANmap seminar: I anledning af Europæisk Antibiotikauge 2016
15/11/2016 → 15/11/2016
Frederiksberg C, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

DANmap seminar
Period: 15 Nov 2016
Helle Bisgaard Korsgaard (Participant)
National Food Institute
Division of Risk Assessment and Nutrition
Description
Annual DANMAP seminar - presenting results of the national monitoring of AMR and use of antimicrobial agents to animals

Related event
DANmap seminar: I anledning af Europæisk Antibiotikauge 2016
15/11/2016 → 15/11/2016
Frederiksberg C, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

DANMAP-seminar i anledning af Europæisk Antibiotikauge 2016
Period: 15 Nov 2016
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety

Related event

DANMAP-seminar i anledning af Europæisk Antibiotikauge 2016
15/11/2016 → ...
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Gravitationsbølger
Period: 15 Nov 2016
Søren Brandt (Lecturer)
National Space Institute
Astrophysics and Atmospheric Physics

Description


Related event

Gravitationsbølger
15/11/2016 → 15/11/2016
Helsingør, Denmark
Activity: Talks and presentations › Conference presentations

Insekter og Fødevaresikkerhed
Period: 15 Nov 2016
Annette Nygaard Jensen (Invited speaker)
National Food Institute
Research Group for Microbial Food Safety

Related event

Kontordag i Fødevarestyrelsen
15/11/2016 → ...
Copenhagen, Denmark
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

Synthetic Aperture Radar for wind energy applications: potential and challenges at high wind speeds
Period: 15 Nov 2016
Merete Badger (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing

Description
Oral presentation
Related event

**International workshop on measuring high wind speeds over the ocean**
15/11/2016 → 17/11/2016
Exeter, United Kingdom
Activity: Talks and presentations › Conference presentations

Workshop: "Bridging the gap between academic research and chemicals regulation - the SciRAP tool for evaluating toxicity and ecotoxicity data for risk assessment of chemicals"
Period: 15 Nov 2016 → 16 Nov 2016
Sofie Christiansen (Participant)
National Food Institute
Research Group for Molecular and Reproductive Toxicology
Degree of recognition: International

Related event

Workshop: "Bridging the gap between academic research and chemicals regulation - the SciRAP tool for evaluating toxicity and ecotoxicity data for risk assessment of chemicals"
15/11/2016 → 16/11/2016
Stockholm, Sweden
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**ATV årsmøde**
Period: 14 Nov 2016
Alfred Heller (Invited speaker)
Department of Civil Engineering
Centre for IT-Intelligent Energy Systems in Cities

**Description**
Integrated and Intelligent Energy Systems

**Documents:**
ATV Conference - Integrated and Intelligent Energy Systems - Nov 2016 - Alfred Heller

Related event

**ATV årsmøde: Akademy of Technical Sciences - Annual meeting**
14/11/2016 → …
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

**BarSOSU workshop i Aalborg: Udvikling af værktøj til strategisk arbejdsmiljøarbejde**
Period: 14 Nov 2016
Kasper Edwards (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management

**Description**
Oplæg på BarSoSu workshop i Aalborg

Related external organisation

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations

**CST Workshop Series 2016**
Period: 14 Nov 2016
Vitaliy Zhurbenko (Organizer)
Center for Hyperpolarization in Magnetic Resonance
Department of Electrical Engineering
Center for Magnetic Resonance
Electromagnetic Systems

Description
Local coordination of the workshop.

Computer simulation activities at EMS, DTU

Related event

CST Workshop Series 2016
14/11/2016 → 14/11/2016
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Danish Microbiological Society Annual Congress 2016
Period: 14 Nov 2016
Tina Beck Hansen (Speaker)
National Food Institute
Division of Food Microbiology

Description
5-min-poster flash
Documents:
P55_poster_flash_DMS2016

Related event

Danish Microbiological Society Annual Congress 2016
14/11/2016 → 14/11/2016
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

DMS Congress 2016
Period: 14 Nov 2016
Rachel Amanda Hickman (Participant)
Novo Nordisk Foundation Center for Biosustainability
Research Groups
Bacterial Synthetic Biology

Description
Oral Flash presentation and poster

Flash oral presentation and poster

Related event

DMS Congress 2016
14/11/2016 → 14/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising a conference

DMS Congress 2016
Period: 14 Nov 2016
Eva Sonnenschein (Participant)
Department of Systems Biology
Bacterial Ecophysiology and Biotechnology

Related event
DMS Congress 2016
14/11/2016 → 14/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising a conference

DMS Congress 2016
Period: 14 Nov 2016
Annette Nygaard Jensen (Participant)
National Food Institute
Research Group for Microbial Food Safety

Related event
DMS Congress 2016
14/11/2016 → 14/11/2016
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

DMS Congress 2016
Period: 14 Nov 2016
Sheila Ingemann Jensen (Speaker)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Cell Factory Optimization

Description
Consortia based production of biochemicals

Related event
DMS Congress 2016
14/11/2016 → 14/11/2016
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

Euro Case Annual Conference 2016: Scientific Advising in the EU and European Cooperation about Innovation
Period: 14 Nov 2016
Henrik Caspar Wegener (Panel member)
Rector's office
Documents:
draft_programme_eurocase-and-atv_technology_day_2016
Links:

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Supervision of PhD students at DTU
Period: 14 Nov 2016
Govindan Puthumana (Participant)
Description
Supervision of PhD students at DTU

Related event
Supervision of PhD students at DTU
14/11/2016 → 14/11/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

2016 AIChE Annual Meeting
Period: 13 Nov 2016 → 18 Nov 2016
Rebecca Frauzem (Speaker)
Department of Chemical and Biochemical Engineering
KT Consortium

Description
I gave 2 presentations and participated in the remainder of the conference.

The 2016 American Institute of Chemical Engineers (AIChE) Annual Meeting. It took place from November 13th to November 18th, 2016 in San Francisco, USA.

Related event
2016 AIChE Annual Meeting
13/11/2016 → 19/11/2016
San Francisco, CA, United States
Activity: Talks and presentations › Conference presentations

INFORMS Annual Meeting
Period: 13 Nov 2016 → 17 Nov 2016
Ignacio Blanco (Speaker)
Department of Applied Mathematics and Computer Science
Dynamical Systems

Description

Related event
INFORMS Nashville 2016 Annual Meeting: Fine Tuning Decisions in Music City
13/11/2016 → 17/11/2016
Nashville, United States
Activity: Talks and presentations › Conference presentations

In-Silico Tailoring Properties of Polylactide
Period: 13 Nov 2016 → 18 Nov 2016
Alexandr Zubov (Speaker)
Gürkan Sin (Other)
Department of Chemical and Biochemical Engineering
CAPEC-PROCESS
Degree of recognition: International
Links:
https://aiche.confex.com/aiche/2016/webprogram/Paper470226.html
Related event

2016 AIChE Annual Meeting
13/11/2016 → 19/11/2016
San Francisco, CA, United States
Activity: Talks and presentations › Conference presentations

Danske Vandværker, Temalørdag, Roskilde
Period: 12 Nov 2016
Hans-Jørgen Albrechtsen (Invited speaker)
Department of Environmental Engineering
Urban Water Systems

Description
Fordøle og ulemper ved forskellige blødgøringsteknologier på vandværket

Related event

Danske Vandværker, Temalørdag, Roskilde
Roskilde, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Danish coast pilot
Period: 11 Nov 2016
Merete Badger (Speaker)
Department of Wind Energy
Meteorology & Remote Sensing

Related event

H2020 CEASELESS: Kick-off meeting
Barcelona, Spain
Activity: Talks and presentations › Conference presentations

EER Seminar
Period: 11 Nov 2016
Claire Bergaentzlé (Speaker)
Department of Management Engineering
Systems Analysis

Description
EER Seminars
Documents:
Regulatory barriers for activating flexibility on the Nordic-Baltic electricity market

Related event

EER Seminar
11/11/2016 → …
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Effects on cells on differentiation.
Period: 11 Nov 2016
Martin Dufva (Lecturer)
Center for Intelligent Drug Delivery and Sensing Using Microcontainers and Nanomechanics
Department of Micro- and Nanotechnology
Fluidic Array Systems and Technology

Related event

DASCS Stem cell conference
Rungsted, Denmark
Activity: Talks and presentations › Conference presentations

Why Big Data? – Test and Understand your Big Data Mindset in the Digital Darwinism with Ringberg, Østergaard Jacobsen
Period: 11 Nov 2016
Pernille Rydén (Speaker)
Center for Bachelor of Engineering Studies
Afdelingen for Forretningsudvikling
Degree of recognition: Local
Links:
http://www.tilmeld.dk/cvpitstop/program.html

Related organisation

Why Big Data? – Test and Understand your Big Data Mindset in the Digital Darwinism with Ringberg, Østergaard Jacobsen
Rydén, P. (Speaker)
11 Nov 2016
Activity: Talks and presentations › Conference presentations

6th AMR Network meeting
Period: 10 Nov 2016 → 11 Nov 2016
Rene S. Hendriksen (Lecturer)
National Food Institute
Research Group for Genomic Epidemiology

Description
10-11 November 2016, EFSA, Parma, Italy.

Related event

6th AMR Network meeting
Parma, Italy
Activity: Talks and presentations › Conference presentations

8th Next Generation Sequencing conference
Period: 10 Nov 2016 → 11 Nov 2016
Ankita Singh (Participant)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design

Description
Next Generation Sequencing conference

Related event

8th Next Generation Sequencing conference
London, United Kingdom
Activity: Attending an event › Participating in or organising a conference

IEA HIA Task 37 Hydrogen Safety
Period: 10 Nov 2016
Frank Markert (Invited speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Documents:
IEA HIA task37 poster_Odense_nov2016

Related event
Den danske brint- og brændselscelledag 2016
Odense, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Latest advances in applying CRISPR/Cas9 for accelerated and efficient generation of CHO cell factories with improved properties. 2nd Annual Genome Editing Congress. London, UK.
Period: 10 Nov 2016
Helene Fastrup Kildegaard (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Cell Line Engineering and Design
CHO Core

Related external organisation
Unknown external organisation
Activity: Talks and presentations › Conference presentations

Measuring and developing Communities of Practice in a blood analysis unit
Period: 10 Nov 2016 → 11 Nov 2016
Rasmus Jørgensen (Speaker)
Department of Management Engineering
Management Science
Implementation and Performance Management
Description
Oral presentation of ph.d. research

Related event
NOVO symposium: Sustainable healthcare through professional collaboration across boundaries
Reykjavik, Iceland
Activity: Talks and presentations › Conference presentations

Novo Nordisk Foundation cluster lecture
Period: 10 Nov 2016
Lumeng Ye (Participant)
Novo Nordisk Foundation Center for Biosustainability
Bacterial Synthetic Biology

**Related event**

**Novo Nordisk Foundation cluster lecture**
Copenhagen, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Quantification of erythropoietin and α1-antitrypsin by biolayer interferometry
Period: 10 Nov 2016
Stefan Kol (Invited speaker)
Novo Nordisk Foundation Center for Biosustainability
CHO Core

**Related event**

**Bioscience 2016: Research through innovative technologies**
Stockholm, Sweden
Activity: Talks and presentations › Conference presentations

**TECNICHE INNOVATIVE DI INDURIMENTO SUPERFICIALE E TRATTAMENTO CRIOGENICO DEGLI ACCIAI**
Period: 10 Nov 2016
Matteo Villa (Speaker)
Department of Mechanical Engineering
Materials and Surface Engineering
Degree of recognition: National
Documents:
Dispense GdS Trento 10 Nov 2016 - Matteo Villa
Links:
http://www.metallurgia-italiana.net/manifestazione.php?id=409&idc=1

**Related event**

**TECNICHE INNOVATIVE DI INDURIMENTO SUPERFICIALE E TRATTAMENTO CRIOGENICO DEGLI ACCIAI**
Trento, Italy
Activity: Talks and presentations › Talks and presentations in private or public companies and organisations

The 6th AMR EFSA Network meeting
Period: 10 Nov 2016 → 11 Nov 2016
Rene S. Hendriksen (Speaker)
National Food Institute
Research Group for Genomic Epidemiology

**Description**
The 6th AMR EFSA Network meeting on 10-11 November 2016, EFSA, Parma, Italy

**Related event**

**The 6th AMR EFSA Network meeting**
10/11/2016 → 11/12/2016
Parma, Italy
Activity: Talks and presentations › Conference presentations
The use of risk assessment to support control of Salmonella in pork

Period: 10 Nov 2016
Maarten Nauta (Invited speaker)
National Food Institute
Research Group for Risk-Benefit

Documents:
The use of risk assessment to support control of Salmonella in pork

Related event

BfR Symposium Zoonosen und Lebensmittelsicherhely
Berlin, Germany
Activity: Talks and presentations › Conference presentations

Dansk Vand Konference
Period: 9 Nov 2016
Jonas Kjeld Kirstein (Speaker)
Department of Environmental Engineering
Urban Water Systems

Description
Fra big data til smart data – driftsoptimering med højopløste sektionsdata i vandforsyningen
Links:
http://www.danva.dk/Admin/Public/DWSDownload.aspx?File=%2fFiles%2fFiler%2fArrangementer%2f2016%2fDVK+2016 +pr%3c%6sentationer%2f11.1+F+Fra+big+data+til+smart+data.pdf (Link to presentation)

Related event

Dansk Vand Konference
08/11/2016 → 09/11/2016
Århus, Denmark
Activity: Talks and presentations › Conference presentations

Euspen Special Interest Group Meeting: Structured & Freeform Surfaces
Period: 9 Nov 2016 → 11 Nov 2016
Prateek Saxena (Speaker)
Department of Mechanical Engineering
Manufacturing Engineering

Description
Poster presentation
Computed Tomography characterization of the Green Fiber Bottle
Documents:
Poster_Saxena and Bissacco

Related event

Euspen Special Interest Group Meeting: Structured & Freeform Surfaces
09/11/2016 → 10/11/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Euspen Special Interest Group Meeting: Structured & Freeform Surfaces
Period: 9 Nov 2016
Mattia Didone (Speaker)
Related event

Euspen Special Interest Group Meeting: Structured & Freeform Surfaces
09/11/2016 → 10/11/2016
Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

Food Safety – New Challenges
Period: 9 Nov 2016
Dorte Lau Baggesen (Speaker)
National Food Institute
Documents:
Food Safety - New Challenges_20161109_Nordic Poultry Conference_Dorte Lau Baggesen_PP

Related event

Nordic Poultry Conference 2016
07/11/2016 → 09/11/2016
Billund, Denmark
Activity: Talks and presentations › Conference presentations

Kortlægning af den bakterielle lattergasproduktion i aktivt slam ved hjælp af stabile isotoper
Period: 9 Nov 2016
Marlene Mark Jensen (Speaker)
Department of Environmental Engineering
Water Technologies

Related event

Dansk Vand Konference
08/11/2016 → 09/11/2016
Århus, Denmark
Activity: Talks and presentations › Conference presentations

Modificering af regnserier så de reflekterer et ændret klima
Period: 9 Nov 2016
Hjalte Jomo Danielsen Sørup (Speaker)
Department of Environmental Engineering
Urban Water Systems

Related event

Dansk Vand Konference 2016
08/11/2016 → 09/11/2016
Aarhus, Denmark
Activity: Talks and presentations › Conference presentations

SOMmic – Microbial Contribution and Impact on Soil Organic Matter, Structure and Genesis
Period: 9 Nov 2016 → 11 Nov 2016
Stefan Trapp (Speaker)
Department of Environmental Engineering
Environmental Chemistry
Related event

**SOMmic – Microbial Contribution and Impact on Soil Organic Matter, Structure and Genesis**

Leipzig, Germany
Activity: Talks and presentations › Conference presentations

**Special Interest Group Meeting: Structured & Freeform Surfaces 9th – 10th November 2016 - Technical University of Denmark (DTU) Copenhagen, DK**

Period: 9 Nov 2016 → 10 Nov 2016
Govindan Puthumana (Participant)
Department of Mechanical Engineering
Manufacturing Engineering

**Description**

Special Interest Group Meeting: Structured & Freeform Surfaces 9th – 10th November 2016 - Technical University of Denmark (DTU) Copenhagen, DK

**Related event**

**Special Interest Group Meeting: Structured & Freeform Surfaces 9th – 10th November 2016 - Technical University of Denmark (DTU) Copenhagen, DK**

09/11/2016 → 10/11/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Special Interest Group Meeting: Structured & Freeform Surfaces 9th – 10th November 2016 - Technical University of Denmark (DTU) Copenhagen, DK**

Period: 9 Nov 2016
Danilo Quagliotti (Speaker)
Department of Mechanical Engineering
Manufacturing Engineering

**Description**

Objectives comparison in a confocal microscope using pseuso-random roughness artefacts

Oral session: Surfaces for nano manufacturing and their metrology

**Documents:**
LWD Bento B_Quagliotti DID # SFS121

**Related event**

**3rd antiSMASH Hackathon**

Period: 8 Nov 2016 → 9 Nov 2016
Tilmann Weber (Organizer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

**Description**

3rd antiSMASH Hackathon

**Related event**
3rd antiSMASH Hackathon
08/11/2016 → 09/11/2016
Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

3rd antiSMASH Hackathon
Period: 8 Nov 2016 → 9 Nov 2016
Kai Blin (Organizer)
Novo Nordisk Foundation Center for Biosustainability
New Bioactive Compounds

Related event

Computational methods for accelerated DFT-based design of energy materials
Period: 8 Nov 2016
Tejs Vegge (Invited speaker)
Department of Energy Conversion and Storage
Atomic scale modelling and materials

Related event

TUM Energy Colloquium
08/11/2016 → 08/11/2016
Münich, Germany
Activity: Talks and presentations › Conference presentations

E-LASS European network for lightweight applications at sea
Period: 8 Nov 2016 → 9 Nov 2016
Vasileios Karatzas (Speaker)
Department of Mechanical Engineering
Solid Mechanics

Related event

E-LASS European network for lightweight applications at sea
08/11/2016 → 09/11/2016
Finspång, Sweden
Activity: Talks and presentations › Conference presentations

Findings from the surveillance of avian influenza in wild birds and poultry in Denmark
Period: 8 Nov 2016
Charlotte Kristiane Hjulsager (Invited speaker)
National Veterinary Institute

Description
Nordic Poultry Conference, Billund, Denmark, 7th-9th November 2016.

Nordic Poultry Conference, Billund, Denmark, 7th-9th November 2016.
Documents:
Abstract for Nordic Poultry Conference_ findings from AI surveillance_ckhj

Related external organisation
High Performance Thermoelectric Materials and Modules for Harvesting Waste Heat
Period: 8 Nov 2016 → 12 Nov 2016
Ngo Van Nong (Invited speaker)
Department of Energy Conversion and Storage
Electrofunctional materials

Related event
The 8th International Workshop on ADVANCED MATERIALS SCIENCE AND NANOTECHNOLOGY
08/11/2016 → 12/11/2016
Activity: Talks and presentations › Conference presentations

IEA 4E SSL Annex’s 13th Expert Meeting
Period: 8 Nov 2016 → 10 Nov 2016
Carsten Dam-Hansen (Organizer)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Organisation of the IEA 4E SSL Annex’s 13th Expert Meeting

Related event
IEA 4E SSL Annex’s 13th Expert Meeting
08/11/2016 → 10/11/2016
Roskilde, Denmark
Activity: Attending an event › Participating in or organising a conference

Integrering af ferskvandspåvirkning i livscyklusvurdering af tre vandteknologier
Period: 8 Nov 2016
Ryle Nørskov Gejl (Speaker)
Department of Environmental Engineering
Urban Water Systems

Related event
Dansk Vand Konference 2016
08/11/2016 → 09/11/2016
Aarhus, Denmark
Activity: Talks and presentations › Conference presentations

Kostvaners sammenhæng med helbred, leveår og livsstil
Period: 8 Nov 2016
Sisse Fagt (Lecturer)
National Food Institute

Degree of recognition: National

Related external organisation
København Universitet
København, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities
ON-SHORE SERVICE AND MAINTENANCE
Period: 8 Nov 2016
Christian Bak (Invited speaker)
Department of Wind Energy

Aerodynamic design

Related event

ON-SHORE SERVICE AND MAINTENANCE
08/11/2016 → 08/11/2016
Aalborg, Denmark
Activity: Talks and presentations › Guest lectures, external teaching and course activities at other universities

Phytotechnologies
Period: 8 Nov 2016
Lauge Peter Westergaard Clausen (Invited speaker)
Department of Environmental Engineering

Environmental Chemistry

Description
Presentation of the applications of phytotechnologies

Related event

Workshop vedr. grønne løsninger/Refshaleøen
08/11/2016 → 08/11/2016
Søborg, Denmark
Activity: Talks and presentations › Conference presentations

Science Meets Parliament: The Science Advice Mechanism of the European Commission
Period: 8 Nov 2016
Henrik Caspar Wegener (Panel member)
Rector’s office

Description
Speaker and panel member
Documents:
SmP-SmR 2016 - concept and programme update 12 Oct 2016
Links:

Related external organisation

Unknown external organisation
Activity: Talks and presentations › Conference presentations

Some experience as an evaluator of Marie Skłodowska-Curie applications
Period: 8 Nov 2016
Sven-Erik Gryning (Lecturer)
Department of Wind Energy

Resource Assessment Modelling

Related event

Hvordan forbereder man-en succesfuld-Marie-Sklodowska-Curie-itn-ansøgning
08/11/2016 → 08/12/2016
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

**Attributing the disease burden to different food groups - will it be easier in the future**
Period: 7 Nov 2016
Tine Hald (Speaker)
National Food Institute
Research Group for Genomic Epidemiology

**Related event**

**New Science for Food Safety: supporting food chain transparency for improved health**
07/11/2016 → 10/11/2016
Singapore, Singapore
Activity: Talks and presentations › Conference presentations

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**Better Training for Safer Food (BTSF): Foodborne outbreak investigations**
Period: 7 Nov 2016 → 11 Nov 2016
Birgitte Helwigh (Organizer)
Birgitte Borck Høg (Organizer)
National Food Institute
Division of Risk Assessment and Nutrition

**Description**
Course in Berlin, Germany
Degree of recognition: International

**Related event**

**Better Training for Safer Food (BTSF): Foodborne outbreak investigations: 30 courses of 5 days**
15/12/2012 → 15/12/2016
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

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**C2E2 seminar on energy efficiency for the student delegation from Utrecht**
Period: 7 Nov 2016
Xianli Zhu (Speaker)
Department of Management Engineering
UNEP DTU Partnership

**Description**
Presentation on energy efficiency and sustainable lifestyle

Presentation to the delegation of around 30 master's degree students on energy from Utrecht University in the Netherlands

Documents:
Energy efficiency and sustainable lifestyle

**Related event**

**C2E2 seminar on energy efficiency for the student delegation from Utrecht**
07/11/2016 → 07/11/2016
Copenhagen, Denmark
Activity: Talks and presentations › Conference presentations

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**Indoor Chemistry Modeling in Context: What questions do we answer?**
Period: 7 Nov 2016 → 8 Nov 2016
Peter Fantke (Lecturer)
Department of Management Engineering
Quantitative Sustainability Assessment

Related event

Workshop on Indoor Chemistry Models
07/11/2016 → 08/11/2016
Washington, United States
Activity: Talks and presentations › Conference presentations

LED Conference 2016
Period: 7 Nov 2016
Anders Thorseth (Organizer)
Department of Photonics Engineering
Diode Lasers and LED Systems

Description
Coordinating organizer of LED conference
Links:
http://conferencemanager.events/ledmet2016/

Related event

LED Conference 2016
07/11/2016 → …
Roskilde, Denmark
Activity: Attending an event › Participating in or organising a conference

Measuring angular light distribution of lamps and luminaries
Period: 7 Nov 2016
Carsten Dam-Hansen (Lecturer)
Department of Photonics Engineering
Diode Lasers and LED Systems

Related event

LED Conference 2016
07/11/2016 → …
Roskilde, Denmark
Activity: Talks and presentations › Conference presentations

SeaBioGha - Seasonal and spatial variation of seaweed species in Ghana
Period: 7 Nov 2016 → 14 Nov 2016
Marcel Tutor Ale (Other)
Department of Chemical and Biochemical Engineering
Center for BioProcess Engineering

Description
Coordinated by Marcel Tutor Ale
Activity: Other

To serve and detect* EURL-AR and WHO CC activities: EURL-AR and WHO CC activities
Period: 7 Nov 2016
Rene S. Hendriksen (Lecturer)
National Food Institute
Workshop on Soft γ-ray Astronomical Telescopes
Period: 7 Nov 2016 → 8 Nov 2016
Søren Brandt (Participant)
National Space Institute
Astrophysics and Atmospheric Physics
Degree of recognition: International
Links:

Related event

Workshop on Soft γ-ray Astronomical Telescopes
07/11/2016 → 08/11/2016
Lyngby, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

7th SETAC World Congress
Period: 6 Nov 2016 → 10 Nov 2016
Philipp Mayer (Participant)
Department of Environmental Engineering
Environmental Chemistry
Documents:
SETAC-Orlando-Abstract-Book

Related event

7th SETAC World Congress: SETAC North America 37th Annual Meeting
06/11/2016 → 10/11/2016
Orlando, United States
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.
7th SETAC World Congress
Period: 6 Nov 2016 → 10 Nov 2016
Philipp Mayer (Participant)

Department of Environmental Engineering

Environmental Chemistry

Documents:
SETAC-Orlando-Abstract-Book

Related event

7th SETAC World Congress: SETAC North America 37th Annual Meeting
06/11/2016 → 10/11/2016
Orlando, United States

Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.