Effects of menopause and high-intensity training on insulin sensitivity and muscle metabolism

To investigate peripheral insulin sensitivity and skeletal muscle glucose metabolism in premenopausal and postmenopausal women, and evaluate whether exercise training benefits are maintained after menopause. Sedentary, healthy, normal-weight, late premenopausal (n=21), and early postmenopausal (n=20) women were included in a 3-month high-intensity exercise training intervention. Body composition was assessed by magnetic resonance imaging and dual-energy x-ray absorptiometry, whole body glucose disposal rate (GDR) by hyperinsulinemic euglycemic clamp (40 mU/m/min), and femoral muscle glucose uptake by positron emission tomography/computed tomography, using the glucose analog fluorodeoxyglucose, expressed as estimated metabolic rate (eMR). Insulin signaling was investigated in muscle biopsies. Age difference between groups was 4.5 years, and no difference was observed in body composition. Training increased lean body mass (estimate [95% confidence interval] 0.5 [0.2-0.9] kg, P
Anthropometry, DXA and leptin reflect subcutaneous but not visceral abdominal adipose tissue by MRI in 197 healthy adolescents

Background Abdominal fat distribution is associated with the development of cardio-metabolic disease independently of body mass index (BMI). We assessed anthropometry, serum adipokines, and DXA as markers of abdominal subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) using magnetic resonance imaging (MRI). Methods We performed a cross-sectional study that included 197 healthy adolescents (114 boys) aged 10–15 years nested within a longitudinal population-based cohort. Clinical examination, blood sampling, DXA, and abdominal MRI were performed. SAT% and VAT% were adjusted to total abdominal volume. Results Girls had a higher SAT% than did boys in early and late puberty (16 vs. 13%, P<0.01 and 20 vs. 15%, P=0.001, respectively), whereas VAT% was comparable (7% in both genders, independently of puberty). DXA android fat% (standard deviation score (SDS)), suprailiac skinfold thickness (SDS), leptin, BMI (SDS), waist-to-height ratio (WHtR), and waist circumference (SDS) correlated strongly with SAT% (descending order: r=0.90–0.55, all P<0.001) but weakly with VAT% (r=0.49–0.06). Suprailiac skinfold was the best anthropometric marker of SAT% (girls: R2=48.6%, boys: R2=65%, P<0.001) and VAT% in boys (R2=16.4%, P<0.001). WHtR was the best marker of VAT% in girls (R2=7.6%, P=0.007). Conclusions Healthy girls have a higher SAT% than do boys, whereas VAT% is comparable, independently of puberty. Anthropometry and circulating leptin are valid markers of SAT%, but not of VAT%.
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
State: Published
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)
Pages: 109-120
Publication date: 2017

MR spectroscopy of hepatic fat and adiponectin and leptin levels during testosterone therapy in type 2 diabetes: a randomized, double-blinded, placebo-controlled trial: A randomized, double-blinded, placebo-controlled trial

Men with type 2 diabetes mellitus (T2D) often have lowered testosterone levels and an increased risk of cardiovascular disease (CVD). Ectopic fat increases the risk of CVD, whereas subcutaneous gluteofemoral fat protects against CVD and has a beneficial adipokine-secreting profile. Testosterone replacement therapy (TRT) may reduce the content of ectopic fat and improve the adipokine profile in men with T2D. A randomized, double-blinded, placebo-controlled study in 39 men aged 50-70 years with T2D and bioavailable testosterone levels

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science , Image Analysis & Computer Graphics, University of Southern Denmark, University of Novi Sad, Statens Serum Institut
Authors: Magnusen, L. V. (Ekstern), Andersen, P. E. (Ekstern), Diaz, A. R. (Ekstern), Ostojic, J. (Ekstern), Højlund, K. (Ekstern), Hougaard, D. M. (Ekstern), Christensen, A. N. (Intern), Nielsen, T. L. (Ekstern), Andersen, M. (Ekstern)
Pages: 157-168
Publication date: 2017
Main Research Area: Technical/natural sciences
Data Analysis of Medical Images: CT, MRI, Phase Contrast X-ray and PET

Data analysis of medical images is an important and growing area, as systems for imaging becomes still more available and complex.

The goal of the thesis is to demonstrate solutions to data analysis problems in a cross disciplinary context. Further, to develop methods for analysis of new imaging modalities and to combine cross disciplinary knowledge from various fields to find new solutions to existing problems.

More specifically the thesis shows segmentation of images, classification and statistics used on a variety of quite different problems. Active Appearance models, Chan-Vese and graph-cut has been used, as well as a variety of statistical tools centred on the General Linear Model.

The point of departure for the thesis is the NanoGuide project, in which gel based x-ray markers for use in radiotherapy has been developed. Two different types of gels has been analysed using segmentation of micro-CT images followed by a statistical analysis of homogeneity, contrast, degradation, and other qualities. By combining knowledge from the different professions in the project, a new application for one of the developed gels - in-vivo dosimetry in radiotherapy - has been studied.

Analysis of differences between groups and of correlations between brain regions and cognitive tests in alzheimers patients is another contribution. Segmentation of fat in abdominal MRI-scans has also been studied and a robust algorithm based on graph-cut is presented.

A relatively new modality phase-contrast x-ray and dark-field has shown promise for diagnosis of a variety of diseases in the lungs. A classification algorithm for differentiation of healthy, emphysematous and fibrotic lung tissue on pixel level is presented.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Authors: Christensen, A. N. (Intern), Conradsen, K. (Intern), Larsen, R. (Intern)
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Main Research Area: Technical/natural sciences
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Publication: Research › Ph.D. thesis – Annual report year: 2016

Injectable silver nanosensors: in vivo dosimetry for external beam radiotherapy using positron emission tomography
Development of safe and efficient radiotherapy routines requires quantification of the delivered absorbed dose to the cancer tissue in individual patients. In vivo dosimetry can provide accurate information about the absorbed dose delivered during treatment. In the current study, a novel silver-nanosensor formulation based on poly(vinylpyrrolidinone)-coated silver nanoparticles formulated in a gelation matrix composed of sucrose acetate isobutyrate has been developed for use as an in vivo dosimeter for external beam radiotherapy. In situ photonuclear reactions trigger the formation of radioactive (106)Ag, which enables post treatment verification of the delivered dose using positron emission tomography imaging. The silver-nanosensor was investigated in a tissue equivalent thorax phantom using clinical settings and workflow for both standard fractionated radiotherapy (2 Gy) and stereotactic radiotherapy (10- and 22 Gy) in a high-energy beam setting (18 MV). The developed silver-nanosensor provided high radiopacity on the planning CT-scans sufficient for patient positioning in image-guided radiotherapy and provided dosimetric information about the absorbed dose with a 10% and 8% standard deviation for the stereotactic regimens, 10 and 22 Gy, respectively.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, Department of Micro- and Nanotechnology, Colloids and Biological Interfaces, University of Copenhagen, Copenhagen University Hospital, Technical University of Denmark
Authors: Christensen, A. N. (Intern), Rydhög, J. S. (Ekstern), Søndergaard, R. V. (Intern), Andresen, T. L. (Intern), Holm, S. (Ekstern), Munck af Rosenschöld, P. (Ekstern), Conradsen, K. (Intern), Jelck, R. I. (Ekstern)
A new self-made digital slide scanner and microscope for imaging and quantification of fluorescent microspheres

Objective: A low-cost microscope slide scanner was constructed for the purpose of digital imaging of newborn piglet brain tissue and to quantify fluorescent microspheres in tissue. Methods: Using a standard digital single-lens reflex (DSLR) camera, fluorescent imaging of newborn piglet brain tissue was performed. A computer algorithm available for download was created to detect fluorescent microspheres in the brain tissue slides and to calculate regional cerebral blood flow (rCBF). The precision of the algorithm was tested by comparing with manual counting of the fluorescent microspheres. Finally, bright-field imaging was tested by adding light diffuser film. Results: Cost of the slide scanner was a fraction of the cost of a commercial slide scanner. The slide scanner was able to image a large number of tissue slides in a semiautomatic manner and provided a large field of view (FOV) of 101 mm² combined with a resolution of 2.9 µm. The mean difference (SD) between manual and automatic counts was in absolute numbers 0.32 (1.5) microspheres ranging from -5 to 5 microspheres per slide. The relative total difference between automatic and manual counts was -3.1%. Conclusions: A slide scanner was constructed and an automatic algorithm to detect fluorescent microspheres in tissue was developed and validated and showed an acceptable difference to "gold standard" manual counting. The slide scanner can be regarded as a low-cost alternative for researchers when digital slide imaging and quantification of fluorescent microspheres are needed.
Injectable Colloidal Gold for Use in Intrafractional 2D Image-Guided Radiation Therapy

In the western world, approximately 50% of all cancer patients receive radiotherapy alone or in combination with surgery or chemotherapy. Image-guided radiotherapy (IGRT) has in recent years been introduced to enhance precision of the delivery of radiation dose to tumor tissue. Fiducial markers are often inserted inside the tumor to improve IGRT precision and to enable monitoring of the tumor position during radiation therapy. In the present article, a liquid fiducial tissue marker is presented, which can be injected into tumor tissue using thin and flexible needles. The liquid fiducial has high radio-opacity, which allows for marker-based image guidance in 2D and 3D X-ray imaging during radiation therapy. This is achieved by surface-engineering gold nanoparticles to be highly compatible with a carbohydrate-based gelation matrix. The new fiducial marker is investigated in mice where they are highly biocompatible and stable after implantation. To investigate the clinical potential, a study is conducted in a canine cancer patient with spontaneous developed solid tumor in which the marker is successfully injected and used to align and image-guide radiation treatment of the canine patient. It is concluded that the new fiducial marker has highly interesting properties that warrant investigations in cancer patients.
Calibrated image-derived input functions for the determination of the metabolic uptake rate of glucose with $[^{18}F]$-FDG PET

We investigated the use of a simple calibration method to remove bias in previously proposed approaches to image-derived input functions (IDIFs) when used to calculate the metabolic uptake rate of glucose ($K_m$) from dynamic $[^{18}F]$-FDG PET scans of the thigh. Our objective was to obtain nonbiased, low-variance $K_m$ values without blood sampling.

**General information**

State: Published

Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, Copenhagen University Hospital, University of Copenhagen

Authors: Christensen, A. N. (Intern), Reichkendler, M. H. (Ekstern), Larsen, R. (Intern), Auerbach, P. (Ekstern), Højgaard, L. (Ekstern), Nielsen, H. B. (Ekstern), Ploug, T. (Ekstern), Stallknecht, B. (Ekstern), Holm, S. (Ekstern)

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Publication date: 2014

Main Research Area: Technical/natural sciences

**Publication information**

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Volume: 35

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Web of Science (2018): Indexed yes

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BFI (2016): BFI-level 1

Scopus rating (2016): SJR 0.618 SNIP 0.697 CiteScore 1.42

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 0.699 SNIP 0.818 CiteScore 1.53

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 0.721 SNIP 0.808 CiteScore 1.68

Web of Science (2014): Indexed yes
Commentary to 'Application of calibrated image-derived input function to a clinical protocol'.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics
Authors: Christensen, A. N. (Intern)
Pages: 1189-1190
Publication date: 2014
Main Research Area: Technical/natural sciences

Publication information
Journal: Nuclear Medicine Communications
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Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 0.618 SNIP 0.697 CiteScore 1.42
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.699 SNIP 0.818 CiteScore 1.53
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.721 SNIP 0.808 CiteScore 1.68
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.615 SNIP 0.748 CiteScore 1.41
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.641 SNIP 0.782 CiteScore 1.41
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.601 SNIP 0.951 CiteScore 1.51
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.55 SNIP 0.627
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.491 SNIP 0.742
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.549 SNIP 0.752
Scopus rating (2007): SJR 0.659 SNIP 0.733
Scopus rating (2006): SJR 0.551 SNIP 0.766
Scopus rating (2005): SJR 0.468 SNIP 0.809
Scopus rating (2004): SJR 0.53 SNIP 0.902
Scopus rating (2003): SJR 0.378 SNIP 0.852
Scopus rating (2002): SJR 0.474 SNIP 0.498
Scopus rating (2001): SJR 0.607 SNIP 0.668
Scopus rating (2000): SJR 0.616 SNIP 0.69
Scopus rating (1999): SJR 0.565 SNIP 0.754
Original language: English
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Publication: Research - peer-review › Comment/debate – Annual report year: 2014

PET and PET/CT Physics

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science , Image Analysis & Computer Graphics
Authors: Christensen, A. N. (Intern)
Pages: 10-27
Publication date: 2014

Host publication information
Title of host publication: PET/CT Atlas on Quality Control and Image Artefacts
Publisher: International Atomic Energy Agency
ISBN (Print): 978–92–0–101014–8
Chapter: 2
Series: IAEA Human Health Series
Number: 27
ISSN: 2075-3772
Main Research Area: Technical/natural sciences
Electronic versions:
Pub1642web_16821314.pdf
Links:
Validation of a new technique to estimate regional cerebral blood flow in piglets using fluorescent microspheres

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science , Image Analysis & Computer Graphics, Copenhagen University Hospital
Authors: Henning, W. (Ekstern), Andersen, J. (Ekstern), Christensen, A. N. (Intern), Greisen, G. (Ekstern), Liselotte, H. (Ekstern), Law, I. (Ekstern)
Pages: 1
Publication date: 2014
Conference: Annual meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) 2014, St. Louis, Missouri, United States, 07/06/2014 - 07/06/2014
Main Research Area: Technical/natural sciences

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Volume: 55
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BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.06 SJR 2.261 SNIP 1.804
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.471 SNIP 1.891 CiteScore 4.83
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.395 SNIP 1.984 CiteScore 4.9
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.253 SNIP 1.933 CiteScore 4.66
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.715 SNIP 2.036 CiteScore 5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.494 SNIP 2.118 CiteScore 5.08
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.549 SNIP 2.29
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.935 SNIP 2.171
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 2.213 SNIP 2.111
Scopus rating (2007): SJR 2.576 SNIP 2.323
Scopus rating (2006): SJR 2.153 SNIP 1.819
Scopus rating (2005): SJR 1.411 SNIP 1.84
Differential effects of aerobic exercise on insulin-stimulated glucose uptake in skeletal muscle and adipose tissue examined with PET/CT

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Image Analysis & Computer Graphics, University of Copenhagen, Copenhagen University Hospital
Authors: Reichkendler, M. (Ekstern), Auerbach, P. (Ekstern), Rosenkilde, M. (Ekstern), Christensen, A. N. (Intern), Holm, S. (Ekstern), Sjödin, A. (Ekstern), Kjaer, A. (Ekstern), Ploug, T. (Ekstern), Højgaard, L. (Ekstern), Stallknecht, B. (Ekstern)
Pages: 1
Publication date: 2013
Conference: Annual meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) 2013, Vancouver, Canada, 08/06/2013 - 08/06/2013
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 5.06 SJR 2.261 SNIP 1.804
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.471 SNIP 1.891 CiteScore 4.83
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.395 SNIP 1.984 CiteScore 4.9
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.253 SNIP 1.933 CiteScore 4.66
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.715 SNIP 2.036 CiteScore 5
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Non-invasive Estimation of Metabolic Uptake Rate of Glucose using F18-FDG PET and Linear Transformation of Outputs

For quantitative analysis and kinetic modeling of dynamic PET-data an input function is needed. Normally this is obtained by arterial blood sampling, potentially an unpleasant experience for the patient and laborious for the staff. Aim: To validate methods for determination of the metabolic uptake rate (Km) of glucose from dynamic FDG-PET scans using Image Derived Input Functions (IDIF) without blood sampling. Method: We performed 24 dynamic FDG-PET scans of the thigh of 14 healthy young male volunteers during a hyperinsulinemic isoglycemic clamp. Ten of the subjects were scanned twice 11 weeks apart and all with concurrent Arterial Blood Sampling (ABS). We proceeded to evaluate different earlier proposed methods as well as several new ones based on Archetypal Analysis for generating IDIFs. Comparison of the methods was based on the sets of Km-values generated for each scan from Patlak plots based on one common tissue curve against all the IDIFs. When compared to ABS Km values, an underestimation was found for all methods. Using ordinary least squares estimation on the ABS Km values vs. the IDIF Km a calibration factor and term was identified for each method and used for transformation. The Mean Squared Error (MSE) was determined for the different methods before transformation, and estimated by N-fold cross validation and .632+ bootstrapping after transformation. Further, since ordinary least squares is an unbiased estimator we could use the estimated MSE to determine the standard deviation of the different unbiased methods after transformation using the relation MSE(θ) = variance(θ)+bias(θ)^2.

Results: All methods performed poorly before transformation, except one described by Backes et al.. After transformation all methods yields unbiased Km based on the IDIF alone but have different standard deviations with the best method- Parker and Feng- at 0.0030 i. e. around 10 %. Conclusion: Based on this study, we can estimate the metabolic uptake rate of glucose with good accuracy and precision in similar future studies without blood sampling. Given the high variance of the femoral artery diameter in the material, the method should also be applicable to women and people of other ages, but used with caution in the elderly due to variance in intramuscular adipose distribution. If only Km and no other kinetic parameters are needed, the described method with transformation of the results based on ordinary least squares, gives unbiased low variance results without arterial blood sampling and it has the potential for use in other regions of the body.

General Information
State: Published
Organisations: Department of Informatics and Mathematical Modeling, Image Analysis and Computer Graphics, Copenhagen University Hospital, University of Copenhagen
Authors: Christensen, A. N. (Intern), Reichkendler, M. (Ekstern), Auerback, P. (Ekstern), Larsen, R. (Intern), Nielsen, H. (Ekstern), Ploug, T. (Ekstern), Stallknecht, B. (Ekstern), Højgaard, L. (Ekstern), Holm, S. (Ekstern)
Number of pages: 1
Publication date: 2012
Event: Abstract from 25th Annual EANM Congress, Milan, Italy.
Main Research Area: Technical/natural sciences
Electronic versions:
Projects:

**Machine Learning for Ultrasonic Fault Detection**

Technical University of Denmark  
Period: 15/08/2017 → 14/08/2020  
Number of participants: 4  
Phd Student:  
Jeppesen, Niels (Intern)  
Supervisor:  
Christensen, Anders Nymark (Intern)  
Vesth, Lars (Ekstern)  
Main Supervisor:  
Dahl, Anders Bjorholm (Intern)

**Financing sources**

Source: Internal funding (public)  
Name of research programme: Eksternt finansieret virksomhed  
Project: PhD

**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)  
Thydén, Karl Tor Sune (Intern)  
Sanna, Simone (Intern)  
Baier, Sina (Intern)  
Bentzen, Janet Jonna (Intern)  
Christensen, Anders Nymark (Intern)  
Project Manager, organisational:  
Gundlach, Carsten (Intern)  
Project Manager, academic:  
Poulsen, Henning Friis (Intern)
Relations
Related projects:
Alliance for Imaging and Modelling of Energy Applications
Publications:
Powder embossing method for selective loading of polymeric microcontainers with drug formulation
Crack Tip Flipping under Mode I Tearing: Investigated by X-Ray Tomography
In-Situ X-ray Tomography Study of Cement Exposed to CO₂ Saturated Brine
Graphite nodules in fatigue-tested cast iron characterized in 2D and 3D
Scene reassembly after multimodal digitization and pipeline evaluation using photorealistic rendering
From concept to in vivo testing: Microcontainers for oral drug delivery
Synthesis and characterization of Fe–Ni/γ-Al₂O₃ egg-shell catalyst for H₂ generation by ammonia decomposition
Microstructure and micromechanics of the heart urchin test from X-ray tomography
Surface Detection using Round Cut
Characterization of graphite nodules in thick-walled ductile cast iron
High-Performance Microchanneled Asymmetric Gd$_{0.1}$Ce$_{0.9}$O$_{1.95-δ}$La$_{0.6}$Sr$_{0.4}$FeO$_{3-δ}$-Based Membranes for Oxygen Separation
Project

Image Analysis for Nanoparticle Guided Radiotherapy
Technical University of Denmark
Period: 01/10/2012 → 21/01/2016
Number of participants: 6
Phd Student:
Christensen, Anders Nymark (Intern)
Supervisor:
Larsen, Rasmus (Intern)
Main Supervisor:
Conradsen, Knut (Intern)
Examiner:
Nielsen, Allan Aasbjerg (Intern)
Bech, Martin (Ekstern)
Østergaard, Lasse Riis (Ekstern)

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Name of research programme: 1/3 FUU, 1/3 inst 1/3 Andet
Project: PhD