Towards airflow sensors with energy harvesting and wireless transmitting properties
The rapidly growing demand for even more detailed low-cost measurements of weather and environmental conditions, including wind flow, asks for self-sustained energy solutions that eliminate the need for external recharge or replacement of batteries. Today’s wind measurement market is limited to traditional anemometers, ultrasonic measurement or expensive LiDAR (Light Imaging, Detection and Ranging) systems. This paper presents the initial design considerations for a low-cost combined air speed and wind direction sensor, which harvests energy to drive it and to power the wireless transmission of system configurations and measurements. An energy-budget for this transmission is included.

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Afdelingen for Informatik, Novitek Solutions ApS, Aalborg University
Contributors: Blaszczyk, T., Sørensen, J. A., Lynggaard, P., Larsen, K.
Pages: 311-319
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Advanced Materials Letter
Volume: 9
Issue number: 5
ISSN (Print): 0976-3961
Original language: English
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review

Wind turbine site-specific load estimation using artificial neural networks calibrated by means of high-fidelity load simulations
Previous studies have suggested the use of reduced-order models calibrated by means of high-fidelity load simulations as means for computationally inexpensive wind turbine load assessments; the so far best performing surrogate modelling approach in terms of balance between accuracy and computational cost has been the polynomial chaos expansion (PCE). Regarding the growing interest in advanced machine learning applications, the potential of using Artificial Neural-Network (ANN) based surrogate models for improved simplified load assessment is investigated in this study. Different ANN model architectures have been evaluated and compared to other types of surrogate models (PCE and quadratic response surface). The results show that a feedforward neural network with two hidden layers and 11 neurons per layer, trained with the Levenberg Marquardt backpropagation algorithm is able to estimate blade root flapwise damage-equivalent loads (DEL) more accurately and faster than a PCE trained on the same data set. Further research will focus on further model
improvements by applying different training techniques, as well as expanding the work with more load components.

General information
Publication status: Published
Contributors: Schröder, L., Dimitrov, N. K., Verelst, D. R., Sørensen, J. A.
Number of pages: 10
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Journal of Physics: Conference Series
Volume: 1037
Issue number: 6
Article number: 062027
ISSN (Print): 1742-6596

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Source: FindIt
Source-ID: 2435910029
Research output: Contribution to journal › Conference article – Annual report year: 2018 › Research › peer-review

2011 Summer School on Healthcare Technology - HCT 2011
The aim of the course is introduction to biomedical, technological and health care application areas, which form the basis for the next generation of telemedicine systems.

The course consists of lectures from the medical, technological and industrial areas related to telemedicine and supplemented by visit at company working with healthcare technology. The course will also have hands-on programming sessions with sensor systems for measuring human physiological parameters.

Course keywords:
- Human physiology, anatomy and the large disease groups: Cancer, diabetes, bloed wessel calcifications, heart diseases and chronic lung disease.
- Measuring human physiological parameters.
- Analysis of biomedical signals.
- Wireless systems as a tool for communicating measured human physiological parameters for clinical monitoring and rehabilitation, targeting telemedicine systems.
- Examples of existing and emerging medical and rehabilitation systems e.g. for clinical diagnosis and monitoring of the large disease groups, using telemedicine.

Course sessions, group work, project work, some course sessions hosted by int. company within healthcare technology and research group within telemecin.
Combines the learning of new methods with the applications of these methods.

Semester: August 2011
Extent: 7.5 ects

**General information**
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Technical University of Denmark, Siemens A/S
Contributors: Sørensen, J. A., Bechmann, H., Baden-Kristensen, K., Holst-Christensen, B., Munck-Fairwood, R., Sørensen, J. K., Gilbert-Jespersen, B., Phanareth, K., Anker Jørgensen, C.
Publication date: 2011

**Publication information**
Year: 2011
Original language: English
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication

**Digital Communication and Modulation**
The course presents the fundamental principles for digital communication, e.g. fixed-wire modems or wireless communication channels, as applied in mobile phones, wireless computer networks or wireless systems in intelligent houses.

Based on the functional blocks of a digital communication system, the fundamental principles for modulation and detection in Gaussian noise is treated.
This includes the principles for the determination of the bit-error rate for a digital communication system.

During the course, a selection of small Matlab exercises are prepared, for simulation of parts of a communication system.

Having passed the course, the student will be able to accomplish the following, within the areas shown below:

**Model for Communication System.**
Prepare and explain the functional block in a digital communication system, corresponding to the specific course contents.

**Model for Communication Channel.**
Prepare and explain a model for a communication channel, corresponding to the specific course contents.

**Modulation Methods.**
Explain the properties of digital modulation methods, corresponding to the specific course contents.

**Intersymbol Interference.**
Explain intersymbol interference, corresponding to the specific course contents.
Prepare and explain methods for the reduction of intersymbol interference, corresponding to the specific course contents.

**Detection.**
Prepare and explain methods for the detection of digital information symbols, corresponding to the specific course contents.

**Performance of a Digital Communication System.**
Prepare and explain a model for bit-error probability versus the energy used per bit and channel noise, corresponding to the specific course contents.

**System Simulation.**
Prepare and explain a simulation program in Matlab for simulating a minor part of a digital communication system.

Sessions in class with active participation by the students. The time will be divided between lectures and the students solving problems, including simulating digital communication building blocks in Matlab.

Combines lectures and hands-on work.

Semester: F2011
Extent: 7.5 ects
Digital Communication and Modulation
The course presents the fundamental principles for digital communication, e.g. fixed-wire modems or wireless communication channels, as applied in mobile phones, wireless computer networks or wireless systems in intelligent houses.

Based on the functional blocks of a digital communication system, the fundamental principles for modulation and detection in Gaussian noise is treated. This includes the principles for the determination of the bit-error rate for a digital communication system.

During the course, a selection of small Matlab exercises are prepared, for simulation of parts of a communication system.

Having passed the course, the student will be able to accomplish the following, within the areas shown below:

Model for Communication System.
- Prepare and explain the functional block in a digital communication system, corresponding to the specific course contents.

Model for Communication Channel.
- Prepare and explain a model for a communication channel, corresponding to the specific course contents.

Modulation Methods.
- Explain the properties of digital modulation methods, corresponding to the specific course contents.

Intersymbol Interference.
- Explain intersymbol interference, corresponding to the specific course contents.

Detection.
- Prepare and explain methods for the detection of digital information symbols, corresponding to the specific course contents.

Performance of a Digital Communication System.
- Prepare and explain a model for bit-error probability versus the energy used per bit and channel noise, corresponding to the specific course contents.

System Simulation.
- Prepare and explain a simulation program in Matlab for simulating a minor part of a digital communication system.

Sessions in class with active participation by the students. The time will be divided between lectures and the students solving problems, including simulating digital communication building blocks in Matlab.

Combines lectures and hands-on work.

Semester: E2011
Extent: 7.5 ects
Discrete Mathematics
The objectives of Discrete Mathematics (IDISM2) are: The introduction of the mathematics needed for analysis, design and verification of discrete systems, including the application within programming languages for computer systems.

Having passed the IDISM2 course, the student will be able to accomplish the following:
- Understand and apply formal representations in discrete mathematics.
- Understand and apply formal representations in problems within discrete mathematics.
- Understand methods for solving problems in discrete mathematics.
- Apply methods for solving problems in discrete mathematics.

Having completed this the student is able to carry out the following:

Expressions and sets:
Define a set; define a logic expression; negate a logic expression; combine logic expressions; construct a truth table for a logic expression; apply reduction rules for logic expressions. Apply these concepts to new problems.

Relations and functions:
Define a product set; define and apply equivalence relations; construct and apply functions. Apply these concepts to new problems.

Natural numbers and induction:
Define the natural numbers; apply the principle of induction to verify a selection of properties of natural numbers. Apply these concepts to new problems.

Division and factorizing:
Define a prime number and apply Euclid’s algorithm for factorizing an integer.

Regular languages:
Define a language from the elements of a set; define a regular language; form strings from a regular language; construct examples on regular languages. Apply these concepts to new problems.

Finite state machines:
Define a finite state machine as a 6-tuble; describe simple finite state machines by tables and graphs; pattern recognition by finite state machines; minimizing the number of states in a finite state machine; construct a finite state machine for a given application. Apply these concepts to new problems.

The teaching in Discrete Mathematics is a combination of sessions with lectures and students solving problems, either manually or by using Matlab.
Furthermore a selection of projects must be solved and handed in during the course.

Semester: E2011
Extent: 5 ects

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics
Contributors: Sørensen, J. A.
Publication date: 2011

Publication information
Year: 2011
Original language: English
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication
Having completed this the student is able to carry out the following:

Expressions and sets:
Define a set; define a logic expression; negate a logic expression; combine logic expressions; construct a truth table for a logic expression; apply reduction rules for logic expressions. Apply these concepts to new problems.

Relations and functions:
Define a product set; define and apply equivalence relations; construct and apply functions. Apply these concepts to new problems.

Natural numbers and induction:
Define the natural numbers; apply the principle of induction to verify a selection of properties of natural numbers. Apply these concepts to new problems.

Division and factorizing:
Define a prime number and apply Euclid’s algorithm for factorizing an integer.

Regular languages:
Define a language from the elements of a set; define a regular language; form strings from a regular language; construct examples on regular languages. Apply these concepts to new problems.

Finite state machines:
Define a finite state machine as a 6-tuple; describe simple finite state machines by tables and graphs; pattern recognition by finite state machines; minimizing the number of states in a finite state machine; construct a finite state machine for a given application. Apply these concepts to new problems.

The teaching in Discrete Mathematics is a combination of sessions with lectures and students solving problems, either manually or by using Matlab. Furthermore a selection of projects must be solved and handed in during the course.

Semester: F2011
Extent: 5 ects

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics
 Contributors: Sørensen, J. A.
Publication date: 2011

Publication information
Year: 2011
Original language: English
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication

Eksempler på krav til næste generations sundhedsteknologingeniører

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Professionshøjskolen Metropol, Copenhagen University Hospital
 Contributors: Sørensen, J. A., Hauge, A., Baden-Kristensen, K., Holst-Christensen, B., Tolstrup Jensen, J., Jeppesen, L., Sølvkær, M., Børresen, B.
Pages: 73-75
Publication date: 2011

Host publication Information
Title of host publication: Profession og teknologi : Videnbasering, udvikling og anvendt forskning i praksis
Editors: Hørdam, B., Lauritsen, J., Lubanski, N.
ISBN (Print): 978-87-7008-017-0
Research output: Chapter in Book/Report/Conference proceeding › Conference abstract in proceedings – Annual report year: 2011 › Research › peer-review

Ingeniørpraktik

General information
Publication status: Published
Medicoteknik 3

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics, Center for Continuing Education
Contributors: Sørensen, J. A., Munck-Fairwood, R.
Publication date: 2011

Publication information
Year: 2011
Original language: Danish
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication

Medicoteknik 4

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics, Professionshøjskolen Metropol, Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A., Sørensen, J. K., Jeppesen, L., Ladelund, S., Petersen, J.
Publication date: 2011

Publication information
Year: 2011
Original language: Danish
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication

Semesterprojekt 3: Distribueret patientdatasystem og simuleringssystem til klinisk overvågning af fysiologisk data

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics, Professionshøjskolen Metropol, Radiografuddannelsen
Contributors: Sørensen, J. A., Holst-Christensen, B., Tolstrup Jensen, J., Pilegaard Knudsen, M.
Publication date: 2011

Publication information
Year: 2011
Original language: Danish
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication

Semesterprojekt 4: Medicinsk teknologivurdering

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics
Contributors: Sørensen, J. A., Baden-Kristensen, K., Holst-Christensen, B.
Publication date: 2011

Publication information
Year: 2011
Original language: Danish
Research output: Other contribution › Other contribution – Annual report year: 2011 › Communication
Telemedicin 1

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics, Center for Continuing Education, University of Copenhagen
Contributors: Sørensen, J. A., Munck-Fairwood, R., Holst-Christensen, B., Phanareth, K.
Publication date: 2011

Publication information
Year: 2011
Original language: Danish
Research output: Other contribution – Other contribution – Annual report year: 2011 – Communication

Digital Communication and Modulation
Fundamental principles in modern digital communication system like modems and wire- and wireless transmission over physical channels.

Class room sessions and projects.

Semester: Autumn 2010
Extent: 7.5 ects
Class size: 18

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A.
Publication date: 2010

Publication information
Year: 2010
Original language: English
Research output: Other contribution – Other contribution – Annual report year: 2010 – Communication

Digital Communication and Modulation
Fundamental principles in modern digital communication system like modems and wire- and wireless transmission over physical channels.

Class room sessions and projects.

Semester: Spring 2010
Extent: 7.5 ects
Class size: 9

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A.
Publication date: 2010

Publication information
Year: 2010
Original language: English
Research output: Other contribution – Other contribution – Annual report year: 2010 – Communication

Discrete Mathematics
The introduction of the mathematics needed for analysis, design and verification of discrete systems, including applications within programming languages for computer systems.

Course sessions and project work.

Semester: Autumn 2010
Discrete Mathematics
The introduction of the mathematics needed for analysis, design and verification of discrete systems, including applications within programming languages for computer systems.

Course sessions and project work.

Semester: Spring 2010
Ectent: 5 ects
Class size: 18

Faglig bedømmelse af ansøgere til stillinger ved IT-faggruppen

Medicoteknik 3
Præsentation af status for aftagerpanel: Diplomingeniør i sundhedsteknologi

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A.
Number of pages: 33
Publication date: 2010

Publication information
Year: 2010
Original language: Danish
Research output: Other contribution – Annual report year: 2010 – Communication

Præsentation af status for udvikling af uddannelses: Diplomingeniør i sundhedsteknologi

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A.
Number of pages: 59
Publication date: 2010

Publication information
Year: 2010
Original language: Danish
Research output: Other contribution – Annual report year: 2010 – Communication

Rapport til Undervisningsministeriet vedr. status for udvikling af uddannelsen: Diplomingeniør i sundhedsteknologi

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies
Contributors: Sørensen, J. A.
Number of pages: 8
Publication date: 2010

Publication information
Original language: Danish

SU-SP3 Semesterprojekt 3: Distribueret patientdatasystem og simuleringsystem til klinisk overvågning af fysiologisk data

General information
Publication status: Published
Organisations: Center for Bachelor of Engineering Studies, Ergoterapeutuddannelsen, Radiografuddannelsen
Contributors: Sørensen, J. A., Holst-Christensen, B., Munck-Fairwood, R., Tolstrup, J., Knudsen, M. P.
Publication date: 2010

Publication information
Year: 2010
Original language: Danish
Research output: Other contribution – Annual report year: 2010 – Communication

Canonical filters and rank-reduction algorithms

General information
Publication status: Published
Organisations: Scientific Computing, Department of Informatics and Mathematical Modeling
Contributors: Hansen, P. C., Hansen, P. S. K., Hansen, S. D., Sørensen, J. A.
Publication date: 2000

Publication information
Publisher: IMM Publications
Experimental Comparison of Signal Subspace Based Noise Reduction Methods
The signal subspace approach for non-parametric speech enhancement is considered. Several algorithms have been proposed in the literature but only partly analyzed. Here, the different algorithms are compared, and the emphasis is put onto the limiting factors and practical behavior of the estimators. Experimental results show that the signal subspace approach may lead to a significant enhancement of the signal to noise ratio of the output signal.

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Scientific Computing
Contributors: Hansen, P. S. K., Hansen, P. C., Hansen, S. D., Sørensen, J. A.
Pages: 101-104
Publication date: 1999

Host publication information
Title of host publication: Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing
Volume: 1
ISBN (Print): 0-7803-5041-3
Electronic versions:
hansen.pdf
DOIs:
10.1109/ICASSP.1999.758072

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Improved diagnosis of MV paper-insulated cables using signal analysis

General information
Publication status: Published
Organisations: Department of Electric Power Engineering, Department of Informatics and Mathematical Modeling, DEFU a.m.b.a.
Contributors: Villefrance, R., Holbøll, J. T., Sørensen, J. A., Jørgensen, H. J.
Publication date: 1999

Host publication information
Title of host publication: Proceedings of Fifth International Conference on Insulated Power Cables
Place of publication: Versailles
Publisher: Jicable
Source: orbit
Source-ID: 173530
Research output: Chapter in Book/Report/Conference proceeding Article in proceedings – Annual report year: 1999 Research peer-review


General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, AT&T, University of Maryland, Delft University of Technology, KTH - Royal Institute of Technology
Contributors: Ostermann, J., Liu, K. R., Sørensen, J. A., Deprettere, E., Kleijn, B.
Number of pages: 650
Publication date: 1999
Virtual Seminar Room
The initial design considerations and research goals for an ATM network based virtual seminar room with 5 sites are presented.

General information
Publication status: Published
Organisations: Department of Photonics Engineering, Department of Informatics and Mathematical Modeling, Department of Telecommunication, Department of Information Technology
Pages: 581-586
Publication date: 1999

Host publication information
Title of host publication: Proceedings of the IEEE 3rd Multimedia Signal Processing
Publisher: IEEE
ISBN (Print): 0-7803-5610-1
Source-ID: 175162

Virtual seminar room-modelling and experimentation in horizontal and vertical integration
The initial design considerations and research goals for an ATM network based virtual seminar room with five sites are presented. The basic observation behind the design of the virtual seminar room is, that besides the constant growth in available bandwidth for transmission in communication networks, many networks either already offer or are developing technologies to give quality of service (QoS) guarantees. This means that applications not only will support transmission of coded audio and video, but can be designed in a known and well-controlled network environment, which enables the applications to provide, in a broad sense, a high and reliable quality presented at the human computer interface.

General information
Publication status: Published
Organisations: Coding and Visual Communication, Department of Photonics Engineering, Department of Informatics and Mathematical Modeling, Department of Telecommunication, Computer Science and Engineering
Publication date: 1999

Host publication information
Title of host publication: IEEE 3rd Workshop on Multimedia Signal Processing, 1999
Publisher: IEEE
ISBN (Print): 0-7803-5610-1
Electronic versions:
Forchhammer.pdf
DOIs:
10.1109/MMSP.1999.793918

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Source: orbit
Source-ID: 266784
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 1999 – Research – peer-review
Feature Extraction Method for High Impedance Ground Fault Localization in Radial Power Distribution Networks

A new approach to the localization of high impedance ground faults in compensated radial power distribution networks is presented. The total size of such networks is often very large and a major part of the monitoring of these is carried out manually. The increasing complexity of industrial processes and communication systems lead to demands for improved monitoring of power distribution networks so that the quality of power delivery can be kept at a controlled level. The ground fault localization method for each feeder in a network is based on the centralized frequency broadband measurement of three phase voltages and currents. The method consists of a feature extractor, based on a grid description of the feeder by impulse responses, and a neural network for ground fault localization. The emphasis of this paper is the feature extractor, and the detection of the time instance of a ground fault
Problem Solutions, Lecture Note for Course 04362, Digital Signal Processing, IMM, DTU

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Larsen, J., Sørensen, J. A.
Number of pages: 58
Publication date: 1998

Publication information
Original language: English
Source: orbit
Source-ID: 170418
Research output: Book/Report › Book – Annual report year: 1998 › Research › peer-review

A Concept for Monitoring Radial Distribution networks Based on Very Few Measurements.

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, NESA A/S
Contributors: Munk, S. M., Sørensen, J. A.
Pages: 227-230
Publication date: 1997

Host publication information
Title of host publication: Proc. 4th International Workshop on Systems, Signals and Image Processing
Place of publication: Poznan
Publisher: Polish Society of Theoretical and Applied Electrical Engineering
Source: orbit
Source-ID: 168645
Research output: Chapter in Book/Report/Conference proceeding › Book chapter – Annual report year: 1997 › Research › peer-review

An EMG Decomposition System Aimed at Detailed Analysis of Motor Unit Activity.

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Contributors: Nikolic, M., Krarup, C., Dahl, K., Sørensen, J. A.
Pages: 220-220
Publication date: 1997
Peer-reviewed: Yes

Publication information
Volume: 103
Original language: English
Source: orbit
Source-ID: 168641
Research output: Contribution to journal › Journal article – Annual report year: 1997 › Research › peer-review

Detailed Analysis of Motor Unit Activity.

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Contributors: Nikolic, M., Sørensen, J. A., Dahl, K., Krarup, C.
Pages: 1257-1260
Publication date: 1997
Detection of Variability of the Motor Unit Action Potential Shape by Means of the Firing Patterns

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Copenhagen University Hospital
Contributors: Krarup, C., Nikolic, M., Dahl, K., Sørensen, J. A.
Pages: 100-100
Publication date: 1997
Peer-reviewed: Yes

Publication information
Volume: 103
Original language: English
Source-ID: 168642
Research output: Contribution to journal › Journal article – Annual report year: 1997 › Research › peer-review

Modeling and Evaluation of Multimodal Perceptual Quality
The increasing performance requirements of multimedia modalities, carrying speech, audio, video, image, and graphics emphasize the need for assessment methods of the total quality of a multimedia system and methods for simultaneous analysis of the system components. It is important to take into account still more perceptual characteristics of the human auditory, visual, tactile systems, as well as combinations of these systems, it is also highly desirable to acquire methods for analysing the main perceptual parameters, which constitute the input for the total quality assessment. A framework is suggested for assessing the quality of modalities and their combinations

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Petersen, K. T., Hansen, S. D., Sørensen, J. A.
Pages: 38-39
Publication date: 1997
Peer-reviewed: Yes

Publication information
Journal: IEEE - Signal Processing Magazine
Volume: 14
Issue number: 4
ISSN (Print): 1053-5888
Original language: English
Electronic versions:
Petersen.pdf
DOIs:
10.1109/79.598591
Bibliographical note
Copyright: 1997 IEEE. Personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution to servers or lists, or to reuse any copyrighted component of this work in other works must be obtained from the IEEE
Source-ID: 168531
Research output: Contribution to journal › Journal article – Annual report year: 1997 › Research › peer-review
Objective Speech Quality Assessment of Compounded Digital Telecommunication Systems

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Petersen, K. T., Sørensen, J. A., Hansen, S. D.
Publication date: 1997

Host publication information
Title of host publication: IEEE Multimedia Signal Processing
Publisher: IEEE
Source: orbit
Source-ID: 168533

Speech Quality Assessment of Compounded Digital Telecommunication Systems; Perceptual Dimensions

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Petersen, K. T., Hansen, S. D., Sørensen, J. A.
Publication date: 1997

Host publication information
Title of host publication: IEEE International Conference on Acoustics Speech and Signal Processing
Publisher: IEEE
Source: orbit
Source-ID: 168532

ULV-Based Signal Subspace Method for Speech Enhancement

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Scientific Computing
Contributors: Hansen, P. S. K., Hansen, P. C., Hansen, S. D., Sørensen, J. A.
Pages: 9-12
Publication date: 1997

Host publication information
Title of host publication: International Workshop on Acoustic Echo and Noise Control, IWAENC'97
Place of publication: London
Publisher: Imperial Collega
Source: orbit
Source-ID: 200454
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 1997 – Research

Adaptive FIR Filters

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Sørensen, J. A.
Number of pages: 46
Publication date: 1996

Publication information
Original language: English
Source: orbit
Source-ID: 164974
Noise Reduction of Speech Signals using the Rank-Revealing ULLV Decomposition

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling, Scientific Computing
Pages: 967-970
Publication date: 1996

Host publication information
Title of host publication: Signal Processing VIII. Theories and Applications, EUSIPCO-96
Editors: Ramponi, G., Sicuranza, G. L., Carrato, S., Marsi, S.
Source: orbit
Source-ID: 200455
Research output: Chapter in Book/Report/Conference proceeding > Article in proceedings – Annual report year: 1996 > Research > peer-review

Time-area efficient multiplier-free recursive filter architectures for FPGA implementation
Simultaneous design of multiplier-free recursive filters (IIR filters) and their hardware implementation in Xilinx field programmable gate array (XC4000) is presented. The hardware design methodology leads to high performance recursive filters with sampling frequencies in the interval 15-21 MHz (17 bits internal data representation). It is demonstrated that the time-area efficiency and performance of the architectures are considerably above any known approach

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Shajaan, M., Sørensen, J. A.
Pages: 3268-3271
Publication date: 1996

Host publication information
Title of host publication: Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing
Volume: Volume 6
Publisher: IEEE
ISBN (Print): 07-80-33192-3
Electronic versions:
Sørensen.pdf
DOIs: 10.1109/ICASSP.1996.550574

Bibliographical note
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Source: orbit
Source-ID: 164935
Research output: Chapter in Book/Report/Conference proceeding > Article in proceedings – Annual report year: 1996 > Research > peer-review

Properties of predictor based on relative neighborhood graph localized FIR filters
A time signal prediction algorithm based on relative neighborhood graph (RNG) localized FIR filters is defined. The RNG connects two nodes, of input space dimension D, if their lune does not contain any other node. The FIR filters associated with the nodes, are used for local approximation of the training vectors belonging to the lunes formed by the nodes. The predictor training is carried out by iteration through 3 stages: initialization of the RNG of the training signal by vector quantization, LS estimation of the FIR filters localized in the input space by RNG nodes and adaptation of the RNG nodes by equalizing the LS approximation error among the lunes formed by the nodes of the RNG. The training properties of the predictor is exemplified on a burst signal and characterized by the normalized mean square error (NMSE) and the mean valence of the RNG nodes through the adaptation

General information
Publication status: Published
Organisations: Department of Informatics and Mathematical Modeling
Contributors: Sørensen, J. A.
Time-area efficient multiplier-free filter architectures for FPGA implementation
Simultaneous design of multiplier-free filters and their hardware implementation in Xilinx field programmable gate array (XC4000) is presented. The filter synthesis method is a new approach based on cascade coupling of low order sections. The complexity of the design algorithm is \( O(\text{filter order}) \). The hardware design methodology leads to high performance filters with sampling frequencies in the interval 20-50 MHz. Time-area efficiency and performance of the architectures are considerably above any known approach.

Time signal filtering by relative neighborhood graph localized linear approximation
A time signal filtering algorithm based on the relative neighborhood graph (RNG) used for localization of linear filters is proposed. The filter is constructed from a training signal during two stages. During the first stage an RNG is constructed. During the second stage, localized linear filters are associated each RNG node and adapted to the training signal. The filtering of a test signal is then carried out by inserting the test signal vectors in the RNG followed by the determination of the filter output as a function of the linear filters or the RNG nodes to which the vectors are associated. Training examples are given on a segment of a speech signal and a signal with burst structure generated from a bilinear Subba Rao model.
Quantized, piecewise linear filter network
A quantization based piecewise linear filter network is defined. A method for the training of this network based on local approximation in the input space is devised. The training is carried out by repeatedly alternating between vector quantization of the training set into quantization classes and equalization of the quantization classes linear filter mean square training errors. The equalization of the mean square training errors is carried out by adapting the boundaries between neighbor quantization classes such that the differences in mean square training errors are reduced.

A family of quantization based piecewise linear filter networks
A family of quantization-based piecewise linear filter networks is proposed. For stationary signals, a filter network from this family is a generalization of the classical Wiener filter with an input signal and a desired response. The construction of the filter network is based on quantization of the input signal \( x(n) \) into quantization classes. With each quantization class is associated a linear filter. The filtering at time \( n \) is carried out by the filter belonging to the actual quantization class of \( x(n) \) and the filters belonging to the neighbor quantization classes of \( x(n) \) (regularization). This construction leads to a three-layer filter network. The first layer consists of the quantization class filters for the input signal. The second layer carries out the regularization between neighbor quantization classes, and the third layer constitutes a decision of quantization class from where the resulting output is obtained.
A circular finite-element model reconstruction in electrical impedance tomography

A circular finite-element model utilizing triangular picture elements is constructed using a previously published reconstruction method. The model is applied to examples of simulated reconstructed pictures to illustrate its properties with regard to sensitivity, contrast and shape of the object.

General information
Publication status: Published
Organisations: Department of Information Technology, Department of Control and Engineering Design, Technical University of Denmark
Contributors: Møsner, L. N., Andersen, O. T., Dawids, S., Sørensen, J. A.
Pages: 446-447
Publication date: 1989

Host publication information
Title of host publication: Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society: Images of the Twenty-First Century
Volume: Volume 2
Publisher: IEEE
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DOIs:
10.1109/IEMBS.1989.95811

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Source: orbit
Source-ID: 264543
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 1989 › Research › peer-review

Projects:

Neural signalbehandling
Grisen, G., PhD Student, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Main Supervisor
Performance optimization of wind farms using model-based data analysis
Schröder, L., PhD Student, Department of Wind Energy
Dimotrov, N. K., Main Supervisor
Mirzaei, M., Supervisor
Sørensen, J. A., Supervisor
Verelst, D. R., Supervisor
Technical University of Denmark
01/10/2017 → 30/09/2020
Award relations: Performance optimization of wind farms using model-based data analysis
Project: PhD

SmartSensorFlow: Development of Smart Sensor for flow & gas concentration measurement
Blaszczyk, T., Project Manager, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Hou, C., Project Participant, Department of Chemistry, NanoChemistry
Sørensen, J. A., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Andersen, F. H., Contact Person, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Andersen, B., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Maack, L., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Ei-teknologi
Project ID: 97254
01/09/2015 → 31/12/2017
Collaborators: Donghua University
Project: Research

Multikanal systemer til kombineret adaptiv støjreduktion og signalseperation
Kidmose, P., PhD Student, Department of Informatics and Mathematical Modeling
Hansen, L. K., Main Supervisor
Hansen, S. D., Supervisor
Hansen, P. C., Supervisor
Sørensen, J. A., Supervisor
Hanssen, A., Examiner
Nolan, J., Examiner
Larsen, J., Examiner
DTU-lønnet stipendie
01/09/1998 → 14/06/2002
Award relations: Multikanal systemer til kombineret adaptiv støjreduktion og signalseperation
Project: PhD

Signalbehandling anvendt til overvågning af distributionsnet
Jensen, K. J., PhD Student, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Main Supervisor
Munk, S. M., Supervisor
Wilhelm, J. E., Examiner
Koldby, E., Examiner
Jørgensen, P., Examiner
Innovationsfonden
01/05/1996 → 19/11/1999
Award relations: Signalbehandling anvendt til overvågning af distributionsnet
Project: PhD

Mobils system til tilstandsvurdeiring af AC-højspændingskabler
Villefrance, R., PhD Student, Department of Electrical Engineering
Henriksen, M., Main Supervisor
Sørensen, J. A., Examiner
Innovationsfonden
01/05/1996 → 03/02/2000
Award relations: Mobils system til tilstandsvurdeiring af AC-højspændingskabler
Højeffektive effektforstærkere
Nielsen, K., PhD Student, Department of Electrical Engineering
Andersen, M. A. E., Main Supervisor
Sørensen, J. A., Supervisor
Anden Forskningsrådsfinan.-SU
Award relations: Højeffektive effektforstærkere
Project: PhD

Støjreduction af talesignaler i mobiltelefoni ved anvendelse af flere mikrofoner og singulær værdi dekomposition
Hansen, P. S. K., PhD Student, Department of Informatics and Mathematical Modeling
Hansen, S. D., Main Supervisor
Sørensen, J. A., Main Supervisor
Forchhammer, S., Examiner
DTU stipendium
01/02/1994 → 29/07/1998
Award relations: Støjreduction af talesignaler i mobiltelefoni ved anvendelse af flere mikrofoner og singulær værdi dekomposition
Project: PhD

Signalbehandling anvendt til overvågning af distributionsnet
Munk, S. M., PhD Student, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Main Supervisor
Pedersen, K. O. H., Supervisor
Grissen, G., Examiner
Akademiet for de Tekniske Videnskaber
01/12/1992 → 09/04/1996
Award relations: signalbehandling anvendt til overvågning af distributionsnet
Project: PhD

Syntetisering af støj i seismiske signaler under udnyttelse af priori viden om undergrunden og den seismiske registrer
Hansen, K. V., PhD Student, Administration
Møller, P. K., Main Supervisor
Sørensen, J. A., Supervisor
Akademiet for de Tekniske Videnskaber
01/07/1991 → 09/01/1995
Award relations: Syntetisering af støj i seismiske signaler under udnyttelse af priori viden om undergrunden og den seismiske registrer
Project: PhD

Condition Monitoring And Fault Diagnosis In Marine Diesel Engines
Fog, T. L., PhD Student, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Main Supervisor
Hansen, L. K., Supervisor
Sørensen, H. B. D., Examiner
Grissen, G., Supervisor
Innovationsfonden
01/12/1994 → 21/05/1999
Award relations: Condition Monitoring And Fault Diagnosis In Marine Diesel Engines
Project: PhD

Talekodning ved digital signalbehandling og lydkvalitet i sammensatte digitale transmissionssystemer
Petersen, K. T., PhD Student, Department of Informatics and Mathematical Modeling
Hansen, S. D., Main Supervisor
Sørensen, J. A., Supervisor
Elberling, C., Examiner
Innovationsfonden
01/10/1994 → 25/05/1998
Award relations: Talekodning ved digital signalbehandling og lydkvalitet i sammensatte digitale transmissionssystemer
Project: PhD

1-bit kodning af audiosignaler.
Risbo, L., PhD Student, Department of Informatics and Mathematical Modeling
Serensen, J. A., Main Supervisor
Møller, P. K., Supervisor
DTU stipendium
01/02/1992 → 01/03/1995
Award relations: 1-bit kodning af audiosignaler.
Project: PhD

Adaptive filtre til undertrykkelse af akustisk ekko i mobiltelefoner
Jensen, S. H., PhD Student, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Main Supervisor
Gammel ordning u/skema-SU
01/09/1990 → 06/09/1995
Award relations: Adaptive filtre til undertrykkelse af akustisk ekko i mobiltelefoner
Project: PhD

Design of neural network filters
Larsen, J., PhD Student, Department of Informatics and Mathematical Modeling
Serensen, J. A., Main Supervisor
Gammel ordning u/skema-SU
01/02/1990 → 21/02/1994
Award relations: Design of neural network filters
Project: PhD

Analyse af tids-frekvens-fordelinger v.h.a. den diskrete Radontransformation
Toft, P. A., PhD Student, Department of Informatics and Mathematical Modeling
Serensen, J. A., Main Supervisor
Møller, P. K., Supervisor
Forchhammer, S., Examiner
Grøn, G., Examiner
DTU stipendium
01/03/1993 → 27/11/1996
Award relations: Analyse af tids-frekvens-fordelinger v.h.a. den diskrete Radontransformation
Project: PhD

Multiplikatorfrie, digitale filterstrukturer
Shajaan, M., PhD Student, Department of Informatics and Mathematical Modeling
Serensen, J. A., Main Supervisor
Møller, P. K., Supervisor
Serensen, H. B. D., Examiner
DTU stipendium
01/02/1993 → 03/09/1996
Award relations: Multiplikatorfrie, digitale filterstrukturer
Project: PhD

CLAFIS: Crop, Livestock and Forests Integrated System for Intelligent Automation, Processing and Control
The Clafis project, with a duration of 36 months and a funding of 3.6 M€ contains 13 beneficiaries with a high focus on research. It intends to develop an open source intelligent Agriculture Management Information System. From the hardware side it contains a cloud based ioGateway (based on OPC UA) and a bus system, enabling to connect all kind of devises and systems, including Internet of Things (IoT) and an sophisticated HMI (Human Machine Interface). The software enables the connectivity and integration of most used platforms, secure data handling, Knowledge Management and middleware integration.
Kaur, B., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Andersen, B., Project Coordinator, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Serensen, J. A., Supervisor, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Blaszczyk, T., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
FP7 Contract ID: 604659
Project ID: 97134
Achieving Channel QoS and Security with a Software Defined Radio

An increasing number of applications require a specific level of QoS on the communication channel and at the same time the fulfillment of some security demands. An example is VoIP that might require at least 100 kbps bandwidth, at most 200 msec delay, and encryption (and/or hiding) of the package stream. Furthermore for example at most 10% of data/packages can be allowed lost or vanished due to noise or DoS attack. In our project we are working on a software defined radio platform (GNU radio) for the reason that we want to look into how the flexibility of a software defined radio can help us in achieving specific QoS and security demands needed by typical applications. The setup is simple and consists of two computing devices connected to software defined radios. The devices are running applications that require package streams over the air. A third computing device connected to a third software defined radio is the adversary that
can carry out any kind of attacks – especially it can carry out DoS attacks by generating noise.
Andersen, B., Project Participant, Center for Bachelor of Engineering Studies, Center for Continuing Education
Khajuria, S., Project Participant
Kaur, B., Project Participant, Center for Bachelor of Engineering Studies
Li, Y., Project Participant
Sørensen, J. A., Project Participant, Center for Bachelor of Engineering Studies, Center for Information Technology and Electronics, Department of Electrical Engineering
Blaszczyk, T., Project Participant, Center for Bachelor of Engineering Studies, Afdelingen for Informatik
Ministry of Higher Education and Science: DKK1,485,000.00, Ingeniørhøjskolen i København: DKK565,000.00
01/07/2006 → 30/06/2010
Keywords: Software defined radio, Radio security, Wireless denial of service attacks, Wireless communication
Project: Research

Ph.D. Project: Prediction of the Cylinder Condition in Marine Engines Using Neural Networks
Marine engine monitoring is an active research area with a long history. Successful monitoring is vital for marine traffic safety and significant economic factors can be involved e.g., in the form of transport delay costs and additional use of spare parts. At present, only quite simple electronic methods exist for monitoring the cylinder condition in marine engines. Certain mechanical systems have been constructed, although robust, they do not provide adequate information about the specific fault conditions. Development of new and better methods for signal analysis in fault diagnosing is therefore of great interest. The goal of the project is to develop a detailed and reliable system for monitoring the cylinder condition in marine engines. The cylinder condition will be monitored by use of sensors which either directly or indirectly can measure important parameters of the cylinder condition (temperature, cylinder pressure and sound/vibrations). This demands integration of information from sources with different signal characteristics and signal-to-noise ratios in a comprehensive evaluation of the cylinder condition (signal/sensor fusion). Also, design of performance criteria by use of for instance Bayesian analysis and integration of specific expert knowledge (prior information) will be considered. One specific form of prior information is the so-called wavelet representation for sound/vibration signals. In this case the network input could be represented as sound/vibration “images” describing time dependent development of the signal's frequency spectrum. Such representation can be useful for detection of anomalies and non-stationarity.
The diagnosing tool will be a neural network and therefore a detailed study of neural network architectures and performance optimization methods will be necessary. Especially methods for analyzing multivariate time series (simultaneous prediction of several parameters) will be in focus.
Serensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, L. K., Project Participant, Department of Informatics and Mathematical Modeling
Fog, T. L., Project Participant, Department of Informatics and Mathematical Modeling
Peteren, P. S., Project Participant, MAN Diesel & Turbo
Lautrup, B., Project Participant, University of Copenhagen
Ukendt: DKK600,000.00
01/12/1994 → 31/05/1998
Collaborators: University of Copenhagen, MAN Diesel & Turbo
Award relations: Ph.D. Project: Prediction of the Cylinder Condition in Marine Engines Using Neural Networks
Project: Research

Analysis of Electromyographic Signals
The object of this project is the analysis of motor unit potentials measured by needle electrodes in muscles. The application area is clinical diagnosis of muscle- and nerve diseases. Emphasis is concentrated on analyzing the sequence of potentials and particularly variations in the potentials forms. These variations, also denoted variability, are expected to form diagnostic parameters for the clinical diagnosis of muscle- and nerve diseases. Furthermore they are expected to form a basis for the analysis of the restitution process of nerve- and muscle lesions. A database consisting of measurements on normal persons and patients with a selection of muscle and nerve diseases has been established. Among others the database contains a selection of measurements which is expected to originate in the variability phenomenon.
The analysis system is being used for clinical diagnosis at the Department of Neurophysiology, The Royal Hospital. In the period of reporting, the work has concentrated on the elaboration of the ph.d. thesis.
Serensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, S. D., Project Participant, Department of Informatics and Mathematical Modeling
Krærup, C., Project Participant, Righospitalet
Nikolic, M., Project Participant, University of Copenhagen
01/06/1996 → 20/04/1999
Collaborators: University of Copenhagen, Copenhagen University Hospital, Righospitalet
Award relations: Analysis of Electromyographic Signals
Project: Research

Project: Prediction of the Cylinder Condition in Marine Engines Using Neural Networks
Marine engine monitoring is an active research area with a long history. Successful monitoring is vital for marine traffic safety and significant economic factors can be involved e.g., in the form of transport delay costs and additional use of spare parts. At present, only quite simple electronic methods exist for monitoring the cylinder condition in marine engines. Certain mechanical systems have been constructed, although robust, they do not provide adequate information about the specific fault conditions. Development of new and better methods for signal analysis in fault diagnosing is therefore of great interest. The goal of the project is to develop a detailed and reliable system for monitoring the cylinder condition in marine engines. The cylinder condition will be monitored by use of sensors which either directly or indirectly can measure important parameters of the cylinder condition (temperature, cylinder pressure and sound/vibrations). This demands integration of information from sources with different signal characteristics and signal-to-noise ratios in a comprehensive evaluation of the cylinder condition (signal/sensor fusion). Also, design of performance criteria by use of for instance Bayesian analysis and integration of specific expert knowledge (prior information) will be considered. One specific form of prior information is the so-called wavelet representation for sound/vibration signals. In this case the network input could be represented as sound/vibration “images” describing time dependent development of the signal's frequency spectrum. Such representation can be useful for detection of anomalies and non-stationarity.
The diagnosing tool will be a neural network and therefore a detailed study of neural network architectures and performance optimization methods will be necessary. Especially methods for analyzing multivariate time series (simultaneous prediction of several parameters) will be in focus.
Serensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, L. K., Project Participant, Department of Informatics and Mathematical Modeling
Fog, T. L., Project Participant, Department of Informatics and Mathematical Modeling
Peteren, P. S., Project Participant, MAN Diesel & Turbo
Lautrup, B., Project Participant, University of Copenhagen
Ukendt: DKK600,000.00
01/12/1994 → 31/05/1998
Collaborators: University of Copenhagen, MAN Diesel & Turbo
Award relations: Ph.D. Project: Prediction of the Cylinder Condition in Marine Engines Using Neural Networks
Project: Research

Analysis of Electromyographic Signals
The object of this project is the analysis of motor unit potentials measured by needle electrodes in muscles. The application area is clinical diagnosis of muscle- and nerve diseases. Emphasis is concentrated on analyzing the sequence of potentials and particularly variations in the potentials forms. These variations, also denoted variability, are expected to form diagnostic parameters for the clinical diagnosis of muscle- and nerve diseases. Furthermore they are expected to form a basis for the analysis of the restitution process of nerve- and muscle lesions. A database consisting of measurements on normal persons and patients with a selection of muscle and nerve diseases has been established. Among others the database contains a selection of measurements which is expected to originate in the variability phenomenon.
The analysis system is being used for clinical diagnosis at the Department of Neurophysiology, The Royal Hospital. In the period of reporting, the work has concentrated on the elaboration of the ph.d. thesis.
Serensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, S. D., Project Participant, Department of Informatics and Mathematical Modeling
Krærup, C., Project Participant, Righospitalet
Nikolic, M., Project Participant, University of Copenhagen
01/06/1996 → 20/04/1999
Collaborators: University of Copenhagen, Copenhagen University Hospital, Righospitalet
Award relations: Analysis of Electromyographic Signals
Project: Research
Virtual Seminar Room; Audio
Project No. 1255.

The aim of the project is the development of a robust speech acquisition system for a Virtual Seminar Room application. The work has been concentrated on the establishment of a multimicrophone, amplifier, signal processor, and loudspeaker system, which allows for research in algorithms for speech localization, noise reduction and signal separation. There has been work on robust adaptive beamforming, where an initial combined beamforming and room simulation model, has been developed in Matlab. Furthermore there has been work on acoustic echo cancellation. This project is a part of a cooperation on the design of a Virtual Seminar Room, and is concentrated on the audio part. The project is carried out in cooperation with the DTU Departments COM, IT and TELE, and in cooperation with the Department of Information and Media Science at Århus University.


Sørensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, P. S. K., Project Participant, Department of Informatics and Mathematical Modeling
Hansen, S. D., Project Participant, Department of Informatics and Mathematical Modeling
Danielsen, P. L., Project Participant, Department of Photonics Engineering
Gram, C., Project Participant, Department of Information Technology
Pedersen, S., Project Participant, Department of Information Technology
Sharp, R., Project Participant, Department of Information Technology
Forchhammer, S., Project Participant, Department of Telecommunication
Jensen, O. R., Project Participant, Department of Telecommunication

Ukendt: DKK425,000.00
01/01/1998 → 31/12/2001

Award relations: Virtual Seminar Room; Audio
Project: Research

Ph.D. project: Multichannel Systems for Combined Adaptive Noise Reduction and Signal Separation

The research goal is the development of noise reduction/signal separation methods, based on a combination of spatial localization, subspace filtering and application of model information on the signals being noise reduced or separated. In particular there is aimed for noise reduction, spatial localization and separation of speech signals and a selection of impulse noise and broad band noise sources.

Sørensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
Hansen, S. D., Project Participant, Department of Informatics and Mathematical Modeling
Hansen, P. C., Project Participant, Department of Informatics and Mathematical Modeling
Kidmose, P., Project Participant, Department of Informatics and Mathematical Modeling
Kidmose, P., Project Manager, Department of Informatics and Mathematical Modeling

Ukendt: DKK1,200,000.00
01/09/1998 → 31/08/2001

Award relations: Ph.D. project: Multichannel Systems for Combined Adaptive Noise Reduction and Signal Separation
Project: Research

Ph.D. Project: Multichannel Adaptiv Analysis of Rotating Systems (MARS)

Project No. 3140.
The objectives of the project are to develop methods for the estimation and tracking of the fundamental frequency components in rotating systems, without using tachometers, but only accelerometer measurements from different acquisition points on the system being investigated. Furthermore, the multichannel measurements must be used for the estimation of parameters, which can be used for the diagnosis of unbalance, misalignment, bent shaft and instability in journal bearings and mechanical looseness, and incipient faults in rolling-element bearings.

Projects participants:
civilingenior Thorkild Find Pedersen, Bruel & Kjaer A/S, ph.d. studnet.
Supervisors:
civilingenior Henrik Herlufsen, Bruel & Kjaer A/S,
civilingenior Ole Roth, Bruel & Kjaer A/S,
Professor Per Chr. Hansen, IMM, DTU,
lektor Steffen Duus Hansen, IMM, DTU,
lektor John Aa. Sorensen, IMM, DTU.
Sørensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling

Ukendt: DKK1,466,950.00
01/09/1999 → 31/08/2001

Award relations: Ph.D. Project: Multichannel Adaptiv Analysis of Rotating Systems (MARS)
IEEE International Workshop on Multimedia Signal Processing, 1999
Project No. 1279.
Responsible for the accomplishment of the paper submission, technical program, invited speakers, and conference site.
The Workshop is sponsored by Nokia A/S, Teledanmark A/S, Thriges Fond, The Danish National Center for IT Research, and IMM DTU.
The workshop was carried out in the period Monday September 13 - 15.
The homepage of the workshop is http://eivind.imm.dtu.dk/mmssp99/.
At IMM the work was carried out in cooperation with Ellen Marie Borup, Steffen Duus Hansen, Peter Søren Kirk Hansen, Preben Kidmose, and Ulla Nørhave.
The workshop was accomplished in cooperation with IEEE Multimedia Signal Processing Technical Committee.
Sørensen, J. A., Project Manager, Department of Informatics and Mathematical Modeling
13/09/1999 → 15/09/1999

Signal and Image Processing for Telemedicine (SITE).
Project No. 3135.
The rapid development in sensor technology, signal processing methods and parallel computing technology has enabled
the physical realization of complex mathematical models in a diversity of scientific and industrial areas. This beginning
interdisciplinary convergence of methodologies in science and technology has already had an impact on several industries
and is emerging in medical imaging and more generally in telemedicine. It seems very likely that bringing together
specialists from the mentioned areas could further boost the development of medical information processing in Denmark.
Such considerations also lead to incorporating the disciplines signal processing, scientific computing, and image analysis
in the Department of Mathematical Modelling (IMM) together with applied mathematical physics, numerical analysis,
operations research, and statistics. Furthermore, there has been established a close cooperation between scientists from
DTU and several departments from different hospitals and university clinics.
Conradsen, K., Project Manager, Department of Informatics and Mathematical Modeling
Madsen, K., Project Participant, Department of Informatics and Mathematical Modeling
Hansen, P. C., Project Participant, Department of Informatics and Mathematical Modeling
Hansen, L. K., Project Participant, Department of Informatics and Mathematical Modeling
Erbsøll, B. K., Project Participant, Department of Informatics and Mathematical Modeling
Carstensen, J. M., Project Participant, Department of Informatics and Mathematical Modeling
Larsen, J., Project Participant, Department of Informatics and Mathematical Modeling
Sørensen, J. A., Project Participant, Department of Informatics and Mathematical Modeling
Sigurdsson, S., Project Participant, Department of Informatics and Mathematical Modeling
01/07/1999 → 30/06/2003

Activities:

7th International Conference on Electrical and Electronics Engineering
Period: 1 Dec 2011 → 4 Dec 2011
John Aasted Sørensen (Participant)
Center for Bachelor of Engineering Studies

Description
ELECO'11, Bursa, Turkey

Medlem af “Technical Program Committee” ELECO’11: The 7th International Conference on Electrical and Electronics
Engineering.

Related event

7th International Conference on Electrical and Electronics Engineering
01/12/2011 → 04/12/2011
Bursa, Turkey
Activity: Attending an event › Participating in or organising a conference

IEEE Denmark (External organisation)
Period: 2011 → 2012
John Aasted Sørensen (Participant)
Center for Bachelor of Engineering Studies

Description
Medlem af bestyrelsen for IEEE Denmark Section.
Links:
http://www.ieee.dk

Related external organisation
IEEE Denmark
Denmark
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

Sundhedsteknologi - metoder, praksis og perspektiver
Period: 18 Nov 2010
John Aasted Sørensen (Organizer)
Center for Bachelor of Engineering Studies

Description
Arrangør
Documents:
Program
Introduktion
Fakta og visioner for det danske sundhedsdsystem
Klinisk besøg og/eller telemedicin.
Telemedicin - status og perspektiver.
Patientkufferten - perspektiver
Videncenter Sundhedsteknologi i hjemmet
Udviklingsperspektiver indenfor ældreområdet
Fordele og ulemper ved digitalisering og telemedicin - med hospitalslægens briller på.
Application and Perspectives for Localization in HealthCare IT Systems
Diplomingeniør i sundhedsteknologi

Related event
Sundhedsteknologi - metoder, praksis og perspektiver
18/11/2010 → …
Ballerup, Denmark
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

Ingeniøruddannelsenæs landsdækkende censorkorps.
Period: 1 Apr 2010 → 31 Mar 2014
John Aasted Sørensen (Internal examiner)
Center for Bachelor of Engineering Studies

Description
Signalbehandling, kommunikation, matematik, medicoteknik.
Activity: Examinations and supervision › Internal examination

Software Defined Radio for Forsvarets Materieltjeneste: Consultancy
Period: 10 Mar 2009 → 18 Jun 2009
John Aasted Sørensen (Consultant)
Center for Bachelor of Engineering Studies

Description
Teaching:
* Antennas, channels, noise and available standards
* Digital filters
* Exam

Kompetenceudvikling hos kunden

Documents:

Course plan

**Related external organisation**

**Forsvarets Materieltjeneste**
Denmark
Keywords: Course SDR
Activity: Public and private sector consultancy › Public sector consultancy

**IEEE Denmark (External organisation)**
Period: 2009 → 2010
John Aasted Sørensen (Participant)

Center for Bachelor of Engineering Studies

Description
Medlem af bestyrelsen for IEEE Denmark Section

Body type: IEEE
Links:
http://www.ieee.dk

**Related external organisation**

**IEEE Denmark**
Denmark
Activity: Membership › Membership of commitees, commissions, boards, councils, associations, organisations, or similar

**Introduction to digital radio communication based on software defined radio, part II: Consultancy**
Period: 9 Dec 2008 → 10 Dec 2008
John Aasted Sørensen (Consultant)

Center for Bachelor of Engineering Studies

Description
Teacher day 2 of course offered by the Wireless Center IHK and TI.

Deltagerne for viden om nyeste princippet og teknologier

Documents:
Presentation_day2.pdf

Links:
http://www.teknologisk.dk/24764,2 (Training "Gør dine produkter trådløse - brug Software Defined Radio")

**Related event**

**Introduction to digital radio communication based on software defined radio, part II**
09/12/2008 → 10/12/2008
Denmark
Keywords: Course SDR
Activity: Public and private sector consultancy › Consultancy

**CensorNet - Ingeniøruddannelsernes landsdækkende censorkorps. (External organisation)**
Period: 1 Apr 2006 → 31 Mar 2010
John Aasted Sørensen (Member)

Center for Bachelor of Engineering Studies

Description
Ingeniøruddannelsernes landsdækkende censorkorps.

Signalbehandling, kommunikation, matematik, medicoteknik.
Related external organisation

CensorNet - Ingeniøruddannelsernes landsdækkende censorkorps.
Denmark
Activity: Membership › Membership of research networks or expert groups