

2nd University Technology Matchmaking Day
- IT, Electronics, Production and Building technology -

24 March, 2009

Programme

12.30 p.m. – 13.15 p.m.	Registration – Sandwiches - Networking
13.15 p.m. – 13.25 p.m.	Welcome
13.40 p.m. – 14.00 p.m.	Matchmaking session 1
14.00 p.m. – 14.20 p.m.	Matchmaking session 2
14.20 p.m. – 14.40 p.m.	Matchmaking session 3
14.40 p.m. – 15.10 p.m.	Break/Networking
15.10 p.m. – 15.30 p.m.	Matchmaking session 4
15.30 p.m. – 15.50 p.m.	Matchmaking session 5
15.50 p.m. – 16.10 p.m.	Matchmaking session 6
16.10 p.m. – 17.30 p.m.	Tapas – Networking

Time between scheduled meetings serves as an opportunity for networking with other network members, researchers and the project managers behind the University Technology Network.

Registration

Please, register to Kristine Kjer Hansen at kkh@adm.au.dk, before 17 March, 2009. If possible please include your matchmaking requests. You can also schedule matchmaking on arrival. Please, note the limited number of matchmaking sessions.

Location

Aarhus University, Fredrik Nielsens Vej, Building 1422, 8000 Aarhus C. Please, follow the signs to "Preben Hornungsstuen"

Parking is free at Fredrik Nielsens Vej or behind the Information Office – through Taasingegade.

MAP: <http://www.au.dk/da/kort/byg1422.htm>

Match 1

Develop Material Properties with Application in Wind Turbine Using Numerical Methods

Presented by: Assistant Professor, Dr. Luiz Carlos H. Ricardo
Aalborg University, Division of Structural Mechanics

The research group: Structural Mechanics Division: Some of the activities of the department are: Analysis of structures subject to static and dynamic loads, which may be stochastic including human induced loads, fracture mechanics and fatigue of e.g. wood, concrete, steel, composites and material interfaces.

Looking for: Research collaboration partner, Investment partner.

Research Presentation: In the current design process of wind turbine components are considered simplest fatigue models or linear fatigue damage to assess design capability. The engineers consider variable amplitude loadings problem as constant amplitude loading due complexity to work and understand the random loadings effects and crack propagation mechanisms. Many applications considering fatigue and crack propagation issues, must to be developed like crack-growth models for evaluation of suitability for service, inspection of quality from the manufacturing process, or simply for a more accurate assessment of capability for servicing variable amplitude loads would be helpful. The proposal of this project is develop crack propagation models by finite element method that can be used in wind turbine components. These models will be validated by experimental tests and will provide the guidelines of the design process. The proposal also is created an experimental and numerical data bank of crack propagation curves that will provide the first assumptions for future projects.

Match 2

Planning and Design of radio over fiber heterogeneous wireless networks

Presented by: Assistant Professor M. Tahir Riaz, Ph.D, M.Sc. E.E.
Aalborg University, Department of communication technology, Institute of Electronics

The Research group: The research group at Center for Network Planning (CNP) and Center for TeleInfrastructure (CTiF) is active and known in research focused on various aspects of planning, modeling and design of future broadband wired and wireless networks with particular focus on fiber optic technologies.

Looking for: Research collaboration partner, Investment partner.

Research Presentation: One of the key research areas within the research group is *Network Planning and Design* of next generation broadband wired and wireless networks. The research group deals with modeling, new computer aided network planning and design methods, and optimization of network topologies to achieve high QoS and reliability in networks. The group is also active in research of Radio over Fiber (RoF) heterogeneous broadband wireless networks. The work on RoF wireless network aimed to fulfill the vision of 4th generation wireless networks with hybrid fiber optic and wireless technologies. Research group is currently developing new architecture for the optical part of RoF heterogeneous broadband wireless network.

Match 3

Wireless Networking for Dependable Service Provisioning

Presented by: Dr. Tatiana Kozlova Madsen
Aalborg University, Dept. of Electronic Systems, Networking and Security
Section.

The Research group: In the Networking and Security section we are dealing with different aspects of modern wireless and wired networks. Different areas include Quality of Service and performance optimization for converging networks; mobility support including mobility in ad hoc networks; dependable mobile services; safety-critical communication; Positioning Information and Position-aided Networking. Application scenarios that we are working with include different wired and wireless networks, e.g. industrial safety-critical networks, car-to-car and car-to-infrastructure networks, cellular networks, personal area networks, sensor networks.

Looking for: Research collaboration partner, Investment partner.

Research Presentation: Research topics: Performance evaluation and optimization of wireless networks, cooperative principles for wireless communication, efficient usage of wireless resources, cross-layer design, protocol enhancement for reliable and dependable communication. The problems of network optimization occurs in many applications and scenarios - e.g. communication with the requirements for safety, dependability, availability, delay-sensitive communication, need for synchronization etc. These are the issues that we are addressing.

Match 4

Wireless networking: communication protocols, spectrum management, antennas and propagation.

Presented by: Assistant Professor, Petar Popovski
Aalborg University, Institute of Electronics

The Research group: The research group is called Antennas, Propagation and Radio Networking and covers all the theoretical and practical aspects of wireless networks, ranging from networks of passive (RFID) devices, short-range technologies (Bluetooth, WLAN), mobile cellular systems, up to wireless multimedia transmission. The group has conducted a large number of projects with international partners (Nokia, Samsung, Docomo, NTT, Panasonic), has a portfolio of more than 40 patents and a large number of publications. In 2008, Petar Popovski has been received the Young Elite Researcher award from the Danish Ministry of Science and Technology for his research in wireless communications.

Looking for: Research collaboration partner, Investment partner.

Research Presentation: We have a number of ongoing research activities in the following areas:
Wireless cooperative communications: How to use relaying strategies to improve the throughput, delay, energy efficient operation in various wireless networks: ranging from sensor networks, wireless mesh networks, wireless ad hoc networks, high-speed mobile cellular networks. In the recent years there has been a great interest in cooperative transmission techniques, as they promise to extend the range, improve the reliability and save energy, especially in wireless sensor networks. **Cognitive radio and dynamic spectrum access:** Efficient method for utilizing the communication opportunities in the unlicensed/licensed bands by mitigating/avoiding the interference. There is an ongoing discussion in the regulatory bodies for improving the spectrum usage and releasing new spectrum for dynamic usage, such as the TV bands in the 700 MHz (FCC in USA), which are expected to create an abundance of novel wireless applications. **Wireless networking for RFID tags:** MAC protocols for RFID tags, protocols for reliable reading of RFID sets. Although the radio identification tags have been around for some time, reliable networking for passive, battery-less devices and sensors, will gain in importance as more devices and persons use tags for various applications. **Secure wireless communications:** Our research group specialized in security mechanisms based on the physical-layer mechanisms, such as channel fingerprinting and protocols for intentional jamming. These are quite new mechanisms that can be used in conjunction with the traditional cryptographic approaches to improve the security of the wireless networks.

Match 5

Reliable embedded systems: Modelling, analysis, programming and construction

Presented by: Lector, Jens Alsted Hansen
Aalborg University, Institute of Computer Science

The research group: CISS represents researchers within Distributed Embedded Systems and Control Theory. The primary research activities are modelling, resource optimization, analysis of embedded systems, their construction and applications.

Looking for: Research collaboration partner.

Research Presentation: The realization of more reliable embedded systems requires research in both rigorous modelling of the system and analysis of these models e.g. deadlock/safety properties, timing behavior and resource consumption e.g. battery life time etc. From these model properties direct paths to development must be considered e.g. code generation for target or further analysis on the implementation; in order to verify that it holds the design specification in implementation. Increased productivity with the use of high level programming languages (e.g. Java) on embedded platforms (e.g. FPGA) is an active research area. Finally deployment/application of embedded systems in various industrial settings e.g. agriculture, home automation or sensor networks has been investigated. The above description covers broadly the research areas the Center for Embedded Systems is centrally involved in. More over various planning problems is of interest e.g. packaging/cutting problems, optimal scheduling of production plants etc is actively being pursued.

Embedded systems are everywhere in today's society and therefore the reliability of these systems becomes even more crucial. By adding formal analysis and model based development to their portfolio producers of such systems gains further product quality, security and robustness.

Match 6

Outlier detection: is everything okay with your data?

Presented by: Assistant professor, Ph.D. Ira Assent,
Aalborg University, Department of Computer Science, Database and Programming Technologies (DPT)

The research group: My research is in the area of multimedia databases. My focus is mainly on two issues: first, improving the efficiency of similarity search, i.e. detection of similar images, videos, time series measurements, etc.. Second, data mining techniques for uncovering new and interesting patterns, for example with respect to customer segregation, that help understand the data as a whole and make informed decisions.

Looking for: Research collaboration partner.

Research Presentation: Outlier detection is an important data mining task for managing today's huge amounts of data. Outliers are objects that deviate from the rest of the data to a great extent. Their detection is useful in a number of applications, including consistency checks of data, fraud detection in transactions or other data, emergency detection in monitoring systems such as health surveillance, and many more. I would like to discuss possible research collaborations that specifically addresses the needs in companies. Possible directions include investigating recurring problems in the data that might indicate needs for changes in business processes, or learning specific outlier patterns for a given business application. For example, by modelling suspicious transactions, fraudulent behavior can be efficiently detected for immediate reactions.

Match 7

Cassiopeia Innovation – Enabling practical use of state-of-the art research for making businesses grow

Presented by: Research assistant, Jens Henrik Hosbond.
Aalborg University, Department of Computer Science

The research group: Cassiopeia Innovation (CaIn) is an organisation founded by the Institute of Computer Science, Aalborg University. Our goal is to make businesses grow by making research practically applicable.

Research Presentation: CaIn represents research from four main areas within the department of Computer Science. These are: Database and programming technologies (DPT), Distributed and embedded systems (DES), Information systems (IS), and Machine Intelligence (MI). Some of the research topics within these areas are:

Research in data management and techniques and tools for data access, design, implementation and application of programming languages, their environments, and tools; Real-time and distributed systems, networks, formalisms for the description and analysis of computer systems, tools for verification and validation; Development and application of computerized systems in organizations; Probabilistic graphical models, data mining, autonomous agents.

Match 8

Human Appliance Technologies

Presented by: Lector, Hans Jørgen Brodersen
Aalborg University, Institute of Mechanical Engineering

The Research group: The research fields I administrate as coordinator, and Center Manager is within Human Appliances and Technology. I.e. I combine business interests with the research areas and research groups for Disabled people, Ergonomics, Human supporting equipment, Biomechanics, Sport etc.
Prof, John Rasmussen, Any Body group - Biomechanics. Department of Mechanical Engineering; Assoc. Prof. Pascal Madeleine, Ergonomic field at the Department of Health Science and Technology; Assoc. Prof. Lotte Struik, Elderly and Disabled people, at the Department of Health Science and Technology; Assoc. Prof. Nicola Morelli, Industriel and System designs, Department of Architecture and Design; Assoc. Prof. Kjeld Petersen, Department of Physics and Nanotechnology.
Involved departments:

Aalborg University, Department of Health Science and Technology,
Aalborg University, Department of Mechanical Engineering,
Aalborg University, Department of Physics and Nanotechnology
Aalborg University, Department of Architecture and Design

Looking for: Research collaboration partner, Investment partner investment. Partners for ongoing network and longer cooperation dialogues.

Research Presentation: All 4 research areas I coordinate and collaborate for, have more research fields for which I work as an intermediary. Human appliances will be in demand in the future Welfare society reducing health costs, supporting self-help and independency, possibly increase zest for life, and avoidance of physical and biomechanical discomfort.

Match 9

Udvikling af intelligente og selvjusterende processer indenfor eksempelvis plast og metal formgivning / støbning

Presented by: Institutleder, professor Karl Brian Nelsen
Aalborg University, Institute of Production

The research group: Forskningsgruppen for metalformning – specielt udvikling af optimale produkter og processer gennem simulering og optimering.

Looking for: Research collaboration, investors.

Research Presentation: Præsentation af eksempler på intelligente og adaptive processer, udvikling af komponentgeometrier der er ultimative og patenterbare.
Opdyrkning af det bio-mekaniske område med henblik på etablering af mere dansk produktion indenfor eksempelvis implants, hjælpe udstyr i forbindelse med operationer, produkter relateret til sundhedsområdet.

Match 10

The Mechatronic Application in Medical Field: The Hearing Aid Scope and the Intelligent Electronic Stethoscope

Presented by: Ph.d. student Fei Yu and Mads Clausen
University of Southern Denmark, Institute for Product and Development

The research group: The focus area for the research group lies in the fields of electronics, mechatronics, sensor technology, instrumentation/measurement and bio-analysis. The invention is done together with Frands Voss, Senior Director, Danfoss Venture.

Looking for: Research collaboration partner, Investment partner.

Research Presentation: Presentation of two inventions, The Hearing Aid Scope and The Intelligent Electronic Stethoscope. The first one is an idea, which we found during my master study, and the later one is the project of my master thesis.

- a. Hearing aid scope is a dual-channel stethoscope using the hearing aid technology.
- b. The intelligent electronic stethoscope is a new concept of home diagnosis system, which is based on an electronic stethoscope and intelligent analyzing software. Heart signal analyzing algorithms as well as the whole developing processes are going to be presented, which include electronic hardware, embedded system, USB communication, and new designs of the stethoscope. Today a pre-industry prototype is available which will be tested by some potential customers and professionals.

Match 11

Experience oriented use of Virtual 3D worlds projected onto real 3D objects

Presented by: Professor Kim Halskov, Head of dept. Morten Constantin Lervig
CAVI, Centre for Advanced Visualization and Interaction, University of Aarhus

Looking for: Research collaboration – Both partners from the chain of needed technology, and partners interested in investigating the use of this ideas.
Investor – For building a framework that makes it easy to handle these productions.

Research Presentation: CAVI investigates the projection of virtual 3D worlds on to physical 3D objects in the real world. This is done primarily with the intention of adding an extra experience to the real 3D objects. Results so far have shown us that we are able to stretch the spectators experience far beyond the expected. The chain of technologies consists of 3D scanning, 3D modeling, CGI, projection technologies, camera- and tracking technologies. CAVI wants to investigate use and limitations both on static situations and dynamical situations, i.e. moving objects. Potentials of use are in the fields of marketing, museums, architecture and design, and projects could develop projections on buildings, mixed reality board games, interactive museum installations, just to mention a few.

The following link, proudly presents the interactive staging of the thousand year old runic stone Mejlbystenen, situated at Randers Kulturhistoriske Museum.

http://www.cavi.dk/projects/tekneproduction_mejlbystenen.php

Match 12

Sounding Architecture – integrating sound technologies in physical space

Presented by: Associate Professor, PhD, Morten Breinbjerg
Technician and Research Assistant Rasmus B. Lunding
Aarhus University, Information- & Media Studies

Looking for: We are looking for research collaboration in areas of sound technology, acoustics and architecture, both within aspects of technological research and development issues as well as partners within a relevant context like for instance museums, science center, experience design, city planning etc.

Research Presentation: Imagine your window is a speaker allowing you to hear the silent fall of rain without feeling the cold breeze from the open window. Imagine, that when you in a few years from now sit on a bench in the new city district at Aarhus harbour, can choose to listen to the sounds from a distant and busy past. Imagine, that historical information are embedded in and retrievable from the physical environment

Sounding Architecture investigates, how audio technologies, integrated into our physical environment, can bring about new auditory experiences in which, places, normally separated in time or space, can be joint together, e.g. indoor/outdoor, past and present etc.

The project is two sided. First, we take an interest in how physical materials like solids and fluids (e.g. glass or even running water) can be used as carriers and transmitters of sound and how these new “speaker systems” can be optimized an integrated into the environment. Second, the project investigates the more aesthetic aspect of sound perception, information retrieval, space and architecture.