Skjemainformasjon

Skjema	SFU
Referanse	1006282
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Host

Information about host institution and center

Name of centre	Center for Excellence in Engineering Education (C3E)
Host institution	Norges Teknisk Naturvitenskapelige Universitet (NTNU)
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About the centre

About the centre

Is the centre already established at the time of application	No

Describe briefly the plans for establishing the centre (maximum 1500 characters)

The Centre will be established in January 2014. C3E will bring together numerous current R&D and teaching initiatives, as well as provide a platform for new collaborative efforts to push the boundaries of engineering education. The C3E consortium members represent complementary academic fields and sets of expertise. The different academic cultures, educational practices and resources will allow C3E activities to be tested in a variety of educational, disciplinary and industrial settings. The focus is on disseminating knowledge and practices across different geographic regions of the country, creating a substantial joint network of partners and resource environments.
The partners are:
- NTNU, represented with the design and engineering groups, encompassing three study programs: Industrial Design, Mechanical Eng., and Eng. and ICT.
- University of Agder, represented by its study program in Mechatronics
- Ålesund University College, represented by the study program in Product and Systems Design.
This triumvirate represents deep knowledge, creativity in education, practice-orientation and industry integration.
In addition, the C3E will include several external academic communities at NTNU which contribute competence in: team based learning (EiT), pedagogy in higher education (UNIPED), and expertise in online learning (MMS). UNIPED and PuP already collaborate on aiming to improve coordination between subjects in the PuP-string and develop innovative teaching methods.

Describe briefly the aims and current as well as planned activities of the centre (maximum 1500 characters)

The next generation of engineers has to go beyond the established academic foundation. Creativity, communication, cooperation, lifelong learning and innovation will be essential to face tomorrow`s challenges. The C3E initiative is a response to this challenge, combining existing initiatives and experts to jointly push the boundaries of engineering education. UiA and AaUC are closely integrated with industry, as experts in interdisciplinary and practice-oriented education with a focus onto mechatronics and onto the maritime industry. NTNU´s programs use innovative teaching methods that foster the creativity and analytical skills required to conceptualize, develop and optimize challenging designs. EiT (Experts in Teamwork) will be an arena for experimentation, testing and optimization, UNIPED (pedagogy in higher education) has a national responsibility for engineering didactics.
C3E`s central task is to identify, test, understand and disseminate novel educational approaches and tools for engineering education. We plan to generate multiple projects with a large potential for leveraging the overall engineering competence in Norway. Real world project integration combining creative/divergent and analytical/convergent approaches will continuously outperform existing innovation paradigms.
C3E`s proposed projects follow a scientific approach, accompanied by dedicated PhD students and NTNUs focus on engineering education research and controlled experimental setups.

Application Document

Application Document

Upload application document	profile_APPLICATION DOCUMENT_final_130511.pdf

Timeline and budget

Timeline and budget

Upload planned timeline and the activities to be conducted	timeline_Timeline C3E projects figures 5 years-final.pdf
Upload plan for financial resource acquisition	financial_Acquisition-final.pdf
Upload budget	budget_Budget-Final.pdf

Attachments

Attachments

- budget_Budget-Final.pdf
- financial_Acquisition-final.pdf
- timeline_Timeline C3E projects figures 5 years-final.pdf
- profile_APPLICATION DOCUMENT_final.pdf
- Attachments_for_the_C3E_proposal.pdf

Comments

Comments to the application form (maximum 1500 characters)

In addition to the required documents uploaded, the following is included in the attachment document:
• References from the application document
• Six CVs for key personnel in the SFU-C3E proposal
• Letters of Intent from the consortium partners
• Statements of support from Stanford University, Strategic Business Insights and the Norwegian industry clusters Aker Solutions,NODE, and Norwegian Center for Expertise-Maritime.

Center for Excellence in Engineering Education (C^3E)

Profile and vision

The role of the engineer has traditionally been seen as a well-defined role demanding specific expertise and independent work. Engineers educated today, and in the coming decades, will increasingly be working as part of interdisciplinary teams or in positions of leadership. (National Science Board, 2007) C^3E will be established with the task to identify, test and understand, and disseminate novel educational approaches and tools for engineering education. We are primarily building on the results of a very large US National Science Foundation (NSF) project (multi-year, 5,400 students, 20 institutions, 100 researchers) (Atman, Sheppard, Turns, Adams, Fleming, Stevens, Streveler, Smith, Miller, Leifer, Yasuhara, and Lund, 2010) that explored the challenges and potentials for engineering education in the USA. In the case of Norway, many of the lessons learned have already been implemented. However, we have identified 4 core dimensions that will allow further improvement of engineering education in Norway.

Our core starting assumptions are:

1) An emerging agreement that engineering projects are conducted by team collaborations and not by individuals. (Dym, Agogino, Eris, Frey & Leifer, 2005)

2) An emerging agreement that due to the problem and project complexities, interdisciplinary teamwork is paramount. (Dym, Agogino, Eris, Frey & Leifer, 2005)

3) An emerging agreement that context specific real world projects are critical for the new product/service /system success. (Jonassen 1994) (Leifer, Steinert, 2011)

4) An emerging agreement that only the combination of creative/divergent/generative approaches (design based) with analytical and methodological rigorous approaches (engineering based) will continuously outperform the traditional innovation paradigm. (Steinert, Leifer 2012) (Ed Board of IJDCI, Taura, Nagai (2013)

Vision: Next generation engineers

C^3E *will create a learning environment that fosters creativity, collaboration, initiative and lifelong learning, preparing the next generation of engineers with the knowledge, skills, tools and values necessary to face tomorrow's challenges*

Main goal:

C^3E *will advance education in the engineering sciences, engaging students through problem-based and multidisciplinary learning that builds on a strong academic foundation. Our aim is*

to "create" engineers that generate more radically innovative solutions that better fit actual needs at a faster pace.

In order to achieve this, the Centre will:

- Apply scientific excellence and technological expertise to solving challenges that benefit society at large
- Create learning environments that promote inquiry learning and application of theoretical knowledge in practice
- Work closely with industry to ensure an up-to-date and relevant education
- Promote and share successful Centre initiatives with other fields of study in the engineering sciences
- Encourage openness, collaboration and sharing of ideas between students and faculties of different fields
- Advance knowledge of pedagogy within the engineering sciences

Values that qualifies C^3E as a unit for sustaining a Centre of excellence in Education

The C^3E is based on four pillars. These lay the foundation for the participating institutions, and represent common areas of focus and current excellence, which the Centre aims to bridge and strengthen.

a. Academic excellence. The study programs included in C^3E all have highly dedicated students, and the Centre will provide them with the resources to achieve academic excellence.

b. Integrative learning. Discovery and creativity, integrating and interpreting, applying knowledge to real-world problems and communicating with the public are all challenges to face for future engineers. It demands learning that is greater than the sum of its parts – integrative learning (Huber, M.T. and P.Hutching, 2004)

c. Professionalism. C^3E uses real industry challenges and project-based learning to expose students to the demands of the professional practice. Partnerships and collaboration with industry contribute valuable resources and ensures relevance in engineering education.

d. Collaboration. Collaboration is a central tenet of C^3E, both between students, on an institutional level, and between the academic institutions and the Norwegian public and private sector. These values are introduced to students through cross-disciplinary courses, industry projects, and specific courses focusing on teamwork and communication skills (EiT).

Quality in established educational activities

All the institutions have a proven record of ***academic excellence***. They have selective and dedicated students who receive high grade averages. The programs of study involved are:

- Program of study Mechanical Engineering (PuP: Produktutvikling og Produksjon)
- Program of study Industrial Design (ID: Industriell Design)
- Program of study Engineering and ICT (I&IKT: Ingeniørvitenskap og IKT)
- Program of study Product and System Design (Produkt og systemdesign, AaUC)
- Program of study Mechatronics (Mekatronikk, UiA)

The graduates are highly sought-after by employers. In addition, the applicants have a tradition for integrating research into courses enabled by advanced labs and learning environments.

The institutions facilitate several projects where students are challenged to work in ***integrative*** teams on projects. NTNU, UiA and AaUC provide necessary labs and equipment to make a prototype, in addition to knowledge transfer between annual teams. External sponsors and partnerships are also an invaluable resource.

The applicants have several projects where students work on actual and relevant cases in cooperation with industry partners e.g. Student Enterprises at AaUC where students work with ***professional*** product development in a real business networks. Many of the master theses are written in collaboration with industry partners.

In initiatives like Teknostart and EiT, teamwork and ***collaboration*** in courses are consistently present, as they are in some courses at all the participating institutions. EiT was awarded "Studiekvalitetsprisen" (Education Quality Award) from the Norwegian Ministry of Education and Research in 2002.

Examples of current excellence:

Many of the successful initiatives from the consortium are to a large degree student-driven and self-motivated. An important task for C^3E will be research on the success factors of these initiatives, and planning how to scale them to a point where similar initiatives can be integrated across the study programs and offered to all students.

Master's level students at IPD are given an innovative introduction to the world of scientific research and academic scholarship, and collaborate with professors on publishing their papers in academic journals. The papers are collected and published each year, serving as an effective measure of dissemination internally, but a significant percentage of the papers are also accepted internationally to journals or conferences.

Shell Eco-Marathon is an international student competition challenging 5th year students to develop, manufacture and race a prototype of a car. Students work in interdisciplinary teams to make a car that runs as far as possible on a given amount of energy. In addition, they must find sponsors and do everything necessary to take part in the competition. Results are not only race results and awards, we also get publications, industry collaboration and sponsorship. All with focus on sustainability, technological innovation, laboratories and prototyping, knowledge transfer between annual teams, and state of the art technology. NTNU's results: 2008 – 2nd place, 2009 – 1st place, 2010 – did not finish, 2011 – 2nd place and 2012 – 5th place.

Revolve is a team set up by NTNU students to participate in the Formula Student competition to design, build and race a formula type race car. It started as a student initiative, but has since been integrated into the PuP program. The team participated for the first time in 2012, and won the prize for best newcomer (all in all number 17). An all-new car is being built for 2013. Student initiatives like these are encouraged, and a flexible study program allows them to become part of the education.

Heave compensation system – UiA. Students work with the multidisciplinary nature of a real engineering problem. The task is to design the heave compensation system for a floating platform. This includes selection of components for the mechanical and hydraulic system, and developing a time domain simulation of the system. The project is evaluated by the students as very motivating, and by the NODE cluster, as extremely relevant for new candidates in the offshore industry.

NX-portal is a new teaching method for software initiated by PuP and I&IKT. It includes a separate sub-course in 3D modeling which is taught and tutored by means of a video course. The course is internet-based with a forum for the students to ask and comment, where student assistants answer. After initial success in the 1st year, the NX-portal has been extended and is now used in two first-year courses (PuP and I&IKT), and one course each in years 2, 3 and 4.

LinkedDesign: The unique interdisciplinary education offered in the program of study I&IKT (Engineering and ICT) is to a large extent complemented by the research in the EU funded research program LinkedDesign (http://www.linkeddesign.eu/) with 13 European partners, including NTNU and Aker Solutions in Norway. NTNU has a key role as leader for a work package covering next generation user interfaces and collaboration. I&IKT has two courses and numerous projects, master theses and PhD assignments within Knowledge Based Engineering (KBE) that are closely connected to the LinkedDesign research.

Summer design office is a NTNU, Innovation Norway and Bedriftsforbundet initiative where groups of six design-students establish a temporarily design office in the Norwegian districts.

It offers the opportunity for small Norwegian Companies to experience design as a tool in product development, and gives the students hands-on work experience with project management, team work and problem-solving.

Following research in Student Enterprise product innovation courses - AaUC

AaUC uses Student Enterprise (SE) in product development and innovation education. AaUC has developed a unique platform where the learning takes place in four contexts: a) Student Enterprises, b) product development in a real business network (suppliers and customers), c) prototyping, both at own lab and supplier's lab, d) national and international competitions for Student Enterprises. Following research has been performed. Educational challenges are pinpointed, and advice is given based on seven years of experience. The course has been improved year by year as a continuous innovation process. This approach has resulted in winning national competitions, and 2nd place two years in a row in European competitions (JA-YE)

Pedagogical competence. Several years ago, NTNU established a pedagogical section for staff development, UNIPED, and is with 8 members one of the biggest sections in Norway. They run courses for new employees (Pedup), prof-II, PhD-candidates and learning assistants (LAOS). LAOS was awarded "Studiekvalitetsprisen" (Education Quality Award) from the Norwegian Ministry of Education and Research in 2005. UNIPED is also responsible for running courses in Engineering Didactics for Norwegian University Colleges, and is arranging a Pedup course especially for AaUC this winter with 15 participants. In addition UNIPED support teachers, programs, departments and faculties, and do research on teaching and learning in higher education. They cooperate with the Nordic technological Universities through Nordic Five Tech, and meets for seminars where dissemination from C^3E could take place.

Potential for innovation and dissemination

The aim is to generate multiple projects, clustered into three batches. All C^3E´s projects will follow a scientific method approach in a three-year pattern (see figure 1).

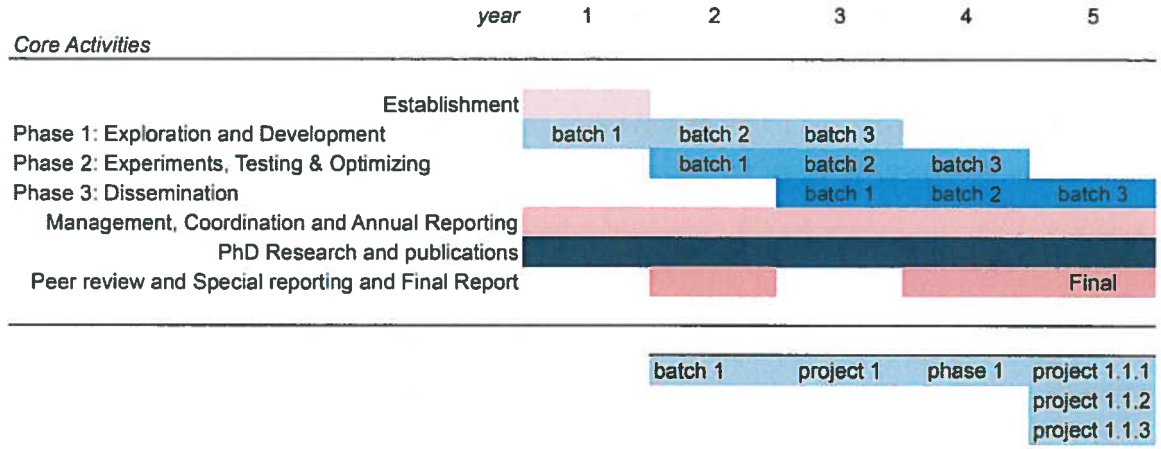

Figure 1, Schematic rolling project pattern at C^3E

A) The first phase aims to identify and develop a new engineering education paradigm, tool or approach. These activities will usually be based on grounded theory (Glaser, Strauss, 1967) and in situ exploration, especially with our industry partners (Eisenhardt 1989) (Yin, 2008, 2011). We approach all educational paradigms from a post problem based perspective, which is project based learning where we also integrate real industry challenges and partners into the curriculum and the learning experience. The aim is to identify leverage points that are relevant and have a big potential to significantly increase Norway's engineering capabilities.

B) Phase two starts by identifying the critical function, theoretical relationship or subcomponent. (Borrego, Douglas, & Amelink, 2009) It is then the aim to focus on experimenting, testing and optimizing the same. (Balamuralithara & Woods, 2009). This phase will be characterized by a constant exchange between a controlled laboratory setup (NTNU) and a real teaching and industry situation (UiA, AaUC).

C) Phase three will then shift the focus onto the question of how to best disseminate the results to the broader Norwegian engineering community. Besides traditional means, such as dedicated workshops, conference presentations and journal papers, we also aim to use modern ICT and social media, such as MOOCs (Massive Open Online Courses) to significantly increase dissemination speed and impact.

The center of gravity during the three years for each project will be shifting continuously based on the project's stage, and the particular strength of each participant (see About the centre). The batches containing the projects will be started sequentially over the five year timeframe. After each year, the C^3E partners will prepare interim reports, and based on the findings and experiences, alter and improve the overall project process. Also, years two and four include a soft peer review through our international partner. A large final report from all participants will conclude the project in year five.

Concrete example Projects – Phase 1: Exploration and Development

Project 1.1.1: Exploring a KBE laboratory in education

In collaboration with the EU project LinkedDesign and Aker Solutions, Department of Engineering design and Materials (IPM) will explore conditions and setups of a KBE (Knowledge Based Engineering) living lab for research and education. The aim is to explore visual collaborative environments for organizing and displaying knowledge for the different phases of KBE, including multidisciplinary, split location engineering: Knowledge acquisition, KBE application implementation, and training in use of the KBE application. Cultural aspects of geographically distributed projects will be studied in international villages of EiT (Experts in Teams).

Project 1.2.1: Developing flipped classroom concept

In an 8th semester course, we will explore the flipped classroom concept. This implies that the students acquire the necessary knowledge at home, and use the time in the classroom to solve problems with the professor at hand to help, assist and explain if necessary. We will explore the use of internet based courses (especially MOOC) from other universities, to see what can be achieved by such a mixture of local and external knowledge sources.

Concrete example for Projects – Phase 2: Experiments, Testing & Optimizing

Project 1.1.2: Piloting the KBE laboratory in education

In collaboration with the EU project LinkedDesign and Aker Solutions the IPM department will set up a KBE living lab for research and education. The lab will be a visual collaborative environment for organizing and displaying knowledge for the different phases of KBE, including multidisciplinary, split location engineering: Knowledge acquisition, KBE application implementation and training in use of the KBE application. Cultural aspects of geographically distributed projects will be studied in international villages of EiT. This lab will be utilized in two new KBE courses and for the course TMM4225 "Engineering collaboration" that will be revised to include state of the art theories and methodologies from LinkedDesign.

Project 1.2.2: MOOC lab

This phase aims to identify and test core success factors for students' motivation to participate, course retention and learning success. Special attention is given to the problem of open ended generative projects, how to pose the design challenges, how to support the distributed and maybe collaborative work, and how to grade massive numbers of projects.

Concrete example for Projects – Phase 3: Dissemination

Project 1.1.3: KBE living lab conference

In this phase we invite educators from across Norway to the KBE living lab, and in multiple workshops and small hands on conference sessions explore the possibilities to adopt the lessons learned to their respective courses and learning environments. The KBE lab will also serve as a tangible prototype for the new courses to gain support from the various other administrative and institutional stakeholders that need to be convinced.

Project 1.2.3: Introducing a MOOC for engineering colleges across Norway

Prepare a MOOC (Massive Open Online Course) in engineering bachelor level for free internet distribution to students at engineering colleges in Norway, including examination. The NTNU course TMM4112 Machine elements could be a candidate for internet distribution. Unlike open education courses, MOOC are fast paced and relatively easily produced courses that combine modern internet technologies and social media. Our intention is to test MOOC's applicability in the Norwegian context as resource to share and jointly offer courses between NTNU and the universities of applied sciences.

PhD Research and Publications. NTNU has committed itself to finance a PhD student throughout the project focusing on engineering education. We are currently exploring ways to find funding to add a second PhD student with an educational background as a counterpart. Prof. Steinert will coordinate and capture the academic publications and presentations throughout the project.

Impact for Norway. In order to impact the entire engineering education of Norway, we intent to leverage C^3E´s results and practices in three ways. Firstly we disseminate our insights amongst other educators by means of workshops and academic conferences and journal publications (coach the coaches). Secondly we teach more than 300 new students annually within the study programs directly connected to C^3E. Thirdly, by experimenting with MOOCs, we intend to prototype the dissemination of core content and practices to all Norwegian Universities of Applied Sciences and to other interested parties that can combine internet based educational modules with supervised work session on tangible products and systems. This way, we believe that we can spread the basic principles of: project base learning, team based collaboration, interdisciplinarity and focus onto contextual solutions, and the inclusion of creativity and divergence generating tools at an early product/service/system development stage throughout Norway in a relatively short time. The intent is to improve the innovation potential of Norwegian Engineering as a whole.

Organizational plan

The C^3E center is organized as a consortium with NTNU, faculty of Engineering Science and Technology, as the host institution, and with UiA and AaUC as consortium participants. A consortium agreement will be signed by all three partners. The organizational entities in the center consist of the three project batches, the R&D coordination entity and the organizational entity for center management. The center leader will be heading the management and coordination entity. For each project batch, a coordinator will be appointed. The batch coordinators are responsible for coordinating the R&D within each project in their batch. The center leader will coordinate the integration between the batch coordinators and the research coordinator through regular meetings. The aim is to continuously capture research potentials and results, and disseminate between partners and foster an ongoing discussion. Year two and four we aim to organize a soft peer review with our international partners (Stanford, MIT, UC Berkeley, SBI, CDIO (MIT, Chalmers/KTH)) and alter the Center's activities accordingly. Each project will appoint a project leader which will be responsible throughout all three project phases. Each program of study appoints one representative to the center's board (also general assembly), and the center leader reports to the board. IPR are regulated by the consortium agreement.

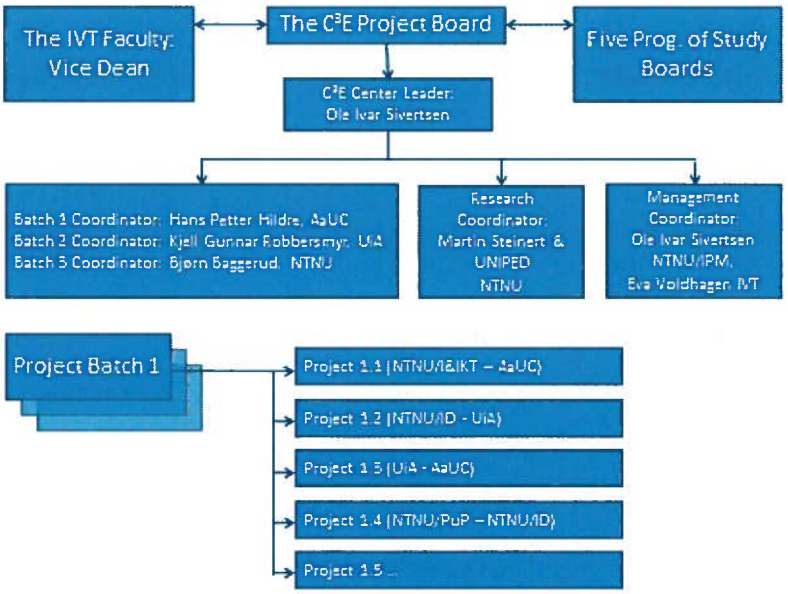

Figure 1: The C^3E organisation

This organizational structure will create a common meeting place for members of the consortium, including student organizations, and will supply better opportunities to coordinate research, develop new course design, improve teaching, discuss evaluation and improve

coordination in and between study programs. Thus the C^3E center will be a direct extension of the programs of study, and represent a major source for educational innovation and dissemination between programs of study and institutions. The center leadership is planned to be transferred from Ole Ivar Sivertsen, who has only a few more years to retirement, to our new NTNU professor Ralf Martin Steinert (previously at Stanford) when he has forged stronger links with the other consortium partners, and has developed a stronger command of the Norwegian language.

Collaborative partners

UniPed -Pedagogical competence. UNIPED run courses for new employees (Pedup), prof-II, PhD-students and learning assistants (LAOS) at NTNU. In addition UNIPED has the responsibility to run courses in Engineering Didactics for Norwegian University Colleges. They support teachers, programs, departments and faculties. The NTNU study programs PuP, ID and I&IKT has cooperated closely with UNIPED to enhance the quality of the education. Uniped will contribute with didactic expertice in C^3E.

EiT – interdisciplinary teamwork. The NTNU course "Experts in Teams (EIT)" originated in the engineering study programs as a response to demands from industry for cross-curricular team work. EiT now covers all study programs at NTNU. Teamwork in courses is used consistently throughout the education at all the participating institutions. EiT is part of the C^3E project team.

Multimediasenteret – ICT in education. MMS is NTNU's unit for use of ICT in education. They handle distance education, videofilm lectures for internet distribution, build infrastructure (e.g. in lecture halls) and educate and promote use of information and communication tools in the education. All three study programs at NTNU in this proposal work with MMS to improve their education.

Stanford University – education in design and development. Stanford University in Palo Alto, California, is a recognized champion of modern education in design and development. They have a tradition of experimentation, of letting students find their own solutions, of integrating industry into courses and studies, and have been an inspiration to design educators everywhere. NTNU have had cooperation with Stanford for many years, and the impressions from Stanford was formative in creating the new study program PuP in 2000. Recently, NTNU hired a professor who has co-managed Stanford's Center for Design Research for 4 years.

Industrial partners: Aker Solutions, NODE and Norwegian Center for Expertise-Maritime

Table of Contents. Attachments

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CURRICULUM VITAE

COMPANY:	Norwegian University of Science and Technology (NTNU) Department of Machine Design and Materials Technology
NAME:	Ole Ivar Sivertsen
YEAR OF BIRTH:	December 29th 1945 in Skjerstad, Norway
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POSITION:	Professor
EDUCATION:	Graduated (Siv.Ing.) from the Norwegian University of Science and Technology (NTNU), Faculty of Mechanical Engineering, Trondheim, 1972. Received the Degree Master of Science in Engineering at the University of Arkansas, Fayetteville, 1978. Received the Degree "Dr.ing." at the Norwegian University of Science and Technology (NTNU), Faculty of Mechanical Engineering,Trondheim, 1981. Research leader seminar, SINTEF, 1986. Pedagogic seminar, NTNU, 1991.

EXPERIENCE:		
	1972-1973	Mechanical Engineer at Tandbergs Radiofabrikker A/S, Oslo, Norway.
	1973-1990	Senior Research Scientist at SINTEF (The Foundation for Scientific and Industrial Research at the Norwegian Institute of Technology), Production Engineering, Norway.
	1976-77	Scholarship from the Royal Norwegian Council for Scientific and Industrial Research, and from SINTEF for one year of studies in USA.
	1979-81	Scholarship from the Norwegian University of Science and Technology (NTNU), Trondheim, to study for the Dr.Ing. Degree.
	1981-82	Assistent Professor in Machine Design at the

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	Norwegian University of Science and Technology (NTNU), Trondheim, Norway.
1990 – 1993	Associate Professor in Machine Design at the, Norwegian University of Science and Technology (NTNU), Trondheim, Norway.
1993 – pres.	Professor in Machine Design at the Norwegian University of Science and Technology (NTNU), Trondheim, Norway.
2002 – 2003	Sabbatical at University of Colorado, Boulder

OTHER INFORMATION:

Chairman of committee for planning investment in CAE-tool for the education at the Faculty of Mechanical Engineering, NTNU, 1995

Member of the board of education (FUU) at the Faculty of Mechanical Engineering, NTNU, 1995-1996

Member of the Central Board of Education (SUK), NTNU, May - Oktober, 1995

Member of committee for planning the organisation of the education in Mechanics at NTNU, 1996

Head of Department of Machine Design and Materials Technology, NTNU, 1996 - 1998

Member of board for the FEDEM AS Company, 1992 – 2003

Managing Director for the FEDEM AS Company, 1995-1996

Head of Department of Machine Design and Materials Technology, NTNU, 2007 – 2011

Heading the programme of study Engineering and ICT, 2004 - present

PROJECTS, PUBLICATIONS:

"Computer in Machine Design". A project funded by the Norwegian Research Council (NRC) and by industry.

Author of the following reports:

1. Interactive Design of Mechanisms - Report 1, A74027, SINTEF Div. 18, 1974 (in Norwegian), pp 41.

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2. Interactive Design of Mechanisms - Report 2, A75003, SINTEF Div. 18, 1975 (in Norwegian), pp 75.
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Coauthor with Kjell Fenheim of the following reports:

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Coauthor of the following reports:

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11. GPM-Report no. 3, Data Flow Studies, Analysis of Products and Production Planning, 1979 (in Swedish), pp 2.1-2.22 and pp A1-A52.
12. GPM-Report no. 6, Specifications of Module for Assembled Plate Construction (APC) 1979 (in Norwegian).

13 GPM-Report no. 12, GPM - Specifications, Assembled Plate

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"Advanced Production Systems (APS)" A Norwegian/German project for development of CAD/CAM systems, and funded by Government Agencies and Industry in the same countries. Reports may be ordered from SINTEF Production Engineering, Trondheim, Norway.

Coauthor of the following report:

17. Preliminary Specifications of Geometric Modeller Version 1, 1983 (in English), pp 82-104.

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Project leader and **author** of the following Reports:

18. Finite Element Dynamics of Elastic Mechanisms (FEDEM), System Documentation, SINTEF, 1983 (internal).
19. FEDEM - Finite Element Dynamics of Elastic Mechanisms, User documentation, STF18 A85007, SINTEF, Div. 18, 1985 (in Norwegian), pp 175.
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"Dynamic Simulation of Multi Body Systems". An internordic project funded by Government Agencies and industry.

Project leader together with Sven Fredrikson, SAAB and Olof Friberg, CTH.

Coauthor of the following report:

21. Dynamic Simulation of Multi Body Systems, SAAB Car Division, 1989. (In Swedish and Norwegian).

"Multidiscipline Simulation", A SINTEF Strategic Project involving

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the SINTEF divisions: Production Engineering (20), Control Engineering (48), Structural Engineering (71), DELAB (40) and MARINTEK.

Project leader and responsible **author** of the final report.

22. Multidiscipline Simulation - summary, results and recommendations, SINTEF, 1990 (In Norwegian).

"Dynamics of Large Reflectors", An ESA project under the main contractor Dornier-Germany, and subcontractors MBB-Germany, University of Liege - Belgium, CASA - Spain and NFT/SINTEF from Norway. The Norwegian contribution was a simulation of the deployment of an antenna from MBB using FEDEM.

Coauthor of the report:

23. Dynamics of Large Reflectors - Final Report, Dornier, 1992. (In English), pp 299.

"High performance Computing for Multidiscipline Dynamic Simulation of Mechanisms". ESPRIT II #5524 MDS, with cooperation between ABB Robotics - Sweeden, KFK and Dornier - Germany, Syntax Factory Automation - Italy. FEMSYS - England, NFT, Veritas Research and SINTEF - Norway and coordinated from DTI - Denmark.

Originator of the FEDEM technology that the project is based on.

Project leader of the NTH/SINTEF part of the project where the central technological developments are located involving SINTEF Production Engineering and SINTEF Control Engineering.

Main contributor to the project proposal and **responsible author** of the reports:

24. Architecture and Computer Environment Document, Deliverable D1101, SINTEF, 1991 (in English), pp 9.
25. A User Interface Scenario, Deliverable D3101, SINTEF, 1991 (in English), pp 15.
26. Multidiscipline Software Specification Document 1, Deliverable D2101, SINTEF, 1991. (In English), pp 44.
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28. Multidiscipline Software Specification Document 2, Deliverable D2104, SINTEF, 1992. (In English), pp 50.
29. Updated Multidiscipline Simulation; User's Guide, Deliverable D2106, SINTEF, 1993. (In English), pp 496.
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Project leader for partner NTNU involving three NTNU departments and SINTEF.

Responsible author of the report:

33. (Coauthor) Methods for KBE related knowledge acquisition and codification report. Deliverable D6.1, LinkedDesign project report, LinkedDesign, FoF-ICT-2011.7.4 Project No: 284613, 2012

The following publications are not connected to a special project:

34. Interactive Computer Graphic Interface for the Program System MECSYN, University of Arkansas, Master Thesis, 1978, pp 130.
35. (Coauthor with A. Myklebust), MECSYN: An Interactive Computer Graphic System for Mechanism Synthesis by Algebraic Means, ASME Paper no. 80-DET-68, Presented at the Mechanisms Conference, Beverly Hills, California, Sept. 28-Oct. 1, 1980.
36. Large Displacement Finite Element Formulations of Elastic Mechanism Dynamics, Dr.Ing. Dissertation, the University of Trondheim, the Norwegian Institute of Technology, Division of Machine Design, 1981 (in English), pp 116.
37. User's manual and Program Documentation for the Non-Linear Finite Element Programs FEDEM-1, FEDEM-2 and Post-Processor Programs, The University of Trondheim, The Norwegian Institute of Technology, Division of Machine Design, 1981 (in English), pp 90.
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39. Report Generator for CAD/CAM Applications, Program Documentation and User's manual, STF18 F84003, SINTEF Div. 18, 1984 (in Norwegian), pp 15.
40. Finite Element Simulation of Mechanical Systems - large displacements and deformations, Lecture at "Kursdagene ved NTH", 1985 (in English).
41. (Coauthor with K. Aamnes and T. Rølvåg), General Design Tool for Flexible Space Mechanisms, Presented at the "Dynamics of Flexible Structures in Space" Conference, Cranfield - England, May 15-18, 1990.
42. Computer-Aided Modelling, Dynamic Simulation and Dimensioning of Mechanisms - Volume I: Fundamentals, A compendium written for the NTH course: 62165 "Machine Simulation Based on the Finite Element Method", 1994 (In English).
43. Norwegian Technology in ESPRIT Project, Teknisk Ukeblad no. 6, 1991 (In Norwegian)
44. The Multidiscipline Design Concept for Mechanisms, Presented at the NATO ASI "Computer Aided Analysis of Rigid and Flexible Mechanical Systems" Conference, 27 June-9 July, 1993.
45. (Coauthor with T. Rølvåg, H.P. Hildre and Å.Ø. Waløen), Multidiscipline Simulation of Elastic Manipulators, Published in MIC (Modelling, Identification and Control) in 1993.
46. (Coauthor with H.P. Hildre, T. Rølvåg and R.H. Sellesbakk), Efficient Design of Machines and Mechanisms by Multidiscipline Simulation and Use of Sensitivity Optimization Capabilities, Presentation by H.P. Hildre at the "International Conference on Engineering Design", ICED '93, The Hague, August 17-19, 1993.
47. The Multidiscipline Design Concept for Mechanisms, Lecture presented for the SIMS Conference, Kongsberg, June 9-11, 1993.
48. (Coauthor with L.E. Bjørset and J. Krabberød), Detailed Modelling and Dynamic Simulation of Deployment of the MBB Unfurlable Reflector UMA, Presented by J Krabberød for the "Dynamics of Flexible Structures in Space" Conference, Cranfield - England, September 6-10, 1993.
49. (Coauthor with G. Moholdt, T. Rølvåg, and H.P. Hildre), Interdisciplinary Modelling Language for Multibody Systems. Presented for the "1. MATHMOD Conference", February 2-4, 1994 at the Technical University of Vienna, Austria.
50. (Coauthor with H.P. Hildre, Torleif Iversen and Terje Rølvåg), Computer-Aided Modelling, Dynamic Simulation and Dimensioning of Mechanisms - Volume II: Advanced Features,

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A compendium written for the NTH course: 62901 "Machine Simulation Based on the Finite Element Method 2", 1994 (In English).

51. (Coauthor with T. Rølvåg and H.P.Hildre), FEDEM User's Guide, FEDEM A/S, 1994. (In English), pp approx. 500
52. (Coauthor with T. Rølvåg, H.P.Hildre and Å Waløen), Multidiscipline Dynamic Simulation of the New Veslefrikk Personel Transfer Bridge. Proceedings of the Fifth (1995) International Offshore and Polar Engineering Conference. The Hague, The Netherlands, June 11-16, 1995 (In English)
53. Lecture for the ESPRIT workshop on parallel computing, January 28, 1996 at CISE Technology Innovative, Milan, Italy
54. (Coauthor with A. Marthinsen), Utilizing Parallel Computing in the Combined Multibody, Control and Structural Dynamic Simulation Code FEDEM, "Sixth Conference on Nonlinear Vibration, Stability and Dynamics of Structures", June 9-13, 1996, Virginia Tech, Blacksburg, Virginia, USA.
55. (Coauthor with S. Trier and A. Marthinsen), Design Sensitivities by The Ajoint Variable Method in Nonlinear Structural Dynamics, SIMS Conference, June 11-13, 1996. The Norwegian Institutt of Science and Technology, Trondheim.
56. (Coauthor with A. Marthinsen), A Parallel Version of the Combined Multibody, Control and Structual Dynamic Simulation Code FEDEM, SIMS Conference, June 11-13, 1996. The Norwegian Institutt of Science and Technology, Trondheim.
57. (Coauthor with A. Marthinsen), Parallelization of Large Mechanical Engineering Codes : A Case Study of the Multibody Simulation Package FEDEM, Computational Methods in Mechanical Systems, NATO ASI Series, Series F: Computer and Systems Sciences, Vol. 161, Edited by J. Angeles and E. Zakhariev, 1997, Page 364-381.
58 Non-Linear FE-Approach for Multidisciplinary Simulation of Mechanism Dynamics, Computational Methods in Mechanics, NATO Advanced Study Institute, Volume I, Invited lectures, J. Angeles and E. Zakhariev, Varna, Bulgaria, June 16-28, 1997, Page 313-339.
59. (Coauthor with A. Marthinsen), Parallelization of Large Mechanical Engineering Codes : A Case Study of the Multibody Simulation Package FEDEM. Computer methods in mechanical systems : mechanism analysis, synthesis and optimization. NATO ASI series. Series F, Computer and systems sciences, Page 364-381, Editor: J Angeles and E Zakhariev, Springer 1998.
60. Non-Linear FE Approach for Flexible Multibody Simulation of Mechanism Dynamics, 1998 ASME Design Engineering Technical Conferences (DETC'98) – 18th Computer in

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Engineering Conference, Proceedings of DETC98 (CD-rom). Atlanta, Georgia, September 13 – 16, 1998.

61. (Coauther) ICT in Learning, P2005 Integrated Product Development, ISBN: 82-91917-09-4, NTNU, Trondheim, 2000.
62. Virtual Testing og Mechanical Systems, Theories and Techniques, Swets & Zeitlinger Publisher, Lisse, Netherlands, 2001.
63. Sivertsen, O.I, Olstad, L(Journalist), Order out of Chaos; The LinkedDesign EU project (In Norwegian), GEMINI no. 1, 2012, Page 38-39

CV, academic career and publications

CURRICULUM VITAE
Martin STEINERT, Ph.D.

CURRENT ACADEMIC POSITION

Professor
Engineering Design and Innovation
Department of Engineering Design and Materials (IPM)
Faculty of Engineering Science and Technology (IVT)
Norwegian University of Science and Technology (NTNU)

- Ideation Space – Mobiliar Dialogue Forum, in collaboration with ETHZ and Mobiliar Insurance and Thun Castle, 5.400.000 mil NOK, (2013-2016)
- Co-PI, NSF grant #1153823: AnalyzeD - Analyzing Engineering Design Activities, project PI-ship, appointed by special waiver from vice provost and dean of research Stanford University; 132, 000 USD, Larry Leifer Co-PI. (2011-2013)
- Senior Lead Researcher, Sponsored Research, Honda Plug In Hybrid; 750,000 USD, Fritz Prinz, PI. (2011-2013)
- Senior Lead Researcher, Co-I, HPDTRP grant: The Personal Trait Myth – A comparative analysis of the innovation impact of design thinking tools and personal traits; 150,000 USD, Kelley, David, PI. (2012-2013)
- Senior Lead Researcher, Co-I, HPDTRP grant: TeamSense: A Modular Measurement and Feedback Platform for Understanding Engineering Design Team Dynamics; 150,000 USD, Leifer, Larry, PI. (2012-2013)
- REVs Program on Past, Present and Future of the Automobile Award: "ME211 ReMake-Design Lessons from Restoration": 16,000 USD, Steinert, Martin (PI) (2012-2013)

- Senior Lead Researcher, Co-I, HPDTRP grant: User-Centred Innovation for the Design and Development of Complex Products and Systems; 150,000 USD, Riitta Katila, PI. (2011-2012)
- Senior Lead Researcher, Co-I, HPDTRP grant: analzeD: A Virtual Design Observatory (CDR/HPI); 300,000 USD Larry Leifer PI. (2011-2012)

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EDUCATIONAL BACKGROUND

2006	Ph.D. (Dr.rer.pol.), University of Fribourg/Switzerland, summa cum laude, *"Joseph-Vigener" Prize for best Dissertation.*	
	supervisors:	Prof. Dr. Dr. h.c. Jürgen Hauschildt, University of Kiel (GER).
		Prof. Dr. Stephanie Teufel, University of Fribourg (SUI).
		Prof. Dr. Dr. h.c. mult. Norbert Thom, University of Berne, (SUI).
2000	M.A. (lic.rer.pol.), University of Fribourg/Switzerland, summa cum laude.	
	supervisors:	Prof. Dr. Dr. h.c. E.-B. Blümle, University of Fribourg (SUI).
		Prof. Dr. R. Purtschert, University of Fribourg (SUI).

PAST ACADEMIC POSITIONS

2011 – 2013	Assistant Professor (Acting), Mechanical Engineering, Stanford University
2010 – 2013	Deputy Director, Center for Design Research (CDR) Stanford University Deputy Director, d.research program (Hasso Plattner Design Thinking Research Program, HPDTRP), Stanford University Deputy Director, Design Industry Affiliate Program, Stanford University
2009	Visiting Scholar, MIT, Mechanical Engineering (MechE), Product Design and Development Group, Prof. Warren Seering, Ph.D., teaching participation at 2.009 Product Engineering Processes, organization of research seminar: Researching Product Design and Development; (August-December), supported by individual researcher SNSF grant IZK0Z1_128977/1.
2008	Visiting Scholar, Stanford University, Center for Design Research (CDR), Prof. Larry Leifer Ph.D.; (June-September).
2006 – 2009	Assistant Professor (Maître-Assistant), University of Fribourg/Switzerland, Faculty of Economics and Social Sciences, international institute of management in technology, Chair of Information and Communication Technology (ICT) Management. Head of Research (since Nov. 2008), international institute of management in technologies (iimt), Chair of Information and Communication Technology (ICT) Management.
2001 – 2006	Research Assistant, University of Fribourg/Switzerland, Faculty of Economics and Social Sciences, international institute of management in technology, Chair of Information and Communication Technology (ICT) Management, Prof. Dr. S. Teufel
1998 – 2000	Junior Research Assistant at the VMI (Institute for Research on Management of Associations and other Nonprofit-Organizations), Prof. Dr. Dr. h.c. E.-B. Blümle, Prof. Dr. R. Purtschert.
1997 – 1998	Visiting Researcher, History, Literature, Spanish etc., *Universidad de Navarra* (ESP).
1994 – 1997	B.A. (Dipl.rer.pol), Economics and Management, *Universität Passau* (GER).
Military service:	
1993 – 1994	Frontnachrichtenlehrkompanie (FNLehrKp). ~Army Intelligence Luftlandebrigade 31 (LLBrig 31). ~31st Airborne Brigade
Secondary education:	
1996	Latinum (*Carl-Schurz-Schule,* Frankfurt a.M.).
1985 – 1993	Abitur. *Herbartgymnasium,* Oldenburg (GER)
1990 – 1991	High School Diploma. *Homewood-Flossmoor High School,* IL (USA

RESEARCH INTEREST

- Fuzzy front end of new product/service development and design: optimizing the intersection of engineering design thinking and new product development, the diversion/conversion design process.
- Physiology frameworks and mobile in-situ measurement setups for divergent and convergent problem solving activities.
- Technology and Innovation management issues with special interest in disruptive technologies, their socio-economic implications, and their underlying industry dynamics such as adoption and diffusion.

REFERENCES (selection)

Prof. Fritz B. Prinz, Chair, Department of Mechanical Engineering, Stanford U.
Prof. Larry J. Leifer, Stanford University, Director, Center for Design Research (CDR), faculty, Stanford U.
Prof. Sheri D. Sheppard, Co-Director, Center for Design Research (CDR), faculty, Stanford U.
Prof. Warren Seering, Massachusetts Institute of Technology (MIT), faculty, Professor of Mechanical Engineering, MIT
Prof. Riitta Katila, Associate Professor of Management Science & Engineering, Stanford U.
Prof. Tim C. MacAloone, Associate Professor of Product Development/ Management Engineering, DTU.
Prof. Christoph Meinel, Director Hasso Plattner Institute (HPI), faculty, University of Potsdam.
Prof. Michael Barrett, Professor of Information Systems & Innovation Studies (Judge), Cambridge U.
Prof. Simon Peck, Associate Professor, Marketing and Policy Studies (Weatherhead), Case Western U.

Prof. Torgeir Welo, Head of Department of Engineering Design and Materials, NTNU.
Prof. Bernhard Roth, Academic Director, Hasso Plattner Institute of Design (d.school), faculty, Stanford U.
Prof. Peter Denning, Chair of the CS Department, Director of the Cebrowski Institute, Naval Postgraduate School (NPS)
Prof. Marino Widmer, PhD. University of Fribourg, Dean Faculty of Economics and Social Sciences (2006-2010)

PUBLICATIONS

PEER REVIEWED JOURNAL ARTICLES

Steinert M., Leifer L. (under review): Divergence Delphi – comparing a round-based vs. a real-time Delphi setup that follows abductive reasoning principles.

Koo J., Steinert M. (under review): The Effects of Visual Feedback Systems in Longitudinal Autonomous Control in Cars.

Gudem M., Steinert M. Welo T. (accepted with revisions 2013): Addressing emotional value in product engineering - A new framework based on a case study of SMEs in the Norwegian sporting goods industry, International Journal of Product Development, ISSN: 1741-8178 (online), 1477-9056 (print). Inderscience Publishers. (SJR indicator 2010: 0.030, equivalent index to Thomson citation index of 0.432)

Gudem M., Steinert M. Welo T., Leifer L. (in press for 2013): Redefining customer value in Lean Product Development. Journal of Engineering, Design and Technology (JEDT), Volume 11, issue 1, ISSN: 1726-0531, Emerald Publishing.

Steinert M., Leifer L. (2013): On Being Creative: a short history and call for abductive questioning, International Journal of Design Creativity and Innovation, in Editorial Board of IJDCI: Perspectives on design creativity and innovation research, Volume 1, issue 1, ISSN: 2165-0349 (Print), 2165-0357 (Online), Taylor & Francis.

Hussein S., Sanders L., Steinert M. (2012): Participatory Design with Marginalized People in Developing Countries: Challenges and Opportunities Experienced in a Field Study in Cambodia. International Journal of Design (IJDesign), ISSN: 1994-036X (online); 1991-3761 (print), open access journal. (impact factor 2011: 2.723, 5-year impact factor 1.253)

Steinert M., Leifer L. (2012): "Finding One's Way" Re-Discovering a Hunter-Gatherer Model based on Wayfaring, International Journal of Engineering Education (IJEE), Special Issue on Design Education: Innovation and Entrepreneurship, Volume 28, Number 2, ISSN 1932-2008, TEMPUS Publications. (SJR indicator 2010: 0.031, equivalent index to Thomson citation index of 0.831)

Currano R., Steinert M. (2012): A framework for reflection in innovation design, International Journal of Engineering Education (IJEE), Special Issue on Design Education: Innovation and Entrepreneurship, Volume 28, Number 2, ISSN 1932-2008, TEMPUS Publications. (SJR indicator 2010: 0.031, equivalent index to Thomson citation index of 0.831)

Leifer L., Steinert M. (2011): "Dancing with Ambiguity: causality behavior, design thinking, and triple-loop-learning". international management journal: Information, Knowledge, Systems Management (IKSM), Special Issue one *Complex Socio-Technical Systems*, Volume 10, Number 1-4, ISSN 1389-1995, IOS Press. open access journal.

Kähr C., Steinert M. (2011): Explaining The (Non)Adoption And Use of Interactive Voice Response Among Small And Medium-Sized Enterprises, International Journal of Speech Technology, Volume 14, Number 1, pp. 11-18, ISSN 1381-2416, Springer; SJR indicator 2011: 0.028, equivalent index to Thomson citation index of 0.40)

Steinert M., Helfenstein M. (2010): Key Indicators to Monitor and Benchmark R&D Activities in China – A Comparative Empirical and Literature Analysis, International Journal of Technology, Policy and Management (IJTPM), Volume 10, Number 3, pp.258-283, Inderscience Publishers. (SJR indicator 2011: 0.027, equivalent index to Thomson citation index of 0.26)

Merten P. S., Steinert M., Teufel S. (2010): Mobile Business in Air Travel: Results from an Explorative Qualitative Workshop, Information Technology & Tourism, Volume 12, Number 1, pp. 65-88(24), ISSN 1098-3058, ingentaconnect publishing.

Steinert M. (2009): A dissensus based online Delphi approach - an explorative research tool, Technological Forecasting & Social Change Volume 76, p. 291-300, ISSN 0040-1625, Elsevier. (impact factor 2011: 1.709, 5-year impact factor 2.214)

Mueller R., Steinert M., Teufel S. (2008): Successful Diversification Strategies of Electricity Companies: An explorative

empirical study on the success of different diversification strategies of German electricity companies in the wake of the European market liberalization, Energy Policy Volume 36, issue 1, p. 398-412, ISSN: 0301-4215, Elsevier. (impact factor 2011: 2.723, 5-year impact factor 3.193)

PEER REVIEWED PUBLISHED PROCEEDINGS OF CONFERENCES, *presented by

Shlusaz-Aquino L., Sadler J., Currano R., Steinert M., Katila R. (under review for 2013): Comparing Novice and Expert User Inputs in Early Stage Product Design, in 5th International Congress of International Association of Societies of Design Research (IASDR), August 26th to 30th, Tokyo, JPN.

Vignoli M., Ferioli G., Steinert, M. (accepted for 2013): Building Agile Design Teams, International Conference on Engineering Design (ICED) 2013, Aug. 19-22, Seoul, KOR.

Aldaz G., Steinert M., Leifer L. (accepted for 2013): Instrumenting the User: Needfinding by Combining Data Logging and Immediate Self-Reporting, International Conference on Engineering Design (ICED) 2013, Aug. 19-22, Seoul, KOR.

Steinert M., Jablokow K. (accepted for 2013): Triangulating Front End Engineering Design Activities with Physiology Data and Psychological Preferences, International Conference on Engineering Design (ICED) 2013, Aug. 19-22, Seoul, KOR.

Dedehayir O., Steinert M., Mäkinen M. (2012): Technological Niche Strategies: An Illustrative Study of the Gaming Industry; SMS (Strategic Management Society) 32nd Annual International Conference, Oct. 7-9, Prague, CZE.

Hoster H., Chung C., Kress G., Steinert M. (2012): Headspace: The Stanford Imaginarium; The 2nd International Conference on Design Creativity (ICDC2012), Sep 18-20, Glasgow, UK.

Currano R., Steinert M. (2012): Understanding Designers' reflective practices: Characterizing activities that promote ideation; The 2nd International Conference on Design Creativity (ICDC2012), Sep 18-20, Glasgow, UK.

Senescu R., Head A., Steinert M., Fischer M. A. (2012): Generating Information Dependencies Automatically; 14th International Dependency and Structure Modeling Conference, DSM'12, Sep. 12-14, Kyoto, Japan.

Steinert M., Jablokow K., Leifer L. (2012): EAGER: AnalyzeD - Analyzing Engineering Design Activities, poster presentation at the 2012 NSF Engineering Research and Innovation Conference, sponsored by the National Science Foundation's Division of Civil, Mechanical and Manufacturing Innovation (CMMI), Boston, 9-12 July, USA.

Agrawal V., Vaidya A. R., Shluzas L. A., Steinert M., Katila R. (2012): Conceptual and practical user integration into the design process – a four step stakeholder approach; International Design Conference DESIGN 2012, Dobrovnik, 21-24 May, CRO.

Nguyen P.T., Steinert M., Carroll A., Leifer L. (2012): Applying bioinformatics analysis principles to CAD data to better characterize and improve the design process; International Design Conference DESIGN 2012, Dobrovnik, 21-24 May, CRO.

Kress G., Schar M., Steinert M. (2012): A standardized measurement tool for evaluating and comparing team reframing capabilities; International Design Conference DESIGN 2012, Dobrovnik, 21-24 May, CRO.

Kress G., Price T., Steinert M. (2012): Cognition as a Measure of Team Diversity, Interdisciplinary Engineering Design Education Conference (IEDEC) 2012, Santa Clara/CA, 19 March, USA

Castro J., Steinert M., Seering W. (2012): On the stability of coordination patterns in multidisciplinary design projects; PUBLISH-ED, the Design Society Workshop to foster publications in Engineering Design Grenoble, 2-3 February, FRA.

Petersen, S. Steinert M., Beckman S. (2011): Design Driven Portfolio Management; ICED'11 (18th International Conference on Engineering Design), 15.-18.08.2011, Copenhagen, DEN.

Gudem M., Steinert M., Welo T., Leifer L. (2011): Customer value is not a number – Investigating the value concept in Lean Product Development; ICED'11 (18th International Conference on Engineering Design), 15.-18.08.2011, Copenhagen, DEN.

Aquino Shluzas L., Steinert M., Leifer L. (2011): Designing to Maximize Value for Multiple Stakeholders: A Challenge to Med-Tech Innovation; ICED'11 (18th International Conference on Engineering Design), 15.-18.08.2011, Copenhagen, DEN.

Castro J., Steinert M., Seering W. (2011): On the stability of coordination patterns in multidisciplinary design projects;

ICED'11 (18th International Conference on Engineering Design), 15.-18.08.2011, Copenhagen, DEN.

Currano R., Steinert M., Leifer L. (2011): Characterizing reflective practice in design – what about those ideas you get in the shower?; ICED'11 (18th International Conference on Engineering Design), 15.-18.08.2011, Copenhagen, DEN.

Currano R., Steinert M., Leifer L. (2011): A framework for reflection in innovation design; MDW VIII, Mudd Design Workshop, 26.-28.05.2011, Claremont, CA, USA.

Petersen S., Steinert M., Leifer L. (2011): What designers can learn from artists and architects about the philosophy within conceptualization; MDW VIII, Mudd Design Workshop, 26.-28.05.2011, Claremont, CA, USA.

Grosskopf A., Steinert M., Edelmann J., Weske M., Leifer L. (2010): Design Thinking implemented in Software Engineering Tools - Proposing and Applying the Design Thinking Transformation Framework, accepted in Design Thinking Research Symposium 8 (DTRS8), University of Sydney, Sydney, 19.-20.10.2010

Steinert M., Leifer L. (2010): Open Education Resource I: Empirical Results on its Demand from an Economics and Management Faculty, accepted at 2010 Academy of Management Annual Meeting, 06.-10.08.2010, Montréal, Canada.

Steinert M., Leifer L. (2010): Open Education Resource II: Empirical Results on its Supply from an Economics and Management Faculty, accepted at 2010 Academy of Management Annual Meeting, 06.-10.08.2010, Montréal, Canada.

Steinert M., Leifer L. (2010): Scrutinizing Gartner's Hype Curve approach, Portland International Conference on Management of Engineering and Technology 2010 (PICMET), 18.-22.07.2010, Phuket, Thailand.

Skogstad P., Steinert M., K. Gumerlock, Leifer L. (2009): Why a universal design project outcome performance measurement metric is needed – a discussion based on empirical research, in ***Norell Bergendahl M., Grimheden M., Leifer L., Skogstad P., Seering W. (eds.):*** Proceedings of ICED'09, Volume 6, Design Methods and Tools, p.473-484, The Design Society, ISBN 978-1904670100 (USA).

Steinert M. (2006): An Expert Model on Barriers to Implement Mobile Data Services; in: *m>business2006*, the 5th International Conference on Mobile Business (ICMB 2006), 26.-27.06.2006, Copenhagen, IEEE Computer Society, ISBN 0-7695-2595-4 (DEN).

Steinert M., Merten P. S., Teufel S. (2006): Expert workshop – Mobile Business Outlook 2008-2010, Results from an Expert Workshop conducted via the real time strategic change (RTSC) method; in ***Khosrow-Pour M. (ed.) (2006):*** Proceedings to Emerging Trends and Challenges in Information Technology Management: Proceedings of the 2006 Information Resources Management Association International Conference, 21.-24.05.2006, Washington D.C.; Hershey PA, idea group publishing, ISBN 1-59904-020-4 and 1-59904-019-0 (USA).

Teufel S., Merten P. S., Steinert M. (2006): A Personal Digital Life Assistant (PDLA); Proceedings ITU Telecom World 2006, „Living the Digital World", 04.-08.12.2006, Hong Kong, (CHN) available online at www.itu.int/WORLD2006 as of 13.12.2006.

Steinert M., Teufel S. (2005): The European Mobile Data Service Dilemma - An empirical analysis on the barriers of implementing mobile data services; in: ***Krogstie J., Kautz K., Allen D. (eds.) (2005):*** Mobile Information Systems II, pages 63-78, Leeds, Springer Publishing, ISBN 978-0-387-29551-0, (GBR). Proceedings to IFIP TC8 Working Conference on Mobile Information Systems (MOBIS) 2005, Leeds, 06.12.2005, (GBR).

Steinert M., Teufel S. (2004): Beyond E-Business; Why E-Commerce and Web Organisations should monitor the Mobile Dimension; in: ***Cun-Gen Cao, Yue-Fei Sui (eds.) (2004):*** Knowledge Economy meets Science and Technology - KEST 2004, Second International Conference on Knowledge Economy and Development of Science and Technology, Bejing, Tsinghua University Press, ISBN 7-302-09502 (CHN).

Steinert M., Teufel S. (2004): Asia's Mobile Powerhouses – Is there only one suitable way to the UMTS pole position?; in: Proceedings to ITU Asia 2004, 07.-11.09.2004, Busan, (KOR), available online at www.itu.int/ASIA2004 as of 13.12.2006.

Steinert M., Teufel S. (2004): European Mobile Data Services 2003-Where are the Promised Innovations?; in: ***Khosrow-Pour M. (ed.) (2004):*** Innovations Through Information Technology: Proceedings of the 15th Information Resources Management Association International Conference, 24.-26.05., New Orleans, Hershey PA, idea group publishing, ISBN 1-59140-279-4 and 1-59140-261-1 (USA).

Steinert M., Teufel S. (2002): The Asian Lesson for Mobile Providers - An All-Out Strategic Paradigm Shift; in: Proceedings ITU Telecom Asia 2002, 02.-07.12.2002, Hong Kong (CHN). available online at www.itu.int/ASIA2002 as of 13.12.2006.

ARTICLES IN OTHER JOURNALS

Boschung Y., Steinert M. (2007): Triple- and Quadruple Play, Does the size of your ISP matter?; in: *Netzguide Business Communications 07*, Basle, Netzmedien AG, ISBN 978-3-907096-00-0 (SUI).

Steinert M., Teufel S. (2004): Asia's Mobile Powerhouses – Is there only one suitable way to the UMTS pole position?; in: *I-Ways,* vol. 27, issue 3/4, p174-180, Amsterdam, IOS Press ISSN 1084-4678 (HOL).

Erat A., Steinert M. (2001): Qualitätssteigerung der E-Mail-Kommunikation im Zeitalter des CRM; in: *io management*, pages 32-36, issue 04/2001, Zürich, Handelszeitung Verlag AG, ISSN 0019-9281 (SUI).

Steinert M. (2001): Le MBA exécutives (EMBA) de l'iimt de l'Université de Fribourg; in: Télécommunications perspectives, special publication of *SWISS Engineering STZ* – Schweizerische Technische Zeitschrift, page 19, Bern, ISSN 1660-4121 (SUI).

Steinert M. (2001): The iimt Executive MBA for Telecommunications Managers; in: *comtec* 5/2001, Bern, ISSN 1420-3715 (SUI).

Steinert M. (2001): The iimt Executive MBA for Telecommunications Managers; in: Telekommunikation in der Schweiz, Seite 26-27, Bern, (SUI).

Steinert M. (2001): ICT Management Education Made in Switzerland; in: Telekommunktion Perspektiven, special publication of *SWISS Engineering STZ* – Schweizerische Technische Zeitschrift, pages 42-43, Bern, ISSN 1660-4121 (SUI).

BOOKS

Steinert M. (2006): UMTS – The Lagging Adoption of a Network System Innovation; A hypothesis generating empirical study, exploring which factors influence European companies' usage and investment behaviour towards packet switched mobile data services; iimt University Press, Fribourg, ISBN 978-3-906428-88-8 (SUI).

Teufel S., Götte S., Steinert M. (eds.) (2004): Managementmethoden für ICT Unternehmen; Zürich, Orell Füssli Verlag, ISBN 3-85743-722-7 (SUI).

Schlienger T., Steinert M., Unterberger, C. (2003): telecom guide Schweiz 2003; in: ***Teufel S. (ed.) (2003):*** Series on Management in Telecommunications, iimt University Press, Fribourg, ISBN 3-906428-38-9 (SUI).

Schlienger T., Steinert M., Erat A., Veltkamp M., Halter J. (2002): Telecom Rating Schweiz 2002; in ***Teufel S. (ed.) (2002)***: Series on Management in Telecommunications, iimt University Press, Fribourg ISBN 3-906428-03-6 (SUI).

BOOK CHAPTERS

Leifer L., Steinert M. (planned for 2013): Dancing with ambiguity: Causality behavior, design thinking, and triple-loop-learning; in Gassmann O., Schweitzer F. (2013): Management of the Fuzzy Front End of Innovation, ???

Aquino-Shluzas L., Steinert M., Katila R. (2012): User-Centered Innovation for the Design and Development of Complex Products and Systems; in Plattner H., Meinel C., Leifer L. (2012): Design Thinking Research, Springer ???

Steinert M., Leifer L. (2012): analzeD: A Virtual Design Observatory; in Plattner H., Meinel C., Leifer L. (2012): Design Thinking Research, Springer ???

Currano, R., Steinert, M., & Leifer, L. (2012). Design Loupes: A Bifocal Study to Improve the Management of Engineering Design Innovation by Co-evaluation of the Design Process and Information Sharing Activity. Design Thinking Research, 89-105. ???

Leifer L., Steinert M. (2011): "Dancing with Ambiguity: causality behavior, design thinking, and triple-loop-learning"; in Rouse, W.B., Boff, K.R., Sanderson, P. (2012): Complex Socio-Technical Systems, Understanding and Influencing the Causality of Change; The Tennenbaum Institute Series on Enterprise Systems, ISBN 978-1-61499-081-9, IOSpress (NED)

Currano B., Steinert M., Leifer L. (2011): Design Loupes: A bifocal study to improve the management of engineering design innovation by co-evaluation of the design process and information sharing activity; In Plattner H., Meinel C., Leifer L. (to be published 2011): Design Thinking Research - Studying Co-Creation in Practice, pages 91-107, Springer, ISBN 978-3-642-21642-8 (USA).

Teufel S., Merten P. S., Steinert M. (2007): A Mobile Computing and Commerce Framework; in: ***Taniar D. (ed.) (2007):*** Encyclopaedia of Mobile Computing and Commerce, pages 466-471, Hershey PA, idea group publishing, ISBN 978-1-

59904-002-8 (hardcover), ISBN 978-1-59904-003-5 (ebook) (USA).

Teufel S., Steinert M. (2007): 2007, das Jahr als die Schweiz die letzte Meile entbündelte; in: ***Netzwoche & ICTswitzerland & Best of Swiss Web (eds.) (2007):*** Schweizer ICT-Jahrbuch 07, , ISBN 978-3-907096-02-4 (SUI).

Kipphardt D., Steinert M., Teufel S. (2006): Krankenhausmanagementsysteme: Grundlagen, Aufgaben und Anwendungen; in: ***Herbig B., Büssing A. (eds.) (2006):*** Informations- und Kommunikationstechnologien im Krankenhaus, pages 43-57, Stuttgart, Schattauer Verlag, ISBN 978-3-7945-2447-1 (GER).

Steinert M., Teufel S. (2005): want to skype?

Steinert M., Bult A. (2004): Strategische Unternehmensführung von Hightech-Unternehmen - Insights von Swisscom Fixnet; in: ***Teufel S., Götte S., and Steinert M. (eds.) (2004):*** Managementmethoden für ICT Unternehmen., Zürich, Orell Füssli Verlag, ISBN 3-85743-722-7 (SUI).

Steinert M. (2001): Country Report, Switzerland; in: ***Schlüter A., Then V., Walkenhorst P. (Bertelsmannn Foundation - eds.) (2001)***: Foundations in Europe - Society, Management and Law, Directory of Social Change, London, Directory of Social Change, ISBN 1-900360-86-1 (GBR).

PUBLISHED PROCEEDINGS OF OTHER CONFERENCES

Steinert M., Teufel S. (2002): The "Omnibus" View of Innovation Management; in: Conference Proceedings: *4th TONIC Workshop on Telecommunications Techno-Economics*, Rennes (FRA).

OTHER PUBLICATIONS

Steinert M. (2005): Mobile Data Services - Why did Europe loose its leadership to Asia on the way from GSM to UMTS?; in: ***Hanns Martin Schleyer-Foundation (eds.) (eds.) (2005):*** Globale Wirtschaft - nationale Verantwortung: Wege aus dem Druckkessel; overview of the research results, almanac of the X. congress Young Science and Economy, pages 214-216, publication of the Hanns Martin Schleyer-Foundation and the Berlin-Brandenburg Academy of Sciences, Berlin/Köln (GER).

Teufel S., Unterberger C., Steinert M., Duran D. (2004): Financial Services and IP Connectivity – An explorative market analysis; *confidential document*; in: ***Teufel S. (ed.) (2004):*** Institute Reports. iimt University Press, Fribourg, (SUI).

Schlienger T., Steinert M., Unterberger C. (2003): Auszug aus: iimt telecom guide Schweiz 2003 – Die Mobilfunkbetreiber, Orange, Schweiz; Extrait de: iimt telecom guide Suisse 2003 – Les opérateurs de services mobiles, Orange Svizzera; Estratto da: iimt telecom guide Svizzera 2003 – Il provider di servizi mobili, Orange, Svizzera, Lausanne (SUI).

Steinert M. (2002): Mobile Business Case; in: ***Teufel S. (ed.) (2002):*** iimt institute report 2/2002, iimt University Press, Fribourg, ISBN 3-906428-21-4 (SUI).

Steinert M., Dürsteler A., Karaoglu F., Krone O., Lux O. (2001): Mobile Business Case, Fallstudie zur Startwoche der Universität St. Gallen, Swisscom, Bern, (SUI).

DISSERTATION THESIS (Dr.rer.pol.)

Steinert M. (2006): UMTS – The Lagging Adoption of a Network System Innovation; A hypothesis generating empirical study, exploring which factors influence European companies' usage and investment behaviour towards packet switched mobile data services; dissertation, University of Fribourg/Switzerland, Faculty of Economics and Social Science, Fribourg (SUI),

awarded with the "Joseph-Vigener" Prize for best Dissertation by the faculty of economics and social sciences, University of Fribourg.

MASTER THESIS (lic.rer.pol)

Steinert M. (2000): Eine Analyse des schweizerischen Stiftungswesens im Rahmen des internationalen Forschungsprojekts „Handbook of Foundations in Europe", master thesis, University of Fribourg/Switzerland, Faculty of Economics and

Social Science, Fribourg (SUI),

financed by the Bertelsmann-Foundation and under the academic supervision of the London School of Economics and Political Science (LSE).

EXTERNAL CONFERENCES, INVITED TALKS, COURSES, SEMINARS etc.

2013

***NARA Design Workshop**, Invited Participant, Kobe, August 23rd-25th.*

***SPIRE** Invited External Evaluator Participatory Innovation Research Center, University of Southern Denmark, Sønderborg, 5.-8. May.*

***10th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop,** several project presentations, April 19-21, Stanford/Tahoe.*

***Skolkovo Tech/MIT**, Invited External Evaluator for the Skolkovo Technolgy University/MIT Project, Lausanne, 28.-31. January.*

2012

***NSF CMMI,** National Science Foundation's Division of Civil, Mechanical and Manufacturing Innovation review Panel, Washington DC, December 10th.*

***NTNU** strategy workshop on product development education, Trondheim/Oslo Nov. 20-23*

various Stanford presentations and workshops

***HSLU** coach the coaches engineering design thinking workshop, Luzern, SUI.*

***SMS 2012 Annual conference,** Technological Niche Strategies: An Illustrative Study of the Gaming Industry Prague, CZE.*

***ICDC 2012 Glasgow,** Headspace: The Stanford Imaginarium (Poster) and* Understanding Designers' reflective practices: Characterizing activities that promote ideation, *Glasgow, GBR.*

***SIG Design Collaboration**, Headspace: The Stanford Imaginarium; Glasgow, GBR.*

***DSM 2012 conference**,* Generating Information Dependencies Automatically, Kyoto, *JAP.*

***Aalto University,** External Evaluator Aalto Factory System, September, Otaniemi and Helsinki, FIN.*

***NSF Engineering Research and Innovation Conference,** sponsored by the National Science Foundation's Division of Civil, Mechanical and Manufacturing Innovation (CMMI), Boston, 9-12 July, USA.*

***Volkswagen** VW IT leader conference, invited keynote and workshop, Berlin 1-3 July, GER.*

***9th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop, several project presentations**, June 26-30, Potsdam (GER).*

***International Design Conference DESIGN 2012**, Dobrovnik, 21-24 May, CRO*

***Doctoral Workshop for Design Research**, Aalto University, Espoo, 15-18 May, FIN.*

***Naval postgraduate School (NPS) E-week: Innovation by Design**, co-taught by Martin Steinert and Peter Denning, Monterey/CA, 28-29 March, USA.*

***World Design Capital 2012, Helsinki, Designing for New realities**! (Aalto University seminar about design for real societal impact), invited panelist, Helsinki 6 March, FIN.*

***8th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop, Conference Chair and several project presentations**, Feb 20-22, Stanford (USA).*

***NORSK INDUSTRI: KBD-Forum Knowledge Based Development Forum System Engineering Lean Product Development Seminar** 7.-8. February 2012, Drammen, NOR*

***PUBLISH-ED, the Design Society Workshop to foster publications in Engineering Design** Grenoble, 2-3 February, FRA.*

***NovoNordisk Device R&D unit annual meeting**, 26-27 January, Båstad, SWE*

***TEDx ConstitutionDrive 2012, Engineering Design: Creativity AND Analysis,** Menlo Park, CA, January 21, USA.*

2011

various Stanford presentations and workshops

***SIG Design Theory,** Copenhagen, DEN.*

***ICED'11 (18th International Conference on Engineering Design) (with Petersen, S.):** Design Driven Portfolio Management, 15.-18.08.2011, Copenhagen, DEN.*

***ICED'11 (18th International Conference on Engineering Design) (with Gudem M. Welo T., Leifer L):** Customer value is not a number – Investigating the value concept in Lean Product Development, 15.-18.08.2011, Copenhagen, DEN.*

ICED'11 (18th International Conference on Engineering Design) (with Aquino Shluzas L., Leifer L): *Designing to Maximize Value for Multiple Stakeholders: A Challenge to Med-Tech Innovation, 15.-18.08.2011, Copenhagen, DEN.*

ICED'11 (18th International Conference on Engineering Design) (with Castro J., Seering W.): *On the stability of coordination patterns in multidisciplinary design projects, 15.-18.08.2011, Copenhagen, DEN.*

ICED'11 (18th International Conference on Engineering Design) (with Currano R., Leifer L.): *Characterizing reflective practice in design – what about those ideas you get in the shower?, 15.-18.08.2011, Copenhagen, DEN.*

UC Berkeley, Berkeley Institute of Design (BiD) Lab, invited seminar: Neighborly update on Design Research at Stanford (CDR) and ME310's international experience, July 13th, Berkeley (USA).

7th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop, Conference Chair and several project presentations*, May 31 - June 3, Stanford (USA).*

Harvey Mudd Design Workshop MDW VIII (with Rebecca Currano and Larry Leifer): A framework for reflection in innovation design, 26.-28.05.2011, Claremont, CA, USA.

Harvey Mudd Design Workshop MDW VIII (with Soren Ingomar Petersen and Larry Leifer): What designers can learn from artists and architects about the philosophy within conceptualization, 26.-28.05.2011, Claremont, CA, USA.

2010

various Stanford presentations and workshops

6th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop, Conference Chair and several project presentations*, Nov 3-5, Stanford (USA).*

NSF (National Sciences Foundation) CPATH project, invited executive committee meeting participant: Collaborative Research II: A Field Guide for the Science of Computation, Peter J. Denning, PI at NPS, and Rick Snodgrass, PI at U Arizona (member of the Executive Committee), Oct. 4-6, Monterey (USA).

Stanford/CDR - Naval Postgraduate School (NPS)/Cebrowski workshop, organizer and presenting: analyzed - A Virtual Design Observatory (CDR/HPI), October 1. Stanford (USA).

Naval Postgraduate School (NPS), invited guest speaker at the Cebrowski Institute: Design Thinking at Stanford, Sep. 1., Monterey (USA)

Academy of Management (AoM) 2010 annual conference, paper presentation: "Open Education Resource I: Empirical Results on its Demand from an Economics and Management Faculty", August 10., Montreal, (CAN).

Academy of Management (AoM) 2010 annual conference, paper presentation: "Open Education Resource II: Empirical Results on its Supply from an Economics and Management Faculty", August 10., Montreal, (CAN).

Academy of Management (AoM) 2010 annual conference, session facilitator: "The Strategic Management of Patent Value", August 9., Montreal, (CAN).

PICMET'10 (Portland International Conference on Management of Engineering and Technology), conference paper presentation: *"Scrutinizing Gartner's Hype Cycle Approach", July 22., Phuket (THA).*

PICMET'10 (Portland International Conference on Management of Engineering and Technology), session chair: *WB-06 Technology Forecasting – 1, July 21., Phuket (THA).*

5th Hasso Plattner Design Thinking Research Program (HPDTR) community building workshop, project presentation: *Design Loupes: A bifocal Study to improve the Management of Engineering Design Innovation by Co-Evaluation of the Design Process and Information Sharing Activity, May 26, Potsdam (GER).*

Eco-Innovation Exchange Workshops (senior researcher): Sharing experiences and developing methods for sustainable product and service developments, in cooperation with Prof. Tim McAloone, DTU, Technical University of Denmark (DEN) (financed by Danish Agency for Science Technology and Innovation, workshop and travel grant), Stanford April 28-29, Stanford June 15-16, Copenhagen Sept. 15-16.

2009

MIT 2.009, Capstone course: Product Engineering Processes, fall term 2009, teams' mentor, Massachusetts Institute of Technology (USA).

MIT Research Seminar: Researching Product design and Development (pdd): We need a universal design project outcome performance measurement metric: a discussion based on empirical research, 24.09.2009, Massachusetts Institute of Technology (USA).

ICED'09, conference paper presentation: "Why a universal design project outcome performance measurement metric is needed – a discussion based on empirical research", 23.08.2009-28.08.2009, Stanford University (USA).

ICED'09, session chair: Session T2-OE4: "Design & Economic Development", 25.08.2009, Stanford University (USA).

HPI – Stanford Design Thinking Research Program, 2nd Community Building Workshop, invited speaker: Outlining A dissensus based online Delphi approach as an explorative research tool, 02.02.-04.02.2009, Stanford University (USA).

2008

TIM workshop, participant, Freiberg, 23.10.-25.10.2008 (GER).

Informatica08, IT Valley Fribourg Innovation Event, key note: Successful Innovation & Production In The Canton of Fribourg For A Global Market, Fribourg, 09.10.2008 (SUI).

2008 Academy of Management Annual Meeting, participant, 08.-13.08.2008, Annaheim (USA)

VHB Annual Meeting 2008, participant, Berlin, 14-17.05.2008 (GER).

2007

Ascom QVoice User Conference 11.-14.09.2007, key note: The exceeding network demands of future mobile B2B customers, Montreux, 13.09.2007 (SUI).

iimt Partner and Sponsor lunch 2007, key note: **STAR**initiative (Swiss Technology Acceptance Research), Restaurant l'Epée, Fribourg, 06.07.2007 (SUI).

VHB Annual Meeting 2007, participant, Paderborn, 31.05.-02.06.2007 (GER).

2006

UMTS – The Lagging Adoption of a Network System Innovation; A hypothesis generating empirical study, exploring which factors influence European companies' usage and investment behaviour towards packet switched mobile data services; Disputation, Faculty of Economics and Social Sciences, University of Fribourg/Switzerland, 13.10.2006 (SUI).

KPMG Internal Course on the Telecommunication Sector for CPAs, with Prof. Dr. S. Teufel, 19.09.2006, KPMG Zurich, (SUI).

iimt Partner and Sponsor lunch 2006, key note: European Mobile Providers' Mismanagement of GPRS/UMTS Services for Business Users, Restaurant de la Cigogne, Fribourg, 07.07.2006 (SUI).

European Mobile Providers' Mismanagement of GPRS/UMTS Services for Business Users - a hypothesis generating empirical study, exploring which factors influence European companies' usage and investment behaviour towards packet switched mobile data services; key note, in iimt annual partner Lunch, 07.07.2006, Fribourg (SUI).

An Expert Model on Barriers to Implement Mobile Data Services; in: Proceedings to the fifth International Conference on mobile business (ICMB 2006), Copenhagen, 26.-27.06.2006 (DEN).

VHB Annual Meeting 2006, participant, Dresden, 07.06.-10.06.2006 (GER).

Expert workshop – Mobile Business Outlook 2008-2010, Results from an Expert Workshop conducted via the real time strategic change (RTSC) method; in: Proceedings to 17th Annual IRMA International Conference, Washington D.C., 24.05.2006 (USA).

2005

The European Mobile Data Service Dilemma, An empirical analysis on the barriers of implementing mobile data services; Delegate to IFIP TC8 Working Conference on Mobile Information Systems (MOBIS) 2005, Leeds, 06.12.2005 (GBR).

2004

Beyond E-Business; Why E-Commerce and Web organisations should monitor the Mobile dimension; in: KEST 2004, Second International Conference on Knowledge Economy and Development of science and Technology, Bejing, 18.09.2004 (CHN).

European Mobile Data Services 2003-Where are the Promised Innovations?; in: 15th Annual IRMA International, 2004, Innovation through Information Technology, New Orleans, 25.05.2004 (USA).

Der schweizerische ICT Markt und seine Wertschöpfung, guest lecture, Master Course, Innovation durch Informations- und Kommunikationstechnologie (IIKT), University of Bern, 18.05.2004 (SUI).

Wireless Applications for the Digital Divide – The European Perspective; in Asian Pacific Conference on ***Emerging Technologies "The Challenge of the Mobile Revolution and the Digital Divide"***, Korea Information Society Development Institute (KISDI) and East-West Centre, Seoul, 12.05.2004 (KOR)

The Scientist in Science and Society, Realities, Visions and Fears; Special presentation for the French Minister Hubert Curien, Young Scientist Program, Forum Engelberg, 05.03.2004 (SUI).

2002

The "Omnibus" View of Innovation Management; in: 4th TONIC Workshop on Telecommunications Techno-Economics, Rennes 15.05.2002 (FRA).

2001

Presentation and evaluation of the Mobile Business Case, A group work case study (~1000 students) conducted in the introduction week of the student intake 2001 University of St. Gallen (HSG), 15.-19.10.2001 (SUI).

UNIVERSITY ADMINISTRATION AND RESEARCH POLITICS

- President of the Scientific Collaborators of the Faculty of Social Sciences and Economics 2001 - 2002
- Electoral Delegate for the Election of the University Rector 2006
- Assistant Representative to the Sports Commission of the University since 2004 - 2008
- Assistant Representative to the Economics Faculty since 2001 - 2009
- Assistant Representative to the Management Department since 2001 - 2009
- Member of the iimt institute council since 2002 - 2009
- Member of other numerous University and Faculty committees and commissions 2001 - 2009

MEMBERSHIPS

Member of the Design Society (2009 -)
Member of INFORMS (2009 -)
Member of the AoM (Academy of Management) (2008 -)
Member of the East-West Centre (2004 -)
Member of VHB (German Academic Association for Business Research) (2006 - 2013)
Member of Schmalenbach Society for the Advancement of Research in Bus. Econ. and Bus. Practice (2006 -)
Member of SGB (Swiss Association for Business Administration) (2000 -)

EDITORIAL BOARDS, PROGRAM COMMITTEES AND OTHER REVIEW ACTIVITIES

AoM	Reviewer, Academy of Management, annual conferences.
ASME	Reviewer, IDETC/CIE International Design Engineering Technical Conferences & Computers and Information in Engineering Conference.
DEXA	Reviewer, International Conference on Database and Expert Systems Applications, annual conference.
DPPI	Member of Scientific Committee, International Conference on Designing Pleasurable Products and interfaces.
EC-Web	Reviewer, International Conference on Electronic Commerce and Web Technologies, annual conference.
IASDR	Program Committee member, International Association of Societies of Design Research, 2013 conference.
ICED	Reviewer, International Conference on Engineering Design, biennial conferences.
IEEE TEM	Reviewer (ad hoc), IEEE Transactions on Engineering Management (IEEE TEM), ISSN 0018–9391.
IFIP	Reviewer, *I3E*, e-commerce, e-business and e-government, annual conference.
II	Reviewer, Industry and Innovation, ISSN (print) 1366-2716, (online) 1469-8390.
IJEE	Reviewer, International Journal of Engineering Education, ISSN (printed): 0949-149X, ISSN (electronic): 0742-0269
IRMA	2004-2007, PC member and Reviewer IRMA International Conferences, 2007 Vancouver (CAN), 2006 Washington (USA), 2005 San Diego (USA), 2004 New Orleans (USA).
IJEBR	Reviewer, International Journal of E-Business Research (IJEBR), ISSN 1548-1131.
IJESMA	Member International Editorial Review Board of the International Journal of E-Services and Mobile Applications (IJESMA), ISSN 1941-627x.

IJISM	Reviewer, International Journal of Information Systems and Management (IJISM), ISSN 1751-3227.
LRP	Reviewer (ad hoc), Long Range Planning (LRP), ISSN 0024-6301.
MDW	Reviewer, Mudd Design Workshop, biennial conferences.
NSF	National Science Foundation's Division of Civil, Mechanical and Manufacturing Innovation National Review Panel
TFSC	Reviewer, Technological Forecasting and Social Change (TFSC), ISSN 0040-1625.

PERSONAL INTERESTS

endurance sports (Jungfrau Marathon, Engadin Skimarathon, Telemarking, Cross Country Skiing, Swimming, Biking etc.) 1983 original VW Westfalia camper van, and cooking.

Martin Steinert
Stanford, May 1st, 2013

CV

Name: **Hans Petter Hildre**
Born: **13.02.62**
Nationality: **Norwegian**
Present position: **Dean/professor at Aalesund University College**
Degrees: **Dr.ing. /PhD**

Education:

MSc Norwegian Technical University (NTH)
PhD/Dr.ing. Norwegian University of Science and Technology (NTNU)

Work experience:

1978 - 79	Workshop experience at the Linespillfabrikken AS
1987 - 88	Product development manager at Tenfjord AS (Rolls-Royce Marine).
1991 - 94	Head of the board in Tenfjord A.S. (Rolls-Royce Marine)
1992 - 93	Researcher at Sintef department for Production Technology.
1993-96	Associate professor at the Norwegian University of Technology (NTNU)
1991/92	Participated in a resource group for development of education in Mechatronic Design
1994-96	Project leader of a research program in MECHATRONIC DESIGN METHODOLOGY.
1996	Guest professor at The Technical University in Denmark (DTU).
1997-98	Design manager at Kværner ASA department for research and technology development. Design leader for development of a new marine diesel engine.
1998/99	Visiting faculty at Stanford University. Member of the Stanford Learning lab.
1999	Professor in product development at Norwegian University of Technology (NTNU)
2000	Head of the department Machine design and materials, NTNU
	Project leader of the "NorLight "Design and production"
	Project leader of the project Action Based Learning (joint learning projects between four departments at NNTU and Statoil.
2002	Project leader of the multidiscipline project PoP at NTNU (joint project between social science and technology)
	Professor II at Aalesund University College (AAUC).
	Member of the board at "NTNU Learning Quality Group".
2003	Leader of the "Problem Based Learning arena" at NTNU
2004-	Professor at AAlesund University College
	Forum leader at Norwegian Centres of Expertice - Maritime (NCE-Maritime)
	Professor II at NTNU, Department of product development and materials
2006	Project leader for project "Next generation Ship and Equipment", Rolls-Royce Marine, Ulstein Design, Kleven Maritime and Odim, founded by NFR
2008	Head of MSc study program Product and system design
2010	Head of research program Integrated Marine Operations (KMB, NFR)
2011	Dean of faculty of Marine Technology and Operations at Aalesund University College

Membership in academic and professional committees:

- Member of the board at "NTNU Learning Quality Group".
- Head of the board in Inventas AS
- Member of the board in In-lieu AS
- Member of the board in Ulstein Power and Control

- Member of the board in Gurskøy Stål og Sveiseindustri
- Member of the board in Isolaft

Present doctoral students supervised:

- Kjetil Kristensen
- Arnar Kristjansson
- Cristian Nilsson
- Tormod Jensen

International editorial advisory board:

- Journal of Engineering Desgin
- Design studies

Peer reviewed journals / Int. conference proceedings

[1] *The Automotive Design Factory - Advanced Concurrent Engineering*, Arnar Kristiansen, Hans Petter Hildre, 9th European Concurrent Engineering Conference, Modena 2002

[2] *Physual Designing - Approaching Design through the Interaction Space*, Kjetil Kristensen, Hans Petter Hidre, 7th International Design Conference DESIGN 2002, Dubrovning 2002

[3] *Læring som Konkurransefortrinn*, IT-galla, Stavanger 2002

[4] *Working Situations in Product Development – A New Approach to Evaluating the Design Process,* Kjetil Kristensen, Hans Petter Hildre m.flere; 8th International Conference on Concurrent Enterprising: 'Ubiquitous Engineering in the Collaborative Economy', Rome 2002

[5] Dennis Krupke, Guoyuan Li, Jianwei Zhang, Houxiang Zhang, Hans Petter Hildre: Flexible Modular Robotic Simulation Environment for Research and Education, Proceedings 26th European Conference on Modeling and Simulation (ECMS 2012), Klaus G. Troitzsch, Michael Möhring, Ulf Lotzmann (Editors), May 29-2 June, Koblenz, Germany, 2012. ISBN: 978-0-9564944-4-3 / ISBN: 978-0-9564944-5-0 (CD)

[6] Guoyuan Li, Houxiang Zhang, Fernando Herrero-Carron, Hans Petter Hildre, Jianwei Zhang: A novel mechanism for caterpillar-like locomotion using asymmetric oscillation, Proceeding of 2011 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM2011), Budapest, Hungary, 3-7. July, 2011, pp.164-169.

[7] Junhao Xiao, Jianhua Zhang, Jianwei Zhang, Houxiang Zhang, Hans Petter Hildre: Fast plane detection for SLAM from noisy range images in both structured and unstructured environments, Proceeding of 2011 IEEE International Conference on Mechatronics and Automation (ICMA 2011), Beijing, China, 7-10, Aug. 2011, pp.1768 – 1773.

[8] Cong Liu, Filippo Sanfilippo, Houxiang Zhang, Hans Petter Hildre, Chang Liu, Shusheng Bi: Locomotion Analysis of A Modular Pentapedal Walking Robot, The Proceedings 26th European Conference on Modeling and Simulation (ECMS 2012), Klaus G. Troitzsch, Michael Möhring, Ulf Lotzmann (Editors), May 29-2 June, Koblenz, Germany, 2012. ISBN: 978-0-9564944-4-3 / ISBN: 978-0-9564944-5-0 (CD)

Other professional publication, course readings/books

1. Hans Petter Hildre, Åge Waløen, *Konstruksjon med hensyn på styrke og stivhet*, 31 sider, fag 60581 Konstruksjonsmetodikk, Institutt for maskinkonstruksjon og materialteknikk 1994
2. H.P. Hildre, *Flenser, Tetninger og Bolter,* 55 sider, EEU-kurs, Dynamisk Analyse av Rørsystemer, NTH 7 februar 1994
3. Hildre. H.P. et.al.; *Mekatronikk Metodikk*, 250 sider, NTNU/SINTEF 1996
4. Hans Petter Hildre, *Use of Computers in Design*, 25 sider, Phd. course in Desgin Methodology, Department of Machine Design and Materials Technology, DTU 1996
5. Hans Petter Hildre, *MECHATRONIC DESIGN, -a business and design approach*, 13 sider, Stanford 1998
6. Hans Petter Hildre, *MECHATRONIC DESIGN, -design methodology*, 18 sider, Stanford 1998
7. Hans Petter Hildre, Produktmodellering, 96 sider, NTNU 2003
8. Hans Petter Hildre, Produkututvikling, 88 sider, NTNU 2003
9. Hans Petter Hildre, Maskinkonstruksjon og mekatronikk, 120 sider, NTNU 2003
10. Hans Petter Hildre, Produktmodellering, 110 sider, HIALS 2007
11. Hans Petter Hildre, Produktutvikling, 98 sider, HIALS 2008
12. Hans Petter Hildre, Produktfamilier, 111 sider, HIALS 2006
13. Hans Petter Hildre, Vilmar Æsøy, Ola Jon Mork, The Design Factory, 180 pages, HIALS 2009
14. Hans Petter Hildre; Product Family Design, 240 pages, HIALS 2012

Other relevant professional publication, research reports

[1] Hans Petter Hildre; *IKT I læring*, Rapport for P2005, 83s, 2000
Hans Petter Hildre, Håkon Fyhn, Ole Ivar Sivertsen, Kjetil Kristensen, *Klasserommet som forskningslaboratorium*, NTNU 2001

[2] Hans Petter Hildre m. flere; Produktutvikling i det virtuelle rom, 130s, NTNU 2001

Name:

Professor Kjell Gunnar Robbersmyr, PhD, e-mail: kjell.g.robbesmyr@uia.no

Professional education

- PhD Mechanical Engineering, The University of Trondheim, The Norwegian Institute of Technology, 1992
- MSc Mechanical Engineering, The University of Trondheim, The Norwegian Institute of Technology, 1985
- MSc Innovation and Business Development, Norwegian University of Science and Technology, 2006

Work experience

2010 -	UHR / NRT, project manager for the implementation of SAK on the education in mechanical engineering in Norway
2008 -	University of Agder, Faculty of Engineering and Science, Study Coordinator at the Master program in Mecatronics.
2007 -	University of Agder, Faculty of Engineering and Science, Department of Engineering Science, Professor.
2006 -	Bergen University College, Department of Machine and Marinecourses, Professor II.
2003 – 2007	Head of studies, Mechatronics, University of Agder
1997 – 2007	Associated Professor, Mechatronics, University of Agder
1997 – 2005	Head of Research Group, Agder Research
1997 – 2005	Senior Researcher, Agder Research
1992 – 1997	Associated Professor, Department of Mechanical Engineering, Sør Trøndelag University College
1988 – 1991	PhD-student, Division of Machine Design, The University of Trondheim, The Norwegian Institute of Technology
1985 - 1988	Research assistant, Division of Machine Design, The University of Trondheim, The Norwegian Institute of Technology
1984 – 1992	Researcher, Institute of Petroleum Engineering and Applied Geophysics, The University of Trondheim, The Norwegian Institute of Technology

Journal Papers (2010-):

- W. Pawlus, H.R. Karimi and K.G. Robbersmyr: "A Fuzzy Logic Approach to Modeling a Vehicle Crash Test", Central European Journal of Engineering, Volume 3, Issue 1, pp. 67-79, March 2013.
- Lin Zhao, Witold Pawlus, Hamid Reza Karimi and Kjell G. Robbersmyr: "Data-Based Modeling of Vehicle Crash using Adaptive Neural-Fuzzy Inference System", IEEE/ASME Trans. Mechatronics, Revision #1.
- Witold Pawlus, Hamid Reza Karimi, and Kjell G. Robbersmyr: "Reconstruction and simulation of the vehicle to road safety barrier oblique collision based on the Levenberg–Marquardt algorithm", International Journal of Crashworthiness, Volume 17.(6) p. 676-692, 2012.
- W. Pawlus, H.R. Karimi, K.G. Robbersmyr: "Wavelet-based estimation of model parameters of a vehicle involved in a full-scale impact", International Journal of Wavelets, Multiresolution and Information Processing, 10, 1250057 (2012) [29 pages] DOI: 10.1142/S0219691312500579.
- Hamid Reza Karimi, Witold Pawlus and Kjell G. Robbersmyr: "Signal reconstruction, modeling and simulation of a vehicle full-scale crash test based on Morlet wavelets", NEUROCOMPUTING, Volume 93, 15.september 2012, ISSN 0925-2312.
- J. Cibulka, M.K. Ebbesen, G. Hovland, K.G. Robbersmyr and M.R. Hansen: "A Review on Approaches for Condition Based Maintenance in Applications with Induction Machines Located Offshore". Modeling, Identification and Control, Vol. 33, No. 2, 2012, pp. 69-86, ISSN 1890-1328.
- J.S. Johnsen, H.R. Karimi, K.G. Robbersmyr, *"The Harp: A vehicle crash test apparatus for full scale crash test experiments"* Int. J. Advanced Manufacturing Technology, December 2012, Volume 63, Issue 9-12, pp 1073-1080.

- J. Cibulka, M.K. Ebbesen and K.G. Robbersmyr: "Bearing Fault Detection in Induction Motor-Gearbox Drivetrain". *J. Phys.: Conf. Ser.* **364** 012140 doi:10.1088/1742-6596/364/1/012140, 2012.
- H.R. Karimi, W. Pawlus, and K.G. Robbersmyr: "Data-based modeling of vehicle collisions by nonlinear autoregressive model and feedforward neural network". *Information Sciences.* ISSN: 0020-0255, In Press, http://dx.doi.org/10.1016/j.ins.2012.03.013, 2012.
- H.R. Karimi, W. Pawlus, and K.G. Robbersmyr: "A review paper on vehicle crash and road safety manufacturing". *International Journal of Materials Engineering and Technology.* ISSN: 0975-0444, vol.7, no.2, pp.93-125, 2012.
- W. Pawlus, H.R. Karimi, and K.G. Robbersmyr: "Ahead prediction of kinematics of vehicles under various collision circumstances by application of ARMAX autoregressive model". *WSEAS Transactions on Applied and Theoretical Mechanics*. ISSN: 1991-8747, vol.6, no.2, pp.80-89, 2011.
- W. Pawlus, K.G. Robbersmyr, and H.R. Karimi: "Mathematical modeling and parameters estimation of a car crash using data-based regressive model approach". *Applied Mathematical Modeling*. ISSN: 0307-904X, vol.35, no.10, pp.5091-5107, 2011.
- W. Pawlus, H.R. Karimi, and K.G. Robbersmyr: "Identification of a vehicle full-scale crash viscoelastic system by recursive autoregressive moving average models". *International Journal of Control Theory and Applications*. ISSN: 0974-5572, vol.4, no.1, pp.11-24, 201 .
- Witold Pawlus, Kjell G. Robbersmyr and Hamid Reza Karimi: "Application of viscoelastic hybrid models to vehicle crash simulation". International Journal of Crashworthiness, ISSN: 1754-2111, Vol. 16, No. 2, pp. 195-205, 2011.
- Witold Pawlus, Hamid Reza Karimi and Kjell Gunnar Robbersmyr: "Mathematical modeling of a vehicle crash test based on elasto-plastic unloading scenarios of spring-mass models". Int J Adv Manuf Technol, DOI 10.1007/s00170-010-3056-x, (10pp), Presented online: 10 December 2010.
- W. Pawlus, H.R. Karimi, K.G. Robbersmyr: "Analysis of Vehicle to Pole Collision Models: Analytical Methods and Neural Networks". International Journal of Control Theory and Applications, 3(2) December 2010, pp. 57-77 © International Science Press • ISSN: 0974-5572.
- Witold Pawlus, Hamid Reza Karimi and Kjell G. Robbersmyr: "Effects of Different Spring-Mass Model Elasto-Plastic Unloading Scenarios on the Vehicle Crash Model Fidelity". ICIC Express Letters, Volume 4, Number 5, October 2010.
- W. Pawlus, J. E. Nielsen, H. R. Karimi and K. G. Robbersmyr: "Development of Lumped-Parameter Mathematical Models for a Vehicle Localized Impact". Submitted to the Journal of Automotive Engineering.
- Witold Pawlus, Jan Eivind Nielsen, Hamid Reza Karimi and Kjell G. Robbersmyr: "Development of Mathematical Models for Analysis of a Vehicle Crash". WEAS TRANSACTION on APPLIED and THEORETICAL MECHANICS, Issue 2, Volume 5, April 2010, p156 – 165, ISSN: 1991-8747.
- K.J.Gåsvik, K.G.Robbersmyr and T.K.Vadseth: "Projected fringes for the measurement of large aluminium ingots", Measurement Science and Technology, Volume 21, Number 10. Meas. Sci. Technol. 21 () 105302 (9pp), 2010.
- H.R. Karimi and K.G. Robbersmyr: "Signal analysis and performance evaluation of a vehicle crash test with a fixed safety barrier based on Haar wavelets", WSEAS TRANSACTIONS on SIGNAL PROCESSING, Issue 4, Volume 6, October 2010, pp 208 – 217, ISSN: 1790-5052.

Selected Conference Papers:

- J. Cibulka, M.K. Ebbesen and K.G. Robbersmyr: "Bearing Fault Detection in Induction Motor-Gearbox Drivetrain". COMADEM, Huddersfield, United Kingdom, (18. to 20.june), 2012.
- Johnsen, Johan Simon; H.R. Karimi and Robbersmyr, Kjell G.: "A Vehicle Crash Test Apparatus for Universities and Small Researched Institutions" I: RECENT RESEARCHES in CIRCUITS, SYSTEMS, MULTIMEDIA and AUTOMATIC CONTROL. World Scientific and Engineering Academy and Society 2012 ISBN 978-1-61804-085-5. p. 43-48.
- M. Ottestad, G. Hovland, S. Persson, K.G. Robbersmyr, J Pohl: "A Survey of Mechatronics Education in the Nordic and Baltic Countries". The 3. International conference on "Mechatronic Systems and Materials 2007", Kaunas University of Technology, Lithuania, 27. – 29. September, 2007.

Name: Bjørn Baggerud

a) Professional Preparation

University of Trondheim, NTH	Operations Research	Siv.ing. 1972-1977
University of Trondheim, NTH	Cad/Cam for shipbuilding industry	Dr.ing. 1979-1984

b1) Appointments

2010- Study program leader, Industrial Design, IVT, NTNU
2001-03 Head of department, Product Design
1997- NTNU, Department of Product Design
1994-96 Head of department, Marine system Design, NTNU
1989-96 NTNU, Department of Marine system Design, Trondheim
1986-89 Norsk Data, Trondheim
1984-86 NebbCon / Autocon, Trondheim
1983-84 Marintek, Trondheim
1978-83 NTH, Norwegian Technical High school, University of Trondheim
1977-78 NSFI, Norwegian Ship Research Institute, Oslo

b2) Awards

2010 EPDE2010 Best paper, reviewer's choice, cowriter.

c1) Five Project Related Publications

Baggerud, Bjørn.

Produktdesign 9 Fordypning. Artikkelsamling Vår/høst 2007. Trondheim: Institutt for produktdesign, Norges teknisk-naturvitenskapelige universitet 2007 (ISBN 82-91917-21-3) 300 s. , NTNU

Vatn, Gunvor Cecilie Dånmark; Baggerud, Bjørn; Rismoen, Jon Herman.

The Summer Design Office: A work-learning experience for industrial design students. I: When Design Education and Design Research meet... Proceedings of the 12th International Conference on Engineering and Product Design Education, 2-3 September 2010. The Design Society 2010 ISBN 978-1-904670-19-3. s. 581-586, NTNU

Baggerud, Bjørn; Boks, Casper; Rismoen, Jon Herman.

The Great Challenge, Staging The Design Education For The Next 20 Years. I: Design education for creativity and business innovation : proceedings of the 13th International Conference on Engineering and Product Design Education, City University London, UK, 8th-9th September 2011. The Design Society 2011 ISBN 978-1-904670-33-9. s. 429-433,NTNU

Baggerud, Bjørn; Boks, Casper.

From Practice to Theory. Has our design research teaching influenced our education and research practice?. I: Creating a Better World. The Design Society 2009 ISBN 978-1-904670-18-6. s. 193-198,NTNU

Baggerud, Bjørn; Østerås, Trond.

Bridging design theory and practice in design engineering education. INTERNATIONAL ENGINEERING AND PRODUCT DESIGN EDUCATION CONFERENCE; 2004-09-02 - 2004-09-04,NTNU

c2) Five general publications

Boks, Casper; Baggerud, Bjørn.

When Design Education and Design Research meet.... I: When Design Education and Design Research meet... Proceedings of the 12th International Conference on Engineering and Product Design Education, 2-3 September 2010. The Design Society 2010 ISBN 978-1-904670-19-3. s. 15-19, NTNU

Høiseth, Marikken; Baggerud, Bjørn.

Development of a Tool for a Course Design and Technology for the Secondary School in Norway. I: New Perspectives in Design Education. The Design Society 2008 ISBN 1-904670-04-0. s. 285-290, NTNU

Baggerud, Bjørn; Nesbakken, Ragnhild; Liem, André.

Design Strategy - Starting Point for Integrated Product Development. I: Proceedings of NordDesign 2006. Hjardarhagi 2-6, 107 Reykjavik, Iceland: Faculty of Engineering, University of Iceland 2006 ISBN 978-9979-9494-9-7. s. 138-147, NTNU

Baggerud, Bjørn; Nesse, Per Jonny; Hestflått, Anne; Pettersen, Ida Nilstad; Parr, Jan Walter Rundquist; Nesbakken, Ragnhild.

Produktdesign 8 Designstrategier. Undervisningsmateriell. Høst 2007.. Trondheim: Institutt for produktdesign, Norges teknisk-naturvitenskapelige universitet 2007 (ISBN 82-91917-22-1) 2000 s., NTNU

Baggerud, Bjørn; Pettersen, Ida Nilstad; Liem, André.

Vision Based Design - Methodology for Development of Long Term Design Strategy. I: Educating Designers for a Global Context?.

Wiltshire / Glasgow UK: Institution of Engineering Designers / The Design Society 2006 ISBN 0-9553942-0-1. s.45-50, NTNU

d) Five Synergistic Activities

2010	Leader of the EPDE2010: 12th International Conference on Engineering and Product Design Education
2008-2013	Member of the EPDE 2011 Scientific Review Committee
2011	Member of N5T QA Pilot Project on Peer Evaluation of Master Programs
2010-2013	Member of the Profession Council of design education in Norway, UHS
2011-	Program leader for the study program of Industrial Design, and responsible for the implementation of the new Study Program

e) Collaborators & Other Affiliations of last 48 months,

Boks, Casper, Professor, Norwegian University of Science and Technology (NTNU), NOR.
Ion, William, Professor, University of Stratclyde, Design, Manufacture And Engineering Management, GB
Keitsch, Martina, Professor, Norwegian University of Science and Technology (NTNU), NOR.
Langenveld, Lau, associate professor, Delft University of Technology, Faculty of Industrial Design Engineering, NL
Lloveras Maciá, Joaquim, Professor, Universitat Politécnica de Catalunya (UPC), ESP
Rismoen, Jon Herman, Associate Professor, Norwegian University of Science and Technology (NTNU), NOR.
Sigurjonsson, Johannes, Associate Professor, Norwegian University of Science and Technology (NTNU), NOR.
van Dijk, Matthijs, Professor, Delft University of Technology, Faculty of Industrial Design Engineering, NL
Øyan, Petter, Dean, Faculty of Technology, Art and Design at Oslo and Akershus University College of Applied Sciences, NOR

Name: Knut Einar Aasland

a) Professional Preparation

Norwegian Inst of Technology/NOR	Mechanical engineering	Sivilingenior, 1976 - 1980
Norwegian Inst of Technology/NOR	Machine design	Dr.ing (PhD), 1990 - 1995

b1) Appointments

2004-	Assoc professor, Dept of engineering design and materials, NTNU
1999-2004	Senior Scientist, SINTEF Industrial Management
1998-1999	Research Director, SINTEF Material Technology
1997	Senior scientist, SINTEF Materials Technology
1994-1996	Research scientist, SINTEF Materials Technology
1992-1993	Research stay at Oregon State University, USA
1990-1993	PhD candidate, Dept of Machine Design, NTH
1989-1993	Research Scientist, SINTEF Production engineering
1981-1989	Research scientist, SINTEF Machine design

c1) Five Project Related Publications

Aasland K. (2013): Individual study of 3d modelling software using interactive video. Engineering And Product Design Education 2013 conference, Dublin (IRL), Sept 2013 (accepted).

Blankenburg D., Aasland K. (2012): Interactive video teaching of CAD software, International Workshop of Advanced Manufacturing 2012, Trondheim (N).

Aasland K. (2010): Large team projects – An alternative type of master project?, Engineering and product design education 2010, Trondheim (N),.

Aasland K. (2010): Multiprofessional projects as final master project for designers, Design 2010, Dubrovnik (HR), 2010.

Aasland K. (2011): Innovation – A question of developing and cultivating a culture?, 5th European conference on entrepreneurship and innovation – ECEI 2010, Athens (GR), 2010.

c2) Five general publications

Aschehoug S., Boks C., Aasland K. (2013): Building sustainability knowledge for product development and design – experiences from four manufacturing firms, Progress in Industrial Ecology, accepted for printing in 2013.

Blankenburg D., Kristensen K., Aasland K., Sivertsen O. (2013): Virtual obeya: Collaborative tools and approaches to boost the use of simulators in concept design, 27th European Conference on Modelling and Simulation, Ålesund (N), May 2013.

Aasland K., Blankenburg D. (2012): Virtualizing the Obeya, NordDesign 2012, Aalborg (DK), 2012.

Aasland K., Blankenburg D. (2012): An analysis of the uses and properties of the Obeya, 18th International ICE-Conference on Engineering, Technology and Innovation, Munich (D), 2012.

Aasland K. (2004): Multiproduct development – The next stage in product development methodology, IMS Forum 2004, Como (I), 2004.

d) Five Synergistic Activities

Design of freehand drawing course in 1st semester course for PuP "Product modelling" – based on use of master-apprentice model applied to class of ~200.

Design of interactive video course in 3D modelling – applied in 5 courses at NTNU.

Design of NTNU's effort in Shell Eco-marathon – cross-curricular one-year project, now in its 6th iteration with continuous good to excellent results

Structuring of PuP specific courses in the study program, as head of task force on program renewal (2006-2008)

e) Collaborators & Other Affiliations of last 48 months

Silje Aschehoug, SINTEF Raufoss Manufacturing – co-author of papers

Sofia Hussain, SINTEF – co-author of paper

Peter Leibl, professor Universität München – cooperation on mechatronics education

Eirin Lodgaard, NTNU, PhD candidate – co-author of paper

Niels Henrik Mortensen, professor DTU Copenhagen – continuous cooperation on design methodology development

Sofia Ritzén, associate professor KTH Stockholm – continuous cooperation on design education issues

Knut Aasland, Ph.D.
Stibakken 12, N-7562 Hundhamaren, Norway. phone: +47 9305 9775, knut.e.aasland@ntnu.no

Faculty of Social Sciences and Technology Management
Programme for Teacher Education

Date 06.05.2012

Letter of intent

Application for Centre for Excellency

We hereby confirm that we are a collaborative partner in the application from The Faculty of Engineering Science and Technology at NTNU to NOKUT on the call for Centre of Excellency, with an application deadline 12/5-2013. We have read and accept the terms of the call.

We confirm that we will participate and contribute in agreement with the description in the protocol. Further details will be described in a consortium agreement if the application is successful.

For
Section of University Pedagogy
Marte B Johansen
Marte Bratseth Johansen

Address NO-7491 Trondheim
Org.no. 974 767 880 E-mail: postplu@plu.ntnu.no http://www.plu.ntnu.no
Location Låven Dragvoll gård NO-7049 Trondheim
Phone + 47 73 59 19 90
Fax + 47 73 59 10 12
Phone: + 47

Letter of intend

On cooperation within a

Centre of Excellence in Education (SFU)

The Letter of Intend documents the understanding between **University of Agder, University College of Aalesund and Norwegian University of Science and Technology** concerning a common Centre of excellence in education.

The centre seeks to further develop the high quality level in engineering education at these institutions and to disseminate results within the institutions and fellow institutions of higher education.

The parties agree on the terms/matters stated hereunder.

1) The Parties are acquainted with the terms and directions specified for a Centre of Excellence in Education (SFU) associated with the Norwegian Agency for Quality Assurance in Education
2) The Norwegian University of Science and Technology will be the coordinating institution.
3) The following contributions per year to the resources of the centre will be provided by the undersigned institution:

   Cash (NOK) .....0.....

   In-kind (man-labour years) 0,25 man year Corresponding to NOK 300.000

4) The parties agree that results generated by each institution of the Centre shall belong to the institution but with unlimited user rights for the other parties. This will also apply to Intellectual property rights (IPRs).
5) The parties have a common obligation to disseminate results to fellow institutions.

University of Agder

Magne Aasheim Knudsen
Faculty director

Letter of intend

On cooperation within a

Centre of Excellence in Education (SFU)

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1) The Partles are acquainted with the terms and directions specifled for a Centre of Excellence in Education (SFU) associated with the Norwegian Agency for Quality Assurance in Education
2) The Norwegian University of Science and Technology will be the coordinating institution.
3) The following contributions per year to the resources of the centre wlll be provided by the undersigned institution:

   Cash (NOK) 300.000 and in-kind (man-labour years) 0,4 man year corresponding to NOK 480000.
4) The parties agree that results generated by each institution of the Centre shall belong to the institution but with unlimited user rights for the other parties. This will also apply to Intellectual property rights (IPRs).
5) The parties have a common obligation to disseminate results to fellow institutions.

University College of Aalesund

Lars Petter Bryne
Study program manager, Product and system design

Norwegian Centre of Expertise
MARITIME

Ålesund, May 3, 2013

Education of Innovative Engineers to the Maritime Industry

The Maritime Cluster on the West Coast of Norway has differentiated itself by focusing on advanced marine operations for the global offshore oil and gas industry. In the Møre Region the cluster consists of over 210 companies, with a total turnover of 50 billion NOK and over 20.000 employees (2012). The cluster is characterized by having a complete value chain linked to offshore vessel activities; it operates globally and is a major international player.

The cluster companies are innovative and have great adaptability. It consist of 15 ship design companies, 19 ship owning companies, 14 ship yards,165 equipment suppliers, as well as specialized maritime education and finance institutions. The cluster was in 2006 awarded the prestigious status as Norwegian Centre of Expertise Maritime by the Norwegian government.

The maritime cluster in Møre part of the Norwegian oil technology industry with at total turnover of over 360 billion NOK. This is a fast growing and highly advanced technology driven industry that employs 190.000 people and is by far the biggest mainland industry in Norway.

Most of the engineers of this cluster come from Aalesund University College and NTNU. Candidates in Maritime Technology from Aalesund University College and Product Development and Production at NTNU are essential.

Innovation of complex systems will be a major challenge in the future. To develop programs in this direction would be of great importance. We are also interested in linking education with real-life cases and challenges in the industry. Here, NCE Maritime will contribute.

Sincerely,
Norwegian Centre of Expertise Maritime

Per Erik Dalen
Project Manager

Ålesund Kunnskapspark AS
Besøksadresse: Larsgårdsveien 4, 6009 Ålesund, Posladresse: Serviceboks 9, 6025 Ålesund, Tlf. 70 32 92 00, Fax 70 32 92 01, www.aakp.no

NCE NODE Norwegian Offshore & Drilling Engineering

Letter of Support
Research project Center of Excellence in Engineering Education (C3E)
NTNU, UiA, HiAls

To whom it may concern

NCE NODE (Norwegian Offshore & Drilling Engineering) is a business cluster of over 50 companies within the oil and gas industry in southern Norway.

The offshore industry in southern Norway represents a strongly industrial environment. A high level of intercompany competition, interaction with demanding oil and gas clients as well as strict governmental requirements have resulted in the fact that several of the companies have gained a unique market position in each of their segments.

The NODE companies deliver everything from complete platform solutions to high-technology equipment for use on platforms and ships. Their client list includes both national and international rig owners as well as oil and shipping companies.

NODE already collaborates with the University of Agder, UiA, about different aspects of the educations. Members from NODE have been directly involved in evaluating the content of the mechatronics education with respect to relevance to the industry in the region. The companies involved in NODE also offer collaboration on BSc. and MSc. graduation projects, and employees in the companies have served as external examiners.

Virtually all of the new engineering candidates get employment in a NODE company. The engineering candidates have experience in developing multidisciplinary products using structured methodology and virtual prototyping (simulation). However, NODE welcomes very much this initiative to increase the quality of the engineering candidates further to meet the future challenges and to maintain the world leading position of the companies.

NODE will be happy to facilitate the Center of Excellence in Engineering Education (C3E) by:

- helping in the process of formulating the requirements to the future engineering candidates
- keep offering industrial projects at BSc. and MSc. level to bring in the challenges of tomorrow into the education. This covers both finishing projects and project work during the education.
- help evaluating the skills of the candidates to cope with the challenges in a work situation

NODE • Adresse: Gimlemoen 19, 4630 Kristiansand • Org. Nr: 989 455 702 • Mail: post@ncenode.no • www.ncenode.no

It will be a great pleasure for NODE to collaborate with this center and the partner institutions to educate the new generation of engineers.

Sincerely

Cluster Manager

Kjell O Johannessen
Tlf: +47 90 99 08 08
E-mail: koj@ncenode.no

Nasjonalt Organ for Kvalitet I Utdanningen (NOKUT)

Date:
May 10, 2013

To whom it may concern

Our reference:
N/A

Letter of Support

Research project Center for Excellence in Engineering Education (CEEE) NTNU, UiA, HiAls

On behalf of Aker Solutions, I would like to express my support for the proposed project Center for Excellence in Engineering Education (CEEE).

As Aker Solutions is recruiting from the three said departments at NTNU and from UiA, I am pleased to learn about this project designed to increase their educational quality. I am also pleased to learn that this project will collaborate actively with Center for Design Research at Stanford University, which I believe will further secure the success of this project.

The Oil and Gas industry is facing many new challenges as the frontiers for exploration and production is pushed to bring new sources on-stream to replace the old ones. Many of these challenges are very complex and the industry does not have readily available solutions. Some of the gaps are knowledge gaps, which makes it all the more important to support this project which will be a "research based education" project.

This I believe will produce candidates that have the required multidisciplinary capabilities, and I further believe that working in a collaborative environment will foster innovative thinking and prepare the candidates for the new and very challenging tasks that lie ahead of us.

To help secure the success of this project, Aker Solutions will contribute with the following:

- Give the students access, as required, to collaborate with the relevant disciplines in Aker Solutions
- Provide relevant and real life challenges for the project (e.g., MS and PhD proposals)
- Participate in reviewing the project to ensure relevance and quality in its program

Taken together, I believe that this project will significantly enhance the quality and the relevance of the future education within the collaborating institutions, and that this is of great importance to us going forward.

Yours faithfully,
for and on behalf of Aker Solutions ASA

Kjartan Pedersen, PhD
Research and Innovation | Corporate Technology
Aker Solutions

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1st May 2013

The Research Council of Norway
Centres for Research-based Innovation (SFI)

Letter of Support
Research project Center for Excellence in Engineering Education (CEEE)
NTNU, UiA, HiAls

C D R

To whom it may concern

On behalf of the Center for Design Research and the Design Group at the Department of Mechanical Engineering at Stanford University, we would like to express our support for the proposed project **Center for Excellence in Engineering Education (CEEE)**. It is our intention to collaborate with the team from Norway, esp. NTNU and Prof. Steinert at the Department of Engineering Design and Materials on this very relevant and challenging project of pushing the boundaries of engineering education in Norway. The three identified levers of pushing the limits of:

1) project based learning,
2) interdisciplinary and collaborative teamwork, and
3) national dissemination through MOOC/local course combinations

have the potential to radically change the engineering education in Norway and to better prepare Norwegian engineers for creative and entrepreneurial product, service and system design and development. Based on our own experience from a 7 year NSF project called Center for the Advancement of Engineering Education and the recent yet powerful emergence of MOOCs, we expect the CEEE to have a significant and positive impact onto the creative engineering potential of Norway.

Based on our discussions with NTNU, we agree to meet bi-annually in the USA or in NOR so that the Norwegian team can present their activities. The aim is to have a rolling soft peer review, some benchmarking and realty checks on the activities, results, and planned actions.

Our particular interest focuses on

1) the integration of industrial projects and teams into engineering education and
2) the arising opportunities to use MOOCs (massive open online courses) in open ended generative teaching situations. The special case of Norway that may allow a fully national test rollout comprising NTNU and the Universities of Applied Sciences is especially appealing.

It would be our great pleasure to further foster our already good relationship with Prof Steinert and the Norwegian team by being allowed to support and participate in this project.

Sincerely,

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Menlo Park, CA
May 3, 2013

NOKUT, Norway

Letter of Support
Research project Center for Excellence in Engineering Education (CEEE)
NTNU, UiA, HiAls

To whom it may concern

On behalf of Strategic Business Insights (SBI)—a futures-focused research and consulting firm spun out of SRI International (formerly Stanford Research Institute) in 2001 and located on the SRI campus (near Stanford University)—I would like to express our support for the proposed project **Center for Excellence in Engineering Education (CEEE)**. We look forward to collaborating with the team from Norway, esp. NTNU and Prof. Steinert and Adjunct Professor Kjetil Kristensen at the Department of Engineering Design and Materials on this very relevant and challenging project of pushing the boundaries of engineering education in Norway.

The focus of the work we have done at SBI over the last decade and more that can support the CEEE include:

- Analysis and evaluation of online education and learning systems
- Monitoring and assessment of emerging education technology tools and platforms (three projects we have done over the last few years have also identified, profiled and evaluated Nordic EdTech companies)
- Tracking and evaluating emerging MOOC platforms and providers and understanding their implications in the Nordic context (we are currently in dialog with Nordic Innovation about organizing a Nordic MOOC Forum in one of the Nordic capitals)

SBI has designed, managed and executed a number of workshops at the SRI campus in Menlo Park for Norwegian organizations—including the Norwegian Research Council and Statoil—where SBI identified and recruited appropriate workshop participants with expertise in the topics of the workshops. Organizing such workshops around key issues related to recent innovations and new thinking about technology-enabled education and learning would likely be of great value to the CEEE team. The workshops could also explore emerging good or best practice in MOOC design and delivery—including such practices emerging in the Nordic countries or in Europé more generally.

We welcome the opportunity to participate in the project and to support the core CEEE project team under the leadership of Prof. Steinert, and look forward to exploring ways in which we can help make the project a great success and help bring about next-generation engineering education practices in Norway.

Best regards,

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The C^3E budget for 2014-2018

COST PLAN	2014	2015	2016	2017	2018	TOTAL
Payroll and indirect expences management and administration	*480*	*503*	*524*	*548*	*574*	*2 628*
Payroll and indirect expences scientific personel	*2 067*	*2 166*	*2 255*	*2 355*	*2 469*	*11 313*
Payroll and indirect expences Ph.D and post docs	*850*	*890*	*930*	*970*	*1 010*	*4 650*
Payroll and indirect expences other personel	-	-	-	-	-	-
Payroll and indirect expences	3 397	3 559	3 709	3 873	4 053	18 590
Laboratory expences	-	-	-	-	-	-
Procurement of R&D services	378	375	374	372	370	1 869
Equipment investment	-	-	-	-	-	-
Travel- and seminar expences	700	700	700	700	700	3 500
Other operating expences	505	507	508	510	511	2 542
In-kind from partners	600	600	600	600	600	3 000
Other projects	-	-	-	-	-	-
TOTAL COSTS	**5 580**	**5 741**	**5 891**	**6 054**	**6 234**	**29 501**

The C^3E plan for financial resource acquisition 2014-2018

FUNDING PLAN	2014	2015	2016	2017	2018	TOTAL
Central own financing NTNU	700	700	700	700	700	3 500
Other own financing NTNU	1 505	1 553	1 597	1 646	1 700	8 001
NOKUT Grant	3 000	3 000	3 000	3 000	3 000	15 000
Cash financing from external partners						-
In-kind financing from external partners	600	600	600	600	600	3 000
Other projects	-	-	-	-	-	-
EU grants (own financing)	-	-	-	-	-	-
TOTAL FUNDINGS	**5 805**	**5 853**	**5 897**	**5 946**	**6 000**	**29 501**

The C^{3}E timeline