**Skjemainformasjon**

| | |
|---|---|
| Skjema | SFU |
| Referanse | 1006480 |
| Innsendt | 08.05.2013 14:42:11 |

## Host

Information about host institution and center

| | |
|---|---|
| **Name of centre** | Centre for student-centred and technology-enhanced learning |
| **Host institution** | Sør-Trøndelag University College |
| **PO Box address** | Postboks 2320 |
| **Postal code / City/place** | 7004 TRONDHEIM |
| **Telephone** | 73559000 |
| **E-mail address** | postmottak@hist.no |

## Contact person

Contact person

| | |
|---|---|
| **Name** | Geir Maribu |
| **Title** | Associate professor |
| **Telephone work / mobile** | 73559553 95807343 |
| **E-mail address** | geir.maribu@hist.no |

## 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 2014 and organised as a consortium between Sør-Trøndelag University College (HiST), Bergen University College(HiB) and Oslo and Akershus University College (HiOA). Dean Einar Hjorthol and Dean Per Borgesen at respectively Faculty of Technology and Faculty of Informatics and e-Learning at HiST will be leaders of the centre in a starting phase. Dean Halvor Åustenå will serve as leader at Bergen University College and Dean Petter Øyan will serve as leader at Oslo and Akershus University College.

After the centre is established a centre leader of permanent basis will be engaged. The work will be divided between the partners with key persons engaged as leaders for each work package (WP).

The university colleges from Oslo, Bergen and Trondheim, have already established a formal partnership at dean level, which will be continued at both management and educational level through this consortium.
We have already established institutional contact with the following colleges and universities: Mid Sweden University, NTNU-Norwegian University of Science and Technology, University of Helsinki, University of Aarhus, Nord-Trøndelag University College (Norway), and Renate National Centre for Recruitment to Science (Norway). We will extend the contact with external partners in the future.

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

The aim of the centre is to become outstanding in educating engineers prepared for the future, by developing a scholarly approach to a student-centred and technology-enhanced learning environment.

The consortium has a wide range of experience and of ongoing activities in developing new teaching and learning methods. We want to include use of response technology to activate students during lectures, new assessment systems and use of constructive alignment between learning outcomes, learning activities and final assessment tasks. We want to formalise a joint effort to improve, transfer and share this knowledge.

The partners in the consortium will join forces to improve the education we offer, and make our students better learners. As professional engineers the graduated candidates have to continue to learn after their final examination. In addition to being highly competent in technology and science, we therefore want our candidates to be able to take control of their learning situation by actively planning and evaluating personal progress. We also want to strengthen the activity that prepares our students for work in an international market, where cooperation across nations and interdisciplinary work is suggested. This will be done by using computer-supported learning and different approaches to collaborative learning. Special attention will be focused on the students' ability to use basic knowledge in mathematics and science in the context of the engineering profession.

## Application Document

Application Document

| | |
|---|---|
| **Upload application document** | profile_APPLICATION-final-document.pdf |

## Timeline and budget

Timeline and budget

| | |
|---|---|
| **Upload planned timeline and the activities to be conducted** | timeline_Timeline-and-milestones.pdf |
| **Upload plan for financial resource acquisition** | financial_Finance-plan-SFU.pdf |
| **Upload budget** | budget_Total-budget.pdf |

## Attachments

Attachments

- CV_Trond_Morten_Thorseth.pdf
- CV_Thomas_Impelluso.pdf
- CV_Per_Borgesen.pdf
- CV_Knut_Arne_Strand.pdf
- CV_John_Haugan.pdf
- CV_Geir_Maribu.pdf
- CV_Einar_Hjorthol.pdf
- CV_Carsten_Helgesen.pdf
- CV_Bjorn_Klefstad.pdf
- References.pdf
- Letter_of_support_HiB.pdf
- Letter_of_support_HiOA.pdf
- Oversendelsesbrev_fra_HiST.pdf
- budget_Total-budget.pdf
- financial_Finance-plan-SFU.pdf
- timeline_Timeline-and-milestones.pdf
- profile_APPLICATION-final-document.pdf
- CV_aasmund_kvamme.doc

Comments

**Comments to the application form (maximum 1500 characters)**

Saksbehandler: Elin Cecilie Balstad, 73 41 20 27
Vår dato: 08.05.2013 Vår ref.: 2013/1267
Deres dato: Deres ref.:

Nasjonalt organ for kvalitet i utdanningen
Postboks 1708 Vika
0121 Oslo

**Søknad om senter for fremragende utdanning**

Vedlagt oversendes søknad om senter for fremragende utdanning.

Søknaden er et samarbeidsprosjekt mellom Høgskolen i Sør-Trøndelag, Høgskolen i Bergen og Høgskolen i Oslo og Akershus, der Høgskolen i Sør-Trøndelag vil være vertsinstitusjon.

Med hilsen

Trond Michael Andersen
rektor

Elin Cecilie Balstad
rådgiver AFT

Kopi: Høgskolen i Bergen
Høgskolen i Oslo og Akershus

HØGSKOLEN I BERGEN

Avdeling for ingeniørutdanning

Saksbehandler: Halvor Austenå
Tlf.: 55587513

Vår dato: 06.05.2013
Deres dato:

Vår ref. 2013/1987 - 0/008
Deres ref.:

Høgskolen i Sør-trøndelag
Ved dekan Einar Hjorthol

## Støtteerklæring til Senter for fremragende utdanning innen teknologi

Høgskolen i Bergen ved avdeling for teknologi har deltatt aktivt i utformingen av denne søknaden. Den adresserer et viktig område for våre ingeniørutdanninger. Den styrker også det gode samarbeidet mellom våre tre høgskoler og ingeniørutdanninger.

Med hilsen

Halvor Austenå
Dekan

HØGSKOLEN I OSLO
OG AKERSHUS

Dekan Einar Hjortol
Høgskolen i Sør- Trøndelag

**Dato:** 3. mai 2013 **Vår ref.:** 2013/2152 **Saksbehandler:** Wenche Skaugvold
**Deres ref.:** ref.

## STØTTEERKLÆRING TIL SØKNAD OM SENTER FOR FREMRAGENDE UTDANNING (SFU)

Høgskolen i Oslo og Akershus, ved fakultet for teknologi, kunst og design har deltatt aktiv i utredningen av søknaden om senter for fremragende utdanning og støtter fullt opp om søknaden som vil være svært positivt for våre ingeniørutdanninger, og for samarbeidet mellom høgskolene.

Med vennlig hilsen

Petter Øyan
dekan

Birger Emblem
fakultetsdirektør

**Fakultet for teknologi, kunst og design**
Postadresse: Pb. 4 St. Olavs plass, 0130 OSLO
Besøksadresse: Pilestredet 35, 0166 Oslo, Telefon: 22453332, postmottak@hioa.no, www.hioa.no

# Centre for student-centred and technology-enhanced learning

The centre is proposed as a consortium of the three institutions: Sør-Trøndelag University College (HiST) (host), Bergen University College (HiB) and Oslo and Akershus University College of Applied Sciences (HiOA).

## Vision

*To become a leading group in educating engineers prepared for the future, by developing a scholarly approach to a student-centred, technology-enhanced learning environment.*

The engineering profession requires a broad range of competences, and not all can be acquired while studying engineering. In the course of their engineering studies, students develop basic competence in the technical fields, as well as managerial skills including teamwork.

HiST, HiB and HiOA have a long tradition of providing Norway with engineering graduates. For a long time we have offered traditional, practically-oriented engineering education, and last year we graduated more than 50% of the total number of bachelor-level engineers nationally. We already have competent teachers providing excellent technical education. However, as teachers it is also our responsibility to teach the students various learning skills. We want to provide individual students with learning strategies to choose from, and we want to encourage them to become conscious experiential learners.

Presently, too many students drop out, and many students seem to have insufficient learning skills to study efficiently. Some students find working and mental strategies by chance – some strategies are partly provided from previous training – while others go through their studies and learning activities on autopilot [1].

To help students develop good learning skills we want to focus on teaching *self-regulated learning* as an important concept in learning contexts. Self-regulation is the ability to take control of one´s learning situation by actively planning and evaluating personal progress.

We want to bring awareness of learning strategies, self-efficacy, attribution and motivational beliefs to students in order to provide alternative ways of thinking, from which they consciously can choose. Due to their cost-efficiency, traditional lectures will probably be the main way of teaching for many years. We therefore have to develop ways to include self-regulation in these traditional lectures. As a consortium we have developed methods that can be used to activate students in the lectures, by providing response technology and new assessment systems that can be extended methodologically to bring learning into focus. We want to develop methods that make lectures formative assessment arenas.

Biggs' idea of "constructive alignment" in university education is based on a constructivist learning idea and on alignment between learning outcomes, learning activities and final assessment [2][3]. The consortium has many different technology-enhanced learning activities that differ from the classical lecture format. We want to continue our research and development of new teaching methods using constructive alignment, as well as contributing to better education. We have developed technology-enhanced activities to ensure a learning environment that teaches critical skills in multidisciplinary work, teamwork and general problem-solving in groups. Bringing

self-regulated learning in focus when students experience an alternative to traditional lectures, will expand the students' learning skills.

## Goal

Our goal is that after 10 years of status as a Centre of Excellence the consortium will be a national knowledge hub with significant experience and expertise in student-centred learning, which will contribute to a higher quality of education within Norwegian engineering studies. We educate engineering graduates who are able practitioners of the engineering profession, with a sound knowledge of basic and specific scientific disciplines, who are good problem-solvers and team workers understanding the importance of multidisciplinary cooperation, and who are eager and competent to engage in lifelong learning. The number of students who graduate has increased significantly as a result of improved learning methods and arenas.

We want to be organisations that have extended experience with technology-enhanced teaching models and learning activities, making students and teachers active users of self-regulated learning strategies. We want to stand out as teaching organisations that educate engineering students who are skilled learners prepared for lifelong learning.

## Consortium of HiST, HiB and HiOA

The consortium has a wide range of experience in developing new teaching and learning methods. HiST has experience from several EU projects and has done research in pedagogical approaches to technology-enhanced learning [4][5]. HiST, HiB and HiOA have a potential for improving engineering studies by adopting a more scholarly approach to learning, combined with the employment of new technological opportunities.

An additional status as centre of excellence will make it possible to bring the pedagogical focus into our educational organisations. Adding self-regulated learning as an additional meta-knowledge will require a change in focus towards developing better engineers with multiple skills required for lifelong learning.

Status as Centre of Excellence will speed up the developments and bring momentum into the pedagogical applications of our technology. It will make it possible to use student perspectives to help navigate more precisely in new developments.

Status as Centre of Excellence will therefore target and improve ongoing activities, and systematically improve a significant fraction of the national education in engineering at bachelor level. As a consortium we can benefit from a centre of excellence through our complementary competence. A centre status will make it possible to systematically cooperate and improve our teaching methods, so that we can continuously evaluate and improve practices of teaching and build academic cultures in technology education.

## Documented quality of the partners

### Educational quality

The recruitment to our technology education is very good and constantly increasing. The quality of our technology programme is based on the high academic quality of our teachers who wish to improve and to integrate new teaching methods in their teaching.

In 2011, HiST's Department of Informatics and e-Learning received the NOKUT prize for high

quality in education. This prize was awarded for the work with P-lab (Collaborative Learning Environment), a room for learning through student-active learning methods. In the P-lab the teacher has to conduct class in a new way and the students are urged to take responsibility for their own learning. Learning outcomes were a central part from the outset in this project, and with support and use of technology the goals were reinforced. This work is based on long experience and knowledge of using technology to reinforce learning. The teachers exchange knowledge and are constantly trying out new and creative activities.

HiOA and HiB have experience from large student groups (several hundred), wide and comprehensive industry contact and a team of teachers who have already done action research with experimental teaching. HiOA also has experience with constructive alignment in practice in mathematics courses. HiOA and HiB will therefore play an important role, having environments for testing the research questions and trying out technology-enhanced learning environments in a variety of settings.

## Research and development

We as a consortium have the technology, knowledge of how to use that technology, technical infrastructure and we have demonstrated through several international projects that we can adapt technology in innovative teaching methods. We have chaired and participated in several national and EU-financed projects dealing with technology-enhanced learning, distance education, joint study programmes and collaborative learning over the last 10 years.

In projects at national level, HiST has been involved in (in charge or as co-partner) several projects funded by Norway Opening Universities (NOU), mostly in areas of lifelong, flexible and ICT-supported learning. The two latest were about video in flexible learning and the use of social media in learning.

In 2012 two candidates completed their PhDs on ICT-supported learning [4][5]. The first doctorate was on Concurrent Design Approach for designing e-learning. The other dealt with a design and pedagogical approach to online voting systems.

HiST has developed a Student Response System (SRS). The system is an online voting system, where students are allowed to respond to any question anonymously from any cell phone, iPod, iPad or a computer. A PhD candidate has defended his thesis on technical design and pedagogical use of this system [6][7][8][9][10]. SRS as a tool is currently being extended to include text interaction between one teacher and a group of students, initially aiming at language training. HiOA is a test partner in this work, running classroom pilots.

HiST has developed an online peer-learning assessment system (Pele) which is finalising this year [11]. This project targets assessment technology and utilises the possibility to provide immediate feedback after an assessment. A PhD candidate, with a background from social psychology, is currently working on developing methods and pedagogical approaches in order to extend the value of feedback through assessments.

HiST has through the **HiST Mobile** initiative, supported several EU-funded projects that target use of mobile technology-enhanced teaching and learning. The projects have a focus on developing technology and pedagogical methods in which mobile technologies are utilised in the classroom. A PhD candidate with a didactical background is working on describing observation of students working together in a digital learning lab. This work reveals partly how a technology-enhanced group activity, without deliberate focus on learning outcome, makes the students organise their way

of working and problem-solving.

**Students** have been used extensively in our development projects. Feedback from the students on the technical issues and methodologies has been essential for all projects. Students have been included extensively through focus group interviews, and quantitative research and reference groups. Students have given a lot of positive feedback on our approaches and the methodology applied. The following citation is from a group interview of the students after using Pele:

> *"If I don't meet this later in my education, I will be really disappointed!"*

More information about Hist Mobile and related projects at http://www.histproject.no/

### Student throughput

HiST, HiB and HiOA are all together a large provider of engineering graduates to Norway. Last year we graduated 50% of the total number of bachelor engineers. In Oslo ca 80% of the students are completing their bachelor's degree in engineering, in Bergen 85% and in Trondheim 87%.

### Industry relevance

All partners have extensive cooperation with industry, both during students' bachelor work and in other collaboration programmes. The students' work often leads to products used by the hosting company.

As examples of extended collaboration programmes, HiST has together with NCE Instrumentation developed an Instrumentation Course, both bachelor and Master, providing engineers whom the NCE Cluster needs. HiB has together with NCE Subsea developed a bachelor's degree in Subsea Technology, targeting the need for engineers that NCE Subsea Industry Cluster needs. Several of the engineering studies at HiB also include work placement as part of the curriculum.

HiOA has together with Aker Solutions a collaboration programme for the final year bachelor project, where 15-18 students from different disciplines (Mechanical-, Electronics- and Chemistry Programme) at HiOA work in teams and contribute to making a process module for the oil industry.

## Centre organisation and management

Sør-Trøndelag University College (HiST), Bergen University College(HiB) and Oslo and Akershus University College (HiOA) will be organised as a consortium. The centre will be established at the Sør-Trøndelag University College, Faculty of Technology and Faculty of Informatics and e-Learning under the direction of Dean Einar Hjorthol and Dean Per Borgesen. Dean Halvor Åustenå will serve as leader at Bergen University College and Dean Petter Øyan will serve as leader at Oslo and Akershus University College.

The work will be divided between the partners with a key person as leader for each work package (WP).

The university colleges from Oslo, Bergen and Trondheim, have already established a formal partnership at dean level, which will be continued at both management and educational level through this consortium.

We have already established institutional contact with the following colleges and universities: Mid Sweden University, NTNU-Norwegian University of Science and Technology, University of Helsinki,

University of Aarhus, Nord-Trøndelag University College (Norway), and Renate National Centre for Recruitment to Science (Norway). We will extend the contact with external partners in the future.

## Organisation of research and development activities

As a consortium we are continuously working to improve the education we offer, and make our students better learners. As professional engineers the graduated candidates have to continue to learn after their final examination and that is why we find it important to improve awareness of self-regulated learning and of ways to make this knowledge available for students and teachers. WP1 and WP2 approach self-regulated learning from research and from the student perspective. In WP3 we want to strengthen the activity that prepares our students for work in an international market, where cooperation across nations and interdisciplinary work is suggested. In WP4, computer-supported learning and different approaches to learning and collaborative learning are targeted. WP5 focuses on the students' ability to use basic knowledge in mathematics and science in the context of the engineering profession.

All partners have positive experience in testing and experimenting with learning methodology, but we want to formalise a joint effort to improve and share knowledge. In the final work package, WP6, we have to find ways to influence, search for ways to make transfer of knowledge, and stimulate further developments and experimentation. By partly applying principles from WP1 and WP2 we realise that improving is a way to say that organisations and teachers have to learn.

## Work packages and development tasks

| WP | Short summary |
|---|---|
| WP1 | Concerns transferring knowledge from research towards applications and strategic use of **self-regulated** learning ("from research to teachers") |
| WP2 | Students and their existing **self-regulating** strategies, what feels relevant. ("from students to teachers") |
| WP3 | International Intensive Programme, infrastructure and pedagogical use |
| WP4 | Computer-supported collaborative learning in engineering education |
| WP5 | Student-centred learning in engineering education |
| WP6 | Transfer of knowledge and change of practice |

### WP1: Self-regulated learning and transfer from research

**Objectives:** Find relevant knowledge and methodology from research, in order to help students develop self-regulation skills.

**Introduction:** Literature on self-regulated learning has models and theories of learning skills that some academic students might possess. An important aspect of self-regulated learning is the students' use of various cognitive and metacognitive strategies to control and regulate their learning. P. R. Pintrich (1999) divides self-regulated learning in three general categories of strategies: cognitive learning strategies, self-regulatory strategies to control cognition, and resource management strategies.

*" Although these studies have clearly revealed how self-regulatory processes lead to success in school, few teachers currently prepare students to learn on their own." Barry J Zimmerman 2002*

We want to use mobile response tools to expose strategies and motivational beliefs and to build consciousness of self-regulated learning. Our main focus is to apply knowledge from learning psychology and pedagogics literature, simplify this knowledge to relevant principles, and include tools for both the student and the teacher to apply during different learning situations. This WP has to be done in cooperation with the research assistant in WP2, who will conduct research on existing strategies and who will try to find correlation between international findings and Norwegian engineering students. We want to employ a PhD candidate or Post Doc. with a background from psychology including grounded theory and focus group interviews as a method of gathering information, supervised from NTNU (PLU).

**Task 1.1:** Get an overview of the pedagogical and psychological research on the field of self-regulated learning, motivational beliefs and and the relevance to learning. Research relevant scientific measurement e.g. "Motivated Strategies for Learning Questionnaire" [12] or similar relevant measurement tools.

**Task 1.2:** Identify and describe different alternative learning conditions that students have to master, and find self-regulating strategies that could benefit learning in the learning contexts.

**Task 1.3:** Map teachers' epistemological stance, (knowledge, attitude and level of awareness about teaching and learning).

**Task 1.4:** Find principles that a teacher can apply in learning situations, when students are exposed to alternative pedagogics and tools that both the student and teacher can use to actually help build self-regulated students.

**Task 1.5:** Perform pilot tests, where some selected principles of self-regulation are applied; identify challenges that relate to implementing these principles from both teacher and student perspective.

**Task 1.6:** Transfer practice and experience to WP3-WP6.

### WP2: Our students and existing self-regulated learning strategies

**Objectives:** Ensure a strong student perspective of the activity

**Introduction:** Some students have learning strategies that help them to succeed in engineering studies and some do not. What would happen if we include and expose alternative self-regulative strategies in learning situations? How do these affect the students (their way of learning, motivation, attitudes)? But more importantly, what are the insights that cause a change of strategy? To work with this task we want to employ a research assistant or similar, who is trained in carrying out group interviews as a method of gathering information.

**Task 2.1:** Map current situation. What self-regulation skills are used by our students? In conjunction with tasks 1.1 and 1.2, start identifying strategies that students apply locally at our institutions.

**Task 2.2:** Identify students who have or who develop positive learning strategies. Select students who show a steep learning curve and seem to have made a significant discovery that has boosted their learning experience. What are the insights that made them change their strategy?

**Task 2.3:** Identify what additional learning tools students actually use, such as school activities and,

even more importantly, external tools such as video lectures, learning objects, MOOCs and other forms of digital learning material.

**Task 2.4:** Compare mapped results of strategies our students apply, as opposed to published ways of working. Related to WP1 Task 1.

**Taks 2.5**: Research different ways to present students to their own learning strategies. If a student never has reflected on his or her own learning strategies, what will happen if he/she is confronted with alternatives?

**Task 2.6:** Map the student perspectives of task 1.5.

### WP3: International Intensive Programmes Online

**Objective**: To offer online international intensive programmes between international partners in order for our students to be able to follow new courses and get international experience in a cost-effective way.

**Introduction**: For several years, HiST has participated and coordinated IPs in the EU Socrates/ Erasmus Intensive Program (IP) – Lifelong learning. In an IP, students from several countries meet for two weeks at one of the participating institutions, developing a product guided by the teachers. The next semester another of the participating institutions is host for a similar activity with a new group of students. This programme stimulates teacher and student mobility and is important for the growing attention regarding internationalisation of education. The programme, however, is expensive (transporting students across all Europe) and it depends on unstable external funding.

Alternative ways to achieve internationalisation through online education are welcome. The potential to develop this IP-idea further is much higher using online collaboration and a dedicated online classroom. It is cheaper, more flexible and we have many pedagogical possibilities we can implement in the study. Can today's IPs be transferred to an online version where we can reduce the costs, where we do not have to travel and where we can achieve the same objectives?

**Task 3.1:** Design and build a video conference classroom and try out the IP-concept in the consortium before we go to European partners. We already have a good deal of experience from the work in P-lab at HiST which will be valuable when building these video rooms.

**Task 3.2:** Identify success criteria to run a successful intensive programme online looking at previous IPs, e.g,. How important is it to know and understand our partners' culture and way of working and thinking? Does this also apply for an online IP?

**Task 3.3:** Design and build a virtual project room. This is the room the students use when they are collaborating with student groups at the other institutions. How should we build and equip this room to work effectively both locally and through the network?

**Task 3.4:** Research. What kind of effect does such a room have on students' work and learning? What effect does it have to work continually in an international team such as this all day, over several days, etc? How does self-regulation work in such a context?

**Task 3.5:** Administrate issues running joint courses. Common understanding of workload per ECTS, approval of joint courses in the institution, and awarding of degree. What does the Bologna agreement tell us about these issues?

## WP4: Computer-supported collaborative learning in engineering education

**Objective**: Today's engineering challenges are characterised by high complexity and require a variety of skills. Engineers have to work across several engineering disciplines, in order to solve problems optimally. Interdisciplinary cooperation in problem-solving processes is therefore increasingly important and these problem-solving processes might also take place between participants who are distributed in time, space, competencies and general background.

**Introduction**: HiST has in recent years worked with a particular form of computer-supported cooperative work which is called concurrent design. In this approach, interdisciplinary problem-solving tasks take place in synchronous cooperation sessions. All the participants are present in a customised cooperation facility where topical information systems are utilised. The work package is a continuation of this effort in which computer-supported collaborative learning is used as a pedagogical method to gain experience in computer-supported interdisciplinary problem solving among tomorrow's engineers. We utilise computer supported collaborative learning so that the students gain knowledge, skills and competence within interdisciplinary problem-solving processes with utilisation of topical information systems. The following four tasks are identified.

**Task 4.1:** Describe guidelines for using a concurrent design approach in interdisciplinary problem-solving processes in engineering education.

**Task 4.2:** Describe and establish pilot-case studies which involve external engineering companies in interdisciplinary problem solving.

**Task 4.3:** Implement a specific pilot-case study involving representatives from selected companies and students from HiB, HiOA and HiST.

**Task 4.4:** Conduct research which helps to document positive and negative effects of this methodological approach.

## WP5: Student-centred learning in engineering education

**Objectives**: To research, develop and implement comprehensive student-centred learning strategies to enable students to solve engineering problems with a wide range of skills.

**Introduction**: The teacher-centred and content-oriented learning conception is mostly used in our institutions today. Traditional lectures and blackboard tuitions are rooted in academic institutions because of their efficiency, specifically with a large group of students. However, this kind of tuition does not put students in focus. A more student-centred learning-oriented conception will most likely increase student retention, learning and motivation with more hands-on tutoring.

Another aspect is whether students understand how the "theoretical" topics are connected, and how they play a role in the engineering profession. Often topics such as mathematics, statistics and science are taught with few or no links as to how they are applied in the engineering profession, and the students do not see their relevance. This may also apply to business management topics.

Traditional mathematics and science courses in engineering education are usually focused on content, demanding that the students have to solve given, well-structured problems with pencil and paper to get "the one right answer". In the engineering profession particularly, mathematics is

always used in context where the most important goal is to come up with a solution that is "good enough" for the problem at hand. This requires that the engineer be able to choose from a wide range of tools, spanning from "back-of-the-envelope solutions", via traditional manual calculations to the use of advanced software packages. Engineering education should help the students to be able to move seamlessly between these skills, always being able to choose the right tool at any time. It is of utmost importance that learning to use tools is blended with deep insight in the underlying mathematical principles.

These aspects do not only apply to the mathematical sciences. The engineering profession is typically characterised by teamwork and cooperation among many experts in different areas. To understand and appreciate this interaction the students must also be exposed to learning arenas where the various topics can be presented and used in context. This is best taught by including e.g. teamwork, projects and industry placements in the curriculum.

**Task 5.1:** Evaluate diversity of approaches to teaching mathematics and science. The three partners have different approaches to teaching basic scientific skills, particularly mathematics. This task will focus on documenting, comparing and evaluating the merits, pros and cons of the various approaches.

**Task 5.2:** Research and design new student-centred learning strategies. We want to adapt results from WP1 and WP2 to develop teaching and learning methods. Student-centred learning might require more, or at least other resources, including both teaching/coaching staff and physical facilities. A plan for re-allocating these resources must be created.

**Task 5.3:** Teach basic sciences in context. This task focuses on making good learning arenas where teachers in engineering disciplines and teachers in basic sciences (particularly mathematics) work closely together to give students "real-world" problems in order to develop deep insight in the "theory" and its application in engineering.

**Task 5.4:** Develop and implement alternatives for mass lecturing. There is a need to move teaching resources from lecturing to supervision and coaching in the student-centred approach. Introducing alternative mass lecturing such as video podcast may be one solution.

**Task 5.5:** Develop the ability to choose the right "tool" for the problem at hand. This task will focus on developing a diversity of problems giving the students the opportunity to learn how to choose the best method of computation (i.e. by hand, or by the use of computers).

**Task 5.6:** Develop problem-solving skills. Tasks 5.2 and 5.3 are organized in such a way that the students will develop their problem-solving skills by using inductive teaching [13], [14]. This requires finding a good balance between the use of lectures, tutorial groups and projects, always having the focus on students' learning outcome.

**Task 5.7:** Develop an integrated "Engineering profession" view. This task will explore how the engineering curriculum can present an integrated view of the engineering profession, how the various "theoretical" topics are used and how they will interact in the work of an engineer. Examples of relevant current activities are the "Innføringsemne" or introductory topic, bachelor project, team assignments and industry placements.

### WP6: Transfer of knowledge and change of practice

Objective: Establish ways to influence our own teachers and high-school teachers with information.

How can we think in new ways to build a culture for learning in the organisations?

**Introduction:** When given the opportunities and how-to-procedures based on experience and research, we do believe teachers are able to change practice. Developing a programme for building teacher awareness is therefore an important step to improve practice in engineering education. Transferring knowledge from pedagogics, learning psychology and coaching to teachers requires time and experience. Making that knowledge relevant in such a way that teachers can apply it is the challenge.

**Task 6.1:** Establish a policy forum ("think tank"), where the focus is on how we influence our colleagues, students and organisations to develop a culture for learning. We want to invite a commercial partner, Bente Kristin Malmo, who has experience from developing a leader culture in Olympic arrangements together with iOS. How do we as teachers and organisations, together build an environment for learning and experimenting?

**Task 6.2:** Establish a community of practice (CoP) for students and a separate one for teachers, where they can share and inspire each other in the search and focus on learning and strategies relevant for self-regulated learning. We have to find a way to organise and categorise the content.

**Task 6.3:** Establish a CoP relevant for mathematics teachers that represents our recruitment channels. A mathematics teacher at high-school level often meets the question: *"Why do we have to learn this?"* Teachers often lack ways to make different areas of mathematics appear relevant. We as a consortium have many examples and can provide these in order to help in building relevance. Where is differentiation used? Why is it important? What do the students accept as relevant?

**Task 6.4:** Involve external organisations (for example, University of Aarhus) both as a reference group and to ensure the quality of our work.

## Dissemination

The success of the centre is totally dependent on how well we manage to transfer the results to the rest of the organisation, and especially teachers and students. Therefore we have created a specific work package for this important task in which we treat the issue of how to build a culture for learning.

The target groups of dissemination are teachers, students and administrative people, and it will take place at several levels:

1. At the local institution
2. Across the three partners in the consortium
3. To other higher educational institutions in Norway
4. Lastly, to the international community through conferences and journals.

The dissemination outcome is high quality practices for engineering education using technology-enhanced learning activities. The dissemination methods to be used are workshops and seminars locally. The preferred method is when participants are at distance webinars . Moreover, findings will regularly be presented on social media such as blogs, wikis, Twitter and at the centre website. The centre website will be presented as a CoP-site, i.e. a Community of Practice with a two-way communication about all the findings and activities in the centre.

## References


[1] Bargh, J. A., & Chartrand, T. L.: *The unbearable automaticity of being*. American Psychologist, 54, 462-479, 1999.

[2] Biggs, J.:*What the Student Does: teaching for enhanced learning*. Higher education research & development, 18(1), 1999.

[3] Biggs J. and Tang C.: *Teaching for Quality Learning at University*. McGraw Hill, third edition, 2007, page 50.

[4] Strand, K.A., Staupe, A. & Maribu G.M.: *Prescriptive Approaches for Distributed Cooperation*. In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012 (pp. 1011-1020).

[5] Strand, K.A., Staupe, A., & Hjeltnes, T. A.: *Principles of Concurrent E-Learning Design*. In K. Patel & S. Vij (Eds.), Enterprise Resource Planning Models for Education Sector: Applications and Methodologies (pp. 48-75), 2013.

[6] Kjetil L. Nielsen, Gabrielle Hansen-Nygård and John B. Stav: *Investigating Peer Instruction: How the initial voting session affects students' experiences of group discussion*. ISRN Education, Volume 2012 (2012), Article ID 290157, 8 pages, doi:10.5402/2012/290157.

[7]Kjetil L. Nielsen, John B. Stav, Gabrielle Hansen-Nygård and Trond M.Thorseth.: *Designing and Developing a Student Response System for Mobile Internet Devices*. Learning with Mobile Technologies, Handheld Devices, and Smart Phones: Innovative Methods, April 2012, page 56-68, ISBN: 978-1-4666-0936-5. Published by IGI Global (273 pages).

[8] Gabrielle Hansen-Nygård, Kjetil L. Nielsen, Trond M. Thorseth and John B. Stav: *Developing and Evaluating Practical Methodological Guidelines for use of Student Response System in Teaching*. Learning with Mobile Technologies, Handheld Devices, and Smart Phones: Innovative Methods, April 2012, page 90-104, ISBN: 978-1-4666-0936-5. Published by IGI Global (273 pages).

[9] Raoul Pascal Pein, John B. Stav, Trond M. Thorseth, and Joan Lu: *A Robust and Scalable RESTful Web Service for Collecting Student Responses: Student Response System (SRS)*. Learning with Mobile Technologies, Handheld Devices, and Smart Phones: Innovative Methods, April 2012, page 209-222, ISBN: 978-1-4666-0936-5. Published by IGI Global (273 pages).

[10] Thorseth, T. M. and Stav J. B.: *Students experience with learning processes, response technologies and webapps for Smartphones*. Proceedings from the 3rd annual International

Conference on Education and New Learning Technologies, Barcelona, 4-6 July, 2011, ISBN:978-84-615-0441-1, page 6733-6740. Published by International Association for Technology, Education and Development.

[11] John B. Stav, Knut Bjørkli and Ketil Arnesen: *Experiences with Use of Students Mobile Devices as Immediate Response Tools*. Proceedings from the International Technology, Education and Development Conference (INTED 2013), 4-6 March 2013, Valencia, Spain, pp 3305-3309, ISBN 978-84-616-2661-8. Published by International Association of Technology, Education and Development (IATED).

[12] Pintrich, P. R., Simith, D., Garcia, T., & McKeachie, W. J.: *Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ)*. Educational and Psychological Measurement, 53(3), 801, 1993.

[13] Prince, M. J., Felder, R. M.: *Inductive Teaching and Learning Methods: Definitions, Comparisons, and Research Bases*. J. Engr. Education, 95(2), 123-138 (2006).

[14] Felder, R. M., Brent, R.: *Active Learning: An Introduction*. ASQ Higher Education Brief, 2(4), August 2009.

# CURRICULUM VITAE

**Name:** Aasmund Kvamme
**Birth date:** 7. July 1963
**Nationality:** Norwegian
**Family:** Married, two children

## Education

| | |
|---|---|
| 1989 | Cand. Scient. (M.Sc.) Mathematics (probability theory), University of Bergen, Norway. |

## Working experience

| | |
|---|---|
| 1989-92 | Teacher (mathematics and computers) Åsane videregående skole (Secondary level), Bergen |
| 1992-Present | Assistant Professor, Bergen University College (Høgskolen i Bergen), Department of Engineering. Teaching duties: Calculus and statistics |
| 1996-97 | Part-time teacher at Bergen University College, Department of Teachers Education |
| 2003-10 | Local and site administrator for itslearning (learning platform)) at Bergen University College |

## Administrative experience

| | |
|---|---|
| 1985-89 | Member of the Nykirken parish council, Bergen. Chairman 1985-1986 |
| 1989-92 | Member of the Sandviken parish council, Bergen |
| 2009-Present | Member of the Landås parish council, Bergen. Chairman 2009-2011. |
| 1994-95 | Member of the organising committee for the conference "Political Dimensions in Mathematics Education", Bergen |
| 1995-Present | Member of the editorial board, Tangenten, tidsskrift for matematikkundervisning (journal of mathematical didactics), Caspar Forlag AS, Bergen |

## Professional skills and interests

Mathematics, mathematical didactics, computer science.

# CURRICULUM VITAE

**Name:** Thorseth,Trond Morten **Born:** 1969

**Profession:** Physics Ph.D. **Nationality:** Norwegian

**Years at HiST:** 11

---

## KEY QUALIFICATIONS:

Have a general knowledge about experimental setup of light measurement in field, experimental design, experimental hardware design, programming and software development for hardware control, data handling and data processing related to solar ultraviolet measurements in field. Experience with radiative transfer calculations for modeling transport of solar radiation through the atmosphere.

11 years of experience in teaching and experimenting with digital learning technologies in education of engineers at HiST. Have developed intelligent online mathematical learning objects, that utilize the possibilities that lie in a digital teaching environment through several projects. Have some experience in 3D animation (Maya) and coupling to advanced simulation tools (Simuling/Femlab) for generating multimedia content applied in regular lectures at HiST. Experienced in developing simulator technologies that can precisely visualize mathematical content online. Has developed Student Response System, where students can use their cellphone as clickers in the classroom, and an Assessment system where they respond to tests using a mobile device.

Current position: Associate professor.

---

## EMPLOYMENT RECORD

| | |
|---|---|
| **200-2001** | **Post. Doc. at Norwegian University of Science and Technology NTNU** |
| **2001** | **Post. Doc. at Steves institute of technology, Hoboken, New Jersey USA** |
| **2001-2002** | **Post. Doc. at Norwegian University of Science and Technology NTNU** |
| **2002 – present** | **Associate prof. in physics at HiST, Faculty of Technology** |

---

## PUBLICATIONS

1. Raoul P. Pein, Joan Lu, John B. Stav and Trond M. Thorseth, **A Robust and Scalable RESTful Web Service for Collecting Student Responses - Student Response System (SRS)**, submitted to the international CELMA 2011 conference, June 1-2, 2011, Lake District, UK
2. Kjetil L. Nielsen, John B. Stav, Gabrielle Hansen-Nygård & Trond M. Thorseth, **Developing a Student Response System for Mobile Internet Devices**, submitted to the international CELMA 2011 conference, June 1-2, 2011, Lake District, UK
3. Gabrielle Hansen-Nygård, Kjetil L. Nielsen, Trond M. Thorseth and John B. Stav, **Developing and Evaluating Practical Methodological Guidelines for use of Student Response System in Teaching**, submitted to the international CELMA 2011 conference, June 1-2, 2011, Lake District, UK
4. John B. Stav, Kjetil Nielsen, Gabrielle Hansen-Nygård and Trond M. Thorseth, **Experiences obtained with integration of Student Response Systems for iPod Touch and iPhone into e-learning environments**, Electronic Journal of e-Learning, Volume 8, Issue 2, p 179 - 190, ISSN 1479-4403
5. John B. Stav, Trond M. Thorseth, Kjetil L. Nielsen and Gabrielle Hansen, **Students experience with use of web-based student rsponse services for modern handheld devices**, Proceedings from the International Conference on Education and New Learning Technologies, 5-7 July 2010, Barcelona, Spain, p 309 - 314, edited by L. Gomez et al., ISBN: 978-84-613-9386-2, published by International Association of Technology, Education and Development (IATED)
6. Raoul P. Pein, Shagufta Scanlon, Joan Lu, Trond M. Thorseth, John B. Stav and Liviu Moldovan, **XML-Based approach for ubiquitous response system - a case study to demonstrate integrity of web services and localization**, Proceedings from the International Conference on internet computing, ICOMP 2010, July 12-15, Las Vegas, Nevada, US, the Eighth International Workshop on XML Technology and Applications (XMLTech´10), page 267-276. CSREA Press 2010, ISBN 1-60132-149-X
7. H. Tsalapatas, O. Heidmann, John B. Stav., Trond M. Thorseth and erik Engh, **"Simulation Towards Production Quality Assurance Management"**, proceedings from the IADIS International WWW/Internett conference, Rome, November 19-22, 2009
8. J. B. Stav, T. M. Thorseth, E. Engh and O. Heidmann, **"New Simulation Tools in Education and Training of Welding Personnel"**, proceedings from the international conference 9th Numerical Analysis of Weldability, Graz University, Austria, September 28-30, 2009
9. J. B. Stav, T. M. Thorseth and E. Engh, **"Expanding Learning Skills in Industrial Production Environments by Developing and Utilizing Innovative Online Simulator Services"**, proceedings from the international conference EduLearn 2009, Barcelona, July 6-8 2009
10. J. B. Stav, E. Engh, T. M. Thorseth, R. Bergh, K. Arnesen, **"Innovative Online Simulator Tools for Quality Management production Process Training in Vocational Training"**, proceedings from The International Technology, Education and Development Conference, Valencia, Spain, March 9-8, 2009
11. J. B. Stav, T. Thorseth, E. Engh, R. Bergh and K. Arnesen, **"Innovative online simulator tools for quality management production process training in vocational education"**, to be published in the proceedings from The International Technology, Education and Development Conference, Valencia, Spain, March 9-8, 2009

12. J. B. Stav and T. Thorseth, "**Interactive Autonomus e-learning task focused web services in sciences**", proceedings from the IADIS International conference eLearning 2008, Amsterdam, July 2008
13. John B. Stav, T. Thorseth, and K. Arnesen, **"Experiences with training methods utilizing just-in-time generation of learning objects"**, proceedings from INTED 2008: The International Technology, Education and Development Conference, Valencia, Spain, March 3-5, 2007
14. John B. Stav, T. Thorseth, and K. Arnesen, **"Experiences with new workplace training methodologies in certification processes in small and medium sized companies"**, proceedings from INTED 2008: The International Technology, Education and Development Conference, Valencia, Spain, March 3-5, 2007
15. J. B. Stav and T. Thorseth, **"Training Methods Utilizing Web-based Generation of Learning Objects in Sciences "**, proceedings of The European Conference on e-Learning, Copenhagen, Denmark, October 4-5th, 2007
16. J. B. Stav, R. Bergh, T. Thorseth and K. Arnesen, "**Just-in-time generation of learning objects in teaching**", proceedings from the International IADIS eLearning Conference 2007, Lisbon, Portugal, July 2007
17. J. B. Stav, T. M. Thorseth, Maria M. Meletiou and H. Tsalapatas, ***"Dynamical Learning Objects and Learning Design in Science Education"***, proceedings of The European Conference on e-Learning - ECEL 2005, Amsterdam, November 2005
18. J. B. Stav, T. M. Thorseth and Joan Lu, **"Learning Object Farms in Mathematics and Natural Sciences"**, proceedings of The 2005 International Multi Conference In Computer Science & Computer Engineering, Las Vegas, June 2005
19. J. B. Stav, H. Tsalapatas, T. M. Thorseth, ***"Design of Scientific eLearning Management Services",*** Proceedings Of the Ed-Media conference, Lugano, July 2004
20. B.K. Bhattarai, B. Kjeldstad, T.M. Thorseth, A. Bagheri. **"Erythemal dose rated in Kathmandu, Nepal based on solar UV measurements from multichannel filer radiometer, its deviation from satellite and radiative transfer simulations."** Atmospheric research, Vol. 85 (1),pp. 112-119, 2007
21. B.K. Bhattaray, B. Kjeldstad, T.M. Thorseth, A. Bagheri, **"Aerosol climathology in Katmandu using sun photometry".** SPIE proceedings Vol 6362 pp. 636204-1-636204-11. 2006
22. **B. Kjeldstad, T.M.Thorseth, "Groundbased ultraviolet radiation-measurements in Trondheim"**. Proceedings of SPIE, Ultraviolet Ground- and space based measurements, models and effects III. Editors: J. Slusser, J. Herman, W. Gao. 5156:101-107 2003.
23. J.Grobner,D. Rembges, A. Bais, M.Blumthaler, T. Babot, W. Josefsson, T. Koskela, T.M. Thorseth. A. Webb, U. Wester. "**Quality assurance of reference standards from nine European solar-utraviolet monitoring laboratories".** Applied Optics, Vol.41.No 21/20, July 2002,
24. B. Kjeldstad, T.M.Thorseth **"All weather UV solar radiation measurements at 0.5 Hz sampling rate".** Applied Optics, ISSN: 0003-6935, 1999
25. B. Kjeldstad, T. M.Thorseth, **"Comparison of solar UV measurements performed with spectroradiometer and moderate bandwidth multichannel radiometer for different cloud conditions."** J. Geophys Res. 105(D4), 4809-4820, 2000

| Timeline and milestones 2014-2018 | | | | | |
|---|---|---|---|---|---|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| **Centre management** | | | | | |
| Centre establishing | m1-m6 | | | | |
| Staff organising | m1-m6 | | | | |
| | | | | | |
| **WP1 Self-regulated learning and transfer from research** | | | | | |
| T1.1 Get an overview of the pedagogical and psychological .. | m1-m60 | | | | |
| T1.2 Identify and describe different alternative learning conditions .. | m1-m24 | | | | |
| T1.3 Map teachers' epistemological stance .. | m1-m24 | | | | |
| T1.4 Find principles that a teacher can apply in learning situations .. | m1-m60 | | | | |
| T1.5 Perform pilot tests, where some selected principles of self .. | | m12-m60 | | | |
| T1.6 Transfer practice and experience to WP3-WP6 .. | | m12-m60 | | | |
| | | | | | |
| **WP2 Our students and existing self-regulated learning strategies** | m1-m36 | | | | |
| T2.1 Map current situation. | m1-m36 | | | | |
| T2.2 Identify students who have or who develop positive learning strategies .. | m1-m36 | | | | |
| T2.3 Identify what additional learning tools students actually use .. | | m12-m36 | | | |
| T2.4 Compare mapped results of strategies our students apply compared .. | | m12-m36 | | | |
| T2.5 Research different ways to present students to their own learning strategies .. | | m12-m36 | | | |
| T2.6 Map the student perspectives of task 1.5 .. | | m12-m60 | | | |
| | | | | | |
| **WP3 International Intensive Programmes Online** | | | | | |
| T3.1 Design and build a video conference classroom and try out the IP concept .. | m1-m12 | | | | |
| T3.2 Identify success criteria to run a successful intensive programme .. | m1-m12 | | | | |
| T3.3 Design and build a virtual project room .. | | m12-m36 | | | |
| T3.4 Research. What kind of effect does such a room have on students .. | | | | m36-m60 | |
| T3.5 Administrative issues running joint courses .. | | | | m36-m60 | |
| | | | | | |
| **WP4 Computer-supported collaborative learning in engineering education** | | | | | |
| T4.1 Describe guidelines for using a concurrent design approach .. | | | m24-m36 | | |
| T4.2 Description and establishment of pilot-case studies .. | | | m24-m48 | | |
| T4.3 Implementation of a specific pilot case study involving representatives .. | | | | m36-m60 | |
| T4.4 Conduct research which helps to document positive and negative .. | | | | m36-m60 | |
| | | | | | |
| **WP5 Student-centred learning in engineering education** | | | | | |
| T5.1 Evaluation of diversity of approaches to teaching mathematics and science | m1-m12 | | | | |
| T5.2 Research and design new student-centred learning strategies | m1-m12 | | | | |
| T5.3 Teaching basic sciences in context | | m12-m48 | | | |

| | | | | | |
|---|---|---|---|---|---|
| T5.4 Develop and implement alternatives for mass lecturing | | | m24-m48 | | |
| T5.5 Developing the ability to choose the right "tool" for the problem at hand | | | m24-m36 | | |
| T5.6 Developing problem-solving skills | | m12-m60 | | | |
| T5.7 Developing an integrated "Engineering profession" view | | m12-m60 | | | |
| | | | | | |
| **WP6 Transfer of knowledge and change of practice** | | | | | |
| T6.1 Establish a policy forum ("think tank") where the subject is concerned with .. | m1-m24 | | | | |
| T6.2 Establish a community of practice (CoP) for students and a separate one .. | | | m24m60 | | |
| T6.3 Establish a CoP relevant for maths teachers in organization that .. | | | | m36-m60 | |
| T6.4 Involve external organizations as a reference group and to assure the quality .. | | m12-m60 | | | |

## Total Budget

| **Finance plan** | **2 013** | **2 014** | **2 015** | **2 016** | **2 017** | **2 018** | **Sum** |
|---|---|---|---|---|---|---|---|
| Own financing | 0 | 3 000 | 3 000 | 3 000 | 3 000 | 3 000 | 15 000 |
| NOKUT | 0 | 3 000 | 3 000 | 3 000 | 3 000 | 3 000 | 15 000 |
| **Total cost project** | **0** | **6 000** | **6 000** | **6 000** | **3 000** | **3 000** | **30 000** |

| **Cost plan** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **Sum** |
|---|---|---|---|---|---|---|---|
| Personnel | 0 | 5 500 | 5 500 | 5 500 | 5 500 | 5 500 | 27 500 |
| Purchase R and D services | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Equipment | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Operating costs | 0 | 500 | 500 | 500 | 500 | 500 | 2 500 |
| **Sum cost** | **0** | **6 000** | **6 000** | **6 000** | **6 000** | **6 000** | **30 000** |

## Finance plan SFU (HiST, HiB and HiOA)

| Finance plan | 2 013 | 2 014 | 2 015 | 2 016 | 2 017 | 2 018 | Sum |
|---|---|---|---|---|---|---|---|
| Own financing | 0 | 3 000 | 3 000 | 3 000 | 3 000 | 3 000 | 15 000 |
| NOKUT | 0 | 3 000 | 3 000 | 3 000 | 3 000 | 3 000 | 15 000 |
| Total finance project | **0** | **6 000** | **6 000** | **6 000** | **6 000** | **6 000** | **30 000** |

THOMAS J. IMPELLUSO
Bergen University College
Post Box 7030
5020 Bergen, Norway
955 57 006
Thomas.J.Impelluso@hib.no

## PROFESSIONAL PREPARATION

| | | | |
|---|---|---|---|
| University of California, | San Diego | Computational Mechanics | Ph.D. 1990 |
| Columbia University, | New York City | Bioengineering | M.S. 1983 |
| Columbia Universtiy, | New York City | Civil Engineering | B.S. 1982 |
| Columbia University, | New York City | Art History | B.A. 1981 |

## ACADEMIC APPOINTMENTS

| | | |
|---|---|---|
| HiB | Professor | 06/13-current |
| SDSU | Professor | 08/08-current |
| SDSU | Associate Professor with tenure | 08/04-08/08 |
| SDSU | Assistant Professor | 05/99-08/04 |
| SDSU | Lecturer | 05/98-05/99 |
| UCSD | Post-doc/Lecturer/Research Scientist | 01/93-12/98 |

## PRIVATE APPOINTMENTS

Project Manager, Science Horizons, Inc.
Developed and managed seismic data and visualization software on contract to the USGS.
Gave presenations and demonstrations in Spain, Scandanavia, Japan.

## HONORS & AWARDS

| | | |
|---|---|---|
| People, Information, Technology Fellow | San Diego State University | 2008 |
| Technology Deployment Award | San Diego State University | 2008 |
| Summer Institute Fellowship | National Science Foundation | 2006 |
| First Place, Poster Presentation | Medicine Meets Virtual Reality | 2005 |
| Outstanding Faculty | SDSU Cap&Gown Mortar Board | 2004 |
| Advisor: Two 1st place students | Computational Science Olympics | 2003 |
| TRW Excellence in Teaching Honor | TRW Defense Systems, Inc. | 2002 |
| Frontiers in Education, Faculty Fellow | FIE Conference | 2001 |
| Education Center Faculty Fellow | NPACI EdCenter | 2000 |

Awarded NIH Training Grant T32 NS 7078-10,11,12 (6/1/87 until 12/31/89) in the amount of $16,926. The Program Director for this grant was Henry C. Powell in the Dept. of Pathology at UCSD. Funded by NIH National Institute of Neurological Disorders and Stroke (NINDS).

## REGIONAL SERVICE

*Reuben H. Fleet Science Exhibit Consultant:* Guided students to develop "Einstein, The Wonder Years." http://attila.sdsu.edu/~anash/spacemuseum/web/home.html

## PROFESSIONAL MEMBERSHIPS

AMERICAN SOCIETY OF MECHANCIAL ENGINEERS
AMERICAN SOCIETY OF ENGINEERING EDUCATION

## NATIONAL SERVICE

*NSF Consultant:* Workshop on Grid Computing for Engineering. June 6-7, 2003

*DARPA Consultant*: Physically Based Virtual Reality for Telepresent Battlefield Surgery. Update Advanced Biomedical Technology Program. Medicine Meets Virtual Reality. January 17, 1996. San Diego, California.

Physically Based Virtual Reality for Telepresent Battlefield Surgery. Workshop 95 Update Advanced Biomedical Technology Program. Image Conference. July 1995. Phoenix, Az.

NSF Panel Reviewer: Science and Engineering Information and Informatics: SEI-MPE (multi-disciplineary physics and engineering). April 24-25, 2006

NSF Panel Reviewer: CI-TEAM. October 20-23, 2007

## UNIVERSITY SERVICE

*IIT Committee 2005,2006*
*IIT Commitee 2006, 2007*

| | | |
|---|---|---|
| *Secretary*: | College of Engineering, San Diego State University, | 2005-2006 |
| *Committee*: | Departmental Reappointment, Tenure and Review, | 2005-2006 |
| *Committee*: | Honors and Awards, | 2005-2006 |
| *Secretary*: | College of Engineering, San Diego State University, | 2004-2005 |
| *Committee*: | Information Technology of the SDSU Senate, | 2005-2006 |
| *Committee:* | Department of Mechanical Engineering By-Laws | 2005-2006 |
| *Committee:* | Department of Mechanical Engineering Web Design | 2005-2006 |
| *Panel*: | SDSU Foundation: Grant Writing, | 2005-2006 |
| *Committee*: | Honors and Awards, | 2004-2005 |
| *Committee*: | Departmental Reappointment, Tenure and Review, | 2004-2005 |
| *Secretary*: | College of Engineering, San Diego State University, | 2003-2004 |
| *Secretary*: | College of Engineering, San Diego State University, | 2002-2003 |
| *Secretary*: | College of Engineering, San Diego State University, | 2001-2002 |
| *Host* | Grantsmanship process: hosted workshop | 2005 |

## JOURNAL REVIEWER

Journal Reviewer: Frontiers in Education Conference
Journal Reviewer: Joural of Biomechanics.
Journal Reviewer: International Journal of Engineerng Education
Journal Reviewer: International Network Engineering Education and Resarch

## INTERNATIONAL EDUCATION SERVICE:

| | |
|---|---|
| Javier Palacios Arauzo & David Fernández González | (09/01/06 – 06/30/07) |
| Alma María Rubio Guerra & Alvaro Zanón Alonso | (09/01/05 – 06/30/06) |
| Juan Pena de Juana & David Garcia | (09/01/04 - 06/30/05) |
| Alberto Miguel Ausin &Julian Sanz Angulo | (08/18/03 - 06/30/04) |
| Carlos Gallego Castro & Luis Angel Belenguer | (08/26/02 - 06/25/03) |
| Javier Fernandez Costero & Blanco Redondo | (08/23/01 - 07/01/02) |
| Raul Bermejo Moratinos & Elena López Tarragato | (09/01/00 - 06/30/01) |
| Carlos Caceres & Beatriz Vaca | (09/01/99 – 06/30/00) |

## COMMITTEES CHAIRED

| | |
|---|---|
| Departmental Reappointement, Tenure and Review Committtee | 2006-2007 |
| College Computer Commitee | 2005-2006 |

## FEATURED IN ARTICLES

"Digital Reality." *SDSUniverse*. Monday, December 01, 2003

"Finite Element Analysis in Interdisciplinary Mechanics." *Gather/Scatter*. San Diego SuperComputer Center, ISSN 0885-3878. June 1989. Vol.5, No. 6.

## CHAIRED CONFERENCE SESSIONS

"Virtual Reality Applications in Engineering." 12th Engineering Mechanics Conference. *Engineering Mechanics: A Force for the 21st Century*. ASCE Specialty Conference. May 17-20, 1998. San Diego Mariott. La Jolla.

"Computers in Education", Frontiers in Education Conference. San Diego, 2006

## ORGANIZER, MODERATOR AND HOST OF SYMPOSIA AND WORKSHOPS

*Symposium: Research in Mechanics and Cyber-Infrastructure*

On July 26, 2006, Dr. Impelluso led a symposium at the 8th US National Congress on Computational Mechanics in Austin, Texas. This symposium, titled *Cyber-Infrastructure and Mechnics: A New Research Arena*, presented work by researchers in the US and abroad at national labs and research institutes. The focus was using the CI to solve multi-phase and coupled problems in mechanics and biomechanics for surgical simulations.

*Symposium: Education*

From June 8-10, 2006, close to 20 mechanical engineering professors from across the Unite States and abroad will attend San Diego State University's first-ever *Mechanical Engineering Curriculum Symposium, hosted by Drs. Impelluso* (Department of Mechanical Engineering) *and Bober (*Educational Technology). Funded by *Fund for the Improvement of Postsecondary Education* (FIPSE)http://attila.sdsu.edu/me295/symposium

*Special Session ACET Education*
"Disseminating a Methodology to Create Virtual Machines." Association for Educational Communications and Technology, *2005 Intenational Convention: Exploring the Vision.* Orlando, Florida, 2005.

*Workshop: Frontiers in Education*
"Physically-Based Virtual Machines for Engineering Education." *The Future – Impact on Engineering and Science Education, Frontiers in Education.* Reno, Nevada. 10/10, 2001.

*Workshop: Frontiers in Education*
"Virtual Machines (get correct title)" San Diego, CA. 10/10, 2006.

**INVITED PRESENTATIONS OUTSIDE SDSU**

"Physics Based Virtual Reality." University of Louisiana, Lafayette. November 18, 2005. Louisiana Immersive Technologies Enterprise. Contact: Ramesh Kolluru, kolluru@louisiana.edu

"Ernesto Boyer and a Model of Scholarship for the Information Age." Georgia Institute of Technology, Savannah, Georgia. Department of Mechanical Engineering. December 3, 2005. Contact: Dr. Farrokh Mistree, farrokh.mistree@me.gatech.edu

"Nonlinear Plane Tomoshenko-Beam Theory and an Eulerian Description." Mitsubishi Electric Research Labs. Boston, Massachusetts. August 25, 1997. Contact: Dwight Meglan (dmeglan@mindspring.com)

"Mechanical Engineering and Virtual Reality: A Future Market." Business Forum Day, Graduate Business Council, Colorado State University, Fort Collins. Business Day. February 8, 1997

**COURSES CREATED**

ME101: Solid Modeling I
ME102: Solid Modeling II
ME203: Computer Programming Applications
ME205: Simulations of Machines
ME610: Finite Element Methods
ME696: Multi-Body Dynamics

**COURSES TAUGHT**

Finite Element Methods: Linear, Elastic, Isotropic (SDSU, UCSD)
Non-Linear Finite Element Methods: Dynamic, Plastic, Large Deformation (SDSU)
Statics (UCSD)
Dynamics (UCSD)
Multi-Body Dynamics (SDSU)
Computer Aided Design (SDSU)
Virtual Machines (SDSU)
C Programming (UCSD, SDSU)
FORTRAN Programming (UCSD)
Numerical Methods in Engineering (UCSD, SDSU)
Theory of Plates (UCSD)

## ADVERTISING ON BEHALF OF SDSU

http://www.wimba.com/community/casestudies.php#cs15
http://www.ptc.com/WCMS/files/1996/en/1996en_file1.pdf

## CURRICULAR DEVELOPMENT

Created new coureses to teach mechanical engineering at its intersection with computer science. The premise is that students learn more when they *create*, rather than *use*, software. Students choose a machine, reproduce it as a three dimensional model, study the physics, write software to implement the physics, create a data acquisition program to control the machine, write the network software to distribute all codes and then write the software to visualize the machine in semi-immersive virtual reality: http://attila.sdsu.edu/me205.

## INFORMAL EDITOR APPROVED PUBLICATIONS

"Crisis in Engineering Education" Editorial Opinion Section. The Norrth Jersey Record, 11/27/06.

## PEER REVIEWED DEMONSTRATIONS:

*Demonstration: Physics Based Virtual Reality with Tactile Force Feedback The I-WAY*

Small Deformation Physics Based Virtual Reality: Created a platform in physics based virtual reality by coupling finite element method, high performance massively parallel computing using MPI, force-feedback haptics devices, and high performance virtual reality theater: I-DESK. Physically Based Virtual Reality". GII Testbed and HPC Challenge Demonstration Applications on the I-WAY." Eds. Korab, H., Brown, M. ACM/IEEE SC'95, 1995.

*Demonstration: Physics Based Virtual Reality with Tactile Force Feedback HPCN '98*

Large Deformation Distributed Physics Based Virtual Reality: Created a platform in physics based virtual reality by coupling large deformation finite element method, high performance massively parallel computing using native Cray Message Passing, force-feedback haptics devices, and high performance virtual reality theater: I-DESK + CAVE. *By invitation.*

*Demonstration: SIGGRAPH: Education*

Impelluso, T. "Physics Based-VR for Education." Program Guide ACM SIGGRAPH, Proceedings. July 27-August 1, 2003. Conference Floor Demonstration.

*Demonstration: SIGGRAPH: Research*

Impelluso, T. "Physics Based-VR for Research." Program Guide ACM SIGGRAPH, Proceedings. July 27-August 1, 2003. Conference Floor Demonstration.

*Demonstration: For Misubishi ElectricResearch Labs (1997)*

Developed a physics based virtual reality simulator to model minimally invasive cardiac catheterization. The 3D beam equations were solved with a finite element code that interpolated curvature using Frenet frame theory to accelerate the solution. Project was completed for Dwight Melan, manager, Mitsubishi Electric Reserach Labs, Boston Massachusettes.

*Demonstration: Tensigrity Structures: (1996)*

Developed a physics based virtual reality simulator to model tensegrity structures with force feedback. Users were able to deform a structure with force feedback joysticks, observe the tensegrity deformation and obtain tactile feedback. Structure solved using non-linear solution scheme forked by local server. Visualization with Open Inventor.

*Demonstration: Wavelets for Edge Detection: (1993-4)*

Developed a wavelet-based edge detection software system for Core Inc., Japan. Travelled to Japan twice (1993, 1994) to demonstrate this system and provide lectures on wavelet theory to be used in automating the detection of flaws in manufacture computer chips.

*Commercial Development (after Ph.D., worked 4 years in industry)*

Developed a turnkey near real-time seismic data acquisition and analysis package for Sun Microsystems, Inc., Computers, 1990-1993. Wrote and maintained record-based disk buffering and time-based disk buffering modules; implemented the system by using both shared memory Inter-Process Communication and BSD socket-based remote procedure calls.

## BOOK CHAPTERS

Impelluso, T., and C. Negus. "Biomechanics and the Cyberinfrastructure: Delivering the Bone and Other Models to the Surgeon." In *Tissue Modeling and Surgical Simulations*. Southampton, Boston: WIT Press, 2005.

## JOURNAL PUBLICATIONS

1. Impelluso, T. "Leveraging Cognitive Load Theory, Scaffolding, and Distance Technologies to Enhance Computer Programming for Non-Majors", Advances in Engineering Education; Accepted 11/1/08.
2. Harris, R, and Impelluso, T, "Asssesment of a Proposed Software Design for the Solution of Multi-phase Mechanics Problems on Networked Laptops," Engineering with Computers, Submitted: June, 2008
3. Perez, A, Mahar, A, Negus, C, Newton P, Impelluso, T. "A Computational Evaluation of the Effect of Intramedullary Nail Material Properties on th the Stabilization of Simulated Femoral Shaft Fractures." Medical Engineering and Physics, 30, 2008 pp 755-760
4. Harris, R, and Impelluso, T, "A Virtual Stress Testing Machine" Engineering with Computers, Springer-Verlag, pp 107-117, Vol. 4, Number 2, June, 2008
5. Impelluso, T., and M. Bober. "Revitalizing the Mechanical Engineering Curriculum: Challenges and Rewards." *Innovations 2005–World Innovations in Engineering Education and Research*. iNEER, 2005.
6. Impelluso, T. "A Proposed Cyber-Infrastructure to Solve Multi-Phase Problems in Mechanics for Physics Based Virtual Reality." *Journal of Computational BioMechanics.* April 2006, Vol 9, 2 pp . 109-120
7. Mahar, A., S. Lee, F. Lalonde, T. Impelluso, and P. Newton. "Biomechanical comparison of stainless steel and titanium nails for fixation of simulated femoral fractures." *Journal of Pediatric Orthopedics* (November/December 2004). Vol. 24, No. 6: pp. 638-641.
8. Impelluso, T. "A Density Distribution Algorithm for Bone Incorporating Local Orthotropy, Modal Analysis and Theories of Cellular Solids." *Computer Methods in Biomechanics and Biomedical Engineering* (June 2003). Vol. 6, No. 3: p. 217.
9. Cox, T., M. Kohn, and T. Impelluso. "Computerized Analysis of Resorbable Polymer Fasterners for the Rigid Fixation of Mandibula Angle Fractures." *The Journal of Oral and Maxillofacial Surgery* (April 2003). Vol. 30: pp. 481-486.
10. Impelluso, T., and T. Metoyer-Guidry. "Virtual Reality and Learning by Design: Tools for Integrating Mechanical Engineering Concepts." *Journal of Engineering Education* (2001). Vol. 90, No. 4: pp. 527-534
11. Murakami, H., and T. Impelluso. "Wavelets for Image and Signal Processing." *Image Technology and Information Display* (November 1994). Vol. 26, No. 21.

12. Impelluso, T., and H. Murakami. "A Homongenized Continuum Model for Fiber-Reinforce Composites." *ZAMM* (1993). Vol. 75: pp. 171-188

13. Murakami, H., T. Impelluso, and G. Hegemier. "Development of a Mixture Model for Non-Linear Wave Propagation in Fiber-Reinforced Composites." *International Journal of Solids and Structures* (1992). Vol. 29: pp. 1919-1937.

14. Murakami, H., T. Impelluso, and G. Hegemier. "A Continuum Finite Element for Single-Set Jointed Media." *International Journal for Numerical Methods in Engineering* (1991). Vol. 31: pp. 1169-1194.

15. Skalak, R., T. Impelluso, L. Soslowsky, E. Schmalzer, and S. Chien. "Theory of Filtration of Mixed Blood Suspensions." *Biorheology* (1987). Vol. 24: pp 35-52.

16. Skalak, R., T. Impelluso, E.A. Schmalzer, and S. Chien. "Theoretical Modeling of Filtration of Mixed Blood Suspension." *Biorheology* (1983). Vol. 24: pp. 41-56.

17. Chien, Shu, E.A. Schmalzer, M.M.L. Lee, T. Impelluso, and R. Skalak. "Role of White Blood Cells in Filtration of Blood Suspension." *Biorheology* (1983). Vol. 20: pp. 11-27.

## CONFERENCE PROCEEDINGS

1. Impelluso, T. "Cognitive Load Theory as a tool to underird and validate distance learning." American Society of Engineernig Education, 2009 Annual Conference, Austin Texas (Abstract Submitted 9/8/02)
2. Negus, C., Impelluso, T., Evans, R. "Toward patient-specific density and stress modelling of the tibia" 8th. World Congress on Computational Mechanics; 5th. European Congress on Computational Methods in Applied Sciences and Engineering. June 30 – July 5, 2008 Venice, Italy
3. Oka, R., A. Mahar, and T. Impelluso. "A Computational Approach to Orthopedic Implant Design Optimization." Computational Biomechanics Symposium. Chicago, Illinois. February 20, 2006.
4. Bober, M., and T. Impelluso. "Disseminating a Methodology to Create Virtual Machines." Association for Educational Communications and Technology, 2005 International Convention: Exploring the Vision. Orlando, Florida, 2005.
5. Bober, M., and T. Impelluso. "Mechanics and the Cyber-Infrastructure: Assessment of a New Curriculum." 8th US Congress on Computational Mechanics. Austin, Texas. July 24-28, 2005.
6. Harris, R., and T. Impelluso. "Solutions to Coupled Problems in Mechanics Using the CyberInfrastructure." 8th US Congress on Computational Mechanics. Austin, Texas. July 24-28, 2005.
7. Negus, C., and T. Impelluso. "A New Approach to Bone Modeling Using the Cyber-Infrastructure." 8th US Congress on Computational Mechanics. Austin, Texas. July 24-28, 2005.
8. Impelluso, T. "A Cyber Infrastructure to Support Physics Based Organ Geometries for Surgical Planning." Medicine Meets Virtual Reality 13. Long Beach, California. January 26-29, 2005. (This presentation won 2nd place in the review.)
9. Impelluso, T., and M. Bober. "Revitalizing the Mechanical Engineering Curriculum: Challenges and Rewards." International Conference on Engineering Education. Gainesville, Florida. October 17-22, 2004.
10. Harris, R., A. M. Ausin, J. S. Angulo, F. Valafar, and T. Impelluso. "VSTM: Virtual Stress Testing Machine." The 2004 International Conference on Parallel and Distributed Processing Techniques and Applications. Las Vegas, Nevada. June 21-24, 2004.
11. Valafar, F., R. Harris, A. M. Ausin, J. S. Angulo, and T. Impelluso. "Scalability of VSTM: A Memory Model and Inter-Processor Communication Perspective." The 2004 International Conference on Parallel and Distributed Processing Techniques and Applications. Las Vegas, Nevada. June 21-24, 2004.

12. Impelluso, T. "Network Protocols for Physics Based Simulations." SDSU Computational Science Research Center. San Diego, California. March 12, 2004.
13. Impelluso, T., and M. Bober. "Virtual Machines." Poster Presentation. FIPSE Annual Project Directors Meeting. Washington, D.C. November 4-6, 03.
14. Impelluso, T. "Physics Based-VR for Education." Program Guide ACM SIGGRAPH, Proceedings. San Diego, California. July 27-August 1, 2003 (conference floor demonstration).
15. Impelluso, T., and G. Lee. "A Wavelet-Based Fuzzy Neural Inference Face Recognition Classifier to Detect Potential Terrorist Attacks." CAINE Conference. Washington, DC. November 6, 2002.
16. Impelluso, T. "Locally Orthotropic Femur Remodelling." American Society of Biomechanics. La Jolla, California. August 10-11, 2001.
17. Selgas, C, B. Vallejo, A. Mahar, and T. Impelluso. "Bone Remodeling Characteristics for Two Types of Femoral Fixation Using Finite element Analysis." International Society of Biomechanics. July 8-13, 2001. Zurich, Switzerland.
18. Vallejo, B, C. Selgas, A. Mahar, and T. Impelluso. "Using Modal Analysis to Determine Failure Characteristics of Remodeled Bone in a Fractured Femur Model." International Society of Biomechanics. July 8-13, 2001. Zurich, Switzerland.
19. Impelluso, T. "A Density Distributing Locally Orthotropic 2-D Femur Remodeling Algorithm." International Society of Bioengineers. Schlieren, Switzerland. July 8-10, 2001.
20. Impelluso, T. and G. Lee. "Integrating Engineering and Science Analysis and Design Concepts Using Virtual Systems." Proceedings of the ISCA International Conference On Intelligent Systems. Washington, D.C. June 2001.
21. Impelluso, T. "Physics Based Virtual Machines." ASEE/IEEE Frontiers in Education Conference. Reno, Nevada. 2001 (peer reviewed proceedings).
22. Impelluso, T., and T. Metoyer. "Virtual Reality and Learning by Design: Tools for Integrating Mechanical Engineering Concepts." ASEE/IEEE Frontiers in Education Conference. Kansas City, Missouri. 2000 (peer reviewed proceedings).
23. Impelluso, T.J. "Physically-based Virtual Reality: Integrating FEM and Visualization." 12th ASCE Engineering Mechanics Conference Proceedings. University of California at San Diego. La Jolla, California. May 17-20, 1998.
24. Murakami, H., Y. Nishimura, T. J. Impelluso, and R. E. Skelton. "A Virtual Reality-Based CAD System for Tensegrity Structures." 12th ASCE Engineering Mechanics Conference Proceedings. University of California at San Diego. La Jolla, California. May 17-20, 1998.
25. Murakami, H., and T. J. Impelluso. "Large-Deformation Analyses of Spatial Beams by Using Frenet's Moving Frame." 12th ASCE Engineering Mechanics Conference Proceedings. University of California at San Diego. La Jolla, California. May 17-20,

1998.

26. Impelluso, T. "Distributed, Physically Based-VR with Tactile Feedback." Program Guide ACM SIGGRAPH, Proceedings. August 4-9, 1996 (pp. 55).
27. Impelluso, T. "Physically-based Virtual Reality." GII Testbed and HPC Challenge Applications on the I-WAY. Holly Koram and M. Brown, editors. ACM, IEEE, 1995.
28. Impelluso, T., and H. Murakami. "A Damage Model for Laminated Composites." 2nd US Congress on Proceeding Computational Mechanics. Washington, D.C., University of Virginia. August 16-18, 1993.
29. Murakami, H., and T. Impelluso. "High Order Computational Model for Fiber Reinforced Composites in Enhancing Analysis for Composite Materials." Proceedings of Winter Meeting of ASME. Atlanta, Georgia. L. Schwer and J.N. Reddy, editors. ASME: New York. Vol. 10. December 1-6, 1991.
30. Impelluso, T., H. Murakami, and G.A. Hegemier. "A Mixture Finite Element for Fiber Reinforced Composites." Proceedings of the 11th US National Congress of Applied Mechanics. Tucson, Arizona. May 21-25, 1990.
31. Impelluso, T., H. Murakami, and G.A. Hegemier. "A Continuous Finite Element for Single-Set Jointed Media." Proceedings of the 12th Canadian Conference of Applied Mechanics. TP5. May 28, 1989 (pp. 804-805).

**REPORTS**

DARPA Final Report W81XWH-04-2-0010: Supporting the Virtual Soldier with a Physics Based Virtual Reality Client/Server Software System. Submitted as per grant requirement: June 27,2005 to Pawlus, Judy K Ms USAMRMC.

Misubishi Electric Research Labs: Surgical Simulations, Boston Massachusettes, Februrary, 1998, Dwight Meglan

"Reduced Nerve Blood in Edematous Neuropathies: Deformatio and Flow Analyses." Murakami and Impelluso. Robert Myers, UCSD VA Hospital.

"A Distance Learning Curriculum in Simulation Science," University of Phoenix, 12/15/07

"Simulation Science," Qualcomm Proposal.

"San Diege Engineering Discovery Center," Plans for an engineering museum in San Diego. Delivered to Burnham Real Estate, 9/1/07.

## THESIS AND DISSERTATION SUPERVISION

### Theses and Projects

**Richard Oka** **Ph.D.** **CURRENT** **Chair**
**Dissertation Title: Tentative: Dynamics and Cartan's Forms**
To reformulate dynamics using theory of forms.
Richard has been accepted into the program and is prepared to take DQE in Spring '09

**David Sims** **Ph.D.** **CURRENT** **Chair**
**Dissertation Title: Tentative: Synthetic Muscle Modeling**
To invert the FE method and conver it into a synthetic tool to create virtual muscle; clinical assessment.
David will apply to the JDP this academic year.

**Charles Negus** **Ph.D.** **2005** **Chair**
**Dissertation Title: "Dynamic Bone Remodeling using a Hypo-elastic Formulation."**
Developed and assessed a new computational method for bone remodeling and re-growth.

**Scott Arthur Gasner** **Ph.D.** **2006** **Advisor**
**Dissertation Title: "Cellular Pattern Formation and Noise in O(2) Symmetric Systems.**
Particular pattern formations in behaviors that could be mathematically categorized as possessing orthogonal symmetry and applied to the problem of flame fronts.

### M .S.

**Richard Harris** **M.S.** **2006** **Chair**
**Thesis Title: "Integrating Mechanics Using the Cyber-Infrastructure."**
This work developed a software platform to integrate two distinct modules of computational mechanics: multi-body dynamics and finite element methods.

**Richard Oka** **M.S.** **2006** **Chair**
**Thesis Title: "Stablization of Spinal Defects"**
This work assessed mechanical methods to stabilize the spin after surgery by conducting an FE analysis on the vertebrae.

**Charles Lam:** **M.S.** **2006** **Advisor**
**Thesis Title: "A Constitutive Law for Aortic Valve Tissue"**
This work developed a constitutive law for the aortic valve.

**Dina Abulon:** **M.S .** **2006** **Advisor**
**Thesis Title: "Morphology and Tissue Characterization of Fusion in Aortic Heart Valves**

**Excised from LVAD patients"**
This work studied the impact of left ventricular assist devices on the material properties of the aortic valve.

**Vikas Sharma** **M.S.** **2005** **Chair**
**Thesis Title: "A Finite Element Based Analysis of New Total Ankle Arthroplasty Implant Using Function Anatomical Positions and Joint Loading."**
This work modeled a new type of ankle implant

**Eric Peterson** **M.S.** **2005** **Advisor**
**Thesis Title: "Interactive Field Geology to Interpret the Neogene Tectono-Stratigraphic Evolution of the Kendeng and Rembang Deformed Zones."**
This work integrated mapping in the jungles of Indonesia along the major strike slip fault zones that run the length of the island of Java Thesis also used field mapping with computers to link remote sensing imagery, field measurements, and server connection to map area as large as southern California in one field season

**Angel Perez** **M.S.** **2004** **Chair**
**Thesis Title: "Biomechanical Comparison within a Finite Element Model of Stainless Steel and Titanium Flexible Intramedullary Nails for Stabilization of a Fractured Femur."**
This work studied the impact of medullary nails and assessed whether less stiff nails can be more effective in carrying loads during femur fixation.

**Michelle Marks:** **M.S.** **2001** **Advisor**
**Thesis Title: "Static and Dynamic Sagittal Spinal Balance in Normal Subjects."**
This study evaluated the static and dynamic sagittal spinal balance in normal subjects utilizing a motion analysis laboratory.

**PROPOSALS FUNDED:**

*Multi-Phase Mechanics*
**Agency:** NSF **Amount:** $124,550 **Duration:** 11-05/11/06
**Summary:** Extend a platform for solution of multi-phase problems by incorporating non-linear interaction and contact.

*Metal Forming*
**Agency:** POSCO Korea **Amount:** $42,000 **Duration:** 10/03-5/04.
**Summary:** Metal forming analyis using MSC software.

*Ankle Modeling*
**Agency:** Kinetikos Medical, Inc. **Amount:** $25,000 **Duration:** 10/03-/04
**Summary:** FE analysis of ankle implants.

*Virtual Soldier Project*
**Agency:** DARPA **Amount:** $200,000 **Duration:** 10/03-3/05
**Summary:** Development of platform to solve problems of flexible linkages using technologies of the cyber-infrastructure.

*ITR: A Virtual Stress Testing Machine*
**Agency:** NSF **Amount:** $300,000 **Duration:** 9/02-0/05
**Summary:** This project tested network communication and inter-process communication to intgrated the modules of mechanics and deliver them to physics based virtual environmnts.

*Dissemination of a New Mechanical Engineering Curriculum*
**Agency:** FIPSE **Amount:** $$370,000 **Duration:** 9/02-9/05
**Summary:** This project funded the evolution and dissemination of a method to teach mechanical engineering at its intersection with computer science.

*SGER: Femur Adaptation in a Smart Surgical Ward*
**Agency:** NSF **Amount:** $33,000 **Duration:** 5/02-5/03
**Summary:** This project funded the proof of concept studies of a method to model bone remodeling and trabecular re-orientation.

*SDSU Grant in Aid* **Amount:** $1,500 **Duration:** 1999-2000
**Summary:** This funded student travel for the Bioresorbable Resins project.

*Curricular Reform in Mechanical Engineering*
**Agency:** TRW, Inc. **Amount:** $15,000 **Duration:** 09/01-09/02
Continuation Grant (see below)

*Curricular Reform in Mechanical Engineering*
**Agency:** TRW, Inc. **Amount:** $20,000 **Duration:** 09/00-09/01
Continuation grant (see below)

*Modeling BioResorbable Resins*
**Agency:** Macropore, Inc. **Amount:** $24,000 **Duration:** 01/00-01/02
**Summary**: This project assessed bio-resorbable resins and their use in fixation of femoral fractures.

*Curricular Reform in Mechanical Engineering*
**Agency:** TRW, Inc. **Amount:** $20,000 **Duration:** 09/99-09/00
**Summary:** This project funded the development of four new classes at SDSU.

*Simulations of Vehicle Re-entry*

**Agency:** Calspace **Amount:** $10,000 **Duration:** 1/99-6/99
**Summary:** This project was a student led effort to create a simulation to retrieve satellites during descent.

*Technology Integration for Physics Based Virtual Reality*
**Agency:** NSF **Amount:** $50,000 **Duration:** 1/97-1/98
**Summary:** This project assessed network traffic configurations for the previous project.

*A Study Toward the Feasibility of Using MPI as a Message Passing Interface to Embed the Finite Element Methodology in a Distributed Environment*
**Agency:** NSF **Amount:** $24,805 **Duration:** 9/95-9/96
**Summary:** This project assessed the use of MPI as opposed to native Cray message passing.

*Physics Based Virtual Reality: Coupling Finite Element Methods to a CAVE in a Massively Parallel Environment*
**Agency:** DARPA **Amount:** $50,000 **Duration:** 9/95-9/96
**Continuation Funding (see below)**

*Physics Based Virtual Reality: Coupling Finite Element Methods to a CAVE in a Massively Parallel Environment*
**Agency:** DARPA **Amount:** $50,000 **Duration:** 9/95-9/96.
**Summary:** This project coupled a haptic device, a CAVE, and a parallelized finite element code.

## Curriculum Vitae

Per Borgesen, født 29.4.1949.
Sosial status: Gift, 2 barn født i 1985 og 1987
Adresse: Saxeborgvn 5B, 7562 Hundhamaren
Nåværende stilling: dekan,1.lektor, HiST/AITeL.

### Utdanning

Jeg har utdanning fra NTH/Teknisk kybernetikk fra 1973/74 med en del datafag i retning prosesstyring.

### FoU-arbeid

Jeg har deltatt i følgende FoU-prosjekter:

- Deltakelse i FoU-prosjektene MultiPro og Concurrent e-learning design som begge er FoU-prosjekter innen IKT og samhandling
- EU-prosjekt: MECPOL (Models for European Collaboration and Pedagogy in Open Learning)
- EU-prosjekt: DoODL (Dissemination of Open and Distance Learning).
- EU-prosjekt: E-LEN: A network of e-learning centres
- Jeg har også utført utviklingsarbeid i stiftelsen TISIP. I 1991 og 1992 arbeidet jeg 50% ved TIH og 50% ved TISIP med et større utviklingsprosjekt for undervisningsdepartementet.

### Publikasjoner/Lærebøker

- Forfatter for boka "Dynamiske Websider", Gyldendal Akademisk, ISBN 82-05-31356-3. Boka benyttes ved flere høgskoler i Norge.
- Medforfatter i boka "Elektroniske informasjonskilder", (217 sider) ISBN 82-434-0059-1
- Medforfatter i læreboka: "Drift av lokalnett", TAPIR forlag,(280 sider) ISBN 82-519-1280-6. Boka benyttes ved mange høgskoler i Norge.
- Medforfatter i læreboka: "Innføring i Informasjonsteknologi", TAPIR forlag (356 sider) ISBN 82-519-1316-0. Boka benyttes ved grunnkurset i informasjonsteknologi ved NTNU.
- Medforfatter i læreboka: "Local Area Network – Management, Design and Security", John Wiley & Sons, ISBN 0-471-49769-X.
- Flere kompendier innen datakommunikasjon og kommunikasjonsstandarder.

### Yrkesfaring

| | |
|---|---|
| Høgskolen i Sør-Trøndelag<br>2011 – (periode fram til 2015) | Dekan ved Avdeling for informatikk og e-læring |
| Høgskolen i Sør-Trøndelag<br>2005 - 2011 | Dekan ved Avdeling for informatikk og e-læring |

| | |
|---|---|
| Høgskolen i Sør-Trøndelag<br>1994 - 2005 | Programlederansvar for dataingeniørutdanningen ved HiST.<br>• programlederansvar for Bachelorutdanningen i ingeniørfag<br>• ansvar for koordinering av laboratorievirksomheten ved AITeL<br>• undervisning i fagområdene datakommunikasjon og webutvikling |
| Trondheim Ingeniørhøgskole fra 1980<br>Senere HiST:<br>- AFT<br>- AITeL | Fra 1980 har jeg vært tilsatt som høgskolelektor og i hovedsak arbeidet og undervist innen fagområdet *datakommunikasjon, datanett og anvendelser innen undervisning.*<br><br>Fra 1990 har jeg arbeidet med webutvikling og bruk av Internett som læringsplattform, senere kalt e-læring.<br><br>I 1999 fikk jeg innvilget opprykk til 1.lektor kompetanse. |
| NORATOM,<br>1978 - 80 | Ved NORATOM (divisjon av Kongsberg Våpenfabrikk) arbeidet jeg med prosesstyring. Vi leverte komplette overordnede styringer av større prosessanlegg. I hovedsak leverte vi styringer til papirfabrikker - men etter hvert også til andre typer anlegg.<br><br>Jeg hadde prosjektansvaret for en leveranse for styring av Tanum jordstasjon (ved Gøteborg) for satellittkommunikasjon.<br><br>Teknologisk var dette tiden da vi for alvor begynte med samarbeidende maskiner over nettverk med høge hastigheter. Jeg var her med på å bygge opp kompetanse på datakommunikasjon og nettverksanvendelser i en tidlig fase. |
| Raufoss Ammunisjons-fabrikker,<br>1976 - 78 | Ved Raufoss ammunisjonsfabrikker hadde jeg to arbeidsområder:<br>1. *Tekniske beregninger*. Fabrikken hadde egen divisjon for produksjon av aluminiumsprofiler. Jeg arbeidet her med programmer for beregninger av belastning og varmeledning på ulike profiler.<br>2. *Målinger*. Ved divisjonen som utviklet ammunisjon var det lagt stor vekt på kvalitetskontroll av ammunisjonen. Dette ble delvis gjort ved prøveskyting av ammunisjon under kontrollerte og målbare forhold. Jeg arbeidet med å skifte ut analogt måleutstyr med digitale måleteknikker. Dette var svært utfordrende teknisk da det var høge krav til målenøyaktighet. |
| Tromsø Datasentral,<br>1974 - 76 | Tromsø Datasentral var et AS eid av forretningsbanker og med primære oppgaver innen administrative databehandlings-oppgaver. Arbeidsområdet mitt var å utvikle databehandlings-tjenester på et mer teknisk/vitenskapelig område. Vi utviklet noen tjenester for lokal entreprenørvirksomhet. Det største arbeidet mitt var likevel å ha hovedansvaret for statistikk- |

| | |
|---|---|
| | behandling av en større helseundersøkelse i Nord-Norge (Tromsøundersøkelsen). Dette arbeidet var et oppdrag fra Regionsykehuset i Tromsø. |

**Organisatorisk erfaring**

Medlem i @Campus strategi- og prioriteringsråd i UNINETT (2010 – )
Medlem i UNINETT stab/fagråd (2000 – 2004)
Styreleder i Stiftelsen TISIP (1995 – 1998)
Styremedlem i Stiftelsen TISIP (1992 – 1995, 1998 – 2001)

europass

# Europass curriculum vitae

## Personal information

| | |
|---|---|
| Surname(s) / First name(s) | **Strand, Knut Arne** |
| Address(es) | Bjøra 12, 7070 Bosberg, Norway |
| Telephone(s) | Fixed: +47 73 57 45 50 Mobile: +47 93 24 10 39 |
| E-mail(s) | knut.arne.strand@hist.no |
| Nationality(-ies) | Norwegian |
| Date of birth | 14.12.1966 |
| Gender | Male |

## Work experience

| | |
|---|---|
| Dates | From August 2012 - |
| Occupation or position held | Associate Professor |
| Main activities and responsibilities | Lecturer and researcher within ICT, computer supported cooperative work and corporate e-learning |
| Name of employer | Sør-Trøndelag University College |
| Type of business or sector | Academia |

| | |
|---|---|
| Dates | From August 2008 to July 2012 |
| Occupation or position held | PhD-Candidate |
| Main activities and responsibilities | Research within customized corporate e-learning |
| Name of employer | Sør-Trøndelag University College |
| Type of business or sector | Academia |

| | |
|---|---|
| Dates | From June 2007 to July 2008 |
| Occupation or position held | Assistant Professor |
| Main activities and responsibilities | Lecturer in ICT related subjects |
| Name of employer | Sør-Trøndelag University College |
| Type of business or sector | Academia |

| | |
|---|---|
| Dates | From Mai 2004 to May 2007 |
| Occupation or position held | Unit Manager – Project Office – Norway |
| Main activities and responsibilities | Leadership and management related to software development at Personec in Norway |
| Name of employer | Personec AS |
| Type of business or sector | Software Vendor |

| | |
|---|---|
| Dates | From January 2000 to April 2004 |
| Occupation or position held | Technology Manager |
| Main activities and responsibilities | Responsibility for software architecture, software development methods and technologies |
| Name of employer | Tieto Enator Resource Management AS |
| Type of business or sector | Software Vendor |
| Dates | From December 1995 to December 2000 |
| Occupation or position held | Software Developer |
| Main activities and responsibilities | Software developer and project manager with responsibility for new technology related to the application development |
| Name of employer | Tieto Enator Resource Management AS |
| Type of business or sector | Software Vendor |
| Dates | From June 1994 to November 1995 |
| Occupation or position held | Software Developer |
| Main activities and responsibilities | Object oriented software development based on Smalltalk from Visual Works |
| Name of employer | Total Personalsystemer AS |
| Type of business or sector | Software Vendor |

## Education and training

| | |
|---|---|
| Dates | From August 2008 to June 2012 |
| Title of qualification awarded | PhD in Information Technology |
| Principal subjects/Occupational skills covered | Courses titled: (1) Topics in Information Technology, (2) Business Research Methods, (3) PhD Seminar in Computer and Information Science (E-Learning), (4) Cooperation Technology and (5) Advanced Cooperation Technology. Doctoral thesis titled: Concurrent Design Approach to the Design of Customized Corporate E-Learning |
| Name and type of organisation providing education and training | Department of Computer and Information Science at the Norwegian University of Science and Technology |
| Level in national or international classification | Doctoral-level degree |
| Dates | From August 2002 to June 2003 |
| Title of qualification awarded | Part of a Master of Management Program |
| Principal subjects/Occupational skills covered | Teamwork Management; Organisational Psychology – Management Program |
| Name and type of organisation providing education and training | BI Norwegian School of Management |
| Level in national or international classification | Master of Management |
| Dates | From August 2001 to June 2002 |
| Title of qualification awarded | Part of a Master of Management Program |
| Principal subjects/Occupational skills covered | Project Management |
| Name and type of organisation providing education and training | BI Norwegian School of Management |
| Level in national or international classification | Master of Management |

| | |
|---|---|
| Dates | From August 1992 to March 1994 |
| Title of qualification awarded | Cand.scient. (Master) in Informatics |
| Principal subjects/Occupational skills covered | Informatics, Software Engineering and Knowledge Engineering |
| Name and type of organisation providing education and training | Norwegian University of Science and Technology |
| Level in national or international classification | Master-level degree |

| | |
|---|---|
| Dates | From August 1986 to June 1992 |
| Title of qualification awarded | Cand.mag. (Bachelor) in Informatics |
| Principal subjects/Occupational skills covered | Informatics, Mathematics and Geography |
| Name and type of organisation providing education and training | Norwegian University of Science and Technology |
| Level in national or international classification | Bachelor-level degree |

| | |
|---|---|
| Dates | From August 1983 to June 1986 |
| Title of qualification awarded | Secondary school examinations |
| Principal subjects/Occupational skills covered | Science |
| Name and type of organisation providing education and training | Brundalen videregående skole |
| Level in national or international classification | Secondary school examinations |

## Personal skills and competences

Mother tongue(s) **Norwegian**

Other language(s)

| *Self-assessment* | Understanding | | Speaking | | Writing |
|---|---|---|---|---|---|
| *European level* (*) | Listening | Reading | Spoken interaction | Spoken production | |
| **English** | B2 | B2 | B2 | B2 | B2 |

(*) *Common European Framework of Reference (CEF) level*

# CV

| | |
|---|---|
| Name: | John Haugan |
| Date of birth: | December 13, 1954 |
| Marital staus: | Widowed, 2 children |
| Current Position: | Professor, Oslo and Akershus University College |

## 1. Education. Competence.

| | |
|---|---|
| 1973 | Examen Artium, Math and Science Branch, Drammen gymnas |
| 1978 | Cand. real (M. Sci) in Physics, University of Oslo |
| 1979 | Pedagogical Seminar, University of Oslo |
| 1980-81 | Courses in Informatics, Geophysics and Astronomy, Bachelor level, Univ. of Oslo |
| 1988-91 | Courses in Cybernetics, Master level, Univ. of Oslo |
| 1992 | Awarded competence as Associate Professor, PhD-level |
| 1992-94 | Advanced courses in Theory of Science and in Research Methods, Univ. of Oslo |
| 1996-2000 | Ph.D.-studies in Science Education, ILS, Univ. of Oslo |
| 2008 | Awarded competence as Professor in Math. and Science Education. |

## 2. Work Experience

**Main positions**

| | |
|---|---|
| 1979-80 | Norwegian Defence Research Establishment, Dept. of Electronics |
| 1980-81 | Lecturer, Elvebakken videregående skole, Oslo |
| 1981-82 | Lecturer, St. Halvard gymnas, Drammen |
| 1982-86 | Senior Researcher, Den Norske Veritas, Høvik |
| 1986-2006 | Head of Dept. for Math. and Science, NKI Distance Education |
| 1986-95 | Associate Professor/Head of Dept., NKI College of Engineering, Bærum |
| 1994-95 | Associate Professor, Buskerud University College, Dept. of Engineering (50% part time) |
| 1995-99 | Senior Consultant, Ministry of Education, Buskerud Department, Drammen |
| 1999-2006 | Associate Professor, Norwegian School of IT, Oslo |
| 2005 | Assistant Professor, Vestfold University College, Institute of Teacher Education, Drammen |
| 2005 – 08 | Associate Professor, Oslo University College, Dept. of Engineering, Oslo |
| 2008 – | Professor, Oslo and Akershus University College, Dept. og Engineering, Oslo |

**Part time positions**

| | |
|---|---|
| 1983-2006 | Assistant/Associate Professor, NKI College of Engineering/NITH |
| 1995 | Project Grant, Det faglitterære Fond (Fysikk for ingeniører) |
| 1997 | Project Grant, Det faglitterære Fond (Teknologiundervisning i skolen) |
| 2006 | Project Grant, Det faglitterære Fond (Eureka! Naturfag for ungdomstrinnet) |
| 2007 | Project Grant, Det faglitterære Fond (Eureka! Naturfag for ungdomstrinnet) |
| 2008 | Project Grant, Det faglitterære Fond (Eureka! Naturfag for ungdomstrinnet) |
| 2013 | Project Grant, Det faglitterære Fond (Eureka! Naturfag for ungdomstrinnet) |
| 1987 – | Author of textbooks |
| 1987-2008 | Teacher in distance education, NKI Distance Education |

## 3. Commissions, Working Groups, Board Memberships et. al.

| | |
|---|---|
| 1975-77 | Head of junior department, Drammen Tennisklubb |
| 1975-78 | Member of Board, Drammen Tennisklubb |
| 1990-93 | Secretary of Norwegian Council for Science and Math in Engineering Education |
| 1993-94 | Secretary Working Group for New Curriculum in Math. and Science, New Engineering Education |
| 1988-91 | Head of Council for Workplace Environment, NKI, Bærum |
| 1991-93 | Member of Advisory Board, NKI College of Engineering |
| 1990-93 | Member of Board, Hans Burums vei 30 foundation, ANS |
| 1990-91 | Member of Board, NIF trade union, NKI |
| 1991-92 | Chief Negotiator NIF trade union, NKI |
| 1994-96 | Head of Orienteering Group, Lærernes Idrettslag, Drammen |
| 1996 | Member of Working Group for Development of Guide to New Curriculum in Science, Lower Secondary Education, L97 |
| 1997-99 | Member of Steering Committee "Teknologi i skolen" (Technology in Education), Ministry of Education |
| 1992-2003 | Member of Working Group for Development of National Leaving Examinations in Science and Math., Prep. Course for Engineering Education, Ministry of Education |
| 1997-2008 | Member of Working Group for Development of National Leaving Examinations in Upper Secondary Physics, Ministry of Education |
| 2005-06 | Head of Working Group for Development of New Curriculum in Upper Secondary Physics (Fys 1 and Fys 2), Ministry of Education |

# OVERSIKT OVER BOKUTGIVELSER
# LIST OF PUBLISHED TEXTBOOKS

| | | | |
|---|---|---|---|
| **Totalt antall boksider utgitt, registrert med ISBN-nummer**<br>**Total number og pages** | | | 9575 |
| **Totalt antall boksider originalskrevet, eget bidrag, inkludert revisjoner (merket R)**<br>**Total number of pages written by me** | | | 4403 |
| **Første utgivelse**<br>**First Edition** | 1988 | **Siste utgivelse** | 2011 |
| **Antall titler**<br>**Number of titles** | 72 | | |

*: Registrert i Forskdok

| Utg. år | Nr | Forfatter | Tittel | ISBN | Sider eget bidr. eller rev. (R) Number of pages | Total antall sider Number og pages |
|---|---|---|---|---|---|---|
| 2011 | 72 | **Haugan**, Aamot | Gyldendals tabeller og formler i fysikk, Fysikk 1 og Fysikk 2. 2. utgave | 978-82-054-1919-3 | 1 R | 48 |
| 2011 | 71 | Haugan, John | Veien til Bologna. Om å beskrive ønsket læringsutbytte i matematikk | 978-82-579-4753-8 | 121 | 121 |
| 2010 | 70 | Haugan, John | Kalkulus med flere variabler | 978-0-273-73476-5 | 262 | 262 |
| 2009 | 69 | **Haugan**, Aamot | Gyldendals tabeller og formler i fysikk. Fysikk 1 og Fysikk 2 | 978-82-539024-9 | 12 | 48 |
| 2008 | 68 | Hannisdal, Hannisdal, **Haugan**, Synnes | Eureka! 10. Lærerens bok | 978-82-05-33432-8 | 60 | 389 |
| 2008 | 67 | Hannisdal, Hannisdal, **Haugan**, Synnes | Eureka! 10. Arbeidsbok | 978-82-05-38310-4 | 19 | 80 |
| 2008 | 66 | Hannisdal, Hannisdal, **Haugan**, Synnes | Eureka! 10. Naturfag for ungdomstrinnet. Grunnbok | 978-82-05-33411-3 | 68 | 275 |
| 2007 | 65 | Haugan, john | Lineær algebra<br>Serie: Matematikk for studenter | 978-82-996392-6-2 | 188 | 188 |
| 2007 | 64 | Hannisdal, **Haugan**, Munkvik | Eureka! 9. Lærerens bok. | 978-82-05-33430-4 | 100 | 334 |
| 2007 | 63 | Hannisdal, **Haugan** | Eureka! 9. Arbeidsbok | 978-82-05-36781-4 | 24 | 74 |
| 2007 | 62 | Hannisdal, **Haugan**, Munkvik | Eureka! 9. Naturfag for ungdomstrinnet. Grunnbok | 978-82-05-33410-6 | 85 | 277 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2007 | 61 | Haugan | Formler og tabeller | 978-82-562-2483-8 | 2 R | 208 |
| 2006 | 60 | Hannisdal, **Haugan**, Frøyland, Nyberg | Eureka! 8. Arbeidshefte | 82-05-33388-2 | 23 | 72 |
| 2006 | 59 | Hannisdal, **Haugan**, Frøyland, Nyberg | Eureka! 8. Lærerens bok | 82-05-33390-4 | 44 | 207 |
| 2006 | 58 | Hannisdal, **Haugan**, Frøyland, Nyberg | Eureka! 8. Naturfag for ungdomstrinnet. Grunnbok | 82-05-33388-2 | 78 | 278 |
| 2005* | 57 | Haugan, John | Analyse med Maple 9.5<br>Serie: Matematikk for studenter | 82-996392-x-x | 108 | 108 |
| 2005* | 56 | Haugan, John | Vektoranalyse med Maple 9.5<br>Serie: Matematikk for studenter | 82-996392-5-5 | 88 | 88 |
| 2004* | 55 | Haugan, John | Matematisk modellering<br>Serie: Matematikk for studenter | 82-996392-3-9 | 159 | 159 |
| 2004* | 54 | Haugan, John | Vektoranalyse<br>Serie: Matematikk for studenter | 82-996392-0-4 | 207 | 207 |
| 2004 | 53 | Haugan, John | Noen temaer fra matematisk analyse<br>Serie: Matematikk for studenter | 82-996392-2-0 | 126 | 126 |
| 2004* | 52 | Haugan, John | Numerisk matematikk<br>Serie: Matematikk for studenter | 82-996392-4-7 | 93 | 93 |
| 2004* | 51 | Haugan, John | Komplekse tall<br>Serie: Matematikk for studenter | 82-996392-x-x | 22 | 22 |
| 2004* | 50 | Haugan, John | Matematikk for forkurset<br>Differensiallikninger.<br>Sannsynlighetsregning | 82-562-6051-3 | 52 | 52 |
| 2003 | 49 | Haugan, John | Fysikk for forkurset. Studieveiledning | 82-562-6047-5 | 38 | 38 |
| 2002 | 48 | Haugan, John | Fysikk. Studieveiledning K1435 | 82-562-5478-5 | 23 | 23 |
| 2002 | 47 | Haugan, John | Funksjoner med flere variable<br>Serie: Matematikk for studenter: | 82-996392-1-2 | 33 | 33 |
| 2002* | 46 | Haugan, John | Teknologien er vår! | 82-05-30505-6 | 125 | 125 |
| 2001 | 45 | Haugan, John | Matematikk for økonomer, K1332 | 82-562-5457-2 | 61 | 61 |
| 2000 | 44 | **Haugan**, Kvikstad | Statistikk I for økonomer, K1237 | 85-562-5057-7 | 10 R | 60 |
| 1998 | 43 | Haugan, John | Fysikk 3FY<br>Studieveiledning K 1112 | 82-562-4600-6 | 27 | 27 |
| 1997 | 42 | Haugan, John | Fysikk 2FY Studieveiledning K1033 | 82-562-4356-2 | 12 R | 25 |
| 1997 | 41 | **Haugan**, Kvikstad | Statistikk for bedriftsøkonomer. K982 | 82-562-4133-0 | 0 R | 105 |
| 1997 | 40 | Haugan, John | Matematikk for bedriftsøkonomer. K981 | 82-562-4132-2 | 3 R | 57 |
| 1996* | 39 | Haugan, John | Matematikk på nytt<br>Matematikk for voksne | 82-562-3443-1 | 22 | 22 |
| 1996 | 38 | Haugan, John | Matematikk på nytt | 82-562-3778-3 | 229 | 229 |
| 1996 | 37 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Elektrisitet og magnetisme | 82-562-2937-3 | 192 | 311 |
| 1996 | 36 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Svingninger og bølger | 82-562-2936-5 | 0 | 247 |
| 1995 | 35 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Termofysikk | 82-562-2935-7 | 6 R | 116 |
| 1995 | 34 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Klassisk mekanikk | 82-562-2934-9 | 0 | 457 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1994 | 33 | Haugan, John | Matematikk for bedriftsøkonomer<br>Studieveiledning, kommentarer og oppg. | 82-562-3507-1 | 2R | 25 |
| 1994 | 32 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Atom og halvlederfysikk | 82-562-2938-1 | 56 R | 206 |
| 1993 | 31 | Pedersen (**Haugan** som medforfatter) | Generell kjemi. Studiebok for det første kjemiemnet på universitet og høgskole | 1993-utgave av årlig publikasjon | 15 | 209 |
| 1993 | 30 | Haugan, John | Fysikk for forkurset. Studieveiledning | 82-562-2965-9 | 47 | 47 |
| 1993 | 29 | Haugan, John | Fysikk 3FY. Studieveiledning | 82-562-2964-0 | 25 | 25 |
| 1993 | 28 | Haugan, John | Fysikk 2FY. Studieveiledning | 82-562-2963-2 | 28 | 28 |
| 1993 | 27 | Haugan, John | Forstå fysikk. 3FY Elevbok | 82-562-2949-7 | 126 | 126 |
| 1993 | 26 | Haugan, John | Forstå fysikk. 2FY Elevbok | 82-562-2943-8 | 136 | 136 |
| 1993 | 25 | Haugan, John | Fysikk for ingeniører<br>Elektrisitet og magnetisme<br>Studieveiledning | 82-562-3100-9 | 61 | 61 |
| 1993 | 24 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Termofysikk. Vær og klima | 82-562-2811-3 | 34 | 135 |
| 1993 | 23 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Miljøfysikk | 82-562-2809-1 | 29 | 87 |
| 1993 | 22 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Lyd og lys | 82-562-2808-3 | 23 | 69 |
| 1993 | 21 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Eksperimentalmetodikk | 82-562-2807-5 | 17 | 51 |
| 1992 | 20 | Isnes, Nilsen, Sandås, **Haugan** | Fysikk for forkurset | 82-562-2817-2 | 20 | 46 |
| 1992 | 19 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Vårt fysiske verdensbilde | 82-562-2806-7 | 29 | 86 |
| 1992 | 18 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Vår elektriske hverdag | 82-562-2805-9 | 32 | 97 |
| 1992 | 17 | Angell, **Haugan**, Isnes | Fysikk i naturfaget<br>Energi og bevegelse | 82-562-2804-0 | 44 | 133 |
| 1992 | 16 | Haugan, John | Formler og tabeller | 82-562-2483-5 | 208 | 208 |
| 1991 | 15 | **Haugan**, Kvikstad | Statistikk for bedriftsøkonomer<br>Studieveiledning og oppgaver | 82-562-2676-5 | 45 | 134 |
| 1991 | 14 | **Haugan**, Kvikstad | Statistikk for ingeniører<br>Studieveiledning og oppgaver | 82-562-2675-7 | 21 R | 138 |
| 1991 | 13 | Haugan, John | Klassisk mekanikk<br>Øvingsoppgaver og kommentarer | 82-562-2484-3 | 33 R | 110 |
| 1990 | 12 | **Haugan**, Kvikstad | Statistikk for bedriftsøkonomer<br>Studieveiledning og oppgaver | 82-562-2446-0 | 22 | 44 |
| 1990 | 11 | **Haugan**, Kvikstad | Statistikk for ingeniører<br>Studieveiledning | 82-562-2501-7 | 23 | 47 |
| 1990 | 10 | **Haugan**, Kvikstad | Statistikk for ingeniører<br>Studieveiledning | 82-562-2571-8 | 42 | 131 |
| 1990 | 9 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører<br>Fasit | 82-562-2646-3 | 9 | 35 |
| 1990 | 8 | Hallseth, **Haugan**, Hjelmen, Isnes | Fysikk for ingeniører | 82-562-2068-6 | 44 R | 769 |
| 1990 | 7 | Haugan, John | Fysikk for ingeniører<br>Klassisk mekanikk<br>Studieveiledning, eksempler, øvingsoppg. | 82-562-2561-0 | 69 | 150 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1990 | 6 | Haugan, John | Fysikk for ingeniører<br>Atom- og halvlederfysikk<br>Studieveiledning, eksempler, øvingsoppg. | 82-562-2275-1 | 44 R | 146 |
| 1989 | 5 | Haugan, John | Matematikk for bedriftsøkonomer<br>Studieveiledning, kommentarer og oppg. | 82-562-2271-9 | 25 | 25 |
| 1989 | 4 | Haugan, John | Fysikk for ingeniører<br>Klassisk mekanikk<br>Studieveiledning | 82-562-2277-8 | 81 | 81 |
| 1989 | 3 | Haugan, John | Fysikk for ingeniører<br>Atom- og halvlederfysikk<br>Studieveiledning | 82-562-2215-9 | 92 R | 140 |
| 1988 | 2 | Haugan, John | Fysikk for ingeniører<br>Atom- og halvlederfysikk<br>Studieveiledning | 82-562-2213-1 | 48 | 48 |
| 1988 | 1 | Haugan, John | Fysikk for ingeniører.<br>Atom- og halvlederfysikk | 82-562-2068-6 | 150 | 150 |

# KOMPENDIER OG NOTATER
# TEACHING MATERIAL

| Forfatter | Tittel | Utgiver | Utg. år | Sider |
|---|---|---|---|---|
| Haugan | Matematikk for studenter: Beregningsorientert matematikk | Høsgskolen i Oslo og Akershus | 2012 | 376 |
| Haugan | Inverse trigonometriske funksjoner | Høgskolen i Oslo | 2007 | 5 |
| Haugan | Delbrøkoppspalting | Høgskolen i Oslo | 2007 | 6 |
| Haugan | Asymptoter | Høgskolen i Oslo | 2007 | 6 |
| Haugan | Matematikk for forkurset | Høgskolen i Oslo | 2006 | 100 |
| Haugan | Matematikk for studenter<br>- Numerisk matematikk | Norges Informasjons-teknologiske Høgskole | 2003 | 87 |
| Haugan | Matematikk for studenter<br>- Laplacetransformasjoner | Norges Informasjons-teknologiske Høgskole | 2002 | 23 |
| Haugan | Matematikk for studenter<br>- Følger og rekker | Norges Informasjons-teknologiske Høgskole | 2002 | 29 |
| Haugan | Løsningsforslag til oppgaver i kjemi | Den Polytekniske Høgskolen | 1999 | 96 |
| Haugan | Hvordan lærer barn naturfag? | Statens utdanningskontor i Buskerud | 1997 | 15 |
| Haugan | Introduksjon til Maple V | Den Polytekniske Høgskolen | 1995 | 25 |
| Haugan | Opplæringsoppgaver i MathCAD | NKI Ingeniørhøgskolen | 1993 | 31 |
| Haugan | Atomteori, vitenskapsteori og naturfag | Universitetet i Oslo | 1992 | 15 |
| Haugan | Strukturerte studier i atom-, kjerne- og kvantefysikk | NKI Ingeniørhøgskolen | 1992 | 54 |
| Haugan | Undervisningsopplegg i atom. og halvlederfysikk og klassisk mekanikk | NKI Ingeniørhøgskolen | 1991 | 32 |
| Haugan | Vektorer | NKI Ingeniørhøgskolen | 1991 | 55 |

# OVERSIKT OVER FAGDIDAKTISKE FoU-PUBLIKASJONER

## LIST of PEDAGOGICAL R&D

1 **Haugan, John:**
*Matematikk for bedriftsøkonomer*
*Tilrettelegging av høgskolefag for fjernundervisning*
NKI Fjernundervisning 1989

2 **Haugan, John:**
*Klassisk mekanikk*
*Tilrettelegging av høgskolefag for fjernundervisning*
NKI Fjernundervisning 1989

3 **Haugan, John:**
*Atom- og halvlederfysikk*
*Tilrettelegging av høgskolefag for fjernundervisning*
NKI Fjernundervisning 1989

4 **Haugan, J., Kvikstad, T. M.:**
*Statistikk for ingeniører*
*Tilrettelegging av høgskolefag for fjernundervisning*
NKI Fjernundervisning 1990

5 **Haugan, John:**
*Vektorer.*
*Matematikk for forkurs for ingeniørhøgskolen*
NKI Ingeniørhøgskolen 1991

6 **Haugan, John:**
*Undervisningsopplegg i atom- og halvlederfysikk og klassisk mekanikk*
*Strukturering og gjennomføring av undervisning i fysikk*
NKI Ingeniørhøgskolen 1991

7 **Angell, C., Haugan, J., Isnes, A.:**
*Fysikk i naturfaget*
*- et fjernundervisningsopplegg med didaktisk refleksjon*
Utarbeiding av fagplaner og undervisningsmateriell
SLS (Universitetet i Oslo) og NKI Fjernundervisningen 1991

8 **Byrkjeland, R., Haugan, J., Isnes, A., Rekkedal, T.**
*Evaluering av Fjernundervisningsopplegget "Fysikk i naturfaget"*
Institutt for lærerutdanning og skoleutvikling UiO, NKI Fjernundervisningen 1995

9 **Haugan, John:**
*Atomteori, vitenskapsteori og naturfag.*
*Et essay om vitenskapsteoretiske og vitenskapshistoriske emner i fagplanen i naturfag*
Universitetet i Oslo, 1992

10 **Haugan, John:**
*Strukturerte studier i atom-, kjerne- og kvantefysikk.*
*Selvinstruerende materiell til bruk i forkurs for ingeniørhøgskolen*
NKI Ingeniørhøgskolen 1992

11 **Haugan, J., Haugstuen, W., Koulichev, V.:**
*Kvalitetssikring av studieplanlegging.*
NKI Ingeniørhøgskolens kvalitetssikringsmanual 1992

12 **Pedersen, B., Haugan, J.:**
*Generell kjemi*
*Studiebok for det første kjemiemnet på universitet og høyskole*
Kjemisk institutt
Universitetet i Oslo 1993

13 **Fagråd for realfag, Ingeniørutdanningsrådet:**
*Fagbeskrivelser i Matematikk I, II og III, Fysikk, Statistikk, Kjemi og miljølære*
Ingeniørutdanningsrådet 1990 - 1993
Deltatt som medarbeider

14 **Haugan, John:**
*Undervisning i elektrisitet og magnetisme.*
*Strukturering og gjennomføring av undervisning i fysikk. En metodisk veiledning for lærere.*
NKI Ingeniørhøgskolen 1993

15 **Haugan, John:**
*Studieplaner NKI Ingeniørhøgskolen, Forkurs og Årskurs 1*
*Strukturering av realfagundervisningen i treårig ingeniørutdanning i en desentralisert skolemodell. (Inngår som del av NKI Ingeniørhøgskolens studieplaner.)*
NKI Ingeniørhøgskolen 1987 - 93

16 **Haugan, John:**
*Problemorientert og prosjektorgansiert undervisning*
*Sammenlikning av to studentgrupper*
NKI Ingeniørhøgskolen 1993

17 **Ingeniørutdanningsrådet:**
*Fagplaner i matematikk for norsk ingeniørutdanning*
Ingeniørutdanningsrådet 1994
(Deltatt som medarbeider i fagplanarbeid)

18 **Fagråd for realfag, Ingeniørutdanningsrådet:**
*En ny start*
*Europeisk standard for ingeniørmatematikk*
Ingeniørutdanningsrådet 1994
(Deltatt som medarbeider)

19 **Haugan, John:**
*Mot en problembasert og prosjektorganisert undervisning i matematikkfaget i ingeniørutdanningen*
Paper presentert på Nettverkskonferansen for universitets og høgskolepedagogikk, Trondheim 7.-8. november 1994

20 **Haugan, J., Holden, G., Houge-Thiis, J.:**
*Videobasert fjernundervisning i realfag*
NKI Ingeniørhøgskolen, 1993 - 1995

21 **Haugan, John:**
*Tradisjon og forandring. Et essay om norsk ingeniørmatematikk 1984 - 1995*
SLS, Universitet i Oslo 1995

22 **Haugan, John:**
*Teaching Science for Technology at Secondary Level: A Video Based Approach*
17th World Conference for Distance Education, Birmingham, UK 1995

23 **Haugan, John:**
*Matematisk modellering og problemløsing.*
*Planlegging, gjennomføring og evaluering av et integrert studietilbud i matematikk og fysikk. Videobasert fjernundervisning*
NKI Ingeniørhøgskolen 1994 -95

24 **Kirke-, utdannings- og forskningsdepartementet**
*Plan for etterutdanning i natur- og miljølære*
KUF 1997
Deltatt som medarbeider i arbeidsgruppen

25 **Kirke-, utdannings- og forskningsdepartementet**
*Metodisk veiledning i natur- og miljøfag*
KUF 1997/1998
Deltatt som medarbeider i arbeidsgruppen

26 **Haugan, John:**
*Vurdering av studenter*
Gjennomgang og forslag til endringer av vurderingsformene ved DPH.
Den Polytekniske Høgskolen, 1998.

27 **Haugan, J., m.fl.**
*Effektivisering av vurderingsprosessen*
Den Polytekniske Høgskolen, 2000

28 **Haugan, John:**
*Fagsertifikat hydraulikk, pumpe- og ventilteknikk.*
Grunnleggende fysikk/mekanikk i væsker
Tilrettelegging av grunnleggende fysikk for fjernundervisning. Kurs for operatører i offshoresektoren og i landbasert prosessindustri.
NKI Fjernundervisning, 2001

29 **Haugan, J., m.fl.**
*Studentene skal lykkes!*
Bruk av nye undervisnings- og vurderingsformer i høgskolestudier
Norges Informasjonsteknologiske Høgskole, 2002

30 **Haugan, John:**
*Bruk av Computer Algebra Systemet Maple i matematikkundervisningen i ingeniørutdanningen.*
Utarbeiding av instruksjonsmateriell, øvingsoppgaver og demonstrasjoner i matematikk for ingeniørstudenter.
NITH 2000 – 2005.

31 **Haugan, John:**
*Improving Students' Understanding of Engineering Mathematics by Using Untraditional Assessment Methods*
International Conference on Engineering Education (ICEE), Conference Proceedings
August 18-21, 2002, Manchester, UK

32 **Haugan, John:**
*Læreplan og eksamen*
Fra Fysikkens Verden, 3/2002

33 **Haugan, John:**
*Introduksjon til Lineær Algebra med Maple 9.5*
"Lær-deg-selv"- opplegg i lineær algebra.
NITH 2005.

34 **Utdanningsdirektoratet**
*Læreplan i programfaget fysikk, Kunnskapsløftet*
Utdanningsdierktoratet, 2005 – 2006
Deltatt som leder av læreplangruppen

35 **Haugan, John:**
*Utarbeiding av detaljerte læringsmål som del av et undervisningsopplegg i matematikk for ingeniørstudenter.*
Høgskolen i Oslo, Avdeling for ingeniørutdanning, 2006 – dd

36 **Utdanningsdirektoratet / Eksamenssekretariatet**
*Eksamensoppgaver i Fysikk 3FY i videregående skole*
Deltatt i oppgavenemnd i Fysikk 3FY i videregående skole 1997 – 2008, og i Fysikk 2 i Kunnskapsløftet 2007 – 2008.

# OVERSIKT OVER TEKNISK- NATURVITENSKAPELIGE FoU-PUBLIKASJONER

## LIST of TECHNICAL AND SCIENTIFIC R&D

---

1 **Haugan:**
*Det fjerde positive båndet i karbonmonoksyd*
Hovedoppgave i fysikk
Fysisk institutt, Universitetet i Oslo, 1978

2 **Haugan:**
*A Study of the Absorption of Infrared Radiation in the Atmosphere*
FFI-E Technical Report, 1979
Forsvarets forskningsinstitutt, Kjeller

3 **Haugan:**
*Radiografi av forspent betong*
Det norske Veritas, Research Division, Technical Report 82-6604, 1982

4 **Berteig, Eriksen, Haugan:**
*ITR 2: Diagnostic Monitoring - Acoustic Emission Attenuation Studies*
Det norske Veritas, Research Division, Technical Report 82-1138, 1982

5 **Andersen, Haugan, Lahn-Johannesen, Kvernvold, Rangnes:**
*Development of a Force Transducer for Measurement of the Effect of Marine Growth on Offshore Structures*
Det norske Veritas, Research Division, Techical Report 83-1326, 1983

6 **Ansok, Berteig, Eriksen, Haugan:**
*Final Report: Diagnostic Monitoring - Acoustic Emission Attenuation Studies*
Det norske Veritas, Research Division, Technical Report 83-0560, 1983

7 **Berteig, Eriksen, Haugan:**
*ITR 3: Diagnostic Monitoring - Acoustic Emission Attenuation Studies*
Det norske Veritas, Research Division, Technical Report 83-0069, 1983

8 **Ansok, Haugan, Lilleeng:**
*Acoustic Emission Monitoring of Propylen Spheres*
Det norske Veritas, Research Division, Technical Report 83-0881, 1983

9 **Haugan:**
*Electromagnetic Acoustic Transducers*
Det norske Veritas, Field Division Norway and Iceland, Technical Report 84-6142, 1984

10 **Haugan, von Trepka:**
*Long Term Test of Ultrasonic Wheel Probe for Veritas -EAN PIG*
Det norske Veritas, Field Division Norway and Iceland, Technical Report 84-6144, 1984

11 **Haugan, Pettersen, Shi Pei Gen:**
*Performance of Radiographic and Ultrasonic Examination of Butt Welds and TK-joints*
Veritec Technical Report 85-3665, 1985

12 **Ansok, Eriksen, Haugan:**
*Akustisk emisjonsovervåkning av sprengstoffemulsjoner*
Veritec, Teknisk Rapport 85-3642, 1985

13 **Haugan:**
*Pressure Test of Moser AE Transducer*
Veritec-Technomare Moser Project, 214 - REL - A103 - I002, 1985
14 **Haugan:**
*New Design of Front Plate for Moser AE Transducer*
Veritec-Technomare Moser Project, 214 - REL - A104 - I002, 1985
15 **Bentley, Haugan, Eriksen:**
*MOSER Acoustic Emission Summary Status Report*
Veritec-Technomare Moser Project, 214 - REL - A104 - I001, 1986
16 **Førli et.al.**
A Comparison of Radiographic and Ultrasonic NDE
Nordtest Report 72-76, 1986

# EUROPEAN CURRICULUM VITAE FORMAT

## PERSONAL INFORMATION


| | |
|---|---|
| Name | **MARIBU, GEIR** |
| Address | **PORSMYRA 58, N-7091 TILLER, NORWAY** |
| Telephone | **+47 73559553** |
| Fax | **+47 73559541** |
| E-mail | **geir.maribu@hist.no** |


| | |
|---|---|
| Nationality | Norwegian |
| Date of birth | 23-04-1950 |

## WORK EXPERIENCE

| | |
|---|---|
| • Dates (from – to) | 1977-1978 |
| • Name and address of employer | *Vestvågøy secondary school, Leknes, Norway* |
| • Type of business or sector | Secondary school |
| • Occupation or position held | Lecturer |
| • Main activities and responsibilities | Teaching |
| • Dates (from – to) | 1978-1981 |
| • Name and address of employer | *Flora secondary school, Florø, Norway* |
| • Type of business or sector | Secondary school |
| • Occupation or position held | Lecturer |
| • Main activities and responsibilities | Teaching |
| • Dates (from – to) | 1981-1983 |
| • Name and address of employer | *Adolf Øien secondary school, Trondheim, Norway* |
| • Type of business or sector | Secondary school |
| • Occupation or position held | Lecturer |
| • Main activities and responsibilities | Teaching |
| • Dates (from – to) | 1983-today |
| • Name and address of employer | *Sør-Trøndelag University College* |
| • Type of business or sector | University College |
| • Occupation or position held | *Associate professor* |
| • Main activities and responsibilities | Teaching, Management of distance learning, design of learning activities using LMS-system and several internal projects about teaching and learning technology. |

## EDUCATION AND TRAINING

| | |
|---|---|
| • Dates (from – to) | 1969-1973 |

| | |
|---|---|
| • Name and type of organisation providing education and training | *Norwegian University of Science and Technology* |
| • Principal subjects/occupational skills covered | *Electrical Engineering* |
| • Title of qualification awarded | Master of Science |
| • Level in national classification (if appropriate) | |
| • Dates (from – to) | 1974-1975 |
| • Name and type of organisation providing education and training | *Norwegian University of Science and Technology* |
| • Principal subjects/occupational skills covered | Pedagogy, 90 ects |
| • Title of qualification awarded | |
| • Level in national classification (if appropriate) | |
| • Dates (from – to) | 1975-1976 |
| • Name and type of organisation providing education and training | *Norwegian University of Science and Technology* |
| • Principal subjects/occupational skills covered | Chemistry, 60 ects |
| • Title of qualification awarded | |
| • Level in national classification (if appropriate) | |

## PERSONAL SKILLS AND COMPETENCES

*Acquired in the course of life and career but not necessarily covered by formal certificates and diplomas.*

| | |
|---|---|
| MOTHER TONGUE | NORWEGIAN |
| OTHER LANGUAGES | |
| | ENGLISH |
| • Reading skills | EXCELLENT |
| • Writing skills | GOOD |
| • Verbal skills | GOOD |
| | GERMAN AND FRENCH |
| • Reading skills | BASIC |
| • Writing skills | |
| • Verbal skills | |

SOCIAL SKILLS AND COMPETENCES

*Living and working with other people, in multicultural environments, in positions where communication is important and situations where teamwork is essential (for example culture and sports), etc.*

HAVE BEEN WORKING IN FIVE EU-PROJECTS WITH PROJECT PARTICIPANTS FROM MORE THAN SIX EUROPEAN COUNTRIES.

ORGANISATIONAL SKILLS AND COMPETENCES

*Coordination and administration of people, projects and budgets; at work, in voluntary work (for example culture and sports) and at home, etc.*

**TISIP**. Board member the years 1994-2006. **Chairman of the board** from 1997-2005. Ref http://www.tisip.no/engelsk/

**Management of e-elearning at AITeL** from 1995-2010. This job is follow-up of teacher and teacher assistants, quality assurance, marketing, development of new courses and methodology for e-learning.

**PROJECTS:**

**Work Package Leader**: *WP3 Competence gaps in the project EuroCompetence (56544-CP-1-98-1-NO-ODL-ODL),* Socrates ODL.

**ITped**: Project leader for a project to increase the pedagogical use of LMS-system at Sør-Trøndelag University College. Duration: 18 months.

**Assess 2010**: Project member in a project with support fram Norgesuniversitetet to develop methods for continous assessment of students in big student classes.

**Snarfilm**: Project leader in a project with support fram Norgesuniversitetet to develop methods using small video clips as part of learning activities using small and available videocams, for example in mobile phones.

**Plab and „Utdanningskvalitetsprisen" from NOKUT**. Project leader in a local project in our departement to find new ways of doing teaching and learning by building a new class room called Plab. This room and the accompanying learning activities did give us an education prize fra NOKUT, the Norwegian organisation for quality in education. The prize was one half a million NOK.

**Several EU-projects**: I have participated in several EU-projects in e-learning from 1994 and till now. The name of these projects are: MECPOL, QUIS, MENU, DoODL, eCMS, EuroCompetence, METER, Understand IT, eLF.

**BOOKS** (all in Norwegian language):

**Internett**: A textbook of how to use the Internet, 496 pages, 1.edtion in 1996. Sixth and last edition in 2006. Publisher: TAPIR.

**Practical Linux**: A textbook of how to use Linux, 525 pages. 1.edtion 2003. Now in the third edition. Publisher: Gyldendal.

**Information technology:** Co-author of an introductory book about computer science together with five other authors. Publisher: TAPIR.

TECHNICAL SKILLS AND COMPETENCES

*With computers, specific kinds of equipment, machinery, etc.*

MASTER IN ELECTRICAL ENGINEERING. TODAY WORKING MOST WITH COMPUTERS AND THE APPLICATION OF COMPUTERS AND COMPUTING IN TEACHING AND LEARNING

ARTISTIC SKILLS AND COMPETENCES

*Music, writing, design, etc.*

[ Describe these competences and indicate where they were acquired. ]

OTHER SKILLS AND COMPETENCES

*Competences not mentioned above.*

Development of methodology and management systems for running distance learning in large scale with more than 70 courses and more than 3000 course applicants per semester.

DRIVING LICENCE(S)

car

## ADDITIONAL INFORMATION

### Publications

Co-author of all the publications and reports developed during the projects MECPOL, Do ODL, EuroCompetence, Menu and Quis. See the web sites:

MECPOL : http://www.idb.hist.no/mecpol/index.html
Do ODL: http://www.idb.hist.no/DoODL/index.html
EuroCompetence : http://www.tisip.no/ec/
Menu : http://www.hsh.no/menu/
QUIS: http://www2.tisip.no/QUIS/index.php

### Papers

Strand, K.A., Staupe, A. & Maribu G.M.: *Prescriptive Approaches for Distributed Cooperation*. In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2012 (pp. 1011-1020).

## ANNEXES

[ List any attached annexes. ]

# CV; Einar M. Hjorthol

Personalia:

- Born: January 8. 1959
- Married
- Three children (-87, -89 og -94)
- Address: Stokkanhaugen 166 7048 Trondheim
- Tlf. +47 93 20 52 12

Education:

- Phd. NTH 1990; Energy and process
- Civil engineer. NTH 1984; HVAC
- Enginer. TIH 1981; HVAC

Work experience:

| | |
|---|---|
| • Dean: Hist, Faculty of technology; 180 employees | 2011 - |
| • CEO: Microplast AS (Part ownership planned) | 2007 - 2011 |
| • CEO: Norwegian Institute for Nature Research (NINA); 170 empl. | 2004 - 2007 |
| • Factory director: Peterson Linerboard AS, Ranheim; 150 empl. | 2000 – 2004 |
| • Factory manager: Peterson Linerboard AS, Ranheim | 1997 – 2000 |
| • Technical manager: Peterson Ranheim AS | 1994 – 1997 |
| • Consultant engineer: Protech; part time | 1992 – 1994 |
| • Senior research scientist: Sintef Energy | 1990 – 1994 |
| • Scolarship holder: Sintef Energy | 1986 – 1990 |
| • Consultant engineer: Gjettum AS | 1985 – 1986 |

Various:

- Chairman of the board: NCEI
- Board member: Molga, (Mid-Norway oil and gas)
- Board member: Maske-group
- Board member: Alupro-N
- Board member: R-group; network of leaders in Trondheim
- Several courses within management and economics
- Arbitrator CSK football, junior
- Practise running
- Like fiddling with practical things

# CURRICULUM VITAE

**Name:** Carsten Gunnar Helgesen
**Birth date:** 24. April 1956
**Nationality:** Norwegian
**Family:** Married, one child.

## Education

1983 Cand. Real. (M.Sc.) Mathematics (coding theory), University of Bergen, Norway.
1988 M.Sc. Knowledge Based Systems, Heriot-Watt University, Edinburgh, UK.
1994 Dr. Scient (Ph.D.), Informatics (bioinformatics), University of Bergen, Norway.

## Working experience

1978-83 Teaching assistant (part time), Department of Mathematics, University of Bergen.
Taught exercise classes in linear algebra and mathematical analysis.

1983-84 Research assistant, Chr.Michelsens Institute, Bergen.
1984-90 Scientist, Chr.Michelsens Institute.
Leave of absence to study in Edinburgh 1987-88.
Worked in the Department of Petroleum Economics, developing decision support systems for the oil industry and the government.
Themes: Economic models, reservoir models, simulation, optimisation, data modelling, user interfaces.

1989 Part time lecturer, Bergen College of Engineering (Bergen Ingeniørhøgskole).
Invited part time lecturer, teaching Expert Systems.

1990-94 Research Associate, Department of Informatics, University of Bergen.
Prepared a doctoral thesis on bioinformatics.
Themes: Sequence analysis, pattern description and search, string search algorithms.
Teaching duties: Introductory programming (Pascal), declarative programming (Lisp, Scheme, Prolog), data modelling (ER, Niam), databases (SQL, Ingres).

1994-96 Associate Professor, Bergen University College (Høgskolen i Bergen), Department of Computing.
Teaching duties: Relational databases, SQL, data modelling, file structures, object oriented programming, logic programming. Supervision of final year student projects.

Summer 1995 Visiting Scientist at European Molecular Biology Laboratory, Outstation Hinxton – The European Bioinformatics Institute (EBI), Cambridge, UK.

Theme: Measuring diversity in sets of biological sequences.

1996-98 Visiting Scientist at European Molecular Biology Laboratory, Outstation Hinxton – The European Bioinformatics Institute (EBI), Cambridge, UK.

| | |
|---|---|
| | Themes: Biological databases, object modelling, UML, Rational Rose, distributed objects, CORBA, Oracle RDBMS, database middleware (Persistance), object relational databases (Illustra), object oriented database (Object Store). |
| Spring 1998 | Scientist at Department of Informatics, University of Bergen.<br>Participated in the bioinformatics research group. Gave a seminar series on databases in molecular biology. Supervision of M.Sc student projects. |
| 1998-2001 | Senior Consultant at Cap Gemini, Bergen.<br>Main responsibilities: Data modelling, database implementation, object oriented analysis and design, object oriented programming, data warehousing. |
| 1984-90 | External examiner in mathematics and informatics, University of Bergen.<br>Mainly oral course examination. |
| 1994- | External examiner in information science, University of Bergen.<br>Mainly examining Cand.Polit. and Master theses. |
| 1994- | External examiner in informatics, University of Bergen.<br>Mainly covering the bioinformatics area, both courses and Cand.Scient and Master theses. |
| 2002-2007 | Associate Professor at Bergen University College (Høgskolen i Bergen), Department of Computing.<br>Teaching duties: Object oriented analysis and design, software engineering, databases, programming. Supervising Bachelor student projects and Master student projects. |
| 2005-2007 | Head, Department of Computing, mathematics and physics at Bergen University College (Høgskolen i Bergen). |
| 2007-2011 | Pro-rector for Academic Affairs at Bergen University College. Responsibilities: Education, quality, internationalisation. |
| 2011-present | Head, Department of Computing, mathematics and physics at Bergen University College (Høgskolen i Bergen). |

## Projects

Chr. Michelsens Institute, Bergen. 1983-1990

- Design and implementation of a system for analysing uncertainty in oil production profiles.
- Design and implementation of two different systems for planning optimal development of oil fields.

Bergen University, Department of informatics, 1990-1994

- Doctoral Thesis: "Approximate Pattern Matching: Algorithms and Applications in Molecular Biology".

The European Bioinformatics Institute (EBI), Cambridge, UK, 1995-1998

- Measuring diversity in sets of biological sequences.
  Joint work with Desmond Higgins, EBI and Inge Jonassen, UiB.

- Design and implementation of a CORBA server for the Radiation Hybrid Database (RHdb).
  Joint work with colleagues at EBI.

- Design of a CORBA server for the EMBL nucleotide database.
  Joint work with colleagues at EBI.

- Designing a proposal for a standard Corba interface for genome maps.
  Joint work with colleagues at EBI and InfoBiogen, France.

- Organising and teaching workshop: "Database Technologies" for EBI Industry Partners.
  Joint work with Philip Lijnzaad and Patricia Rodriguez-Tomé, EBI

- Organising and teaching workshop "Introduction to UML" for EBI Industry Partners.
  Joint work with Philip Lijnzaad, EBI.

Cap Gemini Ernst & Young, 1998-2002

- Developed and taught a 2 days internal course on UML.

- Participated in internal workshop series on Data Warehousing (4 months).

- Developed and taught an internal workshop on IT architecture.

- Design and implementation of components in a new network management system for a major telecom vendor.
  Methods: Object oriented design - UML.
  Interfaces - CORBA IDL.
  Tools: CORBA; Oracle

- Several development projects for a large financial institution, jointly with colleagues:
  - Technological and organisational audit of a major database system.
  - Developing an Internet Banking application (Nettbank).
    Tools: Java; Sybase; IBM MQSeries
  - Developing internal infrastructure to handle electronic billing (eFaktura). Tools: Java.

- Developing plug-in components for secure authentication (logon). Tools: Java; Enterprise Java Beans; Sybase.
- Developing concepts and object model for a new authorization system. Method: Object oriented modelling using UML.

Bergen University College (Høgskolen i Bergen), 2002 -

- Design of conceptual model and database schema for CHRAB, a database system for protein data.
  Joint work with Professor Rein Aasland and others at Dept of Molecular Biology, Bergen University.

- Analysis of micro-array data.
  Joint work with Associate Professor Alvhild Bjørkum, Dept of Chemistry – Biomedical Laboratory Sciences Programme, and 2 exchange students from IT Carlow, Ireland.

## Teaching experience, details

1978-1983 Teaching assistant, University of Bergen, Department of Mathematics.
Gave exercise classes in the following courses:
- Mathematical analysis
- Linear algebra

1989 Part time lecturer, Bergen College, Department of Computing.
Gave lecturing and practical exercises in the following course:
- Expert systems and Logic programming (Prolog).

1990-94 Research Associate, University of Bergen, Department of Informatics.
Responsible for arranging all practical exercise work for the following courses:
- I110: Introduction to programming (Pascal)
- I123: Declarative programming (Scheme, Prolog)
- I126: Data modeling and databases (NIAM, ER, Ingres).
  Responsible for developing all practical exercises the first 2 times this course was held.

1994-96 Associate Professor, Bergen University College, Department of Computing.
Lecturing and giving all practical exercises in the following topics:
- Relational databases and data modelling (Oracle, ER, EER, NIAM).
- File structures and databases (Access, SQL, Oracle).
- Object oriented programming in C++.
- Logic programming (Prolog).

1996-98 Visiting Scientist, European Bioinformatics Institute, Cambridge:
Lecturer and committee member for the following international workshops:

- Oct 1996: "Workshop on Database Technologies"
  Giving lecture: "Object oriented concepts and databases"

- Sept 1998: "Workshop on Object modelling using UML"
  Invited to give a 2 days workshop on object oriented analysis and design using UML.

1998-2001 Senior Consultant, Cap Gemini Norway

- Developed internal 2 days course: "Object modelling using UML".
  The workshop was given in October 1998 and March 2000.

2002- Associate Professor, Bergen University College, Department of Computing.
Teaching the following topics:

- Object oriented analysis and design using UML and the Unified Process.

- Systems analysis and design for further education course for health care workers. Video lectures.

- Lectures on systems development and project work for preparation to final year projects for 3rd year students.

- Databases and database development tools.

2003 Invited lecturer (part time) at Bergen University

Spring: Department of Informatics
- Teaching ½ of a course on basic methods in bioinformatics.

Autumn: Department of Information sciences
- Teaching 1/3 of a course on database management systems

## Thesis and Project Supervision

Cand. Scient and Master theses

1. Linda Akselberg: "Parallel multiple alignment of biological sequences" (in Norwegian). In cooperation with Ingvar Eidhammer, UiB. Degree granted in 1992.

2. Idar Hareide: "Approximate matching of context free patterns" (in Norwegian)
   In cooperation with Ingvar Eidhammer, UiB. Degree granted in 1994.

3. Roald Andresen: "Implementing ProFam: A database of protein families".
   In cooperation with Khalid Mughal, UiB. The candidate cancelled the project in 1996.

4. Trond Hellem Bø: "A divide and conquer approach to the radiation hybrid mapping problem".

In cooperation with Ingvar Eidhammer, UiB and Panos Deloukas, The Sanger Center, Cambridge. Degree granted in June 1999.

5. Inger-Anne Wicklund: "On querying of data sources distributed by means of CORBA". In cooperation with Khalid Mughal, UiB. Degree granted June 2000.

6. Hussam Ahmad: "A new architecture based on .NET for the DelfiDoc document management system".
In cooperation with Ingvar Eidhammer, UiB. Degree granted May 2003.

7. Knut Syed: "An implementation of the PALM pattern language".
In cooperation with Khalid Mughal, UiB. Degree granted March 2005.

8. Kjetil Haaland: "Using external analysis tools in a relational database of biological data".
In cooperation with Ingvar Eidhammer, UiB. Degree granted June 2005

9. Thomas Amble: "A message management system for mobile communication".
HiB Master programme in cooperation with UiB. Degree granted June 2006

10. Per Henrik Larsen: "Managing large measurement databases".
HiB Master programme in cooperation with UiB. Degree planned for October 2006

11. Annett Franke: "Implementation, Optimization and Comparison of Algortihms for Tree Decomposition on Graphs".
In cooperation with Professor Peter Tittmann, Hochschule Mittweida. Degree granted January 2008.

12. Stian Rørlien: "Gasslogistikk – LiquiSys".
In cooperation with Lars-Petter Helland, HiB and the company Liquiline. Degree granted June 2008.

13. Eziz Annagurban: "Automating Exam Management at Bergen University College".
In cooperation with Sven Olai Høyland, HiB. Degree granted June 2009.

14. Goran M Zangana: "Dynamic web-based visualisation of ocean model data".
In cooperation with Torill Hamre and Laurent Bertino, Nansen Environmental and Remote Sensing Center. Degree granted June 2009.

15. Trond Gjertsen: "Scientific Workflow Management Systems".
In cooperation with Pål Puntervold, Bergen University. Degree granted June 2009.

16. Andreas Lien Olsen and Vegard Gillestad: "Fleirmodulsystem for prosjektstyring med tenesteorientert arkitektur " (in Norwegian).
In cooperation with Pål Puntervold, Uni Research. Degree granted June 2009.

Bachelor Projects (Final Year Projects)

Helgesen

- Supervised more than 20 groups of students having final year project in private industry, both during 1994-96 and 2002-2007.

Final Year Projects initiated by myself:

- Kristian Sturzrehm: "A Web interface to the SwissProt and Prosite protein databases". "Diplomarbeit" for exchange student from Stralsund Fachhochschuhle, Germany. In cooperation with Professor Josef Mayer-Fujara, Stralsund Fachhochschuhle. Degree granted in August 1996.

- Hege Andersen and Rune Madsen: "A formatting tool for Radiation Hybrid data". Exchange students from Bergen University College, at EBI during spring 1997. In cooperation with Dr Patricia Rodriguez-Tome, EBI. Degree granted in June 1997.

**Administration experience**

| | |
|---|---|
| 1978-93 | Member of the Board of Bergen International Folk Dance Festival, arranging biannual folk dance festivals in Bergen. Responsible for finances and public relations 1990-1993. |
| 1979-81 | Student representative at the Board of Department of Mathematics, UiB. |
| 1987-88 | Student representative at the Board of the MSc Programme, Department of Computer Science, Heriot-Watt University, Edinburgh. |
| 1998-2002 | Member of the Board of Midttun Skoles Musikkorps (Primary School Brass band). Board leader 2001-2002. |
| 2000-01 | Member of the Board of the local chapter of Tekna (The Norwegian Society of Chartered Technical and Scientific Professionals) at Cap Gemini Ernst & Young. Member of the Pay Negotiation Board 2001. |
| 2003 | Member of the Organising Committee of Scandinavian Conference of Artificial Intelligence (SCAI03), in cooperation with Department of Information Science, Bergen University. |
| 2005-2007 | Head of Department, Computing, Faculty of Engineering, Bergen University College. |
| 2007-2011 | Pro-rector for Academic Affairs, Bergen University College. |
| 2008-2012 | Board Member, Norway Opening Universities (Norgesuniversitetet). |
| 2007-2011 | Chair of the National Erasmus Committee (Erasmusutvalget), The Norwegian Centre for International Cooperation in Higher Education (SIU). |
| 2007-2011 | Vice Member of the Education Committee (Utdanningsutvalget), The Norwegian Association of Higher Education Institutions (UHR). |

2011-present Head of Department of Computing, mathematics and physics at Bergen University College (Høgskolen i Bergen).

## Professional skills and interests

Object oriented analysis and design (UML, Unified Process), project management (in particular using object oriented development methods), software engineering, software testing, XML, IT architecture.
Data modelling (ER, EER, ORM, OMT, UML), databases and database design, database query languages, declarative programming.
Approximate pattern matching, biological data and databases.

## Personal interests

Architecture, antiques, restoration, carpentry, upholstery, garden work. International contacts and travel.

## Languages

Norwegian: Mother tongue.
English: Fluently, both written and spoken.
German: Reasonably well, written and spoken.

# Bjørn Klefstad
# Curriculum Vitae

## Personal Information


| | |
|---|---|
| Name: | Bjørn Klefstad |
| Born: | 26. march 1969 |
| E-Mail: | bjorn.klefstad@hist.no |
| Phone: | 0047 41 63 62 01 |
| Position: | Assistant Professor |
| Work place: | Sør-Trøndelag University College – Faculty of Informatics and e-learning |
| Language: | Norwegian and English |


## Profile

Master of Science degree in mathematics. 16 years of experience as an Assistant Professor in the Faculty of Informatics and e-learning at Sør-Trøndelag University College. I have experience in teaching in many different disciplines within informatics: Project Management, Data Communications, Programming in Java, Programming in C + +, System Management, Communication Standards, Network Technologies and Standards, Information Management, e-commerce, Information management security system, Local Information Services, Internet and Security, ITIL version 3 and Guidance of different student projects. Several of these subjects have also been taught as online courses on the Internet.
16 years of experience from various projects, courses and teaching assignments at TISIP. Various online and campus courses. Understand IT – business models and teaching online after the VITAE method. The SLANK project - a lecture on e-learning on the Fosen study center and Nærøy college. in Rørvik. Nettbasert uppdragsutbildning (NU) - an inter-regional project to develop, test, document and present a model for net-based skills development. Partners were Sor-Trøndelag University college, Nord-Trøndelag University College and Middle Sweden University. Responsible for the course for EUCIP Core Level - Module Build. A web-based course that ends with a certification test. Development of an enterprise custom e-learning scheme for Animalia. Development of a demo of an enterprise custom e-learning plan for Aker Kvaerner MH. Translating the content of FITS from English to Norwegian. 2 years experience of teaching in high school.

## Key qulifications and competence

Teaching related to various topics in computer science at college level within the areas of programming, data communications and security. Teaching both online courses and on campus. See profile.

# Bjørn Klefstad
# Curriculum Vitae

## Work experience

HiST/AITeL, Assistant Professor
1997 -
Development and implementation of teaching plans in various ICT courses at the college level.
TISIP
1997 -
Various projects, courses and teaching assignments at TISIP.

## Education

| | |
|---|---|
| Lecturer - Practical Pedagogical Education part II at NTNU | 1996 |
| M. Sc. in Mathematics at the University of Trondheim | 1995 |
| Cand. Mag. in Mathematics and Informatics at the University of Trondheim | 1994 |

## Publications

"An integrated multimedia e-learning model for vocational training" Arne B. Mikalsen, Bjørn Klefstad, Svend Andreas Horgen, Thorleif Hjeltnes. Published on Networked Learning Conference 2008 in Greece

"Introduction to Data Communications" Øyvind Hallsteinsen, Bjørn Klefstad and Olav Skundberg. Published on Gyldendal Akademisk and Tisip publishing. ISBN 82-05-34689-5

"EUCIP Core Level - Module Build " Tore Berg Hansen, Kjell Toft Hansen, Bjørn Klefstad, Grethe Sandstrak and Stein Meisingseth. Published on Tisip publishing ISBN 82-8055-010-0

"EUCIP Core Level - Module Operate" Geir Ove Rosvold, Geir Maribu, Per Borgesen, Øyvind Hallsteinsen, Olav Skundberg, Greta Hjertø and Bjørn Klefstad. Published on Tisip publishing. ISBN 82-8055-011-9

"Courses for the use of Lego Mindstorm ROBOLAB and object-oriented programming in a project subject" Grethe Sandstrak and Bjorn Klefstad. HiST/AITeL Report No. 2 ISBN 82-7877-101-4

"Experiences with the use of Lego Mindstorm ROBOLAB and object-oriented programming in a project subject" Grethe Sandstrak and Bjorn Klefstad. HiST/AITeL Report No. 1 ISBN 82-7877-100-6"