

**FRIDAY SEMINAR**

**2014-12-05**

***Remote Laboratories’ Integration into MOOCs***

10:00 – 12:00 am

*KTH Main Campus*

*Industriell Produktion – IIP*

*Brinellvägen 68, 114 28*

*Room M311(separate map attached)*

Well educated people is a necessity for our future development.
However, mass education creates pedagogical and logistic problems.
Today there are about the same number of PhD students in Swedish higher education as the number of high school student at the end of the 50's. Still there is a need for a large education growth in many countries.
In the 60's and the beginning of the 70's it was still possible to devote much of the tertiary science education to hands-on laboratory work but with the drastic growth of students, cost, lack of premise spaces and also other curricula demands, lab work has been minimized.
Also need of teaching faculties and instructors is an obstacle in a mass education society.
Well designed internet use can make the education logistically more effective and pedagogically more efficient.
This seminar will give some examples of use of remote internet connected laboratories and their possible integration to Massive Open Online Courses (MOOCs).

Program

10.00 Welcome: Amir Rashid and Göran Karlsson

10.05 Lars Håkansson, Applied Signal Processing, Blekinge Technical University (BTH):

 How to Maintain and Extend Laboratory Experiments in Swedish Engineering Education - The VISIR Laboratory?

10.30 Ingvar Gustavsson, BTH: A Remote Laboratory, VISIR, for MOOCs

10.55 Kristian Nilsson, BTH: New and Extended Areas for the VISIR laboratory

11.20 Gunnar Karlsson, Lab for Communication Networks (KTH): Books or MOOCs: Whither the University?

Göran Karlsson

Biography Göran Karlsson:

Göran Karlsson received his PhD in Quantum Chemistry at University of Uppsala 1970 and a Teaching Certificate in Mathematics and Physics at College of Education, Uppsala 1971.

He was a Post Doc at Northeastern University, Boston, Mass., USA and at University of Guelph, Ont., Canada 1971 and then Research Associate in Theoretical Physics, Univ. of Lund 1972.
After a year as high school lecturer in Mathematics he joined KTH as Associate Professor in Mechanics 1973 having this position until retirement 2008.
Meanwhile he was Associate Professor in Theoretical Physics at University of Uppsala, 1975-1979 and Director Center for Educational Research, KTH, 1979-1983.

He has organized several conferences and served at program committees of several conferences in eLearning, Distance Education and Net Based Learning.

He was chairman for the “Nordic Conference on Computer Aided Higher Education” at KTH, Stockholm 1987-06-02—05 (the first conference of this type in Sweden) and then chairman for the “Nordic Forum for Computer Higher Education” 1988-1990.
He visited Stanford University and Open University, UK several times during the 80's, 90's and 00's. From mid 90's until a two years ago he was involved in several EU projects with particularly UK, France, Lithuania, Romania, and Moldova on assessment of higher education, university structure organization, accreditation of eLearning, and distance learning. He has also been responsible and/or taught several university distance courses in physics, mechanics, and distance education concept (*per se*) inside Sweden and to Uruguay and New Zealand.



Lars Håkansson

“How to Maintain and Extend Laboratory Experiments in Swedish Engineering Education - The VISIR Laboratory?”

Abstract:

During centuries scientists have performed physical experiments in order to verify and test theories and create adequate mathematical models, describing reality well enough. Such experiments are the only way to “communicate” with nature and to learn its principles, often quite revealing. Only recently, it has become clear that mankind must live in symbiosis with nature and focus on sustainability and understanding. Thus, the demand for experimenters will increase. However, during recent decades the amount of hands-on laboratory work, for example, in engineering education has diminished! From some of my experiences of research in areas such as Signal Analysis, Adaptive Signal Processing, Active Noise and Vibration Control, Automatic Control, Analytical and Experimental Modelling of Mechanical and Acoustic Systems and Remotely Controlled Laboratories the capabilities and possibilities of the VISIR laboratory to maintain and extend laboratory experiments in Swedish engineering education will be discussed.

Biografi:

Lars Håkansson received the M.Sc. degree in Electrical Engineering from Lund University of Technology, Lund, Sweden, and the Ph.D. degree, in Mechanical Engineering from Lund University of Technology, Lund, Sweden, in 1989 and 1999, respectively. He joined Blekinge Institute of Technology (BTH) and was appointed Senior Lecturer in Electrical Engineering and continued to expand his research within the area of noise and vibration control. In 2005 he was appointed associate professor and received the responsibility, as principal researcher and advisor, for the active control group at the Department of Signal Processing, BTH. Dr. Håkansson is a professor at the department of Applied Signal Processing, at BTH. His current research interests are in Signal Analysis, Signal Processing, Condition Monitoring, Active Noise and Vibration Control, Automatic Control, Remotely Controlled Laboratories, Analytical and Experimental Modelling of Mechanical and Acoustic Systems. He has a keen interest in developing new technology and his research is generally in collaboration with industry, which has resulted in several patents. Lars Håkansson is a Director of the International Institute of Acoustics and Vibration, a member of the Scandinavian vibration association (SVIB), a member of the Editorial Board of the Journal of Advances in Acoustics and a member of the Editorial Board of Vibration and Journal Low Frequency Noise, Vibration and Active Control.



Ingvar Gustavsson

“A Remote Laboratory, VISIR, for MOOCs.”

Abstract:

When students, especially undergraduates, perform physical experiments, it is typically not to extract some data necessary for a design, to evaluate a new device, or to discover a new addition to our knowledge of nature. Students attend laboratory sessions and perform experiments to acquire laboratory workmanship and to ascertain that models taught are useful predictors of real-world behaviors. Unfortunately, the number of sessions in hands-on laboratories offered at most universities around the world has been reduced during the last decades. The prime cause for the decline in laboratory work is clearly the task of coping with greatly increased student numbers, while staff and funding resources have scarcely changed. Nowadays, most engineering courses focus on theories and mathematical models. Students use simulators to become familiar with them but simulation cannot replace physical experiments if the intention is probing how accurate a model describes a particular phenomenon in nature. In fact, students need heavy laboratory practice to become engineers that are able to design goods and services, which are in tune with nature. Furthermore, today students want extended access to learning resources and increased freedom to organize their own learning activities, which is also one of the main objectives of the Bologna Process. I will discuss a solution enabling universities to deliver engineers compatible with a sustainable society.

Short bio:

Ingvar Gustavsson received the M.S.E.E. and Dr. Sc. degrees in electrical engineering from the Royal Institute of Technology (KTH), Stockholm, in 1967 and 1974, respectively. After completing his military service in 1968, he worked as a DEVELOPMENT ENGINEER at Jungner Instrument AB in Stockholm. In 1970, he joined the computer vision project SYDAT at the Instrumentation Laboratory, KTH. In 1982, he was appointed the head of the Instrumentation Laboratory. Together with another research scientist, he founded a private company providing automatic inspection systems for industrial customers in 1983. In 1994, he returned to the academic world to take up his current position as ASSOCIATE PROFESSOR of electronics and measurement technology at Blekinge Institute of Technology (BTH), Sweden. In 1999, he started a remote lab project at BTH that today is known as VISIR (Virtual Instrument Systems in Reality). He partly retired from office 2012 to be able to concentrate on activities related to VISIR. His research interests are in the areas of instrumentation, remote labs, industrial electronics, and distance learning. Dr. Gustavsson has resigned membership of international committees but he is still a member of the IEEE and of Swedish professional societies.



Kristian Nilsson

"New and Extended Areas for the VISIR laboratory."

Abstract:

during the last decades the amount of physical experiments, for example in engineering education, has successively been reduced. The number of students per course has increased without a related increase in the funding for staff and laboratory equipment. Faster and more flexible network connections have opened doors for so called remote laboratories offering physical experiments operated from a remote location. Today we at BTH have 5 of them up and running, and we are constant looking for new areas or applications where this knowledge can be applied. We have started to investigate condition baste monitoring in the area of rotating machinery for example wind mills or excavators and in the area of health monitoring of buildings and there residents for example in the care of elderly people. In a collaboration with Katedralskolan in Lund we have develop remote laboratories to meet there demands and challengers.

Bio:

Kristian Nilsson received the MSEE degree from Blekinge Institute of Technology, Ronneby, Sweden, in 2007. He started his PhD studies at Blekinge Institute of Technology in 2009 focusing on remote engineering in the filed of electronics and signal processing, he defended his licentiate in 2014 with the title of "Development and evaluation of OpenLabs and the VISIR open electronics lab and radio signal laboratory for education purpose". He is currently with exploring new areas where remote engineering and remote condition measurements can be of interest both for students and for company's. His research interests are in distance learning, remote labs, electronics, and signal processing.



Gunnar Karlsson

“Books or MOOCs: Whither the University? “

Abstract:

Education is now undergoing its internet revolution with online instruction, machine-graded tests and advanced data analytics of study habits and performance. It is interesting to think about the changes that may come from the advanced technology now becoming increasingly used. Lower level education is still dependent on teachers for motivation, guidance and authority, but the higher the level, the more the students can assume responsibility of their own learning. Hence, the changes to higher education are particularly interesting to observe. What will happen with undergraduate and graduate university education? Will massive open online courses, taught by star faculty, eliminate the need for research trained faculty at the universities; leaving only the role of teaching assistants for coaching the students. Or will the students go to other organizations for education? I will give a brief outlook on some possible developments with a few suggestions that may be implemented at a research university, such as KTH.

Biography:
Gunnar Karlsson is professor of KTH and director of the Laboratory for Communication Networks. He has previously worked for IBM Zurich Research Laboratory and the Swedish Institute of Computer Science. His Ph.D. is from Columbia University, New York, and his M.Sc. from Chalmers University of Technology in Gothenburg, Sweden. He has been visiting professor at EPFL, the Helsinki University of Technology (now Aalto Univ.), and ETH Zurich in Switzerland. His research relates to the Internet and mobile communication. He is active in raising awareness of online education, and promoting its use for improved teaching at the School of Electrical Engineering.



Brinellvägen 68 is at the very upper part of the map in the middle (at the end of Brinellvägen)

Enter through the entrance and then proceed straight on until the stairs a little to the right hand of the corridor. Room 311 is then upstairs to left.

