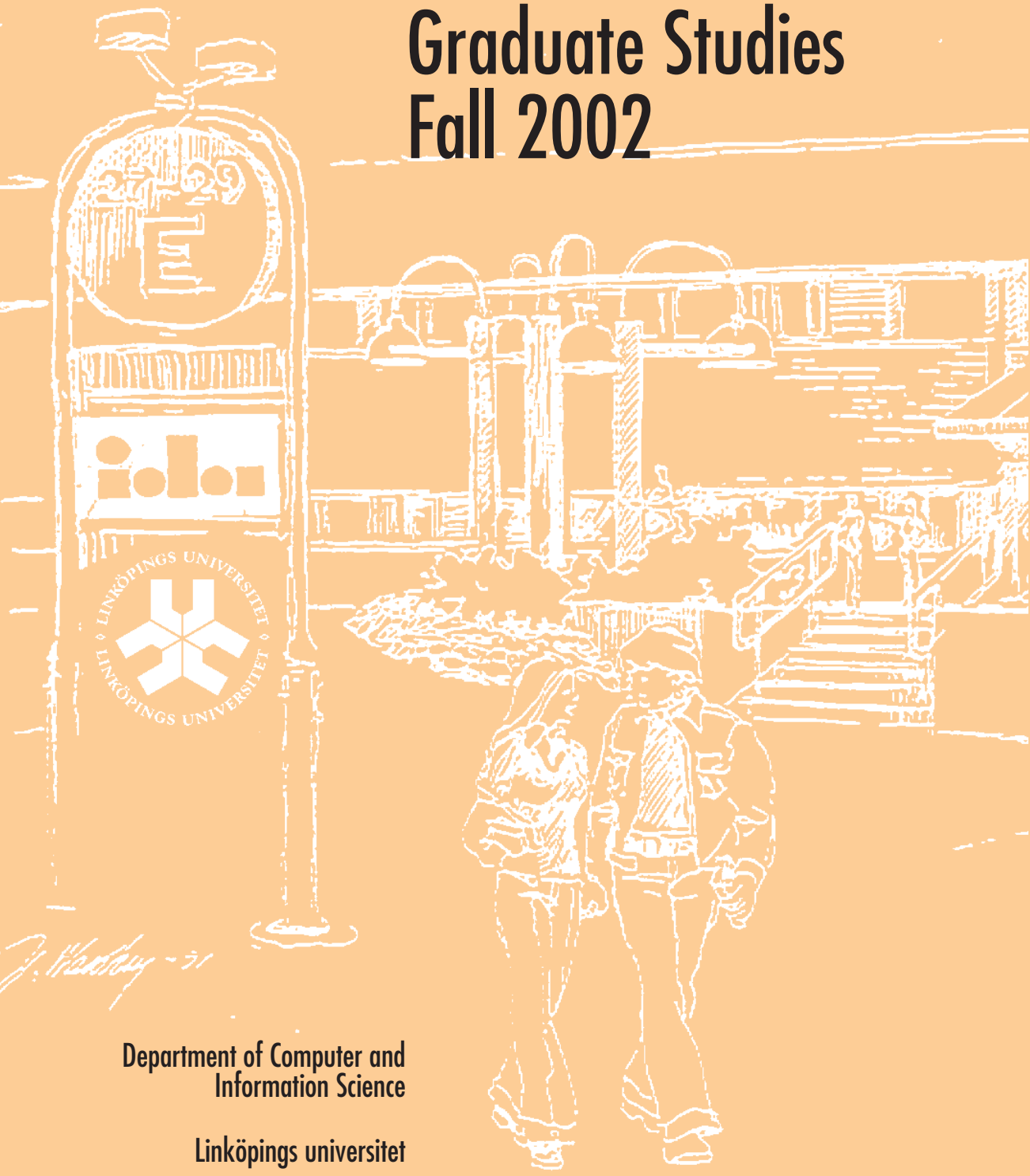
Graduate Studies
Fall 2002



Department of Computer and
Information Science

Linköpings universitet

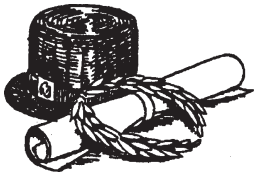
International Graduate School in Computer Science

The Computer Science Graduate School is aimed at both industry and the academic world and covers the following subject areas:

*** Cognitive Systems**
*** Computer Science**
*** Computer Systems**
*** Information Science and Media**
*** Computational Linguistics**
*** Economic Information systems**
*** Information Systems Development**
*** Engineering Information Systems**

The department hosts a National Graduate School in Computer Science, CUGS, with participation from Örebro University, Mälardalen University, Skövde University, Jönköping University and others. This school gradually started its operation during the academic year 2000-2001. In addition, research groups and doctoral students participate in other national graduate schools, for instance in Langauage Technology and in the area of Management and Information Technology.The Department also runs an Industry Research School, as a special programme funded by The Foundation for Knowledge and Competence Development, and participates in the graduate schools Excellence Center in Computer and Systems Engineering (ECSEL), Graduate School for Human-Machine Interaction (HMI) and International Graduate School of Management and Industrial Engineering (IMIE). The research environment is strongly influenced by cooperation at both departmental and international levels and the department is regularly visited by guest professors and graduate students from international study programs. The aims of the graduate school are the following:

- The graduate school emphasizes the value of an integrated course of education in an area of importance for Swedish industry.The aim is to provide the student with broad competence. On completion of studies the student will have deep insights into his or her area of study as well as being well-oriented in the state of the art in related fields.
- The department has 5 divisions and 12 research laboratories and all graduate students belong to one of these. This provides an environment where the student, supported by advisors, formulates and produces his or her thesis as part of the requirements.
- In addition to a main advisor each graduate student has two deputy advisors. The advisory group can provide the student with a wider range of support than is possible with just one advisor.
- The course-work pursued is of central importance in gaining broad competence. The department offers a well-established program of about 30 courses per year. These are often of an interdisciplinary character, thus the range is not limited to the student's particular lab, but is of relevance to the department as a whole. In addition to courses of a more "technical" nature, others are given in research methodology, scientific writing, presentation technique and ethics. Each laboratory also runs courses specific to its range of interests.
- As a consequence the study program promotes communication between students pursuing different interests. Seminar series, graduate student conferences, information and assessment meetings also stimulate collaboration. Methods of continually assessing progress and results and proposing improvements to achieve this end are considered essential.
- In addition to traditional graduate studies the aims of the department have for many years included the further education of teachers and graduate students at regional University Colleges, as well as continuing education for applicants from industry.



Further information concerning the Graduate School of Computer and Information Science can be obtained from
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Phone: +46 13281480 (281000) •Telefax +46 13142231•Internet:lew@ida.liu.se

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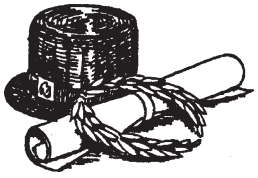

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Department of Computer and
Information Science

LINKÖPINGS UNIVERSITET

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Contents

Graduate Courses Fall 2002

Course	Aug	Sept	Oct	Nov	Dec	Day	Time	Place
Kod: FDA124 Activity Theory, developmental work research, and information systems development Sofie Pilemalm, Toomas Timpka, Vivian Vimarlund 5 p Graduate school: CIS				Starts Nov 21	Continue Jan 16, 23 and 30, 2003	Thursday	10-12	IDA
Kod: FDA026 Avhandlingsseminarier Stefan Cronholm 3 p Graduate school: CIS		Sept 6	Oct 10	Nov 7	Dec 12		09.00-12.40	IDA
Kod: FDA126 Aspects of Scientific Writing Erik Hollnagel 3p Graduate school: CIS			Starts Oct 10	Ends Nov 7		Thursday	14-17	IDA
Kod: FDA089 Business Modelling i teori och praktik Birger Rapp, Anders G Nilsson Upp till 5 p Graduate school: CIS	Scheduled later							
Kod: FDA127 Communication Juha Takkinen 3p Graduate school: CUGS							Crash course	External location

Graduate Courses Fall 2002

Course	Aug	Sept	Oct	Nov	Dec	Day	Time	Place
Kod: FDA128 Computation II Peter Jonsson 2,5 p Graduate school: CUGS							Crash course	External location
Kod: FDA129 Database Systems Nahid Shahmehri, Patrick Lambrix 3 p Graduate school: CUGS							Crash course	External location
Kod: FDA030 Ethics in the Age of Information Technology Göran Collste 3-5 p Graduate school: CIS		Starts Sept 18	Ends Oct 30			Wednesday FDA	13FDA032, FDA143-16	IDA
Kod: FDA130 Formal Modeling and Verification for Real-Time Systems Petru Eles, Zebo Peng, Marius Minea 6 p Graduate school: CIS				Week 46, 47	Continue 3 weeks in Febr 2003		Crash course	IDA
Kod: FDA066 Human Factors Research Methodology and Field Experimentation (HMI 503) Fang Chen, Kjell Ohlsson 5 p Graduate school: HMI/IKP								IKP

Graduate Courses Fall 2002

Course	Aug	Sept	Oct	Nov	Dec	Day	Time	Place
Kod: FDA132 Introduction to Human Factors Engineering (HMI 606) Sidney Dekker 5 p Graduate school: HMI/IKP								IKP
Kod: FDA078 Inter-organisatorisk samverkan och elektroniska affärer Ulf Melin 3 p Graduate school: CIS			Oct 29, 31	Nov 5, 11, 12, 15, 20 Final seminar as agreed				IDA
Kod: FDA133 Introduction to Machine Learning for Data Mining Patrick Doherty 5 p Graduate school: CUGS						Three two day session.	Crash course	IDA
Kod: FDA012 Introduction to Research Methodology in Computer Science Sture Hägglund 3 + 2 p Graduate school: CIS		Starts Sept 26		Ends Nov 14		Thursday	10-12	IDA

Graduate Courses Fall 2002

Course	Aug	Sept	Oct	Nov	Dec	Day	Time	Place
Kod: FDA015 Object Oriented Languages for Dynamic Systems with Modelica Peter Fritzson, Torkel Glad 3 p Graduate school: ECSEL			Starts Oct 28		Ends Dec 16	Monday	9-12	IDA
Kod: FDA135 Perspektiv på forskning och vetenskap Birger Rapp, Lars Engwall 5 p Graduate school: M.I.T.	Scheduled later							
Kod: FDA090 Play & Designing Media for Participation Kevin McGee Graduate scholl: HMI		Starts Sept 11	Ends Oct 30			Wednesday	10-12	IDA
Kod: FDA019 Presentation Technique Ingela Dellby 3p Graduate school: CIS		Starts Sept 10	Ends Oct 11			Tuesday Friday	09.15-12.15	IDA
Kod: FDA131 Research preparation course in GeoInformatics Åke Sivertun, Erland Jungert, Michael LeDuc 5p Graduate school: CIS		Sept 30	Oct 7, 21	Nov 4, 18	Dec 2, 16 Continue Jan 20, 24	Monday	10-12-- 13-15	IDA

Graduate Courses Fall 2002

Course	Aug	Sept	Oct	Nov	Dec	Day	Time	Place
Kod: FDA136 Requirements Engineering Kristian Sandahl 4 p Graduate school: CIS		Starts Sept 27			Ends Dec 13	Friday	13-15	IDA
Kod: FDA137 Semantic Aspects of Logics for Action and Change Erik Sandewall 3 p Graduate school: CUGS						Second half of autumn semester	8 lectures of 2x45 min each	IDA
Kod: FDA050 TCP/IP Architecture and Protocols Nahid Shahmehri, Kent Engström 5+2 p Graduate school: ECSEL		Starts Sept 24		Ends Nov 12		Tuesday	9-12	IDA
FDA056 Teoridriven, induktiv och modelleringsbaserad forskning Göran Goldkuhl 3-5 p Graduate school: CIS		Sept 11	Oct 21	Nov 4	Dec 2		13-17	External location
Kod: FDA138 XML and Databases Jan Maluszynski 2 p Graduate school: CIS	Aug 14, 15, 16, 19, 20					Crash course	10-12	IDA

1. Overview of the Department

1.1 Research

The research at the Department for Computer and Information Science, IDA for short, is carried out in five divisions covering a broad spectrum of areas, several of which are multi-disciplinary. There is research in traditional computer science areas such as programming and specification languages, software engineering, databases and knowledgebased systems, real-time systems, hardware design and verification, intelligent autonomous agents and theoretical computer science. But the department also hosts research in economic information systems, information systems for businesses and other organizations and human/cognitive aspects of computer systems, e.g. natural language processing and human-computer interaction.

The Department of Computer and Information Science, IDA, was formed in 1983 as an independent department. Since then it has grown to be one of the largest CIS-departments in Scandinavia, with several internationally well-known and recognized research groups. Several educational programmes with a large number of courses have been developed for undergraduate and graduate education.

The department has about 220 employees, with a staff of teachers and researchers of about 85 persons and administrative and technical staff of about 35 persons. There are 14 full professors in the department, ten consulting professors from outside the university and about 150 doctoral active students , about half of them employed in the department and the rest being industry doctoral students or employed at university colleges elsewhere.

IDA's research program has been designed to cover areas of strategic importance, both for undergraduate education as well as for the needs of society. Research in the department is organized and carried out in five divisions covering a broad spectrum of areas; several of which are multi-disciplinary. Each division is characterized by its long-term commitment to develop and maintain the knowledge within a defined area, and by its long term responsibility for individual graduate students. Within divisions there are a number of research laboratories and some smaller groups. Below, the research labs are listed by division. Each research lab have it's own web page, where full information about the lab is given.

The Division for Databases and Information Technique (ADIT)

- Engineering Databases and Systems (EDSLAB)
- Intelligent Information Systems (IISLAB)

The Division for Artificial Intelligence and Integrated Computer Systems (AIICS)

- Knowledge Processing (KPLAB)

The Division for Human-Centered Systems (HCS)

- Cognitive Systems Engineering (CSELAB)
- People, Computers and Work (MDA)
- Natural Language Processing (NLPLAB)

The Division for Information Systems and Management (ISM)

- Economic Information Systems (EIS)
- Information Systems and Work Contexts (VITS)

The Division for Software and Systems (SaS)

- Embedded Systems (ESLAB)
- Programming Environments (PELAB)
- Real Time Systems (RTSLAB)
- Theoretical Computer Science (TCSLAB)

1.2 Contacts for the Department of Computer and Information Science

Head of the department:
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Technical manager:
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Internet:
ida.liu.se
Anonymous FTP:
ftp.ida.liu.se (130.236.30.131)
remote-und.ida.liu.se (students domain)
Home page:
http://www.ida.liu.se/

1.3 Overview of divisions and research laboratories

The department hosts research in areas such as programming and specification languages, software engineering, databases and knowledge based systems, real-time systems, hardware/ software codesign and verification, artificial intelligence, intelligent autonomous agents, theoretical computer science, economic information systems, information systems for businesses and other organizations and human/cognitive aspects of computer systems, e.g natural language processing and human-computer interaction. A short review of the five divisons is given in this section.

1.3.1 ADIT - The Division for Database and Information Techniques

Professor Nahid Shahmehri

The Division for Database and Information Techniques (ADIT) conducts research on principles, algorithms, and methods for defining and constructing advanced tools for database and information management systems. Special emphasis is placed upon engineering information systems and applications for future information society and various user categories with different needs. The research topics include information security and privacy, peer-to-peer computing, mobile communication networks, multimedia databases, biological databanks, design of database systems for Internet & mobile applications, live
help systems, user modeling, information extraction, context and content awareness, and agent technology.

Examples of ADIT's current research projects are inter-vehicular communication for traffic safety, e-services and security issues in intelligent homes, information technology for the elderly, dynamic e-service composition.

EDSLAB - Laboratory of Engineering Databases and Systems

Professor Nahid Shahmehri (acting lab leader)

EDSLAB conducts research on methods and theories for database support of engineering applications. Applications for this technology include mechanical, electronic, telecom, and software applications.

IISLAB - Laboratory for Intelligent Information Systems

Professor Nahid Shahmehri

IISLAB conducts research in intelligent information systems. Current projects focus on information security, information retrieval and filtering, and the representation, organization and processing of knowledge in distributed environments such as the World Wide Web.

1.3.2 AIICS - The Division for Artificial Intelligence and Integrated Computer Systems

Professor Patrick Doherty

The focus of interest for the Artificial Intelligence and Integrated Computer Systems Division is intelligent artifacts, that is, man-made physical systems containing computational equipment and software that provide them with capabilities for receiving and comprehending sensory data, for reasoning, and for performing rational action in their environment. Research and teaching activities in AIICS currently include topic areas in artificial intelligence (in particular knowledge representation), theoretical and applied logic, and computer science and programming. The AIICS division consists of one research laboratory and three additional research groups which are intended to grow into full-fledged research laboratories in the future .

KPLAB - Knowledge Processing Laboratory

Professor Patrick Doherty

Research in KPLAB focuses on the theoretical and practical aspects associated with the representation of knowledge and the reasoning techniques associated with the processing of knowledge as used by both physical and software artifacts. Current activities include the development of nonmonotonic temporal logics for reasoning about action, change and process; the development of logically-based knowledge representation frameworks for reasoning about and representing incomplete, uncertain, or vague information; the specification and implementation of higher-level cognitive tasks such as planning, prediction, explanation, diagnosis and execution monitoring; and the design and specification of deliberative/reactive architectures used in the implementation of autonomous artifacts such as robots and softbots. Special emphasis is currently being placed on the design and development of command and control architectures for unmanned aerial vehicles (UAVs) and their integration with active vision systems and other sensors. Such systems require on-line planners, prediction and chronicle recognition mechanisms, GIS and soft real-time databases, and a variety of knowledge representation frameworks with associated inference mechanisms used to dynamically construct and reason about the UAVs internal and external environment. As a new avenue of investigation, we are also pursuing the development of knowledge representation techniques for the semantic web.

Other research groups in the AIICS Division:

SCML - The Soft Computing and Machine Learning Group
Professor Patrick Doherty and Professor Andrzej Skowron

The focus of interest for this group is in the area of approximate reasoning and machine learning techniques. Currently, specific topics being pursued are rough set theory and its application, neural network research and technology, and machine learning and classification techniques based on the use, both individually and combined of rough sets and neural nets. Target applications are in the areas of bioinformatics,sensor fusion and data mining. The SCML group has a strong affiliation with the Group of Logic at the Institute of Mathematics, Warsaw University. Professor Andrzej Skowron leads this group.

CASL - Cognitive Autonomous Systems Group
Professor Erik Sandewall

Cognitive Autonomous Systems are high-level robotic systems in a broad sense of ’robotic’: they are computer systems that have the following capabilities: (1) autonomy - they are capable of operating with goals and with plans for achieving those goals, and of executing such plans in a robust fashion. (2) modelling- the ability to represent knowledge about their environment and about themselves. (3) perception - the ability to perceive phenomena in their environment, and to model them. (4) deliberation - the ability to reason about phenomena within the modelling range of expressivity in the system. (5) communication - the ability to receive information from other similar systems or from people, and to communicate it to them. We use the term ’cognitive’ as an umbrella term for the last four items in the list. Research interests in this group focus on selected aspects of the theory and software technology for cognitive autonomous systems according to the definition above.

EIT - Education in Information Technology Group
Associate Professor Anders Haraldsson

This is currently a support group for experimentation with new pedagogic techniques and tools for undergraduate and graduate courses taught within the AIICS division. Research interests focus on the use of information techology for support of courses in computer science and artificial intelligence. Tools are developed for the traditional deployment of courses and support of information flow in addition to deployment and support of courses on the WWW.

1.3.3 HCS - The Division for Human-Centered Systems

Professor Lars Ahrenberg

Research in the Division for Human-Centered Systems is aimed at studying and improving the interactions among humans, computing systems, and information resources. Human abilities constitute the goal as well as a point of departure for our research.

The research is concerned with the development of new technologies and methods as well as the effects of new technologies for individuals, groups and society at large. Thus, research is usually multi-disciplinary, combining methods from computer and information science with perspectives from the humanities and social sciences.

CSELAB - Cognitive Systems Laboratory
Professor Erik Hollnagel

Cognitive Systems Engineering is concerned with the study, analysis, modelling and design of systems of humans and machines together in ensambles. It is not about machines alone and not about humans alone but rather about what they do together.

MDA - People Computers and Work
Professor Toomas Timpka

The MDA group develops and studies information systems in working-life contexts, with a focus on applications in service organizations. The research has an interdisciplinary character and integrates methods from computer science, psychology and sociology. Specific areas of interest include computer-supported cooperative work, inter-organizational networks, economic evaluations of information systems and participatory design.

NLPLAB - Natural Language Processing Laboratory
Professor Lars Ahrenberg

NLPLAB studies linguistic processing and knowledge representation from linguistic, computational and behavioral perspectives. Current applied projects concern spoken and multimodal natural-language dialogue systems and computer-aided translation.

Other research groups in the HCS Division:

ASLAB - Application Systems (Professor Sture Hägglund)
The research in ASLAB, is conducted in groups working with Human-Computer Interaction, especially usability-oriented methods for IT design and Home Communication, and Web Software Engineering, with a special emphasis on knowledge acquisition tools and advanced web programming support.

*LIBLAB - Laboratory for Library and Information Science (*Prof. Sture Hägglund)
Research at LIBLAB, is focused on long term studies of the interactions between information technology and the generation, access to and use of information resources, in particular documents and document collections.

GIS - Geographical Information Systems (Dr. Åke Sivertun)
Research in the GIS group is applications of geographical information systems and with algorithms for spatial data processing.

1.3.4 ISM - The Division for Information Systems and Management

Professor Birger Rapp

ISM conducts research about management issues arising from the use of modern ICT, including the impact on organisations and business, communication, knowledge development and utilisation, business oriented model- and system development, and strategic and economic management control, accounting, auditing, design of control and responsibilities applied to information usage for information provision. Research is often conducted in co-operation with industry to achieve applicable solutions to business and organisational issues. Mutual research interests for the collaborating research groups are also encouraged and supported. ISM has responsibility for courses within the areas of model building and system development, information systems and business management, and economic thinking applied to business and organisational use of information.

EIS - Economic Information Systems

Prof. Birger Rapp

The research area of Economic Information Systems involves, among other things, communication and transfer of information between people, as well as the development of suitable information systems for this purpose. This subject also deals with the use of modern information technology and the development of structures within organizations, together with the effects of information technology on people and organizations. This involves both questions concerning economic direction and control, and the capacity of people to take in and use information as well as training.

The division of Economic Information Systems conduct research in the following main streams: Business Information Development ; Application of Transaction and Principal Agent Theory ; IT and New Organizational Structures; Simulation, Decision Support System and Control Systems of Manufacturing Flows; Business Control; IT-Economics; Internal Auditing; External Accounting and Auditing; Economic Crime Prevention; E-Business; Knowledge Management.

VITS - Development of information systems and work contexts.

Prof. Göran Goldkuhl

Research areas covered by VITS include business processes and information systems; inter-organisational relationships and electronic commerce; IT support for transportation, travelling and tourism; information systems - design & architecture; CASE/method tools; knowledge and method management. The research is mainly based on communicative and action theories and has a strong emphasis on methods for business and information systems development. Research approaches are mainly qualitative and case study based. VITS is a network research group with 30 researchers from the universities of Linköping, Borås, Dalarna (Borlänge), Jönköping, Karlstad and Örebro.

1.3.5 SAS - The Division for Software and Systems

Professor Zebo Peng

The division for Software and Systems (SaS) deals with research and education in the areas of software engineering, programming environments, systems software, embedded hardware/ software systems, computer systems engineering, real-time systems and theoretical computer science.

The division has approximately 35 Ph.D. students involved in three postgraduate study programs: computer systems, computer science and engineering information systems. The research is funded from Linköping School of Engineering and receives also significant external funding from VR, VINNOVA, the Foundation for Strategic Research (SSF), KK-stiftelsen and the European Commission. The research covers both basic research and projects in cooperation with industry, for instance ABB Robotics, ABB Industrial Systems, Ericsson Radio Systems, Ericsson Telecom, SKF, Saab, Saab Bofors Dynamics, Saab Combitech and several other companies. The research is carried out in four research laboratories:

ESLAB - Embedded Systems Laboratory

Prof Zebo Peng

ESLAB conducts research on the design and test of embedded systems, especially those consisting of interacting hardware and software components. Special emphasis is placed upon the development of methods and tools for specification, modeling, synthesis, simulation, design for test, formal verification and hardware/software co-design. We are also concerned with the exploitation of systematic design and design automation techniques for industrial application areas, such as telecommunication, automotive electronics and aerospace.

PELAB - Programming Environments Laboratory

Prof. Peter Fritzson

Software engineering tools and architectures, programming languages and environments, including compilers, debuggers, testing tools, parallel and real-time programming tools; software engineering methodology and process improvement.

RTSLAB - Laboratory for Real-Time Systems

Doc. Simin Nadjm-Tehrani

Systems engineering, safety-critical systems, network survivability, fault-tolerance in distributed systems, real-time and embedded databases, resource allocation and quality of service guarantees.

TCSLAB - Theoretical Computer Science

Doc. Ulf Nilsson

Programming theory, declarative programming and specification languages, formal models and methods, algorithms and complexity.

2. Graduate studies in Computer and Information Science

2.1 General information

Graduate studies at the department consists of courses and project participation.The course programme is organized at the department level as *regular courses*, each of which is given approximately every second or third year (if possible), and *occasional courses* which depend on the profile and interests of current faculty and visiting scientists. The programme covers the areas: Computer Science, Computer Systems, Information Systems and Media, Economic Information Systems, Computational Linguistics, Cognitive Systems, Engineering Information Systems and Information Systems Development.

The department also hosts a National Graduate School in Computer Science, CUGS, with participation from Örebro University, Mälardalen University, Skövde University, Jönköping University and others. This school gradually started its operation during the academic year 2000-2001. In addition, research groups and doctoral students participate in other national graduate schools, for instance in Language Technology and in the area of Management and Information Technology.

The department also participates in several other special graduate schools aiming for interdisciplinary studies preparting also for a career outside the university, with funding from the Foundation for Strategic Research. ECSEL, Excellence Center in Computer Science and Systems Engineering, started in 1996 in cooperation with primarily the Department of Electrical Engineering. HMI, Human Machine Interaction, started in 1997 and its goal is to improve Swedish competence by educating specialists in HMI. It is a cooperation between Linköping (IDA, IKP, Tema-K) and Stockholm (NADA, DSV). IMIE, International Graduate School of Management and Industrial Engineering, has been in operation for some years with contributions from the subject area Economic Information Systems in our department. Graduate students in these schools belong to research groups in the home department, but follow a special study programme.

A special study programme for industry-based graduate students is available in the area of Applied IT and Software Engineering. This Industry Research School is funded by the Foundation for Knowledge and Competence Development and by participating companies.

About 150 Ph.D. students participate in the graduate programme, and may choose among about 30 courses given each year. The courses and seminars are normally given in English (unless all participants are fluent in Swedish).

The programme leads to one of the following degrees:

Licentiate of technology or philosophy. The requirements include 40 points (one point equivalent to one week full time studies) of completed courses and 40 points thesis work.

Doctor of technology or philosophy. The requirements are generally 80 points courses and 80 points thesis work. Most of the Ph.D. students take the licentiate degree as an integral part of their doctoral studies.

For the degree in technology, a master of engineering (4.5 years of study) is normally assumed as a prerequisite.

As an executive, there is one director of graduate studies (Ulf Nilsson). However, most of the administration and organization rests upon the director of graduate studies administration (Lillemor Wallgren). Most graduate students are employed by the department full time. They assist in undergraduate courses and other internal assignments of the divisions/laboratories, up to about 20% of their time. The rest of the time is spent on graduate courses and thesis project.

2.2 The Graduate Studies Programme Fall 2002

The presentation in later sections contains the following types of courses:

- **General graduate courses offered for students of the whole department**
- **Graduate courses offered mainly for students within a division/research group or graduate school**

In addition to the graduate study courses given in the Department of Computer Science, graduate students may also take courses from other departments, in particular courses from the special graduate schools CUGS, ECSEL, HMI, IMIE.

Main seminar series and seminars in the divisions.

The seminars are announced by e-mail, and occasionally by special announcement. They are strongly recommended for students, and although the do not automatically give credit points in graduate studies, they are a necessary ingredient in the PhD training.

2.3 Contact for graduate studies information

Further information concerning the contents of this program can be obtained from Lillemor Wallgren, phone 013- 28 14 80, Ulf Nilsson, 013-28 19 35, Britt-Inger Karlsson, 013-28 17 06 or for a particular course from the person responsible for that course.

Contact information: Lillemor Wallgren
Director of Graduate Studies Administration, Department of Computer and Information Science
Linköping University, S-581 83 Linköping, Phone: 013-281480, Fax: 013-142231, E-mail: lew@ida.liu.se

FDA124

Activity Theory, developmental work research, and information systems development (CIS)

Lectures:
16 h

Recommended for
Graduate students in informatics and information systems development.

The course was last given:
Fall 1998.

Goals
To acquire knowledge of the theoretical background of Activity Theory, and its relevance for computer supported work re-design and information systems development.

Prerequisites
Basic courses in informatics and information systems development.

Organization
Lectures and seminars.

Contents
Theoretical overview - origin, tradition (Vygotsky, Leontjev.)
Activity Theory and information systems development (Kuutti.)
Cultural-historical Activity Theory and developmental work research (Engeström.)

Literature
To be decided.

Teachers
Sofie Pilemalm, Toomas Timpka, Vivian Vimarlund.

Examiner
Toomas Timpka.

Schedule
Fall 2002.

Examination
Active seminar participation, course paper writing and presentation.

Credit
5 credits.

FDA026
Avhandlingsseminarier (CIS)

Lectures:
20 h.

Recommended for
Kursen vänder sig till forskarstuderande som arbetar med sin lic- eller doktorsavhandling. För att få delta på kursen behöver kursdeltagare inte ha färdiga avhandlingskapitel, men ett synopsis eller utkast till sin avhandling skall finnas.

The course was last given:
Vårterminen 2001.

Goals
Huvudsyftet med kursen är att deltagarna får delar av sina pågående avhandlingsarbeten (lic- eller doktorsavhandling) granskade av en utsedd opponent samt av övriga deltagare. Ett annat viktigt syfte är att deltagarna får träning i att opponera på andra arbeten.

Prerequisites
Inga.

Organization
Kursen genomförs i seminarieform med presentation, opposition och diskussion.

Contents
Seminariebehandling av utkast till avhandlingsbidrag. Presentation och opposition. Varje bidrag behandlas i ungefär 45 minuter. Kursdeltagare förväntas aktivt delta i diskussioner kring struktur och innehåll i avhandlingar.

Literature
Presenteras senare.

Teachers
Göran Goldkuhl, Stefan Cronholm.

Examiner
Göran Goldkuhl.

Schedule
Höstterminen 2002.

Examination
Avhandlingsseminarierna hålls i kursform och ger doktorandpoäng beroende på aktivitetsgrad. Opponentroll: Skriftliga oppositioner 1-2 sidor. Respondentroll: Efter seminariet skriver respondenten ett lärpapper, som sammanfattar de viktigaste kommentarerna från seminariet.

Credit
3 poäng.

FDA126
Aspects of scientific writing (CIS)

Lectures:
15 h.

Recommended for
All doctoral students at IDA/HMI.

The course was last given:
Fall 2001.

Goals
To provide the basic skills needed for reading, writing and presenting scientific work (journal papers, monographs, presentations). This includes guidelines for structuring written and oral presentations, as well as for critical reading.

Prerequisites
Good working knowledge of English.

Organization and Contents
The seminars will take the form of guided discussions of a number of selected scientific papers, and use these to illustrate essential points relating to reading, writing and presentation. Course participants are required to read through selected papers and discuss these during classes. Course participants are encouraged to suggest examples of papers that they consider particularly good or bad. The papers need not be within their own area of interest or expertise.

Literature
Swales & Feak (1994). Academic writing for graduate students. The University of Michigan Press.

Teachers
Erik Hollnagel.

Examiner
Erik Hollnagel.

Schedule
Fall 2002.

Examination
Active presence during seminars + summary report or presentation.

Credit
3 credits.

Comments:
Maximum 12 participants.

FDA089

Business Modelling i teori och praktik (CIS)

Recommended for

Doktorander och forskarstuderande vid

- Ekonomiska informationssystem (EIS)

- Informationssystemutveckling (VTIS/ISU)

- IMIE forskarskola

- MIT forskarskola

The course was last given:

Höstterminen 2001.

Goals

Öka förståelsen för användning av "business models" (affärsmodeller, verksamhetsmodeller) vid förändringsarbete inom företag och organisationer med speciell fokus på sambandet mellan de tre utvecklingsnivåerna:

- Affärsutveckling (Strategi)
- Verksamhetsutveckling (Process, Funktion)
- Systemutveckling (IS/IT-stöd)

Prerequisites

Grundkunskaper i företagsekonomi eller systemutveckling.

Organization

Kursen består av koncentrerade presentationer, litteraturbevakningar, teoretiskt modelleringsarbete och praktikfallsanalyser. Inom området Business Modelling finns många olika teman som vi kommer att beröra t.ex.:

- Modellers och metoders roll vid förändringsarbete
- Olika perspektiv och aspekter vid modelleringsarbete
- Teorier från företagsekonomi och informationssystem för modellering
- Metodkombinationer (t.ex. metodkedjor och metodallianser)
- Kvalitetssäkring av modeller och metoder
- Modelleringsarbete inom mindre och större företag

Presentationerna ger en kort orientering kring litteraturen för att skapa ett underlag för de två självständiga tillämpningsuppgifter som ska genomföras under kursens gång. Deltagarna ägnar en stor del av tiden under kursens inledning till aktiva självstudier av litteraturen. Under den senare delen av kursen genomför deltagarna experiment med att kombinera eller integrera ett par metoder för förändringsarbete (teoretiskt modelleringsarbete) samt studerar ett antal företag i praktiken vilka erfarenheter de har av kombinerad metodanvändning vid Business Modelling.

Contents

Denna doktorandkurs behandlar sambandet mellan affärsutveckling, verksamhetsutveckling och systemutveckling på företag och organisationer. Det är ett försök att integrera kunskaper från två olika vetenskapliga discipliner nämligen Företagsekonomi ("Business Administration") och Informatik ("Information Systems"). Kursen ger som helhet 5 poäng efter godkända resultat på två tillämpningsuppgifter.

Bakgrund:

Inom ämnet Informatik/ADB har vi konstruerat specifika modeller och metoder för utveckling av informationssystem på företag (systemutveckling). Men även inom Företagsekonomi har man skapat mycket intressanta, generella ansatser för affärsmodellering inom företag. Affärsmodellering vid strategisk planering och verksamhetsförnyelse är ofta en kontinuerlig process inom organisationer och kan utgöra en värdefull bas för att starta upp nya informationssystemprojekt.

En central forskningsfråga med stor praktisk relevans är hur vi kan samordna och integrera metoder för affärsmodellering och systemutveckling. Ett stort upplevt problem i praktiken är att ledningsgrupper ofta genomför affärsutveckling tillsammans med managementkonsulter som ofta går stick i stäv mot systemutvecklingsprojekt som bedrivs på initiativ från IT-avdelningar.

Literature

Huvudboken

1. Nilsson, A.G. & Tolis, C. & Nellorn, C. (Eds.) (1999). "Perspectives on Business Modelling - Understanding and Changing Organisations", Springer-Verlag, Berlin Heidelberg (Hemsida med information om boken finns på Internet: http://www.dsv.su.se/~chn/BM)

Möjlighet till rabatterat pris på huvudboken i kurs 3 >>>

Kompletterande litteratur

2. Lind, M. & Goldkuhl, G. (2001). "Generic Layered Patterns for Business Modelling". In "Proceedings of The Sixth International Workshop on the Language-Action Perspective on Communication Modelling (LAP 2001), Montreal, Canada.

3. Nilsson, A.G. (1995). "Utveckling av metoder för systemarbete - ett historiskt perspektiv", Research report LiTH-IDA-R-95-13, IDA-institutionen, Linköpings universitet. Engelsk utgåva: Nilsson, A.G. (1995). "Evolution of Methodologies for Information Systems Work - A Historical Perspective". Ingår i Dahlbom, B. (Ed.) (1995). The Infological Equation - Essays in Honor of Börje Langefors, Göteborgs universitet, pp. 251-185.

4. Nilsson, A.G. (2001). "Affärsutvecklarens verktygslåda - utvecklingsarbete med metoder i samspel". Ingår i Gottschalk, P., & Welle-Strand, A., (red.) (2001) Læring gjennom økonomi, system og prosjekt. NKI Forlaget, Oslo, sid. 195-218.

5. Ralyté, J. & Rolland, C. (2001). "An Assembly Process Model for Method Engineering". In Dittrich, K. & Geppert, A. & Norrie, M.C. (Eds.) Proceedings of the Conference CAiSE 2001, LNCS 2068, Springer-Verlag, Berlin Heidelberg, pp. 267-283.

6. Tolis, C. & Nilsson, A.G. (1996). "Användning av verksamhetsmodeller vid processorientering". Ingår i Lundeberg, M. & Sundgren, B. (red.) (1996) Att föra verksamheten framåt - Människor och informationssystem i samverkan, Studentlitteratur, Lund, sid. 161-184. Engelsk utgåva: Tolis, C. & Nilsson, A.G. (1996). "Using Business Models in Process Orientation". In Lundeberg, M. & Sundgren, B. (Eds.) (1996). Advancing Your Business - People and Information Systems in Concert, EFI, Stockholm School of Economics, Chapter VIII. Engelska

utgåvan är även fritt tillgänglig på Internet: Sök på Altavista efter "Advancing Your Business" eller använd adressen: http://www.hhs.se/im/efi/ayb.htm

Teachers

Anders G Nilsson, Birger Rapp.

Examiner

Anders G Nilsson, Birger Rapp.

Schedule

Höstterminen 2002.

Examination

För godkänt deltagande och resultat på doktorandkursen i Business Modelling (5 poäng) krävs:

- Författande av två rapporter som behandlar de obligatoriska tillämpningsuppgifterna (examinationsgrundande)
- Aktiv närvaro vid de två seminarietillfällena där rapporterna presenteras och diskuteras (dvs obligatorisk närvaro på seminarierna)
- Tillämpningsuppgifterna måste vara klara till seminarietillfällena dvs ingen extra möjlighet till examination kommer att ges. Rapporterna lämnas i form av papperskopia till kursledaren vid seminariets början. Vidare ombesörjs spridning av rapporten till övriga kursdeltagare eftersom behovet av att studera varandras "forskningsfynd" säkert är stort.

Tillämpningsuppgifter

Det egna forskningsarbetet på kursen kretsar kring två tillämpningsuppgifter inom området Business Modelling. Det råder stor frihet att lösa uppgifterna inom de ramar som ges nedan. Den första uppgiften syftar till att göra en självständig litteraturbevakning inom ämnesområdet. Den andra uppgiften syftar till att genomföra experiment kring metodkombinationer inom Business Modelling. Nedan beskrivs de två tillämpningsuppgifterna mer utförligt.

I Egen litteraturbevakning

Litteraturbevakningen består av tre delar: Referat, Egen referensram och Koppling till egen forskning. Referatarbetet består i sin tur av två delar: Referat av minst fem artiklar i boken "Perspectives on Business Modelling" (dock ej kapitel 1 och 12, det senare kapitlet ska studeras för uppgift II) samt Referat av en egen genomförd Internet sökning kring "Business Modelling" begreppet. Referaten ska vara kommenterande dvs även innehålla dina synpunkter på det som tas upp i litteraturen. Efter referatarbetet vidareutvecklas en egen referensram kring området Business Modelling som dokumenteras. Slutligen penetreras vilka beröringspunkter som finns mellan den egna planerade forskningen och Business Modelling området. Som underlag för arbetet med den första tillämpningsuppgiften kommer en författarträff att arrangeras kring kursboken "Perspectives on Business Modelling".

De olika delarna i tillämpningsuppgiften ska nedtecknas i en rapport på ca 15 sidor. Tillämpningsuppgiften ska ske i form av ett enskilt, individuellt arbete. På seminariet den 8 oktober kommer vi först att dela in oss i ett antal grupper och diskutera våra resultat av litteraturbevakningen. Sedan kommer varje grupp att presentera några "highlights" från diskussionerna i en efterföljande plenum-session.

II Genomförda experiment

Experimenten består av teoretiskt modelleringsarbete och praktikfallsanalyser. Det teoretiska arbetet går ut på att göra en kombination av minst två olika metoder för förändringsarbete. Rekommenderas att någon form av "meta-modellering" genomförs för att underlätta arbetet med metodkombinationer. Aktuell litteratur att studera är kapitel 12 i boken Business Modelling: "The Business Developer’s Toolbox - Chains and Alliances between Established Methods". Det råder frihet att välja vilka metoder som man önskar kombinera. Metodvalet bör dock förankras hos kursledningen.

Efter det teoretiska modelleringsarbetet sker en empirisk studie med några praktikfallsanalyser. Man kan välja mellan två former av undersökningsdesign: Djupintervjuer (2 företag) eller Begränsad enkätstudie (ca 10 företag). Syftet är att undersöka erfarenheter av hur företagen jobbat med metodkombinationer vid förändringsarbete. Helst bör företagen använda någon eller några av de metoder du/ni analyserade i det teoretiska modelleringsarbetet. Resultaten av de genomförda experimenten ställs mot den egna referensramen som utvecklades i uppgift I ovan.

Forskningsarbetet med den teoretiska metodkombinationen, empiriska studien (intervjuer eller enkät) och kopplingen till egen referensram dokumenteras i en rapport på ca 15 sidor. Denna tillämpningsuppgift bör genomföras i grupp om två personer. På seminariet kommer vi att ha en plenum-session där varje grupp presenterar några "highlights" från sina genomförda experiment inom Business Modelling. Förbered här en professionell presentation med OH-bilder eller interaktiva hjälpmedel på ca 10-15 minuter.

Credit

Upp till 5 p.

Comments

Kursen är utspridd över ett par månader med två introducerande presentationer av kursledarna och två seminarier där de egna tillämpningsuppgifterna presenteras och diskuteras

FDA030

Ethics in the Age of Information Technology (CIS)

Lectures:
27 h.

Recommended for
Graduate students.

The course was last given:
Fall 2001.

Goals
To introduce ethical theories and methods. To present and analyse ethical issues related to computerisation and information technology. To present and analyse problems in research ethics.

Prerequisites
None.

Organization
Presentations, seminars and discussions.

Contents
Ethical theories and methods for analysing ethical arguments. The course focuses on ethical issues related to the use of information technology, like privacy, responsibility and decision support and ethical issues related to the use of Internet. Another focus is on research ethics. This includes cheating, rights and responsibilities of researchers, ethical issues related to publication and the confrontation of different systems of norms in applied research.

Literature
Beach, Doré, The Responsible Conduct of Research, Weinham: VCH, 1996.
Collste, Göran, ed, Ethics in the Age of Information Technology, Studies in Applied Ethics, 7, Linköping, 2000 (Can be bought at the start of the course).
Johnson, Deborah, Computer Ethics, 3rd ed., Upper Saddle River: Prentice Hall, 2001.

Teachers
Göran Collste and Bo Petersson, Centre for Applied Ethics. Erik Sandewall, IDA.

Examiner
Göran Collste.

Schedule
Fall 2002.

Examination
Seminar activity and written papers.

Credit
3-5 credits.

FDA130

Formal Modeling and Verification for Real-Time Systems (CIS)

Lectures:
32 hours.

Recommended for
Graduate students, researchers, practitioners.

The course was last given:
New course.

Goals
To provide theoretical basics and to introduce advanced research issues. Examples will be presented and some state of the art tools will be discussed.

Prerequisites
Basic knowledge in logics, modeling and real-time systems.

Organization
Lectures.

Contents
Introduction

- Discrete and continuous time; modeling

Model checking basics

- Temporal logics
- Explicit state model checking
- Symbolic model checking

Model checking for discrete real-time

- RTCTL model checking
- Quantitative analysis

Models for continuous real-time

- Timed automata
- Time Petri nets

Model checking for timed automata

- Region graph
- Zone automaton
- Time-abstract (bi)simulations
- Tools: UPPAAL, KRONOS

Advanced model checking issues:

- Symbolic representation
- Partial order reduction

Languages for real-time systems:

- SDL
- Synchronous languages

Real-time system design and analysis:

- Compositionality issues
- Scheduling and control
- High-level design and refinement

Literature
Research papers.

Teacher
Marius Minea.

Examiner
Petru Eles, Zebo Peng.

Schedule
Fall 2002.

Examination
To be decided.

Credit
6 credits.

FDA078

Inter-organisatorisk samverkan och elektroniska affärer (CIS)

Lectures:

24 timmar (inklusive seminarier).

Recommended for

Kursen ges av ämnesområdet informationssystemutveckling. Den vänder sig till personer med intresse för teorier kring inter-organisatorisk samverkan och elektroniska affärer samt praktiska exempel på detta.

The course was last given:

Höstterminen 2002.

Goals

Kursen skall ge kunskap om inter-organisatorisk samverkan och elektroniska affärer. Kursen fokuserar både affärer mellan företag (b2b) och affärer med konsumenter (b2c). Kursen skall ge kunskap om olika modeller, tillvägagångssätt och metoder för interaktion och utveckling av samverkan i nätverk. Ett mål med kursen är att visa hur informationsteknik kan innebära både möjligheter och begränsningar för denna typ av samverkan. Kursen kommer att ge såväl teoretiska som praktiska bilder av området.

Prerequisites

Inga särskilda förkunskapskrav.

Organization

Kursen består av ett antal föreläsningar samt diskussions- och examinationsseminarier. Delar av doktorandkursen kan samläsas med D-studenter (gäller främst föreläsningar).

Contents

Affärslogik vid elektroniska affärer.

Modeller för interaktion i nätverk.

Grundläggande begrepp inom området.

Metoder och tillvägagångssätt vid utveckling av inter-organisatorisk samverkan.

Informationsteknikens möjligheter och begränsningar.

Koordination i och av relationer.

Bilder från praktiken - exempel på inter-organisatorisk affärssamverkan.

Literature

Huvudlitteratur: Timmers (1999), Electronic Commerce, John Wiley & Sons.
Artiklar

Teachers

Ulf Melin (samt gästföreläsare).

Examiner

Ulf Melin.

Schedule
Höstterminen 2001.

Examination
Inlämningsuppgift som examineras på seminarium.

Credit
3 credits.

FDA012

Introduction to Research Methodology in Computer Science (CIS)

Lectures:
16 h.

Recommended for
New graduate students. Special study groups will be arranged for students with common interests, such as students in the Industry Research School, HMI Research School, etc.

The course was last given:
Fall 2001.

Goals
To prepare for graduate studies in general and for formulating research problems and thesis topics in particular.

Prerequisites
None.

Organization
Lectures and seminars. Optional study groups for extra course credit.

Contents
Computing as a discipline. Introduction to the philosophy of science. Scientific writing, publication and information retrieval. Science and technology, methodological issues. The Ph.D. study process. Aspects of ethics and quality control in scientific work. Research funding and politics.

Literature
Chalmers: What is this thing called science.
Journal papers.

Teachers
Sture Hägglund and invited guests.

Examiner
Sture Hägglund.

Schedule
Fall 2002.

Examination
Written examination and seminar activity. Study group report for 2 extra credit points.

Credit
3 + 2 credits.

FDA019
Presentation Technique (CIS)

Lectures:
Ca 30 h.

Recommended for
Graduate students.

The course was last given:
Spring 2002.

Goals
To achieve better presentations of your own research at international conferences and local meetings. To feel confident in front of an audience. To practise introduction of speakers and dealing with questions.

Prerequisites
None.

Organization
Day 1-2: Voice- and body language, mind-mapping, how to take notes, the students present prepared presentations.Day 3-4: Body language, overheads, short performances, students presentations (10 min). Day 5-6: The language, students own unprepared presentations. Some of the presentations will be video recorded.

Contents
Different presentation techniques. Mind-mapping, flash-cards and other preparations. Body language, visual aids and vocabulary expansion.

Literature
Powerful Presentation.
Notice: The book will be bought by the teacher and handed out at the first lecture.

Teachers
Ingela Dellby.

Examiner
Ingela Dellby.

Schedule
Fall 2002.

Examination
Presentations and active participation in workshops, discussions and continuous evaluation of performances.

Credit
3 credits.

Comments
Maximum twelve participants. The course is given in English.

FDA136

Requirements Engineering (CIS)

Lectures:

24 h.

Recommended for

All graduate students with basic courses in Software engineering and Software development projects and/or working experience.

The course was last given:

New course.

Goals

The students will acquire theoretical insights and practical experience from processes, tools and techniques that are used in requirements engineering activities in large-scale software development and applied research.

Prerequisites

Undergraduate course TDDB61 PUM, or TDDB62 PUM-I and/or working experience.

Organization

- A seminar series of 12x2 hours
- A role-game exercise
- A lab series with tools for requirements prioritation and management
- A possibility to submitt and present term papers

Contents

- Requirements elicitation
- Requirements specification
- Inspection of requirements
- Formal specification of requirements
- Semi-formal notations of requirements
- Software quality requirments
- Requirements prioritation
- Attribute-driven requirements engineering
- Software release planning
- Research issues

Literature

Ian Sommerville and Peter Sawyer: Requirements Engineering: A Good Practice Guide, Wiley, 1997, ISBN 0-471-97444-7.

Selected articles

Teachers
Kristian Sandahl, Simin Nadjm-Therani, Pär Carlshamre, Joachim Karlsson, Andreas Borg ("course assistant").

Examiner
Kristian Sandahl.

Schedule
Fall 2002.

Examination
- A written, open-book exam on Sommerville and Sawyer.
- Short, written reflections from the labs.
- Term paper and presentation (optional)

Credit
4 credits (approved term papers will add 1-3 credits).

FDA131

Research preparation course in Geoinformatics (CIS)

Lectures:

32 h.

Recommended for:

Graduate students.

The course was last given:

Fall 2001.

Goals:

The purpose with this course is to give the students deeper knowledge and theoretical perspectives on Geoinformatics and perspectives on computer methods to handle spatial data. The subject Geoinformatics is interdisciplinary and share several academic and application fields. The course will give an overview of the research in the area and prepare for research.

Prerequisites

Organization

Tuition, seminars and exercises are provided concentrated between 10-15 during one day every second week to once a month between October January (totally ca 10 events). Parts of the course communication as well as access o tutorials can be provided on distance.

Contents

– Theoretical perspectives on capture, handling, preparation and analysis of geographic and other spatial data.

– Methods to analyse networks and cartographic algebra to handle and analyse spatial questions within technology, natural science, medicine, social science and humanities

– Spatal statistical methods to identify clusters and diffusion of physical as well as biological and non material properties (languages, dialects, names, habits etc)

– Methods to visualise dynamic events in two or more dimensions and multi modal communication of processes in time and space.

Tuition

Tuition, seminars and exercises are provided concentrated between 10-15 during one day every second week to once a month between October and January (totally ca 10 events). Parts of the course communication, as well as access to tutorials, can be provided on distance.

Literature

Laurini, Robert & Thompsson, Derek (1992) Fundamentals of spatial information systems. The APIC series, Academic Press, ca 700 sidor.
Worboys, M.F. "GIS: A Computing Perspective".

Ref
Chang S.K. & Jungert E. Projection for Image Information Retrieval and Spatial Reasoning, Academic Press London 1996

Teachers
Åke Sivertun , Erland Jungert, Michael LeDuc, guests.

Examiner
Åke Sivertun.

Schedule
Fall 2002.

Examination
Examination by active participation in the lectures, seminars and exercises and a written report. Publication of the report in a scientific paper or presentation at conferences are rewarded.

Credit
5 credits.

FDA056

Teoridriven, induktiv och modelleringsbaserad forskning TIM (CIS)

Lectures:

ca 30 h.

Recommended for

Forskarstuderande inom informatik och informationssystemutveckling, samt andra med intresse för empirisk forskning och teoriutveckling. Kursen är seminariebaserad och är även öppen för disputerade som önskar fördjupa sina kunskaper.

The course was last given:

Hösten 2001.

Goals

Kursen skall ge ökade kunskaper och färdigheter avseende datainsamling, dataanalys och teoriformulering vid forskningsarbete samt ökad förståelse för hur man kan kombinera teoridrivet och induktivt-empiribaserat och modelleringsbaserat angreppssätt. Kursen avser att vara ett konkret stöd för kursdeltagare att analysera empiriska fall och utveckla teori förutom att bidra till ökade färdigheter i dessa avseenden. Kursen har ett uttryckligt bimål att öka förmågan att kritiskt granska samt skriftligen kommentera och muntligen kommunicera kring vetenskapliga arbeten.

Prerequisites

Inga speciella förkunskaper behövs. Samtidigt bör påpekas att kunskaper inom vetenskapsteori och forskningsmetodik (t.ex motsvarande kurserna Vetenskapsteori, Kunskapsprojektering samt Kvalitativ analys och teoriutveckling) befrämjar förståelse av kursens innehåll. Kursen bygger också på (vad avser fallseminariedelen) att kursdeltagarna har egna fall att redovisa, dvs empiriska resultat från pågående eller genomförd forskning.

Kursen kan samläsas med kursen Avhandlingsseminarier. Kursen kompletterar Avhandlingsseminarier genom att fokusera analysprocessen före skrivande av avhandlingskapitel.

Organization

Kursen bedrivs seminariebaserat. Kursen består av två typer av seminarier:

fallseminarier och litteraturseminarier

Fallseminarier innebär att kursdeltagare redovisar pågående forskning. Redovisning och analys görs av stegen från empiriska data till beskrivningar av data och vidare till abstraherade kategorier och formulerade teorier. Särskilt fokus riktas mot användning av teorier och modelleringstekniker för insamling och analys av data och för teoriutveckling. Fallseminarier utnyttjar kursdeltagares fall och avser att bidra till utveckling av aktuell fallanalys samt därmed utgöra en illustration av lämpliga tillvägagångssätt. De kursdeltagare som deltagit med fall på ett seminarium dokumenterar lärdomar från fallseminariet ("lärpapper").

Litteraturseminarier innebär granskning av litteratur med relevans för kursens syften. Litteratur kan avse vetenskapsteoretiska, forskningsmetodologiska, ämnesteoretiska eller modelleringsinriktade frågor. Till varje seminarium granskas ett utvalt och fastställt litteraturstoff (artiklar

och/eller bokkapitel). Kursdeltagare granskar litteraturen och skriver en granskningsrapport till aktuellt seminarium. Granskningsrapporten skall innehålla 1) rekonstruktion och analys av de viktigaste teserna/principerna och använda begreppen, 2) en kritisk värdering samt 3) en relatering till kursens tema samt egen forskning. Granskningsrapporterna distribueras till kursdeltagarna före seminariet så att läsning av dessa granskningsrapporter kan ske innan seminariet. På seminarierna diskuteras aktuell litteratur och de framställda granskningsrapporterna. Jämförelse sker mellan de olika granskningsrapporterna.

Varje kurstillfälle (normalt 4 timmar) kommer att bestå av både fallseminarier och litteraturseminarier.

Contents

Kursen behandlar empiriska och teoriutvecklande faser av forskningsarbete och samspel mellan dessa. Särskilt fokus riktas mot möjligheter att kombinera ett teoridrivet och ett induktivt-empiriskt och ett modelleringsbaserat angreppssätt (TIM) vid dataanalys och teoriformulering. Vad gäller datainsamling görs en primär avgränsning till kvalitativa fallstudier, men andra

tillvägagångssätt är möjliga att tillämpa inom en TIM-ansats. Kursen avser att fokusera, problematisera och vidareutveckla den kombinerade forskningsansats (TIM) som har kommit att utvecklas inom forskarstudieämnet informationssystemutveckling och Forskningsgruppen VITS. Kursen är starkt tillämpningsorienterad till sin karaktär och har forskningsutvecklande syften; såväl på individnivå som för ämnesområdet.

Enligt TIM-strategin så skall sålunda forskningsprocessen bedrivas med aktivt stöd från generativa teorier med relevans för forskningsdomänen, ett rikt empiriskt datamaterial som skall behandlas med ett öppet och nyfiket sinne, strukturerade och åskådliggörande modeller (bilder och texter) som konceptualiserar och abstraherar data med stöd av explicita notationer.

Kursen behandlar mer specifikt följande moment:

TIM som en särskild form av abduktiv forskning

Teoribegreppet

Användning av teorier vid datainsamling, dataanalys och teoriutveckling

Exempel på teorier som brukas som aktivt teoristöd (handlingsteori, affärsaktsteori, praktikteori, talaktsteori)

Diagnostiska kvalitativa fallstudier

Kvalitetssäkring av empiriska data

Triangulering

Kvalitativ analys (Grounded Theory och andra ansatser)

Behov av kunskapsmodellering

Modelleringstekniker för beskrivning av empiriska data, kategorier och teorier (t.ex begrepp grafer, teorigrafer, handlingsgrafer, målgrafer)

Transparens i analys och redovisning av empirisk och teoriutvecklande forskning

Literature

Artikar och bokkapitel kommer att väljas utifrån kursens syften och de behov som uppstår under kursen.

Teachers
Göran Goldkuhl.

Examiner
Göran Goldkuhl.

Schedule
Höstterminen 2002.

Examination
Deltagande på fallseminarier och litteraturseminarier. Presentation av egna fall. Dokumentering av lärdomar efter fallseminarier ("lärpapper"). Granskningsrapporter till litteraturseminarier.

Credit
3-5 poäng. (efter insats)

Comments
Kursen är ett samarbetsprojekt mellan ämnesområdet informatik vid Internationella Handelshögskolan (IIH) i Jönköping och ämnesområdet informationssystemutveckling vid Institutionen för datavetenskap, Linköpings universitet. Kursen genomförs på IHH i Jönköping..

Aktuellt seminarium. Granskningsrapporten skall innehålla 1) rekonstruktion och analys av de viktigaste teserna/principerna och använda begreppen, 2) en kritisk värdering samt 3) en relatering till kursens tema samt egen forskning. Granskningsrapporterna distribueras till kursdeltagarna före seminariet så att läsning av dessa granskningsrapporter kan ske innan seminariet. På seminarierna diskuteras aktuell litteratur och de framställda gransknings-rapporterna. Jämförelse sker mellan de olikagranskningsrapporterna.

Varje kurstillfälle (normalt 4 timmar) kommer att bestå av både fallseminarier och litteraturseminarier.

FDA138
XML and Databases (CIS)

Lectures:
10 h (preferably, 5 sessions of 2 hours each).

Recommended for
Graduate students.

The course was last given:
New course.

Goals
This course aims at introducing techniques and methods related to XML and databases that have been developed during the last years, some of which are still the subject of active research.

Prerequisites
Common knowledge of basic notions in Computer Science. No knowledge of XML will be assumed. No specific knowledge in document management and/or in database systems is assumed.

Organization
5 sessions during week 34 and 35.

Contents
XML is emerging as the markup language of choice for data modeling and data interchange on the Web. Furthermore, many aspect of data modeling and data management on the Web are related to database systems. Indeed, the Web can be seen as a distributed information system and it provides databases with a convenient interface. This course aims at introducing to techniques and methods related to XML and databases that have been developed during the last years, some of which are still the subject of active research. The course will give an introduction to XML basics, to formalisms for specifying XML data schemas, to query and transformation languages for XML, and to indexing methods for XML data. The course will also present research results on some of these issues recently obtained at the University of Munich. No specific knowledge in document management and/or in database systems is assumed.

Course Summary
1. XML Basics

- 1.1 Markup Languages: Origins and Typology
- 1.2 Structure of an XML Document
  - 1.2.1 Document Prolog
  - 1.2.2 Elements and Attributes
  - 1.2.3 Entities and Notations
  - 1.2.4 Namespaces
  - 1.2.5 Character Sets
  - 1.2.6 Document Tree
- 1.3 XML vs. SGML
- 1.4 XML vs. HTML
- 1.5 References

2. XML, Databases, and Data Schemas for XML
  2.1 Features of Standard Data Models
  2.2 Advantages of Dispensable Data Schemas
  2.3 Semistructured Data
  2.4 DTD
  2.5 XML Schema
  2.7 References

3. Query and Transformation Languages for XML
  3.1 Need for Transformations
  3.2 Data Selection with XPath and XPointer
  3.3 Styling with CSS
  3.4 The Transformation Language XSLT
  3.5 The Query Language XQuery
  3.6 Xcerpt: Querying XML Data Reconsidered
  3.7 Streamed Evaluation of XPath
  3.8 References

4. Indexing XML Data
  4.1 Basics: Tag and/or Keyword Indexing
  4.2 Path Indexing
  4.3 Navigation Indices: Data Guides, Signature Files, and Improvements Thereof
  4.4 References

Literature
Teaching material.

Teachers
François Bry, visiting professor.

Examiner
Jan Maluszynski.

Schedule
Fall 2002.

Examination
Written report.

Credit
2 credits.

Comments
Intensive course.

Schedule
Fall 2002.

Examination
Active participation and seminar presentations.

Credit
3 credits.

FDA127
Communication (CUGS)

Lectures:
24 h.

Recommended for
Graduate students in electrical engineering, computer engineering, or computer science.

The course was last given:
New course.

Goals
To give knowledge of advanced network architectures, mobile and wireless networks, and multimedia information and networking.

Prerequisites
Basic course in computer networks.

Organization
Seminars, reading assignments, and laborations.

Contents
- Mobile and Wireless networks

  spontaneous networking techniques

  MAC protocols: CSMA, MACAW

  cellular: GSM/GPRS, UMTS/WCDMA, WAP, mobile IP

  home: infrared, Bluetooth
- Location management and context awareness.
- Network management: SNMP, MIB, etc.
- Routing protocols: BGP, IGP, RIP etc.
- Services & protocols.
- Security: Firewall, Ipsec, access methods, evaluation methods.
- Network architectures: internet exchange points, DMZ nets (de-militarized zone networks.)
- TCP/IP: QoSx, ICMP, Mobile IP, IPv6x etc.
- Peer-to-peer networking.

Literature
Tanenbaum, A: Computer Networks. Foruth Edt.. Prentice Hall.

Teachers
Juha Takkinen.

Schedule
Fall 2002.

Examination
Active participation and seminar presentations.

Credit
3 credits.

FDA128
Computation II (CUGS)

Lectures:
Två heldagar.

Recommended for
Important for all CUGS students, in particular those with little or no experience in constructing and analyzing algorithms.

The Course was last given
2001.

Prerequisites
CUGS Computation I or similar (familiar witht the contents of chapter 1-5 in Corman et al's book; see textbook for this course.

Organization
Intensive course.

Contents
Basic methods for constructing and analysing algorithms. The theory is illustrated by examples from graph algorithms, approximation algorithms and probabilistic algorithms.

Literature
1.H. Cormen, C. E. Leiserson, and R. L. Rivest, Introduction to Algorithms, MIT Press (see http://www-mitpress.mit.edu).
Detailed reading list:
Read everything but concentrate on II, IV, VI, VII:31-33 and VII:35-37.

Teachers
Peter Jonsson.

Examiner
Peter Jonsson.

Schedule
Fall 2002.

Examination
Written examination.

Credit
2,5 credits.

Comments
This course is based on TDDA32, and more information about course content can be found at http://www.ida.liu.se/~TDDA32/.

FDA129
Database Systems (CUGS)

Lectures:
24 h.

Recommended for
CUGS students.

The course was last given:
New course.

Goals
The aim of the course is to give knowledge on issues underlying the design and implementation of particular types of modern database systems.

Prerequisites
Course on data modeling (e.g. using entity-relationship model or UML) and relational databases (including relational model, relational algebra, SQL, query processing, data structures, transactions, recovery.
Course on artificial intelligence.
Logic I.

Organization
2 or 3 intensive contact periods.

Related courses
Forthcoming CUGS CS advanced courses in databases.

Contents
- Object-oriented and extended relational database systems.
- Semi-structured data
- Integration models for access to heterogeneous information sources.

Literature
To be announced..

Teachers
Nahid Shahmehri, Patrick Lambrix.

Examiner
Nahid Shahmehri, Patrick Lambrix.

Schedule
Fall 2002.

Examination
To be announced.

Credit
3 credits.

FDA133

Introduction to Machine Learning Methods for Data Mining (CUGS)

Lectures:

20 h + Labs: 20 h.

Recommended for

All PhD students in informatics, systems and computer science. The course demands a certain mathematical and practical programming sophistication.

The course was last given:

New course.

Goals

To provide a hands-on introduction to practical machine learning tools and techniques with applications to data mining.

Organization

Lectures and labs.

Contents

The course course will consist of introductory seminars on various practical machine learning tools and techniques and their theoretical underpinnings. The course is intended to be lab intensive in the sense that each of the techniques considered will be followed by exercises and labs using appropriate software tools.

Topics include data mining and machine learning. Algorithmic techniques covered include statistical modeling, decision trees, covering algorithms, mining associatio rules, rough set based techniques. Other topics include decision rules, classification rules, instance-based learning, clustering, concept learning, and possibly Bayesian learning, PAC learnability and reinforcement learning.

Literature

The following books may be used in addition to other articles:

Witten, Ian & Frank Ebe (2000).
Data Mining, Practical Machine Learning Tools and Techniques with Java Implementations
Morgan Kaufmann Publishers
ISBN 1-55860-552-5

In addition, we may also use the following book as reference literature or as a second course book:
Mitchell, Tom (1997).
Machine Learning
WCB McGraw-Hill
ISBN 0-07-042807-7

Teachers

Marcin Szczuka, guest researcher.

Examiner
Patrick Doherty.

Schedule
Fall 2002.

Examination
Completion of a lab series (and possibily a written exam if required).

Credit
5 credits.

FDA137

Semantic Aspects of Logics for Action and Change (CUGS)

Lectures:

Preliminary: 8 lectures of 2x45 min each.

Recommended for

Graduate students.

The course was last given:

New course.

Goals

To familarize the participants with the basic issues in the validation and analysis of range of applicability for logics of actions and change, as well as with existing results in this area.

Prerequisites

Previous study of the C4 course "AI - Kunskapsrepresentation" or the CUGS course "Knowledge Representation" is required or at least strongly recommended.

Organization

Lectures and literature study by the participants.

Contents

Reasoning about actions and change is important for cognitive robotic systems, that is, systems with high-level autonomy. A number of logics for action and change have been proposed during the last ten years. Nonmonotonic inference is understood to be a necessary feature of such logics. The formal properties of those logics have been explored in some cases, but still there are several logics that appear to be practically plausible but whose properties are not well understood.

This course will present the lecturer’s approach to analysing the properties of nonmonotonic logics of action and change, based on his book ’Features and Fluents’ (Oxford University Press, 1994) as well as more recent contributions also by other authors. Generally speaking, the approach is to define an *underlying semantics* for classes of logics with similar expressivity, and then to investigate the *range of applicability* for each logic in such a semantics-defined class.

Literature

Erik Sandewall: Features and Fluents.
More recent papers in Logic of Computation, KR96, AICOM, and ETAI.
Paper by Pavlos Peppas at IJCAI 2001.
Possibly papers by other authors (Thielscher, etc).

Teachers

Erik Sandewall.

Examiner

Erik Sandewall.

Schedule
Fall 2002.

Examination
Conventional written exam.

Credit
3 credits.

FDA015

Object-Oriented Languages for Dynamic Systems (ECSEL)

Lectures:
24 h.

Recommended for
Students in ENSYM, SCORE, STEM, interested in software for modeling and simulation of dynamic systems.

The course was last given:
Fall 2001.

Goals
To give an overview of modern equation-based object oriented modeling languages, with emphasis on the new language Modelica, and how to model complex dynamic systems.

Prerequisites
General background for type 3 courses.(Advanced ECSEL course).

Organization
Lectures and exercises/mini-project.

Contents
What is an object oriented modelling language? The concepts of model, simulation, simulation experiment. Different forms of ordinary differential equation systems. Object model. Connection structure. Units. Type system and type checking. Connection of subsystems. Integration of discrete and continuous system modelling. Examples of realistic application models, e.g. robots, airplanes etc. Compilation techniques for modelling languages.

Literature
Articles and book draft on Modelica.

Teachers
Peter Fritzson, Torkel Glad.

Examiner
Peter Fritzson.

Schedule
Fall 2002.

Examination
Exercises and mini project.

Credit
3 credits.

FDA050

TCP/IP Architecture and Protocols (ECSEL)

Lectures:

24 h.

Recommended for

All ECSEL students.

The course was last given:

Fall 2000.

Goals

The goal of the course is to provide an overview of the numerous communication protocols and services that comprise the core functionality of the TCP/IP Internet. After the course a student should have an understanding, based on knowledge of the underlying technologies, of the possibilities and limitations present in the current Internet. The student should also be familiar with ongoing to development and its possible impact on the kind of services that will be available to the end user in the future.

Prerequisites

Undergraduate network technology course TDTS41.
In case many participants are uncertain about their background prerequisite knowledge, there is a possibility to arrange an introduction half-day to computer networks. We assume that the participants would be complementing by self-study.
Basic knowledge in computer security (see Ecsel's course in Basic Computer Security)

Organization

Lectures (8 lectures of 3 hours each) Seminars for presentation of implementation exercises and/or term papers.

Contents

he course touches upon many areas as shown below. The focus is on the protocols from the network layer and upwards, although some physical and link layer concepts are discussed in the beginning.

As well as giving information about the specific protocols, the course also aims to convey the architecture and philosophies behind the Internet protocols. Also, while future extensions and emerging protocols are discussed, the focus is on the currently deployed protocols.

The following preliminary lecture plan shows the topics covered:

Lecture 1

Course organization
Introduction
Basic principles, terminology, layering
The physical layer (brief discussion of media and topologies)
The link layer (e.g. Ethernet, PPP)
Internet organization and standards

Lecture 2

The network layer (IP, ICMP)
Link layer address resolution (ARP)
Host auto-configuration (BOOTP, DHCP)
Routing

Lecture 3

The connection-less transport layer (UDP)
The connection-oriented transport layer (TCP)

Lecture 4

Remote login protocols (telnet, rsh, SSH, X)
File transfer protocols (FTP, HTTP)
E-mail protocols (SMTP, POP, IMAP, MIME)
News protocols (NNTP)

Lecture 5

API to the transport layer: sockets
Data representation and remote procedure calls: XDR, RPC, ASN.1
Distributed file systems (NFS)

Lecture 6

Dmain Name System (DNS)
Network Time Protocol (NTP)
Network management (SNMP)

Lecture 7

Security issues in TCP/IP
Firewalls
IPsec

Lecture 8

Multicast
QoS
IPv6
Emerging application protocols

Related Courses

Basic Computer Security
Cryptology
Applied Network Security
Network Services and Protocols with new themes

Literature

Stevens, W. Richard, TCP/IP Illustrated, Volume 1, The Protocols, ISBN 0-201-66346-9, Addison-Wesley.
Request For Comments (RFC) documents and other information available on the Internet

Teachers
Kent Engström, UNIT. Some parts of the lectures may be given by invited speakers.

Examiner
Nahid Shahmehri.

Schedule
Fall 2002.

Examination
Open-book written exam. During the exam any written material is allowed.

For additional practice and credits, the participants can choose to do an implementation exercise or write a term paper for extra credits.

Credit
5+2 credits.

Comments
Related Courses:

Basic Computer Security.
Cryptology.
Applied Network Security.
Network Services and Protocols with new themes.

FDA066

Human Factors Research Methodology and Field Experimentation - HMI503 (HMI)

Lectures:
45 h.

Recommended for
Graduate students.

The course was last given:
Fall 2001.

Goals
This course is an introduction to scientific research methodology focusing primarily on various methods of data collection and analysis in field research.

Prerequisites
Graduate Student status or advanced undergraduate.

Organization
15 x 3 hours/week.

Contents
Ethics in research, Field experimentation, Laboratory versus field research, Quasi-experimental design, Validity and reliability of measurement. Critique of scientific articles. Various methods for studying human performance and collecting data including: use of behavioral taxonomies, task analysis, system analysis, verbal protocols, questionnaires, surveys, scaling, and psycho-physics.

Literature
Cook, T.D. , and Campbell, D.T. (1979).
Quasi-Experimentation: Design & Analysis Issues for Field Settings.
Houghton Mifflin Company, U.S.A.

Wilson, J.R. ,and Corlett, E.N. (Eds.) (1995). Evaluation of Human Work - A practical ergonomics methodology. Taylor & Francis, Great Britain.

Research articles

Teachers
Håkan Alm, IKP.

Examiner
Håkan Alm, IKP.

Schedule
Fall 2002.

Examination
Home works, Two written tests.

Credit
5 credits.

FDA132

An Introduction to Human Factors Engineering - HMI606 (HMI)

Lectures:
30 h.

Recommended for
Graduate students and well-qualified undergraduate students.

The course was last given:
Spring 1998.

Goals
To give student basic knowledge in Human Factors Engineering.

Prerequisites
Graduate Student status or qualified Undergraduate.

Organization
This course is arranged as a series of four seminars. It is necessary for students to have read pages before class, so that there is a meaningful discussion. Every student should bring about 6 prepared issues to discuss for each seminar. Location: Röda Rummet, A-huset, Linköpings universitet.

Contents
Human Factors and Systems, Human Factors Research Methods, Information Input and processing, Text, Graphics, Symbols and Codes, Visual displays, Auditory Displays, Speech Communication, Physical work, Motor Skills, Human Control of Systems, Control and Data Entry, Hand Tools, Antrhopometry, Work Place Design, Seating, Arrangements of Components in Space, Interpersonal Aspects, Illumination, Climate, Noise, Motion, Human Error, Safety, Automobiles, Systems Design.

Literature
Sanders, M.S. an McCormick, E. Human Factors in Engineering and Design. McGraw-Hill, 1993 about 800 pages.

Teachers
Sidney Dekker, IKP.

Examiner
Sidney Dekker, IKP.

Schedule
Fall 2002.

Examination
Two written tests.

The two written tests give 60% of the course grade. Passing grades on the written tests are necessary for a passing grade on the course.

The paper corresponds to 40% of the grade. The topic for the paper must be discussed with the teacher. It should be a new paper on some relevant issues to Human Factors. It could be either a review paper or a proposal.

Credit

5 credits.

FDA090

Play & Designing Media for Participation - HMI723 (HMI)

Lectures:

16 h

Recommended for

Graduate students.

The course was last given:

New course.

Goals

To develop the ability to describe, use, and invent design solutions in the area of media technology – with particular emphasis on co-adaptive designs that facilitate both good experience and good praxis.

Prerequisites

None.

Organization

The course is organized as a series of design sessions, discussions, and small, weekly "deliverables." (Note: The weekly deliverables are a mechanism for students to make regular progress towards their final projects; students can expect weekly feedback on their deliverables.) The course will meet weekly for 8 weeks, and then, again, twice at the end of the Fall term for review and rejoicing.

Contents

This course is a studio for designer-developers of computational media. The focus is on developing media that allow people to instantly (or quickly) do the self-fulfilling activities they find important.

The course will explore aspects of media technology, cognitive science, and aesthetics that are relevant when designing to support engaging participation. We will draw insights from example technologies that are practical (programming environments), engaging (games), or both. We will also examine different models of human-computer interaction and of cognition – including both models of the third-person and experiences of the first-person ("how do we improve the experience of particular activity?"). Finally, we will look at different approaches to "non-utilitarian" media and experiences, such as games, play, art, and performances.

Literature

Readings will be adapted to the needs and interests of course participants, but will most likely include pieces by Christopher Alexander, Mihaly Csikszentmihalyi, Jean Lave, Scott McCloud, Marvin Minsky, Seymour Papert, Edward Tufte, and Francisco Varela. These readings will be short and distributed as needed.

Teachers

Kevin McGee

Examiner
Kevin McGee

Schedule
Fall 2002

Examination
Active participation, weekly deliverables, and a final project.

Credit
3 (+ 2) credits

Comments
Course size is limited to 15 participants. All students are expected to define and complete a small project that contributes in some definite way to their thesis work; examples of projects include a publishable article, a thesis chapter, a prototype, a small hardware/software implementation, or even a formal thesis proposal. The difference between the 3-point and 5-point version of the course is the scale of the final project. Course language will be a mix of English and Swedish.

FDA135

Perspektiv på forskning och vetenskap (M.I.T)

Lectures:

26 tim (6 dagar).

Recommended for

Graduate students.

The course was last given:

New course.

Goals

Kursen syftar till att introducera de studerande till forskning och vetenskap. Målet är att de efter genomgången kurs skall ha erhållit kunskaper om forskningens och vetenskapens framväxt, hur vetenskapen är organiserad samt dess roll i det moderna samhället.

Organization

Kursen ges på helfart. Undervisningen sker på svenska och består av föreläsningar samt seminarier. Kursen förutsätter närvaro och aktivt deltagande från de studerande. Undervisningen är koncentrerad till sex dagar; totalt 26 timmar.

Contents

Kursen innehåller tre moment:

1. Historiska perspektiv på forskningen.
2. Vetenskap som social organisation med tillämpning på management och informatik.
3. Vetenskap i det moderna samhället.

Literature

1. Historiska perspektiv på forskningen

- Haynes, Roslyn D., 1994, From Faust to Strangelove. Representations of the Scientist in Western Literature, Baltimore, MD and London: The John Hopkins University Press (Paperback) (375 s.).
- Kuhn, Thomas, 1996/1962, Structure of Scientific Revolutions, Chicago, IL: University of Chicago Press (Paperback) (220 s.).
- 2. Vetenskap som social organisation med tillämpning på management och informatik
- Whitley, Richard, 2000/1984, The Intellectual and Social Organization of the Sciences, Oxford: Oxford University Press (Paperback) (354 s.).
- Engwall, Lars, 1992, Mercury Meets Minerva, Oxford: Pergamon Press. (224 s.).
- Engwall, Lars, 1995, "Management Studies: A Fragmented Adhocracy?", Scandinavian Journal of Management, 11, No. 3, pp. 225-235. (10 s.).
- Engwall, Lars, 1996, "The Vikings vs. the World. An Examination of Nordic Business Research", Scandinavian Journal of Management, 12, No. 4, pp. 425-436. (11 s.).
- Nilsson, Anders G., 1995, "Utveckling av metoder för systemarbete - ett historiskt perspektiv", LiTH-IDA-R-95-13 (31 s.).

3. Vetenskap i det moderna samhället

- Gieryn, Thomas F., 1999, Cultural Boundaries of Science. Credibility on the Line. Chicago, IL: University of Chicago Press (Paperback) (376 s.).
- Nowotny, Helga, Peter Scott and Michael Gibbons, 2001, Rethinking Science. Knowledge and the Public in Age of Uncertainty, Cambridge: Polity Press (Paperback) (262 s.).

Teachers
Lars Engwall.

Examiner
Birger Rapp.

Schedule
Fall 2002.

Examination
För godkänd kurs krävs aktivt deltagande i undervisningen samt godkänd hemtentamen.

Credit
5 poäng.

Faculty engaged in the graduate study programme

ADIT: Database and Information Techniques

Patrick Lambrix, Ph. D., Linköping 1996. Associate professor (*docent*, universitetslektor).

Bioinformatics and intelligent information systems: knowledge representation, organization and management of information, information retrieval, ontologies, integration of biological databases.

Nahid Shahmehri, Ph. D., Linköping 1991. Professor of computer science. Group leader, IISLAB and EDSLAB. Head of the Division for Database and Information Techniques. Previous affiliation: Carlstedt Elektronik AB.

Engineering information systems and applications, information security, peer-to-peer computing, Internet and mobile services, information retrieval and information extraction.

Lena Strömbäck, Ph. D.,Linköping 1997. Assistant professor *(universitetslektor)*. Previous affiliations: Assistant professor, NLPLAB, Linköping University, Coordinator of research activities at Nokia Home Communications.

Multimedia databases, information extraction, functionalities for intelligent homes.

Juha Takkinen, Ph. D., Linköping 2002. Assistant professor (*forskarassistent*).

Intelligent Informations Systems: information retrieval and filtering, electronic mail and the semantic web, work-flow and task management.

AIICS: Artificial Intelligence and Integrated Computer Systems

Marcus Bjäreland, Ph. D., Linköping 2001. Assistant professor (*vik. universitetslektor*), computer science.

Artificial Intelligence, Knowledge Representation, Execution Monitoring, Constraint satisfaction, Reasoning about Action and Change.

Patrick Doherty, Ph. D., Linköping 1991. Professor of computer science. Group leader, KPLAB. Head of the Division for Artificial Intelligence and Integrated Computer Systems.

Artificial Intelligence, Knowledge Representation, Autonomous Systems, Deliberative/Reactive Systems, Reasoning about Action and Change, Planning, Non-monotonic Reasoning.

Anders Haraldsson, Ph. D., Linköping 1977. Associate professor ***(****bitr professor*), computer science. Head of the department of computer science, 1990-1999. Chair of the board of undergraduate studies for the computer science and engineering programmes at Linköping Institute of Technology. Previous affiliation: Uppsala.

Programming languages and systems, programming methodology, program manipulation, partial evaluation.

Witold Lukaszewicz, Ph. D., 1979 in Warsaw University. On leave from College of Economics and computer science TWP Olsztyn.

Research interests include reasoning about action, non-monotonic reasoning, planning and knowledge base update.

Erik Sandewall, Ph. D., Uppsala 1969. Professor of computer Science. Group leader, CASL. Director of the WITAS project. Chairman of the Board for the National Graduate School in computer science (CUGS). Director of Linköping University Electronic Press.

Representation of knowledge with logic, reasoning about action and change, cognitive robotics, autonomous agents.

HCS: Human-Centered Systems

Lars Ahrenberg, Ph. D., Uppsala 1987. Professor of computational linguistics. Group leader, NLPLAB. Head of the Division for Human-Centered Systems.

Syntax, semantics and pragmatics of natural language; dialogue systems, natural language; machine-aided translation, parallel corpora.

Nils Dahlbäck, Ph. D., Linköping 1992. Associate professor (*universitetslektor*), cognitive science. Deputy/Dean in the Arts and Science faculty

Natural language processing, especially empirically based computational models of discourse. Individual differences in cognitive styles and abilities, including learning styles, and their relationship to hypermedia navigation and IT-based learning. Cultural differences in social responses to media.

Henrik Eriksson, Ph. D., Linköping 1991. Associate professor (*docent, universitetslektor*), computer science. Previous affiliations: Stanford University, Stanford, CA, 1991-94 and the Swedish Institute of computer science (SICS) 1996-97.

Knowledge-based systems, knowledge acquisition, ontologies, semantic web, medical informatics, software development environments, command-and-control systems, Internet-based applications, and Java programming

Niklas Hallberg, Ph. D., Linköping 1999. Assistant professor (*forskarassistent*), informatics.

System development, requirements engineering, organizational development, quality methods, participatory design, information technology.

Erik Hollnagel, Ph. D., Århus 1981. Professor of Human-Computer Interaction. Several previous affiliations in Denmark, England and Norway.

Cognitive systems engineering, risk and reliability analysis, user modelling and simulations, decision support and expert systems

Sture Hägglund, Ph. D., Linköping 1980. Professor of knowledge-based systems. Deputy head of the department of computer science. Manager Industry Research School. Group leader, ASLAB. Previous affiliation: Uppsala.

Expert systems and artificial intelligence applications, database technology, human-computer interaction, intelligent tutoring systems and software engineering.

Erland Jungert, Ph. D., Linköping 1980, consulting professor (*docent, adjungerad professor)* geographical information systems and computer science. Main affiliation: Swedish Defense Research Establishment (FOI).

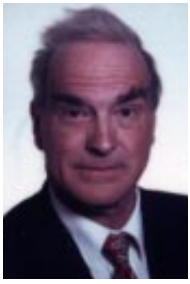
Qualitative spatial reasoning, geographical information systems, database technology, visual languages.

Arne Jönsson, Ph. D., Linköping 1993. Associate professor (*docent, universitetslektor*), computer science. Director of undergraduate studies for the Cognitive Science program. Previous affiliation: Monash University, Clayton, Australia, 1994-95.

Artificial intelligence, natural language processing, dialogue systems, especially empirically based computational dialogue models.

Rita Kovordányi, Ph. D., Linköping 1999. Assistant professor (*forskarassistent*), computer science. Previous affiliation: Lund University.

Cognitive technology, cognitive modelling, cognitively based agents in adaptive support systems, visual reasoning.



Bertil Lyberg, Ph. D., Stockholm 1981. Consulting professor (*adjungerad professor*), speech technology. Manager of spoken language processing, Telia Research AB. Research Affiliate, Research Laboratory of Electronics, M.I.T. 1982-83.

Text-to-speech conversion, speech recognition, speech-to-speech translation, prosody in speech synthesis and recognition.

Hans Marmolin, Ph. D., Uppsala 1973. Consulting professor *(adjungerad professor)*, human-computer interaction, especially information psychology. Previous affiliation KTH and others.

Human-computer interaction, usability engineering, cognitive ergonomics, user interface design.

Magnus Merkel, Ph. D., Linköping 1999. Assistant professor (*universitetslektor*), computational linguistics.

Natural language processing, computational support for writing and translation; machine-aided translation, parallel corpora, information extraction.

Kjell Ohlsson, Ph. D., Umeå 1982. Professor at the Department of Mechanical Engineering. Part time at the Department of Computer and Information Science, human-computer interaction. Previous affiliations Umeå, Luleå and others.

Human-computer interaction, usability engineering, cognitive ergonomics, decision making, psycho acoustics.

Eva Ragnemalm, Ph. D., Linköping 1999. Assistant professor (*universitetslektor*), computer science.

Intelligent tutoring systems, simulation based tutoring systems, student modelling and user modelling, human-computer interaction.

Nancy Reed, Ph. D., University of Minnesota 1995. Assistant professor (*universitetslektor*), computer science. Previously at University of California, Davis.

Autonomous agents, knowledge-based systems, modelling human expert reasoning, real-time systems and specification languages for agents. Current application areas are agents in dynamic simulation environments and knowledge-based systems in diagnosis.

Åke Sivertun, Ph. D. Umeå 1993. Assistant professor (*universitetslektor*), geoinformatics. Group leader, GIS-Lab.

Geographical Information Systems - GIS. Communication of complex data and linking multi disciplinary models in GIS. Research in environmental programs, programs for medical geography, physical planning and decision support.

Toomas Timpka, MD., Stockholm 1983, Ph. D., Linköping 1989. Professor of Social Medicine and Public Health Sciences. Part time at the Department of Computer and Information Science, informatics. Group leader, MDA.

Hypermedia, computers and society, human-computer interaction, systems development.

Shumin Zhai, Ph. D., University of Toronto, 1995. Guest Professor, Human-Computer Interaction. Research Staff Member, IBM Almaden Research Center, San Jose, California.

Advanced user interfaces; interaction devices and methods; multi-dimensional, multi-stream, multi-hand, and multi-modal input; human performance modeling and experimentation.

ISM: Information Systems and Management

Leif Appelgren, Lic.Eng. Consulting professor (*adjungerad professor*), economic information systems. Previous academic appointments with Linköping and Handelshöyskolen Bl, Norway. Several previous affiliations. Current affiliation: Leif Appelgren Consulting AB.

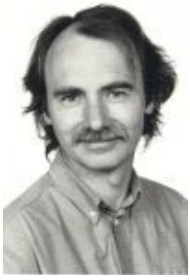
Measurement and audit methods related to economic crime prevention. Trust issues in electronic commerce B2C.

Karin Axelsson, Ph. D., Linköping 1998. Assistant professor (*forskarassistent*), information systems development.

Information systems architecture, theories on information systems development, inter-organisational business development, qualitative research methods.

Stefan Cronholm, Ph. D., Linköping 1998, Assistant professor (*universitetslektor*), computer science. Co-leader, VITS. Director of undergraduate studies for the Information Systems Analysis Program.

Theories/methods on business process and information systems development, method modelling, qualitative research methods, method tools, usability.



Göran Goldkuhl, Ph. D., Stockholm 1980. Professor of information systems development. Group leader, VITS. Part time professor of informatics, Jönköping International Business School. Research director VITS network. Research director at Centre for studies on Man, Technology and Organization. Previous affiliations: Stockholm, Göteborg.

Communicative action theories and methods for evaluation and design concerning inter-organisational networking, business processes, information systems, human-computer interaction, electronic commerce and knowledge management. Method modelling and renewal. Qualitative research approaches.

Anna Moberg, Ph. D., Linköping 1997. Assistant professor, (*forskarassistent*), economic information systems.

IT and organisational design, e-work, telework, callcentre, non-territorial office, organisational communication, location.

Fredrik Nilsson, Ph. D., Linköping 1997. Consulting professor (*adjungerad professor*), strategy and management control systems. Senior Manager at Deloitte Consulting.

Strategy and management control, environmentally-driven business development, valuation and accounting of intangible assets, production control.

Nils-Göran Olve, Econ. Dr., Stockholm 1977. Consulting professor (*adjungerad professor*), management control. Positions with the Stockholm School of Economics and EIASM in Brussels. Partner in Cepro Management Consultants (now Concours Cepro AB) since 1986.

Management issues arising from IT-enabled business change, especially how accounting, control, and pricing could be modified to provide information and incentives appropriate for the new business situation.

Birger Rapp, Econ. Dr., Stockholm 1974, Professor of economic information systems. Group leader, EIS. Head of the Division for Information Systems and Management. Director of the Swedish Research School of Management and Information Technology, M.I.T.. Among many other appointments president of the board of the Swedish Teleworking Association, Distansforum and program director in Management and Economic Information Systems at IMIT.

Accounting, business control, agency theory, IT and organization, production, economics.

Rolf Rundfelt, Ph. D., Stockholm 1974. Consulting professor (*adjungerad professor*), economic information systems, especially in Swedish and international Financial Accounting. Docent in Business Administration, University of Stockholm. Since 1966, lecturer at the University of Stockholm.

Bengt Savén, Econ. Dr., Linköping 1995. Consulting professor (*adjungerad professor*), change management. Director within Saab Commercial Programs since 1997.

Main interests in Computer Simulation in Change Processes, Process Management and Manufacturing Planning and Control.

Vivian Vimarlund, Ph. D. Linköping 1999. Assistant professor (*forskarassistent*), informatics.

Health informatics and the organizational and societal economic effects of the development, use and implementation of Information and Communication Technology (ICT). Economic. Human-computer interaction, and development of methods and models for Economic Evaluation of user centered approaches to develop Information Systems.

Alf Westelius, Econ. Dr., SSE Stockholm, 1996. Assistant professor (*universitetslektor*), economic information systems, especially electronic commerce and knowledge management. Previous affiliations: The Stockholm School of Economics, the Ministry of Culture.

Knowledge management, project management, electronic commerce, change management and implementation processes.

SaS: Software and Systems

Uwe Assmann, Dr. rer. nat., Karlsruhe, 1995. Associate professor *(docent, universitetslektor*). Group leader, RISE (Research Center for Integrational Software Engineering) and the Swedish Semantic Web initiative (SWEB). Previous affiliations: Karlsruhe University, INRIA Rocquencourt, GMD. Member of IFIP WG 2.4 System Implementation Techniques.

Software engineering, software composition, aspect oriented development, Semantic Web, graph rewriting, software architecture, program analysis and optimization. Tools: Pike, COMPOST, Optimix, CoSy.

Wlodzimierz Drabent, Ph. D., Warsaw 1985. Associate professor (*docent, universitetslektor*), computer science. Associate professor at the Institute of computer science, Polish Academy of Sciences.

Logic programming: proving properties of programs, types, error diagnosis, constraint logic programming, negation; programming languages semantics.

Petru Eles, Ph. D., Bucuresti 1993. Professor of embedded computer systems. Previous affiliation: Technical University Timisoara, Romania.

Design of embedded systems, design automation for digital systems, real-time systems, hardware/software co-design, computer architectures, concurrent programming, hardware description languages and languages for system specification.

Vadim Engelson, Ph. D., Linköping 2000. Assistant professor (*forskarassistent)*, computer science.

Computer graphics, virtual reality, physics-based simulation, visualization and animation; modelling and simulation environments.

Johan Fagerström, Ph. D., Linköping 1988. Associate professor (*universitetslektor*), computer science.

Distributed systems, object-oriented programming, object-oriented analysis and design, operating systems.

Dag Fritzson, Ph. D., Göteborg 1988. Consulting professor (*adjungerad professor*), engineering information systems especially scientific computing. Previous affiliation Chalmers University of Technology, Göteborg. Current affiliation SKF AB.

Modelling techniques, parallel simulation, visualization, machine element modelling, e.g. rolling bearings.

Peter Fritzson, Ph. D., Linköping 1984. Professor of programming systems and software engineering. Group leader, PELAB. Previous affiliations: Sun Micro Systems, USA, 1985-86, Linköping University Hospital 1976-79. LiU Physics dept., 1975-76.

Programming environments and languages, design languages and simulation environments, scientific computing, debugging tools, incremental compilation technology, compiler generation, compilers and development tools for parallel hardware.

Jörgen Hansson, Ph. D., Linköping University 1999. Assistant professor (*universitetslektor*), Director of CUGS - national graduate school of computer science. Chair of the board of studies for the bachelor's engineeering curriculum at the Linköping Institute of Technology. Previous affiliations: University of Skövde and University of Virginia, Charlottesville.

Real-time systems, database support for embedded and real-time systems, real-time operating systems, distributed systems.

Peter Jonsson, Ph. D., Linköping 1996. Associate professor (*docent, universitetslektor*), computer science.

Construction and analysis of algorithms. Complexity theory.

Christoph Kessler, Ph. D., Saarbrucken, Germany 1994 Associate professor *(docent, universitetslektor*), for data structures, algorithms, and programming, at PELAB. Director of undergraduate studies for the Software and Systems division (SaS).

Code generation, code optimization, programming parallel computers, design and implementation of parallel programming languages, algorithms and data structures, computational geometry.

Erik Larsson, Ph. D., Linköping 2000. Assistant professor (*vik. universitetslektor*), computer systems.

Design and optimization of hardware test of computer systems, computer architecture, operating systems, computer-aided design of electronic systems.

Mariam Kamkar, Ph. D., Linköping 1993. Professor of software engineering. Head of the department of computer science.

Software engineering, software testing, program debugging, program analysis, optimization in compilers, programming environments and languages.

Jan Maluszynski, Ph. D., Warsaw 1973. Professor of programming theory. Several previous affiliations.

Constraint logic programming, formal methods in computer science.

Simin Nadjm-Tehrani, Ph. D., Linköping 1994. Associate professor *(docent, universitetslektor)*, Real-time Systems, Group leader, RTSLAB.

Modelling and formal verification, Dependable systems, Resource allocation and Fault-tolerance in Distributed systems.

Ulf Nilsson, Ph. D., Linköping 1992. Associate professor (*docent, universitetslektor*), computer science. Associate head of the department of computer science. Director of graduate studies. Group leader, TCSLAB. Previous affiliations: State University of New York at Stony Brook and École Normale Supérieure de Cachan.

Logic programming and constraint programming; Formal verification; Automated fault diagnosis; Program transformation and abstract interpretation.

Zebo Peng, Ph. D., Linköping 1987. Professor of computer systems. Group leader, ESLAB. Head of the Division for Software and Systems.

Design and test of embedded systems, electronic design automation, design for testability, hardware/software co-design, real-time systems, computer architecture, VLSI.

Kristian Sandahl, Ph. D., Linköping 1992. Professor of software engineering. Director of undergraduate studies for the Software and Systems division (SaS).

Industrial software engineering, knowledge management, requirements engineering, software quality, software processes, knowledge engineering, empirical research methods, inspection methods.

Anders Törne, Ph. D., Uppsala 1980. Consulting professor (*adjungerad professor*), computer support in automation. Main affiliation is Xelin Research & Development AB, Linköping.

Tools, methods and architecture for systems engineering and real-time system design. Applications in automation and embedded systems. Real-time programming and specification languages. Robot programming.

Guest researchers and affiliated faculty engaged in the graduate study programme

Sten F. Andler, Ph. D., Carnegie-Mellon University 1979. Professor of computer science, Högskolan i Skövde, (*docent, LiU*), distributed systems, real-time systems, operating systems. Previous affiliations: IBM Software Solutions (1992-93) and Almaden Research Center (1979-92), San Jose, CA.

Distributed real-time systems, real-time databases, active real-time databases, distributed databases, real-time operating systems.

Anders Avdic, Ph. D., Linköping 1999. Senior lecturer *(universitetslektor)*, Örebro University.

End User Computing, Local Systems, Knowledge Management.

Christer Bäckström, Ph. D., Linköping 1992. Associate professor (*docent, universitetslektor*). On leave.

Planning and temporal reasoning, algorithms and complexity, model-based diagnosis.

David Carr, Ph. D., Maryland 1995. Assistant professor (*universitetslektor*), human-computer interaction. Previous affiliations Maryland and Luleå.

User interface design, visualization, computer-supported cooperative work and groupware for teamwork.

Dimiter Driankov, Ph. D., Linköping 1989. Professor of Computer Engineering at the Department of Technology, Örebro University and Research Coordinator for the Center for Applied Autonomous Sensor Systems. Guest researcher at the Division for Artificial Intelligence and Integrated Computer Systems.

Intelligent Control, Fuzzy Systems and Control, Autonomous Robotics.

Owen Eriksson, Ph. D., Linköping 2000, Senior Lecturer (*universitetslektor*), informatics. Co-leader, VITS. Director of undergraduate studies for Informatics at Dalarna University.

Theories/methods on business process and information systems development and evaluation, data base and conceptual modelling, IT and mobility.

Roland Hjerppe, Director of Libraries, Mid Sweden University. Previous Group leader, LIBLAB.

Library science and systems, hypertext and -media, knowledge organization and information retrieval, citation analysis and bibliometrics, personal and everyday life information/document management.

Olof Johansson, Ph. D., Linköping 1996.

Engineering databases, complex product models.

Bengt Lennartsson, Ph. D., Göteborg 1974. Associate professor (*docent, LiU*), software engineering. Group leader, PELAB 1981-88, and head of the Department of computer science 1983-90. Previous affiliation: Carlstedt Elektronik AB, Göteborg 1992-94. Current affiliation ITN, Campus Norrköping.

System development models, development of complex systems, organizational learning.

Mikael Lind, Ph. D. Linköping 2001. Research fellow, information systems development.

Business processes and information systems. Method engineering qualitative research methods, change analysis, knowledge management.

Witold Litwin, Professor University Paris 9. Guest professor Linköping, Stanford, Berkeley, Santa Clara university.

Distributed scalable data structures (SDDSs), multidatabase systems, storage structures, query languages.

Jonas Löwgren, Ph. D., Linköping 1991. Associated professor (*docent, LiU*) of human-computer interaction, 1995. Professor of interaction design, Malmö university college. Research director, Animationens hus, Eksjö.

Interaction design, human-computer interaction.

Anders G. Nilsson, Econ. Dr., Stockholm 1991. Professor of information systems, Karlstad University. Associate professor (*docent, LiU*) of information systems development in 1995. Acting professor of economic information systems in 1992. Previous affiliations: KTH, University of Stockholm and Stockholm School of Economics.

Application packages, business modelling, business process re-engineering (BPR), information management, ISD methods, IS/IT strategies, maintenance management.

Henrik Nilsson, Ph. D., Linköping 1998. Assistant professor (*forskarassistent*), computer science.

Functional programming languages, programming language implementation, functional programming, declarative debugging.

James M. Nyce, Ph. D., Brown 1987. Guest professor (*docent, LiU*) computer and information science. Associate professor, School for Library and Information Management, Emporia State, Emporia, KS, USA. Previous affiliation Brown.

Work and knowledge (medicine and academia); tradition, innovation and technology; hypertext and visual resource development paths.

Andrzej Szalas, Ph. D., Warsaw University 1984. Guest professor. Also a professor in the College of Economics and computer science, Olsztyn, Poland.

Applied logics, knowledge representation, deductive databases.

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