ID2012 Ubiquitous Computing 7.5 credits

Ubiquitous Computing

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for ID2012 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Basic courses in mathematics, computer science, human computer interaction, artificial intelligence and programming of distributed systems.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

On successful completion of this course the student has: Knowledge and understanding regarding:

- the objectives and the historical development of the field of ubiquitous computing
- development in new materials
- fundamentals of sensor technology and sensor networks
- design of new (often embedded) interactive artefacts
- contextaware and adaptive systems
- middleware for fine-grained distributed systems
- analysis and coordination of complex systems
- new styles of interaction, e.g. tangible interfaces
- most important applications in the field
- general implications of the field.

Skills and capacities, to be able to:

- apply middleware techniques to implement ubiquitous computing systems
- design and implement coordination schemes for systems with many software and hardware components
- design and implement simple context aware applications, using standard sensor technology
- design and implement interfaces suitable for ubiquitous computing in particular tangible interfaces.

Values and attitudes, to be able to:

- compare the usability of alternative design of interactions for specific ubiquitous computing systems
- compare the adequacy of alternative coordination strategies for specific ubiquitous computing systems
- judge the user acceptance and relevance of specific designs for adaptive and context aware systems
- compare the adequacy of alternative middleware techniques for particular ubiquitous computing systems.

Course contents

Introduction to the field of ubiquitous computing including objectives of the field, core technologies, applications and implications for society. Core technologies are innovative materials, design of new computational artifacts, sensor technology, middleware for fine grained distributed systems, context aware systems, theory of complex systems, artificial intelligence techniques for coordination of behaviour (multi agent systems) and new forms of interaction. A specialization in middleware for ubiquitous computing with a bias on support for collaborative applications, context aware functionalities and tangible interfaces.

Disposition

The course has two parts, a theoretical part covered by a series of lectures and a lab part covered by a few basic lectures, guest lectures and some instructive sessions. The lab part consists of a smaller lab with the purpose to acquire basic skills and a more extensive integrated lab. The labs are performed in groups.

Course literature

A collection of articles.

Examination

- INLA - Assignment, 1.5 credits, grading scale: P, F
- LABA - Laboratory Work, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- SEM1 - Seminar, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

The course has three parts:
- Essay (individual, 1,5 hp)
- Lab design and implementation (group, 3 hp)
- Seminar with lab report and presentation (individual, 3 hp)

Grades are based on the individual parts focused on the seminar.

Ethical approach

- All members of a group are responsible for the group's work.

- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.