



EQ2870 Machine to machine communication 6.0 credits

Maskin till maskin kommunikation

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

Establishment

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Basic eligibility to be accepted to the course requires that the applicant has a degree on the first level consisting of at least 180 higher education credits or a corresponding foreign degree. And a good knowledge of English, equivalent to Eng 6.

Language of instruction

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

Intended learning outcomes

In order to pass the course, students should be able to:

- Identify the main challenges associated with machine-to-machine communications with respect to the status quo in networking today.
- List the main standards/protocols/algorithms/research activities which address these challenges as of today.
- Describe how these standards/protocols and algorithms solve the challenges at hand.
- Dimension either local or wide-area networks for machine-to-machine applications with respect to the standard/protocol chosen.
- Identify limits of standards/protocols and algorithms with respect to machine-to-machine applications
- Explain major technological approaches for the problems of tagging/identification and localization
- Analyze a selected application scenario for machine-to-machine communications and demonstrate the interrelationship between the different components (capillary, widearea and auxiliary functions) with respect to the application scenario chosen.

A-level students should be able (in addition) to:

- Identify the most important research problems in the different areas of machine-to-machine communications and current approaches to overcome them.
- Combine different standards/protocols/approaches of different areas (capillary, widearea, auxiliary) into a single system conceptually and identify performance bottle necks.
- Summarize, explain and apply the most important models underlying the major technical solutions developed in the different areas of machine-to-machine communications.

Course contents

The course introduces the main challenges, solutions and application fields of machine-to-machine communications. As an emerging networking paradigm, machine-to-machine communications spans all communication processes that do not involve humans and which are designed to pursue tasks of automation in the most general sense. This enables completely new application areas but introduces several novel and severe challenges. These have been addressed by research industry over the last couple of years and have initiated new standardization activities as well as significant research findings. This course deals with these new insights and technologies and puts them in relation to the new emerging application fields. In particular, the course is divided into five different blocks: Capillary networking, wide-area networking, tagging / identification / localization services, and application scenarios (Internet-of-things, smart grid, vehicular networks). Each block is accompanied by

a mandatory assignment for students to be worked on individually as well as in groups. Assignments that have to be worked on in groups are afterwards presented in front of class.

Disposition

See further about the examination requirements.

Course literature

Reading assignments (research papers) are passed to the students one week before class.

Examination

- INL1 - Homework, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Exam, 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.

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

Other requirements for final grade

The course is graded on an A-F basis. Assessment contains two components. Students have to work on the exercise sets and take a final exam. Two exercise sets will be worked on alone, two will be worked on in groups. For the exercise sets that are worked on individually, the grading is afterwards performed based on peer-reviewing (hence, students also have to grade two assignments of their colleagues). All exercise sets together yield a certain grade (A-F). The final exam is either a written examination or (more likely) an oral examination. Exams and exercises have equal weight towards the final grade.

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.