



EL2320 Tillämpad estimering

7,5 hp

Applied Estimation

Fastställande

Kursplan för EL2320 gäller från och med HT10

Betygsskala

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

Utbildningsnivå

Avancerad nivå

Huvudområden

Elektroteknik

Särskild behörighet

For single course students: 120 credits and documented proficiency in English B or equivalent.

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

The overall goal of the course is to give the participants theoretical as well as practical skills and experience in estimation. The course will start from a number of concrete examples to motivate the need for various filtering techniques such as Kalman filters and particle filters. After completing the course the participants should:

- be able to analyse estimation problems and choose suitable techniques to solve them
- understand the theoretical basis for the estimation techniques
- use different estimation techniques such as Kalman filters and particle filters to solve real world problems

Kursinnehåll

The course focuses on giving the participants practical experience in using different estimation techniques on real problems. Examples used in the course are for example from navigation with mobile robots. The following will be covered in the course: Observability, the Markov assumption, data association, estimation techniques such as Kalman filter, extended Kalman filter, particle filter, Rao-Blackwellized particle filter, Unscented Kalman Filter, Covariance Intersection.

Kursupplägg

There are 12 lectures and two projects in the course.

During the lectures both theory and practice of estimation will be covered. Getting practical skills in anything requires you to get hands-on experience and as such the work between the lectures will be very important.

Kurslitteratur

There is no official course book. Lectures notes will be made available. This course is at advanced level so some of the material will be in the form of research publication. The students are assumed able to research for additional material to solve the project assignment.

The recommended reading is "Probabilistic robotics" by Thrun, Burgard and Fox, The MIT Press, ISBN 0-262-20162-3 covers most of the material in the course from a robotics points of view.

Utrustning

No special equipment needed, you only need access to a computer

Examination

- PRO2 - Projekt, 2,0 hp, betygsskala: P, F
- PRO1 - Projekt, 2,0 hp, betygsskala: P, F
- TEN1 - Tentamen, 3,5 hp, betygsskala: P, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enskilda studenter.

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

The basic part of the examination in the course consists of one regular exam and two individual lab like project assignments.

PRO1: 2.0hp

PRO2: 2.0hp

TEN: 3.5hp

Each of these will be reported to the system with a P/F grade and passing them means that the student has passed the course.

For higher grades the student needs to select a topic to study in a more focused project, researching for material in the literature. This project assignment can be completed in groups of two students.

The final grade is given as A-F and is based on the performance on the exam and the project work. Completing only the two basic parts of the project gives the grade E.

Övriga krav för slutbetyg

To get a passing grade in the course the students need to pass the mandatory part of the project assignments and the exam.

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.