FEL3320 Applied Estimation 7.5 credits

Tillämpad estimering

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

Establishment

Course syllabus for FEL3320 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

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: describe the parts of a Bayesian recursive filter in terms of the underlying probabilities, compare and contrast different estimation techniques, and select and apply appropriate techniques to problems.
- have reflected on the relationship between measurement uncertainty, probability theory and estimation methods.
- have gained experience in finding information from current scientific literature including recently published journal articles. As well as presentation of results in well structured scientific reports.

Course contents

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.

Examination

- EXA1 - Examination, 7.5 credits, grading scale: P, 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.

The basic part of the examination in the course consists of two lab assignments (PRO1), a project (PRO2) and an exam (TEN1). These are credited as,

PRO1: 2.0hp
PRO2: 2.0hp
TEN: 3.5hp

Passing them means that the student has passed the course.

On the Exam the passing grade will be a score of 80% correct. To pass PRO2 a result corresponding to at least a B is required.

Other requirements for final grade

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

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.