



FEL3320 Tillämpad estimering

7,5 hp

Applied Estimation

Fastställande

Betygsskala

G

Utbildningsnivå

Forskarnivå

Särskild behörighet

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: Recursive estimation, 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.

The project part of the course start with two simpler, more lab like assignments, where the basics of the Extended Kalman Filter and the Particle Filter are dealt with. The student then need to select a theme for further the final project work and conduct a more in depth, research like project to show that he/she is able to apply the knowledge acquired in the course and complement it with information found in additional research literarture. Ideally the result of this project course can be submitted for publication.

Kurslitteratur

There is no official course book. Letcures notes will be made available and some complementary material will be in the form of reseach 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

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 enstaka studenter.

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

There is an exam in the course which is aimed at testing the theoretical and general knowledge. The examination of the practical skills are tested in the project assignments.

Övriga krav för slutbetyg

To pass the course the student need to pass the exam with at least a 80% score (the exam is joint with EL2320) and complete the project assignments.

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.