SF2935 Modern Methods of Statistical Learning 7.5 credits

Moderna metoder för statistisk inlärning

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

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

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

Education cycle

Second cycle

Main field of study

Mathematics

Specific prerequisites

- English B / English 6
- Completed basic course in probability theory and mathematical statistics (SF1918, SF1922 or equivalent).

Language of instruction

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

Intended learning outcomes

For the methods presented in the course, the student shall possess both theoretical and practical understanding of how the methods work, which ones to choose for a given problem and how to implement rudimentary versions of them. Computer-aided projects form an essential learning activity.

To pass the course the student shall be able to

- formulate and apply methods for supervised learning,
- formulate and apply methods for unsupervised learning,
- apply mathematical theory to analysis and explain properties of methods in statistical learning,
- design and implement methods in statistical learning for different tasks.

Course contents

This course presents an overview of the most important methods of the modern theory of statistical learning. Topics covered include supervised learning with a focus on classification methods, support vector machines, artificial neural networks, decision trees, boosting, bagging and methods of unsupervised learning with focus on K-means clustering and nearest neighbours. This course focuses primarily on the practical aspects of statistical learning. Computer-aided project work with a variety of datasets forms the essential learning activity.

Examination

- TENA - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Assignments, 3.0 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.

The written exam deals with concepts.

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.