ID2225 Learning Machines 7.5 credits

Lärande maskiner

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

Establishment

Course syllabus for ID2225 valid from Autumn 2017

Grading scale

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

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Admitted to a master's programme at KTH in the main field of study.

Language of instruction

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

Intended learning outcomes

1. Independent problem-solving

- Take part of the literature about learning machines and understand their role both historical and today and in the future.
- Base own understanding around learning machines in existing solutions to evaluate the efficiency in the own solutions.
- Analyse statistical confounders, overfitting as well as generalizability in own solutions based on learning machines.
- Carry out self critical review of own programming of learning machines including ethical perspectives and sustainability perspectives, as well as to document the same.

2. Master abstraction

- Define what a learning machine are and is not.
- Identify relevant concepts and applicable methods and tools.
- Master the meta level through modelling of different solutions based on learning machines that is to be able to talk about these using adequate terminology.
- Associate critically different relevant concepts and phenomena with learning machines.
- Instrumentalize relevant abstract concepts.

3. Implement learning machines

- Use tools to build own learning machines, as well as analyse others'.
- Program, test and evaluate critically own software for learning machines.
- Estimate the correctness and the computational complexity in programme for learning machines.

Course contents

- AI basis for learning machines.
- Statistical learning theory I: Perceptrons and neural networks.
- Statistical learning theory II: The learning problem.
- Machine learning methods.
- Internet psychiatry as a typical case for learning machines.
- Critical perspectives on learning machines.
- Systematic properties of learning machines LM2LM communication and learning in multi agent systems.
- Technological change and learning the future of machines.
- Applications of learning machines.

Disposition

The basis consists of a lectures that covers established literature. Invited lectures cover deep technical fields and applications. New platforms for interactive software that supports development of learning machines come be used.

Course literature

Course compendium and open Internet resources.

Examination

- SEM1 - Active participiation in seminars, 3.0 credits, grading scale: P, F
- RAP1 - Examination report, 4.5 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.

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.