Course syllabus

Tillämpad maskininlärning
Applied Machine Learning

EDAN95, 7.5 credits, A (Second Cycle)

Valid for: 2020/21
Decided by: PLED C/D
Date of Decision: 2020-03-30

General Information

Elective for: BME4, C4-pv, D4-bg, D4-mai, E4-bg, F4, F4-pv, F4-mai, MSOC2, Pi4-fm, Pi4-pv, MMSR2
Language of instruction: The course will be given in English

Aim

To give an introduction to several subdomains of machine learning and to give an orientation about fundamental methods and algorithms within these domains. To convey knowledge about breadth and depth of the domain.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- display basic knowledge concerning theories and methods related to the following subdomains:
  - unsupervised and supervised learning, classification and regression
  - neural networks, including convolutional neural networks, recurrent neural networks and deep learning
  - bayesian learning
  - reinforcement learning
  - support vector machines, decision trees, random forests, ensemble methods

Competences and skills
For a passing grade the student must

- complete a number of assignments based on problems related to some of the previously mentioned subdomains and demonstrating the ability to:
• evaluate and prepare the data
• select and train a model
• evaluate the outcome and fine-tune the model

Judgement and approach
For a passing grade the student must

• be able to judge suitability of a given machine learning method to a given problem,
• understand limitations of applicability of machine learning methods

Contents
• unsupervised and supervised learning, classification and regression
• neural networks, including convolutional neural networks, recurrent neural networks and deep learning
• bayesian learning
• reinforcement learning
• support vector machines, decision trees, random forests, ensemble methods

Examination details
Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: (Laboratory) Assignments and optional written exam. Completed assignments result in a pass (mark 3), better grades can be achieved through participation in the optional written exam.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission
Admission requirements:

• EDAA01 Programming - Second Course or EDAA30 Programming in Java - Second Course or EDAA45 Introduction to Programming or EDAA55 Programming, First Course
• EDAA01 Programming - Second Course or EDAA30 Programming in Java - Second Course or FMNN25 Advanced Course in Numerical Algorithms with Python/SciPy

The number of participants is limited to: 60
Selection: Completed university credits within the program. Priority is given to students enrolled on programmes that include the course in their curriculum.
Reading list


Contact and other information

Teacher: Pierre Nugues, pierre.nugues@cs.lth.se
Course coordinator: Elin Anna Topp, elin_anna.topp@cs.lth.se
Teacher: Volker Krueger, volker.krueger@cs.lth.se
Course homepage: http://cs.lth.se/edan95
Further information: Detailed rules concerning the assignments will be found in the course web site.