

Course Syllabus

Machine Learning 7.5 Credits*, Second Cycle

Learning Outcomes

Upon completion of the course, students will be able to:

- apply neural networks to real-world problem-solving
- conduct comparative analysis, both theoretical and empirical, in order to determine which neural network is most suitable for a particular task
- design different kinds of neural networks, evaluate their performance, and use them to solve complex problems
- apply deep learning to solve real-world problems
- show understanding of and be able to use software tools for modern deep learning
- explain both the advantages and the limitations of solutions based on neural networks and deep learning

Course Content

The course focuses mainly on the applied aspects of machine learning with special emphasis on neural networks and deep learning. The course provides an introduction to machine learning and an overview of neural networks. The perceptron as the basic element for linear separability and its limitations in classification are discussed. Students then study the different activation functions and the sigmoid perceptron so that they can solve non linear classification problems. Different types of machine learning paradigms such as supervised, unsupervised, and reinforcement learning are covered. Feed forward neural networks and the back propagation algorithm are presented. The course also covers recurrent neural networks. Finally, deep learning is discussed with emphasis on the basic principles and different types of neural networks for deep learning.

Assessment

Project work that is submitted in written and oral form 3 Credits

Labs 3 Credits

Seminars and written reflections 1.5 Credits

Forms of Study

Lectures, compulsory labs, projectwork, and seminars.

Grades

The Swedish grades U–VG.

Project work U-VG

Labs, seminars, and written reflections U-G

The final grade of the course is determined based on the case study and the project work.

Prerequisites

30 credits second level within the Mainfield of Microdata Analysis

Subject:

Microdata Analysis

Group of Subjects:

Other Interdisciplinary Studies

Disciplinary Domain:

Natural Science, 100%

This course can be included in the following main field(s) of study:

1. Microdata Analysis

Progression Indicator within (each) main field of study:

1. A1F

Approved:

Approved 17 October 2019

Valid from 24 December 2019