DD2433 Artificial Neural Networks, Advanced Course 6.0 credits

Artificiella neuronnät, fortsättningskurs

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

Establishment

Course syllabus for DD2433 valid from Spring 2009

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The goal of the course is to give the students

- more depth with regard to theory and methodology for some of the more common ANN-techniques
- experience from practical use of some ANN method on a larger problem
- more insight in development trends in the area of brain-inspired algorithms and architectures

so that they will be able to

- judge the applicability of and how to apply ANN
- critically evaluate results from studies using ANN
- to follow the future development of the ANN area.

Course contents

Extension of theory and methodology for using multilayer perceptrons and error correction learning. More about learning theory and support vector machines (SVM). Basics about statistical methodology for learning systems and techniques based on “mixture of experts”. Use of attractor neural networks and SOM (Self-Organizing Maps) as associative memory and for clustering. Distributed and localized representation in neural networks, e.g. fuzzy representation and Gaussian mixtures. ANN for time series prediction. Development trends in brain-inspired algorithms and architectures.

A project where ANN is applied in practice on some larger problem involving classification, prediction, categorization, clustering and/or visualization.

Course literature

To be announced at least 2 weeks before course start at course web page. Similar courses have used e.g. Neural Networks – a comprehensive foundation by Simon Haykin

Examination

- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 1.5 credits, grading scale: P, F
- LAB1 - Laboratory Work, 1.5 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Examination (TEN1; 1,5 university credits).
Laboratory assignments (LAB1; 1,5 university credits).
Project report (PRO1; 3 university credits).

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.