

T-61.183 Special Course in Computer and Information Science III

Spring 2003 (4 cr)

The topic of the special course in spring 2003 is

Support Vector Machines and Kernel Methods

Topic

Support vector machines and related kernel methods are currently a hot topic in machine learning. They are based on the idea of an implicitly computed feature mapping which allows one to implement 'nonlinear' classifiers and representations using linear techniques. Several factors have contributed to the current popularity of kernel methods. They are theoretically much more tractable than for example neural networks; their statistical performance is usually very good; and there are available a large number of efficient algorithms and implementations.

About the Course

The course is based on selected parts the book

Materials

B. Schölkopf and A. Smola: *Learning with Kernels - Support Vector Machines, Regularization, Optimization, and Beyond*, The MIT Press, 2002, xviii+626 pages.

The book has been received quite well, and more information on it can be found on its home page

<http://www.learning-with-kernels.org/>

Useful auxiliary material complementing the book are also available, including other related books, tutorial articles and talks, and software.

The course is intended mainly for graduate students, but it can be taken also by undergraduate students who are mathematically mature enough, having already passed most of the studies required for the Dipl.Eng. degree. Even though the mathematics required in the remainder of the book are presented in the first part of the book, a basic knowledge of probability theory and linear algebra is necessary. Some knowledge of pattern recognition and/or neural networks is also useful but not necessary. This seminar would be in english.

Pre-requisites

Requirements for passing the course are:

Passing Requirements

- Sufficient participation in the seminar meetings
- Giving one's own talk(s)
- Solving a sufficient percentage of the problems chosen from the book
- Performing given computer assignment(s).

Detailed requirements will be decided later on.

The course is arranged in the usual way in as a seminar. The first meeting will be on Monday 20th January at 14:15 in the lecture room T4 in the Computer Science Building at HUT. Note that the room has changed (from the earlier announced TB353). After this, the course continues weekly at the same time in the same place. The details of the course will be determined later on after the number of the participants is roughly known.

Timetable

The responsible teacher of the course is Prof. Juha Karhunen, email Juha.Karhunen@hut.fi, room TB327, tel. 451 3270. You can contact him during the seminar meetings or otherwise preferably at reception time, on Fridays 15-16. The course assistant is MSc. Karthikesh Raju, email: karthik@james.hut.fi, room TB330.

Contacts

Welcome!

Prof. Juha Karhunen