

Fall 2003
CIS 526: Machine Learning

Meeting Days: Tuesday, 4:40P - 7:10P, TL302

Instructor: Slobodan Vucetic, 303 Wachman Hall, vucetic@ist.temple.edu, phone: 204-5535, www.ist.temple.edu/~vucetic

Office Hours: Tuesday 2:00 pm - 3:00 pm; Thursday 2:00-3:00 pm; or by appointment.

Objective:

The goal of the field of machine learning is to build computer systems that learn from experience and that are capable to adapt to their environments. Learning techniques and methods developed by researchers in this field have been successfully applied to a variety of learning tasks in a broad range of areas such as finance, biosciences, social sciences, or engineering. This introductory machine learning course will give an overview of major techniques and algorithms in machine learning. The objective of the course is to provide both the basic intuitions behind the methods and a more formal understanding of how and why they work.

Textbook:

- (required) T.M. Mitchell, Machine Learning, 1997.
 - (required) T. Hastie, R. Tibshirani, J. Friedman, The Elements of Statistical Learning: Data Mining, Inference, and Prediction, 2001.
 - (recommended) R.O. Duda, P.E. Hart, D.G. Stork, Pattern Classification, 2000.
- Additional papers and handouts relevant to presented topics will be distributed as needed.

Topics:

- Overview of machine learning
- Linear methods for regression and classification
- Neural networks
- Classification and regression trees
- Model assessment and selection
- Ensemble methods
- Kernel methods
- Support vector machines
- Bayesian learning
- Unsupervised learning
- Reinforcement learning
- Directions in machine learning research

Grading:

(30%) Homework Assignments (programming assignments, problems sets, lecture notes preparation);
(20%) Midterm (end of October);
(10%) Class Presentation (15-20 minute presentation of research papers; during November);
(20%) Individual Project (proposals due first week of November; written reports due the last day of the finals);
(20%) Final Exam.

Late Policy and Academic Honesty:

The projects and homework assignments are due in class, on the specified due date. NO LATE SUBMISSIONS will be accepted. For fairness, this policy will be strictly enforced.

Academic honesty is taken seriously. You must write up your own solutions and code. For homework problems or projects you are allowed to discuss the problems or assignments verbally with other class members. You MUST acknowledge the people with whom you discussed your work. Any other sources (e.g. Internet, research papers, books) used for solutions and code MUST also be acknowledged. In case of doubt PLEASE contact the instructor.