

Spring 2004
CIS 525: Neural Networks

Meeting Days: Wednesday, 4:40P - 7:10P, TL305

Instructor: Slobodan Vucetic, 304 Wachman Hall, vucetic@ist.temple.edu, phone: 204-5535, www.ist.temple.edu/~vucetic

Office Hours: Monday 2:00 pm - 3:00 pm; Wednesday 2:00 - 3:00 pm; or by appointment.

Summary:

Neural networks provide powerful techniques to model and control nonlinear and complex systems. The course is designed to provide an introduction to this interdisciplinary topic. The course is structured such that students from computer science, engineering, physics, mathematics, statistics, cognitive sciences and elsewhere have an opportunity to explore promising research topics by a hands-on experience with neural networks applied to classification and prediction problems ranging from bio-medical sciences to finance and business.

Prerequisites:

Stat 503; or 511 and undergraduate level understanding of probability, statistics, and linear algebra; or a permission of the instructor.

Textbook:

- (required) S. Haykin, Neural Networks, Second Edition, 1999.
 - (recommended) T.M. Mitchell, Machine Learning, 1997.
- Additional papers and handouts relevant to presented topics will be distributed as needed.

Topics:

- Overview of neural networks
- Multilayer perceptrons;
- Radial basis functions
- Support vector machines
- Committee machines
- Principal component analysis
- Independent component analysis
- Self organizing maps
- Stochastic machines
- Recurrent networks
- Hidden markov models
- Special topics (relevant papers about the covered topics, main applications of neural networks)

Grading:

- (30%) Homework Assignments (programming assignments, problems sets, reading assignments);
- (20%) Midterm (end of March);
- (20%) Class Presentations (two 15-20 minute presentations of research papers);
- (30%) Individual Project (proposals due last week of March; written reports due during the finals week);

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.

Disability Disclosure Statement

Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.