

Statistical and Neural Pattern Recognition
MW 11:30AM - 1:00PM, Room: 4424 AV Williams

- Instructor:** Dr. Volkan Cevher, AVW 4409, Phone: 5-1737, vcevher@umd.edu
- Office Hours:** MTW 2:00PM - 3:00PM by appointment only.
- Textbook:** R. O. Duda, P. E. Hart, and D. G. Stork, *Pattern Classification*, 2nd Edition, John Wiley & Sons, Inc., 2000.
- Web page:** <http://www.umiacs.umd.edu/users/volkan/teaching.htm>
- Grading:** Homeworks (20%), Term Project (20%), Midterm I (15%), Midterm II (15%), Final (30%).

- Reading:**
1. A. Webb, *Statistical Pattern Recognition*, Arnold Publishers, 1999.
 2. K. Fukunaga, *Introduction to Statistical Pattern Recognition*, Academic Press, 1990.
 3. L. I. Kuncheva, *Combining Pattern Classifiers*, John Wiley & Sons, Inc., 1959.
 4. P. A. Devijver and J. Kittler, *Pattern Recognition*, Prentice-Hall, 1946.
 5. E. L. Lehmann and J. P. Romano, *Testing Statistical Hypotheses*, 3rd Edition, Springer, 2005.
 6. T. S. Ferguson, *Probability and Mathematical Statistics*, Academic Press, 1967.
 7. J. O. Berger, *Statistical Decision Theory and Bayesian Analysis*, 2nd Edition, Springer-Verlag, 1985.
 8. A. Gelman, J. B. Carlin, H. S. Stern, and D. B. Rubin, *Bayesian Data Analysis*, Chapman & Hall/CRC, 2000.
 9. B. D. Ripley, *Stochastic Simulation*, John Wiley & Sons, Inc., 1987.
 10. B. D. Ripley, *Pattern Recognition and Neural Networks*, Cambridge University Press, 1996.

Announcements: No class on September 4.

Term Project: There will be a term project that will involve application of multiple pattern recognition techniques on various data sets. You will work in teams. I will determine the teams after the first midterm. The project will require a final report written in a journal paper draft format, and a powerpoint presentation at the end of the semester.

Tentative Course Outline:

Introduction to Pattern Recognition
Bayesian Decision Theory
Parametric Models
Non-parametric Methods
Midterm I *TBA*
Feature Reduction and Selection
Non-Bayesian Classifiers
Stochastic Methods
Midterm II *TBA*
Unsupervised Learning and Clustering
Algorithm-Independent Learning Issues
Term Project *TBA*
Final *TBA*