CS 591Q/791V ~ ADTP: Pattern Recognition
Spring 2010
West Virginia University

Instructor and Office Hours:
Dr. Arun Ross (arun.ross at mail.wvu.edu)
Office: 751 ESB
Office hours: TBA

Lecture Details:
Time: Tuesday and Thursday, 11:00a-12:15p.
Room: MRB-E 109

Textbook:
Pattern Classification by Duda, Hart and Stork, Second Edition, ISBN: 9-780471-056690.

Suggested Prerequisites:
STAT462, MATH343, or equivalent.
An undergraduate level understanding of probability, statistics and linear algebra is assumed. A basic knowledge of Matlab will be useful.

Course Description:
This course will introduce a graduate audience to salient topics in pattern recognition. These include concepts in Bayesian decision theory, linear discriminant functions, neural networks, kernel methods, graphical models, and k-means clustering. Topics in dimensionality reduction, boosting and bagging will also be visited. The project component of this course will test the student's ability to design and evaluate classifiers on appropriate datasets.

Students taking this course at the PhD level (CS 791V) will be required to (a) solve additional problems in homework assignments, and (b) write critiques on papers addressing advanced topics in pattern recognition.

Course Topics:
- Introduction to Pattern Recognition
- Decision theory
- Density estimation
- Discriminant functions
- Neural networks
- Kernel methods
- Clustering
- Dimensionality reduction
- Boosting and Bagging

Grading:
The tentative weight associated with each grading component is as follows:

- Homework - 30%

- Quiz - 20%
- Midterm exam - 15%
- Project - 15%
- Final exam - 20%

Final grades will be assigned based on the following scale:

- 90 and above: A
- 80 - 89: B
- 65 - 79: C
- 50 - 64: D
- 49 and below: F

Grading Policy:

- A hard-copy of the homework has to be turned in before lecture begins on the due date.
- No make-up for quizzes.
- Make-up for exams will be issued only under exceptional circumstances provided prior arrangements are made with the instructor.
- Instructor reserves the right to deny requests for make-up exams.

Course Outcomes:

1. A good knowledge of Bayesian decision theory and Bayesian learning.
2. Fundamental understanding of classifiers such as linear discriminant functions, neural networks and SVMs.
3. Ability to evaluate the performance of various classifiers on real-world datasets.

Academic Integrity:

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be compromised. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code at http://www.arc.wvu.edu/rightsa.html. During the course of completing an assignment, should you have any questions about improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

Social Justice:

West Virginia is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangement with Disability Services (293-6700)."
