ENGR 691/692 Section 66: Machine Learning (Fall 2006)

Location: Weir 225  
Time: 9:00 – 10:15 am, Mondays and Wednesdays  
Instructor: Prof. Yixin Chen  
Office Hours: 3:30pm – 5:00pm, Tuesdays, or by appointment at other times  
Instructor’s Contact Information:  
   Office: 219 Weir Hall  
   Telephone: 662-915-7438  
   Fax: 662-915-5623  
   Email: ychen@cs.olemiss.edu  
   Web: www.cs.olemiss.edu/~ychen  
The class website is www.cs.olemiss.edu/~ychen/courses/ENGR691F06

Course Goals
This course seeks to introduce to the students the basic theory, concepts, and techniques of machine learning and give them a glimpse in the state-of-the-art of the area. The students will attain knowledge and skill of converting a machine learning algorithm discussed in the class to a computer program for a real world application.

Prerequisite
Basic knowledge of statistics and linear algebra; good programming skills in C, or C++, or JAVA, or Matlab, or other programming languages.

Textbook
- A collection of additional readings from journals and conference proceedings will be handed out.

Topics
- Bayesian decision theory  
- Maximum-likelihood estimation  
- Bayesian estimation  
- Nonparametric techniques  
- Linear discriminant analysis  
- Artificial neural networks  
- Support vector machines  
- Kernel methods  
- Clustering  
- Dimensional reduction

Homework Assignments
There will be around four (4) homework assignments. The assignments must be done individually and are due at the beginning of class on the date specified.
They will be accepted after that time with a 25% penalty per day after the due time.

**Computer Projects**

There will be two (2) computer projects. Computer projects are done in groups of 1 or 2. We strongly encourage working with partner(s) to share workload but you are responsible for any contingencies (loss of partner due to course drop, travel, etc). If you have any preference for your group members you should send email to me before Wednesday, August 30. If I do not hear from you by this date, we will assume that you are working individually.

Projects are due at the beginning of class on the date specified. Each project must be accompanied by a report (describing the methods developed or applied, results, observations, and a discussion), a commented source code (preferably in electronic format), and associated materials. Late submission of the report will NOT be accepted. As part of your project, you are expected to prepare a short oral presentation to describe your project in a professional manner. Your presentation should be 10-12 minutes long.

**Important:** A **signed** copy of the following Honor Code statement should be included in each homework assignment and project report on a separate page:

In keeping with the Honor Code of the School of Engineering, I affirm that I have neither given nor received assistance in preparing this assignment.

Signature:___________________________________

**Exams**

The course will have one mid-semester exam on Monday, October 9. There will NOT be a final exam.

**Grading**

The final grade will be determined by a weighted average of homework, projects, and mid-semester exam with the corresponding weights:

- Homework 30%
- Projects 40%
- Mid-semester exam 30%

The conversion between total percentage and grade is based on

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**Academic Integrity**
All students in ENGR691/692 Section 66 are expected to conduct themselves in a professional manner according to the Honor Code of the School of Engineering, the Information Technology Appropriate Use Policy, the *M Book*, and any other relevant policies.

"The Honor Code shall apply to all students, both undergraduate and graduate, registered in and/or seeking degrees through the School of Engineering. The Honor Code shall be understood to apply to all academic areas of the School such as examinations, quizzes, laboratory reports, themes, computer programs, homework, and other possible assignments. Only that work explicitly identified by the class instructor not to be under the Honor Code is excluded. The intent of the Honor Code is to recognize professional conduct and, thus, it shall be deemed a violation of the Honor Code to knowingly deceive, copy, paraphrase, or otherwise misrepresent your work in a manner inconsistent with professional conduct."

**Disability Services at The University of Mississippi**
Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the office of Disability Services at 915-7128 as soon as possible to better ensure that such accommodations are implemented in a timely manner.