Machine Learning
Syllabus

CS425/528, Fall 2012

Class web page: http://web.eecs.utk.edu/~parker/Courses/CS425-528-fall12

Instructor: Dr. Lynne E. Parker
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Office Hours: Tuesday/Thursday: 10:30 – 11:00AM, 12:30 – 1:00 PM
(or send email for appointment at another time; or, just stop by when I'm in my office)

TA:

Mike Franklin
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Office Hours: Mondays/Wednesdays: 10 – 11 AM

Time and Place: Tuesday/Thursday, 11:10 AM– 12:25 PM, MK 525

Course Description:
Machine Learning is the study of how to build computer systems that learn from experience. This CS425/528 course on *Machine Learning* will explain how to build systems that learn and adapt using real-world applications. Some of the topics to be covered include concept learning, neural networks, genetic algorithms, reinforcement learning, instance-based learning, and so forth. The course will be project-oriented, with emphasis placed on writing software implementations of learning algorithms applied to real-world problems, along with short reports describing your results. No exams will be given, although there will be some mini-quizzes to ensure you keep up.

Textbook: *Machine Learning,* by Tom Mitchell, McGraw-Hill, 1997. Other materials will also be provided.

Prerequisites: Familiarity with basic concepts of computer science (algorithms, data structures, and complexity), mathematical maturity commensurate in discrete math (CS311), matrix math (Math 251), probability and statistics (Math 323), and the ability to program algorithms in a language of your choice (e.g., C++ or Matlab) in a Linux environment.

Evaluation:
Grading will be based 85% on project grades and 15% on mini-quizzes (with 2 lowest mini-quiz grades dropped). Some projects will count more than others. The value of each project will be announced.

Final grades will be determined by overall average as follows:

A: 90 – 100	C+: 75 – 79.9	Decisions on borderline grades will be based
B+: 85 – 89.9	C: 70 – 74.9	upon class participation and attendance.
B: 80 – 84.9	D: 60 – 69.9	
	F: 0 – 59.9	

Undergraduates and graduates will have separate grading scales, meaning that the ultimate assignment of grades is based on a student's work relative to his/her corresponding group of students (i.e., other undergraduate students, or other graduate students).

Students taking the class for undergraduate credit will be assigned the same projects as those taking the class for graduate credit, except when announced otherwise. However, the quality and/or quantity of the work expected is higher for graduate students than for undergraduates, and thus will be graded more strictly. More details of expectations will be provided for each project (as it varies by project).

Class Policies:

- Class attendance: Class attendance will be taken. Decisions on borderline grades will be based upon exceptional class attendance and participation, as deemed merited by the course instructor. Of course, if you have a good reason to miss class (e.g., you are sick, or you need to present a paper at a research conference, or you have a job interview, etc.), then it is not a problem. Just let the instructor know as soon as you know you will need to miss class. Please don't come to class if you think you have a contagious illness. We will work with you to help keep you posted on class activities and material covered. In any case, it is your responsibility to catch up (or keep up) with all course material and announcements covered in class.

- Class participation: Decisions on borderline grades will be based upon exceptional class participation, as deemed merited by the course instructor.

- Project assignments: Project assignments will be handed out in class and posted on the course web site, along with the due dates. All projects will be introduced and discussed during class time. Projects will involve a combination of programming and/or writing up your results (in report form). You may use any programming language you like to program your own projects, as long as the compiler is available on our CS Linux machines, and as long as your code runs on our CS Linux machines. Note that you will NOT be allowed to use existing machine learning packages (including some MATLAB packages) for your project assignments, unless specifically stated. As part of the project materials you turn in, you will be required to submit instructions for how to compile and run your code, along with all files needed to successfully run your code.

- Collaboration Policy: Discussing and exchanging ideas is encouraged. You may help each other with your strategy for how to solve the projects. You are expected to note significant collaborations by giving the name of your student collaborators on the project material you turn in. However, except if specifically allowed by the instructor, copying from any outside sources (e.g., fellow students, Internet, etc.) on any material to be graded is not permitted, and will be

considered cheating. Cheating will be dealt with harshly, and may result in failure of the assignment/exam and/or failure of the class. Each student is responsible for securing his or her work from copying. Each student is expected to abide by UT's policies on Academic Conduct and the Honor Statement. Refer to the University of Tennessee Undergraduate Catalog and the HillTopics Student Handbook for more details.

- Due dates and Late Projects: One (1) project may be turned in up to four days late and still receive full credit. All projects after this will immediately be given a grade of zero, with no exceptions. The specific due time will be given for each project. All projects turned in more than five (5) minutes after the specified time (according to the timestamp on the email) will be considered late.

- Exams: There will be no exams ☺ .

- In-class mini-quizzes: In-class mini-quizzes will be given at the beginning of random classes. They will not be announced in advance, but will occur frequently – sometimes twice a week, sometimes once a week, although we will also sometimes skip weeks. They are designed to ensure that you keep up with the material. They will be multiple choice and/or short answer questions that cover recent lectures and assigned readings. They will be short – no more than 5-10 minutes per quiz. As long as you pay attention in class and read what you are assigned, you should find them easy.

  Two (2) mini-quizzes with your lowest scores will be dropped. These drops account for times when you might have to miss class due to illness, travel, etc. That is, if you miss a quiz because you are not in class, then that quiz grade will be a 0. But, we'll drop the lowest two grades, so it gives you some flexibility when you can't be in class. Plan wisely!

- Grading corrections: Bring any project grading correction requests to the instructor or TA within 1 week of receiving the grade, or before the end of the semester, whichever comes first. After that, your grade will not be adjusted. If you find any mistake in grading, please let the instructor or TA know. Your grade will not be lowered.

- Announcement responsibilities: Important announcements, schedule revisions, etc., will be distributed via the class email list. You are responsible for information distributed to this email list, so be sure you are on the list.

- Schedule and readings: The schedule for each class will be posted on the class web site, along with relevant readings for each topic. You are expected to keep up with the readings as we go, as they will help provide the foundation for completing your projects.