CPSC 633-600 Machine Learning: Spring 2006

Syllabus

NEWS: *1/16/06, 01:18PM (Mon)*

- [1/16] Lecture note slide01.pdf uploaded.
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- All past lecture notes are available in the lectures/ directory.

Read-Only Bulletin Board.: 1/14/06, 10:50AM (Sat)

Page last modified: 1/18/06, 09:59AM Wednesday.

General Information | Resources | Reading List | Weekly Schedule | Lecture Notes

I. General Information

Instructor:

Dr. Yoonsuck Choe
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Phone: 845-5466
Office hours: 2:30-4pm, MW

TA:

Yingwei Yu
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Office: HRBB 322A
Phone: 845-5481
Office hours: TR 10:30-12:00

Prerequisite/Restrictions:

CPSC 420, 625, or consent of instructor.

Lectures:

MWF 12:40--2:30pm HRBB126.

Introduction:

Machine learning is the study of self-modifying computer systems that can acquire new knowledge and improve their own performance; survey machine learning techniques, which include induction from examples, Bayesian learning, artificial neural networks, instance-based learning, genetic algorithms, reinforcement learning, unsupervised learning, and biologically motivated learning algorithms. Prerequisite: CPSC 420 or 625.

Goal:

The goal of this course is to

1. learn various problems and solution strategies in machine learning.
2. learn practical methodology for applying ML algorithms to problem domain of your choice.

Textbook:

- Tom Mitchell (1997) Machine Learning, McGraw-Hill. [Book home page]

Administrative Trivia:

1. Computer accounts: if you do not have a unix account, ask for one on the CS web page.
2. Programming languages permitted: C/C++, Java, or Matlab (or octave), and must be executable on CS unix hosts or any windows system in the departmental lab.

Topics to be covered:

See the Weekly Schedule section for more details. The content will closely reflect Mitchell (1997).

Grading:

1. 4 homeworks, 6% each = 24%
2. 3 programming assignments, 10% each = 30%
3. Midterm and final exam, 15% each = 30%
4. Mini project 16%

Grading will be on the absolute scale. The cutoff for an 'A' will be at most 90% of total score, 80% for a 'B', 70% for a 'C', and 60% for a 'D'. However, these cutoffs might be lowered at the end of the semester to accomodate the actual distribution of grades.

Academic Integrity Statement:

AGGIE HONOR CODE: An Aggie does not lie, cheat, or steal or tolerate those who do.

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

For additional information please visit: http://www.tamu.edu/aggiehonor/

Local Course Policy:

- All work should be done **individually** and **on your own** unless otherwise allowed by the instructor.
- Discussion is only allowed immediately before, during, or immediately after the class, or during the instructor's office hours.
- If you find solutions to homeworks or programming assignments on the web (or in a book, etc.), you may (or may not) use it. Please check with the instructor.

Students with Disabilities:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

Resources:

1. UCI Machine Learning Repository: datasets to test machine learning algorithms.
2. Research resources page
3. Ganeral reading list (u: p:): includes short blurb about how to find, read, and critique others' work. This list is **not** the course reading list.

III. Weekly Schedule and Class Notes

- **Lecture notes (in PDF format)**: all notes will be uploaded in this directory.
- It is **your responsibility** to download, print, and bring the notes to the class. Notes will be available 24 hours before each class.
- See the **2006 Spring TAMU Calendar** for breaks, etc. May 2 is the last class day (note that it is Tuesday).

Week	Date	Topic	Reading	Assignments	Notices and Dues	Notes
1	1/16	MLK Day (Holiday)				
1	1/18	Introduction	1.1--1.2			slide01.pdf
1	1/20	Introduction	1.3--1.5			slide01.pdf
2	1/23	Concept learning	2.1--2.4			
2	1/25	Concept learning	2.5--2.6			
2	1/27	Concept learning	2.7--2.8			
3	1/30	Decision tree	3.1--3.4			
3	2/1	Decision tree	3.5--3.8	HW1 TBA Prog1 TBA		
3	2/3	ANN	4.1--4.4			
4	2/6	Guest lecture	TBA		Project PI meeting at NIH (Make up TBA)	
4	2/8	ANN	4.5--4.6			
4	2/10	ANN	4.7--4.9			
5	2/13	ANN (applications)	TBA			
5	2/15	Evaluating hypotheses	5.1--5.3			
5	2/17	Evaluating hypotheses	5.4--5.7			
6	2/20	Bayesian learning	6.1--6.4			
6	2/22	Bayesian learning	6.5--6.9	HW2 TBA Prog2 TBA		
6	2/24	Bayesian learning	6.11--6.13			
7	2/27	**Midterm exam**				
7	3/1	Term project ideas				
7	3/3	Instance-based learning	8.1--8.3			
8	3/6	Instance-based learning	8.4--8.7	HW3 TBA		
8	3/8	Genetic algorithms	9.1--9.3			
8	3/10	Genetic algorithms	9.4--9.8			
9	3/13	**Spring break**				
9	3/15	**Spring break**				

9	3/17	**Spring break**				
10	3/20	Genetic algorithms (neuroevolution)	TBA			
10	3/22	Genetic algorithms (neuroevolution)	TBA			
10	3/24	Reinforcement learning	13.1--13.3.3			
11	3/27	Reinforcement learning	13.3.4--13.5			
11	3/29	Reinforcement learning	13.6--13.8	Prog 3 TBA		
11	3/31	Reinforcement learning (autonomous semantics)	TBA			
12	4/3	Guest lecture	TBA		NIH blueprint meeting	
12	4/5	Reinforcement learning (intrinsically motivated)	TBA	HW4 TBA		
12	4/7	Reinforcement learning (imitation)				
13	4/10	Computational learning theory	7.1--7.3			
13	4/12	Computational learning theory	7.4--7.6			
13	4/14	Unsupervised learning	TBA			
14	4/17	Unsupervised learning	TBA			
14	4/19	Unsupervised learning (biological vision)	TBA			
14	4/21	Holographic memory	TBA			
15	4/24	Project presentation				
15	4/26	Project presentation				
15	4/28	Project presentation				
16	5/1	Project presentation				
16	5/2	Final review and Course wrapup				

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