CPSC 420-500 Artificial Intelligence: Spring 2006

Syllabus

NEWS: *1/17/06, 04:48PM (Tue)*

- [1/17] Lisp installation: /opt/apps/cmucl/bin/lisp, on CS unix machines.
- [1/17] Lecture notes slide01.pdf uploaded.
- [1/14] Course web page goes online [syllabus.pdf].
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- Grades are posted in the grades page (pw needed).
- All tips are in the Read Only Board.
- All example codes are in src/.
- All lecture notes and other handouts are in lectures/.

Read-Only Bulletin Board.: 1/17/05, 01:15PM (Mon)

Page last modified: 1/17/06, 12:25PM Tuesday.

I. General Information

Instructor:

Dr. Yoonsuck Choe
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Office: HRBB 322B
Phone: 845-5466
Office hours: MW 2:30pm--4:00pm.

TA:

Yifang Liu
Office:
Email:
Phone:
Office hours: TBA

Prerequisite/Restrictions:

CPSC 311

Lectures:

M/W 4:10pm-5:25pm, HRBB 113

Goals:

To understand the problems in AI and to learn how to solve them:

1. traditional methods in AI (search, pattern matching, logical inference, theorem proving, etc.).
2. modern approaches in AI (learning, probabilistic approaches, etc.).

Textbook:

Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (AIMA, hereafter), **2nd Edition**, Prentice Hall, New Jersey, 2003.
ISBN 0-13-790395-2
Book Homepage
* The first edition may be okay if that's what you have.

Computer Accounts and Usage:

1. Computer accounts: if you do not have a unix account, ask for one on the CS web page. We will be using the CMU Common Lisp as our main language. Example code will only be made available in Lisp, and in general other languages will not be permitted.
2. CMU Common Lisp:
   - Carnegie Mellon U. Common Lisp homepage
   - On all SunOS systems in the department (**sun.cs.tamu.edu, interactive.cs.tamu.edu, compute.cs.tamu.edu,** etc.), the program is installed in **/usr/local/bin/lisp**. (Do **not** run your jobs on **unix.cs.tamu.edu**.)
   - See the Read-only Board for a brief example.

Topics to be covered:

See the Weekly Schedule section for more details.

1. Introduction : 1 week
2. LISP : 1 week
3. Search : 1.5 weeks
4. Game playing, alpha-beta pruning: 0.75 week
5. Propositional Logic, first-order logic, theorem proving: 3.5 weeks
6. Uncertainty, probabilistic approaches: 1.5 weeks
7. Learning: 2 weeks
8. Special topics : 1 week

Grading:

1. Exams: 45% (midterm: 20%, final: 25%)
2. Homeworks: 15% (about 3, 5% each)
3. Programming Assignments: 36% (about 3, 12% each)
4. Paper commentary: 4% (1 page, single-spaced)

Grading will be on the absolute scale. The cutoff for an 'A' will be 90% of total score, 80% for a 'B', 70% for a 'C', 60% for a 'D', and below 60% for an 'F'.

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.

II. Resources

1. LISP quick reference
2. **CMU Common Lisp** (This one will be used in the class.)
3. GCL manual (very in-depth and technical).
4. GNU Common Lisp
5. Lisp resources
6. My general resources page
7. 625/689 Reading List
8. An interesting popular view of AI

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 **2005 Fall TAMU Calendar** for breaks, etc. December 6 (Tue) is the last class day.
- When reading the chapters, you do not have to memorize everything. A separate list of terms you need to know will be handed out prior to each exam.
- All reading material below refers to the AIMA book 2nd edition. The *(old XX)* tags next in the Reading field are the corresponding chapters in the old AIMA book (1st edition). To see how the 1st and the 2nd edition chapters correspond, see the "AIMA 1st and 2nd edition chapter map".
- More detail will be available as we go along.

Week	Date	Topic	Reading	Assignments	Notices and Dues	Notes
1	1/16	MLK Day	No class			
1	1/18	Introduction	Chapter 1 1.1 and 1.2		First day of class	slide01.pdf
2	1/23	Introduction	Chapter 26 26.1 and 26.2		Unix basics (DIY); Last day to drop a course is 9/2	slide01.pdf slide02.pdf
2	1/25	Lisp	Lisp quick ref			slide02.pdf
3	1/30	Lisp (Symbolic Differentiation)		Prog. Asmt. #1 to be announced		slide02.pdf
3	2/1	Uninformed Search (BFS,DFS,DLS,IDS)	Chapter 3.1-3.5 (3.6,3.7 optional)			slide03.pdf
4	2/6	No class			Project PI meeting at NIH (make-up to be announced)	slide00.pdf

4	2/8	IDA*,Heuristic Search, Simulated Annealing, etc.	Chapter 4			slide03.pdf
5	2/13	Informed Search (BestFS,Greedy,A*)	Chapter 4.1-4.3 (4.4 optional)(old 4.1-4.3)			slide03.pdf
5	2/15	Game playing Min-Max, Alpha-Beta	Chapter 5 (optional) and 6.1-6.8 (old 5)	Prog. Asmt. #2 to be announced	Prog. Asmt. #1 due changed to Monday 9/26 (midnight)	slide03.pdf
6	2/20	Game playing wrap up; Propositional Logic	Chapter 7.1, 7.3, 7.5, 7.6 (old 6)	HW#1 to be announced		slide03.pdf slide04.pdf
6	2/22	Theorem proving	Chapter 9 (old 10)			slide04.pdf
7	2/27	First-order logic	Chapter 8 (old 7)	HW#2 to be announced	HW#1 due	slide04.pdf
7	3/1	**Midterm**	**Exam**		In class exam.	
8	3/6	Inference for FOL	Chapter 9			slide04.pdf
8	3/8	Theorem proving for FOL	Chapter 9 (old 10)		HW#2 due	slide04.pdf
9	3/13	**Spring break**				
9	3/15	**Spring break**				
10	3/20	Uncertainty	Chapter 13 (old 14)		10/17: Midsemester grades due.	slide05.pdf
10	3/22	Uncertainty (continuted)	Chapter 13 (old 14)			slide05.pdf
11	3/27	Probabilistic reasoning	Chapter 14 (old 15)		Program #2 due 10/26	slide05.pdf slide06.pdf
11	3/29	Learning	Chapter 18			slide06.pdf
12	4/3	"			11/5 (Q-drop)	slide06.pdf
12	4/5	"		Prog. Asmt. #3 to be announced; Homework #3 to be announced		slide06.pdf
13	4/10	Learning (Nnets)	Chapter 20 (old 19)			slide06.pdf
13	4/12	Natural language processing				slide08.pdf
14	4/17	Advanced topics	Autonomous semantics Paper Commentary Asmt. to be announced		Course evaluation; **Homework #3 due (in class); Mini project proposal due (in class)**	slide07.pdf
14	4/19	Advanced topics	Biologically inspired vision			
15	4/24	Advanced topics	Thalamus and analogy			

15	4/26	Advanced topics	Analogy		Last day of class. **Program #3 due (midnight)**	
	5/8	**Final Exam**			3:30--5:30pm, HRBB 113 **Paper commentary due (in class)**	

IV. Credits

Many ideas and example codes were borrowed from Gordon Novak's AI Course and Risto Miikkulainen's AI Course at the University of Texas at Austin (Course number CS381K).

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