Foundation of AI

About the course

Lecture and Project

CS4700: Foundations of Artificial Intelligence

- Lecture
- Introduction to AI techniques
- Agents, Search, CSP, Machine Learning, Planning, Reasoning, Knowledge Representation, Reinforcement Learning

CS4701: Practicum in Artificial Intelligence

- Project
- Hands-on experience with AI methods
- Project management: Software engineering, project planning, deadlines, code reviews, teamwork, presentation, documentation, reporting, demoing
- Meets separate from CS4700
- CS4700 is co-requisite

Logistics

Where: Hollister B14
When: Mon, Wed, Fri 11:15-12:05
Professor: Hod Lipson, Mechanical & Aerospace Eng., Comp. & Information Science
Email: hod.lipson@cornell.edu
URL: www.mae.cornell.edu/lipson
Office Hours: 242 Upson, Tue Thu, 1-4pm or by appointment
Course web site: www.cs.cornell.edu/courses/CS4700/2011fa/

Name	email	Office hours & location
Hod Lipson	Hod.lipson@cornell.edu	Tuesday + Thursday, 1-4pm, Upson 242
Jason Yosinski	yosinski@cs.cornell.edu	TBD, Upson 328
Nikos Karampatziakis	nk@cs.cornell.edu	TBD, Upson 328
Yue Gao	ygao@cs.cornell.edu	TBD, Upson 328

Questions: Send email to
cs4700ta-l@lists.cs.cornell.edu

Foundations of Artificial Intelligence

CS4700 - Fall 2011 - Hod Lipson
Cornell University

This course uses an i-clicker. If you do not already have one, please get one and register it.
This course uses CMS. If you are registered for the course but do not have an account, please contact the head TA to be added.

Time and Place

Monday, Wednesday, Friday, 11:15am - 12:05pm. Location: HLS B14

First lecture: Wednesday, August 24, 2011
Last lecture: Friday, December 2, 2011

Midterm (in-class): Friday, October 7, 2011. Open books and notes. Non-programmable calculators are allowed, but no phones, laptops, or any other electronic devices. Topics: Informed and uninformed search, local and adversarial search, CSP, Markov models, Reinforcement learning.
Final Exam: Fri, 9 Dec 2011 2:00 PM - 4:30 PM, location TBD. Open books and notes. Non-programmable calculators are admitted, but no phones, laptops, or any other electronic devices. If you are unable to make it please notify the instructor well in advance with justification (email with subject line: "CS4700: Request for final exam makeup")

Course Staff and office hours

Instructor: Hod Lipson
Head TA: Jason Yosniski

Name	email	Office hours & location
Hod Lipson	Hod.lipson@cornell.edu	Tuesday + Thursday, 1-4pm, Upson 242
Jason Yosinski	yosinski@cs.cornell.edu	TBD, Upson 328
Nikos Karampatziakis	nk@cs.cornell.edu	TBD, Upson 328
Yue Gao	ygao@cs.cornell.edu	TBD, Upson 328

Mailing List

For questions email cs4700ta-l "at" lists.cs.cornell.edu. (Note: Remove the extra spaces). The list is set to mail all the TA's and Prof. Lipson -- you will get the best response time by using this facility, and all the TA's will know the question you asked and the answers you receive.

Syllabus

Problem solving

principles of search, uninformed search, informed ("heuristic") search, constraint satisfaction, local search, genetic algorithms, game playing

Learning

inductive learning, decision tree learning, statistical approaches, support vector machines, kernels, neural networks

Knowledge representation and reasoning

knowledge bases and inference, propositional and first-order logic, theorem-proving, planning

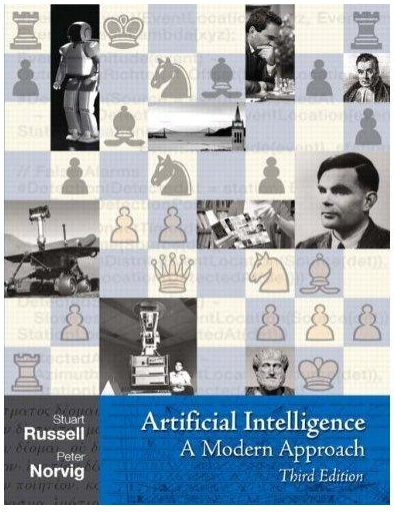
Natural language understanding

syntactic processing, ambiguity resolution, text understanding

Grading

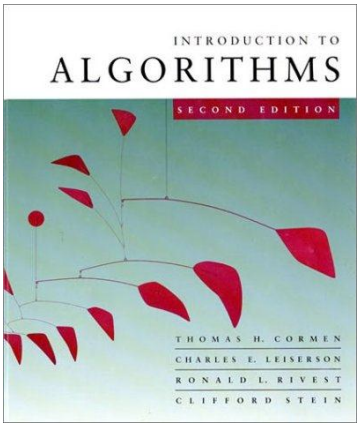
- 15%: Midterm
- 35-45%: Final Exam
  - percentage depends on participation
- 40%: Homework (~6 assignments)
- 0-10%: Participation (optional)

Textbook



Artificial Intelligence: A Modern Approach (3rd Edition)

Prerequisites



Introduction to Algorithms 2nd Edition or later
Elementary Data Structures, Hash tables, Binary Search trees, and Elementary Graph algorithms

Examinations

- Midterm
  - Fri Oct 8, in class
- Final
  - Fri, 9 Dec 2011 2:00 PM - 4:30 PM, location TBD
- Open book & notes. Closed electronics.

Class notes, schedule, readings

- Available from course web site

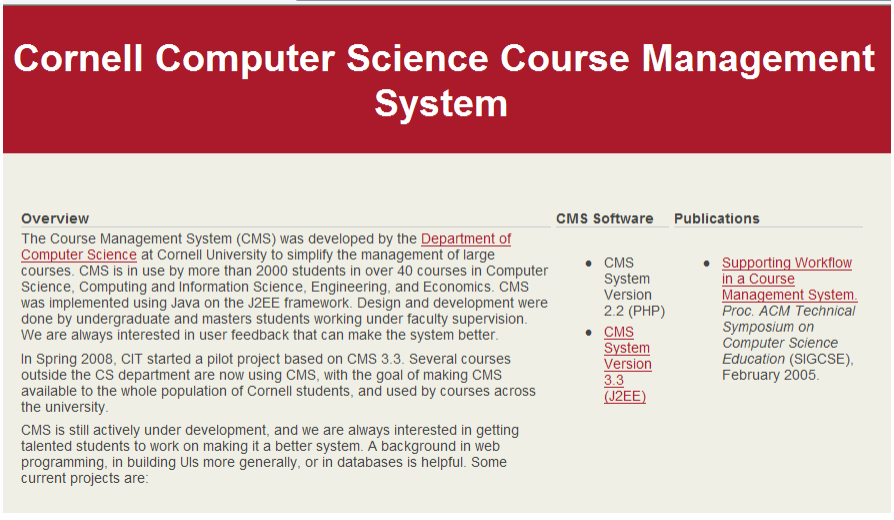
Tentative Schedule (dates tend to shift during the semester)

Date	Topic	Reading
Wed 8/25	About the course	
Fri 8/27	Introduction	R&N Ch. 1,2
Mon 8/30	*cont.*	
Wed 9/1	Agents and Problem-Solving as Search	R&N Ch. 3
Fri 9/3		
Mon 9/6	***Labor day break***	
Wed 9/8	Informed Search	R&N 4.1-4.2
Fri 9/10		
Mon 9/13	Intro to NLP	
Wed 9/15		
Fri 9/17	Local Search	R&N 4.3. and p. 120
Mon 9/20	Constraint Satisfaction	R&N Ch. 5
Wed 9/22		

Homework

- About 6 assignments
- One week to complete, one week to grade
- Submit paper copies at the beginning of class
- Submit PDF copies in CMS
- Three slack days

CMS



http://cms.csuglab.cornell.edu/

Academic Integrity

- Your assignments should reflect your individual work
  - Inform instructor immediately if solutions is available online or are being circulated
  - You must explicitly identify anything you did not code/write yourself
- OK
  - To discuss concepts with peers
  - To use standard data-structure libraries (trees, hash tables)
- Not OK
  - To copy or share code
  - To compare results
  - To use AI libraries (search algorithms, DFS, BFS)

Review classes on demand

- Before prelim and occasionally as needed
  - About once every two weeks
- Would you like a review on a topic?
  - please ask

Clicker

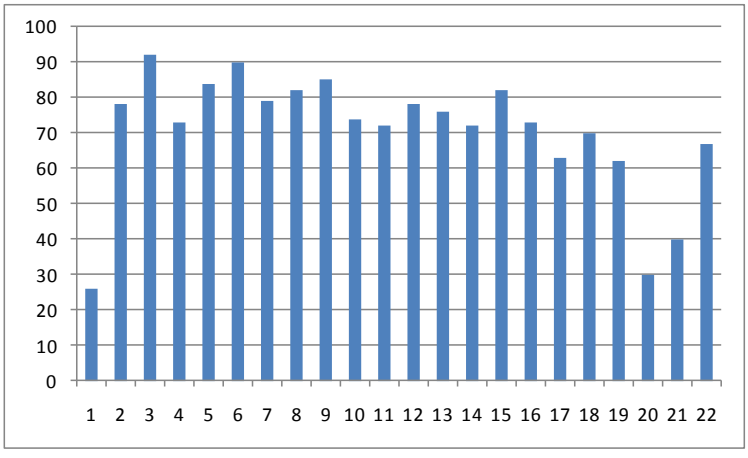
Register at: http://atc.cit.cornell.edu/course/polling/clickers.cfm

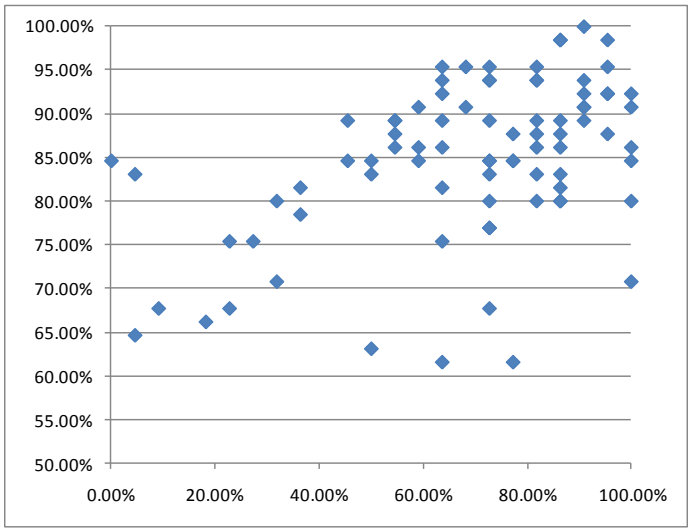
Test Question

- **A: I like AI**
- **B: I will like AI**
- **C: I have always liked AI**
- **D: All of the above**
- **E: Whatever**

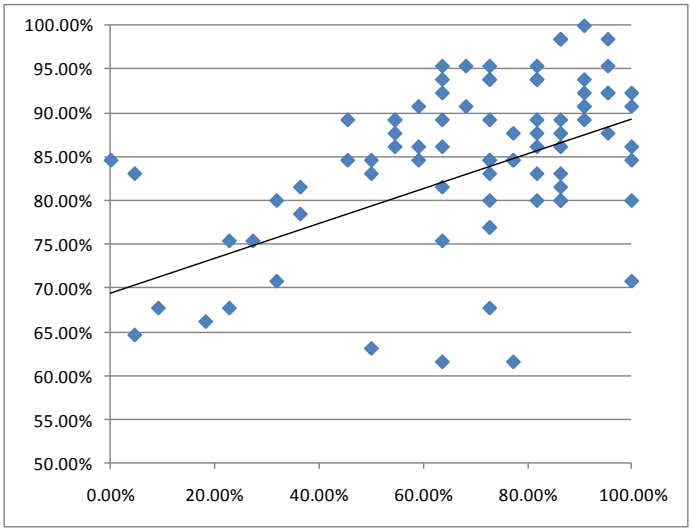
Optional 10% Participation grade determined using clickers

Participation = 10%





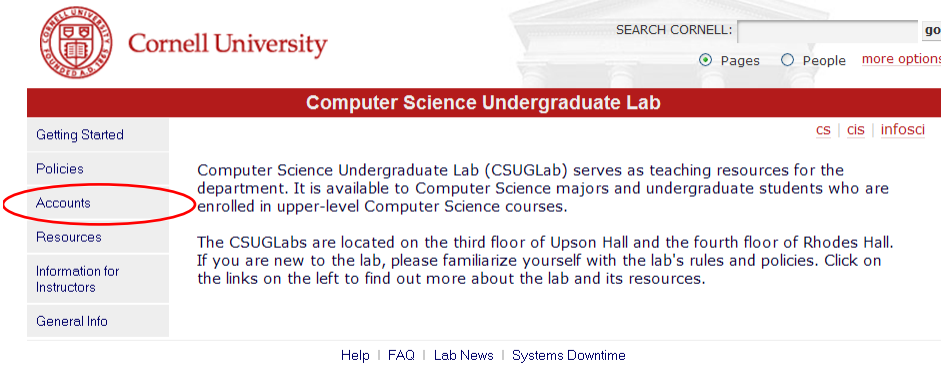
Participation Correlated with Higher Grade



Competency Requirement

- PhD students fulfilling competency requirement can do one of the following:
  - If you change your mind, change by 3rd week
- **Enroll in the course**
  - Do all assignments and exams
  - Grade will count and appear in transcript
- **Or just take the final**
  - May enroll as "audit", if desired
  - Welcome to do assignments and midterm for practice, but they won't count

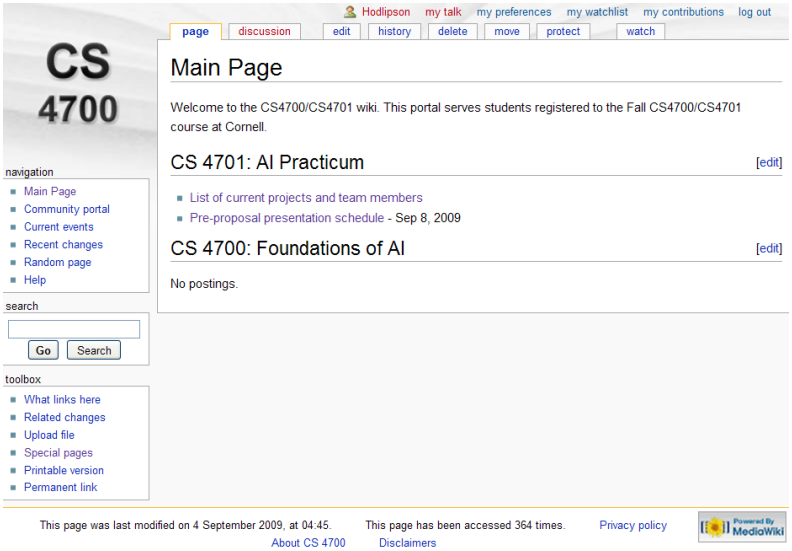
CSUG Accounts



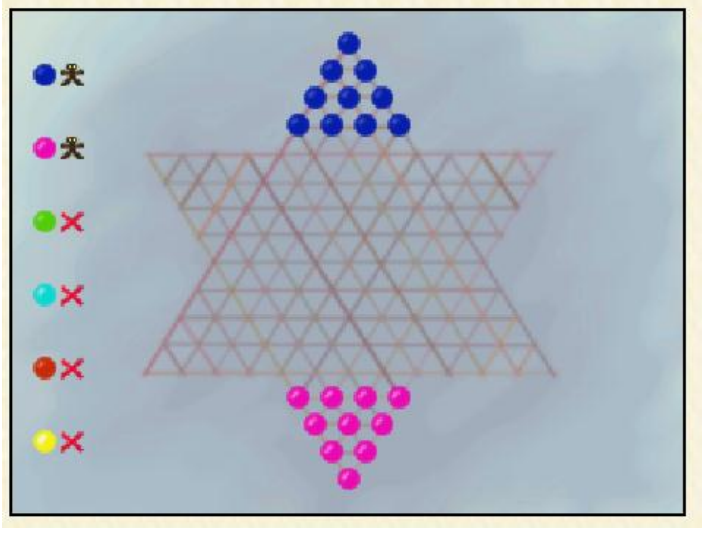
Lab door, MSDNAA, and Net-Print will be activated shortly

http://www.csuglab.cornell.edu/

Wiki



http://fabathome.mae.cornell.edu/cs4700



http://lnx-bsp.net/java/chichk.html

http://ocw.dixie.edu/computer-and-information-technology/artificial-intelligence/chinese-checkers-adversarial-search