

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 Yosinski

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@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

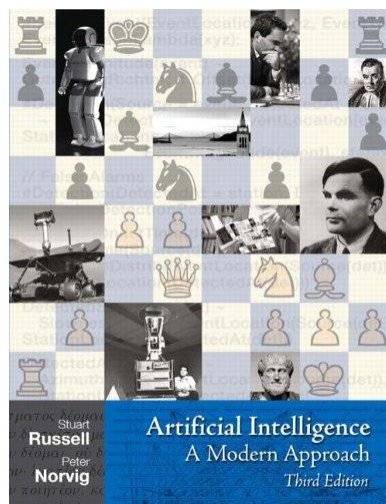
Natural language understanding

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)

STANFORD ENGINEERING

Oct. 10 - DEC. 16, 2011

INTRODUCTION TO

Artificial Intelligence

In partnership with the Stanford University School of Engineering.
You can join this online worldwide class this fall.



Sebastian Thrun

Sebastian Thrun is a Research Professor of Computer Science at Stanford University, a Google Fellow, a member of the National Academy of Engineering and the German Academy of Sciences. Thrun is best known for his research in robotics and machine learning.

Fast Company Magazine selected him as the 8th most creative person in business, the UK Telegraph included him in their list of 100 living geniuses, and Popular Science included him in their list of Brilliant Ten. His self-driving car was named one of the 50 best inventions of 2010 by Time Magazine, and Scientific American named Thrun one of the 50 business and technology leaders. Thrun is the inaugural winner of the AAAI Ed Fagliabaum Prize and a recipient of the Max Planck Research Award. Thrun will be conference chair of the IJCAI 2013 conference in Beijing, China.

Name:

E-mail:

[Sign Up](#)

[Follow @class](#)

127473 have signed up!

Official registration will open later this summer. Your information will be kept private and only used to contact you once registration is available.

Stanford's [Introduction to Databases](#) and [Introduction to Machine Learning](#) are also available online this fall!

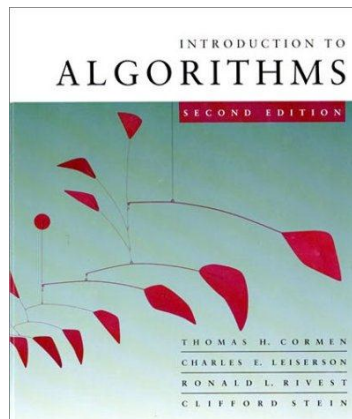


Peter Norvig

Peter Norvig is Director of Research at Google Inc. He is also a Fellow of the American Association for Artificial Intelligence and the Association for Computing Machinery.

Norvig co-authored *Artificial Intelligence: A Modern Approach*, which is the world's most popular text book on Artificial Intelligence. *Artificial Intelligence: A Modern Approach* is used in over 1,200 universities in over 100 countries, and it has been translated into 12 languages. Prior to joining Google, Norvig was

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	<i>cont.</i>	
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

Cornell Computer Science Course Management System

Overview

The Course Management System (CMS) was developed by the [Department of Computer Science](#) at Cornell University to simplify the management of large courses. CMS is in use by more than 2000 students in over 40 courses in Computer Science, Computing and Information Science, Engineering, and Economics. CMS was implemented using Java on the J2EE framework. Design and development were done by undergraduate and masters students working under faculty supervision. We are always interested in user feedback that can make the system better.

In Spring 2008, CIT started a pilot project based on CMS 3.3. Several courses outside the CS department are now using CMS, with the goal of making CMS available to the whole population of Cornell students, and used by courses across the university.

CMS is still actively under development, and we are always interested in getting talented students to work on making it a better system. A background in web programming, in building UIs more generally, or in databases is helpful. Some current projects are:

CMS Software

- [CMS System Version 2.2 \(PHP\)](#)
- [CMS System Version 3.3 \(J2EE\)](#)

Publications

- [Supporting Workflow in a Course Management System](#), *Proc. ACM Technical Symposium on Computer Science Education (SIGCSE)*, February 2005.

<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>

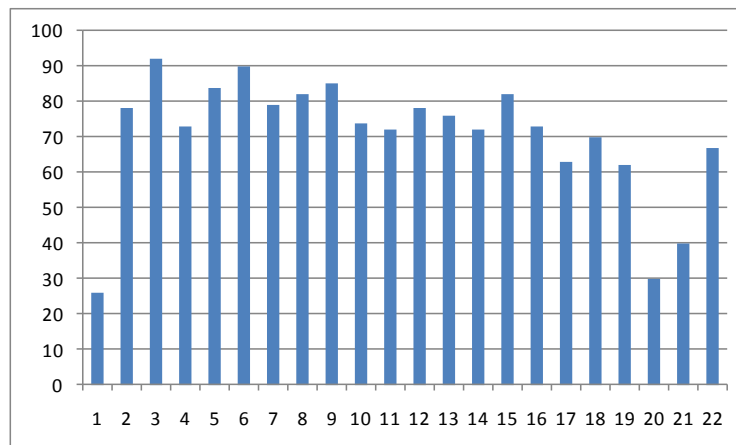


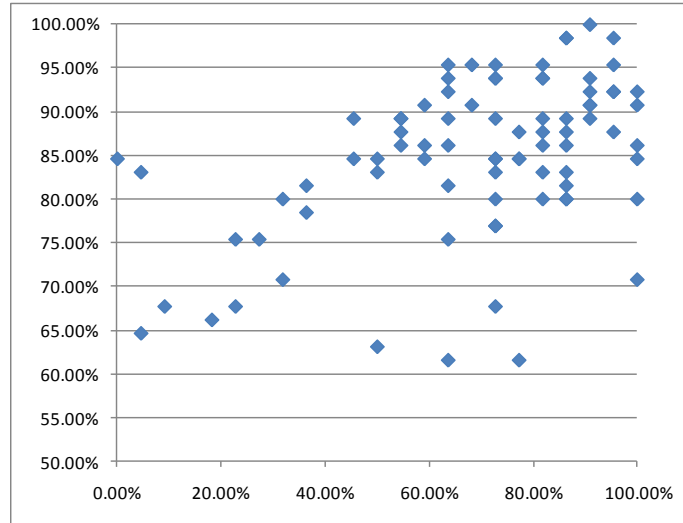
Test Question

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

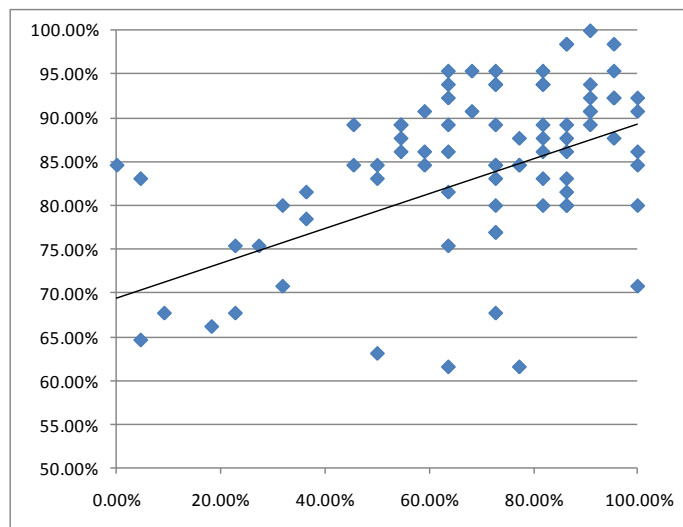
Optional 10% Participation grade determined using clickers

Participation = 10%





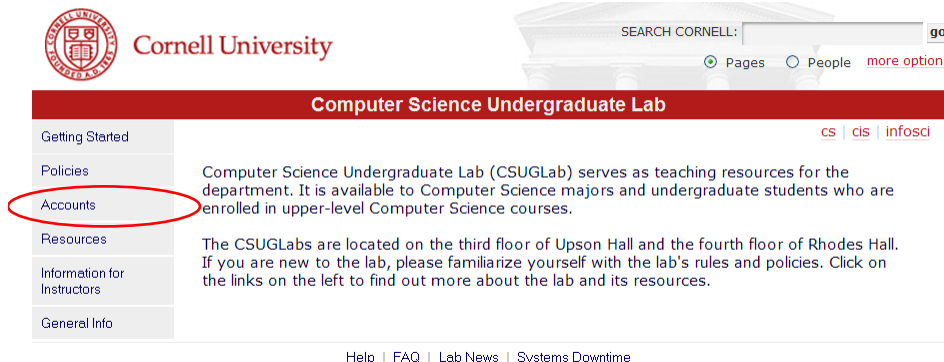
Participation Correlated with Higher Grade



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



The screenshot shows the Cornell University website header with the search bar and navigation links. Below the header is a red banner for the 'Computer Science Undergraduate Lab'. A left-hand navigation menu lists several categories, with 'Accounts' highlighted by a red circle. The main content area provides information about the lab's purpose and location.

Computer Science Undergraduate Lab	
Getting Started	cs cis infosci
Policies	Computer Science Undergraduate Lab (CSUGLab) serves as teaching resources for the department. It is available to Computer Science majors and undergraduate students who are enrolled in upper-level Computer Science courses.
Accounts	
Resources	The CSUGLabs are located on the third floor of Upson Hall and the fourth floor of Rhodes Hall. If you are new to the lab, please familiarize yourself with the lab's rules and policies. Click on the links on the left to find out more about the lab and its resources.
Information for Instructors	
General Info	

Help | FAQ | Lab News | Systems Downtime

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

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

Wiki

CS 4700

navigation

- Main Page
- Community portal
- Current events
- Recent changes
- Random page
- Help

search

toolbox

- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link

[page](#) | [discussion](#) | [edit](#) | [history](#) | [delete](#) | [move](#) | [protect](#) | [watch](#)

Main Page

Welcome to the CS4700/CS4701 wiki. This portal serves students registered to the Fall CS4700/CS4701 course at Cornell.

CS 4701: AI Practicum [edit]

- List of current projects and team members
- Pre-proposal presentation schedule - Sep 8, 2009

CS 4700: Foundations of AI [edit]

No postings.

This page was last modified on 4 September 2009, at 04:45.

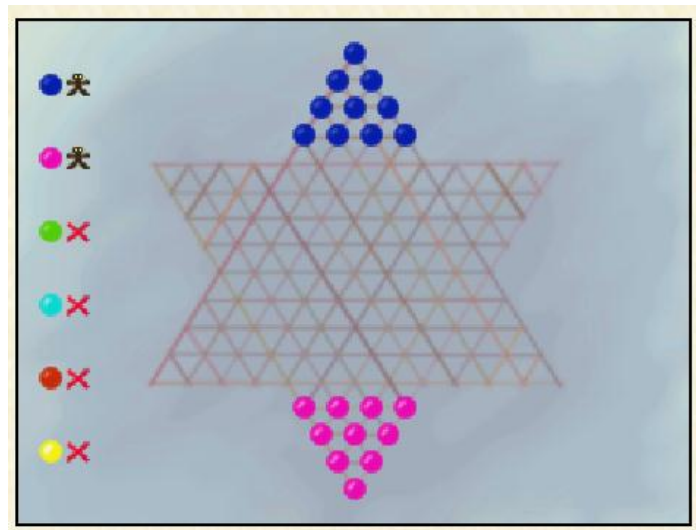
This page has been accessed 364 times.

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[About CS 4700](#)

[Disclaimers](#)

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



<http://lnx-bsp.net/java/chickk.html>

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