EECS 391: Introduction to Artificial Intelligence
Fall 2016

Instructor

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Teaching Assistants

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Billy Barbaro
office & hours: Glennan Student Lounge, Mon 1:00 - 2:00 & Tue 9:00 - 9:50

Class meeting times

Tue/Thu 10:00 - 11:15 AM in White 411

Web page

The course has a blackboard site (https://blackboard.case.edu). You should be automatically added if you are registered for the course, but if you are not, please contact me. Check the blackboard site periodically for the latest announcements, homework assignments, lecture slides, handouts, etc. For help submitting assignments to blackboard google "Submitting Assignments :help.blackboard.com."

Course Description

EECS 391 is an introduction to artificial intelligence. We will study the concepts that underlie intelligent systems. Topics covered include problem solving with search, adversarial games, knowledge representation and reasoning using propositional and first order logics, reasoning under uncertainty, introduction to machine learning, neural networks, planning and reinforcement learning.

Course Goals

In this course we will teach the concepts and principles that underlie intelligent systems. We cover a broad range of basic concepts:

- problem solving with search
- constraint satisfaction
- adversarial games
- knowledge representation and reasoning
- reasoning with uncertainty
- basics of machine learning and neural networks
- basics of planning and reinforcement learning

Prerequisites

EECS 132 or ENGR 131. Although not explicitly, required it is very helpful to have a working familiarly with basic algorithms and data structures as taught in EECS 233.

Textbook

Artificial Intelligence: A Modern Approach (3rd ed) by Stuart Russell and Peter Norvig.

Grading

Students are required to attend lectures and are expected to master all the material covered in class. Classes missed due to reasons other than medical conditions cannot be made up. Prior experience shows that students regularly attending lectures usually perform much better in the exams than those who do not.

The course grade is determined as follows:

- five written assignments (6% each, 30% total)
- three project assignments (10% each, 30% total)
- three exams: (13 1/3% each, 40% total)

I encourage questions and discussion. I will consider class participation as one of the factors in determining borderline grade cases.

Late Assignments

Late submission of assignments is permissible, but with a grade reduction but of 10% per day up to at most three days.

Academic Conduct, Collaboration, and Cheating

Collaborative discussion is encouraged, but any work submitted as a homework assignment must be entirely your own and may not be derived from the work of others, whether a published source, assignments from previous years, another student, or any other person. Doing otherwise without acknowledging that you have done so is cheating. It is your responsibility to take standard measures to protect your programs, homework assignments, and examinations from illicit inspection or copying. Violations will be handled in accordance with the University Policy on Cheating and Plagiarism. We can detect cheaters quite reliably. Cheaters are parasites and academic thieves. They try to falsely benefit from the hard efforts of others and weaken the value of a good grade.

Copying from old exams and assignments is cheating. Looking up answers on the internet is also cheating. You can search for explanation of the concepts, but not specific answers to problems. Making new problems takes a lot of time and effort. We don't make new problems for every assignment or test. More importantly, we want to keep good problems, so that everyone can benefit and learn from them. If we have to throw them out due to the potential of cheating, it is everyone's loss.

More importantly, if you see previous solutions to problems, it seriously impairs your originality and your ability to come up with novel solutions. I like nothing better than to see good, novel approaches, and I always look to see who it is. That tells me you're thinking. There is a big difference between being able to follow the solution to a particular problem, versus

understanding the general concepts the problem is based on, so that you can solve the problem *on your own*. If you understand the principles, you can often solve similar problems. If could only follow the solution, but didn't solve it on your own, it is likely you'll just be stuck again when you encounter a new problem. This is the last thing we want for Case students. For this reason, we try to place novel problems in exams.

You will have plenty of example problems to work from, and there are a wealth of problems in the book. Do not study from old exams, and once you have finished the course, take responsibility for the stewardship of the problems by preserving their learning value for others. Providing answers or even too many hints is neither charitable nor helpful. It can undermine the learning value of the problem and often sets up the person you are trying to help for failure. When you help, try to correct misunderstandings or help them realize the errors in their approach. What you want is for them to have the insight to reach the solution.

Our goal is for the grades the accurately reflect your understanding of the material and ability, solve these types of problems, and program their solutions. To help preserve the integrity of the solutions, when we hand them out, we only give the *minimal* answer. Students who understand the material are able to provide a full and detailed answer. If the solutions are not enough, ask myself or your TAs for help. For this same reason, we sometimes only go over a solution in class.

Schedule (subject to revision)

L	Date	Topic	Chap.	Assignments and Notes
	Tue, Aug 30	Course Overview		
1	Thu, Sep 1	Introduction	1	
2	Tue, Sep 6	Intelligence, Agents, and Representation	2	
3	Thu, Sep 8	Problem Solving by Search	3	HW 1 out
4	Tue, Sep 13	Search Methods	3	P1 out
4,5	Thu, Sep 15	Search Methods	4	
5	Tue, Sep 20	Search Methods		
6	Thu, Sep 22	Optimal Game Play	5	HW1 due
7	Tue, Sep 27	Optimal Game Play	5	
8	Thu, Sep 29	Constraint Satisfaction Problems	6	HW2 out
9	Tue, Oct 4	Constraint Satisfaction Problems	6	P1 due
10	Thu, Oct 6	Constraint Satisfaction Problems	6	
11	Tue, Oct 11	Overview of Reasoning with Uncertainty	13	HW 2 due
	Thu, Oct 13	**Exam 1**		
12	Tue, Oct 18	Probabilistic Reasoning	13	
13	Thu, Oct 20	Probabilistic Reasoning	13	
	Tue, Oct 25	*Fall Break - no class*		
13	Thu, Oct 27	Bayesian Networks	14	HW3 out
14	Tue, Nov 1	Inference Bayesian Networks	14	P2 out
15	Thu, Nov 3	Reasoning with Continuous Variables	20	
16	Tue, Nov 8	Probabilistic Learning	18,20	HW3 due; HW4 out
	Thu, Nov 10	**Exam 2**	20	
17	Tue, Nov 15	Naïve Bayes	20	P2 due; P3 out
18	Thu, Nov 17	Unsupervised Learning and Clustering	20	HW4 due; HW5 out
	Tue, Nov 22	TBD		
	Thu, Nov 24	*Thanksgiving Holidays*		
19	Tue, Nov 29	Neural Networks	18	
20	Thu, Dec 1	Models for Sequential Data	15	HW5 due
21	Tue, Dec 6	Probabilistic Reasoning Over Time	15	P3 due
	Thu, Dec 8	**Exam 3 (there is no final)**		