

CS 3600: Introduction to Artificial Intelligence

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Office Hours: Tuesday and Wednesday, 2-4 Lecture: Tuesday and Thursday 8:00-9:55

Office: TBD

Class Room: TBD

Course Description

Introduction to Artificial Intelligence is a three-credit undergraduate course emphasizing the building of agents, environments, and systems that can be considered as acting intelligently. In particular, you will learn about the methods and tools that will allow you to build complete systems that can interact intelligently with their environment by learning and reasoning about the world.

There are three primary objectives for the course: To provide a broad survey of AI; To develop a deeper understanding of several major topics in AI; To develop the design and programming skills that will help you to build intelligent artifacts.

In practice, you should develop enough basic skills and background that you can pursue any desire you have to learn more about specific areas in AI, whether those areas are planning, knowledge representation, machine learning, vision, robotics or whatever. In particular, this class provides a useful foundation for a number of courses involving intelligence systems, including Machine Learning (CS4641), Knowledge-Based AI (CS4634), Computer Vision (CS4495), Robotics and Perception (CS4632), Natural Language Understanding (CS4650) and Game AI (CS4731).

Required Materials

Artificial Intelligence: A Modern Approach, 4th Edition (the purple edition) by Russell and Norvig. This is a comprehensive and respected text, and we will do readings from it. The cover of the fourth edition is lavender, not blue.

Prerequisites

To succeed at this class, you should know a bit about data structures and algorithms. At the very least, you will have to be able to read pseudocode and understand basic algorithms as they are presented to you.

Much of AI concerns itself with finding fast algorithms that give good approximations of solutions to NP-hard problems. You should be comfortable with the common data structures (hash tables and trees mostly) and big-O notation.

Finally, you should feel pretty comfortable programming on your own. All projects will be implemented in Python. I will spend no lecture time teaching you Python, so if you don't know Python you will be learning that too.

Topics Covered

- Introduction to AI and Agents
- Uniformed Search
- Informed Search
- Markov Decision Processes
- Reasoning with Uncertainty
- Probabilistic Reasoning over Time
- Decision Trees
- Neural Networks
- Monte Carlo Tree Search

Grading

Programming Assignments: (72%) There will be 12 graded projects (6% each) throughout the semester. Many assignments will have extra credit opportunities.

Late policy: The summer semester is compressed, so I need the class to keep up. There will be no credit for late submissions.

Quizzes: (28%) On many Thursdays there will be quizzes to check comprehension. You must be present in class to take the quiz.