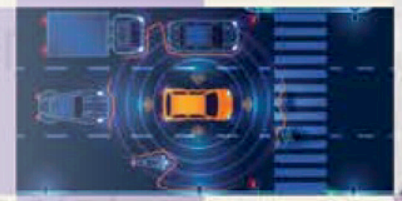
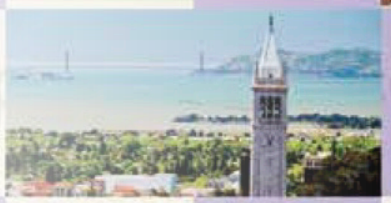
CS 5/7320
Artificial Intelligence

Course Introduction





Slides by Michael Hahsler

Online Material

Course Goal

This course will introduce AI from the viewpoint of **creating an autonomous intelligent agent** that acts rationally in its environment.

For example, a self-driving car is an intelligent agent with the **objective** of delivering a passenger to a desired destination. The agent needs **to make decisions** about stopping, turning, and changing lanes by **observing its environment**, which consists of roads, other cars, pedestrians, and traffic signals.

We will focus on the algorithms used by the agent to make decisions. We will survey the following important topics:

- Searching for a solution
- Using knowledge for decision making
- Decision-making under uncertainty
- Learning from examples

Course Learning Outcomes

- CLO 1: **Define** what **artificial intelligence** (AI) is and explain how it is used.
- CLO 2: Identify **ethical and security issues** with artificial intelligence applications.
- CLO 3: Define **intelligent agents** and explain how they interact with their environment.
- CLO 4: Apply **search** to create agents that can perform simple tasks.
- CLO 5: Explain how **knowledge-based agents** make decisions.
- CLO 6: Explain how **probabilistic reasoning** is used by agents to make decisions under uncertainty.
- CLO 7: Apply **machine learning** to different components of an intelligent agent.

Learning Method

Lecture + Problem Sets: We will discuss algorithms appropriate for different tasks and types of environments. Problem sets will improve the understanding.

Projects: You will implement algorithms to solve several tasks and conduct experiments to investigate how well the algorithms work and how they scale with problem size.

Exams: Checks knowledge of AI concepts and the ability to apply them.

Evaluation is based on problem sets, projects, and exams.

Course Mechanics

- **Office hours**:
  - My office hours can be found on my home page.
  - Weekly TA office hours will be done using Zoom. The time and the link will be on Canvas soon.
- **Communication**: Use Canvas messages and leave comments for assignments.
- **Assignment Grading**: The TA will grade assignments and problem sets. Please contact the TA (e.g., during office hours or by leaving a comment) to discuss your assignment and grade.
- **Final Grade**: The calculated grade on Canvas serves as a rough guide. I will assign your final grade at the end of the semester.

To Be Successful you need…

- Course assignments require substantial advanced **Python** programming.
- Students need practical knowledge of how to implement **data structures and algorithms** (Big-O notation, search trees).
- Students must have a working knowledge of **probability theory and combinatorics.**

- Students are expected to obtain any missing knowledge independently.