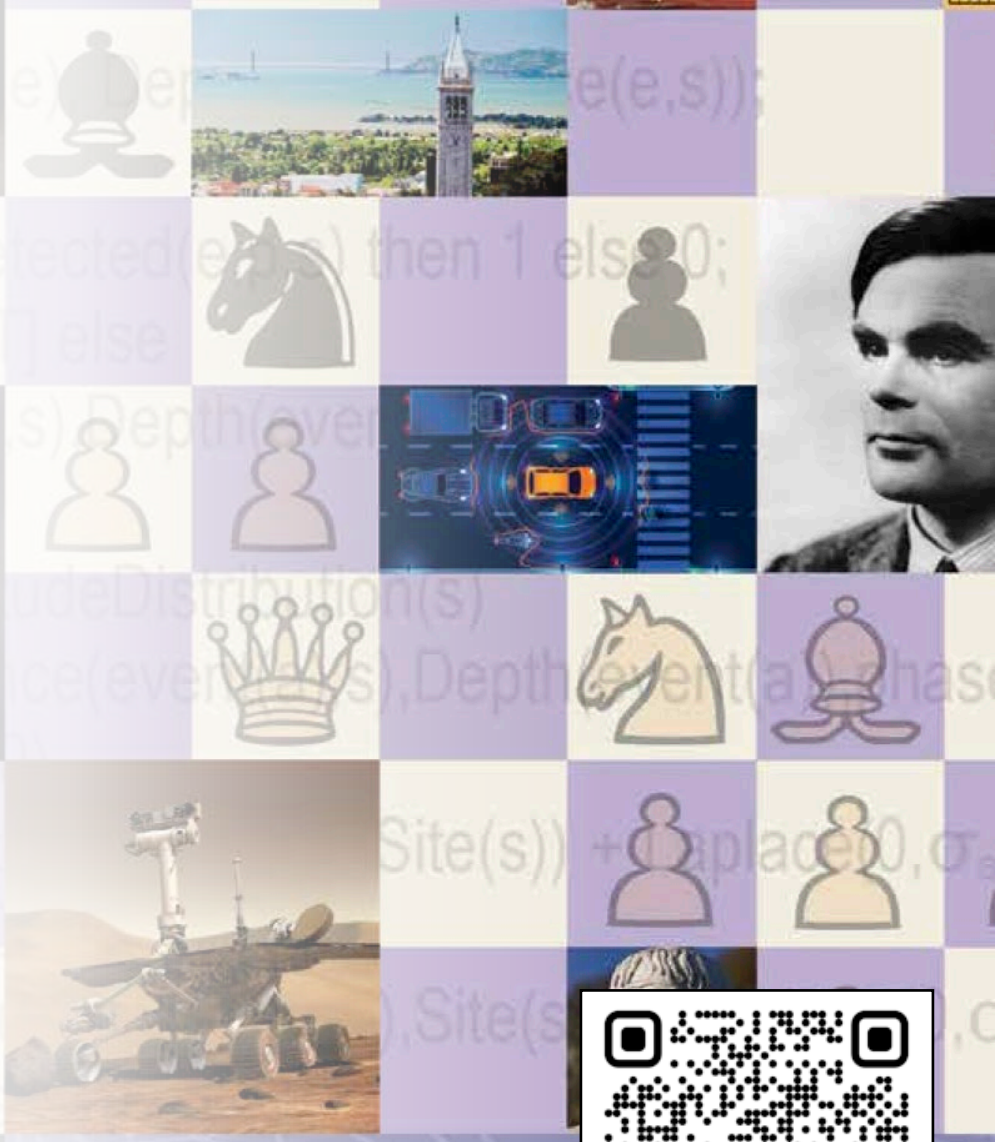
CS 5/7320
Artificial Intelligence

Course Introduction

Slides by Michael Hahsler



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

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 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.

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.