

Spring 2021 CS59000 Artificial Intelligence

Course Description

In this course, we study Artificial Intelligence (AI) algorithms and learn intuitive explanations behind them. AI algorithms are the algorithms used for automated decision making and execution. AI algorithms are behind the technologies in scheduling flights, search engines, self-driving vehicles, recommendations systems, navigation systems, robotics, solvers, voice recognition, translation, and so many other complex and advanced problems.

The course assumes students are comfortable with basic concepts in analysis, elementary algebra, elementary probability, statistics, and programming. It is recommended that students have the basic knowledge of linear algebra, the basics of machine learning, and the basics of deep learning, but it is not necessary. We will cover the required material in this course.

Course Details

- Lectures on T/T at 3:00pm-4:15pm, synchronous online learning
- Office hours, one hour right after class, T/T at 3:15pm-4:15pm (to be updated)
 - *Make sure you are enrolled in the course piazza (contact Enoch Adu if no access).**
 - *Lecture videos will be streamed and uploaded to Brightspace.**
 - *For information regarding auditing and enrolling contact Lori O'Brien.**
 - *We do not use a particular textbook.**
 - *The main body of the course material is borrowed from Stanford University CS221 Artificial Intelligence by Percy and Dorsa.**

Grading

- Homework Assignments
[HW1: 8%, HW2: 8%, HW3: 8%, HW4: 8%, HW5: 8%, HW6: 8%]
- Midterm: 20%
- Coding Project: 12%
- Final: 20%

***No late submission would be accepted.**

Collaboration Policy

I encourage the students to discuss and exchange ideas about the course materials. The students shall accomplish each of their problem sets, project, midterm, and final individually. No collaboration or discussion prior to the due times.

Topics

- **Intro to AI**
- **Prerequisites of Machine Learning**

Search

- **Markov Decision Processes (MDPs)**
- **Games**
- **Constraint Satisfaction**
- **Markov Networks**
- **Bayesian Networks**
- **Logic**

Extra Resources

- **Book:** *Artificial Intelligence: A Modern Approach* by Stuart Russell and Peter Norvig
- **Book:** *Probabilistic Graphical Models* by Daphne Koller and Nir Friedman
- **Book:** *Foundations of Constraint Satisfaction* by Edward Tsang
- **Book:** *Reinforcement Learning: An Introduction* by Richard S. Sutton and Andrew G. Barto
- **Book:** *Algorithms for Reinforcement Learning* by Csaba Szepesvári
- [\[Course on AI\]](#) by Percy Liang and Dorsa Sadigh

Note-Covid-19

In case you observe symptoms or become quarantined or isolated at any point in time during the semester, immediately reach out to the Protect Purdue Health Center, Academic Case Manager, and the Office of the Dean of Students.