Welcome to CS 232 Fall 2022!
Practicalities
Staff

Carolyn Anderson (she)
Professor

Lepei Zhao
Grader

Heeba Nazeer
Tutor

Cynthia Wang
Grader
Is anyone willing to be a note-taker?

There is a student in our class who requires the service of a note taker. If you take accurate and legible notes and attend class regularly, please apply for this position at https://shasta.accessiblelearning.com/wellesley/.
Room: SCI L039
Lecture: 9:55-11:10 on Tuesdays and Fridays
Assignments are due on Mondays at 10 PM
Help Hours

- Tutor hours:
  - TBA

- My help hours:
  - Monday 4-5:30pm
  - Thursday 4-5:30pm
  - By appointment

Come to my help hours to …
- Get help with CS232
- Talk about AI
- See pictures of my cats
Guest Lectures

We will have at least one guest lecture:

October 5th @ 4pm

Joydeep Biswas
UT Austen
Most readings will be from Janelle Shane’s book *You Look Like A Thing And I Love You* (abbrev. YLLATAILY).

All readings are listed on the schedule. Some recommended readings are also posted there—many from Russell & Norvig’s *AI: A Modern Approach*.

Please finish each week’s required reading *before our Tuesday class*. 
Homework will be in Python

I recommend setting up a Python 3.8 virtual environment.

This will be a fun programming language to learn.

wait this is a snake

photo credit: Kat Maddox
Assignments

- Assignments are due on **Mondays at 10 PM**
- Homework submission will be through Gradescope
- Expect an assignment **every week**
- Get help early!
Final Project

There are no exams in this course. Instead, you will work on a final project.

Some intermediate deadlines are sprinkled throughout the semester as part of homework assignments.

We will have presentations on the last day of class.
Late Policy

You have **5 late days** for the semester, which you can use all at once, or spread across assignments. **I will not accept late work beyond these days.**

Important: I will not answer questions on late work during help hours.
Late Policy

This system is meant for dealing with ordinary life circumstances: deadlines in multiple classes, sports tournament, bad headache day, etc.

If you have a prolonged illness or unexpected circumstance, let me know and we'll work together to make a custom plan.
Collaboration policy

In this class, you can talk at a high-level with other students about homework assignments, but you cannot show them your code.

If you discuss a homework problem with another student, please note which students on your assignment when you submit it.
Feedback and Questions

You can submit anonymous feedback or anonymous questions through the **Anonymous Question Form**.

Questions submitted using the form will be answered in the **Q&A document**. Check it regularly for help with assignments!

If you are submitting feedback about the course rather than a question for the Q&A document, just say that in the form.
What is Artificial Intelligence?

“Artificial intelligence is the ability of a computer to mimic human intelligence in perception, learning, planning, and problem solving. What are some examples of artificial intelligence? An alarm clock that wakes you up at the same time every morning. A tax preparation program. A chess program. A program that plays Jeopardy.”
“Artificial intelligence is increasingly understood to be a field of technology that builds intelligence in machines by replicating the way the human brain works. The term ‘artificial’ means that the intelligence is being created by a computer program rather than by the mind of an individual.”
“Artificial intelligence is the ability of computers to process information in a way that is similar to the way that humans do. But now the way computers are structured, it is not possible for them to do that. What we need is to be able to use computers to understand the world.”
What is Artificial Intelligence?

“Artificial intelligence is a branch of computer science that emphasizes the creation of machines that can perform tasks that humans can do. The term is often used to refer to the creation of computers that can perform tasks that humans can do. The term is also used to describe the machines that can perform tasks that humans can do. The term is also used to describe the machines that can perform tasks that humans can do. The term is also used to describe the machines that can perform tasks that humans can do. The term is also used to describe the machines that can perform tasks that humans can do.”
“Artificial intelligence is the search for rules. This search is often referred to as the search for a "general purpose" programming language (GPL). Some of the goals for the search of the rules are to find a "language that has no obvious errors" (i.e. to "avoid false positives"). We can also find rules for the "meaning of life".”
What is Artificial Intelligence?

“Artificial intelligence is an artificial intelligence, not a computer, and we can't have it for our children.”
What is intelligence?

- The ability to make choices after encountering a situation.
- Having and using a store of knowledge.
- Knowing how to act in a novel situation (not just following rules).

What is intelligence?

- Learning from mistakes.
- Ability to generalize from past experiences to novel situations.
- Classifying new observations.
- Ability to process information.
Types of AI
Types of AI

- Narrow/weak AI: human-like performance on a single task
- General/strong AI: AI that can do everything humans can do
Task-based AI
Our goal is to write programs that can solve tasks. This is sort of the goal of all computer science.

In AI, though, the tasks we focus on are ones that seem to require human intelligence. This is a moving standard- what seems impossible for a computer to solve one day may eventually become very easy.
Almost all AI tasks can be grouped into one of three main categories:

- **Search**: Robot retrieves something
  - Chess-playing
  - Information retrieval
- **Classification**: Recognition
  - Image recognition
  - Sentiment analysis
  - Language identification
- **Generation**: Language generation
  - Image generation
  - Deepfakes
How do people learn?

- Some tasks have a **critical acquisition period**:
  - Language acquisition
  - Vision
  - Music training

- Others can be consciously acquired
Example 1

Gareth Roberts @garicgymro · 45m
Just overheard from two of my kids:
Osian (5;1): Look how I caught Mickey!
Eirwen (8;2): Do you mean caught?
Osian: … yeah.
Eirwen: But you can keep saying caught!
Osian: Look how I caught him!
How do people learn?

With fast mapping, I can learn the meaning of a word in 3 exposures in my human brain powered by food.

1 trillion parameters and a carbon footprint please.

human infants

large language models

Photo credit: Josef Fruehwald
How does AI learn?

- Symbolic AI
  - Program rules for the model

- Machine learning
  - Supervised learning
    - Give model input/output pairs to learn from
  - Reinforcement learning
    - Give model a reward function
  - Unsupervised learning
    - Model tries to separate data