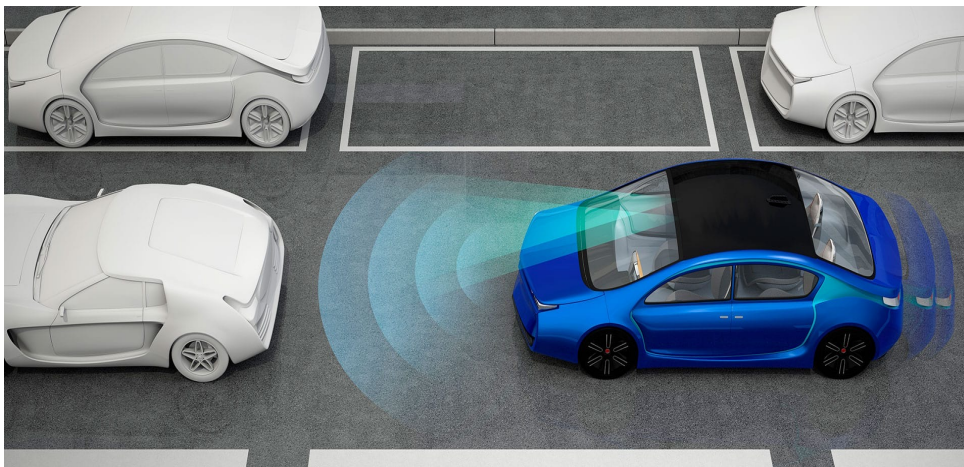


Artificial Intelligence



What is this course about?

Goals

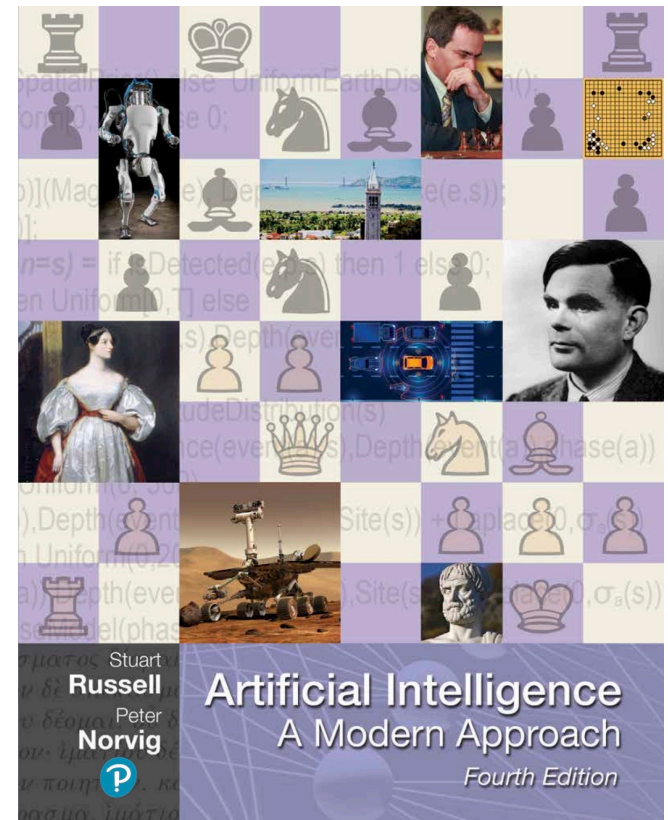
- Help you understand + implement a wide variety of AI/ML algorithms.
- Analyze problems to decide which algorithm are the best for any situation.

Goals

Administrivia

- Course info:
 - Webpage will be the main source of knowledge.
 - Contact me through email or Slack (Slack is better for office hours and real-time discussion.)
- Programming:
 - In Python or Java. Check with me if you want to use something else.

- *Artificial Intelligence, A Modern Approach* (4th ed.)
- 3rd edition is OK too.
- Get it; standard textbook in the field.
- Additional readings supplied by me.



Syllabus – Grading breakdown

- Written homework 20%
- Programming projects 35%
- Midterm 20%
 - Wed, March 23 or Thu, March 24, in class
- Comprehensive final exam 25%
 - Wed, May 4 or Fri, May 6, 5:30pm

Office Hours - TBA

- Office hours will be held over Zoom and/or Slack while we are remote.
 - Send me an email or Slack message and I can open up a Zoom for us.
- Also send me email or a Slack message for "unscheduled" office hours.
 - I can't promise I'll respond immediately, but I'll always get back to you within a day, and we can most likely schedule a time to meet.

Zoom Things

- Come to synchronous classes if possible.
 - Recordings available after class.
- Please turn on your cameras if you feel comfortable.
 - It helps us build a sense of community and your reactions do help me figure out how class is going.
- Please keep yourselves on mute unless talking.
- To ask a question:
 - Wait for a pause and just ask out loud. You can also use the "raise hand" feature.
 - Put it directly in the chat if it's short. (You can private-chat me as well if you want.)
- To answer a question:
 - Put the answer in the chat or, use "raise hand."
 - Or private-chat it to me if you want.

Scheduling Quirk

- Monday next week is MLK Jr Day.
 - Mon/Wed class only gets one class.
- But the Tue/Thu class gets two classes.
- In an effort to keep the two classes as synchronized as possible, I will hold a "bonus" Mon/Wed class on Friday, January 14, 2-3:15.
- You can also attend the regular Thursday class on January 13.

Guest Speaker

- Rhodes' chapter of Phi Beta Kappa is hosting Dr. Collin Stultz, a medical doctor and professor of computer science.
- He is going to give us a round-table discussion of machine learning (just for our class and Prof Millson's AI class) during class time on Monday, January 24th (over Zoom).
- He will give a lecture to the larger Rhodes community that evening at 6pm (over Zoom).

Introductions - Me






Introductions - You

- Name
- Year at Rhodes (first-year, sophomore, etc)
- Where you're from, or where you're zooming in from.
- Tell me your favorite animal that you like to visit at the zoo.
- If you have a pet with you, you must introduce the pet as well.

Course outline

- Blend of "classic AI" (still relevant), "statistical AI" and machine learning (ML).
 - Classic AI: Heuristic search, adversarial search
 - Probability* → – Statistical AI: Bayesian networks, naive Bayes classifiers, Markov chains, hidden Markov models
 - – Machine learning: Reinforcement learning, neural networks

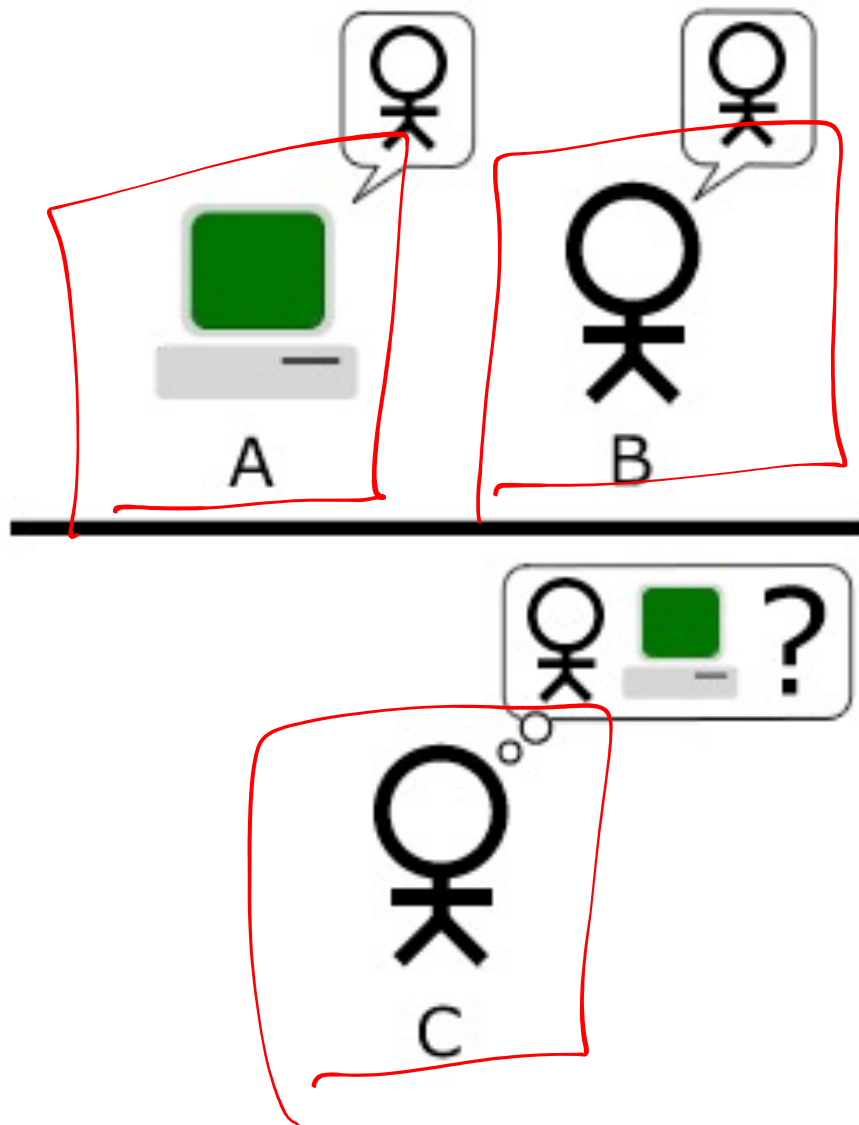
Projects

- Project 0: Graph warmup
-  • Project 1: Use heuristic search techniques to build a turn-by-turn navigation program
-  • Project 2: Use adversarial search techniques to build a bot that can easily beat you at a board game
-  • Project 3: Use probabilistic AI techniques to predict the most likely location of an object based on motion sensors
-  • Project 4: Use machine learning to train a spam classifier
-  • Project 5: TBA; machine learning for something

What is artificial intelligence?

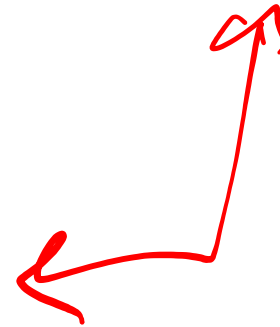
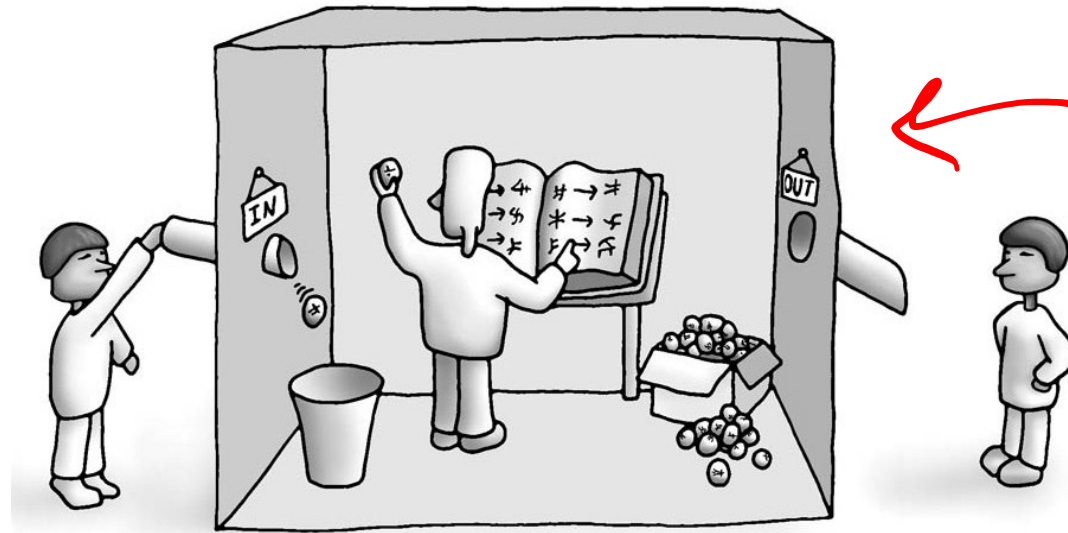
Answer #1: Acting like a human

*Turing test
1950s*



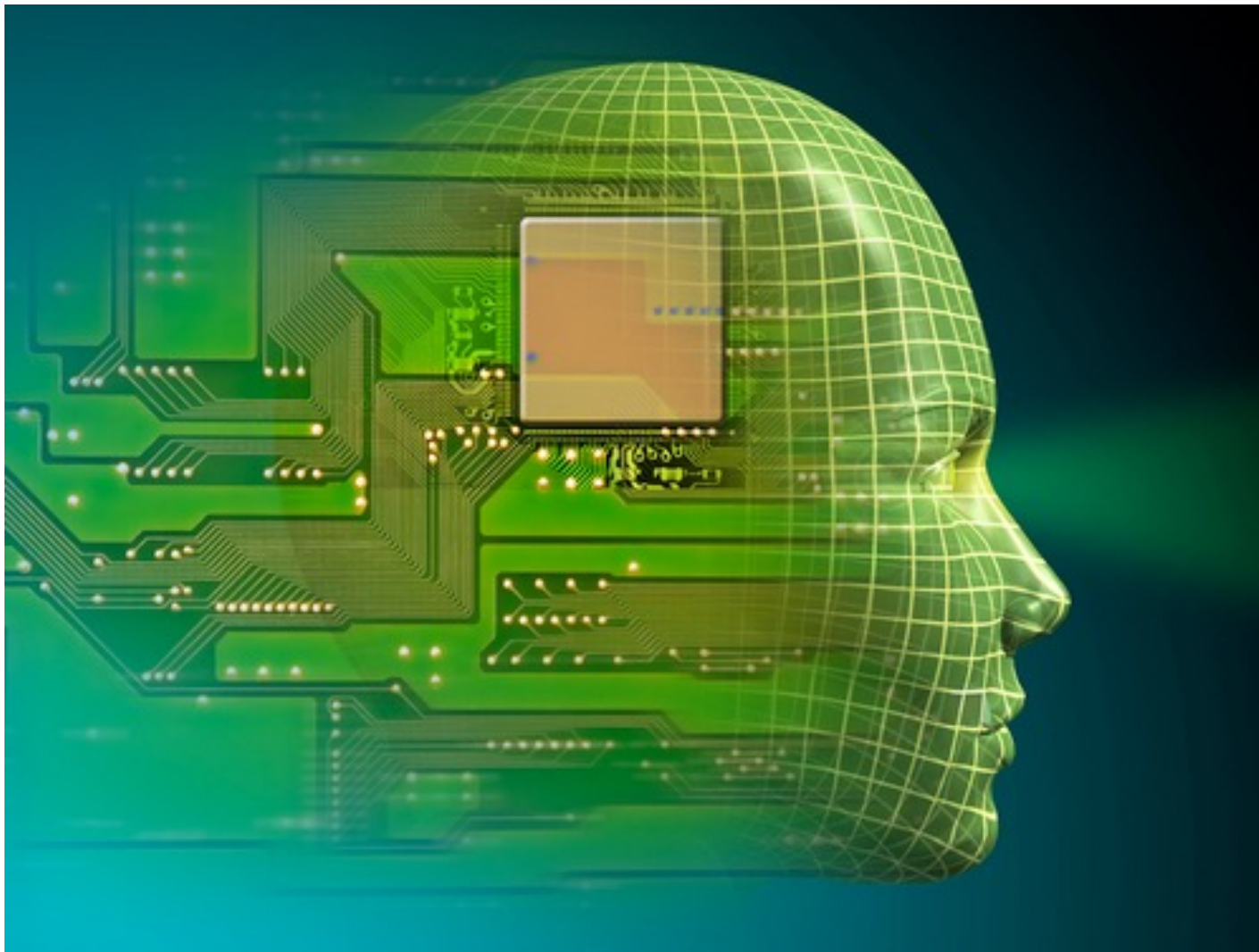


Chinese room



Cognitive modeling approach

Answer #2: Thinking like a human



|

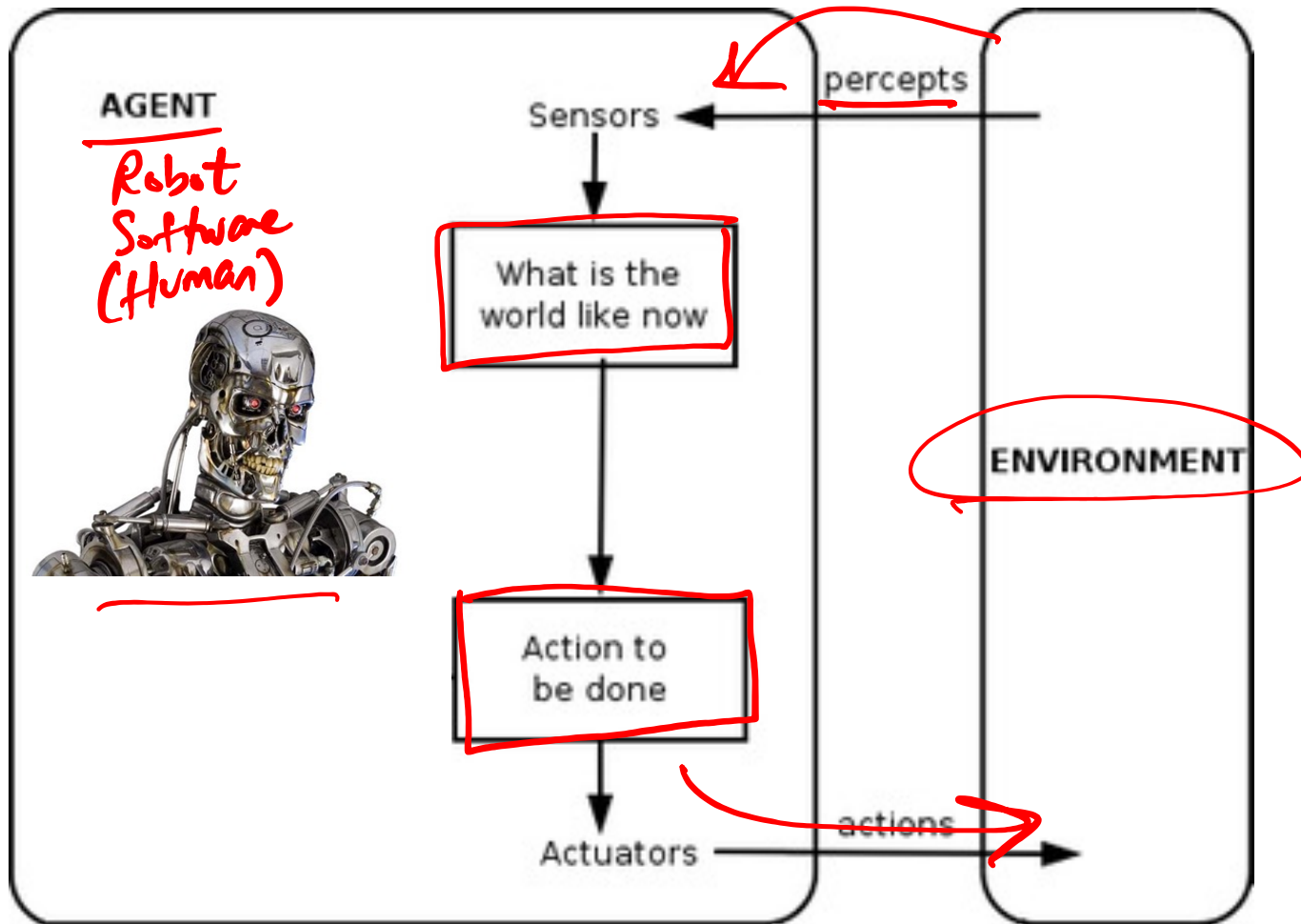
Answer #3: Thinking rationally



Answer #4: Acting rationally



Rational Agents



Agents interact with their environment through sensors and actuators.

Rational Agents

- Rational agent:
 - For every possible percept sequence, a rational agent should
 - select an action that is expected to maximize its performance measure,
 - given evidence provided by the percept sequence and whatever built-in knowledge the agent has.

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Environments

- Fully-observable vs partially-observable
- Single agent vs multiple agents
- Deterministic vs non-deterministic
- Episodic vs sequential
- Static or dynamic
- Discrete or continuous