

ADAM PURTEE

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# CSC 442: ARTIFICIAL INTELLIGENCE

## ABOUT THE INSTRUCTOR

- ▶ Name: Adam Purtee
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- ▶ Pronouns: He, him, his, Mr.
- ▶ Office: Wegmans 2109
- ▶ Office Hours:
  - Tuesday – 2:00pm - 4:00pm
  - Thursday – 2:00pm - 3:00pm

## SOURCES OF INFORMATION

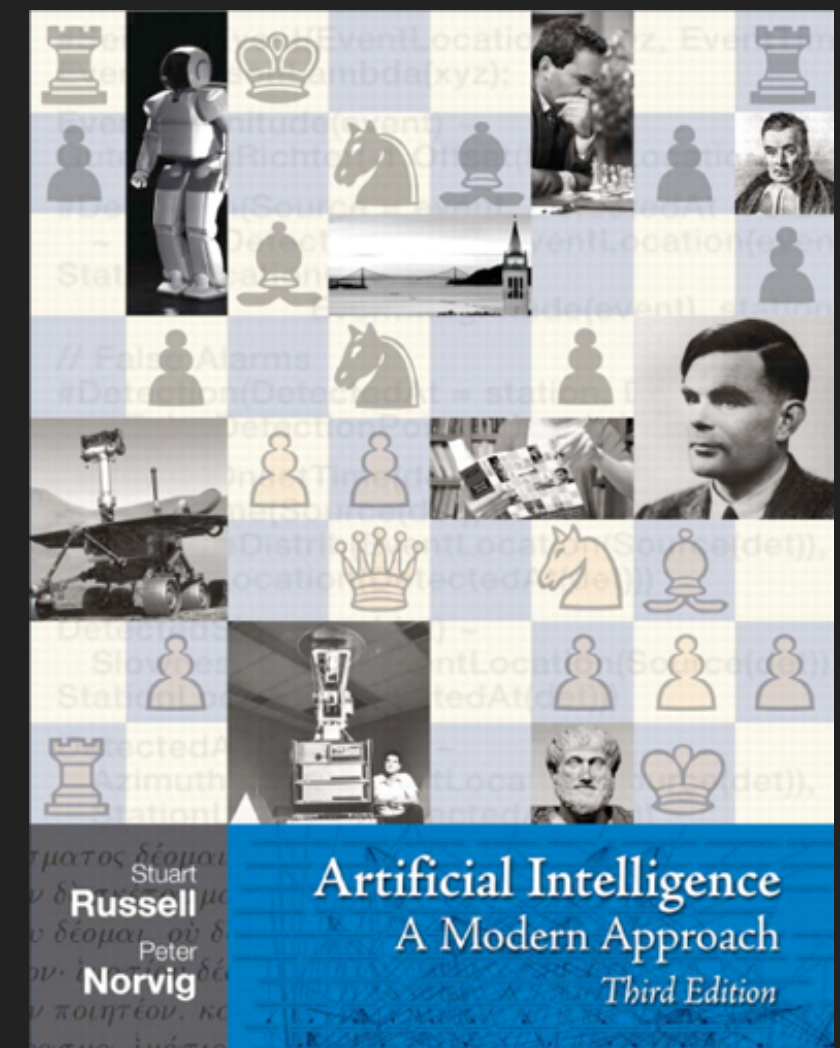
- ▶ Website: [cs.rochester.edu/u/apurtee/442](https://cs.rochester.edu/u/apurtee/442)
- ▶ Piazza: [piazza.com/rochester/fall2019/csc442](https://piazza.com/rochester/fall2019/csc442)
- ▶ Lectures will be posted to Blackboard.

# TOPICS

- ▶ Course Logistics
  - ▶ Syllabus, Grading, Assignments, Policies
- ▶ What is AI?

# RECOMMENDED TEXTBOOK

- ▶ Artificial Intelligence: A Modern Approach, Stuart Russel and Peter Norvig, 3rd ed.
- ▶ Reading strongly recommended.



# ORGANIZATION

Unit 1: Search	Reading	Quizzes	Homework	Project
Unit 2: Representation	Reading	Quizzes	Homework	Project
Midterm Exam	Monday, October 28			
Unit 3: Uncertainty	Reading	Quizzes	Homework	Project
Unit 4: Learning	Reading	Quizzes	Homework	Project
Final Exam	Thursday, December 19, 0830			

# GRADING

Projects	$4@10\% = 40\%$
Quizzes	10%
Midterm Exam	25%
Final Exam	25%

# GRADING

A	Excellent	$\geq 90$
B	Good	$\geq 80$
C	Poor	$\geq 70$
E		$< 70$



# HOMEWORK

- ▶ There are suggested homework problems for each topic.
- ▶ Homework problems are not graded.
- ▶ They are intended to give you additional practice.

# PROJECTS

- ▶ There is a project for every unit (4).
- ▶ Implementation of the ideas covered in the unit.
- ▶ These are meant to be challenging, interesting guided programming experiments.
- ▶ They will require writeups.

# QUIZZES

- ▶ We will have approximately 9 quizzes this term.
- ▶ Quizzes will be short in-class exercises meant to get you early feedback on your understanding of key topics.
- ▶ Your lowest quiz score will be dropped.

# WHAT IS AI?

- ▶ What is AI?

# WHAT IS AI?

- ▶ Intelligence is a multi-faceted phenomenon.
- ▶ In Computer Science, we are interested in computational solutions to problems that are associated with intelligent behavior.
- ▶ Our tools are programs that exhibit intelligent behavior.

# WHAT IS AI?

- ▶ We use formal models of problems associated with intelligent behavior,
- ▶ algorithms for solving those problems, and
- ▶ programs that implement the algorithms and demonstrate the solution.

# THE AIMA PERSPECTIVE

Human Thinking	Thinking Rationally
Human Actions	Acting Rationally

# THINKING RATIONALLY





## THINKING RATIONALLY

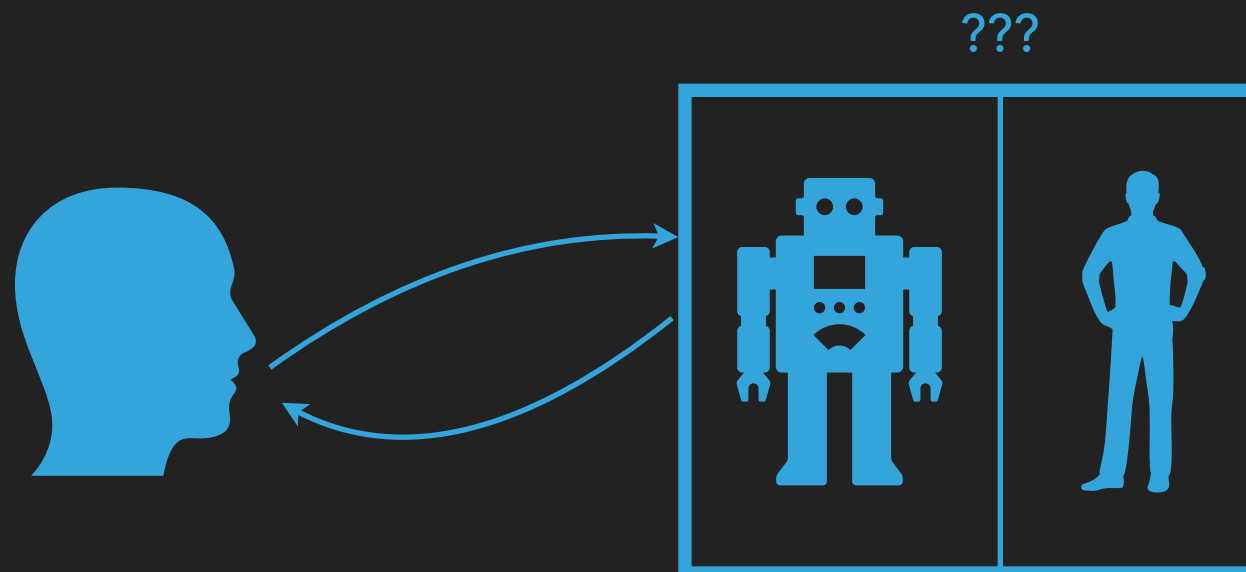
- ▶ “Every art and every inquiry, and similarly every action and pursuit, is thought to aim at some good.” – Aristotle.
- ▶ Is there any purpose to thought without action?

## ACTING RATIONALLY

- ▶ Not all actions are result of “thoughts”.
  - ▶ E.g., touching a hot stove, riding a bike, ...
- ▶ Many actions can be a result of thoughts.
  - ▶ E.g., speaking, writing, problem solving, ...

# THE TURING TEST

- ▶ Alan Turing. 1950. Computing Machinery and Intelligence. *Mind: A Quarterly Review of Psychology and Philosophy*.
- ▶ A proposed “imitation game” where a human judge communicates with either a machine or a person and determines which is which.



# LIMITATIONS

- ▶ The TT examines if a machine can **imitate** a human.
- ▶ Some “successful” approaches have included writing programs which incorporate misspellings and grammatical errors.
- ▶ Also, if a machine is more intelligent than a human, it would have to avoid revealing that fact!

# THE TURING TEST — NOTABLE ATTEMPTS

- ▶ 1966 – Weizenbaum's ELIZA
- ▶ 1972 – Colby's PARRY

# TURING TEST PASSED IN 2014?

- ▶ "On 7 June Eugene convinced 33% of the judges at the Royal Society in London that it was human."
- ▶ ""A true Turing test does not set the questions or topics prior to the conversations. We are therefore proud to declare that Alan Turing's test was passed for the first time on Saturday."

## Computer AI passes Turing test in 'world first'

9 June 2014

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A computer program called Eugene Goostman, which simulates a 13-year-old Ukrainian boy, is said to have passed the Turing test at an event organised by the University of Reading.

TURING TEST EXTRA CREDIT:  
CONVINCE THE EXAMINER  
THAT HE'S A COMPUTER.

YOU KNOW, YOU MAKE  
SOME REALLY GOOD POINTS.

/

I'M ... NOT EVEN SURE  
WHO I AM ANYMORE.

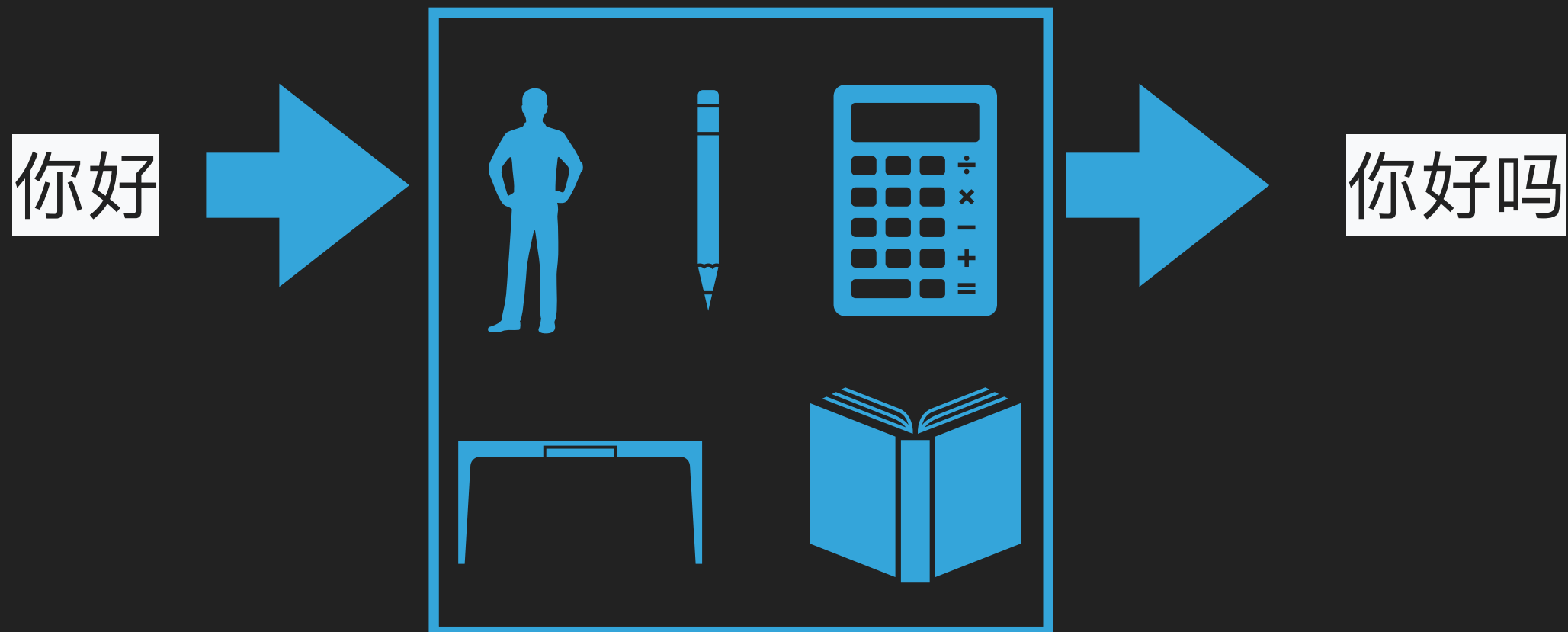


## THINKING VS ACTING

- ▶ John Searle's argued against intelligent machines is that observing behavior alone is not enough to conclude that something is intelligent.
- ▶ He proposes a distinction between **true intelligence** and **simulating intelligence**.
- ▶ John Searle. 1980. Minds, Brains, and Programs. *Behavioral and Brain Sciences*.



# THE CHINESE ROOM IDEA



# THE TURING TEST

- ▶ Problems:
  - ▶ subjective results
  - ▶ various ways to "cheat"
- ▶ Contributes to:
  - ▶ Knowledge Representation and Reasoning
  - ▶ Natural Language Processing and Understanding
  - ▶ Machine Learning

# SUMMARY

- ▶ Sources of information:
  - ▶ [cs.rochester.edu/u/apurtee/442](https://cs.rochester.edu/u/apurtee/442)
  - ▶ Piazza, Blackboard
- ▶ Intelligence is hard to define; AI is a big field with deep problems.
- ▶ Please get the book and do the readings before class next time.