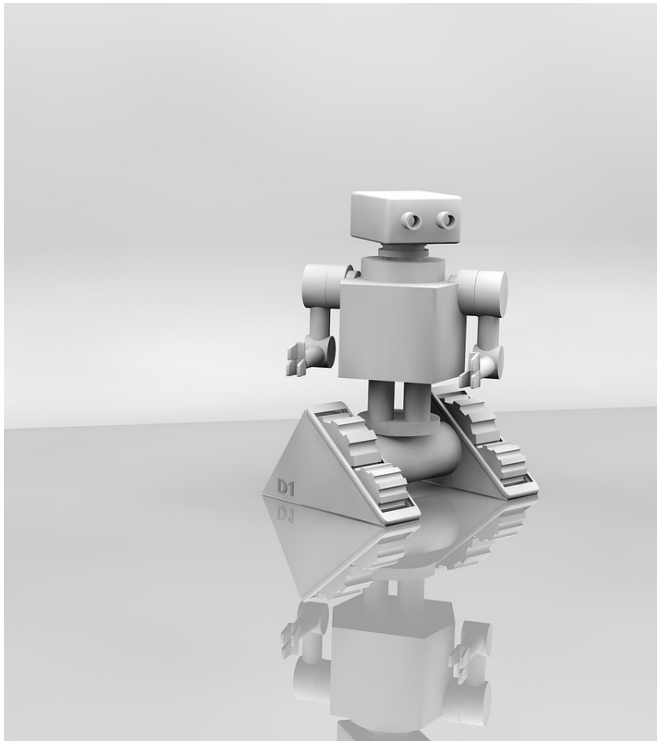

CPSC 481
Artificial Intelligence

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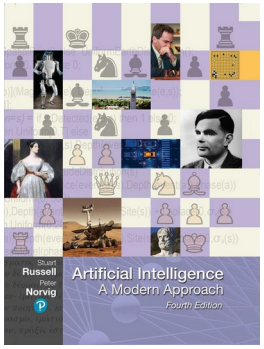
What we will cover today

- Introductions
- Course Syllabus
- What is Artificial Intelligence?
- History of AI

Textbook: Chapter 1.1-1.3



Instructor

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Office Hours

- Tuesday 830-930am
- Tuesday and Thursdays at 1-2pm
- CS-510 or zoom (https://fullerton.zoom.us/my/mirakim)

Background and Research Interests

Background

- 8 years at IBM Automation group as a Product Manager
- Ph.D. at UC Irvine
- M.S. at UCLA

Research

- Recommender system using reinforcement learning
  - Medical Treatment recommender
- Intelligent software engineering
  - Smart sprinkler system
- Others

Recruiting students to join my research – email me

What about you?

- In the next 10 minutes
  - Form a group of 3-4 students
    - Manager, Presenter, Recorder, Reflector
  - Intros and discuss the following
    - Name
    - What do you think of AI?
    - What do you know about AI?
    - What you want to achieve from this class?

Course syllabus

- CPSC 481 Syllabus

Recommender Systems

- Provide personalized recommendations

Virtual Assistants

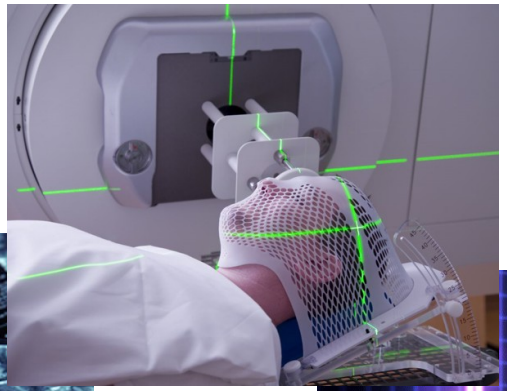
- Understand/respond to user queries and perform tasks

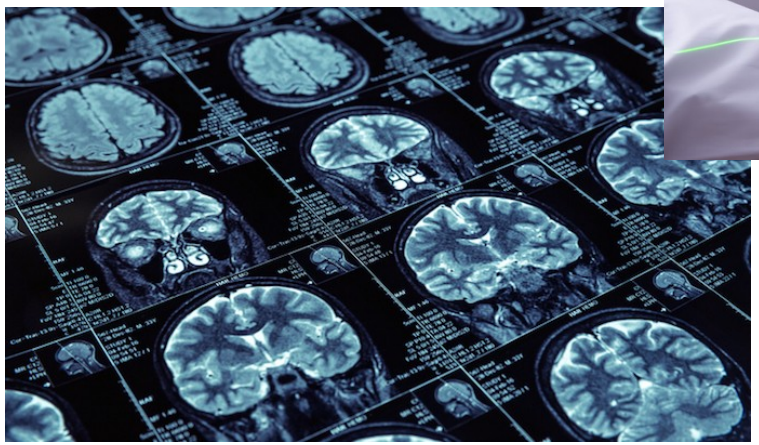
Autonomous vehicles

- Perceive the environment, make decisions and navigate safely without human intervention

Healthcare diagnostics

- Identify abnormalities and assist healthcare professionals in making diagnosis





What is AI?

- AI may be defined as the branch of computer science that is concerned with the automation of intelligent behavior
  - Luger

- The study and design of intelligent agents where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success
  - Russell and Norvig

- The science and engineering of making intelligent machines
  - John McCarthy

What is AI?

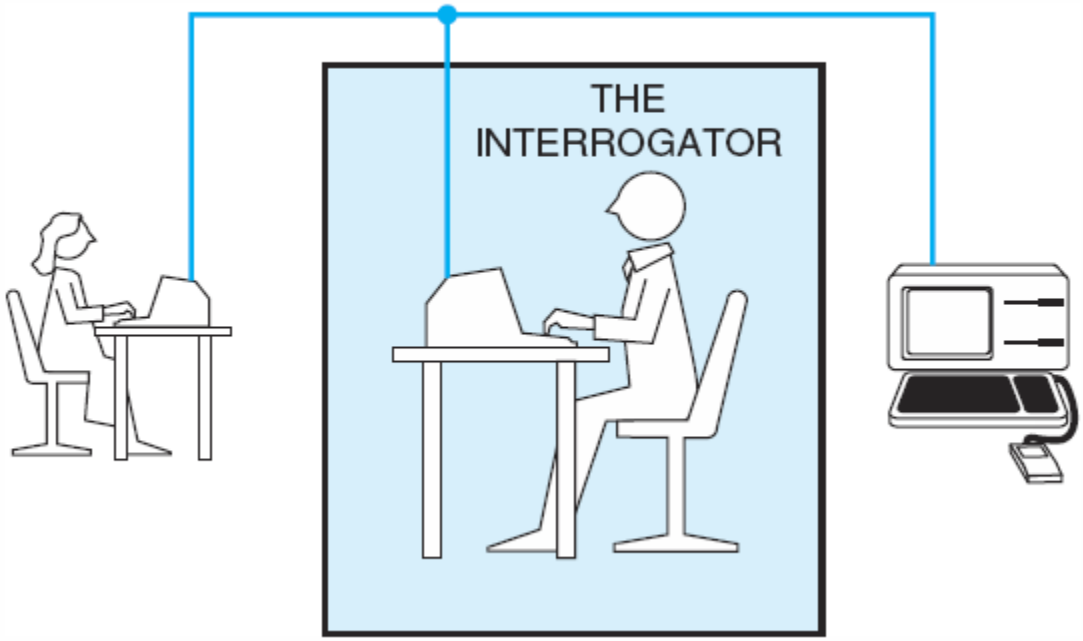
- Concerned with not just understanding but also *building* intelligent entities – machines that can compute how to act effectively and safely in a wide variety of novel situations

What is Intelligence?

- No precise definition
- Some capabilities
  - learning
  - recognition, understanding
  - reasoning
  - imagination (or abstract thinking)
  - creativity
  - communication
  - planning
  - decision making
  - problem solving

Turing Test

(as a Way of Testing Acting Humanly)



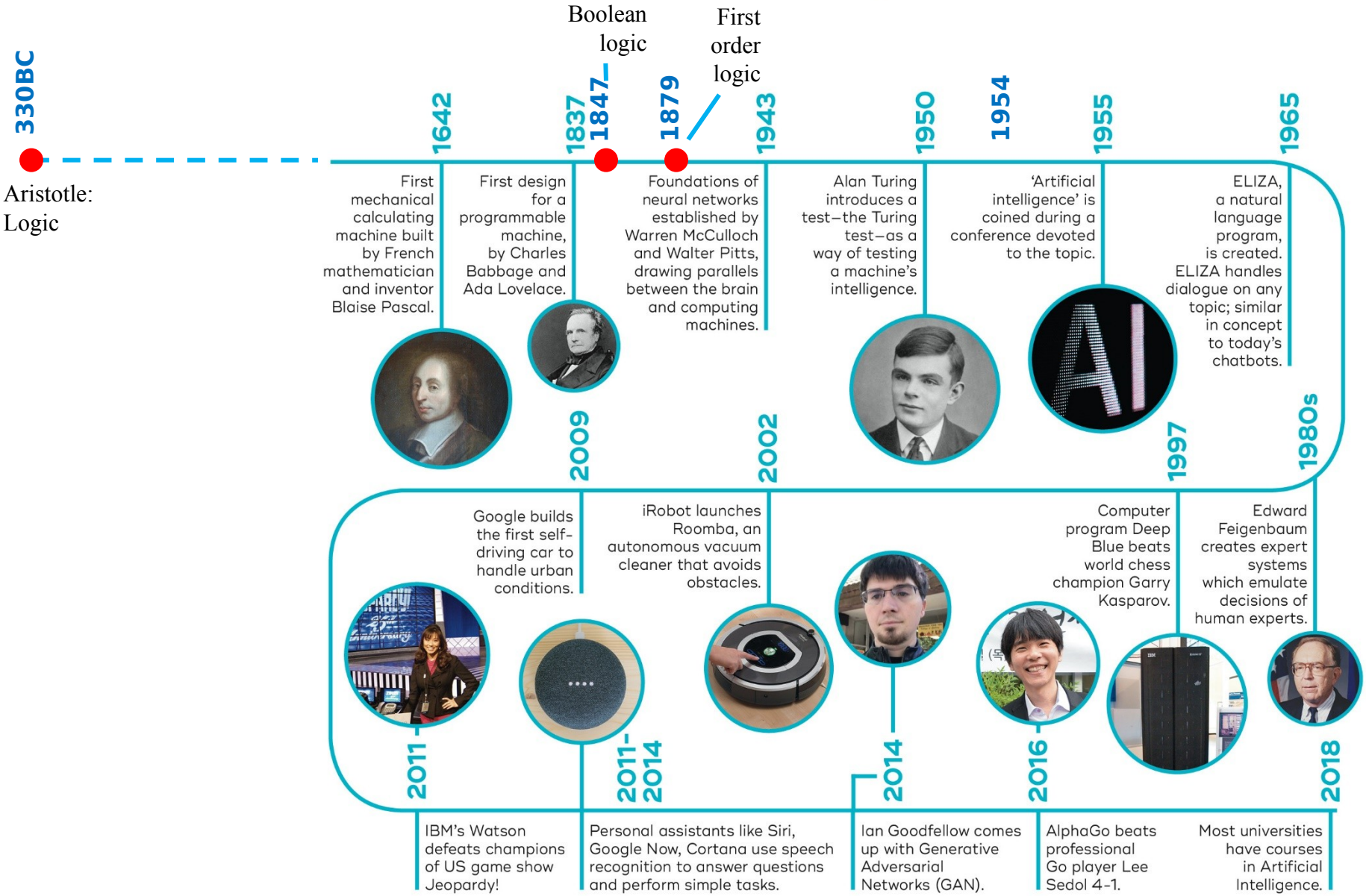
Turing test by Alan Turing in the theory of computability

Asking a question "Can a machine to be made to think?"

The Turing Test measures the performance of an intelligent machine against that of a human being through the imitation game.
Trying to determine which player – A or B – is a computer and which is a human

Importance and Criticisms for Turing Test

- **Importance of Turing Test**
  - Attempts to give an objective notion of intelligence by eliminating any bias in favor of living organisms.
- **Criticisms of Turing Test**
  - Focuses on purely symbolic and problem-solving skills, not on perceptual skill.
  - A distraction to the important tasks such as developing general theories to explain the mechanisms of intelligence in human and machines to solve problems.
  - Only based on simulating human intelligence. Machine can do a lot better than human for many tasks.



https://qbi.uq.edu.au/files/40697/The-Brain-Intelligent-Machines-AI-timeline.jpg

Evolution of AI

- **Early stages**
  - Focused on concepts, theories, and simulating human intelligence such as formal logics, theorem proving, graph theory, search, knowledge representation, stochastic analysis, other related mathematics.
- **Modern AI**
  - Focus more on practical applications and problem solving – demand from real-world business applications.
    - Machine learning, data mining, search engines, intelligent systems, robots, big data analytics, etc.
  - Collective intelligence

Directions of Artificial Intelligence

- Strong AI – AI with general intelligence
- Weak AI – AI with specific intelligent abilities

- Researchers started with the goal of strong AI but has achieved weak AI
  - *AI (robot or agent with AI) still weak at recognition, feeling, emotion*
  - **Strong AI** is still a long-term goal of AI research.

Areas of AI

- AI research is specialized and divided into subfields
  - Knowledge representation
  - Reasoning: Knowledge-based or Expert systems
  - Planning
  - Machine learning
  - Natural language processing and understanding
    - Personal assistants, e.g., Siri
  - Perception and the ability to move and manipulate objects
    - Machine vision
    - Robotics

References

- Russel and Norvig, Artificial Intelligence: A Modern Approach, 4th edition, Prentice Hall, 2010.