Intro to AI

By Ayaan Haque and Viraaj Reddi

Course Curriculum

- **Week 1:** Introduction to Artificial Intelligence (AI) and Machine Learning (ML)
- **Week 2:** AI/ML/DL Theory
- **Week 3:** Practicing individual concepts in code

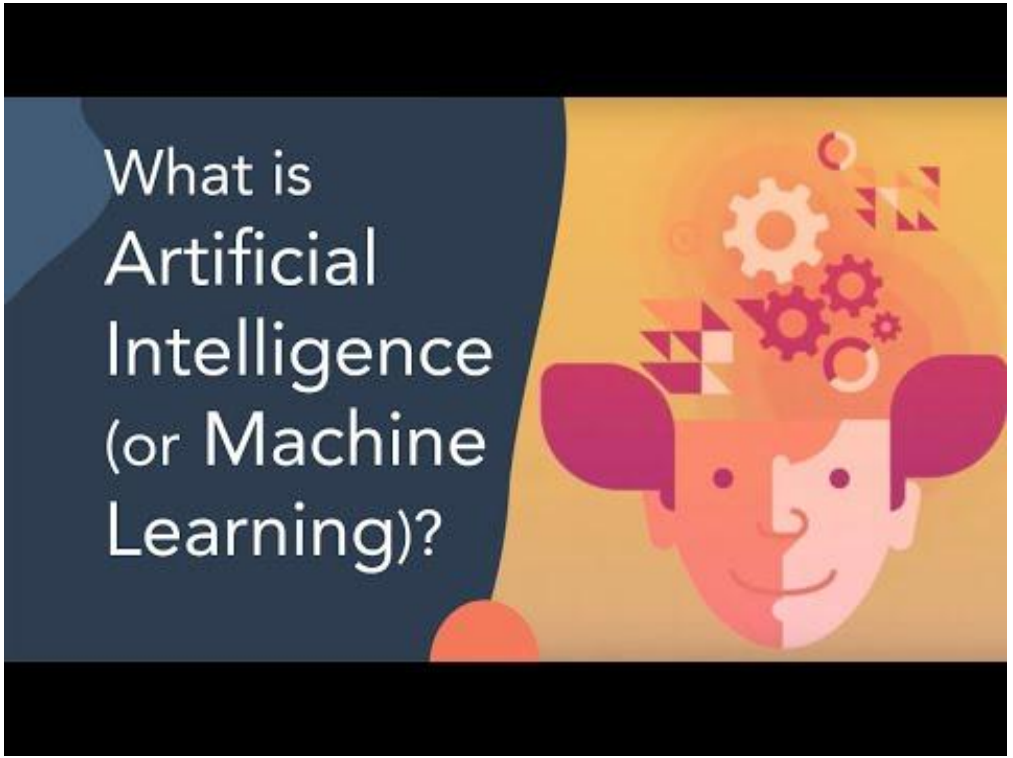
Week 4: Walking through a comprehensive project

Week 5: Getting started on individual projects

Week 6: Presenting your projects and further learning

Week 1: Intro to AI/ML

Intro Video



AI is everywhere

- Used in: Virtual Assistants, Security, Self-driving cars, Healthcare, Medical Imaging Analysis, and more
- Your phone has AI
- Netflix is AI
- Google searches are AI

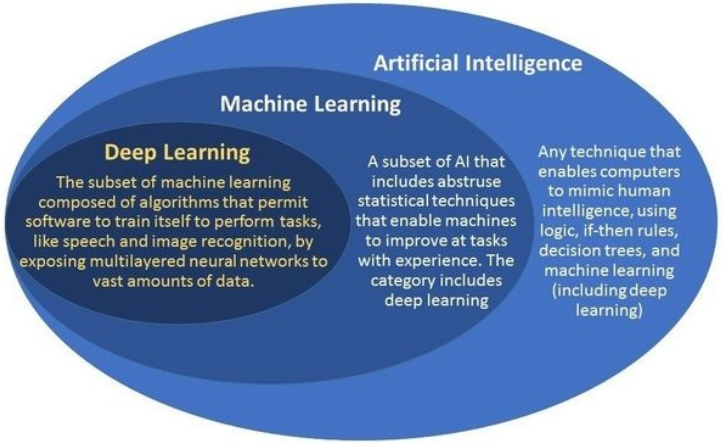
What is AI?

- Definition: The simulation of human intelligence in machines that are programmed to think and act like humans.
- A program learns from its own results, using thousands of tests to gradually get closer to its goals
- The program mimics how humans gradually learn from their surroundings by doing the same in their virtual environment
- There are multiple types of AI used for different situations -- Computer Vision for understanding images, NLP for understanding human communication (e.g. speech and text), and many more

AI vs ML

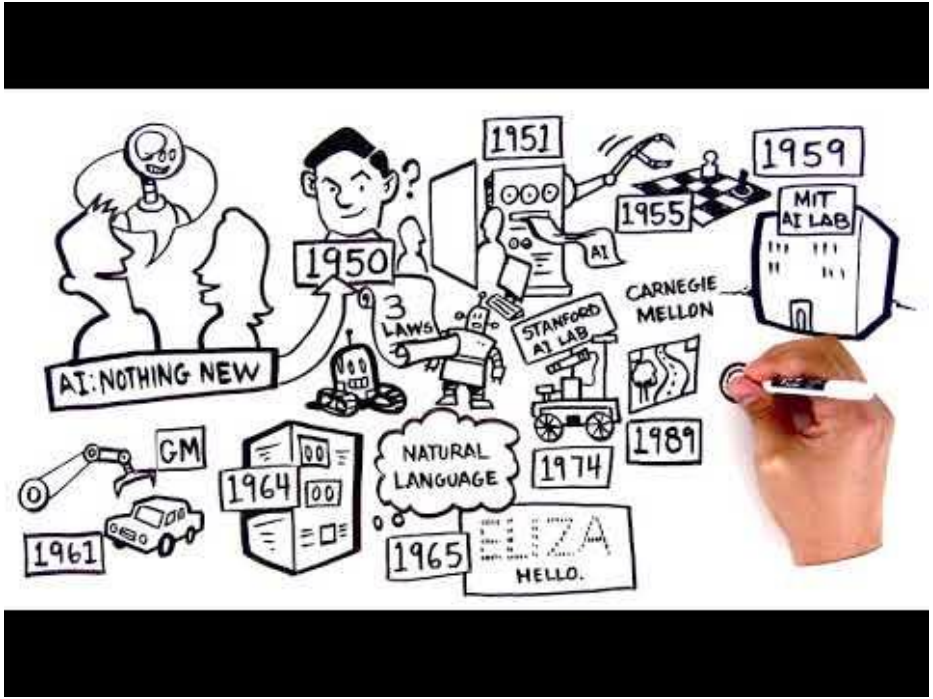
AI Definition: The simulation of human intelligence in machines that are programmed to think and act like humans.

ML Definition: The practice of using algorithms to analyze data, learn from that data, and then make a determination or prediction about new data.



History of AI

- the field of AI wasn't formally founded until 1956 at a conference at Dartmouth College, where the term "artificial intelligence" was coined.
- in 1997, IBM's Deep Blue became the first computer to beat a chess champion when it defeated Russian grandmaster Garry Kasparov. And in 2011, the computer giant's question-answering system Watson won the quiz show "Jeopardy!" by beating reigning champions Brad Rutter and Ken Jennings.



Types of AI

- Computer Vision: https://machinelearningmastery.com/what-is-computer-vision/
- NLP: https://machinelearningmastery.com/natural-language-processing/
- Recommendation Systems: https://developers.google.com/machine-learning/recommendation/collaborative/basics
- Deep Learning: https://machinelearningmastery.com/what-is-deep-learning/

Practical Applications of AI

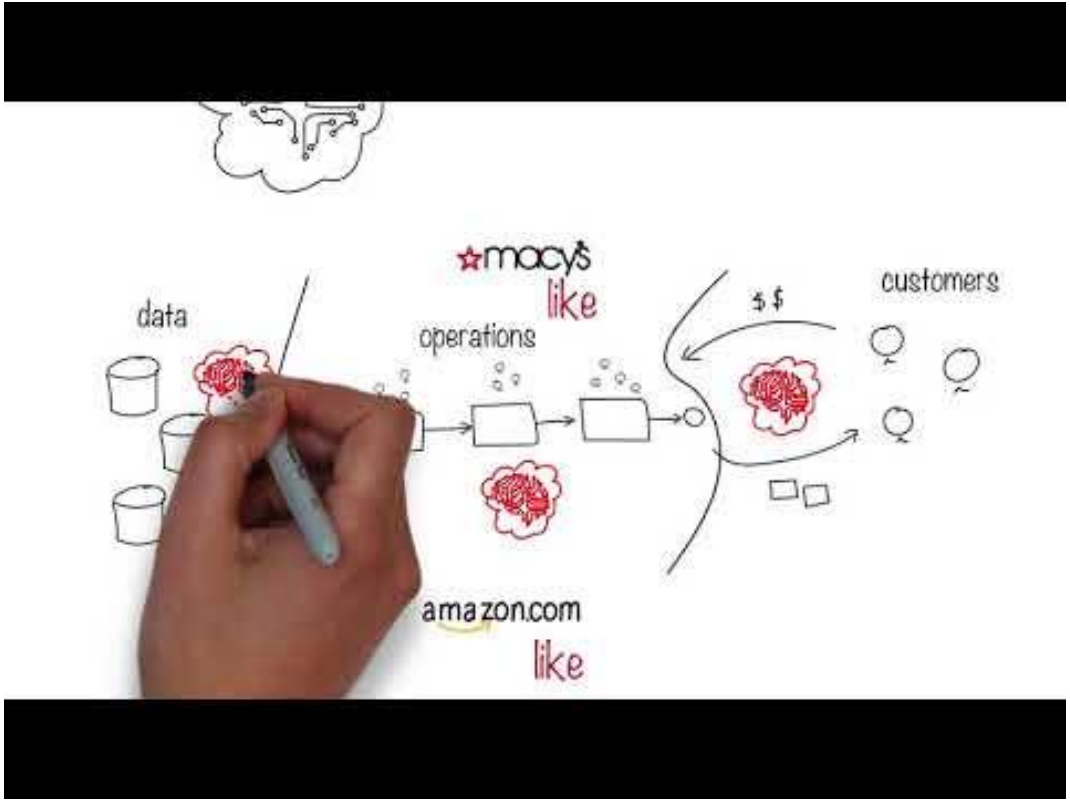
AI is extensively used in:

- Healthcare: https://www.forbes.com/sites/bernardmarr/2018/07/27/how-is-ai-used-in-healthcare-5-powerful-real-world-examples-that-show-the-latest-advances/#3dd5aeb95dfb
- Sustainability: https://www.youtube.com/watch?v=mJ6rjJiIHyo
- Business: https://www.youtube.com/watch?v=N_eHmaRf9T4
- Economics: https://www.youtube.com/watch?v=0BAFOJbo4W4

Ethics of AI

- There is very little regulation surrounding AI considering how new it is, but there are various ethical questions about how far to take this technology
- Stanford article summarizing ethics of AI
- Big questions:
  - How can we ensure a right to privacy and knowledge of surveillance?
  - Will AI ever be able to do things on its own?
    - Far reached example, but think Ultron from Avengers

Video -- Ethics of AI(How it hurts employees)



How AI will help you

- **College Applications:**
  - Potential Major in CS, Engineering
    - Then AI will be very useful
  - There's no AI/ML major yet, but it might be a thing in the future
- **AI is the future in careers:**
  - Every career is gradually integrating AI, and developing a foundation in AI will assist you wherever you choose to go
  - Regardless of what you want to pursue, AI will most likely be important
    - Viraaj wants to be a doctor, but he still learns AI because of its vast potential and application in healthcare

Setting up google colaboratory

- Google colab: A free integrated development environment (IDE) hosted by Google that allows you to run your Python code
- Ayaan will screen-share and show you how to set this up in your Google Drive

Learning Github

- We will be using Github as our primary source of storing and sharing code and materials for this course
- All of you should make Github accounts and we will teach you how to share your code on github using Github Desktop.
    - All of you should make your own repository where you will make a folder for your practice code as well as a folder for your actual project when you make it

HW: Python Brush Up

General python reference center: https://www.w3schools.com/python/

Questions?