Welcome to Beginner Track!

Intro To Machine Learning: Beginner Track #1

Attendance code: Canada
Feedback: https://forms.gle/JiuLMsYFP6xatrCUA

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Our Mission

To build and develop a community of students interested in **Artificial Intelligence** at UCLA and beyond.

Our Values

- Technical Proficiency and Awareness in Artificial Intelligence
- Creating a Positive Impact on Society
- Diversity and Inclusion

ACM AI Initiatives

Workshops

Events

Outreach

Projects

ACM AI Projects

What?

- Get a chance to work on a real-world deep learning project!
- What we're currently working on:
  - Detecting plant diseases from images of Cassava leaves.
  - Identifying humpback whales from images of their tails.

Why?

- Gain practical experience with machine learning
- Meet some cool people :)

How can I get involved?

- Take Beginner and Advanced track!

AI Podcast

- The newest, You Belong in AI, podcast is out!
- focuses on inspiring individuals in the AI community and discusses their background and views on diversity in AI
- already 10 episodes
- https://anchor.fm/ucla-acm-ai/episodes/You-Belong-in-AI--S2-E3-Dr--Leshell-Hatley-eudelo

Beginner Track

Who's it for?

- no experience in machine learning
- minimal experience coding
- want a solid foundation in the theory behind ML

What's covered?

- basics of machine learning
- theory and implementation of simple models
- introduction to useful ML libraries

When and where are meetings?

- **Time:** Tuesdays 7-9 PM (PDT)

Jenson Choi

Nikhil Suresh

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Our Workshops Portfolio

- **Beginner Track - *What is ML?***
  - Basics of machine learning
  - implement linear and logistic regression

- **Advanced Track - *Deep Learning***
  - Concepts like deep neural networks, CNNs, RNNs
  - Basic knowledge of ML concepts expected

- **Advanced++ Track - *More Deep Learning Concepts***
  - Transformers, Autoencoders, Quantum ML
  - Some knowledge of ML concepts expected

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Office Hours

Time and Date TBD PST on the ACM discord

Join now! https://bit.ly/ACMdiscord

Beginner Track: Schedule

- Workshop 1 (4/13): Intro to ML + Intro to Python
- Workshop 2 (4/20): Intro to Python + K-Nearest Neighbours
- Workshop 3 (4/27): Linear Regression
- Workshop 4 (5/4): Logistic Regression + Multiclass Classification
- Workshop 5 (5/11): Numpy and Pandas
- Workshop 6 (5/18): Guided Project
- Workshop 7 (5/25): Guided Project (continued)

Don’t worry!

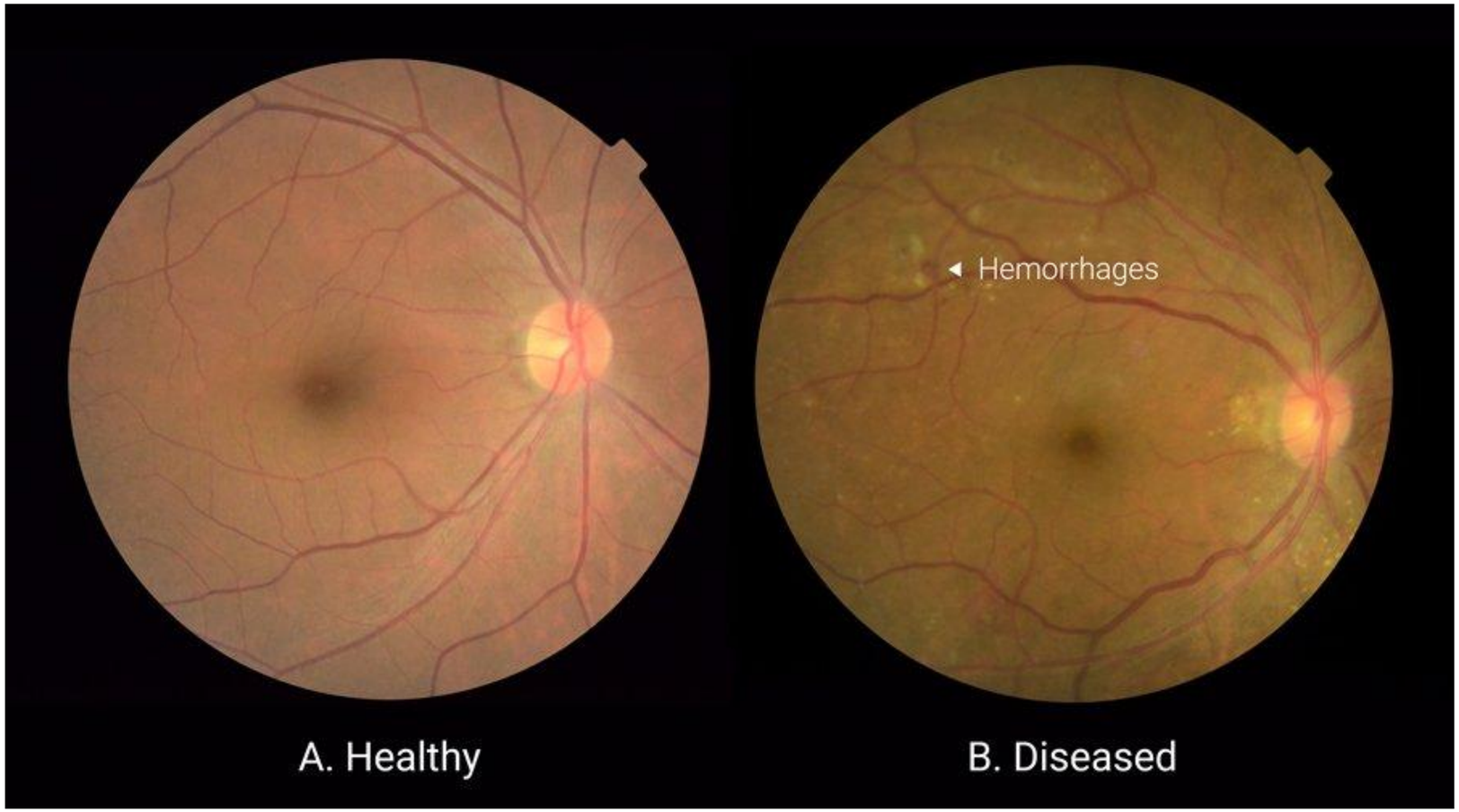
- Machine Learning can be daunting!
- We’ve got you! We’ll walk you through all details and try to get you as comfortable with the math and coding sections as possible

AI and ML in real life

Computer vision

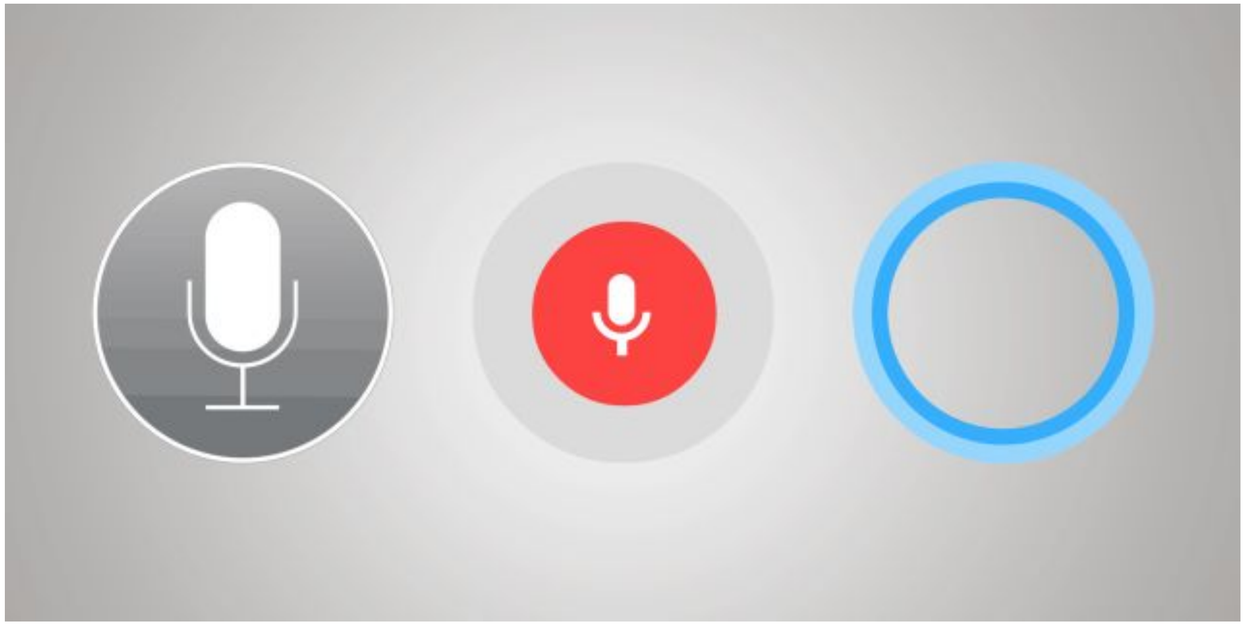
Convolutional neural networks have achieved stunning results in computer vision!

Healthcare



Deep Learning techniques **outperform** trained specialists in some medical recognition tasks.

Natural language processing



- https://www.technologyreview.com/2020/08/14/1006780/ai-gpt-3-fake-blog-reached-top-of-hacker-news/

Intuition behind ML

Let’s play a game

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50-50

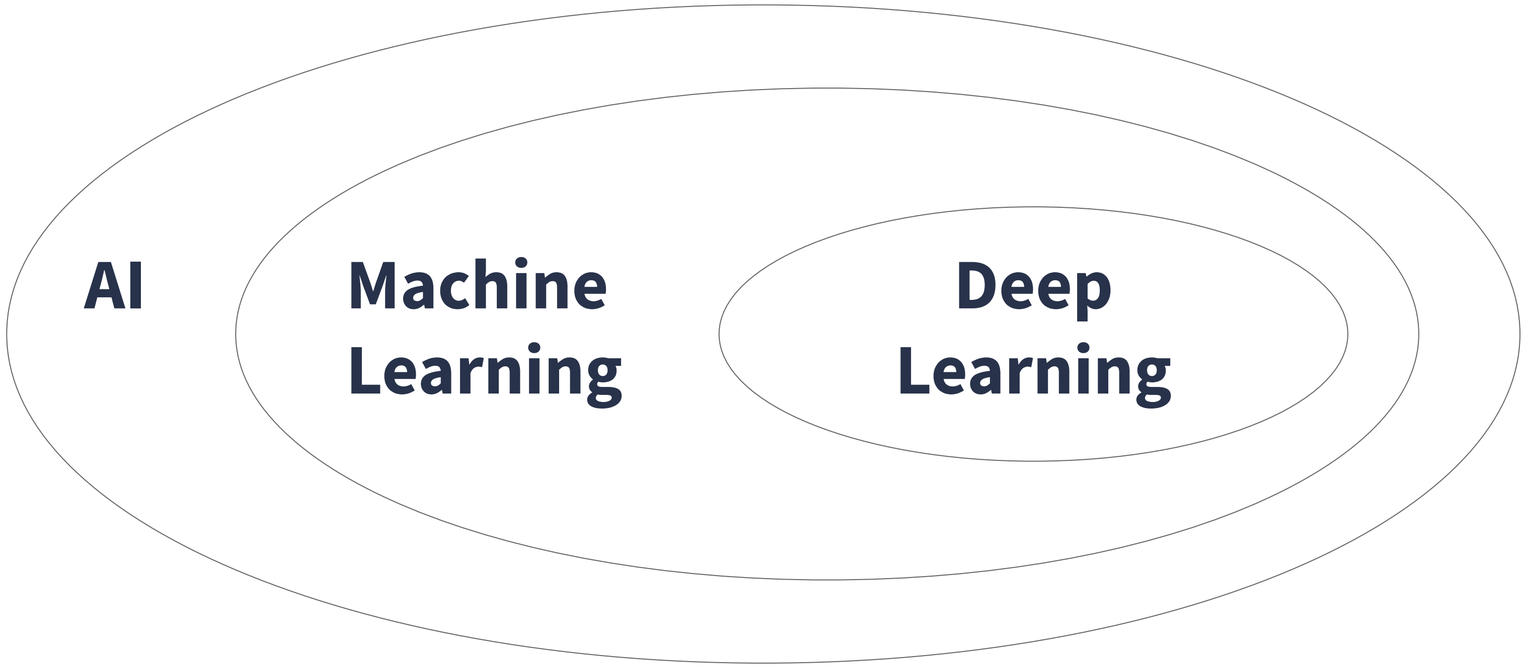
- We’re going to play a game using the poll feature on Zoom
- The objective of the game is to find the **letter of the alphabet** such that **50%** of the audience’s first names come **before** this letter, and 50% **after**
- We’re going to start off by choosing a random letter
- On your screen now you should see a poll with 3 options:

  Before current letter, After current letter, At current letter
- Vote for one of these options. What does the result tell us?

What is ML?


THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS

AI vs ML vs Deep Learning



Definitions

Artificial Intelligence - A concept

- The theory and development of computer systems able to perform tasks that normally require human intelligence,
- E.g visual perception, decision-making, and translation between languages.

Machine Learning - A type of AI

- A type of AI that provides computers with the ability to learn without being explicitly programmed.

ML Pipeline

- This can be in the form of a text file, spreadsheet, etc.
- Learn a formula to represent the trend of data
- Apply the model to real word data

With more detail...

Training and testing data
The more data we have, the better

Scaling data, removing outliers, etc.

Learning the parameters of a **function** and representing the data in that form; Training data is used to develop model

Evaluating the model using testing data

Apply the generated model to real world data

Let's Discuss

- Say you were asked to estimate what a house's price was
- What are some possible inputs for our model?
    - Think about what you would need yourself to tell how expensive a house is
- What would the output of our model look like?
    - Would it be continuous, or would it be categorical ("this or that")?

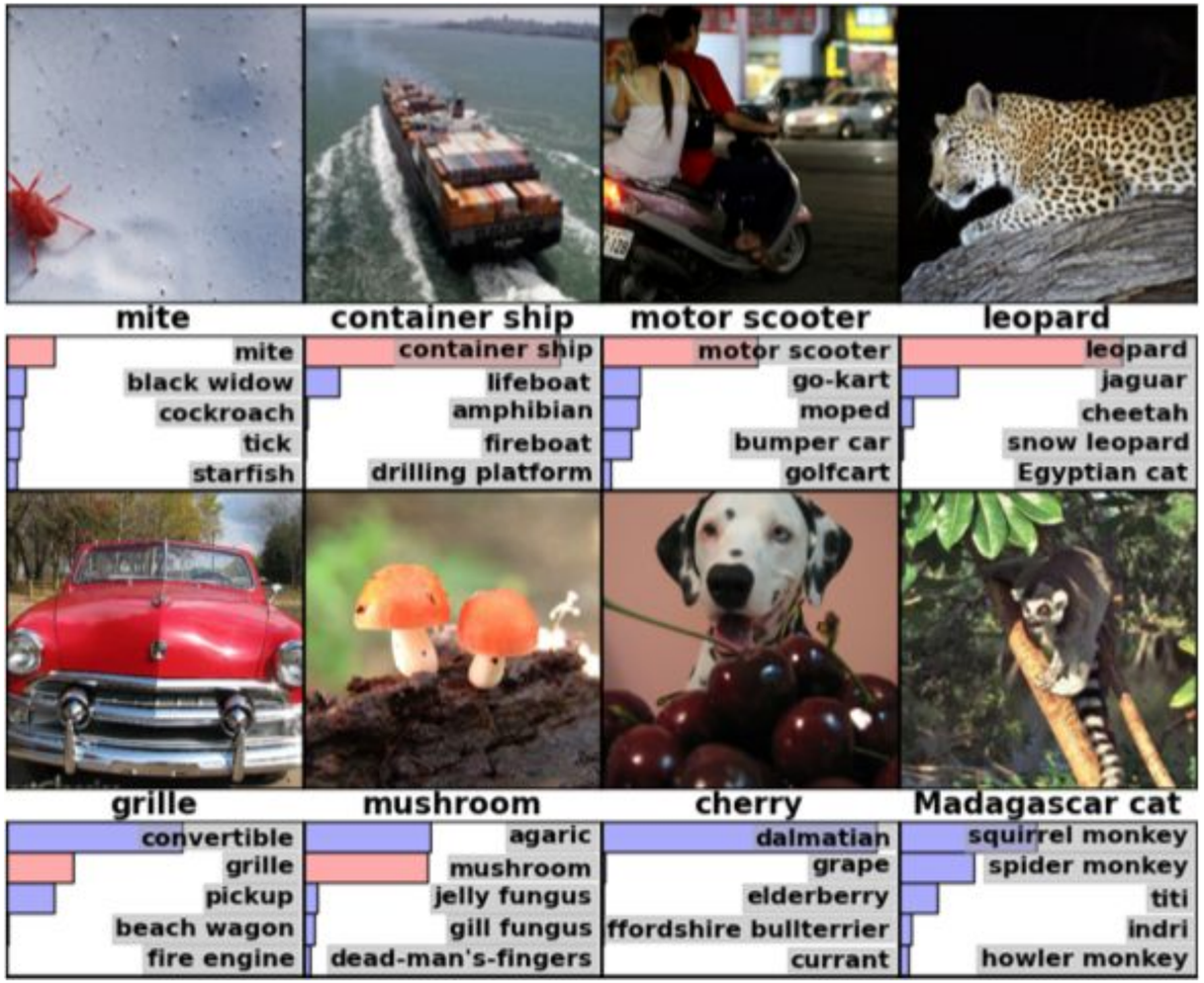
More on the intuition

How do you know the difference between a cat and a dog?

- Did someone teach you what to look for?
- What specific features distinguish them?
- Every time you got it wrong, your parents told you what animal it was.
- Eventually, you can successfully distinguish a cat from a dog.

Recognizing Objects in Images: AlexNet

- Trained on millions of photos of different objects (ImageNet)
- Learned to **classify** different images by slowly recognizing patterns



Python + Environment setup

- We will be using **Google Colab** notebooks, which will come with all the packages pre-installed.

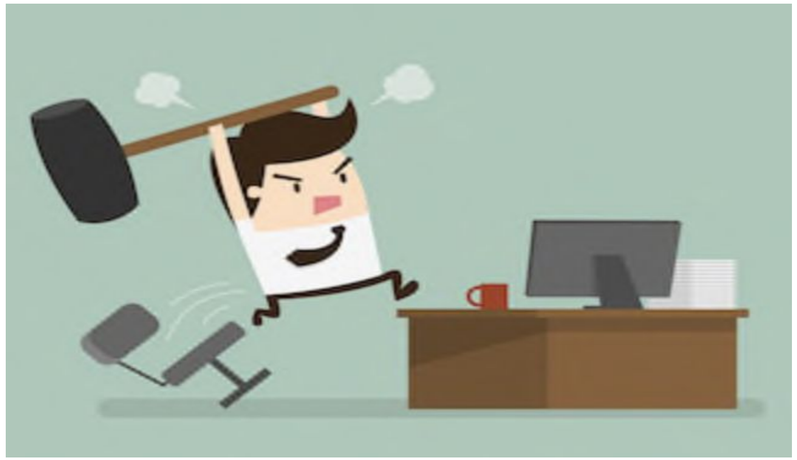
- The **Anaconda Distribution** is not required for this workshop series, but it's a great tool to work with Jupyter notebooks in general.

Code Along With Us!

- We'll be doing a quick intro to Python
- We'll be linking our notebook in chat!
- Reference: Intro to Python
  - If you ever need help with python, check out this notebook

Thank you! We'll see you next week!

Please fill out our feedback form:
https://forms.gle/JiuLMsYFP6xatrCUA



Next week: K-Nearest Neighbours

How do we classify an animal if we know what dogs and cats look like?

FB group: **facebook.com/groups/uclaacmai**

Github: **github.com/uclaacmai/beginner-track-spring-2021**