Lecture 0: Welcome to Machine Learning Club!

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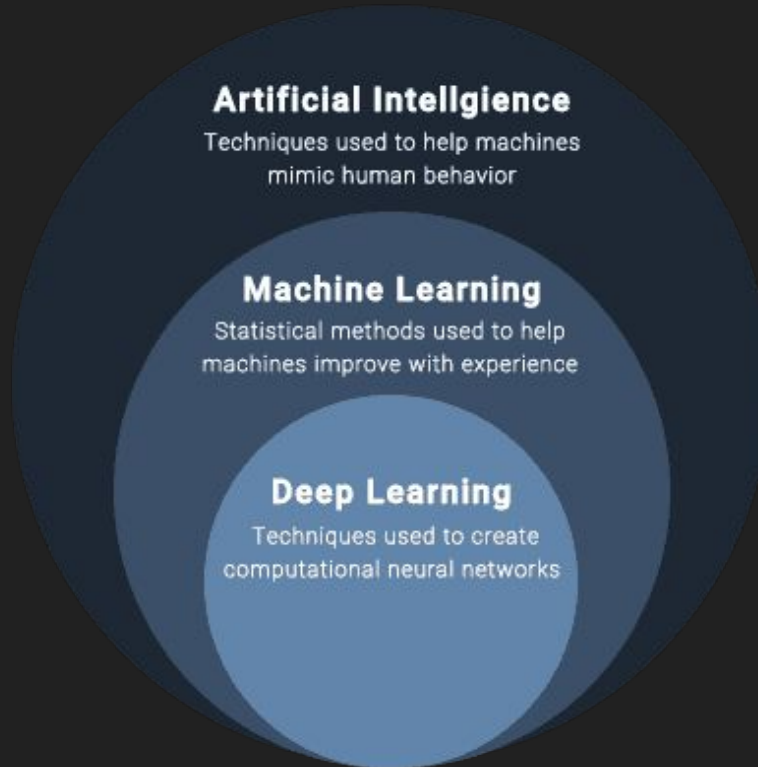# Welcome!

ml.mbhs.edu

Club Overview

- Weekly Meetings, Tuesday at Lunch @ Room 220
- Each week has a lecture covering ML technique/algorithm, along with associated notebook
- Available for people of all levels of familiarity with machine learning (although prior experience with Python is helpful)
- Will be using Python (Scikit-learn, Tensorflow, Pytorch, etc.)

Club Overview (continued)

- Will allow opportunity for anyone to provide lecture of specific topic or research
- Invite guest speakers in future (depending on interest level)
- Invite SRP presentations
- Potentially include competitive aspect

What is Machine Learning?

Artificial Intelligience
Techniques used to help machines mimic human behavior

Machine Learning
Statistical methods used to help machines improve with experience

Deep Learning
Techniques used to create computational neural networks

What is Machine Learning?

- We wish to make computers "intelligent"
- To do this, we give them predictive capabilities (ability to learn patterns from information)
- Similar to human brain

Examples of Machine Learning

- Linear Regression/Logistic Regression
- Decision Trees
- Neural Networks
- Dimensionality Reduction
- Reinforcement Learning Algorithms

Supervised vs. Unsupervised Learning

- **Supervised** - Labeled data
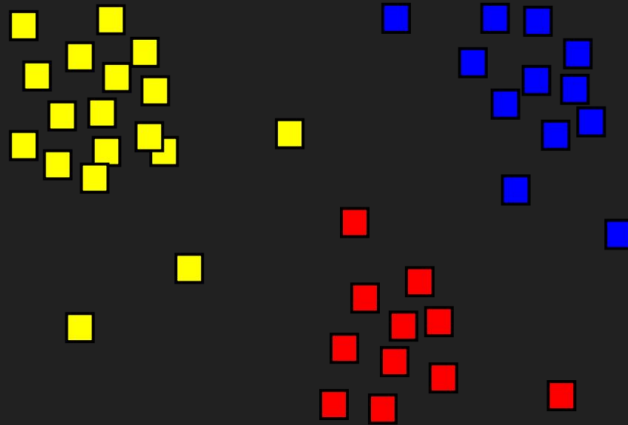- **Unsupervised** - Unlabeled data

Supervised Machine Learning Algorithm

- We refer to our algorithm as our *model*
- Let's say we are trying to predict whether images are cats or dogs
  - We need dataset comprised of different images, each of them labeled as cats or dogs
  - Features → images (think of this as input)
  - Labels → "cat" or "dog" (think of this as output)
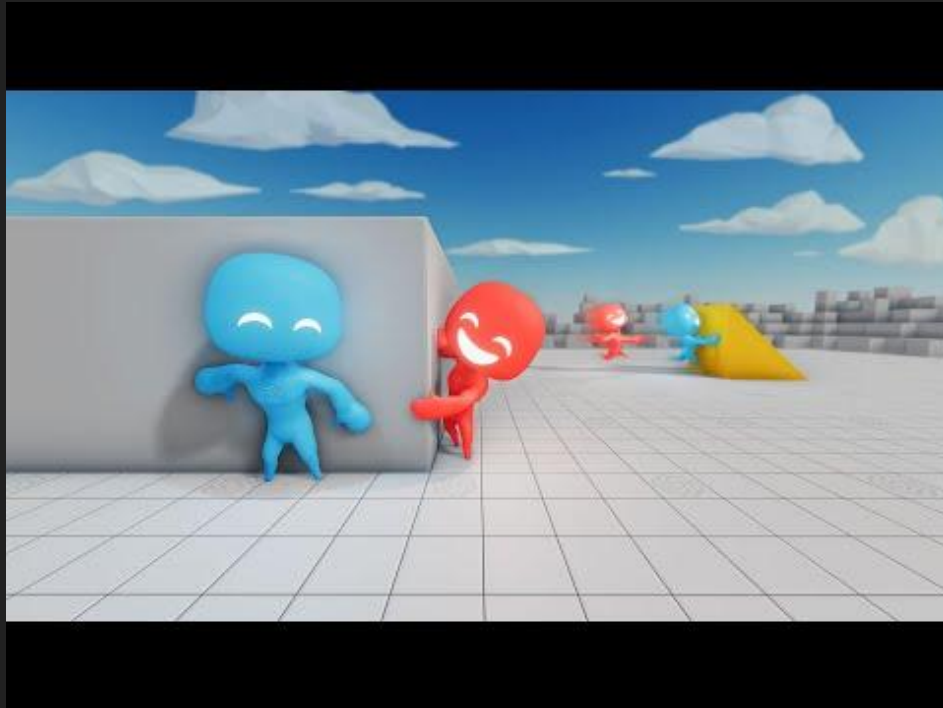- Model will learn the relation between features and labels

Unsupervised Machine Learning Algorithm

- Let's say we are trying to predict what cluster different points fall into
  - We need dataset comprised of different points
  - Features → points (think of this as input)
  - Labels → ???
- Model will automatically learn patterns in the features

Real Example of Machine Learning

https://www.youtube.com/watch?v=kopoLzvh5jY

Demo!

https://teachablemachine.withgoogle.com/train/image

Images

Join Our Groups

- Sign up for Discord (https://discord.gg/3Z5YuPqt)
- Join Deepnote (https://deepnote.com/join-team?token=af3af0284bc8497)
- Fill out our form (https://forms.gle/Fr31aFLWx8cHdtTY8)
  - Join mailing list + Github organization