Lecture 0: Welcome to Machine Learning Club!

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Welcome!

ml.mbhs.edu

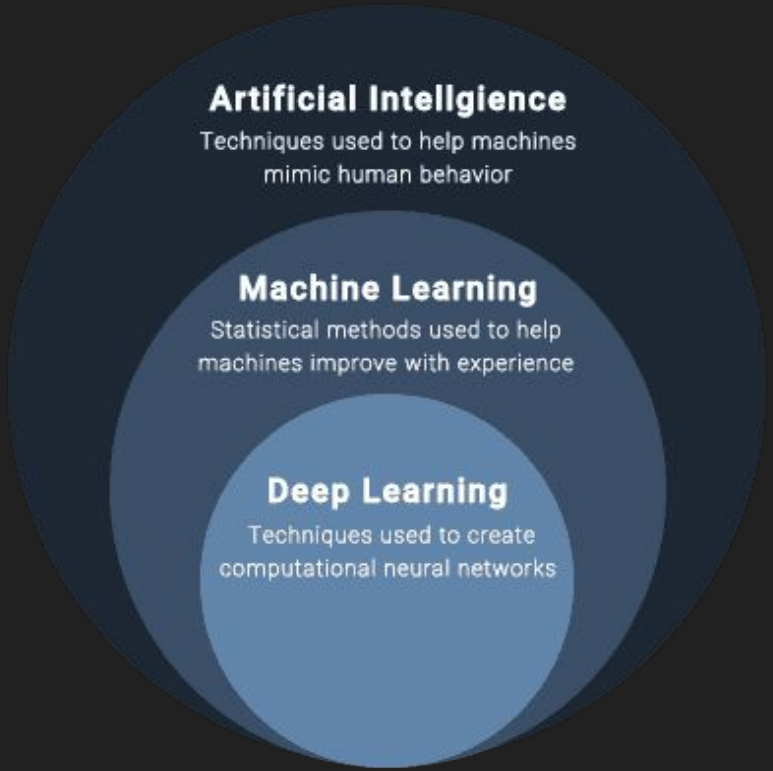
Club Overview

- 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?



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

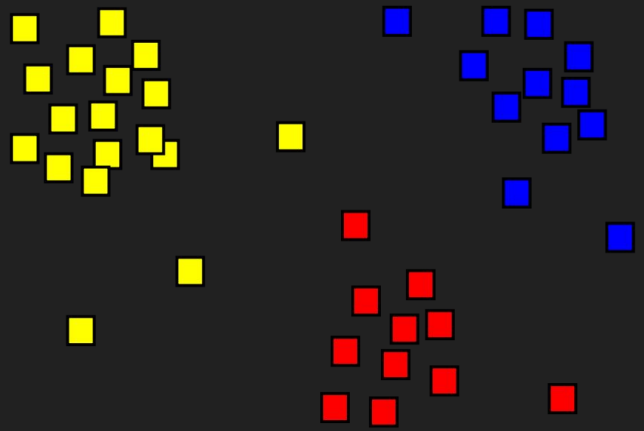
- **Supervised** - Labeled data
- **Unsupervised** - Unlabeled data

Supervised Machine Learning Algorithm

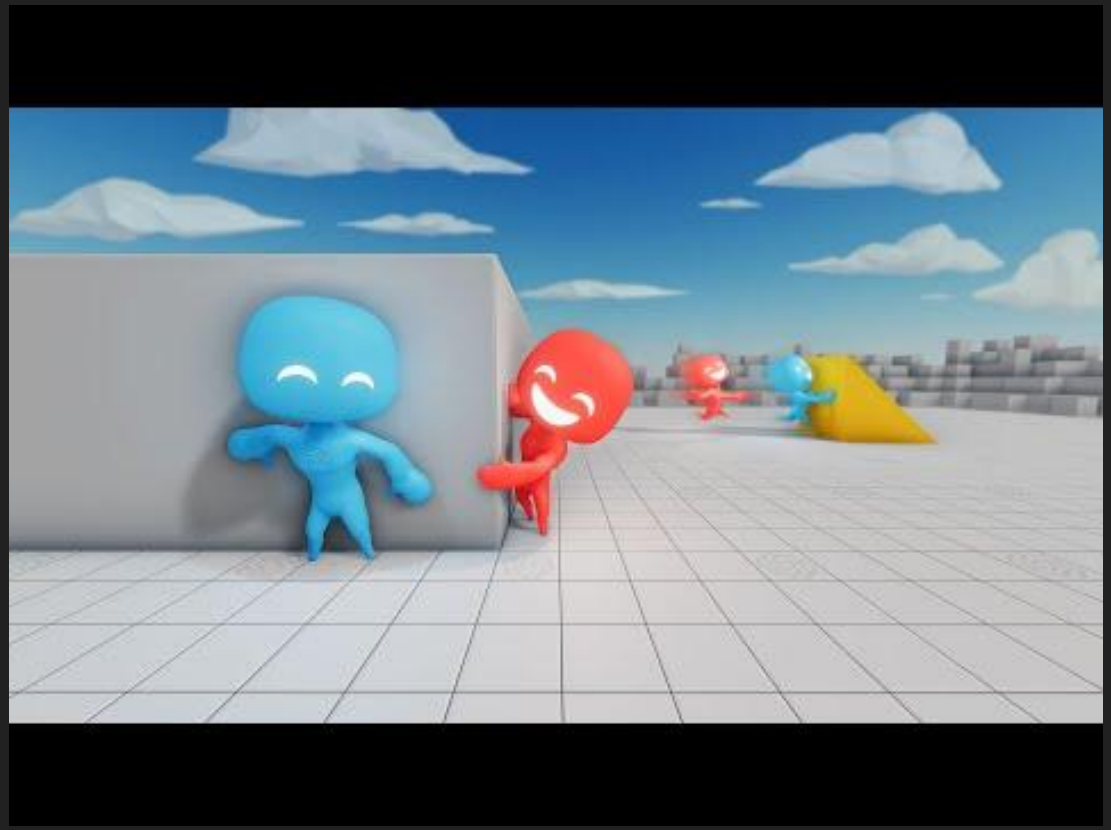
- We refer to our algorithm as our *model*
- Let’s say we are trying to predict whether images are cats or dogs
  - We need dataset comprised of different images, each of them labeled as cats or dogs
  - Features → images (think of this as input)
  - Labels → “cat” or “dog” (think of this as output)
- 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



Demo!

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