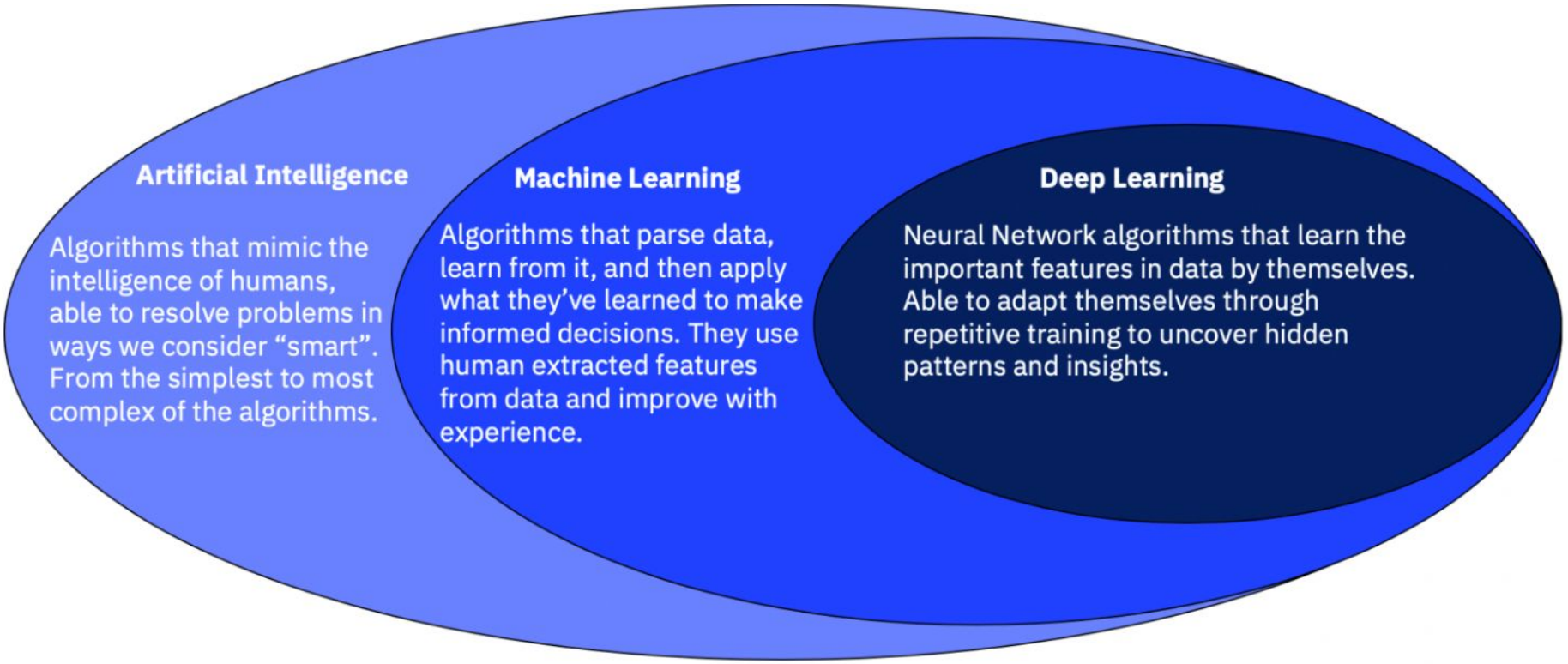
Berkeley Engineering | BerkeleyHaas

PROFESSIONAL CERTIFICATE IN MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

Office Hour #2 with Matilde D'Amelio

March 17, 2022 at 10 pm UTC

WHAT IS ARTIFICIAL INTELLIGENCE



Souce: IBM (https://medium.com/@UdacityINDIA/difference-between-machine-learning-deep-learning-and-artificial-intelligence-e9073d43a4c3)

ARTIFICIAL INTELLIGENCE APPLICATIONS

MACHINE LEARNING

- Product Recommendation
- Image Recognition
- Sentiment Analysis
- Employees Recruitment, Productivity, Retention and Development
- Wildlife Preservation
- Healthcare Efficiency
- Fraud Prevention
- Cybersecurity
- …

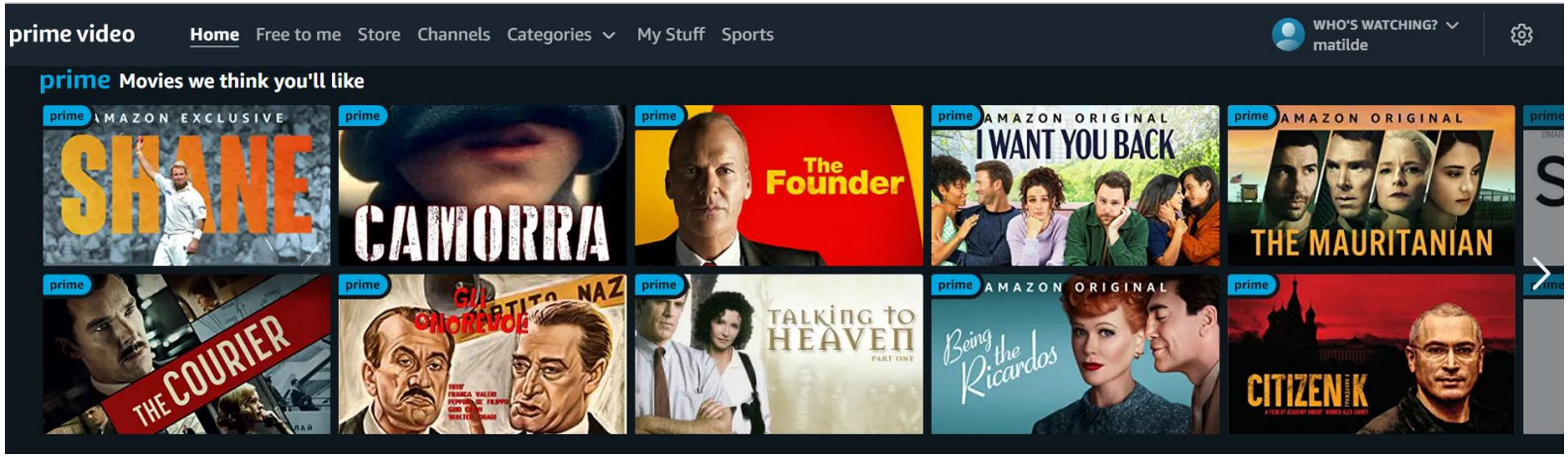
DEEP LEARNING

- Virtual Assistant
- Chatbots
- Netflix, Youtube, Amazon … (recommendation)
- Fake News
- Composing Music
- Image Coloring
- Advertising
- Robotic (self-driving cars)
- …

MACHINE LEARNING APPLICATIONS

Arab Spring

Movies Amazon thinks I like



DEEP LEARNING for CREATING MUSIC

Souce: https://www.youtube.com/watch?v=wYb3Wimn01s&t=143s (minutes 0:40 - 3.35)

TYPES of AI LEARNING METHODS

SUPERVISED LEARNING

UNSUPERVISED LEARNING

REINFORCEMENT LEARNING

TYPES of AI LEARNING METHODS

SUPERVISED LEARNING

If you're learning a task under supervision, someone is present judging whether you're getting the right answer. Similarly, in supervised learning, that means having a full set of labeled data while training an algorithm.

Fully labeled means that each example in the training dataset is tagged with the answer the algorithm should come up with on its own.

UNSUPERVISED LEARNING

Clean, perfectly labeled datasets aren't easy to come by. And sometimes, researchers are asking the algorithm questions they don't know the answer to. That's where unsupervised learning comes in.

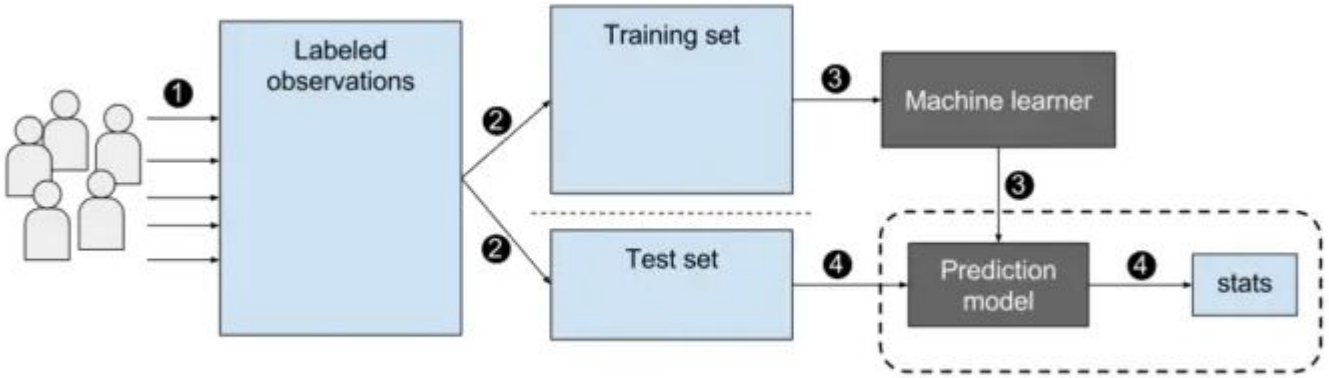
In unsupervised learning, a deep learning model is handed a dataset without explicit instructions on what to do with it. The training dataset is a collection of examples without a specific desired outcome or correct answer.

REINFORCEMENT LEARNING

It is neither based on supervised learning nor unsupervised learning. Moreover, here the algorithms learn to react to an environment on their own. It is rapidly growing and moreover producing a variety of learning algorithms. These algorithms are useful in the field of Robotics, Gaming etc.

Source: https://www.aitude.com/supervised-vs-unsupervised-vs-reinforcement/

SUPERVISED LEARNING



With supervised machine learning, the algorithm learns from labeled data.

Classification problems

Ask the algorithm to predict a discrete value, identifying the input data as the member of a particular class, or group. In a training dataset of animal images, that would mean each photo was pre-labeled as cat, koala or turtle. The algorithm is then evaluated by how accurately it can correctly classify new images of other koalas and turtles.

Regression problems

Look at continuous data. One use case, linear regressions: given a particular x value, what's the expected value of the y variable? For example, predicting the price of a piece of land in a city, given the area, location, number of rooms, etc. And then the input is sent to the machine for calculating the price of the land according to previous examples

Source: https://www.aitude.com/supervised-vs-unsupervised-vs-reinforcement/

GROUP DISCUSSION

Once in your group:

- Discuss about possible applications of **Supervised Learning** (e.g., https://pythonistaplanet.com/applications-of-supervised-learning/)
- Present the key discussion points back to the the class

Time: 10 minutes

QUESTIONS?