UMSL

Department of Mathematics & Computer Science

Machine Learning &
Protein Structure Prediction Lab

http://umsl.edu/~adhikarib/

Hands-on Workshop on Deep Learning

Wednesday, November 14, 2018 - 3:30 PM to 6 PM *

Room 304, Express Scripts Hall

https://github.com/badriadhikari/Deep-Learning-Workshop-Nov-14-2018


Brandon
Cody
Patrick
Som
Tony

Platform and Data

1. Jupyter Notebook hosted on Google Colab
2. Libraries
   a. Tensorflow, Keras, Numpy, Matplotlib, sci-kitlearn (automatically installed when you need)
3. Programing language: Python

Code: `https://github.com/Balfabb7/DeepLearningWorkshop`

Today's Plan

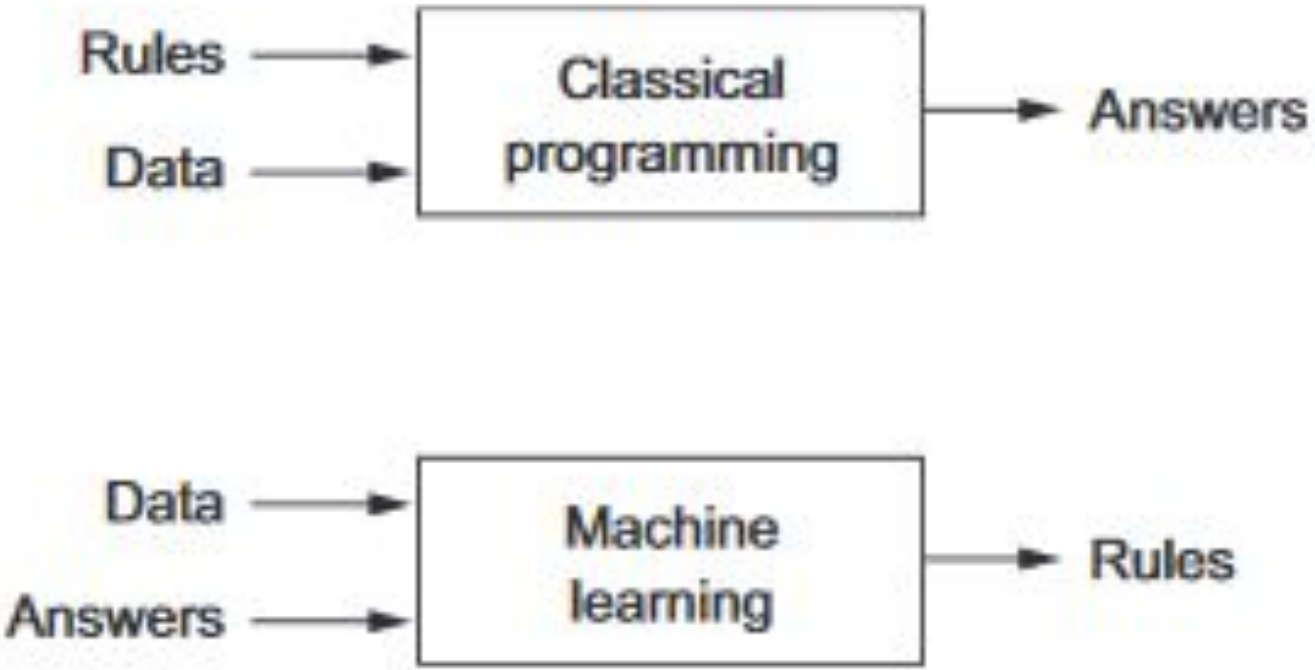
1. [Tony] Introduction
2. [Cody] Neural networks for predicting diabetes (Pima Indians Diabetes Dataset)
3. [Patrick and Som] Challenge - Predict crime

   5 minutes break for QnA

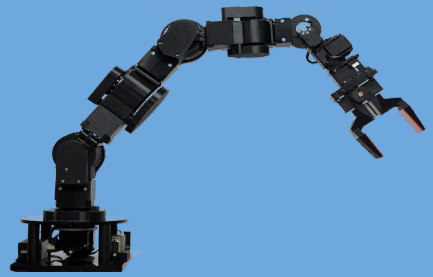
4. [Brandon and Patrick] Handwritten character recognition (MNIST dataset)
5. [Badri] Thank you note

Obtain a signature after each sessions and submit your paper to earn a certificate

Classical programing vs Machine Learning



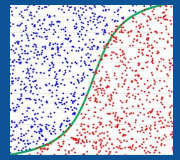
AI vs Machine Learning vs Deep Learning



ARTIFICIAL INTELLIGENCE

a very broad field

1950s



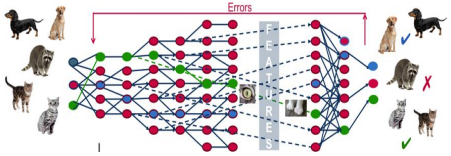
MACHINE LEARNING

Fundamentals of "learning from data"

1980s

Deep Learning

Powerful trending ML methods



2010s

What is Deep learning?

- Deep learning is a specific subfield of machine learning
- It is a new take on learning representations from data
  - that puts an emphasis on learning successive layers of increasingly meaningful representations - Francois Chollet
- So what does that mean?
- How do you do it?
- What tools to you need?

What is needed?

1. Input data points
2. Examples of the expected output
3. A way to measure whether the algorithm is doing a good job

Representations of data

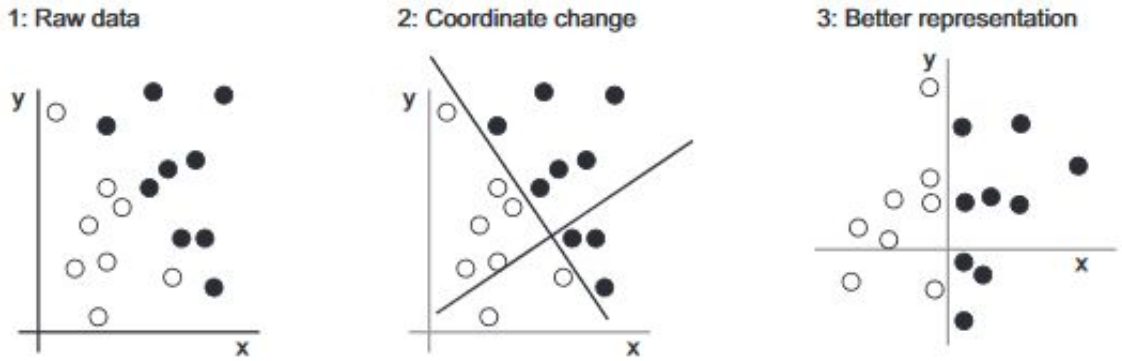
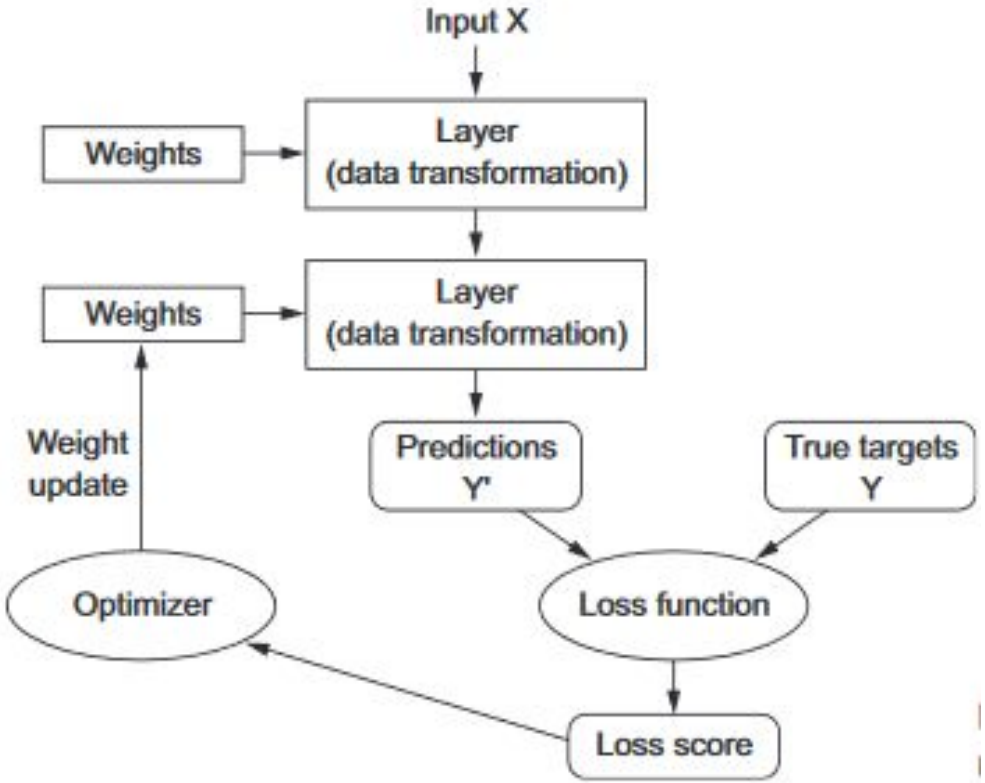


Figure 1.4 Coordinate change

Anatomy of a neural network



Thank you! Enjoy the Workshop!

We are around to help!