Basic Image Classification with TensorFlow

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The Basics

- TensorFlow: open source machine learning library that can be used for research and production
- Keras: high-level API to build and train deep learning models
- Neural Network: set of machine learning algorithms, modeled loosely after the human brain, that are designed to recognize patterns.
  - Convolutional Neural Network (CNN): type of neural network primarily used for image recognition.

CNN Architecture

1. Convolutional Layer
    a. Extract high level features from the input image
2. Pooling
    a. Extract dominant features and decrease computational power needed to process the data
3. Flattening
    a. Convert image into a linear array
    b. Think of this as just unstacking rows of pixels in the image and lining them up
4. Fully Connected Layer
    a. Classification

The whole CNN

shirt, sneaker, coat ……

Convolution

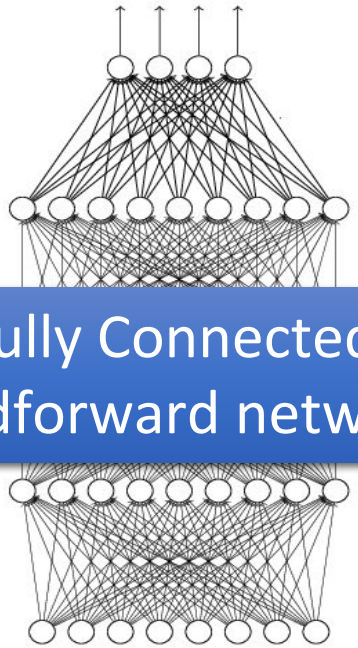
Max Pooling

Convolution

Max Pooling

Can repeat many times

Flatten



Fully Connected Feedforward network

https://colab.research.google.com/drive/1fezDC3wptbBXDeS7w1DJou-t1m936RHr

Sources

- https://medium.com/nybles/create-your-first-image-recognition-classifier-using-cnn-keras-and-tensorflow-backend-6eaab98d14dd
- Deep Learning of NTU