CNN – TensorFlow

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Agenda

- Basic cnn
- Layers
- Type of layers
- Training process
- Questions and Answer

Training Using TensorFlow

- Constructions phase
  - Import tensorflow
  - Load data
  - Create placeholder
  - Create variable
  - Cost fuction
  - Minimize cost
- Traing phase
  - Create session
  - Init variable
  - Run traning
  - Save your model

Z= W.T.x + b

W= wieght

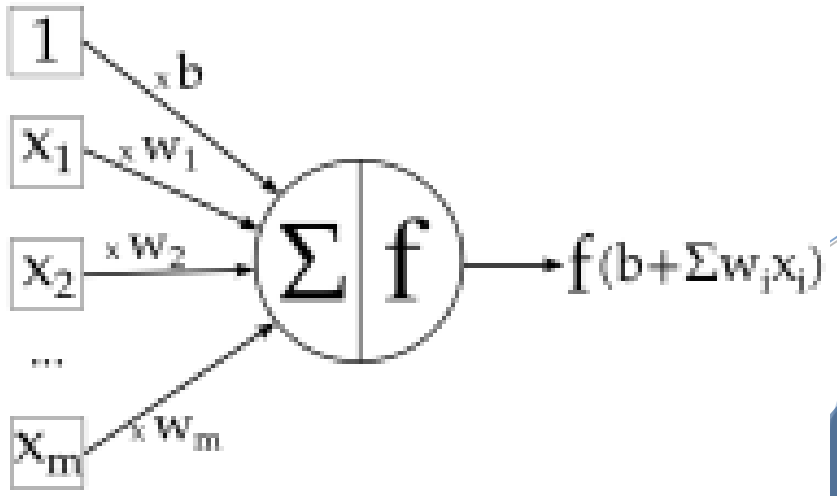
X= input

b=bias

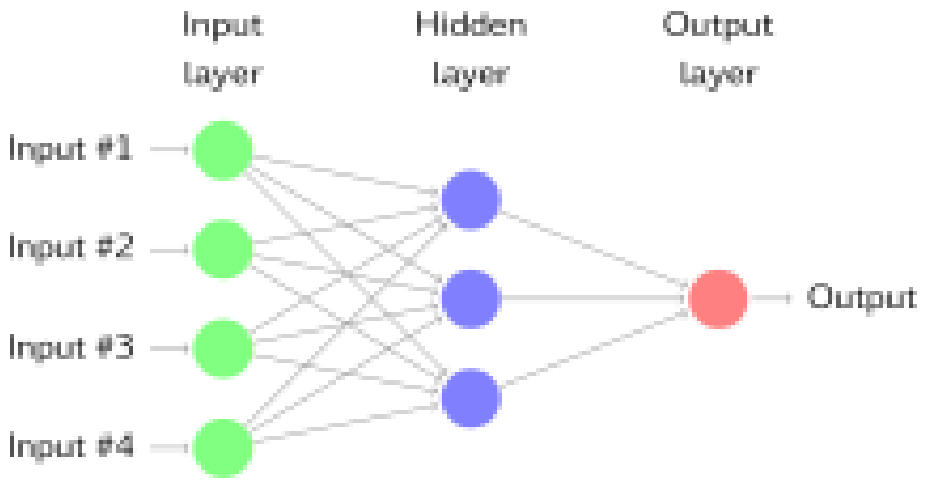
Activation function-Sigmoid

$$z = b + \sum_i x_i w_i \qquad y = \frac{1}{1 + e^{-z}}$$

Architech

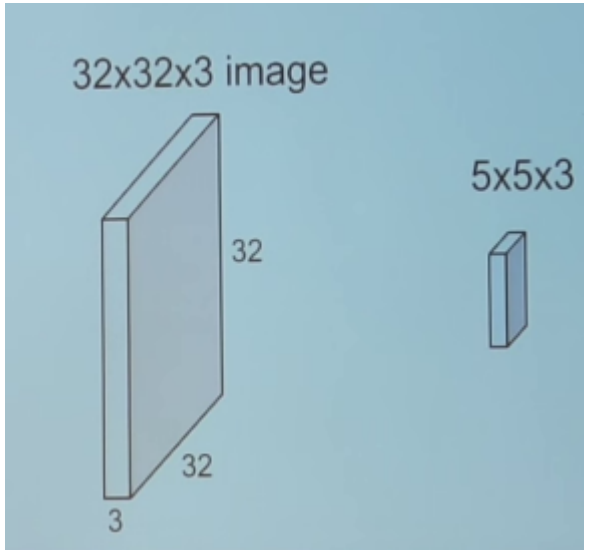


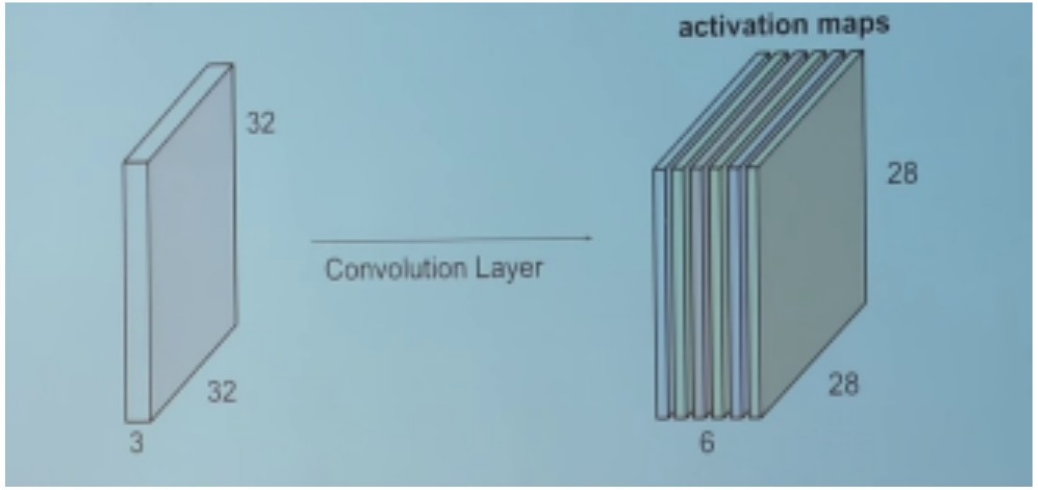
Layers


Input layer
Hidden layer
Output layer
Input #1
Input #2
Input #3
Input #4
Output

Type of Layers

Convolution layer





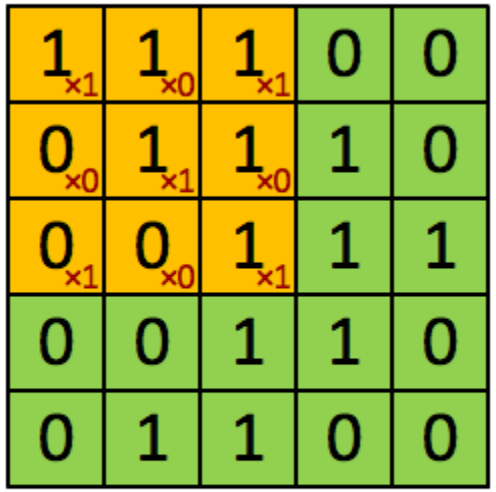
(N-F-2P)/s+1

N=number of input size

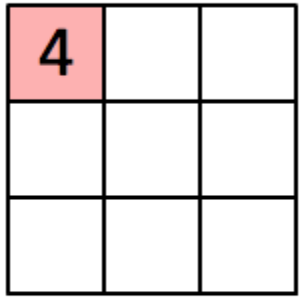
F=Number of filter size

s=Stride

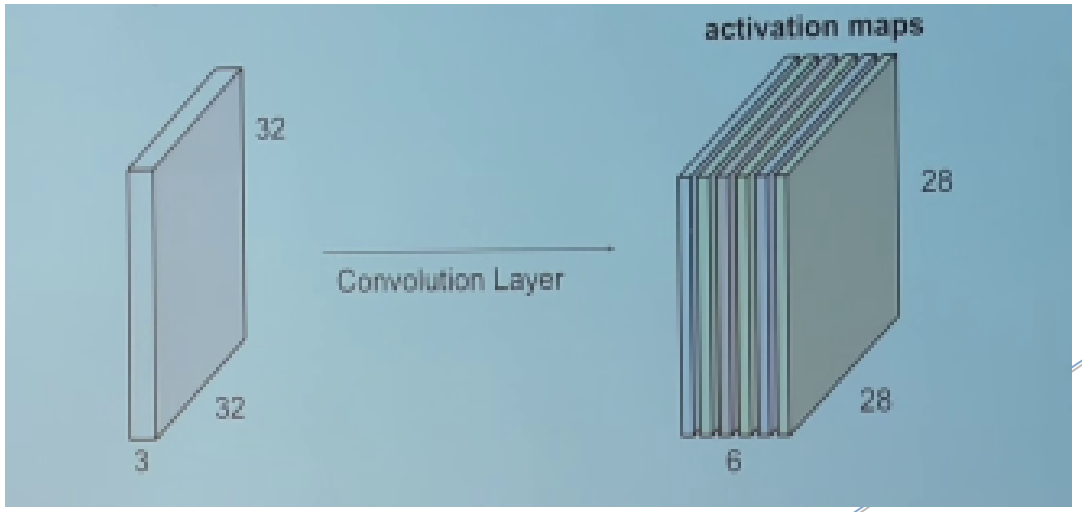
P = pad



Image



Convolved Feature

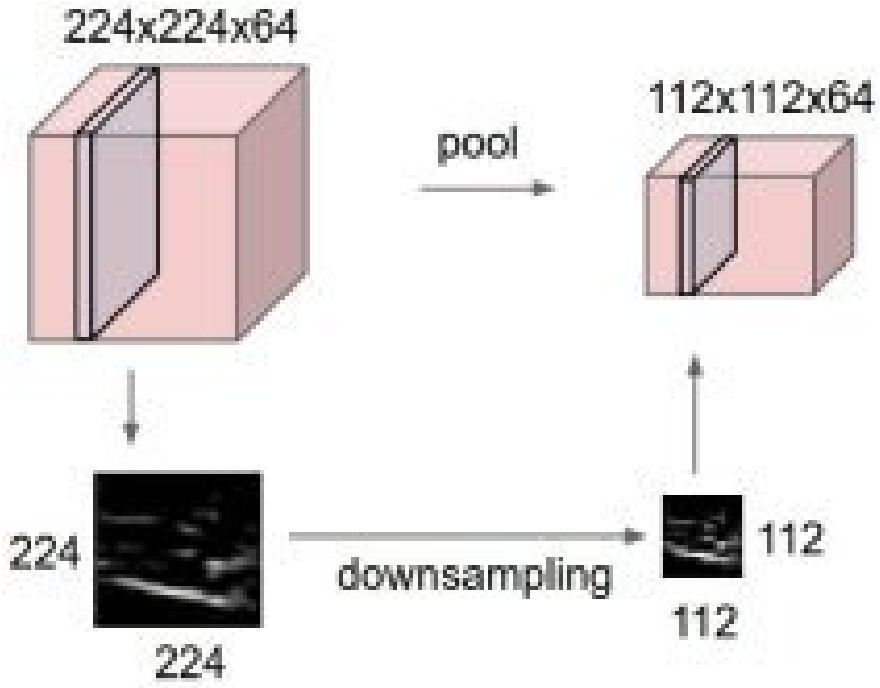


Type of Layers

2. Pooling layer

Input — w1*h1*d1

output — w2*h2*d2



w2= (w1-f)/S +1

h2=(h1-f)/S +1

d2=d1

Type of Layers

3.Fully Connected Layer:

If each neuron in a layer receives input from all the neurons in the previous layer, then this layer is called fully connected layer. The output of this layer is computed by matrix multiplication followed by bias offset.

Traing process

The Architecture of the network:

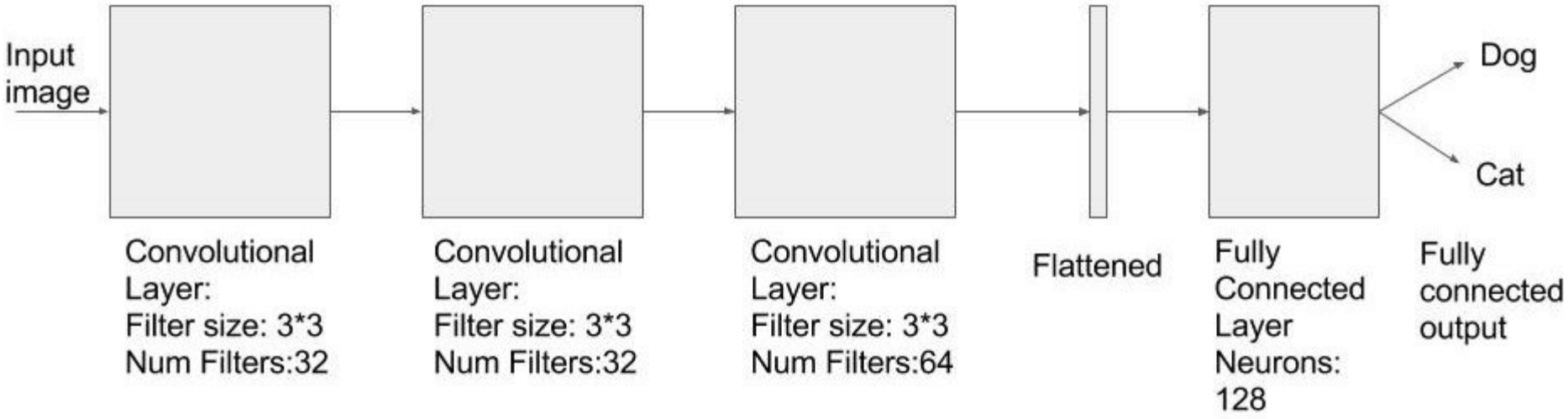
- AlexNet
- GooleNet
- VGG

Correct weights/parameters:

$$cost = 0.5 \sum_{i=0}^{n} (y_{actual} - y_{prediction})^2$$

- Minoimize cost function
- Backpropagation → Gradiant Desent algoritms

Building a small Neural network based image classifier



Training