

ENGR 4350: Applied Deep Learning

Convolutional Neural Network

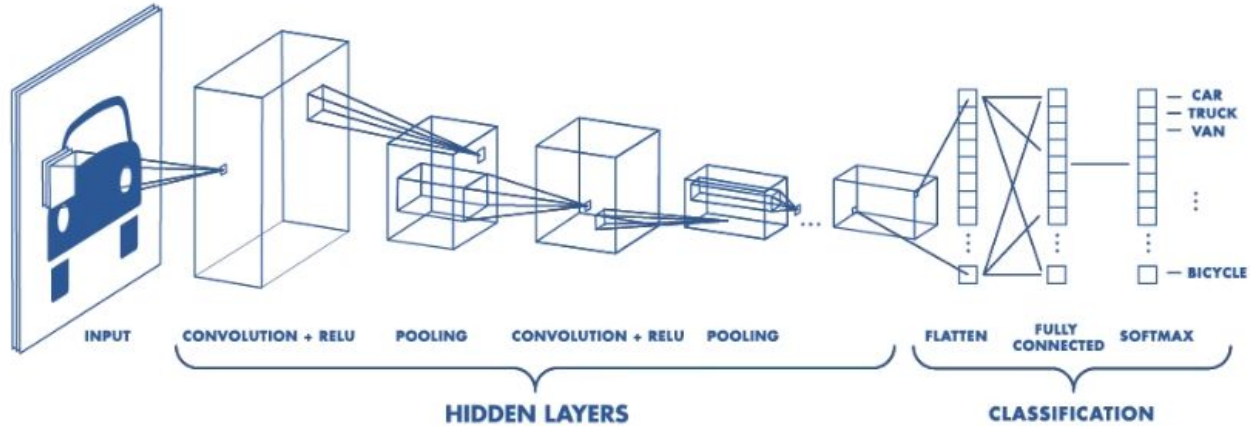
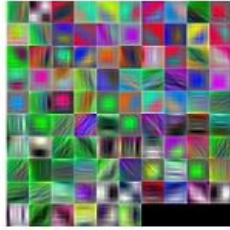
10/19/2022



Outline

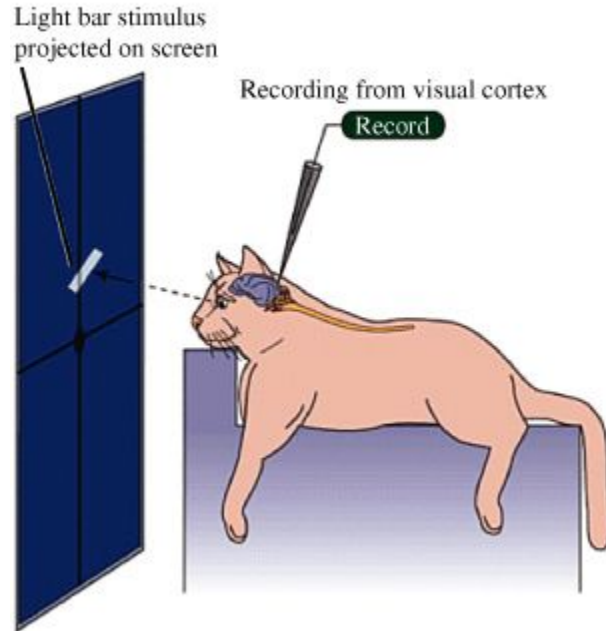
- Convolutional Neural Network Introduction
- Convolution Layer
- Examples of ConvNet
- Visualize Convolved Features

Convolutional Neural Network

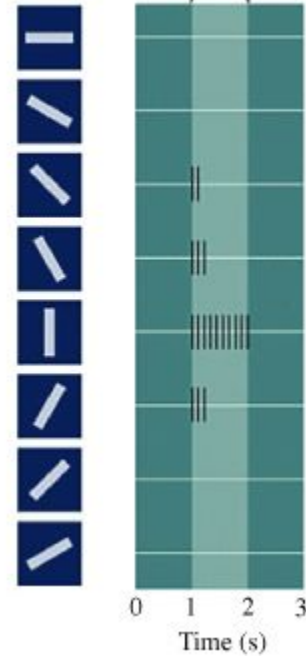


Hubel & Wiesel's Cat Experiment

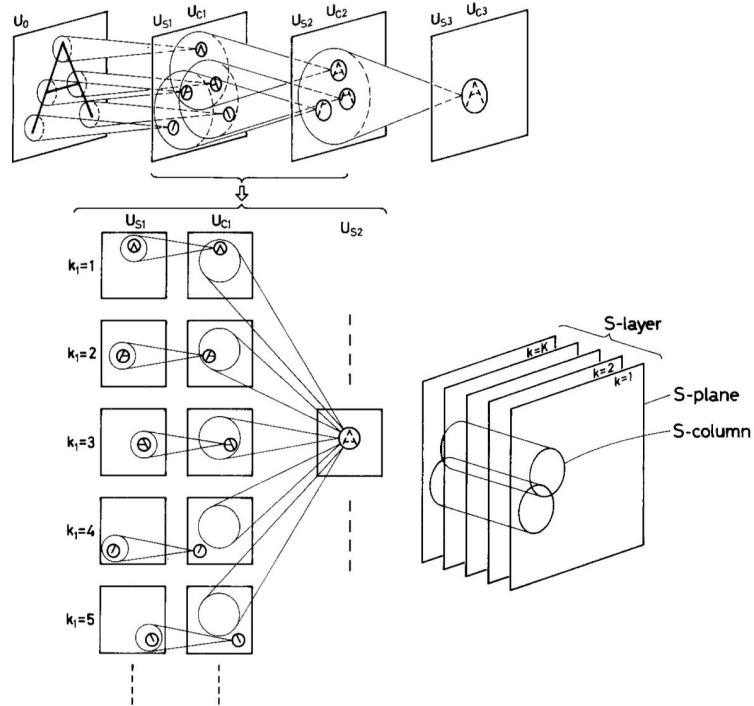
A Experimental setup



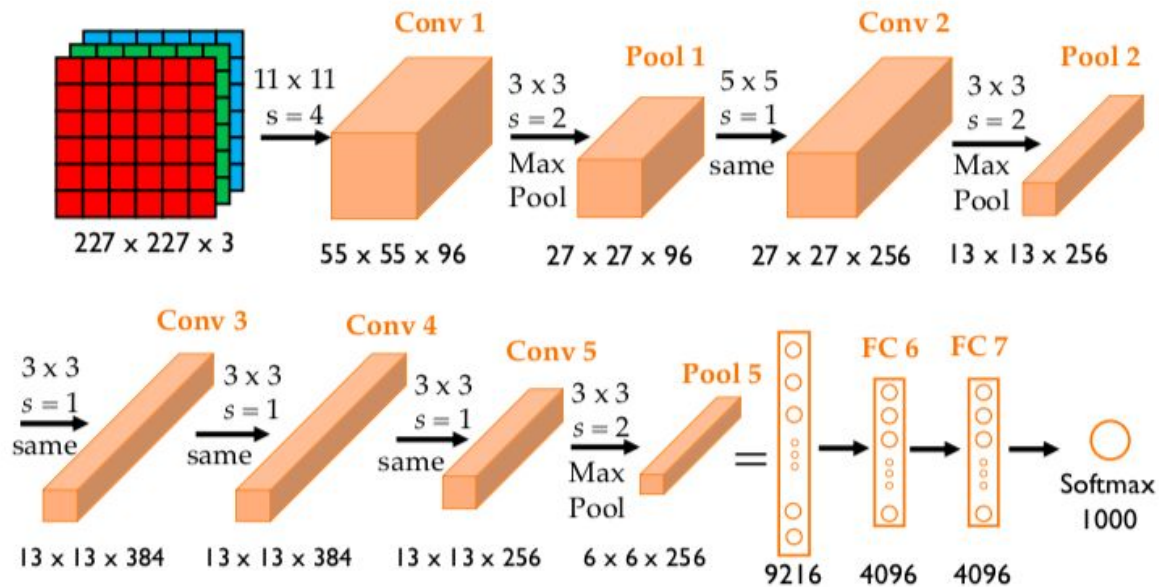
B Stimulus orientation Stimulus presented



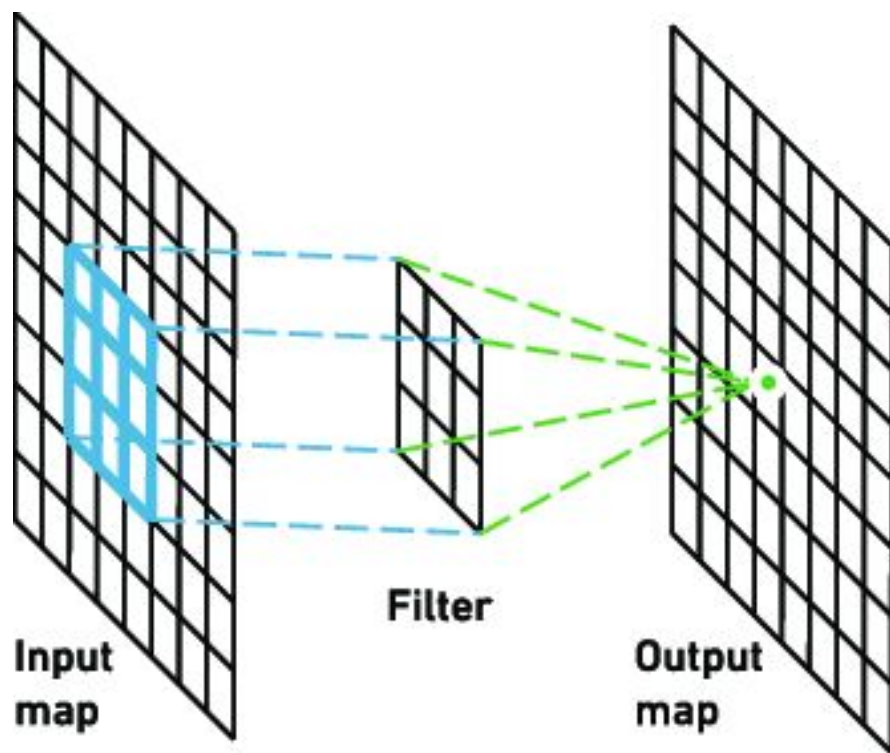
Early ConvNet



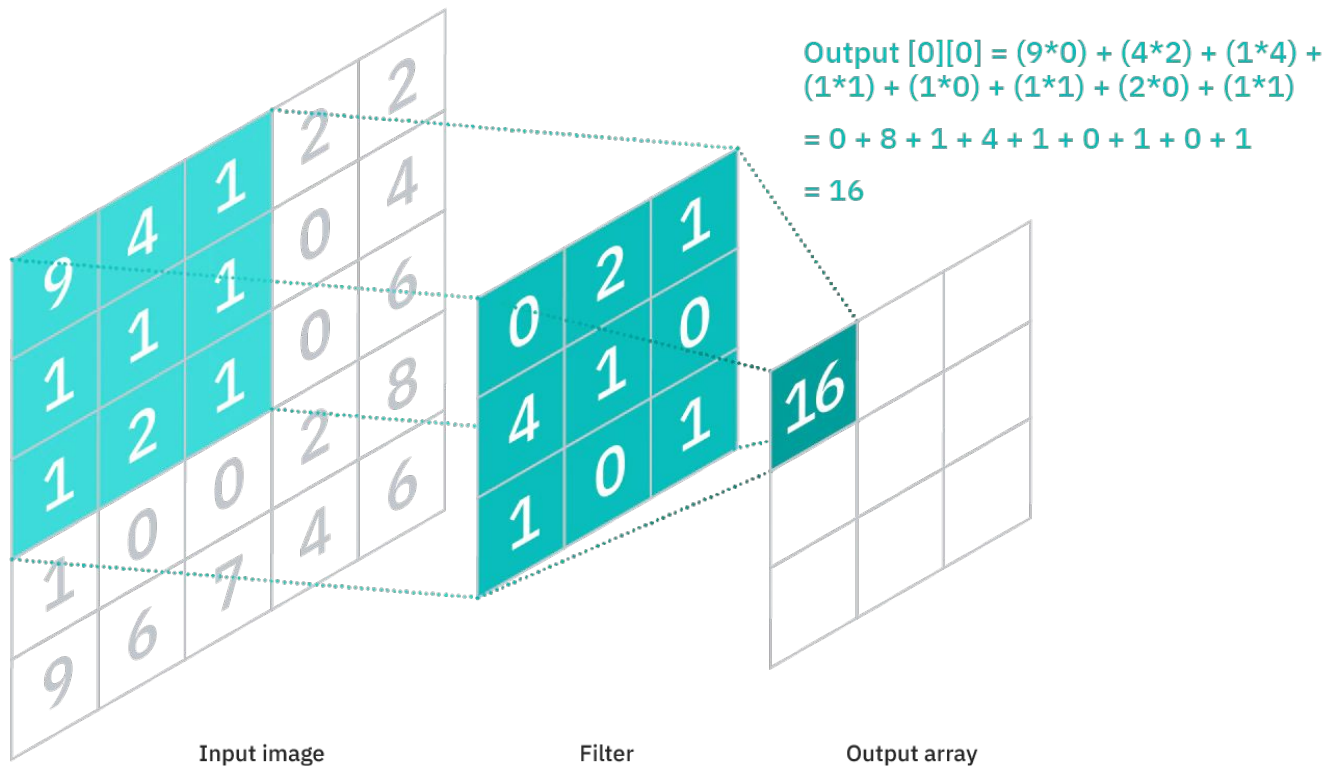
AlexNet



Convolution Layer



Convolution Operation



Pattern Detection



-1	-1	-1
1	1	1
0	0	0



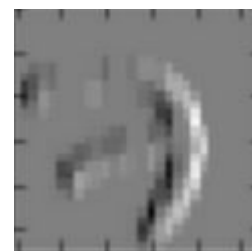
-1	1	0
-1	1	0
-1	1	0



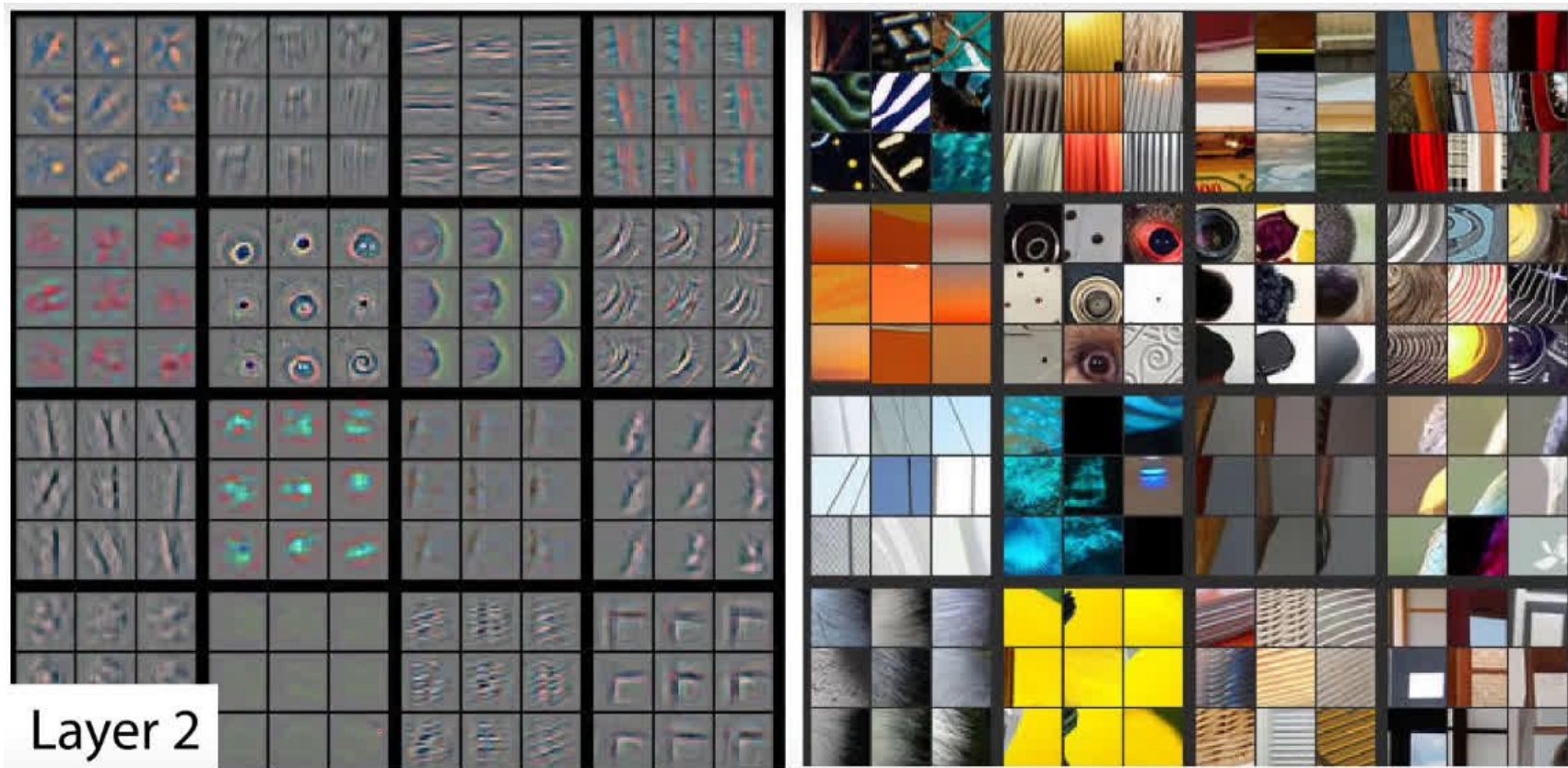
0	0	0
1	1	1
-1	-1	-1



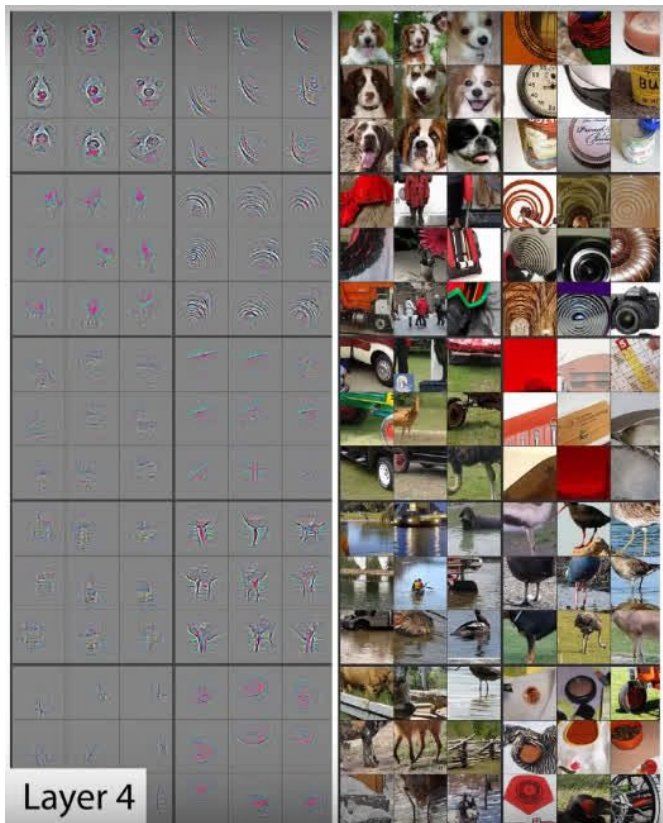
0	1	-1
0	1	-1
0	1	-1



Low-Level Conv Layers



High-Level Conv Layers



Patterns in Conv Layers

