Deep Learning

week 5

The Plan

- Discuss homework:
  - NN&DL book, ch6
  - ideas for pet projects
- Alternative structures (talks + discussion)
- talk, read, code, repeat

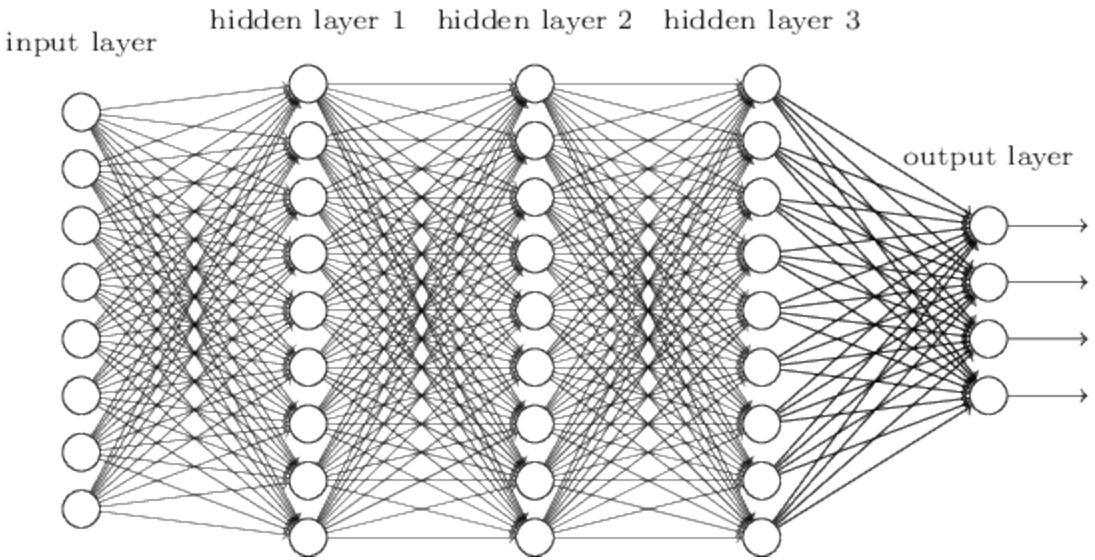
Neural Networks & Deep Learning

Chapters:

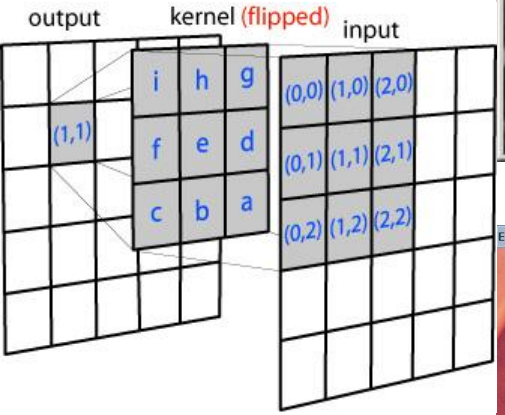
1. Basics (neurons, networks) 24p
2. Basic learning (backprop) 12p
3. Improvements 44p
4. Intuitive proof function learning 16p
5. Why is DL hard 09p
6. **Deep Learning** 26p

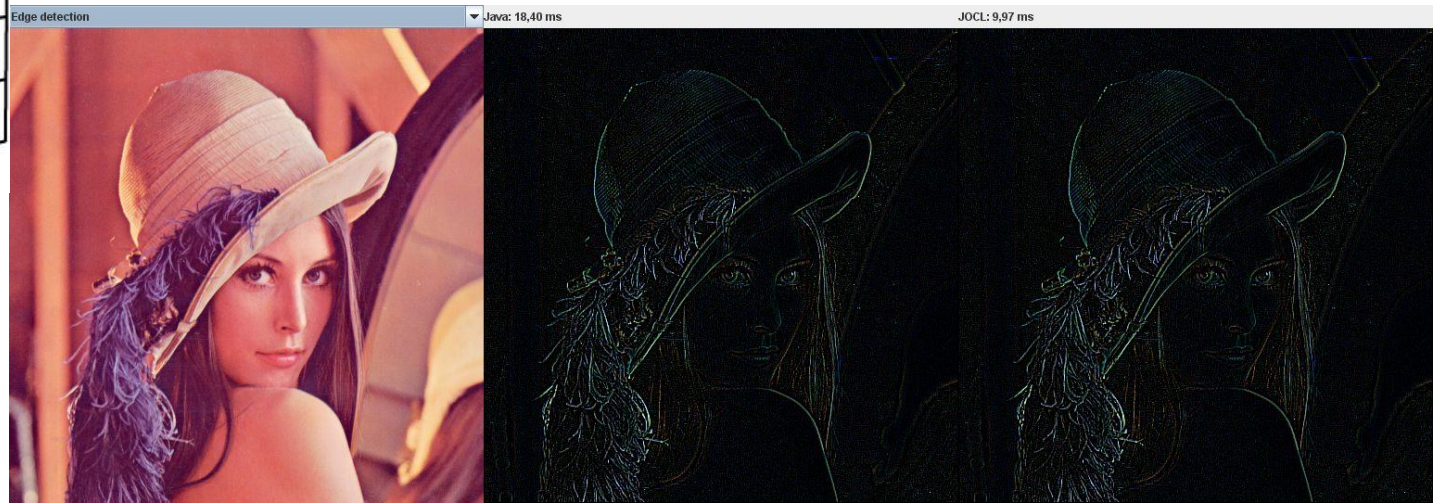
Deep network

Simplest structure:

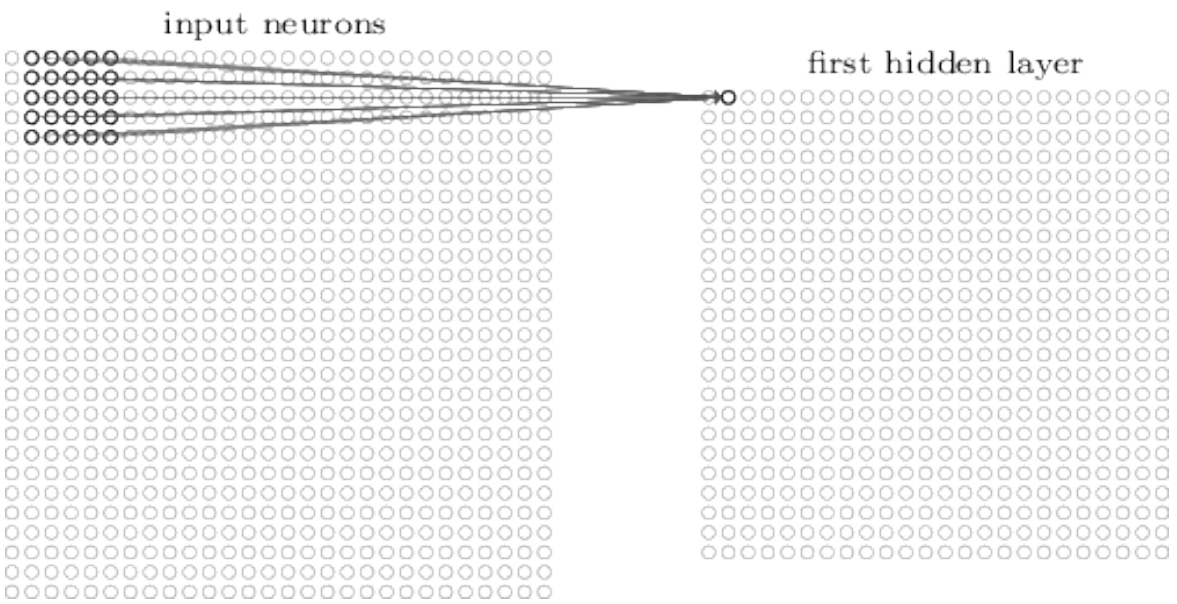


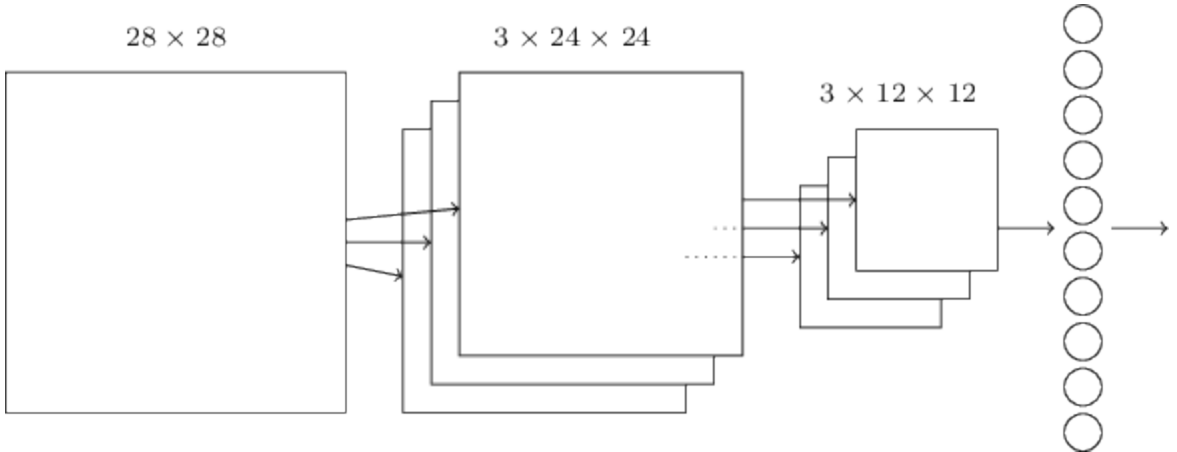
Convolution

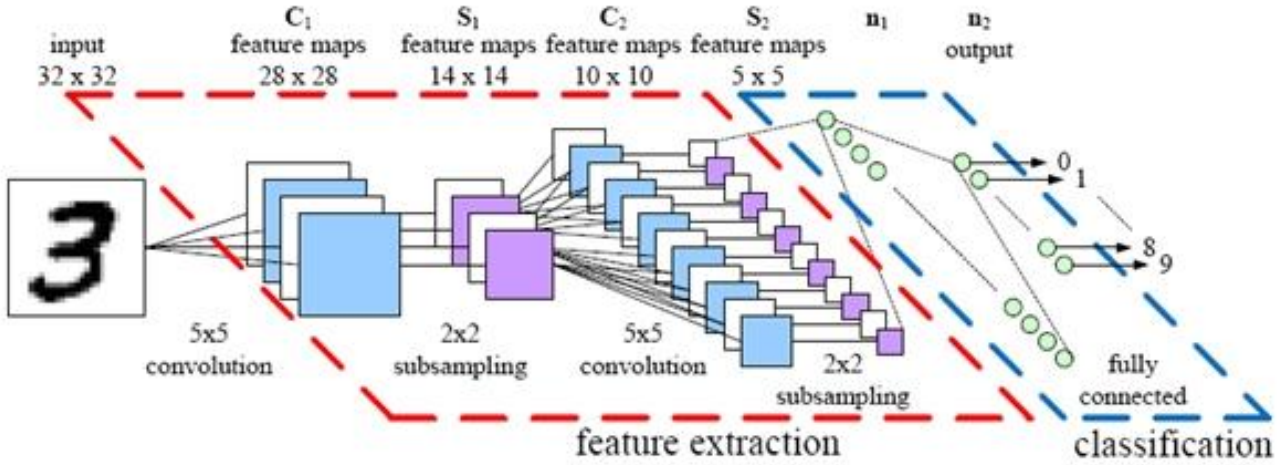


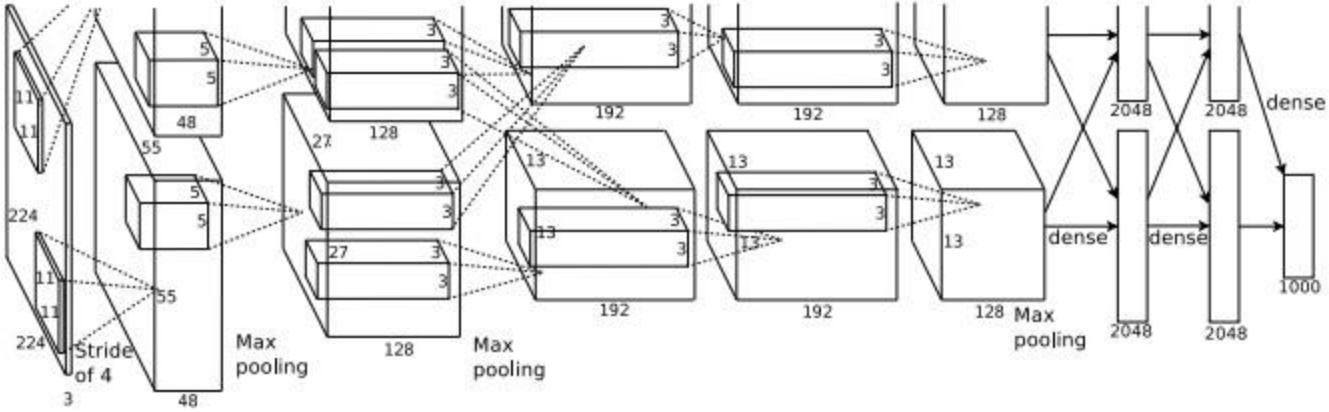


Deep Convolutional Networks





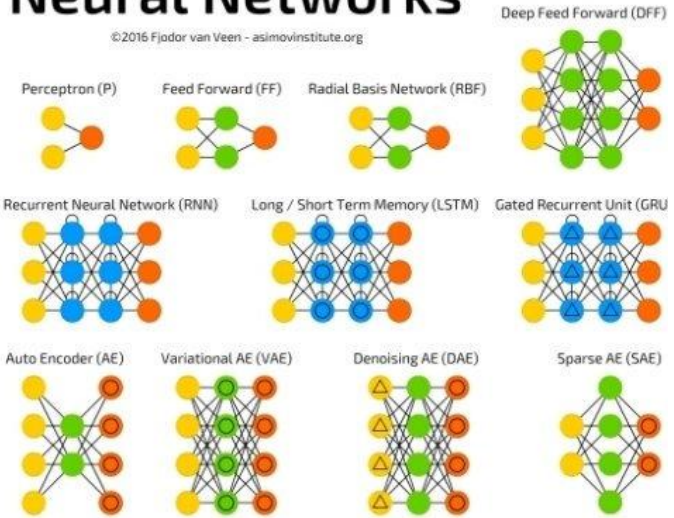

input
32 x 32
C1
feature maps
28 x 28
S1
feature maps
14 x 14
C2
feature maps
10 x 10
S2
feature maps
5 x 5
n1
n2
output
0
1
8
9
5x5
convolution
2x2
subsampling
5x5
convolution
2x2
subsampling
fully
connected
feature extraction
classification


224
224
3
11
11
Stride
of 4
55
55
48
48
5
5
Max
pooling
27
27
128
128
3
3
Max
pooling
13
13
192
192
192
192
128
128
Max
pooling
dense
dense
dense
2048
2048
2048
2048
1000

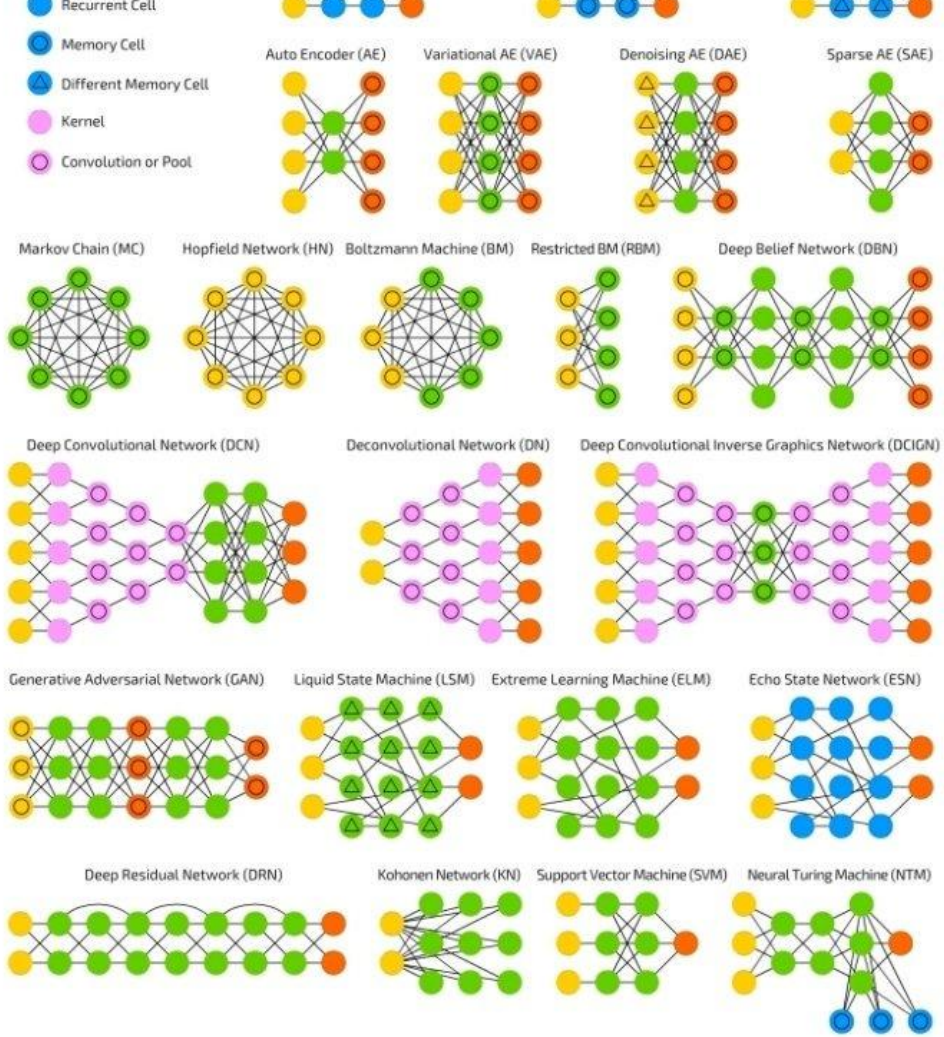
A mostly complete chart of

Neural Networks

- Backfed Input Cell
- Input Cell
- Noisy Input Cell
- Hidden Cell
- Probablistic Hidden Cell
- Spiking Hidden Cell
- Output Cell
- Match Input Output Cell
- Recurrent Cell
- Memory Cell
- Different Memory Cell
- Kernel
- Convolution or Pool



- Recurrent Cell
- Memory Cell
- Different Memory Cell
- Kernel
- Convolution or Pool



Alternative structures

Structures in deep learing (playlist):
https://www.youtube.com/watch?v=JjZDoojyzXQ&index=4&list=PLjJh1vlSEYgvGod9wWiydumYl8hOXixNu

ConvNets in practice:
https://www.youtube.com/watch?v=s716QXfApa0

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