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

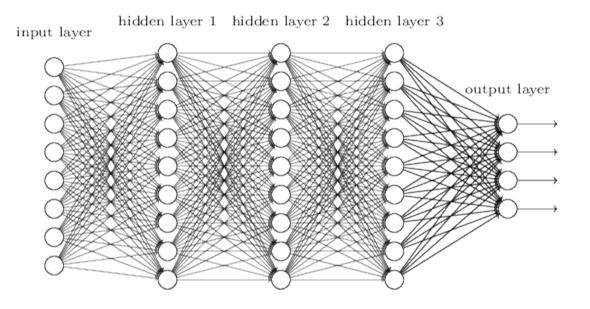
Chapters:

- 1. Basics (neurons, networks)
- 2. Basic learning (backprop)
- 3. Improvements
- 4. Intuitive proof function learning
- 5. Why is DL hard
- 6. Deep Learning

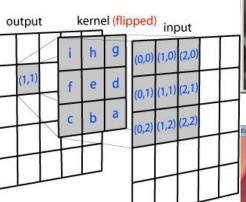


Deep network

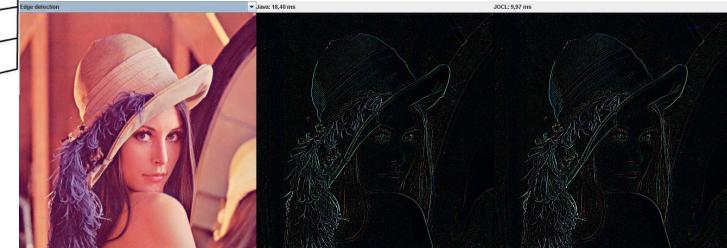
Simplest structure:



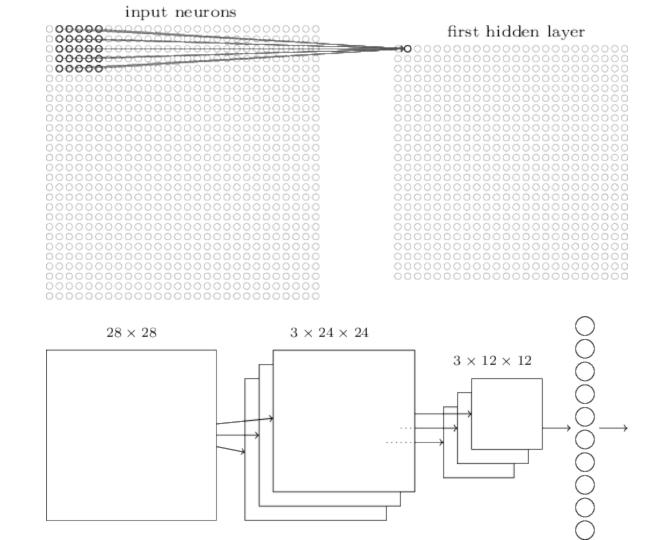
Convolution

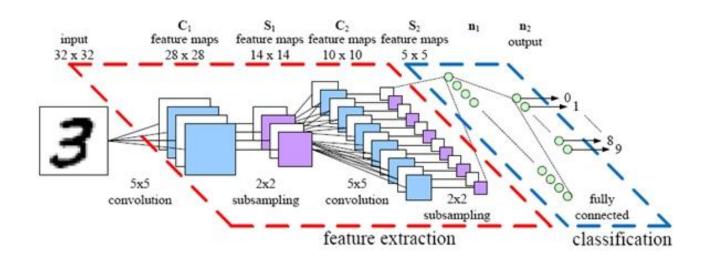


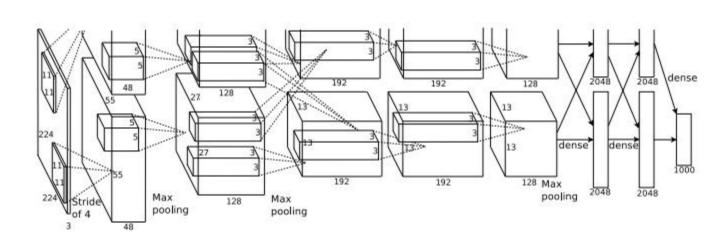




Deep Convolutional Networks







A mostly complete chart of Memory Cell **Neural Networks** Auto Encoder (AE) Variational AE (VAE) Denoising AE (DAE) Sparse AE (SAE) Backfed Input Cell Deep Feed Forward (DFF) Different Memory Cell ©2016 Fjodor van Veen - asimovinstitute.org Input Cell Kernel Noisy Input Cell Convolution or Pool Perceptron (P) Feed Forward (FF) Radial Basis Network (RBF) Hidden Cell Probablistic Hidden Cell Hopfield Network (HN) Boltzmann Machine (BM) Restricted BM (RBM) Markov Chain (MC) Deep Belief Network (DBN) Spiking Hidden Cell Recurrent Neural Network (RNN) Long / Short Term Memory (LSTM) Gated Recurrent Unit (GRU Output Cell Match Input Output Cell Recurrent Cell Memory Cell Auto Encoder (AE) Sparse AE (SAE) Variational AE (VAE) Denoising AE (DAE) Deep Convolutional Network (DCN) Deconvolutional Network (DN) Deep Convolutional Inverse Graphics Network (DCIGN) Different Memory Cell Convolution or Pool Deep Belief Network (DBN) Markov Chain (MC) Hopfield Network (HN) Boltzmann Machine (BM) Restricted BM (RBM) Liquid State Machine (LSM) Extreme Learning Machine (ELM) Generative Adversarial Network (GAN) Echo State Network (ESN) Deep Convolutional Network (DCN) Deconvolutional Network (DN) Deep Convolutional Inverse Graphics Network (DCIGN) Deep Residual Network (DRN) Kohonen Network (KN) Support Vector Machine (SVM) Neural Turing Machine (NTM) Generative Adversarial Network (GAN) Liquid State Machine (LSM) Extreme Learning Machine (ELM) Echo State Network (ESN)

Recurrent Cell

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

???

• talk, read, code, repeat