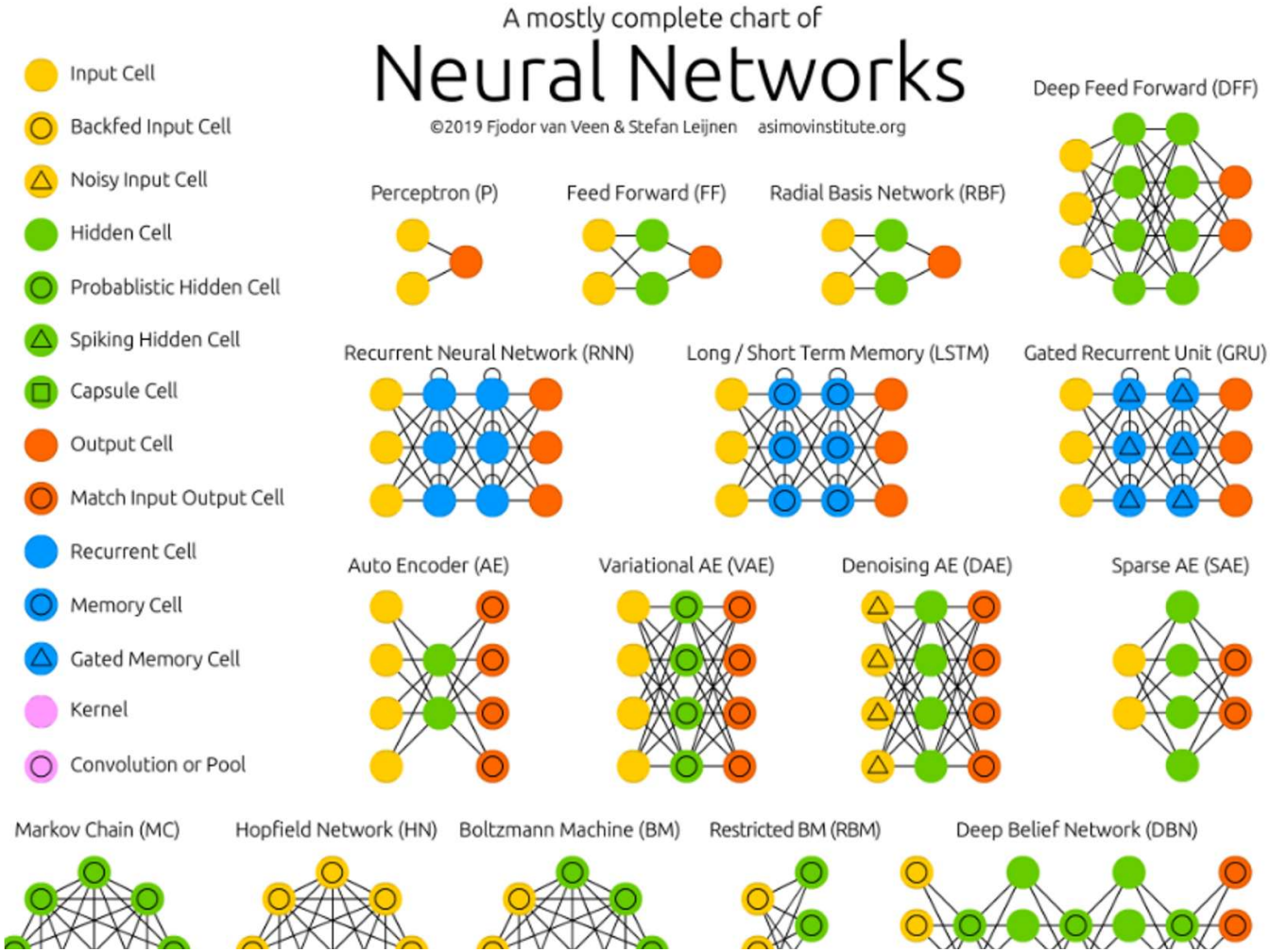
Planning of course:

- Dimensional reduction: singular value decomposition, principal component analysis
- Regression, optimization, model selection
- Neural networks
- Physics informed neural networks, model discovery
- Projects


A mostly complete chart of
Neural Networks
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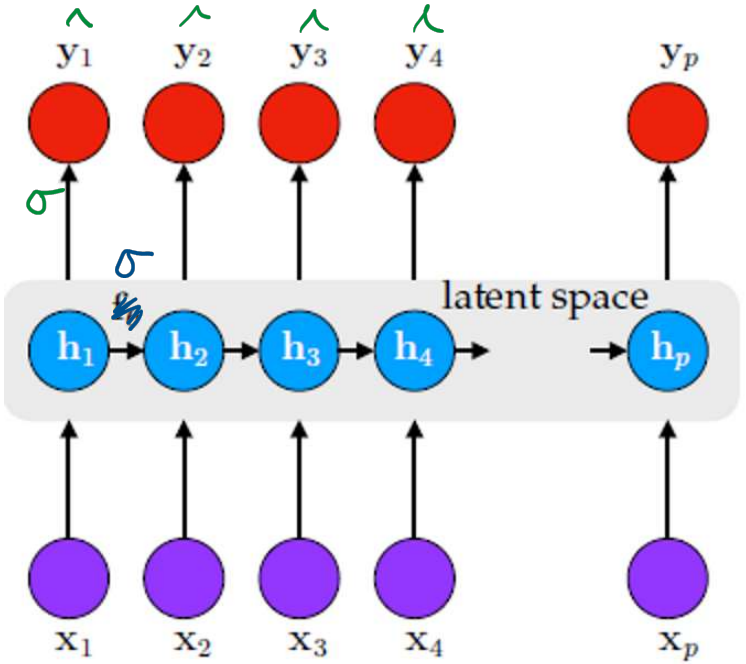
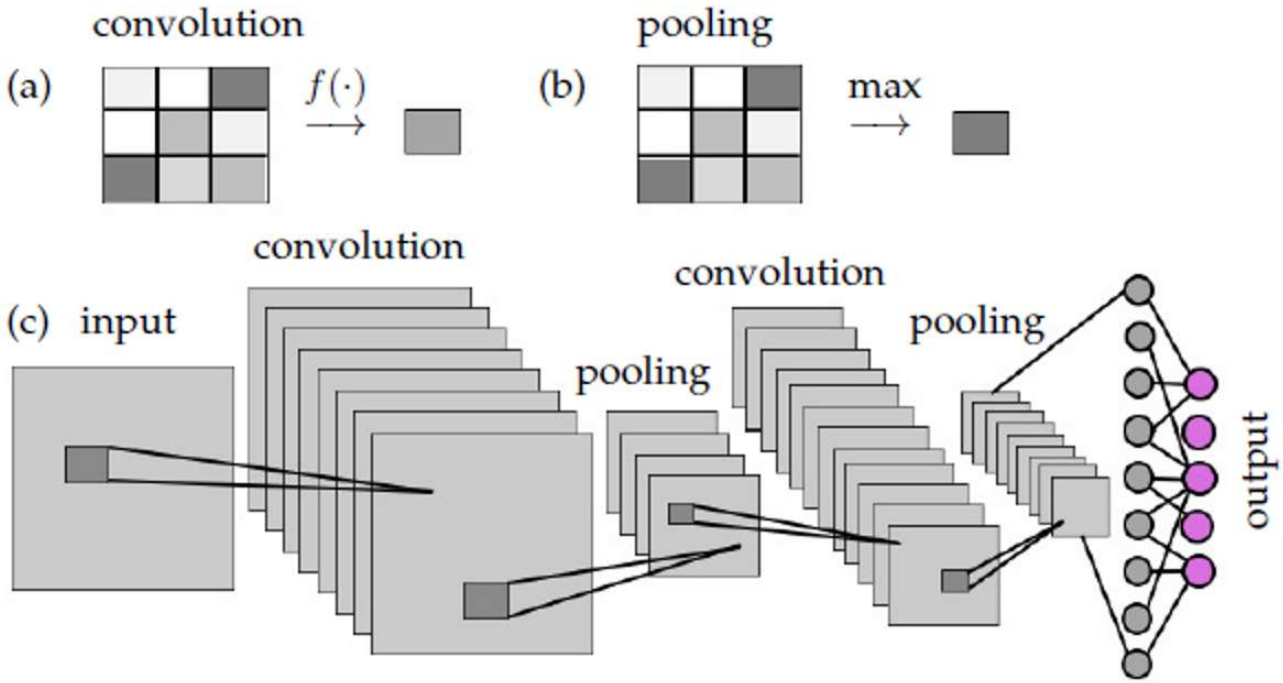
Input Cell
Backfed Input Cell
Noisy Input Cell
Hidden Cell
Probablistic Hidden Cell
Spiking Hidden Cell
Capsule Cell
Output Cell
Match Input Output Cell
Recurrent Cell
Memory Cell
Gated Memory Cell
Kernel
Convolution or Pool
Perceptron (P)
Feed Forward (FF)
Radial Basis Network (RBF)
Deep Feed Forward (DFF)
Recurrent Neural Network (RNN)
Long / Short Term Memory (LSTM)
Gated Recurrent Unit (GRU)
Auto Encoder (AE)
Variational AE (VAE)
Denoising AE (DAE)
Sparse AE (SAE)
Markov Chain (MC)
Hopfield Network (HN)
Boltzmann Machine (BM)
Restricted BM (RBM)
Deep Belief Network (DBN)

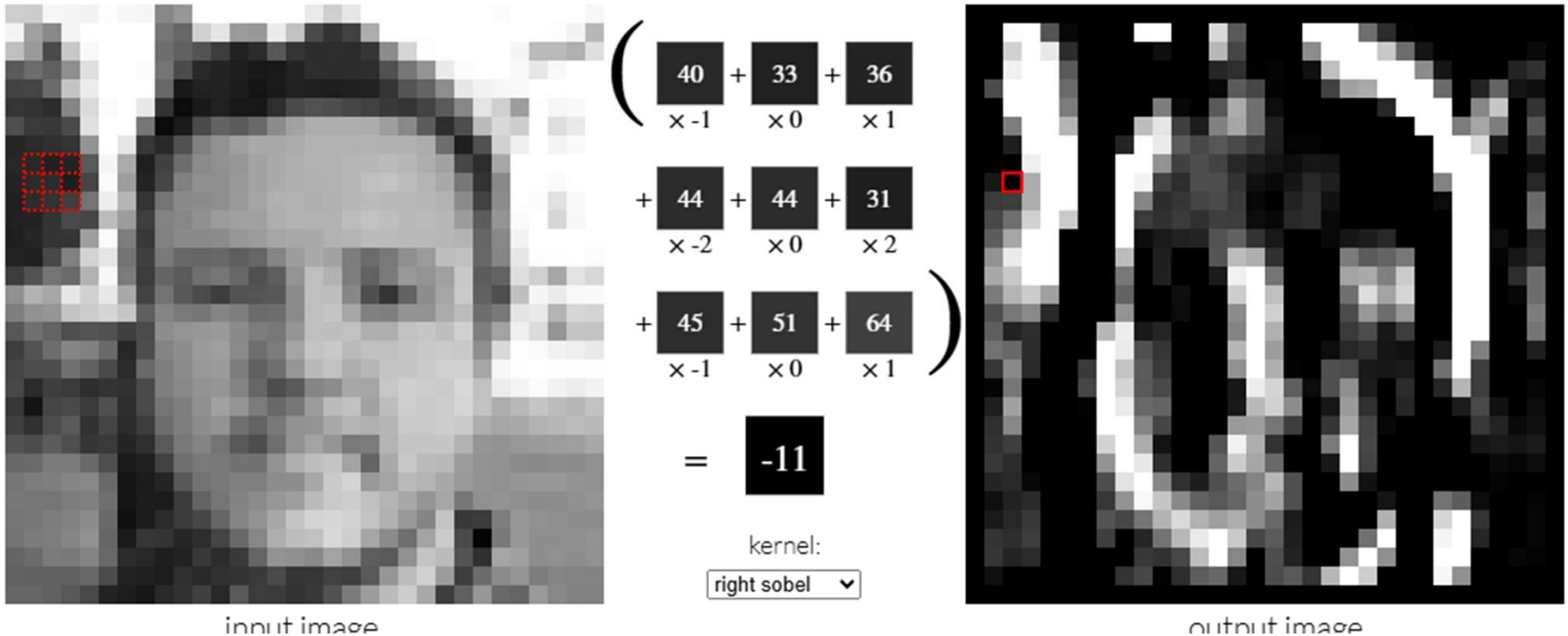

$\hat{y}_1$
$\hat{y}_2$
$\hat{y}_3$
$\hat{y}_4$
y_p
latent space
h_1
h_2
h_3
h_4
h_p
x_1
x_2
x_3
x_4
x_p

Deep convolutional neural networks



See youtube (https://www.youtube.com/watch?v=N15mjfAEPqw&t=551s)

And how convolutions (kernels) work:https://setosa.io/ev/image-kernels/


40 + 33 + 36
× -1 × 0 × 1
+ 44 + 44 + 31
× -2 × 0 × 2
+ 45 + 51 + 64
× -1 × 0 × 1
= -11
kernel:
right sobel
input image
output image