Deep Learning

Instructor: András Lukács

Term: Spring

Weeks: 8-14

Contact hours: 3

Credits: 6

Aim and scope:

Understanding neural networks and their teaching; knowledge and ability to use several types of deep neural networks, application of neural networks for different types of data. Practice covers the weekly topics in the form of Python notebooks. Main tools: Tensorflow, PyTorch, Keras.

Syllabus:

Neural networks, activation functions. Teaching methods, back propagation. Convolutional Neural Network. Techniques: dropout, maxout, ReLu, batch normalization. ResNet; optimisation in NN

Generative models: autoencoders, Variational Autoencoders, Generative Adversarial Networks, Recurrent neural networks, Sequence Modelling: long short-term memory (LSTM), gate recurrent unit (GRU). Natural Language Processing, Representation Learning.Deep Reinforcement Learning, AlphaGo.

WaveNet, 1D Convolutional Networks. Self supervised learning.

Grading: term mark (incorporating the solution of homeworks)

Literature:

Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. *Deep learning*. MIT press, 2016.

Chollet, Francois. *Deep Learning with Python*. 2017.