

Introduction to Deep Learning (Python)

Understand the basics of deep learning, from the mathematical fundamentals to modern applications, with hands-on practice.

Mathematical and algorithmic fundamentals

Implement a simple multi-level perceptron training from scratch.

Applications

Apply various architectures (convolutional, recurrent, transformers) to problems from the domains of computer vision and natural language processing.

DL frameworks

Learn how to work with one of the popular DL frameworks in Python, utilizing the GPU and monitoring the process.

	Day 1	Day 2	Day 3	Day 4	Day 5
09:00	Introduction MLP math MLP formulation forward & back prop.	Intro to DL libraries Model definition Loss functions Training loop Optimizers	Tensorboard, troubleshooting Convolutions	RNN Concept LSTM GRU Language models	Attention and the transformer architecture
17:00	Practice session #1 MLP implementation from scratch	Practice session #2 DL library basics (Tensorflow + Keras / PyTorch)	Practice session #3 Convolutional NN	Practice session #4 NLP with DL	Practice session #5 Transformers Closing remarks

Prerequisites:

- Experience with the data science ecosystem in Python
- ML background
- Comfortable with linear algebra and calculus