training code: PYTH_UM_P / ENG DL 3d / EN

Machine learning in Python

Purpose of the training

The training is intended for people who want to start using machine algorithms in practice.

Benefits of completing the training

The participants are acquainted with the basics of using high-level machine learning algorithms, environment and the packages being used in machine learning, as well as methods of data preprocessing.

Expected Listener Preparation

Knowledge of Python at the basic level and theoretical aspects of machine learning.

Training Language

- Language: English

Duration

3 days / 21 hours

Training agenda

1. Practical Introduction
   - PyCharm environment
   - The basics of NumPy
   - Data loading
   - Pandas basics
   - "Hello world" of machine learning – iris flower classification
2. Data preparation
   - The basics of data exploration
   - Fundamentals of data visualisation
   - Feature encoding
   - Dealing with missing data
   - Feature standardarisation
   - Feature selection/dimensionality reduction
3. The basics of machine learning
   - Spliting data into training, validation and test sets
   - Linear regression
   - Logistic regression
   - Model evaluation
   - Randomness and reproducibility
   - Cross-validation
   - Hyperparameter optimization (grid search, random search)
4. Classical algorithms of machine learning
   - k-nearest neighbors algorithm
   - Decision trees
   - Random forest
   - Support Vector Machine (SVM)
   - Clustering: k-means
5. Artificial neural networks
   - Implementation of neural networks using scikit-learn package
   - Batch and online learning
   - Introduction to deep learning
   - Implementation of deep neural network with Keras package