Hands-on Machine Learning Training

Session 1 – Basic Principles

Theoretical Preparation

In the first session, focus is on understanding the basics of programming in Python. You will understand Python datastructures, some important Python packages, and also learn image manipulations. Some common Machine Learning terminology will also be introduced, and using the publicly available Iris dataset, we will lear Principal Component Analysis.

Prepare yourself on the mentioned topics using the following resources. These are important for you to have a successful session:

- Introduction to Python
  - PythonTutorial [1]
  - You should get familiar with python programming basics.
- Introdcution to SciPy
  - ScipyTutorial [2]
  - You do not need to know all functions in detail.
- Introduction to NumPy
  - NumPyTutorial [3]
  - You should understand basic array operations.
- Introduction to ML
  - Pattern Classification (Chapter 1) [4]
  - You should understand the concept of features, decision boundaries, and overfitting/underfitting [5].
- Understanding PCA
  - PCA [6]
  - You should understand the basic principle and how PCA works.

[1] https://www.stavros.io/tutorials/python/
[2] https://docs.scipy.org/doc/numpy-dev/user/quickstart.html
[3] https://www.machinelearningplus.com/python/numpy-tutorial-part1-array-python-examples/
[4] https://www.byclb.com/TR/Tutorials/neural_networks/ch1_1.htm
[5] https://machinelearningmastery.com/overfitting-and-underfitting-with-machine-learning-algorithms/
[6] https://medium.com/@aptrishu/understanding-principle-component-analysis-e32be0253ef0