

# Introduction to Machine Learning in Python

## Objective

This online course will give an introduction to basic data science and machine learning techniques using the Python programming language.

Machine learning and neural network based techniques have already disrupted many fields of industry, science, and society, and this process will continue in many years to come. The goal of this course is to get you familiar with common tools and techniques in machine learning using the Python programming language, the currently most popular programming language in the scientific community. Using examples, we will learn the basics of how to deal with big data sets and how to analyze them using machine learning methods, from support vector machines to neural networks.

## Description

Novel machine learning based methods have transformed both industry and science alike, with data-driven methods revolutionizing virtually all fields of science, from agriculture to zoology. In this course, we will learn how to analyze data sets using machine learning techniques using the Python programming language.

Topics:

- Python basics, and the Visual Studio Code editor
- Basic data import and wrangling, the packages numpy and pandas
- Plotting data with the matplotlib package
- Hands on machine learning with the scikit-learn package
- Machine learning methods: decision trees, SVMs, the perceptron, feed forward networks, autoencoders, CNNs, recurrent networks
- Domains: natural language processing (text analysis, e.g. sentiment classification), image and audio analysis

## Methodology

- Lectures
- Practical exercises and programming in pairs
- Group discussions

## Conditions

Basic Python or Matlab skills

## Organizational Information

|              |   |
|--------------|---|
| Language     | English   |
| Target group | Doctoral Candidates at all stages and Postdocs from all faculties |
| Date         | Tuesday-Wednesday, 14-15 July 2022, 10:00 – 17:00                 |
| Registration | <a href="#">For registration click here</a>                       |

## Trainer



**Dr. Felix Effenberger**  
Ernst Strüngmann Institut  
(ESI), Frankfurt

After his PhD in mathematics (University of Stuttgart), Dr. Effenberger focused on the study of theoretical neuroscience. This was followed by research stays at the MPI for Mathematics in Leipzig and at ESI/FIAS in Frankfurt, where he investigated self-organization processes in neuronal networks and properties of dendritic trees, among other things. After spending time in Silicon Valley and founding an AI startup, he is now back at ESI working in Wolf Singer's group at the interface between machine learning and theoretical neuroscience. He has been programming since the age of 14 and has been using Python for many years.