Machine Learning Fundamentals in Python

Zürcher Hochschule für Angewandte Wissenschaften
zh aw Life Sciences und Facility Management

Ziel:

- To **develop** a **new course** on Machine Learning Fundamentals in **Python**
- New module as a part of **CAS** in **Digital Life Sciences**
- Specialization of Machine Learning Research in Life Sciences

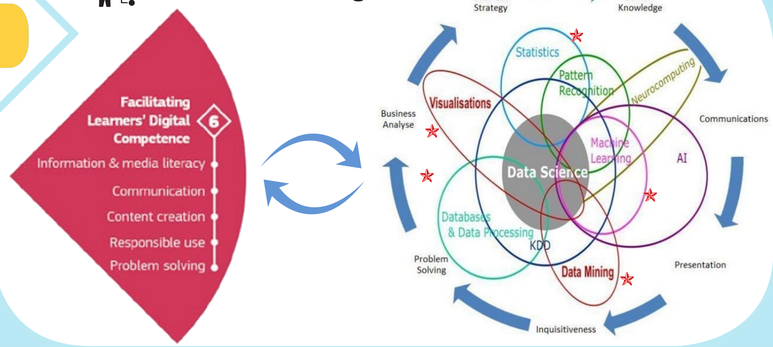
Nutzende:

- Attendees of further education at the IAS
  - Beginners and/or intermediate in ML and/or Python
- ZHAW students and employees
- Maker Space for Coding Literacy

Projektbeschrieb:

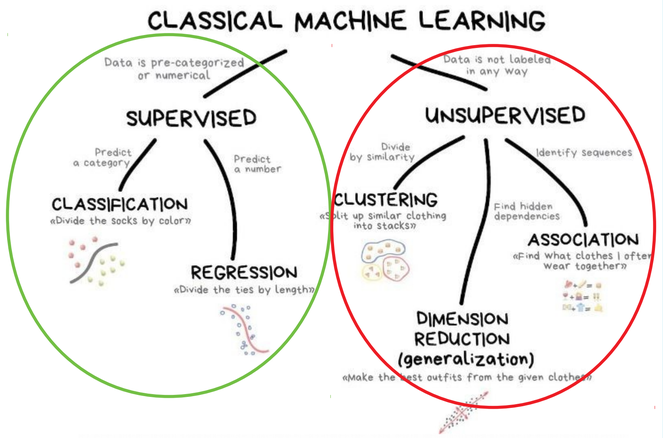
- This project creates and develops a course module as a part of continuous education at the Institute of Applied Sciences (IAS)
- The course offers students and/or professionals in all areas to start with and to develop ML algorithms using Python

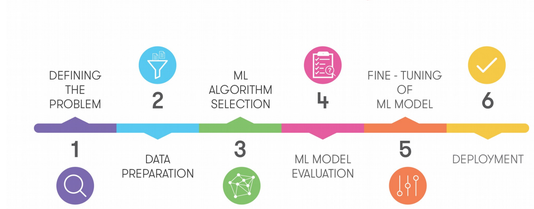
Geförderte Fähigkeiten:



Projektskizze (Umsetzung & Innovation):

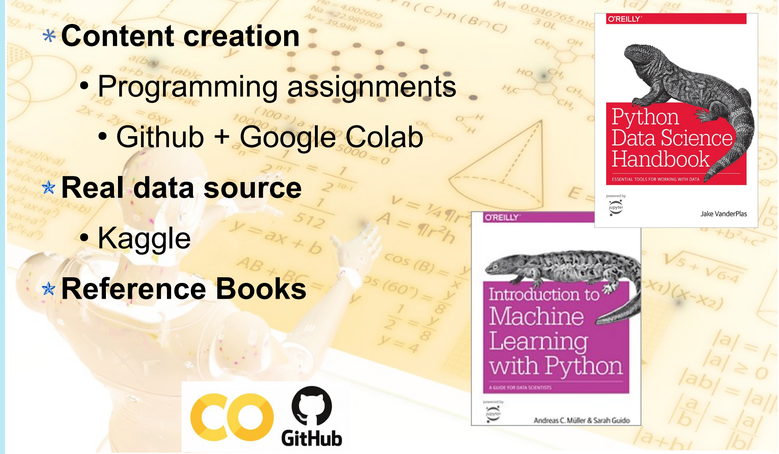
- **Python Programming**
  - Basics, functions, scripts, data structures, data manipulation
  - Essential data science and data visualization libraries
    - scikit-learn, Pandas
    - SciPy, Numpy
    - Seaborn, Matplotlib
- **ML algorithms implementation**
  - Supervised and unsupervised learning
- **Model regularization and evaluation**
  - Bias and variance, model over-fitting
  - Cross-validation
- **Application to real world data**
- **Provide students with digital (programming) know-how for active problem solving in the field of ML**





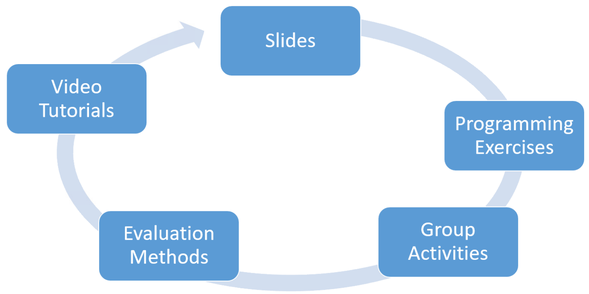
Lessons learned:

- **Content creation**
  - Programming assignments
    - Github + Google Colab
- **Real data source**
  - Kaggle
- **Reference Books**



Nächste Schritte:

- **Content creation** with focus on:
  - unsupervised learning
  - model evaluation
- **Create a video tutorials for selected topics**



Offene Fragen:

- **Flipped Classroom**
  - Video lectures for selected topics – how?
- **Assignments assessment methodology**
  - Generalization, automation???
- **Courses inter-connection**
  - Prerequisites

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Institut/Abteilung: **Institute of Applied Simulation**