

Exercise 1.1

October 28, 2024

1 What are the stages of the ML cycle? Which ones are iterative stages?

The machine learning design cycle has the following phases:

- preprocessing
- feature extraction / encoding
- feature selection
- machine learning
- evaluation and model selection
- post-processing

Each step of this cycle is iterative, and revisited multiple times!

2 What are different types of learning?

There are multiple different types for ML. We distinguish between *supervised*, *semi-supervised*, *unsupervised* and *reinforcement*.

3 How would you describe the overfitting and underfitting phenomenon?

Underfitting means that our model, cannot represent the data, as the number of parameters is simply not enough for capturing the correct trend, or possibly cannot process irregularities in the data.

Overfitting means, that there are too many parameters in our model, that can be adjusted, and the model will simply learn the data, but cannot be used to make further predictions, with data points, that were not learned before.