Homework 1: Sine Wave Regression

Deadline Friday May 26, 9:15

Notebook: Homework_1_pre.ipynb

In this exercise, you will use a Feedforward Neural Network (FNN) to fit a sine wave (i.e. a nonlinear regression). In the notebook the data are already generated and the MLP class is also given (with reference values of the hyper parameters).

a.
Use 50%, 25% and 25% for the training, validation and testing data set and randomly select these data from the total data set. Make a scatter plot (x versus $\sin(x)$) of these three data sets.

b.
Plot the training and validation error (e.g. the mean squared error) as a function of the number of epochs.

c.
Describe the effect of the learning rate on the behaviour of the loss function. What is the optimal value of this hyper parameter?

d.
Determine the performance of the FNN on the test data. What is the accuracy of the predictions for the chosen hyper parameters?