

Problem Sheet 5 – Starting a Small Project

Goal. The goal of the sheet / small project is to get familiar with the principles of an autoencoder and to apply them.

Deliverables.

- Presentation of the concept and the results.
- Corresponding executable code.

Approach.

- (i) We work on the MNIST data set (basic version). Download and get familiar with the data set.
- (ii) We want to learn about autoencoders. Get familiar with the concept. Write down important points for your presentation.
- (iii) **Main part.** Model autoencoder networks and train them on the MNIST data set.

Task 1. Use the encoder part as a feature extractor by applying a classifier to the resulting features.

Task 2. Use the autoencoder for denoising. To this end, train it with pairs of noisy and clean data (You have to generate the noisy data. Try different kinds of noise).

Optional Task. Try denoising and deblurring, and as a next step include inpainting, i.e., destroy some image pixels.

- (iv) Work out your presentation (including demonstration of your code.)