Small Exercises 8

Neural networks 2

These exercises are meant as preparation for the inverted classroom lecture. Keep your answers short: two or three sentences, sometimes even less, should suffice.

Problem 1: How do you determine the number of output neurons of an autoencoder?

Equals the number of inputs.

Problem 2: Why does an autoencoder NN usually have fewer neurons in the latent layer than in the input/output layer?

Because it's usually used for compression.

Problem 3: Why can't we use SVD to train a neural network?

The loss is nonlinear w.r.t. the parameters.

Problem 4: Why does using a momentum term usually help in training neural networks?

Figure on slide 16 demonstrates it.

Problem 5: Why is a large condition number of the Hessian of the loss, i.e. the matrix of second derivatives, bad for learning?

Limited computer numerical representation accuracy.