Homework 4: Deep Learning

Out May 23; Due May 29, 12 a.m.*

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In this homework, you will again use a neural network to classify MNIST.

1 Feedforward NN in Pytorch

Please complete this task in PyTorch using the provided notebook.

1. Implement a NN, similar to the previous homework, with at least 2-hidden layers (you get to decide on the size) and a 1-output layer of size 10 (each output represents a class). Use ReLU activation functions for the hidden layers and Softmax at the output activations.

2. Train the NN with an optimizer of your choice. Optimize the network with the Cross-Entropy-Loss.

HINT: If you use *nn.CrossEntropyLoss* keep in mind that it computes the Softmax itself.

3. Try out techniques like data pre-processing, batch normalization, weight initialization, dropout, early stopping and visualize the training behavior.

*We will discuss the solutions in the exercise session. It is my suggestion that you try to address at least 50% of the exercise questions. Simply try hard to solve them. This way, you will get familiar with the technical terms and with the underlying ideas of the lecture.