Deep Learning Lab – Assignment 2
Hakan Yilmaz

Introduction

The goal of this assignment is the implementation and the investigation of a small convolutional neural network (CNN) in Tensorflow (scaled-down version of LeNet) applied to image classification (MNIST digits). During the training phase of the network, different learning rates and numbers of parameter were used to investigate their effect on learning performance and run times. Herein, only a CPU (AMD A10-5750M APU) was used.

Implementation of the CNN

The network architecture follows the description in exercise 1 of the exercise sheet.
For exercise 2 (learning performance with different learning rates), the default number of filters (16) was used.
For exercise 3 (runtime performance with different numbers of filters), the default learning rate (0.01) was used.
For all exercises, the batch size was 500 resulting in 100 steps per epoch and the number of epochs was 20 (https://www.tensorflow.org/tutorials/layers#create_the_estimator).

Exercise 2: Changing the learning rate

Exercise 3: Runtime