DATA.ML.200 Pattern Recognition and Machine Learning

Exercise Set 5: Neural networks

Be prepared for the exercise sessions (watch the demo lecture). You may ask TAs to help if you cannot make your program to work, but don't expect them to show you how to start from the scratch.

1. `python` *Define the network in Keras.*

   Define the homework convolutional network in your code.

2. `python` *Compile and train the net.* (5 pts)

   Use the same two class German Traffic Sign Recognition Benchmark (GTSRB) dataset from the previous exercise and the same train-test split.

   Use the following parameters:

   - **Loss:** binary crossentropy (same thing as log loss; see previous exercises)
   - **Optimizer:** stochastic gradient descent (SGD)
   - **Minibatch size:** 32
   - **Number of epochs:** 20

   Compute the test set accuracy for your network. You may give the test data as validation data so that you will see the accuracy after each epoch.

   Note that by calling the `.summary()` function of the compiled model you can check that your calculations of layer outputs and total number of parameters is the same.