

DATA.ML.200 Pattern Recognition and Machine Learning

Homework 5: Convolutional neural networks

This homework prepares you for the next week exercises.

1. pen&paper Count the form and number of parameters in different layers
 - a) Last week we defined a full-connected (“vanilla”) neural network for $64 \times 64 \times 3$ size RGB images. The images represented traffic signs from two different classes.

Let’s now define an alternative convolutional structure:

 - The first layer is 2D convolution layer of 10 filters of the size 3×3 with stride 2 and ReLU activation function.
 - The first layer is followed by a 2×2 max pooling layer.
 - The max pooling layer is followed by another convolutional layer with the same parameters as the first.
 - The second convolutional layer is followed by another max pooling layer of the same parameters.
 - The second max pooling layer is “Flattened” and followed by a full-connected (dense) layer of two neurons with sigmoid activation function.

Compute the output size of each layer. Also compute the total number of parameters (weights).