Assignment 2: Report

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Abstract

This report summarizes the two most relevant and well-performing models used for classifying images in the German Traffic Signs Benchmark dataset. I have included the model architectures in section 1 and 2 and graphs of training and validation accuracy against the number of epochs in section 3.

1 Model 1

Conv1:
input channels: 3
output channels: 32
kernel size: 5x5

Conv2:
input channels: 32
output channels: 64
kernel size: 5x5
Dropout: 0.2
Maxpool: 2x2

Conv3:
input channels: 64
output channels: 128
kernel size: 5x5
Dropout: 0.2
Maxpool:2x2

Fully-connected layer 1: 128x4x4 to 1024 with a dropout of 0.5

Fully-connected layer 2: 1024 to 43

All layers except the last output layer used Relu non-linearity. Optimizer used was ADAM with a learning rate of 0.001 with linear annealing by a factor of 0.5 after every 3rd epoch. This was the final model used for submission with a test accuracy of 97.862

2 Model 2

Conv1:
input channels: 3
output channels: 32
kernel size: 5x5
padding: 2

Conv2:
input channels: 32
output channels: 32
kernel size: 5x5
padding: 2

Conv3:
input channels: 32
output channels: 64
kernel size: 5x5
padding: 2
Dropout: 0.2

Conv4:
input channels: 64
output channels: 128
kernel size: 4x4
Dropout: 0.2
Maxpool: 2x2

Conv5:
input channels: 128
output channels: 256
kernel size: 4x4
Dropout: 0.2
Maxpool: 2x2

Fully-connected layer 1: 256x5x5 to 1024 with a dropout of 0.5

Fully-connected layer 2: 1024 to 43

All layers except the output layer used Relu non-linearity. Optimizer used was ADAM with a learning rate of 0.001 with linear annealing by a factor of 0.5 after every 3rd epoch. This model gave a test accuracy of 97.640 which was not better than model 1.

3 Training and Validation accuracy graphs

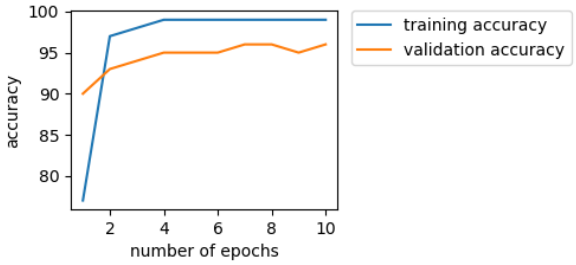

Figure 1: Validation and Training Accuracy for Model 1

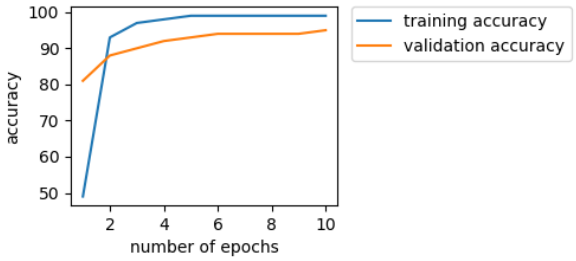

Figure 2: Validation and Training Accuracy for Model 2