Convolutional Neural Network

Batch size = 64

Epochs = 25

Layers:

1. Conv1 = Conv2d(1,10,5), ReLU
2. Pool = MaxPool(2)
3. Conv2 = Conv2d(10,20,5), ReLU
4. Fc1 = Linear(500,250), ReLU
5. Fc2 = Linear(250,2)

CrossEntropyLoss

learning_rate = 1e-3

Training accuracy = 0.9966

Validation accuracy = 0.993125

Testing accuracy = 0.994

The training accuracy is the highest of the three as expected. The test accuracy is slightly larger than the validation accuracy. The difference is not large, and may be attributed to the random selection of samples.

The best classifier in HW2 (Random Forest classifier) had a validation accuracy of 0.9832. The CNN performs significantly better than the Random Forest classifier and required much parameter tuning (initial architecture worked well). To be fair, I did use 32x32 images for the CNN but only 16x16 for the Random Forest classifier, but the parameter search for the Random Forest was quite expensive to get to a good validation accuracy.