

CSE 455 Homework 5

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1 Installing PyTorch

Done!

2 Find the best network

2.1 Training a classifier using only one fully connected Layer

See Figure 1a. We can say that the model successfully trained since the loss is decreasing throughout the training process and there is a healthy gap between the training accuracy and testing accuracy.

2.2 Training a classifier using multiple fully connected Layers

See Figure 1b. The training is not successful because the testing accuracy plateaus whereas the training keeps increasing.

2.2.1 Question

See Figure 1c. The model accuracy is significantly worse than the previous model. This is because the model is expressively limited since it has less non-linearity. The model can actually become just as good as LazyNet since without activations, the forward pass is just a couple of matrix multiplications, which is nothing but a single matrix multiplication by the composed matrices. But somehow, by separating the weight update process in back propagation, it achieves a slightly higher accuracy than LazyNet.

2.3 Training a classifier using convolutions

2.3.1 Question

3 How does learning rate work?

4 Data Augmentation

5 Change the loss function

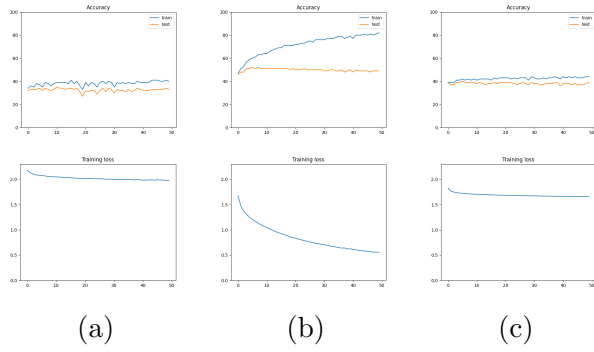


Figure 1: Training results of LazyNet and BoringNet: (a) LazyNet, (b) BoringNet, (c) BoringNet without activations.