Introduction to Deep Learning for Computer Vision Assignment 5: Convolutional Neural Networks 1

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Abstract

This report focuses on setting up a Convolutional Neural Network (CNN) to analyze and classify images through a series networks. The two main modules used to evaluate the datasets were Pytorch's Conv2d and a custom-made one.

4.1 Reproducing default architecture results – Testing

When the testing mode was run on the Conv2d and the custom module with 100 epochs each, they both returned a test accuracy and test loss of approximately 51.4% and 1.36, respectively.

This was lower than the expected 61.26% accuracy.

4.2 Reproducing default architecture results – Training

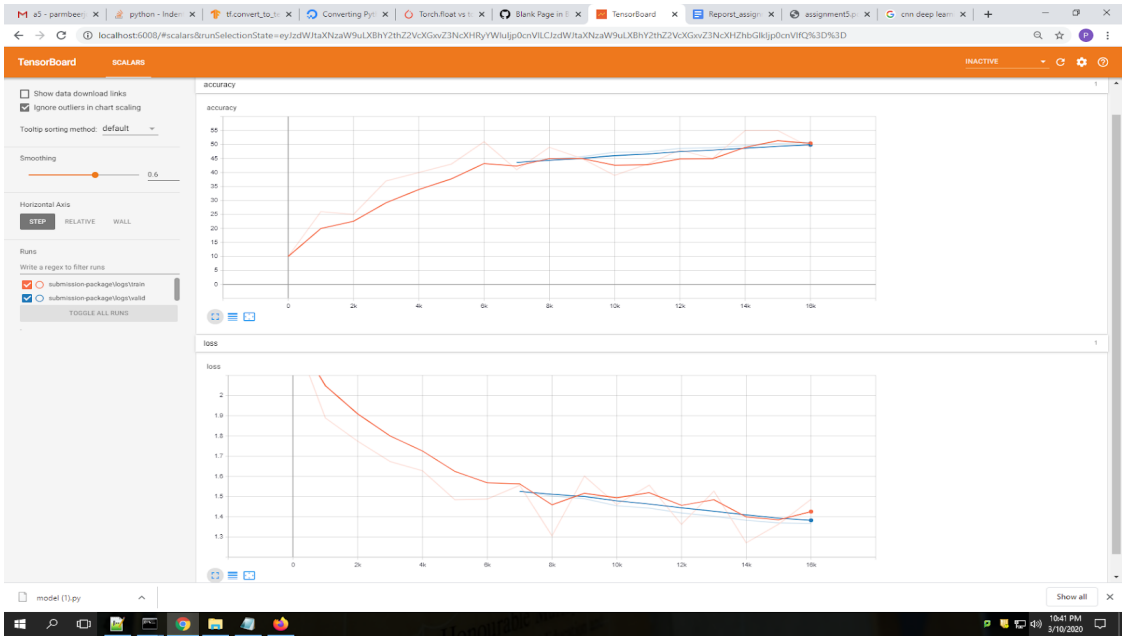

Figure 1: Accuracy of default architecture training (train=orange, valid=blue)

Dataset	Accuracy (%)
Train	50.42
Valid	49.9

From figure 1 above, we see that the training set accuracy is lower than the validation accuracy and is eventually slightly higher than it. This may be due to overfitting of the dataset. With the possibility of too much noise in the dataset, this could be improved by reducing the number of elements in the hidden layers.

4.3 CNN Architectures

With kernel size being 4x4 and running with 5 epochs, we get the following result in figure 2:

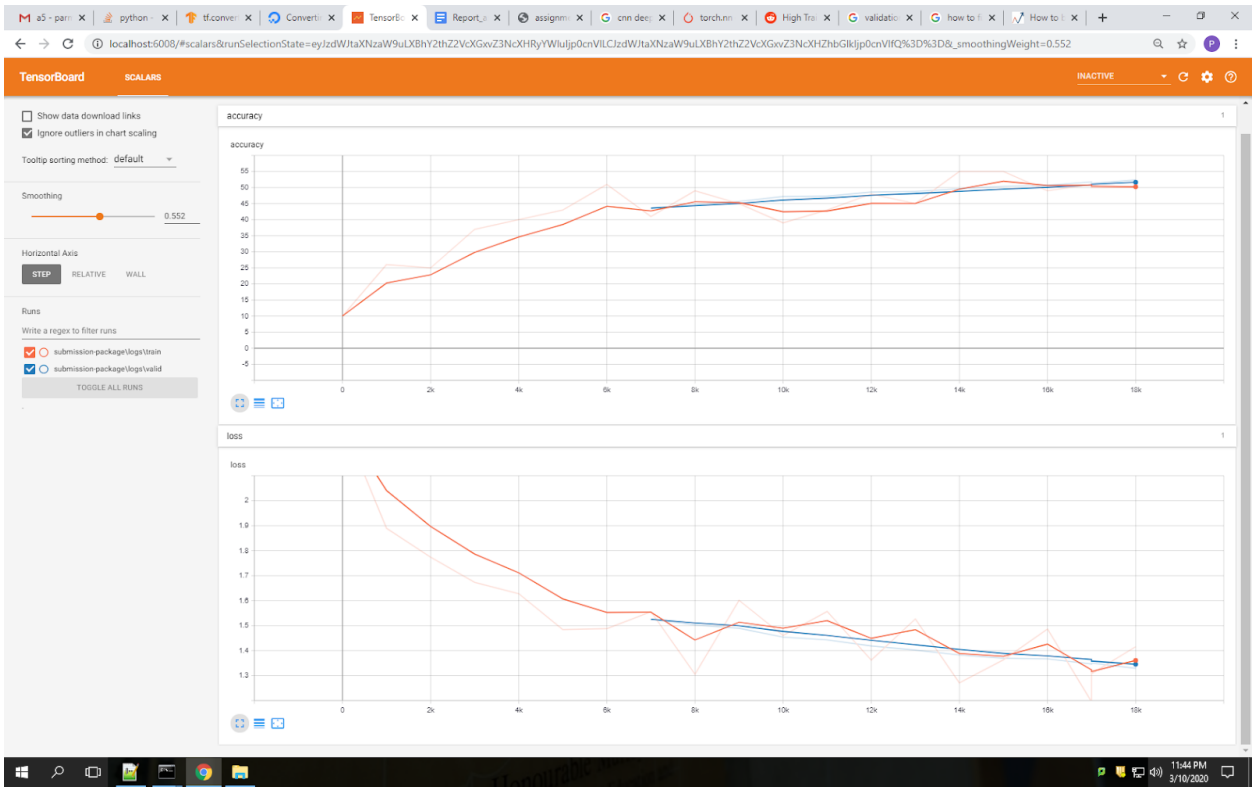

Figure 2: Accuracy of architecture with 5 epochs and kernel size of 5 (train=orange, valid=blue)

With a training accuracy of 48.3% and a validation accuracy of 52.0%, we see that this is not a good architecture for the dataset.