

Project 2 Traffic sign classifier

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1 SUMMARY OF PROJECT 2

Project 2 and corresponding course talked about use Tensorflow to implement traffic signs classification use LeNet architecture. From the project, I have the following thoughts:

1. Data preprocessing matters. I tried directly using the original image, using min-max scaling and zero-score scaling. The results can be significantly different. Directly using original training data achieved less than 80% training accuracy. However, using zero-score I achieved 99% training accuracy and 93% testing accuracy. The improvement is significant.
2. Learning rate is important. Large learning rate converge fast but results in lower accuracy, lower learning rate converge slower. The rule of thumb of this value can be 0.001.
3. GPU is much faster than CPU. I also tried training CPU in my machine, the GPU-based training and testings can be speed up by 50X.
4. Dropout is very helpful. The testing accuracy improved from 90% to 93%.

2 POSSIBLE IMPROVEMENTS

There is no difference between deep learning and more conventional "neural network". I can try deeper layers (with more than 10 convolutional layers) or new architecture introduced in recent years such as ResNet to improve the classification rate.

More detail can be found at `ipython` file.