Report on Machine Learning Lab, Ex 2

Mostafa Mohamed, Omar Kassem

November 29, 2016

1 Introduction

This is a report about the deep learning lab, exercise 2. The general task of this assignment was to use Tensorflow to implement a convolutional neural network to train it on labelling images. As well as, trying different architectures for the network and different sizes.

2 Data

The training data set that consists of nearly 28,000 images, that mostly contain a lot of images about some objects; for each object we have similar images but with variants in some features, like brightness, color, the viewing angle. Then we used a validation data set of nearly 5,400 images and a testing data set of nearly 6,100 images.

3 Tensorflow

Tensorflow is a machine learning opensource software library (developed by Google) for running large computations on data flow graphs. It's architecture allows parallel computation on different GPUs. It also provides a variety of control statements over data flow graphs.

4 Architecture

We used a convolutional neural network of 2 layers in some tests and 3 layers in some other tests, we tried a variety of number of neurons in layers. This 3rd layer has shown an improvement on some of the results. All the datasets were batched, and in some of the runs we tried to shuffle some of the training data sets before batching in order to avoid overfitting.

5 Results

We tried training the network using 2 layers sometimes and 3 layers some other times, we present here a plot of the results for each of them when we run on 3 channels(RGB) and 4 channels(RGBD).

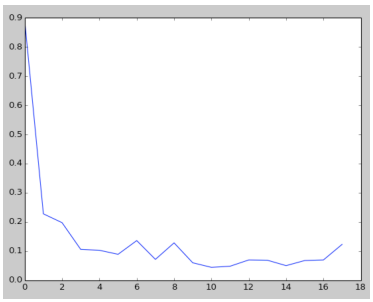

Figure 1: 2 Layers, 3 Channels, Accuracy: 89%

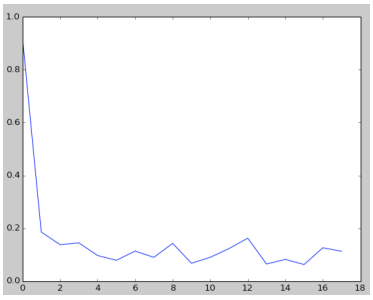

Figure 2: 2 Layers, 4 Channels, Accuracy: 91%

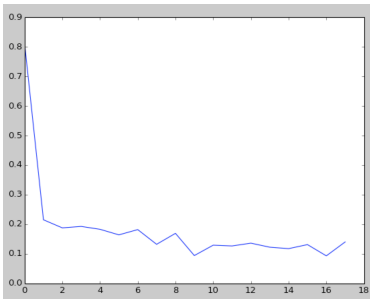

Figure 3: 3 Layers, 3 Channels, Accuracy: 92%

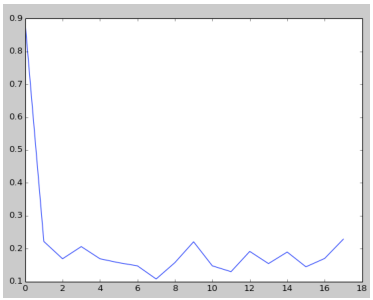

Figure 4: 3 Layers, 4 Channels, 87%