MINI-REPORT

Topic: Speech Recognition

Aims and Objective:

To develop and train a Tensorflow-based Convolutional Neural Network that can recognizes different words

Methodology:

A subset of audio data from online open source was divided into two folders; train and test. Each of the folders contains 6 sub-folders. The sub folders inside the train folder contains 500 samples each, where different individual pronounces the same words under different circumstances and considering different environmental influences. While sub folders inside the test folder contains 50 samples each.

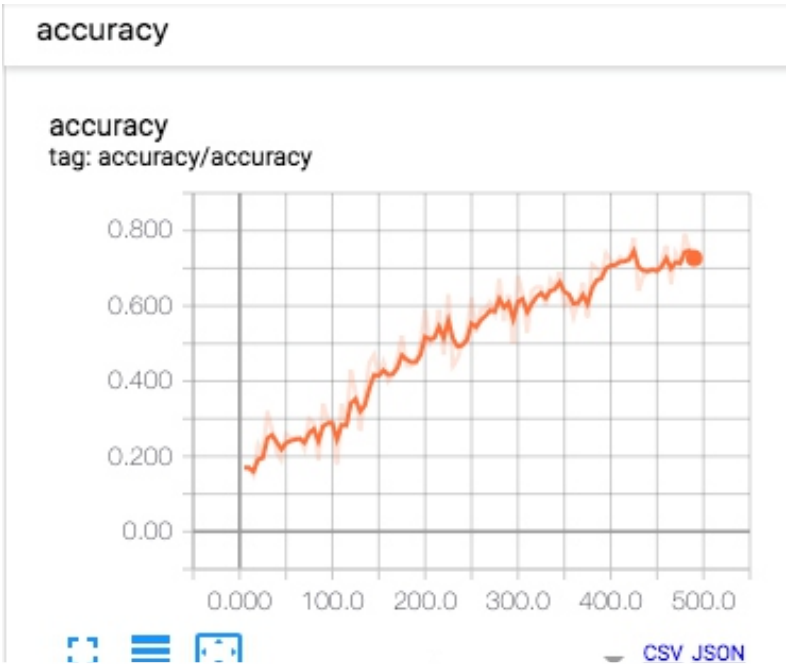
However, the MFCCs of the wave samples were extracted and employed to train the model. I used AdamOptimizer to minimize the loss. The accuracy, loss, distributions and histograms of the weights were sent to the console to be visualized.

Results:

The images from the Tensorboard are shown in subsequent pages. Also, training loss, training accuracy and confusion matrix were printed in the code to detail the training.

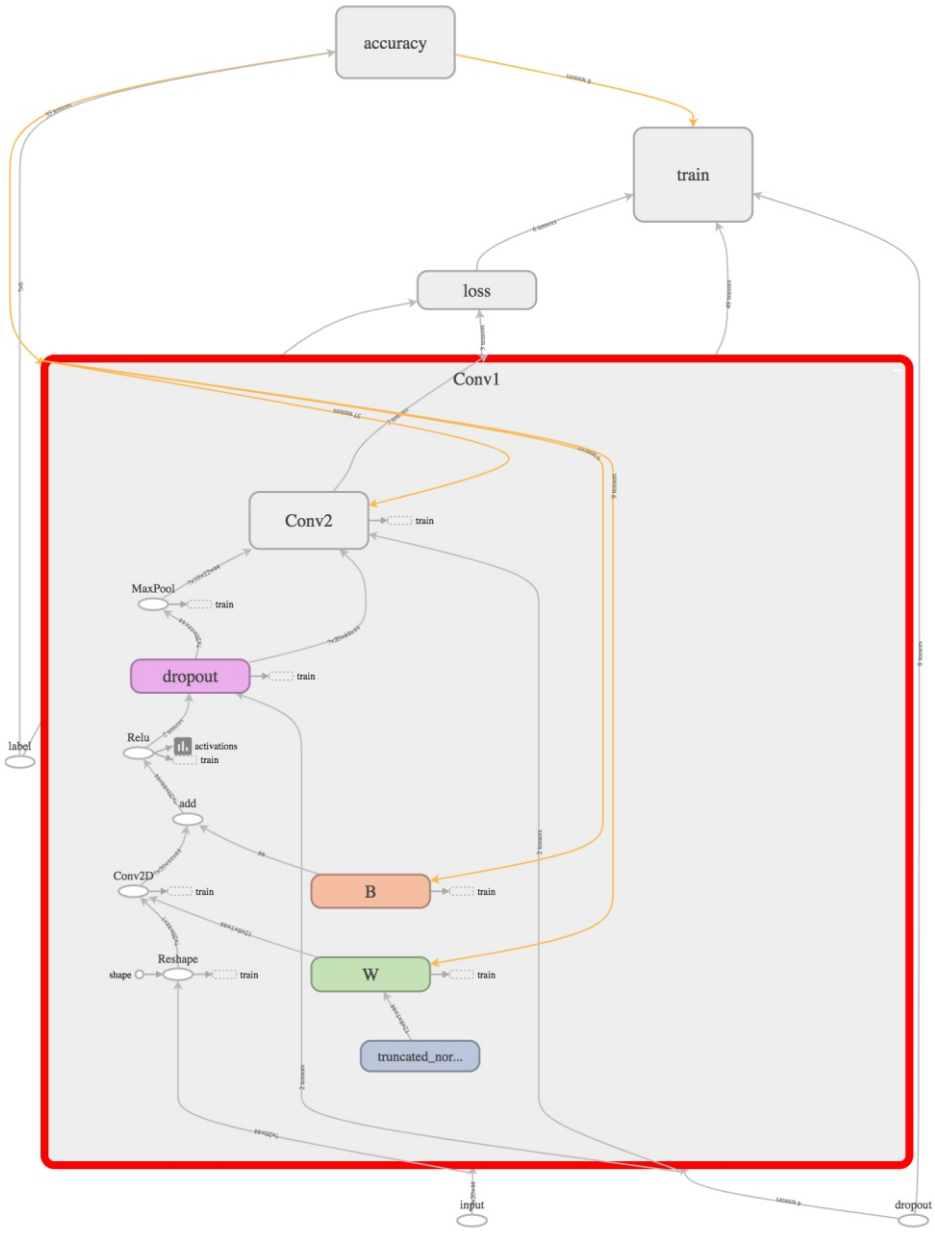
Conclusion:

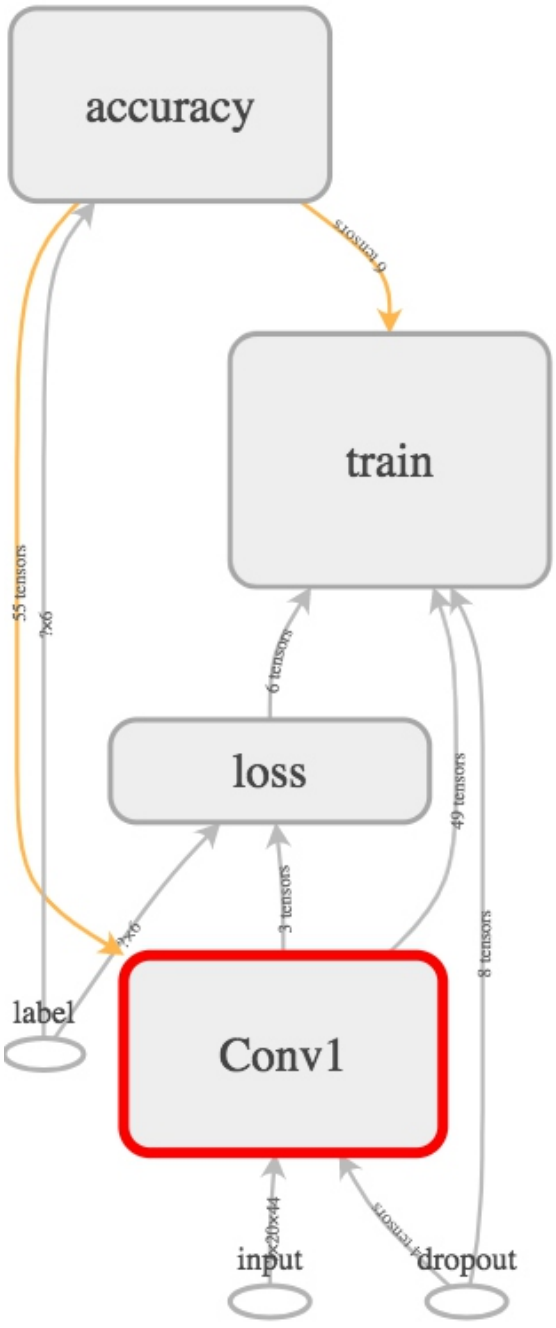
Accuracy of 80% was achieved, the lower value in accuracy was as a result of using small samples, due to limited time.


accuracy
accuracy
tag: accuracy/accuracy
0.800
0.600
0.400
0.200
0.00
0.000
100.0
200.0
300.0
400.0
500.0
CSV JSON


loss
loss
tag: loss/loss
1.90
1.70
1.50
1.30
1.10
0.900
0.000
100.0
200.0
300.0
400.0
500.0

MAIN GRAPH

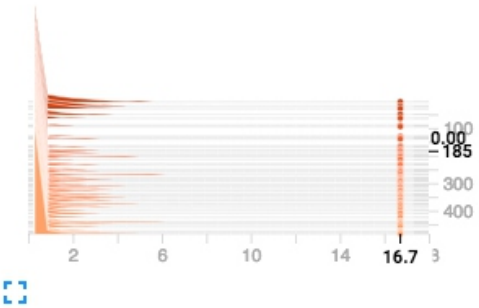

accuracy
train
loss
Conv1
Conv2
train
MaxPool
train
dropout
train
Relu
activations
train
add
Conv2D
train
B
train
Reshape
shape
train
W
train
truncated_nor...
label
input
dropout


accuracy
6 tensors
train
55 tensors
9x6
6 tensors
loss
49 tensors
3 tensors
9x6
8 tensors
label
Conv1
20x44
4 tensors
input
dropout

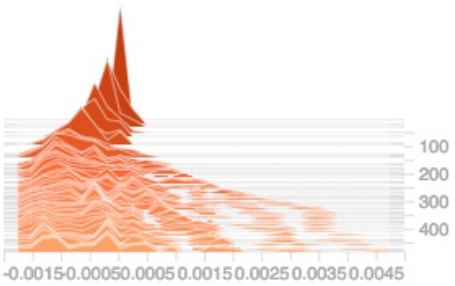
HISTOGRAM

Conv1

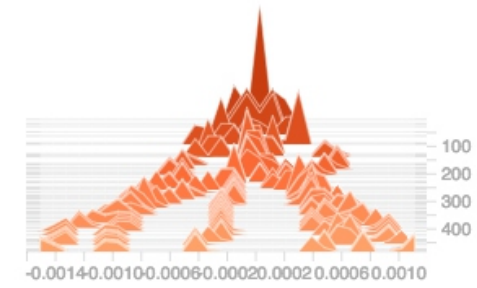
Conv1/Conv2/activations



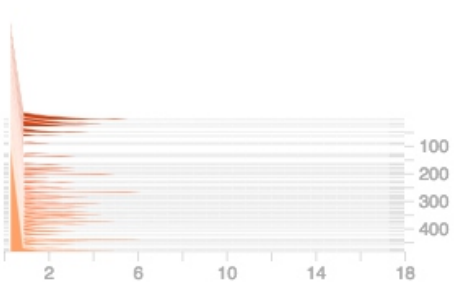
Conv1/Conv2/biases



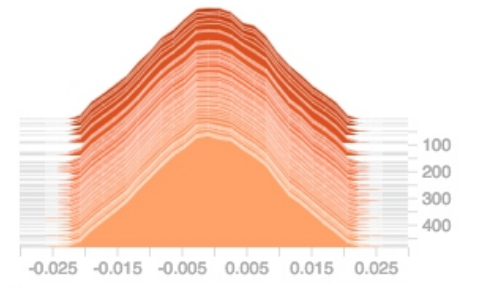
Conv1/Conv2/biases_1



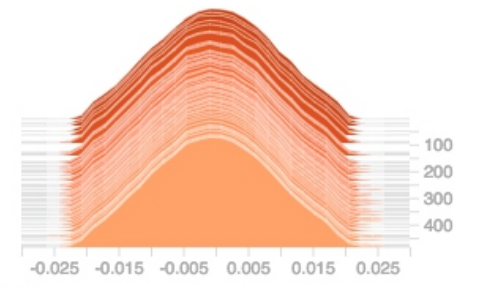
Conv1/Conv2/dropouts



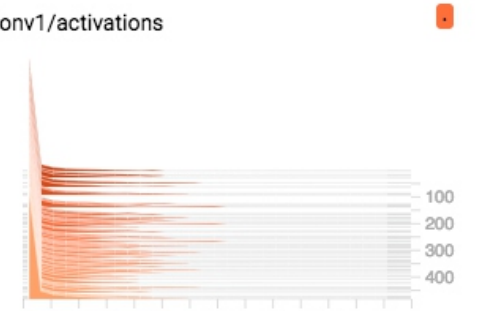
Conv1/Conv2/weights



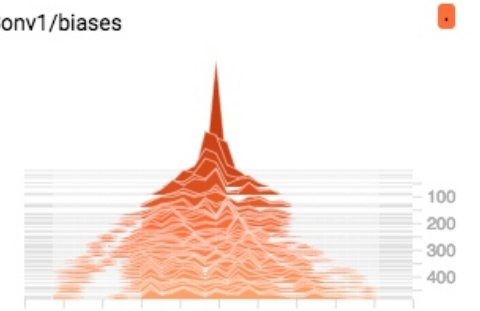
Conv1/Conv2/wights



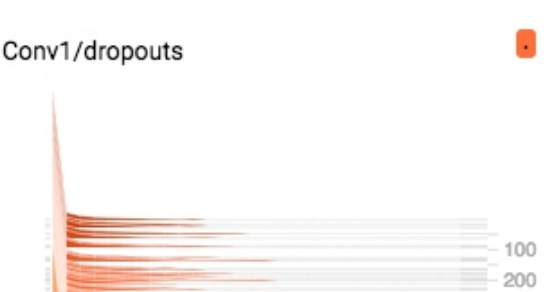
Conv1/activations



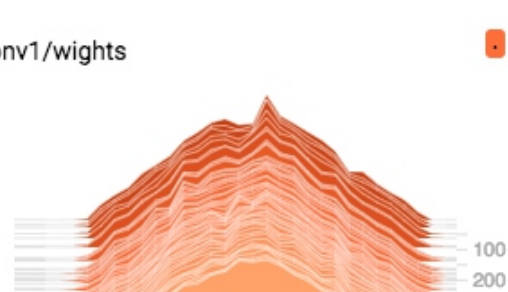
Conv1/biases



Conv1/dropouts



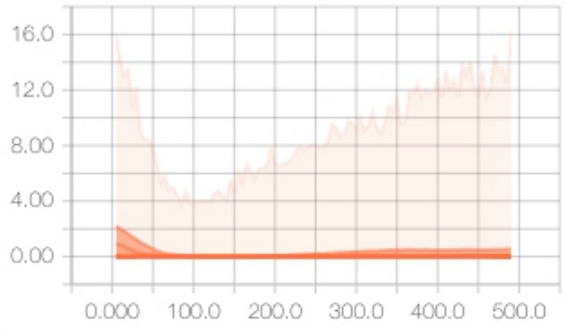
Conv1/wights



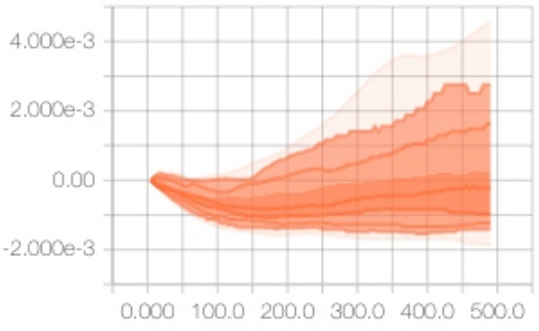
DISTRIBUTIONS

Conv1

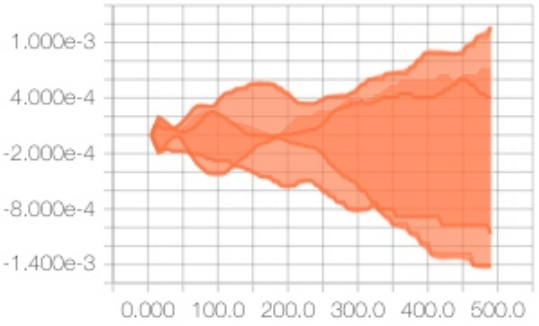
Conv1/Conv2/activations



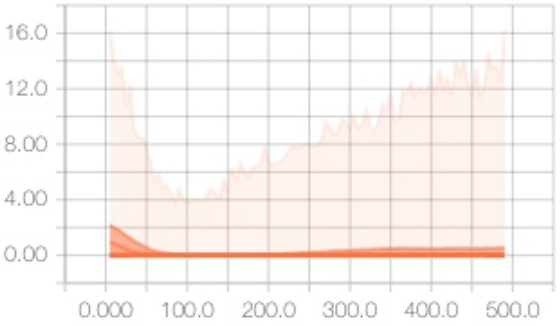
Conv1/Conv2/biases



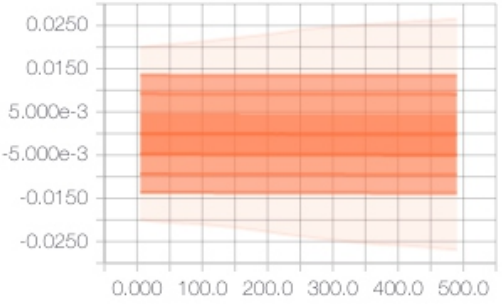
Conv1/Conv2/biases_1



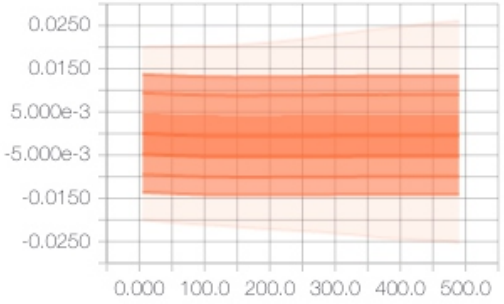
Conv1/Conv2/dropouts



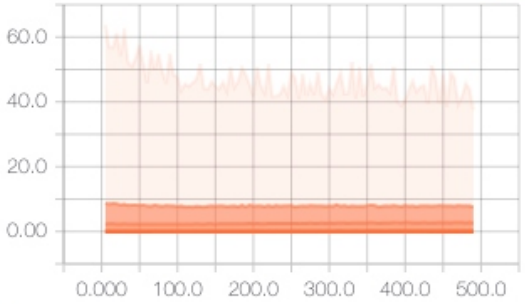
Conv1/Conv2/weights



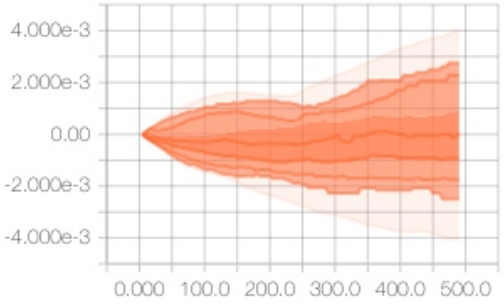
Conv1/Conv2/wights



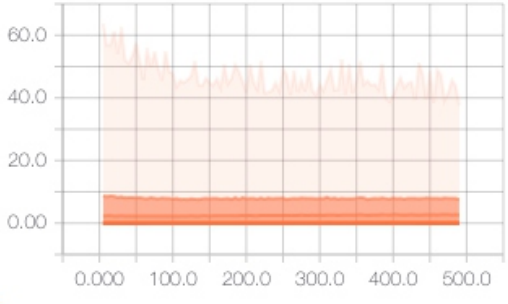
Conv1/activations



Conv1/biases



Conv1/dropouts



Conv1/wights