Neural Networks in Tensorflow (Assignment 1)

JIANG Fan, [fan.jiang@polytechnique.edu](mailto:fan.jiang@polytechnique.edu)

# Introduction

For this assignment, we are going to use neural network implemented with Tensorflow to tackle a classification problem. The data set contains 2000 points, splitted to train/test data set with a ratio 6/4. The dimension of X is 294, and the dimension of Y is 6. Since the classes of Y are independent, we have used sigmoid classifier at the output layer. The number of neurons in each layer of my network is 294-64-32-16-6, and the activation fuctions are all sigmoid functions.

# Hyper-parameter Tuning

The best learning rate is 0.005, and the best batch size is 100. The following tables shows the hyper-parameter tunning process :

This table shows the process of finding the best structure.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Neurons in Hidden layers | Epoches | Learning rate | Time | Hamming losses |
| 16 | 2000 | 0.005 | 24s | 0.10604 |
| 32-16 | 2000 | 0.005 | 39s | 0.10208 |
| 64-32-16 | 2000 | 0.005 | 47s | 0.08958 |
| 128-64-32-16 | 2000 | 0.005 | 76s | 0.09583 |
| 256-128-64-32-16 | 2000 | 0.005 | 138s | 0.09271 |

This tables shows the process of finding the best learning rate (with structure 64-32-16 and ).