Graph Convolutional Network

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Performing binary classification on given data set

1 Introduction

The objective is breast-cancer classification (two classes: "benign" and "malignant"). Data set contains 569 rows, where each row is a sample. In each row, the first entry denotes patient-id, the second denotes the ground-truth category, and 3-32 entries denote 30 real-valued input features.Data set is divided into 70 percent training set, 20 percent validation set and 10 percent test set.

2 Summary

GCNs are a very powerful neural network architecture for machine learning on graphs. In fact, they are so powerful that even a randomly initiated 2-layer GCN can produce useful feature representations of nodes in networks. Below are the results of analyses for several classifiers and comparison between them.

3 Experimental Results
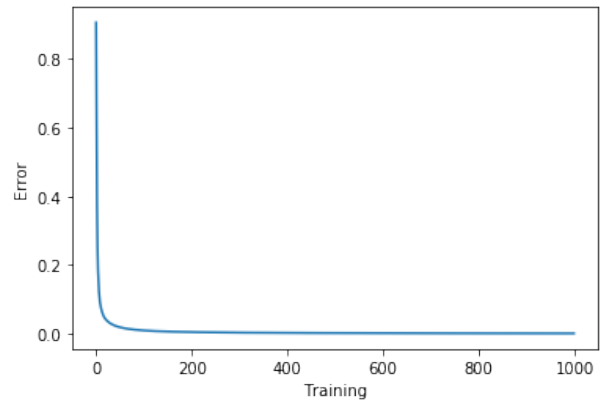
GCN training accuracy is given as follows.[1]

Figure 1: Training Vs. Error

Method for Classification	Accuracy Obtained
1. Graph Convolutional Network	
1.1 Training Accuracy	99.91%
1.2 Testing Accuracy	99.91%
1.3 Validation Accuracy	99.94%
2. Logistic Regression	93.85964912280701 %
3. K-Nearests Neighbour	94.73684210526315 %
4. Support Vector Machine	100.0 %

Figure 2: Results

4   Conclusion

GCN is much more effective as compared to other methods of classification, based on results I have obtained.

References

[1] Adeniyi Bello. Coding for 2 layer neural network. *Kaggle*, 2019.