Finding Optimized Machine Learning Model For Recognizing English Handwritten Digit

Nowfel Mashnoor
Roll: 1503069

Amir Faruk
Roll: 1503075

Abstract

This paper is about the comparison between different Machine Learning models(classifiers) trained and tested on MNIST dataset. For declaring a model as best, we only considered low error score. A standard machine learning library written in Python Programming Language is used during this research.

1 Introduction

Handwritten Digit Recognition has been very successful in recent years. A lot of research and studies has been done in recent years on it like Devnagari Handwritten Character Recognition[1]. Handwritten digit recognition technique is used in various fields like PDA, bank cheque, handwritten fields in form etc.[2] Using machine learning technique, which which can be briefly defined as enabling computers make successful predictions using past experiences, [3] handwritten digit recognition system is greatly improved. Handwritten Digit recognition is a supervised learning algorithm problem. There are many classifier in supervised learning like Neural Network, Decision Tree, Bayesian Network, Support Vector Machine(SVM), Random Forest etc[4]. A comparison study has been already done where *Base Linear Classifier, Baseline Nearest Neighbor Classifier, Large Fully Connected Multi-Layer Neural Network, Tangent Distance Clasifier(TDC), LeNet 4 With KNN, Optimal Margin Classifier* are compared among.[5] In our research we are going to compare among algo1, algo2, algo3. We will chose the best classifier among them based on their accuracy on testing set.

References

[1] U. Pal, T. Wakabayashi, and F. Kimura, "Comparative study of devnagari handwritten character recognition using different feature and classifiers," in *Document Analysis and Recognition, 2009. ICDAR'09. 10th International Conference on*, pp. 1111–1115, IEEE, 2009.

[2] R. Plamondon and S. N. Srihari, "Online and off-line handwriting recognition: a comprehensive survey," *IEEE Transactions on pattern analysis and machine intelligence*, vol. 22, no. 1, pp. 63–84, 2000.

[3] Y. Baştanlar and M. Özuysal, "Introduction to machine learning," in *miRNomics: MicroRNA Biology and Computational Analysis*, pp. 105–128, Springer, 2014.

[4] S. B. Kotsiantis, I. Zaharakis, and P. Pintelas, "Supervised machine learning: A review of classification techniques," *Emerging artificial intelligence applications in computer engineering*, vol. 160, pp. 3–24, 2007.

[5] Y. LeCun, L. Jackel, L. Bottou, C. Cortes, J. S. Denker, H. Drucker, I. Guyon, U. Muller, E. Sackinger, P. Simard, *et al.*, "Learning algorithms for classification: A comparison on handwritten digit recognition," *Neural networks: the statistical mechanics perspective*, vol. 261, p. 276, 1995.