Kings Engineering College

Department of Computer Science and Engineering

LITERATURE SURVEY

TITLE : A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM

DOMAIN NAME : Artificial Intelligence

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ABSTRACT

Due to the development of various Machine Learning, Deep Learning, and Computer Vision algorithms, handwritten digit recognition has recently attracted a lot of interest from researchers. In this report, we compare the outcomes of some of the most popular machine learning algorithms, such as CNN (convolutional neural networks) and multilayer CNN (using Keras, Theano, and Tensorflow), with those of deep learning algorithms. MNIST is a dataset which is widely used for handwritten digit recognition. The dataset consist of 60,000 training images and 10,000 test images. Artificial neural networks, which are a crucial component in the field of image processing, can most closely resemble the human brain. Convolution neural networks with back propagation, for instance, are used to process images. The banking industry, where it can be used to manage secure pin numbers, is one use for this handwritten digit recognition technology. It can also be utilised for blind persons by using sound output.

INTRODUCTION

This has been a subject of study for many years. Verifying signatures, processing bank checks, deciphering postal addresses from envelopes, and other research topics are some of them. Here comes the use of Deep Learning. In the past decade, deep learning has become the hot tool for Image Processing, object detection, handwritten digit and character recognition etc. A lotof machine learning tools have been developed like scikit-learn, scipy-image etc. and

pybrains, Keras, Theano, Tensorflow by Google, TFLearn etc. for Deep Learning. These tools make the applications robust and therefore more accurate. The Artificial Neural Networks can almost mimic the human brain and are a key ingredient in image processing field. For example, Convolutional Neural Networks with Back Propagation for Image Processing, Deep Mind by Google for creating Art by learning from existing artist styles etc..

LITERATURE SURVEY:

The author describes [1] The field of machine learning is a rapidly developing one. Recent developments in the field of image processing and machine learning has led to efficient extraction of features from images of peoples' faces. It is difficult to identify handwritten digits from images. It deals with the challenge of visual pattern recognition, which is made painfully clear when an attempt is made to create a computer software that can identify numbers. Our research's objective is to develop a model that can identify and ascertain the handwritten numbers from their image. We aim to complete this by using the concepts of Convolution Neural Network. The aim of our study is to open the way to digitalization.
Though the goal is to just to create a model which can recognize the digits but it can be extended to letters and then a person's handwriting. Through this work, we aim to learn and practically apply the concepts of Machine Learning and Neural Networks. Moreover, digit recognition is an excellent prototype problem for learning about neural networks and it gives a great way to develop more advanced techniques like deep learning.

The author describes [2] Hand written digit recognition is highly nonlinear problem. Recognition of handwritten numerals plays an active role in day to day life now days. Reading printed or handwritten papers and converting them to digital media is a very important and time-consuming operation in office automation, e-governors, and many other domains. Therefore, the system should be created in a way that allows it to read handwritten numerals and respond appropriately, much like humans do. However, handwritten digits are varying from person to person because each one has their own style of writing, means the same digit or character/word written by different writer will be different even in different languages.This paper presents survey on handwritten digit recognition systems with recent techniques,with three well known classifiers namely MLP, SVM and k-NN used for classification. This paper presents comparative analysis that describes recent methods and helps to find future scope

The author describes [3] A handwritten digit recognition system was used in a demonstration project to visualize artificial neural networks, in particular Kohonen's self-organizing feature map. The purpose of this project was to introduce neural networks through a relatively easy-to-understand application to the general public. This paper describes several techniques used for pre-processing the handwritten digits, as well as a number of ways in which neural networks were used for the recognition task. Whereas the main goal was a purely educational one, a moderate recognition rate of 98% was reached on a test set.

REFERENCES

[1] Dr.Kusumgupta2 ,"a comprehensive review on handwritten digit recognition using various neural network approaches", international journal of enhanced research in management & computer applications, vol. 5, no. 5, pp. 22-25, 2016.

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[3] Y LeCun,"COMPARISON OF LEARNING ALGORITHMS FOR HANDWRITTEN DIGIT RECOGNISATION". In International conference on Artificial Neural networks, France, pp. 53–60. 1995.