KINGS ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LITERATURE SURVEY

TITLE: A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM

TECHNOLOGY: ARTIFICIAL INTELLIGENCE

DOMAIN: EDUCATION

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ABSTRACT

Handwriting recognition has gained a lot of attention in the field of pattern recognition and machine learning due to its application in various fields. Optical Character Recognition (OCR) and Handwritten Character Recognition (HCR) has specific domain to apply. Various techniques have been proposed to for character recognition in handwriting recognition system. Even though, sufficient studies and papers describes the techniques for converting textual content from a paper document into machine readable form. In coming days, character recognition system might serve as a key factor to create a paperless environment by digitizing and processing existing paper documents. This paper presents a detailed review in the field of Handwritten Character Recognition.

INTRODUCTION

Character recognition is a fundamental, but most challenging in the field of pattern recognition with large number of useful applications. It has been an intense field of research since the early days of computer science due to it being a natural way of interactions between computers and humans. More precisely Character recognition is the process of detecting and recognizing characters from the input image and converts it into ASCII or other equivalent machine editable form [1][2].

The technique by which a computer system can recognize characters and other symbols written by hand in natural handwriting is called handwriting recognition system. Handwriting recognition is classified into offline handwriting recognition and online handwriting recognition [3]. If handwriting is scanned and then understood by the computer, it is called offline handwriting recognition. In case, the handwriting is recognized while writing through touch pad using stylus pen, it is called online handwriting recognition.

LITERATURE SURVEY

“In this paper, the mnist data set is used as handwritten digital historical data. The mnist data set is a very classic” “data set in the field of machine learning.”

“An early notable attempt in the area of digit recognition research was made. The origin of a great deal of” “exploration work in the early sixties was grounded on an approach known as analysis- by- conflation system.”

“In view of the increasing demand for handwritten digit recognition, a handwritten digit recognition model based” “on convolutional neural network is proposed. The model includes 1 input layer and 2 convolutional layers (5*5” “convolution Core), 2 pooling layers (2*2 pooling core), 1 fully connected layer, 1 output layer, and use the mnist” “data set for model training and prediction. After a lot of training and participation, the accuracy rate of the” “training set was finally reached to 100%, and the accuracy rate of 98.25% was also achieved on the test set, which” “can meet the requirements of recognizing handwritten digits[2].”

“With the humanization of machines, there has been a substantial quantum of exploration and development work” “that has given a swell to deep literacy and machine literacy along with artificial intelligence. With time, machines” “are getting Further and more sophisticated, from calculating the introductory totalities to doing retina recognition” “they've made our lives more secure and manageable. Likewise, handwritten text recognition is an important” “application of deep learning and machine learning which is helpful in detecting forgeries and a wide range of” “research has already been done that encompasses a comprehensive study and implementation of various popular” “algorithms like works done by S M Shamim [3], Anuj Dutt [4], Norhidayu binti [5] and Hongkai Wang [6] to” “compare the different models of CNN with the fundamental machine learning algorithms on different grounds like” “performance rate, execution time, complexity and so on to assess each algorithm explicitly. S M Shamim concluded” “that the Multilayer Perceptron classifier gave the most accurate results with minimum error rate followed by” “Support Vector Machine, Random Forest Algorithm, Bayes Net, Na¨ıve Bayes, j48, and Random Tree respectively” “while Anuj Dutt presented a comparison between SVM, CNN, KNN, RFC and were able to achieve the highest” “accuracy of 98.72% using CNN (which took

maximum execution time) and lowest accuracy using RFC. Norhidayu" "binti did the detailed study-comparison on SVM, KNN and MLP models to classify the handwritten text and" "concluded that KNN and SVM predict all the classes of dataset correctly with 98.25% accuracy but the thing" "process goes little complicated with MLP when it was having trouble classifying number 9, for which the authors" "suggested to use CNN with Keras to improve the classification."

"The comparison of the algorithms(Support vector machines,Multi-layered perceptron and Convolutional neural" "network) is grounded on the characteristic map of each algorithm on common grounds like dataset, the number of" "ages, complexity of the algorithm, delicacy of each algorithm, specification of the device(Ubuntu20.04 LTS, i5 7th" "word processor) used to execute the program and runtime of the algorithm, under ideal condition[7]."

REFERENCES

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