A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM

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LITERATURE SURVEY

S.NO	TITLE	AUTHORS	DESCRIPTION
1.	A Novel Method For Hand Written Digit Recognition Using Deep Learning	Rohini.M , Dr.D.Surendran	Handwritten digit recognition has recently been of very interest among the researchers because of the evolution of various Machine Learning, Deep Learning and Computer Vision algorithms. In this report, We compare the results of some of the most widely used Machine Learning Algorithms like CNN- convolution neural networks and with Deep Learning algorithm like multilayer CNN using Keras with Theano and Tensorflow. MNIST is a dataset which is widely used for handwritten digit recognition. The dataset consist of 60,000 training images and 10,000

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			test images.The artificial neural neworks can all most mimic the human brain and are a key ingredient in image processing field.For example Convolution Neural networks with back propagation for image processing.The applications where these handwritten digit recognition can be used are Banking sector where it can be used to maintain the security pin numbers, it can be also used for blind peoples by using sound output.
2.	A novel method for Handwritten Digit Recognition with Neural Networks	Malothu Nagu, N Vijay Shankar ,K.Annapurna	Character recognition plays an important role in the modern world. It can solve more complex problems and makes humans' job easier. An example is handwritten character recognition. This is a system widely used in the world to recognize zip code or postal code for mail sorting. There are different techniques that can be used to recognize handwritten characters. Two techniques researched in this paper are Pattern Recognition and Artificial Neural Network (ANN). Both techniques are defined and different methods for each technique is also discussed. Bayesian Decision theory, Nearest Neighbor rule, and Linear Classification or Discrimination is types of methods for Pattern Recognition. Shape recognition, Chinese Character and Handwritten Digit recognition uses Neural Network to recognize them. Neural Network is used to train

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			and identify written digits. After training and testing, the accuracy rate reached 99%.This accuracy rate is very high.
3.	A Novel Handwritten Digit Classification System Based on Convolutional Neural Network Approach	Ali Abdullah Yahya, Jieqing Tan and Min Hu	An enormous number of CNN classification algorithms have been proposed in the literature. Nevertheless, in these algorithms, appropriate filter size selection, data preparation, limitations in datasets, and noise have not been taken into consideration. As a consequence, most of the algorithms have failed to make a noticeable improvement in classification accuracy. To address the shortcomings of these algorithms, our paper presents the following contributions: Firstly, after taking the domain knowledge into consideration, the size of the effective receptive field (ERF) is calculated. Calculating the size of the ERF helps us to select a typical filter size which leads to enhancing the classification accuracy of our CNN. Secondly, unnecessary data leads to misleading results and this, in turn, negatively affects classification accuracy. To guarantee the dataset is free from any redundant or irrelevant variables to the target variable, data preparation is applied before implementing the data classification mission. Thirdly, to

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			decrease the errors of training and validation, and avoid the limitation of datasets, data augmentation has been proposed. Fourthly, to simulate the real-world natural influences that can affect image quality, we propose to add an additive white Gaussian noise with σ = 0.5 to the MNIST dataset. As a result, our CNN algorithm achieves state-of-the-art results in handwritten digit recognition, with a recognition accuracy of 99.98%, and 99.40% with 50% noise
4.	A Novel Method for Persian Handwritten Digit Recognition Using Support Vector Machine	Mojtaba Mohammadpoor, Abbas Mehdizadeh, Hava Alizadeh Noghabi	Handwritten digit recognition has got a special role in different applications in the field of digital recognition including; handwritten address detection, check, and document. Persian handwritten digits classification has been facing difficulties due to different handwritten styles, inter-class similarities, and intra-class differences. In this paper, a novel method for detecting Persian handwritten digits is presented. In the proposed method, a combination of Histogram of Oriented Gradients (HOG), 4-side profiles of the digit image, and some horizontal and vertical samples was used and the dimension of the feature vector was reduced using Principal Component Analysis (PCA). The proposed method applied to the

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			HODA database, and Support Vector Machine (SVM) was used in the classification step. Results revealed that the detection accuracy of such method has 99% accuracy with an adequate rate due to existing unacceptable samples in the database, therefore, the proposed method could improve the outcomes compared to other existing methods.