

S.NO	JOURNAL PAPER TITLE	AUTHOR'S NAME	SOURCE	FINDINGS
1.	A Novel Technique for Handwritten Digit Classification using Genetic Clustering	S. Impedovo, F. M. Mangini	IEEE	<p>The aim of this paper is to introduce a novel technique for handwritten digit recognition based on genetic clustering. Cluster design is proposed as a two-step process. The first step is focused on generating cluster solutions, while the second one involves the construction of the best cluster solution starting from a set of suitable candidates. An approach for achieving these goals is presented. Clustering is considered as an optimization problem in which the objective function to be minimized is the cost function associated to the classification. A genetic algorithm is used to determine the best cluster centers to reduce classification time, without greatly affecting the accuracy. The classification task is performed by k-nearest neighbor classifier. It has also been developed a new feature and a distance measure based on the Sokal-Michener dissimilarity measure to describe and compare handwritten numerals. This technique has been</p>

				evaluated through experimental testing on MNIST dataset and its effectiveness has been proved.
2.	A Novel method for Handwritten Digit Recognition with Neural Networks	Malothu Nagu,N VijayShankar	IJCSIT	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 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	Research Gate	<p>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</p>

				any redundant or irrelevant variables to the target variable, data preparation is applied before implementing the data classification mission.
4.	Handwritten Digit Recognition using Deep Learning	Rohini.M , Dr.D Surendran	Technical Research Organisation	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 test images.The artificial neural networks 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

				<p>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.</p>
5.	A Novel method for Isolated Handwritten Arabic Characters	Ahmeed Talat,Chen Suen	Research Gate	<p>There are many difficulties facing a handwritten Arabic recognition system such as unlimited variation in human handwriting, similarities of distinct character shapes, interconnections of neighbouring characters and their position in the word. The typical Optical Character Recognition (OCR) systems are based mainly on three stages, preprocessing, features extraction and recognition. This paper proposes new methods for handwritten Arabic character recognition which is based on novel preprocessing operations including different kinds of noise removal also different kind of features like structural, Statistical and Morphological features from the main body of the character and also from the secondary components. Evaluation of the accuracy of the selected features is made. The system was trained and tested by back</p>

				propagation neural network with CENPRMI dataset. The proposed algorithm obtained promising results as it is able to recognize 88% of our test set accurately. In Comparable with other related works we find that our result is the highest among other published works.
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