

Ideation Phase

Literature Survey

Date	19 September 2022
Team ID	PNT2022TMID53487
Project Name	A Novel Method for Handwritten Digit Recognition System

S.no.	Title	Author	Year	Findings
1	Handwritten Digit Recognition Based on Convolutional Neural Network	Chao Zhang; Zhiyao Zhou; Lan Lin	2020	This paper proposes a new type of handwritten digit recognition system based on convolutional neural network (CNN). With the trained deep learning model, a recognition accuracy of 97.3% in test process.
2	Novel Deep Neural Network Model for Handwritten Digit Classification and Recognition	Ayush Kumar Agrawal and Vineet Kumar Awasthi	2021	The suggested model in the paper consists of six layers with softmax and relu activation functions. After model implementation, accuracy for ARDIS samples reached 98.70% testing and 99.76% training, which is greater than

				accuracy from prior research.
3	Intelligent handwritten digit recognition using artificial neural network	Saeed Al Mansoori	2015	It was developed by using the method called Neural Network and Gradient descent back propagation algorithm. The proposed system was proved efficient with an overall training accuracy of 99.32% and testing accuracy of 100%. Larger number of datasets to be trained in this process, it takes large amount of time to train the whole datasets.
4	Handwritten Character Recognition using Neural Network and TensorFlow	Megha Agarwal, Shalika, Vinam Tomar, Priyanka Gupta	2019	The training algorithm used is Convolution Neural Network. The paper will describe the best approach to get more than 90% accuracy in the field of Handwritten Character Recognition (HCR). The offline handwritten character recognition in this study will be carried out using Tensorflow and a convolutional neural network. a process known as using SoftMax

				Regression.
5	Improved Handwritten Digit Recognition Using Convolutional Neural Networks (CNN)	Savita Ahlawat , Amit Choudhary , Anand Nayyar , Saurabh Singh and Byungun Yoon	2020	an appropriate combination of learning parameters in the design of a CNN that leads us to a new absolute record in categorising MNIST handwritten digits. We conducted extensive trials and achieved 99.87% recognition accuracy for an MNIST dataset.
6	A novel method for handwritten digit recognition using deep learning	M. Nagu, N. Shankar, K. Annapurna	2011	By using the Convolution Neural Network we can be able to get an accuracy of 95.72%. Sometimes it doesn't provide the appropriate solution based on input
7	A Novel Handwritten Digit Classification System Based on Convolutional Neural Network Approach	Ali Abdullah Yahya, Jieqing Tan, Min Hu	2021	the paper suggests adding an additive white Gaussian noise with a threshold of 0.5 to the MNIST dataset in order to imitate the natural factors that can affect image quality in the real world. With a recognition accuracy of 99.98% and 99.40% with 50%

				noise, our CNN algorithm achieves state-of-the-art performance in handwritten digit recognition.
8	Effective Handwritten Digit Recognition using deep convolution Neural Networks	Bharadwaj Yellapragada ;Bhanu PRAKASH Kolla	2020	By using theDeepconvolution,it works onthepatternsinlowDi mension SpacewhereScaling is 2000timeslesserresults with99.25%accuracyT he proposedsystemwassu rprisingly higher whencompared tomanyotherapproach es with97%Accuracy.
9	Handwritten Digit Recognition Using Image Processing and Neural Networks	Faisal Tehseen Shah ; Yousaf Kamran	2022	The systemnot onlyproduces aclassificationofthe digit but alsoarichdescriptionof theinstantiationparame terswhichcanyieldinfo rmationsuchasthewriti ng styleThe generativemodelscanp erformrecognitiondriv ensegmentation
10	A trainable feature extractor for handwritten digit recognition	Fabien Lauer, Ching Y. Suen, Gérard Bloch	2007	In order to increase the recognition rate, new training samples are generated by affine transformations

				<p>and elastic distortions. Experiments are performed on the well-known MNIST database to validate the method and the results show that the system can outperform both SVMs and LeNet5 while providing performances comparable to the best performance on this database.</p>
11	<p>Recognition of isolated and simply connected handwritten numerals and Pattern Recognition</p>	<p>M Shridhar ; A Badreldin</p>	1986	<p>In this paper the authors describe the results of their investigation into the development of a recognition algorithm for identifying numerals that may be isolated or connected, broken or continuous using a structural classification scheme, the recognition algorithm is derived as a tree classifier. In an extensive test experiment, an accuracy of 99% was realized with isolated numerals. When connected numerals were also included a recognition accuracy</p>

				of 93% was obtained.
12	Handwritten digit recognition by neural networks with singlelayer training	S. Knerr; L. Personnaz; G. Dreyfus	1992	It is shown that neural network classifiers with single-layer training can be applied efficiently to complex real-world classification problems such as the recognition of handwritten digits. The STEPNET procedure, which decomposes the problem into simpler subproblems which can be solved by linear separators, is introduced.