ANNAMALAIAR COLLEGE OF ENGINEERING

MODAIYUR

A NOVEL METHOD FOR HANDWRITTEN DIGIT RECOGNITION SYSTEM

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PROBLEM STATEMENT

The handwritten digit recognition is the capability of computer applications to recognize the human handwritten digits. It is a hard task for the machine because handwritten digits are not perfect and can be made with many different shapes and sizes.

The handwritten digit recognition system is a way to tackle this problem which uses the image of a digit and recognizes the digit present in the image. Convolutional Neural Network model created using Torch library over the MNIST dataset to recognize handwritten digits

Handwritten Digit Recognition is the capability of a computer to fete the mortal handwritten integers from different sources like images, papers, touch defenses, etc, and classify. them into 10 predefined classes (0-9).

This has been a Content of bottomless- exploration in the field of deep literacy. Number recognition has numerous operations like number plate recognition, postal correspondence sorting, bank check processing, etc . (2). In Handwritten number recognition,   we face numerous challenges . because of different styles of jotting of different peoples as it . is not an Optic character recognition. This exploration provides a comprehensive comparison between different machine literacy and deep literacy algorithms for the purpose of handwritten number recognition. For this, we've used Support . Vector Machine, Multilayer Perceptron, and Convolutional .

 The comparison between these algorithms is carried out on the base of their delicacy, crimes, and .testing- training time corroborated by plots and maps that have been constructed using matplotlib for visualization.

Datasets Details : -

The **MNIST dataset** is an acronym that stands for the Modified National Institute of Standards and Technology dataset.

It is a dataset of **60,000 small square 28×28 pixel grayscale images** of handwritten single digits between **0 and 9**.

The task is to classify a given image of a handwritten digit into one of 10 classes representing integer values from 0 to 9, inclusively.

It is a widely used and deeply understood dataset and, for the most part, is "solved." Top-performing models are deep learning convolutional neural networks that achieve a classification accuracy of above 99%, with an error rate between 0.4 %and 0.2% on the hold out test dataset.

Handwritten character recognition is an extensive exploration area that formerly contains detailed ways of perpetration which include major literacy datasets, popular algorithms, . features scaling and

point birth styles. **MNIST dataset** (Modified National Institute of Norms and Technology database) is the subset of the NIST dataset which is a combination of two of NIST's databases Special. Database 1 and Special Database 3. Special Database 1 and Special Database 3 correspond of integers written by high academy scholars and workers of the United States Census Bureau,. independently. MNIST contains a aggregate of handwritten . number images (- training set and- test set) in . 28x28 pixel bounding box andanti-aliased. All these images have corresponding Y values which apprises what the number

Implementation Steps : -

1. Import the libraries and load the dataset
2. Preprocess the data
3. Create the model
4. Train the model
5. Evaluate the model
6. Create GUI to predict digits