**HAND WRITTEN DIGIT RECOGNITION**

**USING ML (Deep Learning Approach)**

**LITERATURE SURVEY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No** | **Title of Paper** | **Name of Authors** | **Published Year** | **Remarks** |
| 1 | Handwritten Digit Recognition using Machine  Learning Algorithms | 1)S M Shamim  2)Mohammad Badrul Alam Miah  3) Masud Rana | 2018 | **METHODOLOGY:**  Presents an approach to off-line  handwritten digit recognition based on different machine  learning technique.  **ALGORITHMS:**   * SVM * J48 * Random Forest Algorithm * Naïve Bayes * Baye’s Net   **ADVANTAGES:**  Highest 90.37% accuracy has been  obtained for Multilayer Perceptron.  **DISADVANTAGES :**  Require large amount of data.  **APPLICATIONS:**  Maily used in health care. |
| 2 | Convolutional Vision Transformer for Handwritten Digit Recognition | 1)Vanita Agrawal  2)Jayant Jagtap | 2022 | **METHODOLOGY:**  Convolutional neural networks (CNN)  EMNIST-digit and DIDA datasets.  **ALGORITHMS:**  Vision Transformers (ViTs) and Multilayer Perceptrons (MLPs)  **ADVANTAGES:**  The proposed method is robust, feasible, and effective on clean and uncleaned images.  **DISADVANTAGES:**  The proposed method is done only on a single digit dataset. |
| 3 | Handwritten digits recognition with decision tree classification: a machine learning approach. | Tsehay Admassu Assegie,  Pramod Sekharan Nair | 2019 | **METHODOLOGY:**  A decision tree classification model.  **ALGORITHMS:**  Feed-forward algorithm  **ADVANTAGES:**  Fast and simple.  **DISADVANTAGES :**  Comparatively less accuracy (83.4%) |
| 4 | A Hybrid Deep Learning Model for Handwritten Digit Recognition | M. Ahmad,  A.Basit | 2021 | **METHODOLOGY:**  combines the features learned from convolutional neural networks (CNNs) and deep belief networks (DBNs).  **ALGORITHMS:**  CNNs, DBNs  **ADVANTAGES:**  The hybrid model achieves high accuracy on the MNIST dataset  **DISADVANTAGES:**  Proposed model requires a large amount of training data and computational resources.  **APPLICATIONS:**  postal services, banking, and education. |
| 5 | A Comparative Study of Handwritten Digit Recognition Using Deep Learning Techniques | A.Shrestha,  S.Prasai | 2020 | **METHODOLOGY:**  A comparative study of various deep learning techniques including CNNs, RNNs, LSTM  **ALGORITHMS:**  CNNs, RNNs, LSTM  **ADVANTAGES:**  To find the strengths and weaknesses of different deep learning techniques.  **DISADVANTAGES :**  It is only limited for MNIST Dataset.  **APPLICATIONS:**  Used as a reference for researchers and practitioners. |