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Literature Survey

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| S.NO | TITLE OF PAPER | NAME OF AUTHORS | PUBLISHED YEAR | REMARKS |
| 1. | Hand Written Digit Recognition using Machine Learning | Rohan Sethi,  Ila Kaushik | 2020 | Methodology:  Optimal Character Recognition(OCR) and Optical Character Reader(OCR)  MNIST(Modified National Institute of Standards and Technology) Dataset is used  Algorithms:  K- Nearest Neighbour Algorithm(KNN)  Advantages:  1.No Training Period(KNN is called Lazy Learner)  2. New data can be added seamlessly  3.KNN is very easy to implement(It has only 2 Parameters Value of K and the Distance Function)  Disadvantages:  1.KNN is sensitive to noise in the dataset  2.Always needs to determine the value of K  3.Computational cost is high  Applications:  1. It is efficiently utilised by the visionless and visually impaired  2.Used by banks to digitize documents.  3.Barcode Recognition  4.Number Plate Recognition  5.Education  6.Finance |
| 2. | Handwritten Digit Recognition Using CNN | Mayank Jain,  Gagandeep Kaur,  Muhammad Parvez Quamar | 2021 | Methodology:  Some Libraries such as NUMpy,Pandas,TensorFlow,Keras  Algorithms:  CNN(Convolution Neural Network)  It has 4 layers:  1. Convolution Layer  2. ReLu Layer  3. Pooling Layer  4. Fully connected Layer  Advantages:  1. High accuracy in Image Recognition  2. Automatically detects the Important Features without Human regulation  Disadvantages:  1. CNN doesnot encode the Position and Orientation of Object  2. Lack of ability to be spatially invariant to the Input data  3. More amount of training data is required  Applications:  1.Decoding Facial Recognition  2.Analysing Documents  3. Understanding Climate  4.Advertising  5. Driverless cars  6.Predicting Earthquakes and Natural Disasters  7. Robots that can mimic human behaviour |
| 3. | Handwritten Digit Recognition using Machine and Deep Learning Algorithms | Ritik Dixit,  Rishika Kushwah,  Samay Pashin | 2021 | Methodology:  MNIST data set is used which consists of a combination of two NIST dataset  1. Special Database1 - Which consists of digits written by high school students  2. Special Database3 - Which consists of employees of the United States Census Bureau  \* To visualize the information obtained by the detailed analysis of algorithms  we have used bar graphs and tabular format charts using module matplotlib,  which gives us the most precise visuals of the step by step advances of the  algorithms in recognizing the digit.  Algorithm:  CNN , SVM, MLP  1. SVM(Support Vector Machine) - 2 types ---  (i) Linear SVM - Used in this Paper  (ii) Non-Linear SVM  Advantages:  1. The Training and Testing sets have atmost Accuracy  2. SVM has the highest accuracy on training data  3. CNN accomplishes the utmost accuracy on testing dataset  Disadvantages:  1. CNN accounts Maximum running time  2. SVM,due to its simplicity, it’s not possible to classify complex and  ambiguous images as accurately as achieved with MLP and CNN algorithms  3. Increasing the number of epochs without changing the configuration  of the algorithm is useless because of the limitation of a certain model and gives  us biased prediction  Applications:  1. Face Recognition  2. Handwriting Recognition  3. Medicinal Imaging |
| 4. | Bangla Handwritten Digit Recognition Using an Improved Deep Convolutional Neural Network Architecture | Chandrika Saha, Rahat Hossain Faisal,  Md. Mostafijur Rahman | 2019 | Methodology:  Concept of Water Flow, Seven layered D-CNN,CMATER  database is used  Windows 7 machine containing Intel core i5-3470 CPU  with 8 GB RAM and 4GB NVIDIA GeForce 1050 Ti graphics  card  Algorithm:  Deep Convolutional Neural Network Architecture  It consists of 3 layers- Convolution Layer,Pooling layer and  Fully connected layer  Advantages:  1. Provide in-depth Results  2. It recognises patterns and details that are minute  Disadvantages:  1.Understanding the contents of an image fails  2.Power and resource Complexity  Applications:  1.Used to moderate Social Media Content  2.Facial Recognition  3.Image Search and editing |
| 5. | Mobile Client- Server Approach for Handwriting Digit Recognition | Hasbi Ash Shiddieqy,  Trio Adiono,  Infall Syafalni | 2019 | Methodology:  LeNet5 is one of the basic and significant CNN architecture  that designed for handwritten recogintion  Tensorflow is the platform to predict digit recognition  Algorithm:  Artificial Neural Network(ANN) and  Convolution Neural Network(CNN) based in Lecun2  Advantages:  The advantage of a client-server-based system is proven,  highly scalable, easy to integrate, low cost  Disadvantages:  Disadvantages of the client-server based system eliminate  the ability to run offline, concern in data privacy and  protection, the cost for service managing servers  Applications:  Social Media, Personal Assistants like Siri, Alexa,etc., |