

## Literature Survey

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| S.NO | TITLE OF THE PAPER   | Authors                      | PROBLEMS ADDRESSED BY THE PAPER   | METHODOLOGY USED  | LIMITATION OF THE SYSTEM  |
|------|--|------------------------------|---|---|---|
| 1    | Handwritten Digit Recognition Using Various Machine Learning Algorithms and Models           | Pranit Patil, Bhupinder Kaur | In this paper we use various Machine Learning algorithms to enhance the productiveness of technique and reduce the complexity using various models.               | 1)K-Means<br>2)K-star<br>3)Decision Tree  | It does not contain enough data for recognize all the digits. Accuracy is very low  |
| 2    | A comparison of three classification algorithms for the identification of handwritten digits | R.G Jadhav                   | One of the most popular problem is Skin color detection. The identification and extraction of hands from a cluttered and dynamic background poses another problem | Comparison of three classification algorithms<br>In other terms<br>Multilayer Perceptron (MLP),<br>Naive Bayes(NB),<br>and K-Star | After Evaluation for all algorithms on 46K instances with 10 cross validations for these K-star get highly accuracy of 82.36% follow by NB of 67.04% then MLP by 78.35%.<br>Algorithm: K-Star |

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| 3 | Development of a high precision handwritten digit recognition detector based on a Convolution-Neural Network | Sonia Flora, Anju kakkad         | Skin color recognition .  | Determine accuracy and efficiency using Convolutional neural network with two layers on with 32 images and another with 64 images with some neurons on each layer.                          | After completion of training with dataset the accuracy of neural network was found to be 92.6% for training set and for test set it was 90.1%. Convolutional neural network is much accurate in-depth learning models and give excellence performance.<br>Algorithm: CNN |
| 4 | Own Handwritten Digit recognition using MLP and CNN in tensorflow  | Deepti D.Nikumbh, Rupali S. Kale | Object recognition in image is very popular and is widely used in almost all image processing applications. Handwritten digit recognition system is one such application. | Author has focused mainly on neural network approaches. Three approaches compared and evaluated for their accuracy and efficiency. Author concluded with more efficient approach as DNN.[7] | For CNN, it is observed that its architecture is complex hence difficult to implement and takes more time to train and test  |
| 5 | HANDWRITTEN DIGIT RECOGNITION USING OPENCV AND CNN   | K. Swetha, Y. Hithaishi,         | Handwritten Digit Recognition (HDR) is the process of converting images of handwritten digit into digital format. A lot of money is wasted on                             | In the classification and recognition step, the extracted feature vectors are given as single input values to each classifier. CNN Convolution layer and the subsampling                    | It requires large amount of data and low quality pixel images are not recognized.  |

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|  |  |  | <p>converting the information that is in paper to digital format. This problem can be solved by using HDR.</p> | <p>layer can have various different layers . The down sampling layer is also known as pooling layer . The image is divided into small segments of small areas, and a value is calculated for each area. Then the calculated values are rearranged in sequence to form a new image .</p> |  |
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