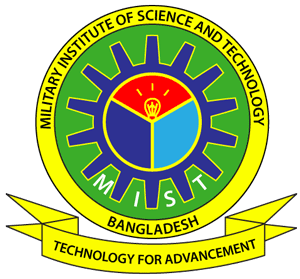
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**Handwritten Digit Recognition**

Group no-04

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**Introduction**

The main purpose of the system is to recognize the handwritten English digits by using Support Vector Machine(SVM). Here we captured handwritten digit images from Microsoft Paint and used it as a dataset to train the machine. Several image processing methods are used to convert those images before fitting them on the SVM. Then we use Microsoft Paint to draw a digit and our system captures the drawing on the Paint after every 10 seconds and predicts the digit and converts it into speech. The accuracy of our system is about 97%.

**Methodology**

The most important thing for a machine learning project is what kind of dataset we are using to fit the machine. Here we used the real-time dataset which is a collection of drawn digits at Microsoft Paint. For increasing the accuracy of the machine learning model, we have used a set of image processing techniques given below:

1. First of all, we have converted the BGR image into Grayscale
2. Now for reducing the noise and smoothing the image we have used Gaussian Blur Effect
3. Then resize the image as 28\*28 pixels
4. Each pixel value is converted as either 0 or 1

After conversion, we fit the converted data into the machine learning model.

Now for prediction, we again use Microsoft Paint to draw the digit. Then the system captured the drawing on Paint and try to predict the digit captured from Paint. After every 10s the system captures the drawing on Paint and predicts the digit. Before each prediction, the image processing techniques mentioned above are used. After that, the recognized digit is converted into speech.

**Result Discussion**

The system’s accuracy is about 97%. If we draw a digit on Paint, we get the digit as well as the speech. The system cannot predict the correct digit all the time and the accuracy varies between 94-98% sometimes. By increasing the number of datasets and varieties of images, prediction could be done more accurately.