AI ML Project Update-01 Report

Group No - 44
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Project Idea : **Handwritten Number recognition**

Description :

We want to develop a system that can lebel any handwritten image with appropriate numbers. First we have to train a model with a labeled data set and then measure the accuracy of the model using a testing data set.

What we have done so far!

- We are doing a Coursera ML online course by Andrew Ng (almost 50% completed) and hope to finish by the end of May.
- We have different dataset handwritten digit from kaggle.Their link ar given below
- MNIST Dataset Dataset:https://www.kaggle.com/competitions/digit-recognizer/data
- Housing Street Number Dataset https://www.kaggle.com/competitions/recognize-a-street-view-house-number/overview

Dataset description :

MNIST dataset : It has two portions, training and testing data.In this case the images are 28x28 pixels, and represented in gray scale.

Housing Street Number Dataset: This data is collected from google street view, sized in 32X32 pixels,total 73257 images.

AI ML Project Update-02 Report
Handwritten Bangla Number Recognition

Our Approach:

1. Build a digit (০-৯) classifier using a CNN architecture.
2. Apply character segmentation for the handwritten number image.
3. Classify each segmented digit and then get the final number in the image

Dataset : We used Ekush dataset which contains bangla digit images.

Total Number of image Data : **30,687**
Mean Number of image Data per digit : **3068**
Number of Training Data : **24546 (80%)**
Number of Validation Data : **6141 (20%)**
Input Image Dimension : **32x32 pixel**

Model Description :

We are using the CNN sequential model. In a total of three layers we use filters of size 32 , 64 and 128 sequentially. And we use a kernel of fixed size 3x3 in each case. We perform two max-pooling operations in between. After flattening 512 nodes gets generated which then mapped against 128 nodes in the dense layer . Finally the model outputs 10 classes each representing bengali digits from ০ to ৯ .

Segmentation :

Firstly we convert the input image to grayscale. Then images of individual digits are separated and forwarded to the digit recognizer. Finally, predicted individual digits are assembled together to form the corresponding number.

Limitations :

1. The digit recognition system can not segment multiple numbers in a single image
2. It can not detect number with other characters correctly(‘’১১-১২”, “৫,৫৫০”)

Project Github Link : Handwritten Bangla Number Recognition