Optical Digit Recognition

In this project, we’ll create an ML model to recognise digits from a clicked photograph and print the exact number on an android application screen.

Checkpoints:

# Create a Machine Learning algorithm to work on the MNIST digit dataset to train itself and predict the specific digits from the test set.

Consider that the dataset contains pixel value of 60000 images in the “train.csv” folder provided in the “Mymodel” folder.

We’ll divide the dataset into train set and test set : 40000 labelled images for training set and rest other unlabelled images for the test set.

Then we’ll use Random Forest classifier from sklearn to predict the unlabelled images from the test set.

# For image processing, we’ll write code to read the digits from the photograph using OpenCV library.

The MNIST digit dataset contains grayscale images. So to convert the any colour image to it’s grayscale equivalent, we need to process it.

The value for pure black color is 0 and the value for pure white colour is 255. So, we’ll transform them accordingly. Also MNIST dataset contains images of 28 X 28 = 784 pixels. But, our images of digits may not be that much, so we’ll crop, resize and pad up all the individual images of each digit.

The source code for image processing is present in “Image\_Processing” folder with the name: “image\_processing.py”.

LIBRARIES REQUIRED:

What do I need to install all python libraries?

To install the mentioned libraries you would need to make sure that your python installation also has pip installed and setup correctly.

What is pip?

pip is a package-management system used to install and manage software packages written in Python.

How to check if pip is installed?

To check if pip is correctly installed on your system, run the following commands:

● For Windows & Ubuntu both : pip

How to install pip?

If you see that this command doesn’t work, you need to install pip. To do that follow the below-given instructions:

1. Save the pip installation script from the url [https://bootstrap.pypa.io/get-pip.py on your system](https://bootstrap.pypa.io/get-pip.py%20on%20your%20system).

2. Open the command prompt (or terminal), navigate to the location where you saved the pip installation script & run the following command python get-pip.py

Installing numpy :

● On Windows ○ pip install numpy

● On Ubuntu ○ sudo pip install numpy

Installing pandas :

● On Windows ○ pip install pandas

● On Ubuntu ○ sudo pip install pandas

Installing sklearn :

● On Windows ○ pip install sklearn

● On Ubuntu ○ sudo pip install sklearn

Installing opencv :

● On Windows ○ pip install opencv-python

● On Ubuntu ○ sudo pip install opencv-python

Installing PIL :

● On Windows ○ pip install pillow

● On Ubuntu ○ sudo pip install pillow

Installing flask

● On Windows ○ pip install flask

● On Ubuntu ○ sudo pip install flask

Installing matplotlib :

● On Windows ○ pip install matplotlib

● On Ubuntu ○ sudo pip install matplotlib

**Other necessary applications:**

6) PuTTy and PuTTygen SSH Client and Key Generator. These will be used to connect to AWS.