Handwritten Character Recognition with Convolutional Neural Network

CNN

In this project I use Convolutional Neural Network (ConvNet/CNN), CNN is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other. I create a model with is algorithm which recognize alphabetic character in image. The follow this following step-by-step process to execute this project from development to deployment.

Step 1

Download dataset - Clean dataset

Download dataset as images in CSV format with its label. And then clean this dataset by extracting its label value and convert pixel values to image, putting all image in directories according to it label, separate this dataset for train and test sets of images.

Step 2

Train Model

Explore the training set i.e. find frequency of distinct labels in train set and plot its histogram. Using Tensorflow's high level API Keras create 2 layers of CNN and then 3 layer of DNN(Deep Neural Network) to build my classification model. Save that model for validation.

Step 3

Evaluate Model

Import saved model and evaluate model on test dataset of image. Check how accurately this trained model classify image of test data and record its accuracy value. if test accuracy is satisfactory then this model is approved to use for classification.

Step 4

Visualization - Web interface

Visualize how different layers of CNN convert image in different layers and find features of the images to classify that image. Then create a interactive web interface using css, html and python package flask to classify character of uploaded image.

Step 5

Deployment on AWS

Deploy this web app on cloud AWS to use it from anywhere and anytime for classification of character in this image.