HANDWRITTEN TEXT CLASSIFICATION USING DEEP LEARNING

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ABSTRACT

Character recognition is one of the important techniques to recognize Handwritten English character using optical character recognition model. After recognizing text, we use google translate API to translate recognized text to another language. Character is identified by studying its shape and comparing its features that differentiate each character. This process will be repeated till every character is recognized. This system helps to recognize and translate recognized text to another language. The system was trained using 1500 samples of handwritings given by both male and female participants of distinct age groups. Test result was performed on 500 samples different from training data and we got good recognition accuracy of 94% for recognition and translating to different language.

Keywords- Pre-processing; Optical character recognition; CNN; RNN; Feature Extracting; Google translate API.

I. INTRODUCTION

Image processing can be a control of images inside PC vision. Along with occasion based on innovation, there were numerous strategies for the control of photos. The content recognition remembers an enormous job for some regions. Yet, it's hard to attempt to do such an undertaking next to a machine. For undergoing recognition, we have to mentor the framework to recognize content. character recognition includes a few stages like procurement, highlight extraction, grouping, recognition. Neural figuring can be a nearly new field, and style parts were consequently slighter all around determined than that of other engineering. Neural PCs execute the information in parallelism. A neural PC works in a manner which is totally not quite the same as the activity of standard PC. Neural PCs were prepared and that they do not appear to be customized. With goal that the given information was contrasted with the prepared framework and gives the worthy yield content to the client.

Human Text Recognition was undertaking of deciphering Handwritten content into advanced content. It is an innovation that is genuinely necessary in this world starting today. Before legitimate execution of this innovation, we have depended on composing writings with our own hands which can bring about mistakes. It's hard to store and access actual information with productivity. Difficult work is needed to keep up legitimate association of the information. From the beginning of time, there has been extreme loss of information in light of the customary technique for putting away information. Advanced innovation is allowing individuals to store the information over machines, where the capacity, association and getting to of information is generally simpler [2]. Besides, it gives greater security to the information.

The essential explanation is that various individuals have various styles of composing. The optional explanation is there are parcel of characters like Capital letters, Small letters, Digits and Special images. Along these lines a huge dataset is needed to prepare a close exact neural organization model. Written by hand Text Recognition (HTR) is partitioned into on the web and disconnected recognition. Online recognition is performed while the content to be perceived is composed (for example by a pressing factor affectability gadget), in this manner mathematical and transient data is accessible. Disconnected recognition, then again, is performed after the content has been composed. The content is caught (for example by a scanner) and the subsequent images are prepared.
To assemble the Handwritten Text Recognition model (HTR), the neural organization is prepared word-images from IAM dataset. The proposed framework makes use of Artificial Neural Networks (ANNs). Different Convolutional Neural Network (CNN) layers are prepared to remove applicable highlights from the input image. These layers yield a 1D or 2D component guide (or arrangement) which is given over to the Recurrent Neural Network (RNN) layers. The RNN engenders data through the arrangement[7]. A short time later, the yield of the RNN is planned onto a grid which contains a score for each character per succession component. As the ANN is trained using a particular coding plan, a deciphering calculation should be applied to the RNN yield to get the last content[8][9]. Preparing and disentangling from this framework is finished by the Connectionist Temporal Classification (CTC) operation.

The primary goal of my venture is to improve exactness when we train on passage information. With the assistance of CNN and RNN calculations we can accomplish great exactness when we train on section sort of information. The hand record can without much of a stretch distinguish by people. Various dialects have various examples to spot. People can distinguish the content precisely. The hand record can't be recognized by machine. It's hard to recognize the content through the framework[10][11]. During content recognition, we would measure information image, extraction of highlights, and order blueprint happens, preparing of framework to recognize the content. On this methodology, framework is prepared to search out likenesses, and furthermore the distinctions among the different Handwritten examples[12][13].

II. RELATED WORK

K. Gaurav, Bhatia P. K. [1] Et al, paper manages the different pre-preparing strategies associated with character recognition with various sort of images goes from straightforward Handwritten structure based reports, records containing hued, complex foundation and changed forces. In this, extraordinary preprocessing strategies like slant identification and revision, image upgrade the methods of difference extending, binarization, commotion evacuation procedures, standardization along with division, morphological processing procedures were talked about. It is reasoned utilizing a solitary method for preprocessing, we cannot totally handle image.

A. Brakensiek et al[2][3] in this paper framework for the disconnected cursive recognition was depicted that depends on Hidden Markov Models (HMM) utilizing separate and mixture displaying procedures.

Bajaj et al[4] has utilized three distinct styles of highlights, for example, the thickness highlights, second highlights, and, clear segment highlights for characterization of the Devanagari Numerals. Sandhya Arora et al [5][15], utilized four element extraction methods in particular, convergence, shadow highlight, chain code histogram, straight line fitting highlights.

Mohammed et al[6][14], this paper depicts which Recognition of characters enormously relies on highlights utilized. A few highlights of the written by hand Arabic characters are chosen and examined. Further upgrades were accomplished by utilizing highlight freight dependent on bits of knowledge acquired from exactness of individual highlights.

III. PROPOSED SYSTEM

The proposed model “Hand written recognition using deep learning techniques” is based on the new technologies which makes the whole process efficient. It is going to be very important and profitable for everyone. This model will help in recognizing the hand written text and able to translate the recognized text to different languages. After converting into digital text our application will help to translate the recognized text to different languages. In this proposed system “IAM Handwriting” Dataset is used. The proposed work utilizes convolution neural networks is shown in fig.1. The steps for recognition are:

1. Collect the handwritten digit images.
2. Images are divided into training and test set.
3. Apply pre-processing techniques.
4. Normalize the data.
5. Split the dataset into similar size.
6. Train the CNN model.
7. To analyze the recognition accuracy.

Connectionist fleeting order (CTC) is a sort of neural organization to deliver yield utilizing related scoring capacity, for preparing intermittent neural organizations (RNNs, for example, LSTM organizations to handle grouping issues where the circumstance is variable. The NN for such use-cases for the most part comprises of convolutional layers (CNN) to separate a succession of highlights and intermittent layers (RNN) to spread data through this grouping.

IV. RESULT AND DISCUSSION

In this venture we have given image as an information then it predicts the yield by load. Subsequent to preparing our pre-handled information in CNN and RNN layers, we can show written by hand perceived information is shown in fig.2.
V. CONCLUSION

In this venture arrangement of characters happens. The undertaking is accomplished through the ordinary neural organization. The exactness we acquired in this is above 90.3%. This calculation will give both the productivity and powerful outcome for the recognition. The task gives best exactness for the content which has less commotion. The exactness totally relying upon the dataset on the off chance that we increment the information, we can get more precision. In the event that we attempt to evade cursive composition, likewise its best outcome. Along these lines, we can accomplish great exactness in perceiving and deciphering our human information.

REFERENCES: