Team Name : Prose Radars

OCR

OPTICAL CHARACTER RECOGNITION

Team Mentor : DR. VARALAKSHMI M

Team Members : RUPIN PATEL, AATMAN PRAJAPATI, PARTH SHAH, SHREYA KUNDU, NISHIT PANDIT

INTRODUCTION

We propose an Optical Character Recognition system based on deep learning algorithms to improve the accuracy and analyse each of the network architectures. This project outlines the many approaches that may be taken in order to create a deep learning solution for handwritten Hindi and English letters recognition using various methods.

We are using convolutional neural networks to detect the handwritten text in image and focus on applications of automatic digital text identification .And ***this model will detect handwritten text, convert it to corresponding digital Hindi letters and paste the recognised text on same coordinates of detection without changing the format of document.***

1. a deep learning solution for handwritten Hindi and English letters recognition using various methods.

2. Our **GOAL** :

   - Identify HIndi letters especially with Matras
   - Automatically trace the document
   - Generate the corresponding digiyalized text

3. With use of CNN , our model will detect handwritten text > convert it to digital format without any changes in the text .

PROBLEM STATEMENT

- One of the most promising applications of character recognition in computer vision is optical character recognition and documents monitoring which is becoming increasingly important in our daily lives and as well as in our professional lives. Since Now also there are some forms and documents which are filled handwritten, and a person must fill the details manually for storing on online database which is very time-consuming process. And specially in India some people fill handwritten forms and document in their native languages which is very difficult job for officers to recognize and understand.

- There are some present technologies for OCR but all are generally for English handwritten text. But as in India , Hindi being our national language which have very complex text formations and different letters it is almost impossible to use simple OCR. Since EasyOCR python library have an ability to recognise Hindi text from image but with constraint that text in image should digitally printed, which is in-efficient for Hindi because people generally prefer handwritten Hindi format in forms and documents.

- Examples of **present OCR apps: Office lens, Text-Fairy, Google Lens, Adobe Scan, etc. All this apps are based on OCR technology but *generally providing more accuracy for English words and in that also generally which are digitally printed on scanned image or document.***

SOLUTION

1

Deep learning has recently been demonstrated to be a highly strong image identification technology. The biggest distinguishing feature is that improved image features for identification are derived automatically via training. One of the approaches that meets the requirements of the deep learning approach is the convolutional neural network (CNN).Hence the general data would be handwritten text on image or document or may some images might not have good quality of pixels, so we need more type feature and very deep convolution network for recognition.

2

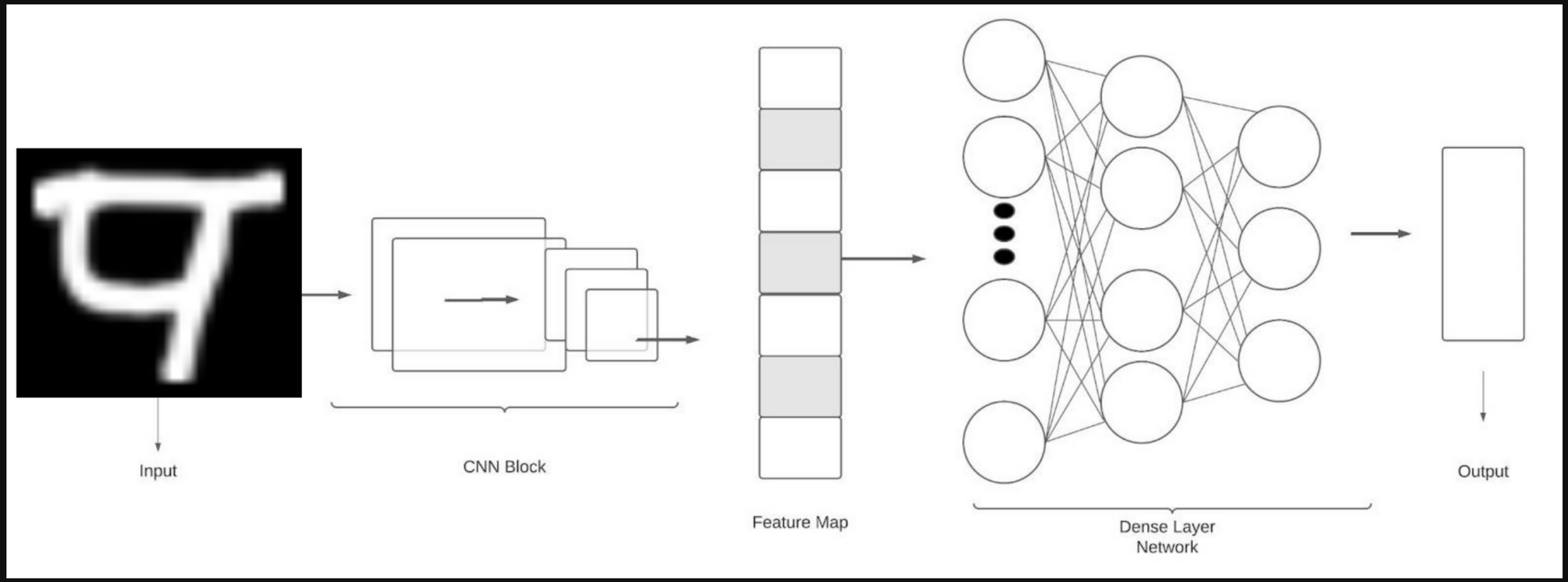
Convolutional neural networks, unlike traditional artificial neural networks, can estimate the score function directly from picture pixels. Data augmentation techniques based on geometric transformation were applied to increase the size of training images. We also use the Max-Pooling function for the data, and the features extracted from this function are used to train the network. It is demonstrated that using data augmentation and by increasing the number of convolution layers, these networks exhibited much better performance, making these networks suitable for practical applications.

3

We have deployed 3 model approach instead of traditional single model approach, where the character list is equally divided among each model and the word or sentence is fed to each one of the model , then whichever model provides maximum accuracy out of three is selected.

FLOWCHART

SIMPLE FLOW OF DATA FROM CNN MODEL



CONCLUSION

In conclusion, we applied the knowledge of Convolution Neural Networks to identify the input image or document we have achieved a satisfactory accuracy for handwritten text recognition for both Hindi and English.

Secondly, we will deployed our trained model as online web app using Flask . Where the user uploads the photo or can take snapshot and gets a digital converted text result based on the prediction without change in any format of document. We will print same resulted text on document from pixel coordinate from where it was detected with help of OpenCV and create another copy.

Thus our final objective would be to create a Real time web app ,where users can use online camera to scan documents, get their text recognised and digitalise it.

SCOPE

We will try to make analysis of the cnn model with different types of machine learning algorithms such as KNN, Naive Bayes, Decision tree, Random forest, SVM, Multilayer perceptron model

OCR

THANK YOU!

Team Name : Prose Radars