

OPTICAL CHARACTER RECOGNITION FOR VISUALLY IMPAIRED PEOPLE USING TENSOR FLOW

1)PROPOSED SYSTEM:

OCR model is conversion of images of typed or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo).OCR is a field of research in pattern recognition, artificial intelligence and computer vision.

In this project, the model takes English text scanned image as an input. This image is analyzed in order to identify each letter or digit. When a character is recognized it translates it into braille language as well as in English language. The output is in the form of well recognized and understandable document.

Optical Character Recognition is to provide an efficient and enhanced software tool for the users to perform Document Image Analysis, document processing by reading and recognizing the characters in research, academic, governmental, business organizations and for blind people that are having large pool of documented, scanned images. Irrespective of the size of documents and the type of characters in documents, the product is recognizing them, searching them and processing them faster according to the needs of the environment.

2)FLOW OF MODULES:

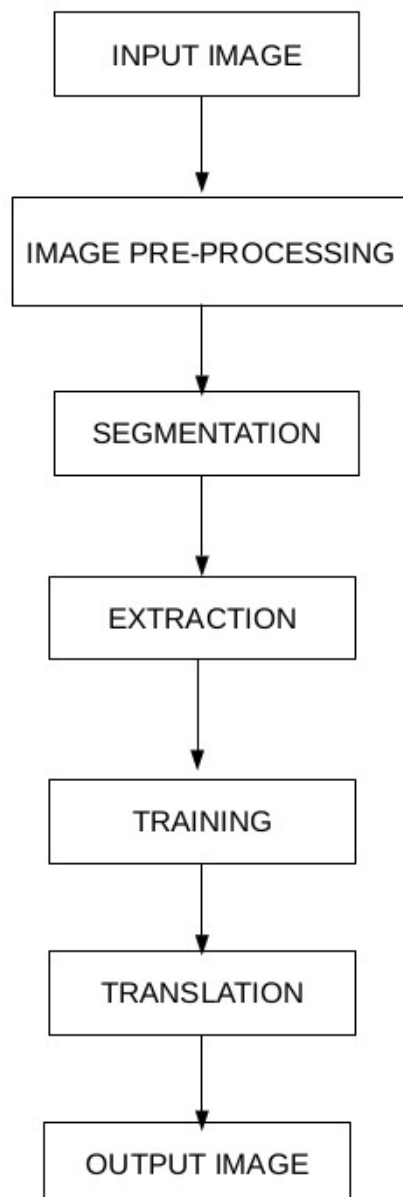
The Modules in the OCR Model are:

- 1)Preprocessing
- 2)Segmentation and Extraction
- 3)Training the Model
- 4)Translation

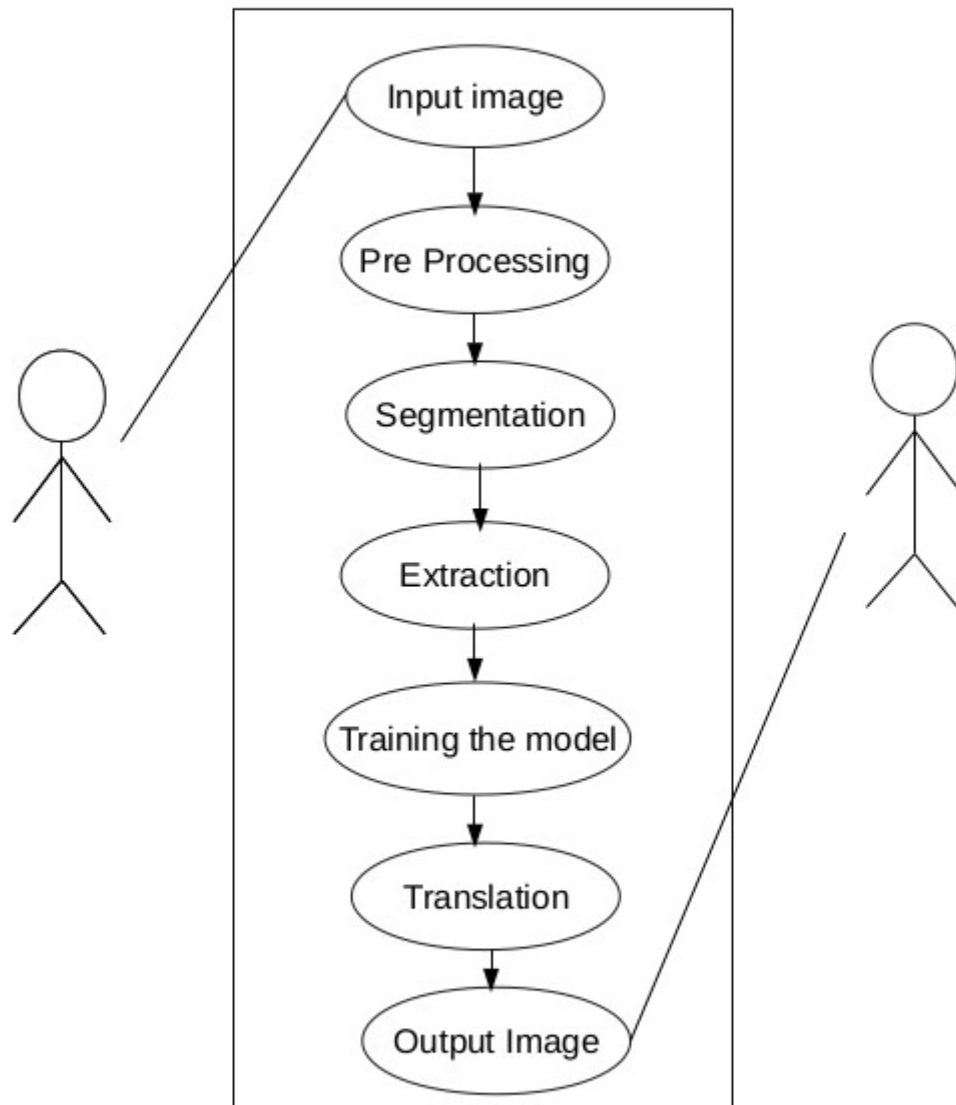
The input image is provided to the model and necessary pre-processing steps are done,which includes Rescaling the image ,increasing or decreasing the contrast of the image,increasing and decreasing the brightness,greyscaling the image,binarisation of the image,noise removal,erosion and dilation,finding contours.Bythis step,we get a clear image all the background noise is cleared here.The output of this step is given as input to the Segmentation step where there are various levels.Firstly in a given paragraph,line segmentation is done.It includes horizontal scanning of the image, pixel-row by pixel-row from left to right and top to bottom.Next,word segmentation is done.It includes vertical scanning of the image, pixel-row by pixel-row from left to right and top to bottom.Lastly,character segmentation is done,according to the intensity the bounding box is created to each letter in the word.Then extracting the letters and saving them where every letter is extracted.Training in which dataset is given and then it recognises by matching the letters and if they are matched they are

printed. Next, by using Google Translate API, we translate the English letters into Braille Language.

3) ACTIVITY DIAGRAM:



4)USE CASE:



5)DESCRIPTION OF USE CASE:

Use cases used in this project are input image,pre-processing,segmentation, extraction. Text document undergoes segmentation whose output is given to background cleansing in this stage all the noise is removed based on the area for the accurate detection of the text line.The textline is detected and segmented,each detected line is indicated by bounding box .It includes rescaling, increases in brightness, contrast, greyscaling, binarization.The system eliminates small text fragment in the background cleansing stage. After pre-pocessing step it finds all the connected documents then grouping and text line extraction and then conversion to braille language.

An input image is taken, for image preprocessing-resize it accordingly and then increase or decrease the contrast and brightness of the image as per required.Text image segmentation can be achieved at three levels. It includes horizontal scanning of the image, pixel-row by pixel-row from left to right and top to bottom.It includes vertical scanning of the image, pixel-row by pixel-row from left to right and top to bottom.Character segmentation is the final level for text based image segmentation. It is similar to in operations as word segmentation.Then extracting the letters and saving them where every letter is extracted.Training in which dataset is given and then it recognises by matching the letters and if they are matched they are printed.Next,by using google translate API,we translate the english letters into Braille Language.

In this step the output of the previous step is taken and with the help of google translate api translation of english character is translated to braille language.

6)MODULES

6.1)Image Pre-Processing Step:

The following are the preprocessing steps performed before segmentation of the image: An input image is taken, for image preprocessing-resize it accordingly and then increase or decrease the contrast and brightness of the image as per required.

For more accuracy, the image is converted into a grayscale.Next binarisation is done, here binary image is created which will be helpful in segmentation processes.

Two basic morphological operations are used: Dilation and Erosion

Dilation: It increases the object area and is used to accentuate features.

Erosion: Erodes away the boundaries of foreground objects and is used to diminish the feature of an image.

Noise Removal: Noise is generally considered to be a random variable with zero means. This step clears the noise in the image and Increases the accuracy.

6.2)Segmentation And Extraction:

Level of text Segmentation:

Text image segmentation can be achieved at three levels. As we move at different levels of text segmentation hierarchy, we obtain specifically finer details. Using all

the three levels is not compulsory. Segmentation at any of these levels directly depends on the nature of the application. More the details required for the image, the more is the level of segmentation.

Line Segmentation:

Line segmentation is the first and a primary step for text based image segmentation. It includes horizontal scanning of the image, pixel-row by pixel-row from left to right and top to bottom. At each pixel the intensity is tested. Depending on the values of the pixels we group pixels into multiple regions from the entire image. The different region indicates different content in the image file.

Word Segmentation:

Word segmentation is the next level of segmentation. It includes vertical scanning of the image, pixel-row by pixel-row from left to right and top to bottom. At each pixel the intensity is tested. Depending on the values of the pixels we group pixels into multiple regions from the entire image. The different region indicates different content in the image file. Subsequently the desired content can be extracted.

Character Segmentation:

Character segmentation is the final level for text based image segmentation. It is similar to in operations as word segmentation. A few precautions should be followed while performing character segmentation. Such errors are undesirable. Another precaution is of ligatures. If the text image contains a cursive type font then while segmenting the ligature should be separated for better efficiency.

Extraction:

Then extracting the letters and saving them where every letter is extracted.

6.3) Training:

Training in which dataset is given and then it recognises by matching the letters and if they are matched they are printed. Next, by using google translate API, we translate the english letters into Braille Language.

6.4) Translation:

In this step the output of the previous step is taken and with the help of google translate api translation of english character is translated to braille language.

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