# Review Paper based on Different Technologies to Read Text using Optical Character Recognition

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#### Abstract

There are approximately 285 million visually impaired people worldwide. Almost braille is used by blind people to recognize word. But the problem is that very few visually impaired people can read braille. Also there are very less books are available in braille. Visually impaired people deal with many difficulties to accessing printed text. This paper is discussed about various technique to read printed text.

**Keywords:** visually impaired, camera, OCR (Optical Character Recognition), text to speech, raspberry pie, back propagation algorithm, text to speech converter, template matching and neural network

#### **METHOD-I:** USING RASPBERRY PIE



Figure 1: Block diagram of method 1

In this method small camera is put on a specs which is near to the eyes. Book is placed on the visually impaired person's hands. The whole paper is formed by three main phases: Calibration, Line separation and Data preparation. According to camera' relative position, locate the best point of view for processing the book pages one by one. Image is being captured as he move the book towards or away from him. This process is done with reference of voice command to meet requirement of best position. Calibration procedure is not done only once but it is repeated for every page. With the help of horizontal projection (HP) and vertical projection (VP) algorithm locates text lines. Sum of grey scale intensities of every column is defined by HP signal and sum of grey scale intensities of every row is defined by VP signal. HP signal is used for remove finger existence. Filtering of good data and bad data from the image, VP signal is used. Higher level value and lower level value of the images are corresponds to good data and bad data respectively. VP signal differentiate text line from the background with respect to text line's boundaries. The goal is to separate words and space. Space is divided in two parts first is space between words and second is space between characters. Every single characters are detected and forming the words. Space between the words and characters are identified with respect to distance. Distance between the words is much larger than the distance between the characters. Words are grouped into lines. From this text document is created and it is used by TTS module. TTS module convert text into speech.

### **METHOD-II: BRAILLE CONVERTER**



Figure 2: Block diagram of method 2

Evolution of braille is for blind people to make their life easy. But the problem is that limited books are converted in braille. To convert text into braille, fingertipelectrode interface of current Electrotactile braille display is used. Fingertip-electrode interface of current Electrotactile braille display is wear by blind person in his index finger. Small camera is added to the device. As he move his finger OCR capture the image and convert text into Braille like they read Braille display. For better result, keep minimum distance between camera and text document. To improve the accuracy of OCR, Pan-tilt-zoom (PTZ) camera is used. Main feature of PTZ camera is zooming into capture high-resolution images. Transformation of grey scale image to a binary image is done by using adaptive threshold method. By using pan-tilt-zoom camera we get clear views of zoom images. First homography is used for zooming of image. Second homography is used for correction of distorted image.

## METHOD-III: USING BACK PROPAGATION ALGORITHM



Figure 3: Block diagram of method 3

OCR converts scanned paper documents like books, image captured into characters, which are online or offline. Offline character are printed or handwritten. Online character are image captured character. In segmentation process, printed data is separated from figures and graphics. Separate each character individually. In classification process, each characters are identified and assign it to the correct character class. The process of character recognition is depend upon quality of image. RGB image is converted into a grey scaled image. Identification of character and matched it to correct class is done by back propagation algorithm. In pre-processing step, unwanted graphics, unwanted text and noise are removed. For character recognition, there are different steps are perform like zoom in, zoom out, rotate image left, right and crop. By performing cropping operation, it remove unwanted data, graphics which lead to increase accuracy of OCR. In post processing, spelling error are corrected with help of dictionary.

## **CONCLUSION:**

By using Raspberry Pi as mobile processing unit and camera, visually impaired people can read text books in natural way without any human interruption. With the help of OCR and TTS module, text to speech conversion is done.

By using fingertip-electrode interface of the current Electro-tactile Braille Display and camera, it convert text into Braille. It works as blind people read any Braille book.

By using back propagation algorithm and pre processing and post processing algorithm, it will help to increase accuracy of OCR and remove noise.

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