IOT BASED SMART GLASSES THAT CAN READ BOOK
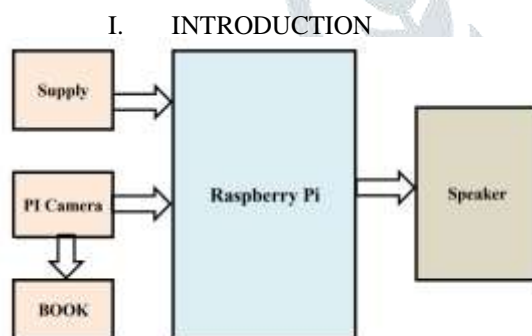
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Abstract— since there are many blind and visually impaired people in the world, reading presents certain difficulties for them. Until recently, Braille was the sole way for people who are blind or have low vision to read and study. However, there aren't enough Braille training courses available, and there aren't enough Braille machines or related resources. A smart reader for the blind population is suggested as a solution to these problems, incorporating the Raspberry Pi technology. This research proposes a smart reader for the blind that incorporates a full text study out system with page turning functionality and dictionary query features. The text is then read aloud through speaker or headphones.

Keywords— OCR, Raspberry PI Buster, Speaker, camera, Pyttsx3, Open CV

I. INTRODUCTION

Numerous statistics are available in materials and on the internet. This does have some restrictions, according to Louis Braille, the inventor of the renowned Braille script. One of them uses expensive, specialist printers to print in that particular script. These expensive printers will undoubtedly result in the production of expensive books. Additionally, there are very few of these books in the library. The person will have to rely on other individuals who can easily examine if they need to read a book that isn't available in the library for the blind. Additionally, this can't be always the case.
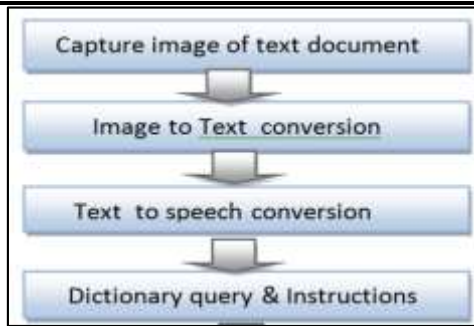
This system is designed such that after reading the text on the current web page, all the user has to do is place a book down, and the system takes care of the remaining chores like analyzing the text and changing the page. It also aids in helping the user understand the meaning of any term that he or she may not have fully comprehended without the use of a dictionary, where the user interrupts the machine and requests the definition of the word. Additionally, the user has the option to halt the reading whenever they like. The pressing of the special buttons carries out this.

A. Objective

Reading is essential to daily life for most people, and text can be found in newspapers, consumer goods, signboards, digital screens, and other places. As a result, those who are 2 blind or visually impaired encounter several challenges. The goal is to help with many daily tasks by utilising the benefits of wearable design.

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1.Input unit: The device's input unit is made up of a PI camera and interrupt buttons. The primary input source for the processing unit's high-quality image is the PI camera. It is a plug-and-play USB device that can be programmed using the Open CV library in Python. With a tiny USB port, it supports the USB 2.0 protocol. It typically comes with a 5MP resolution camera. The quality of an image, the correctness of the transformed text, and subsequently the voice, all improve with increasing MP. With the aid of a host stand that has a clip to hold the camera, the camera is raised to a specific height above the page.

Smart Reader initially takes a picture of the text document. Open CV is used to take a picture of a book page and use the built-in pre-processing tools. Therefore, the image will be in the best possible condition for the OCR module to transform it to text. This will revolve around the concept of picture processing. The time is better now to outline it.

Image processing is a technique that involves applying some results to a digital photo, such as cropping, zooming, grey-scaling, thresholding, etc., to obtain some reformation in the picture as needed. Digital Image Processing (DIP) is the name given to image processing carried out on digital images saved on computers. It has a wide range of applications in the current popular machine learning and AI concepts like scene focus, face recognition, and sample recognition. The DIP methods are used in the design to generate the acquired image in the best possible way that tesseract-ocr requires. In order for it to accurately reproduce the text. using this technique, the image is processed before being supplied to Pre-processing is the process of using an OCR engine to convert a picture to text. The built-in pre-processing features are Binarization is the process of turning a colour image into a black and white image, or from an RGB image into monochrome image. The pipeline for preprocessing begins with this step. Because converting a photo to monochrome would reduce the image's size, eliminate any noise that might be present in the RGB colour space, and make it simpler for an OCR engine to recognise the characters more quickly and produce accurate results.

By assigning the same value to each pixel, binarization turns a pixel image into a binary image. This is accomplished by first converting to grey scale and then using thresholding. In Open CV, there are sophisticated binarization techniques. To eliminate any unwelcome noise in an image, image smoothing is done. By using special filters (2D convolution, linear filters, Gaussian filter, etc.), it smoothes out photos. This technique is also known as photo blurring. Choosing a great filter and using certain settings will produce a great image that has been smoothed..

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FUTURE SCOPE

Other than English, the system can support several languages and multiple speech rates. The machine can be made smarter so that if a user requests that a specific web page be read, if the file page_N.mp3 already exists, the system can skip the conversion of the image to voice and 1 immediately start playing the mp3 file. The bookmark feature might be offered by the machine. The user can retailer and save any lines or paragraphs that stand out to them for easy access.

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