

Blind Reader

Submitted to University of Mumbai in partial fulfillment
of the requirements of the degree of

Bachelor of Engineering

in

Instrumentation Engineering

by

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CERTIFICATE

This is to certify that, the Project-I entitled

“Blind Reader”

is a bonafide work done by

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Declaration

We declare that this written submission represents our ideas in our own words and where other's ideas or words have been included, We have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Project-I Report Approval for B. E.

This Project-I report entitled “ *Blind Reader* ” by *Mr. Swapnil Yadav* , *Mr. Nikhil Vidhate* , *Mr. Rajiv Mandade* and *Mr. Vikas Mishra* is approved for the degree of *Bachelor’s Degree in Instrumentation Engineering, University of Mumbai*.

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Date

Signature

Abstract

Vision impairments can result from variety of causes, including congenital conditions, injury, eye disease and brain trauma or other conditions such as diabetes and multiple sclerosis. India has largest blind population of the 37 million people were visually impaired across the globe among which 15 million people are from India. Blind students can read only by audio books, Braille or with the help of personal assistant. The scope of this project is to provide technical solution and to assist the visually impaired people to access various text resources and enhance their knowledge. It is a handy device with a camera which captures the text and converts it into a speech signal that is read out through the earphones of the person. In a wearable form-factor, it is possible to use the body as a directing and focusing mechanism to assist VI person. Exploring the design concepts with blind users revealed the need to have a small, portable device that supports free movement, requires minimal setup and utilizes real-time. It enables more manageable eye free operation with trivial setup. The text which is captured from the camera is converted into a speech signal using local sequential text scanning. The text to speech algorithm is implemented with the help of Optical Character Recognition (OCR) software. The page and audio control is provided by Raspberry Pi model. The program is simulated using Python software which gives audio signal as output. This enables visually impaired people can read the text easily.

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Chapter 1

Introduction

In this work , the intention of the project is to develop an instrument by creating photo-to-speech application which will help visually blind persons. Sometimes life of some person is not that easy because of blindness but with the use of technology they can sustain.[1]. In this camera module is being used to capture the real time images of the things with the purpose to allow visually impaired persons to read text . In this important module is the raspberry Pi which is in itself is a mini computer which does the task of processing of the image that is captured by the camera module.[2]. Raspberry Pi processes captured image internally to separate the text from that image by using openCV (open source computer vision) library. The tesseract OCR identify the desired letters and then it undergoes OCR technology . OCR is optical character recognition.[1]. When the system starts , the webcam of the system captures image in front of it . This system is connected to raspberry pi using USB . The raspberry pi module contains the image processing code , optical character recognition.[3]. The image which is captured gets converted into machine encoded text from scanned document . It converts handwritten , typed or printed texts and here tesseract library is used for which the main vision is camera for detecting the image of the paper which is processed internally and gets separated into text region from image by using open source computer vision library and then finally through voice the identified text is pronounced.[2]. Ear phones are connected to audio jackpot and converted text should be converted to voice . stream of digital text gets converted into the high quality voice by using the fully integrated module platform .[1]. For text to speech application text to speech platform is used as an standard hardware style . finally the text which is converted to voice can be heard by audio jackpot using headphones or by using earphones also.[2].

1.1 Motivation

Speech and text are the two important modes through which human communicates . blind persons are the important part of human society and for blind peoples reading becomes very difficult but in today is world reading is as important as speech.[2]. But by using various technologies being made for visually impaired persons they can use these technologies accordingly to sustain and to understand what is given in the text . However due to this disability they depend on other persons for various purposes like shopping, reading ,moving also for their knowledge/ideas and most importantly they are not known to important factors that happening around them which is necessary for human to be aware.[4]. If they get to assess all these technologies they can have a big positive impact on our society. As per the survey , 30 crore peoples are visually impaired person but from them 4 crore peoples are total blind and also according to the NCR (national census of India) 2.2 crore disabled peoples are India and from them 1.5 crore people suffering from total blindness.[3]. After this study we can say that there are more blind peoples in India than disabled peoples and this is not a good sign for making India healthy . For the betterment of the society and the comprehensive development of human society there should be proper attention given to visually impaired persons so that no one is spared from all round development. Blind person has to depend on other person in almost every work also there are some instruments are available in market through which blind persons can read like Braille reading system , digital speech synthesizer but the majority of printed written works does not embrace properly Braille systems.[5]. In some cases dogs are also used for helping blind peoples for their help those dogs are trained , very discipline and monitored time to time. There is an important need to develop an portable device which blind peoples or visually impaired persons can use for that help even if they are moving from one place to another.[1]. The text-to-speech conversion is very important these days as warning messages that are written on walls and posters cannot be read by blind persons and by creating this portable device they can read and act in that manner just like an aware person of the society. If blind person given chances , opportunities and health guidance they can also stand head to head and give fight to this competitive society and can work for their well-being and for society also . Thus this portable device fills the cavity which is required to be filled.[8].

1.2 Objectives

The main intention of this project is to help the persons in the technical resolutions and to help visually impaired persons to assess all the knowledge which are written in the text format into their knowledge and data also.[12]. The main part of the system is the camera module which captures the image placed in front of the webcam and that system is connected to the raspberry pi which is also a mini computer to USB connector. Raspberry pi module is employed here as an important part of the system to method the image and it works internally.[6]. Here open CV is used efficiently to separate the text from the image and the raspberry pi module contains image process code , optical character recognition technique. Once the system starts the image that is placed at the front of the webcam gets captured and then processed using raspberry pi module internally.[3]. After capture of the image , that image undergoes OCR technology . OCR identifies the return characters victimisation pc code and it converts the handwritten typed and also printed text into machine encoded text from scanned document for helping visually impaired persons. This conversion of captured image into text and then into voice helps blind persons efficiently.[4]. Here camera module is an important part of the system which captures image and then process internally also the text get separated from the image by using victimization open CV library. The voice which is generated after the text to speech module can be heard by visually impaired persons by using headphones or earphones.[9]. The Text-to-Speech platform is an integrated module which converts highly digital text data into voice. The raspberry pi is developed by raspberry pi foundation and it could be a tiny, bare bones PC .[2]. The camera module and the text to speech module both works integratedly to perform wall function . Raspberry pi box like and conventional personal computer and is supposed to be used as the major final product. Using this system , the visually impaired persons feels good since it is cheaply and as potential also capable enough to work.[15]. Raspberry pi uses commonplace keyboard and also mouse and could be as low in value also it is Master card size PC that plugs television or PC monitor. The third generation raspberry pi is the[10]. raspberry pi three and in February 2016 the raspberry pi two model B is replaced by raspberry pi three.[11].

1 Bluetooth four .

2 Bluetooth low energy (BLE)

3 802.11n wireless local area network

4 A 1.2GHz 64 bit quadcore ARMv8 central processor

1.3 Organisation of Report

Sometimes life of some person is not that easy because of blindness but with the use of technology they can sustain. In this work, the intention of the project is to develop an instrument by creating photo-to-speech application which will help visually blind persons. In this camera module is being used to capture the real time images of the things with the purpose to allow visually impaired persons to read text. In this important module is the raspberry Pi which is in itself is a mini computer which does the task of processing of the image that is captured by the camera module. Raspberry Pi processes captured image internally to separate the text from that image by using OpenCV (open source computer vision) library. The tesseract OCR identifies the desired letters and then it undergoes OCR technology. OCR is optical character recognition. Ear phones are connected to audio jack-pot and converted text should be converted to voice.

Speech and text are the two important modes through which human communicates. Blind persons are the important part of human society and for blind people reading becomes very difficult but in today's world reading is as important as speech. But by using various technologies being made for visually impaired persons they can use these technologies accordingly to sustain and to understand what is given in the text. The main intention of this project is to help the persons in the technical resolutions and to help visually impaired persons to assess all the knowledge which are written in the text format into their knowledge and data also. We succeed in half work of this project. Whatever we have done till now is on Software basis. We are getting output in the form of voice by using Internet. We have shown proof of that by attaching the photos and outputs of that in Chapter 5 of this project report. Now our main objective will be to make our project in working condition with the help of Hardware. As we discussed with our guide that how to identify the different labels of number of companies. We will try to implement machine learning for this purpose to make it in working condition. Also, during viva, after discussion with external examiner they gave us another idea about how can be our project will become not only attractive but also useful for visually impaired person in their daily life use. After that conversation we came across that we must add speech to text algorithm. By doing this blind person can make his own notes, without taking help of other persons. Thus, project will be based mostly on Speech to text algorithm as well as Text to speech algorithm.

Chapter 2

Literature Survey

Finger Reader: A Portable Device to Know Printed Letters on the Go - Roy Shilkrot, JochenHuber¹, MengEeWong, PattieMaes, SurangaNanayakkara, MIT MediaLab, Cambridge, MA USA.

This Project will give information of Finger-worn device. Finger Reader gives direction to blind users for reading printed text on the go. Having demand for printed text with the help of mobile context must be with lost of difficulties for the blind. This is the compulsion to use this system during a tiny finger-worn kind issue, that gives extra manageable eyes free operation with setup. A Preparation study with blind idiosyncratic reveals various difficulties with existing developed technologies with problems and allignment, focus, accuracy, mobility and efficiency. We establish a novel pc vision algorithmic rule for local sequent text scanning that can give reading single lines, blocks of text or skimming the text with complementary, multimodal feedback. We help with findings from three studies analysis to determine the increase of the finger reader.

Teaching System based on OCR mechanism for Visually Impaired Students Shreya Gandhi, Bhaskar Thakker, Shreelal Jha

Nowadays smartphones are available for blind persons to interact with Web Technology. The progress in technologies have alleviated in achieving many forms of systems like sensing the mobile displays with the help of sensors. There are eloquent advancements in technology from 10-15 years that prove necessary and useful to physically disabled individuals. There are screen which helps them to understand text present in Device in the form of braille technology and also take the inputs from them in braille and convert it into normal text. But such inventions are not more in use. Since last so many years and even nowadays, teaching equipment like Wooden Boards with Embossed Dots or indentations

are used for teaching Braille alphabet to visually impaired students in their School. Advancements in technology for high-level teaching of Braille Codes are projected with the help of embedded systems such as Microcontroller. But, in this technique, a single tutor able to teach only a single student at a time. But tutor also needs a command on Braille alphabets to teach students in an understandable format.

Label detection using vision-based technology with Voice Output Vasanthi and Ramesh Babu Department of ECE, DMI College of Engineering, India

In this, the camera will capture the image and will able to give a real-time output in-voice. This will help to visually impaired people in their daily life activities such as reading the boards on buses, shops, detecting different types of labels of different companies. This advanced technology will minimize the background from the image and separate the text whichever present. That text will recognize by our system with the help of ASCII codes. After that, it will give an output invoice.

This is an improvement in access to text and books easier and decreases the value of the transformation of Braille.

There is an increase in the ultimatum of an assistive device for blind and part blind individuals which may get help from machines to browse any written text or book while not converting the literature into Braille. Then our system will process images extraction from video and will give it to OCR technology to convert into ASCII character which can be corrected and recognize by Our developed system will scan texts into Audio with the help of text-to-speech algorithm which is a google file. Google file helps to convert the extracted text from the image into the audio voice just like some applications present in our mobile.

Chapter 3

Hardware and Software Requirements:

3.1 Hardware Requirement

Raspberry Pi 3 Model: The raspberry pi board is very small and is easy to carry because of its portability. The raspberry pi model due to its small size is very cheap. The main motivation behind designing the raspberry pi board is to encourage learning among the school level students by experimentation and innovation[4]. The mobile computing technologies has seen a major growth in the 21 st century, since a large section of it is used by the mobile industries. The raspberry pi is a single computer board which is of the size of a mastercard[7]. The ARM technology is being used in almost 98 percent of the mobile phones[9].

1. A 1.2GHz 64-bit quad-core ARMv8 CPU
2. 802.11n Wireless LAN
3. Bluetooth 4.1
4. Bluetooth Low Energy(BLE)

Raspberry pi Techonology:There are basically two models of raspberry pi available in market. They are model A and model B. the USB port plays an important role in differentiating both these models[15]. The model A board is very efficient as it consumes less power and does not contains a LAN port. While in the model B the Ethernet port is available as designed in china[1].Open supply technologies such as communication and multimedia web technologies are present in the raspberry pi. The computer modules were launched after the foundation of the raspberry pi board in the year 2014[9]. The model B raspberry pi board is packed into the module which can be used as a part of the embedded systems to encourage their use[4].

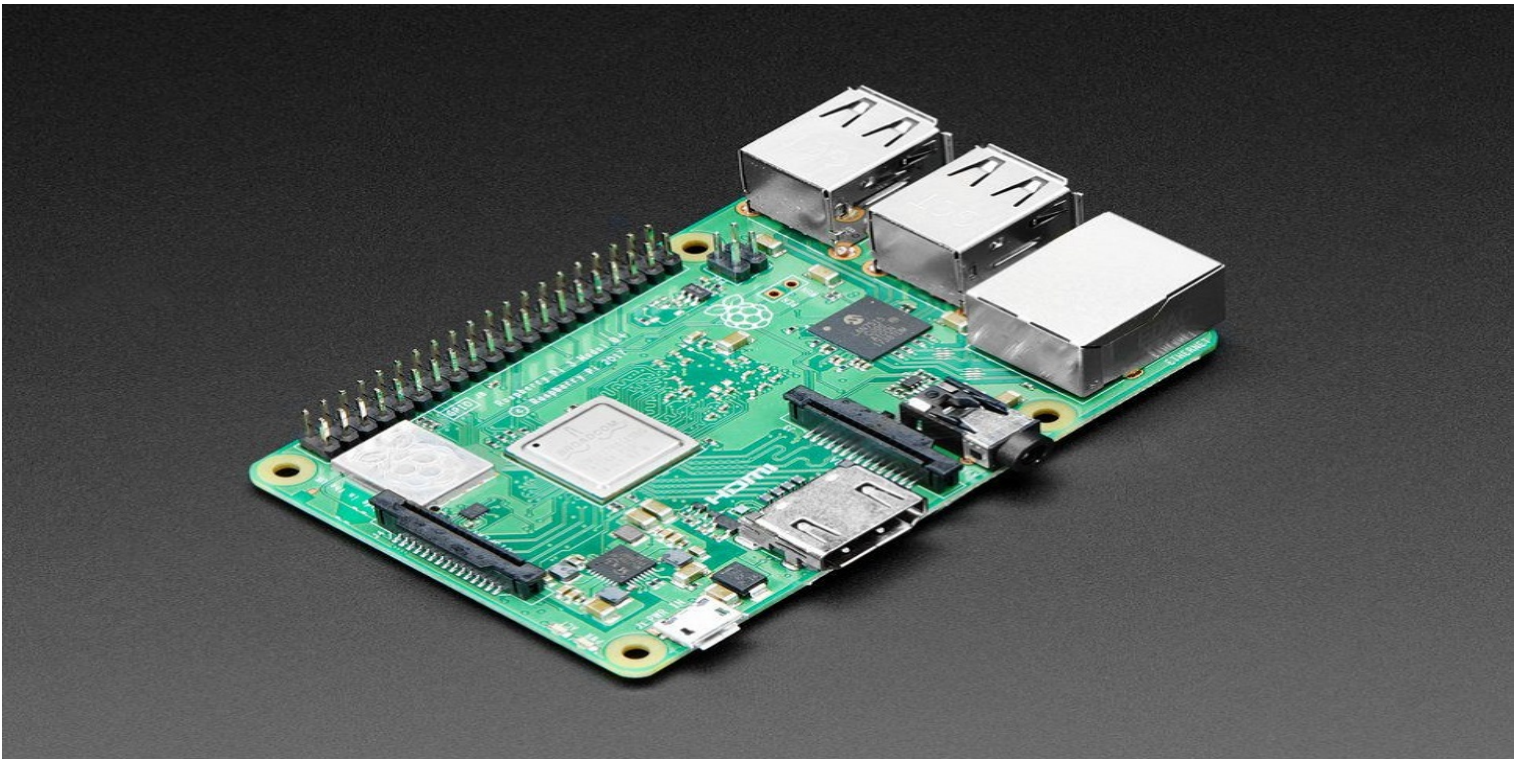


Figure 3.1: Raspberry Pi

CAMERA MODULE: It also uses the optical system, which typically uses a lens having variable diaphragm to focus light onto an image pickup device. The digital images and digital videos are being encoded and stored by the digital cameras[8]. The digital camera helps in recording and storing the photographic images in digital form. The imager is provided with the right quantity of sunshine by the diaphragm and shutter, just like the image pickup device is electronic rather than chemical[3]. Many models are currently present to capture the images[2].

PRINCIPLE OF CAMERAS: It captures lightweight images from the front consisting of a tiny low lens, employing a small grating of microscopic lightweight detectors designed into a picture sensing semiconductor device (either a charge-coupled device (CCD) or more likely these days, a CMOS image sensor[16]. A simple digital camera setup consists of a photographic cameras which uses the USB port to connect the camera to your laptop. There is nothing different in the digital camera it is simply a photographic camera. The nature of the camera in the digital camera come with a package[14].

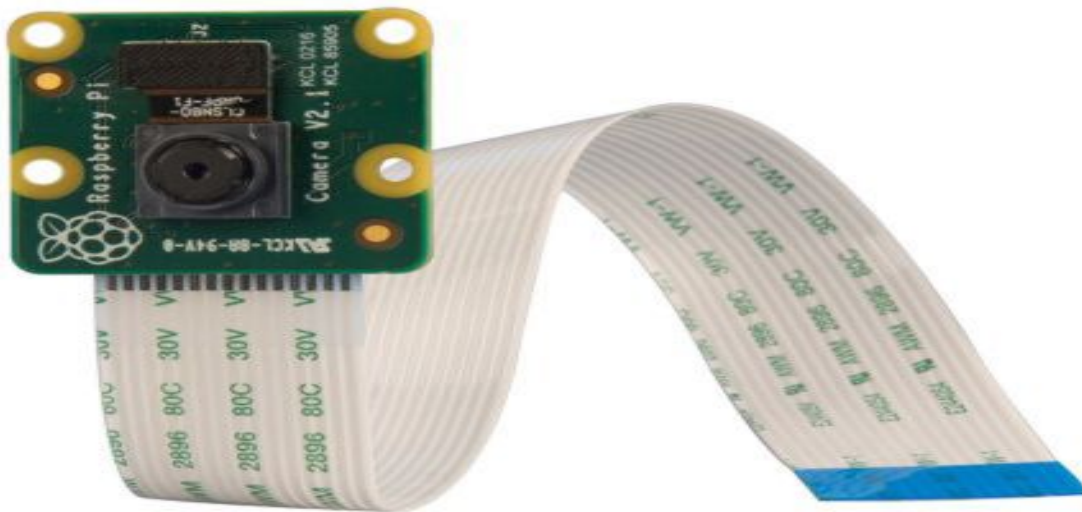


Figure 3.2: Cameras

USB Port: The interface between any compatible digital audio/video source and a compatible digital audio/video monitor is being provided by the HDMI[11]. The high definition multimedia is an industry supported digital audio/video interface. The HDMI is independent of various DTV standards such as ATSC, DVD, which are enclosed by the MPEG data streams. Due to which the output can be obtained as uncompressed video data, which can be high definition by passing it to the decoder[12]. The customary, enhanced, or high definition video, plus multi-channel digital audio on a single cable is being supported by the HDMI. The video is then encoded into TDMS for transmitting it digitally over HDMI. In the super audio CDs the one-bit audio is what's used.[14]. Initiating with the version 1.2, up to 8 channels of one-bit audio are being supported by the HDMI. 8-Channel uncompressed digital audio are being supported by the HDMI. Super audio CDs uses the one-bit audio[13].



Figure 3.3: USB port

Speaker and Headphones: The basic principle for both the loudspeakers and headphones is same which converts electrical signal into sound waves[13]. A magnetic field is generated by the signal which is sent in the driver through the voice coil. The fixed magnets are kept around the voice coil surrounding it, and the alternating current in the voice coil attracts and repels it from the magnet[9]. With the help of the suspension material the voice coil is attached to the driver's cone, which moves back and forth between 20 to 20000 times per second, by making the air pressure changes in front of it and generating sound waves which a normal person can hear[6]. The output of the energy of the receiver amplifier used to power the loudspeaker is described using an electrical watt. Size is the major difference between the loudspeaker and headphones. Headphones are usually smaller in size whereas the loudspeakers vary in size from small to big depending upon the area of application[9]. In the loudspeaker system the loudspeaker needs to set all the moving air in a room so one can hear the sound properly without any disturbance[7]. Whereas the speaker in a headphone has to move the quantity of air within one's external auditory canal[5].



Figure 3.4: Headphone And Speaker

3.2 Software Requirements

1. Programming Language: Python
2. Text extraction algorithm.
3. Integration layer with tesseract ocr.
4. Text to speech.

Chapter 4

Design and Implementation Details

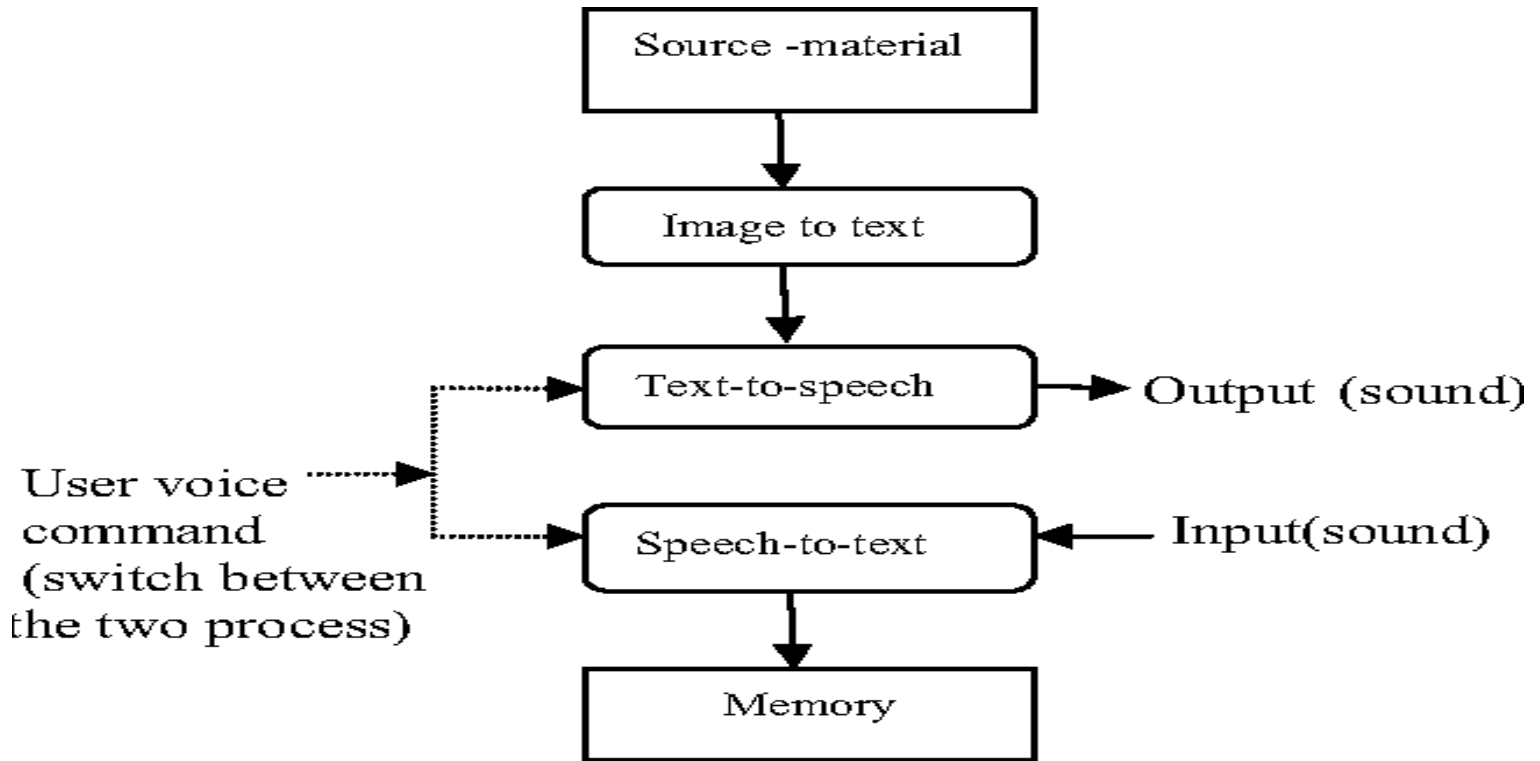
4.1 Methodology

Raspberry pi is being used in the system. The drawbacks experienced by the existing system have been overcome in the proposed system. The Image processing section is being provided by the camera's image[2]. The camera is being used to capture the image of the text. The output which is in the filtered form is provided to the production unit. The processed image consists of the noise signal, for the removal of this noise signal the processed image output is given to the filter[3]. The filter output is provided to the edge reduction unit. Background separation unit is provided with the output[4]. At last the output is provided to the OCR, before it is given to OCR it is being given to the raspberry pi for correction. The image contents are being detected and output signal in the form of audio signal is provided by the raspberry pi[4].

4.2 Design

The entire process can be concluded to the following steps:

- 1) Capturing the Image.
- 2) Pre-Processing the Image.
- 3) Filtering.
- 4) MSER.
- 5) OCR conversion.
- 6) Raspberry pi Speech Output.



The visually impaired people use the brail method which is an existing system and is traditionally written on the embossed paper[1]. In this proposed system the main motive is to help the visually impaired people and the people suffering from reading disorder and also suffering for dyslexia to help them in reading the text[2]. But there are the difficulties such as the visually impaired people cannot read the text on the normal people, are being faced by the system. Due to which the OCR method is being considered which converts the images of typed or printed text into machine encoded text[1]. Wearable devices such as camera is being proposed to overcome those difficulties. The camera captures the image in which the text is being written and the captured text is first detected and extracted using the MSER algorithm. From OCR algorithm the text is checked for finding the errors and using the post processing algorithm[9]. Images of typed or printed text is converted into machine encoded text using the OCR methodology. Using the text to speech algorithm the captured text is converted into the speech signal. Python is the software being employed in the system[1]. Visually impaired persons use ear phones to read out the converted speech signal. The entire system is implemented using raspberry pi 3 model[7].

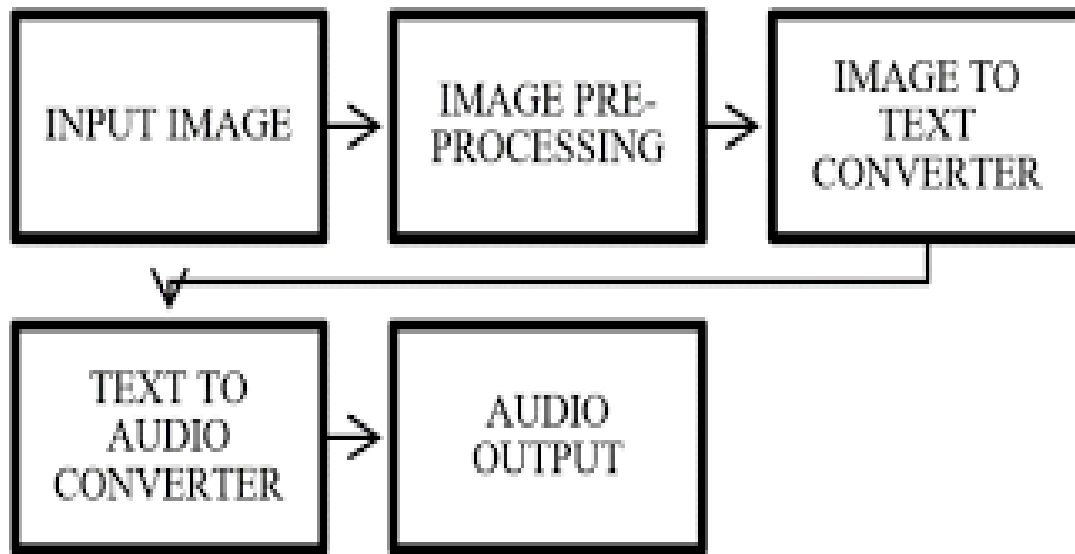


Figure 4.1: functional block diagram

PRE-PROCESSING: The removal of any noise and alternative disturbances associated with the image are done in the pre-processing unit so that the image is prepared for feature extraction[7]. Grayscale images are distinct from that of the one-bit black-and-white pictures which in the context of the computer imaging are images with only the two colours, black and white (Bi-level of binary images)[4]. To remove the blurriness in the image the smoothing is being performed. Where the gradient of the images has large magnitudes there the edges should be marked properly. Noise in image is random (not present in the object imaged) as the brightness or colour information in the images vary, and are usually an aspect of electronic noise[3]. Detector in the electronic equipment's of the scanner or camera are mainly the creators of the noise. Certain filters are being used to reduce the noise. For removing the noise content in the pictures here we have a tendency to use the median filter[3].

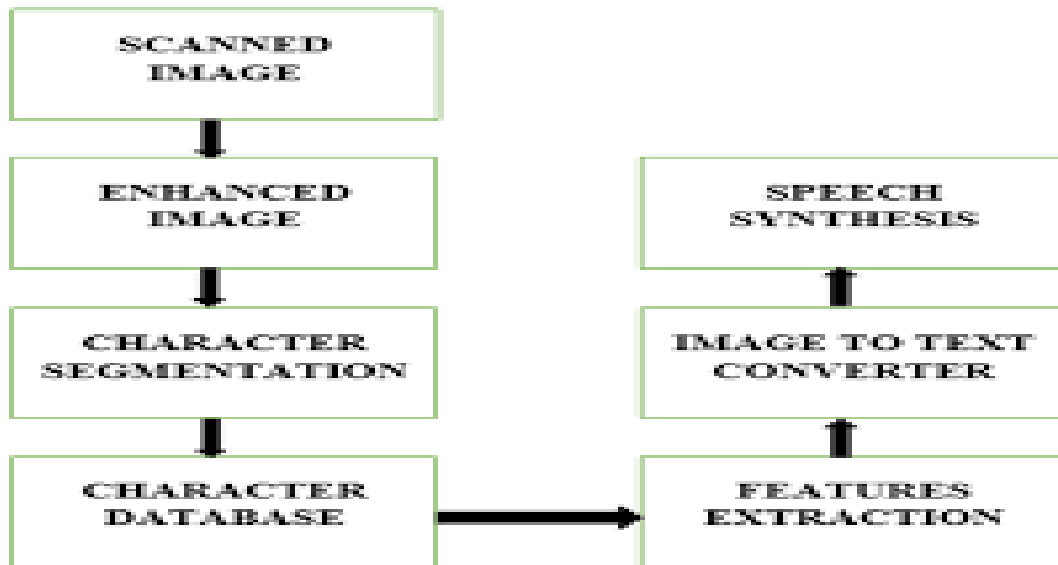


Figure 4.2: PreProcessing

OPTICAL CHARACTER RECOGNITION (OCR) The optical character recognition is the process of converting any printed document of scanned pages into ASCII characters which can be recognised by the computer[5]. Even in the laptop systems we can find such OCR technologies which help in improving speed of input operation and also decrease some possible human errors, enables compact storage, fast retrieval and other file manipulations[2]. OCR technology vary in its applications which may include the code recognition, automatic data entry into large administrative systems, automatic cartography and reading devices for blind, banking, etc. A good OCR system is characterized by accuracy, flexibility and speed[9]. According to the featured choice several algorithms for character recognition have been developed. Out of which some of them are commercially viable and have gone into production like omni page, word scan, type reader, etc. Depending upon the font, size and orientation the performance of the system is being constrained[12]. Also depending upon the choice of the features recognition rate in these algorithm is taken into consideration. Most of the prevailing algorithms which involve the intensive process on the image before the options are extracted which has helped in increased machine time[16]. The primarily based technique for character recognition that effectively scales back the image interval whereas the maintaining of the efficiency and versatility has been discussed in this paper pattern. High speed of recognition which is

critical to commercial environment is being ensured by the parallel computational capability of neural network. Optimal selection of features which helps in categorizing, defines the details of characters, the number of options and coffee image interval, are the key factors involved in the implementation[14].

POST PROCESSING:To correct errors and resolve ambiguities in OCR results by using contact information is the main objective of the post processing unit. The context may be operative in the number of levels. It can be at the word level, at the sentence level and at the level of semantics[13]. The system which is built in dictionary (lexicon) is compared to the output of the OCR and candidates are generated. There are distinction between the output of the OCR and also the output of the word book look-up due to which the numbers denoting the confidence level in the correct classifications are modified. Firstly the output sequence of the suitable candidates is ordered accordingly the best candidate is selected[15]. For the instance, the correction candidates for the error word popes can be opposed,proposed,pops,popes. There exist many non-trivial dictionary based error correction algorithms, out of which one is the string matching algorithm that weights the words in a text using the distance metric representing various costs. The best suitable correction is considered as the correction candidate with very cheap distance with reference to the misspelled word[7]. The language syntactic properties and the n-gram model which helps in speeding up of the process for generation of correction candidates and ultimately studying the simplest matching candidates are also demonstrated in another algorithm[1]. The next proposed OCR post error correction method based on pattern learning, whereas firstly the lexicon generates a list of correction candidates. And then according to the correction based on, the most proper candidate is selected[1].

TEXT TO SPEECH:Text to speech synthesizer is an application which helps in the conversion of text into spoken words, by processing and analysing the text using Natural language processing (NLP) and mistreatment Digital signal processing (DSP) technology to convert this process text into a much synthesized feature representation of the text[3]. There are two main phases in the text to speech (TTS) synthesizer's procedure. Firstly we go through the text analysis where the input text is transcribed into phonetic or any other linguistic illustration. Second one helps in generation of speech waveforms where output is being produced from this phonetic and prosodic information[14]. These two phases are sometimes known as high and low level synthesis. Data from the word processor, standard ASCII from email, a mobile text-message or scanned text from a newspaper might be used as an example for the input text[11]. The charac-

ter string is then pre-processed and analysed into phonetic illustration which is typically a string of phonemes with some further information for proper intonation, duration and stress. Finally the speech sound is generated with low level synthesizer by taking the information from the high level synthesizer[10].

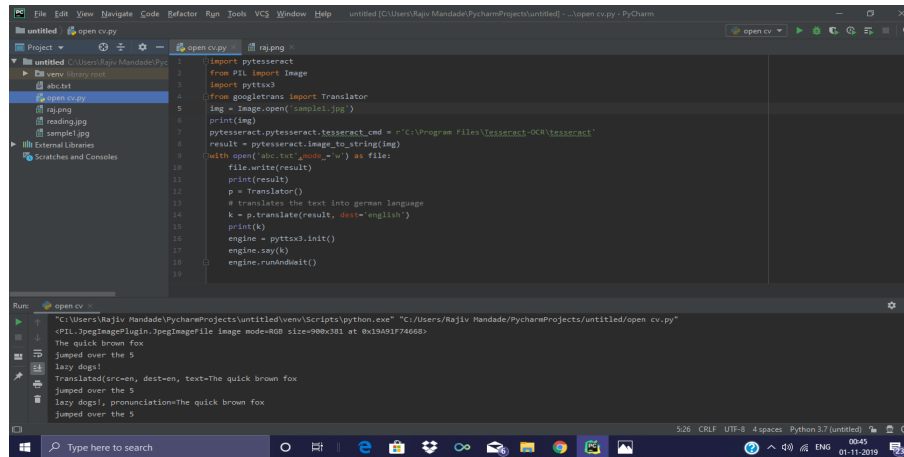
Chapter 5

Results and Applications

5.1 Results

The main objective of our project is to convert the text signal to speech signal. This is achieved by the components and methodology which is described above. The main problem that we faced while developing this prototype is that to get the machine operating code from the image and to convert that code into speech synthesizing code. But finally the prototype can be built and thus it can convert the text image to the sound signal which can create a revolution for the blind people to read by listening to the speech, output from the speaker.

**The quick brown fox
jumped over the 5
lazy dogs!**



5.2 Applications:

Individuals with learning disabilities: Some individuals have problem reading giant amounts of text because of learning disorder and alternative learning disabilities. giving them a better possibility for experiencing web site content may be a good way to have interaction them.

People that have skill difficulties: Some individuals have basic literary levels. They typically get annoyed attempting to browse the net as a result of such a lot of it is in text kind[1]. By giving them AN choice to hear the text instead of reading it, they will get valuable data during a manner that is more well-off for them[1].

People that speak the language however do not browse it: Having a speech possibility for the foreign born can open up your audience to the present under-served population. many of us World Health Organization return to a replacement country learn to talk and perceive the linguistic communication effectively, however should still have problem reading during a second language[2]. Tho they will be ready to browse content with a basic understanding, text to speech technology permits them to require within the data during a manner they are more well-off with, creating your content easier to understand and retain[9].

People that multitask: A busy life typically implies that individuals do not have time to try and do all the reading they had wish to do on-line[1]. With the prevalence of smart-phones and tablets, it conjointly provides AN possibility for content consumption on the go, taking content far from the pc and into any setting that is convenient for the patron[4].

Individuals with visual impairment:Text to speech are often a awfully useful gizmo for the gentle or moderately visually impaired[6]. Even for individuals with the visual capability to browse, the method will typically cause an excessive amount of strain to be of any use or enjoyment[11]. With text to speech, individuals with vision defect will soak up all manner of content in comfort rather than strain[11].

People that access content on mobile devices: Reading a good deal of content on a tiny low screen isn't continually simple. Having text-to-speech software system doing the work is far easier. It permits individuals to urge the knowledge they require while not a good deal of scrolling and aggravation[15].

Individuals with completely different learning styles: Some individuals square measure exteroception learners, some square measure visual learners, and a few square measure kinesthetic learners – most learn best through a mixture of the 3 [4]. Universal style for Learning may be a arrange for teaching that, through the employment of technology and adaptable lesson plans, aims to assist the most range of learners comprehend and retain data by appealing to all or any learning designs[6].

Chapter 6

Conclusion

This project provides a novel concept for text reading for the blind, utilizing a local-sequential scan. The system includes a text tracking algorithm that extracts words from a close-up camera view[5]. Text to speech synthesis may be a chop-chop growing facet of technology and is progressively taking part in a more necessary role within the method we tend to move with the system and interfaces across a variety of platforms[1]. The planned system provides a awfully easy methodology for text to speech conversion. Text inputs like the alphabets, sentences, words and numbers are given to the system. Text to speech conversions is achieved and receives a better result which is audible and perfect[2]. This system is very much used in the web applications, email readings, mobile applications and so on for making an intelligent speaking system[6]. Suggested system, as an independent program, is fairly cheap and it is possible to install onto smart phone held by blind people. This allows blind individuals to simple excess the program[13]. This project is a standalone application developed in Python which can be installed on any system free of cost. The motivation for the event of this rule was the easy indisputable fact that English alphabets are fastened glyphs and that they shall not be modified ever[14]. In this project, we have described a system to read printed text and hand held objects for assisting the blind people is described. To extract text regions from complex backgrounds, a novel text localization algorithm based on models of stroke orientation and edge distributions using canny algorithm is proposed[11]. Block patterns project the planned feature maps of a picture patch into a feature vector. Adjacent character grouping is performed to calculate candidates of text patches ready for text classification[8]. OCR is used to perform word recognition on the localized text regions and remodel into audio output for blind users[7]. The camera acts as input for the paper. As the Raspberry Pi board is supercharged, the camera starts streaming. Speech recognition technology is of explicit interest because of the mission of communications between human and computers[9]. The streaming data will be displayed

on the screen. Using Tesseract library the image will be converted into data and the data detected from the image will be shown on the status bar[16]. The obtained data will be pronounced through the ear phones. An image to speech conversion technique using raspberry pi is implemented[13]. The simulation results are with success verified and also the hardware output has been tested mistreatment totally different samples[15]. The algorithm successfully processes the image and reads it out clearly and it provides significant help for the people with disabilities. This is a cost-effective additionally as economical device for the visually impaired individuals. We have applied our rule on several pictures and located that it with success will its conversion[3].The device is compact and useful to the society.The main advantages of this project are it requires less consumption of time in recognizing and reading text with lower operational costs also text of different fonts can be recognized. This project can also be used by partial blind people and elderly people with different eyesight problems. It plays a significant role for visually impaired students in their education[1]. Logically, if listening gets a reader through text more quickly, then it must be considered more efficient when time is of concern[2]. Other advantages include more flexibility, high accuracy, it is best suited for different illuminant condition and it can be executed easily. There are few limitations to this project. Font size below 20 cannot be recognized and the camera does not auto-focus. The major challenge is that, it is hard to adjust to the distance between the camera and book[2]. Speech recognizers are not perfect listeners. They make mistakes. A big challenge in designing speech applications is working with imperfect speech recognition technology[4].

vspace1in

Chapter 7

Future scope:

- 1.It can be used in blind schools and colleges.
- 2.This can also be used as application of artificial intelligence.
- 3.It is helpful for illiterate people. We also can make mobile application of same topic.

Chapter 8

Project Plan and Cost Analysis

Sr. No	Month	Work Done
1	Jul-Aug	Research on the previously done projects and related papers of blind reader.
2	Aug-Sep	Collected data set and study methods of feature extraction.
3	Sep-Oct	On the Collected data set of blind we performed pre-processing.
4	Oct-Nov	Using Python we performed the software part and completing Text to Speech conversion.
5	Dec-Jan	On the Segmented image we will perform normalization by sing OCR method and prepare data set.
6	Jan-Mar	Using the data set we will make a model for feature matching and blind reading for input image.

Sr. No	Components	Price (Rs)
1	Rasberry Pi 3	6000
2	Cameras	4000
3	USB Port	100
4	Speakers	400
5	Connecting Wires	100
6	Power Supply	200
	Total	10800

Table 8.1: Cost Analysis

Chapter 9

Plagiarism Report

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