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A Review Paper on Voice Assisted Text Reading and Google Home Smart Socket Control System for Visually Impaired Persons Using Raspberry Pi

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ABSTACT*:* Speech and text is main medium for human communication. A person needs eyesight access the information in a text. However those who have very poor eyesight can collect information from voice. This paper offers a camera based assistive text reading to help blind person in reading the text present on the captured image. The proposed idea involves text extraction from scanned image using Tesseract OCR (Optical Character Recognition) and converting the text to speech by e-Speak tool, which is a process that makes visually impaired persons to read the text. This is a prototype for blind people to recognize the products in real world by extracting the text on image and converting it into speech. For blind people it is very difficult to switch on /off electrical devices and some time they get shock. We made use of Google Home's voice recognition with the conception of machine-learning to prove the feasibility analysis about fulfilling the users' needs by a smart home. So blind people van control devices by using voice .Proposed method is carried out by using Raspberry pi and portability is achieved by using a battery backup. Thus the user can carry the device anywhere and able to use at any time. This technology helps millions of people in the world who experience a significant loss of vision.

KEYWORDS: Tesseract OCR, e-Speak, HT 12 D Decoder, Raspberry Pi.

I. INTRODUCTION

Due to eye diseases, uncontrolled diabetes, accidents and other reasons the number of visually impaired persons increased every year. The most significant difficulty for a visually impaired person is to read. In this proposed system text recognition is done by Open Computer Vision, a library of functions used for implementing image processing techniques. An image or a set of parameters related to image is the output of image processing. Text extraction from an image is carried out by OCR. OCR is the method of conversion of images of printed books, sign boards etc. to text. The binary image is converted to text by Tesseract library in OCR engine that detects the outline, slope, pitches, white spaces and joint letters. It also checks the quality of the recognized text. In this system the conversion of text to voice output is by e-Speak algorithm. The e-Speak is a Text- To-Speech (TTS) system which converts text into speech. The artificial production of human speech is known as speech synthesis. The speech synthesizer can be implemented in a software or a hardware product. The platform used for this purpose is known as a speech synthesizer. The storage of entire words or sentences allows for high-quality output in specific usage domains. A synthesizer can incorporate the model of a vocal tract and other human voice characteristics. This project aims to build an efficient camera based assistive text reading device. The idea involves text extraction from image taken by a camera installed on a spectacle. The extracted text is then converted to audio signals and to voice output. It is also used to detect a person's face in the

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frame. This is carried out by using Raspberry pi where the portability is the main aim, which is achieved by providing a battery backup.

II. LITERATURE REVIEW

There are a lot of devices which assist the visually challenged for navigation indoor and outdoor. All these devices rely mainly on Global Positioning System (GPS) alone, to navigate around. These solutions based on GPS are not always reliable because of their low accuracy. All these navigational devices give instruction to the blind on how to navigate, in which case the user still has to think and move around i.e., it is not autonomous. None of these devices physically help to the blind move around. The basic properties and limitations of existing devices are discussed.

1. Ultrasonic blind walking stick: The system is intended to provide artificial vision and obstacle detection around the blind person. The system uses ultrasonic sensor to detect the presence of object. It also has a moisture sensor to detect the presence of water. The microcontroller used is a small computer on a single integrated circuit. When the system detects an object the signal is transferred to the micro controller which notifies the user through a buzzer.

2. Advanced cane for visually impaired: The guide cane is used to assist the blind person both indoors and outdoors. It has an obstacle detection system along with a GPS navigation system. The GPS navigation system is pre-programmed to help the user navigate to their desired location. A raspberry pi is used to store the obstacle detection programs and GPS navigation programs. The user is given audio feedbacks for navigation and obstacle detection.

3. Smart Ultrasonic stick for blind: A study was made in the system to help blind people use the pulse echo technique in order to provide a warning sound when detecting the obstacles. By means of calculating the difference between the signals transmit time and signal's receiving time we can predict the distance between the user and the obstacles. This system is very useful in detecting the obstacles with a detection range up to 3 meters and a detection angle 0 to 45 degree. However, this system consumes more power to operate because of the transmitter and receiver circuits. So,

This system needs to be re-designed to operate with less power consumption and thereby increase its efficiency.

4. Voice aided electronic stick: Alejandro R. Garcia Ramirez and Renato Fonseca Livramento da Silvaetal (2012) together have designed an electronic long cane to serve as an aid to the blind and visually impaired. They have implemented the cane by an ergonomic design and an embedded electronic system. The system was designed using haptic sensors that are used to detect obstacles above the waistline. So every time it detects an obstacle, the electronic stick vibrates or makes a sound. But this system is held back as it can detect obstacles only above the waistline

5. Walking system with image matching: Kenta Yamamoto, KatsuyaSuganuma, Daisuke Sugimori, Masaki Murotani have come up with a system which is a walking support system for the visually challenged.

III. PROPOSED SYSTEM

The proposed method is to help blind person in reading the text present on the text labels, printed notes and products as a camera based assistive text reader. The implemented idea involves text recognition and faces detection from image taken by camera on spectacle and recognizes the text using OCR. Conversion of the recognized text file to voice output by e-Speak algorithm. The system is good for portability, which is achieved by providing a battery backup. The portability allows the user to carry the device anywhere and can use at any time. A prototype was developed which uses a camera on spectacle and Raspberry pi that works in real time.

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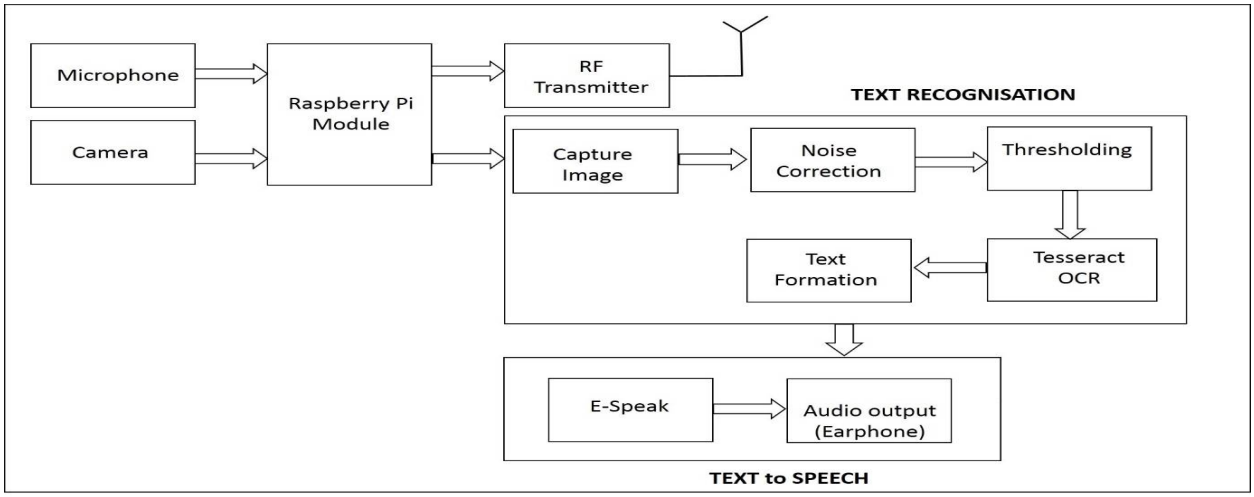

Fig. III(a): Proposed Block Diagram of Text Mode

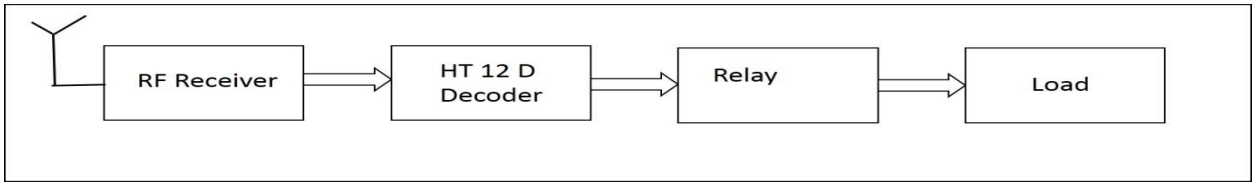

Fig. III(b): Proposed Block Diagram of Automation Mode

A. *Text Mode*

Camera mounted on a captures the image of text. All processing is done using Raspberry Pi. Text reorganization process contains several blocks including Noise correction, Thresholding. Text formation and OCR. Text to speech conversion is carried out using E-speak software. Speech is then delivered to the person through earphone.

B. *Automation Mode*

In the automation mode using Microphone the blind person give command to the system in the form of audio. This auto input process in to raspberry pi and signal send to the receiver side by using RF Transmitter. At receiver side signal received by using RF Receiver and signal is decode by using HT 12 D decoder ic and these decoded signal transfer relay. Using relay particular devices on and off by user voice command.

REFERENCES

[1] Ani R, Effy Maria, J Jameema Joyce , Sakkaravarthy V,Dr.M.A.Raja, "*Smart Specs: Voice Assisted Text Reading system for Visually Impaired Persons Using TTS Method*" IEEE International Conference on Innovations in Green Energy and Healthcare Technologies(ICIGEHT'17),978-1-5090-57788/17/$31.00©2017 IEEE.

[2] diwakar srinath, Praveen Ram, "*Hot glass –human face, object and textual recognition for visually challenged*," 978-1-5090-6221-8/17/$31.00_c 2017 IEEE.

[3] Akhilesh Krishnan, Deepakraj G, Nishanth N, Dr.K.M.Anandkumar, "*Autonomous Walking Stick For The Blind Using Echolocation And Image Processing*" 978-1-5090-5256-1/16/$31.00_c 2016 IEEE.

[4] Chen-Yen Peng and Rung-Chin Chen, "*Voice Recognition by Google Home and Raspberry Pi for Smart Socket Control*," 2018 Tenth International Conference on Advanced Computational Intelligence (ICACI) March 29–31, 2018, Xiamen, China, 978-1-5386-4362-4/18/$31.00 © 2018 IEEE.

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[5] Ms.Rupali, D Dharmale, Dr. P.V. Ingole, "Text Detection and Recognition with Speech Output for Visually Challenged Person",vol. 5, Issue 1, January 2016.
[6] Nagaraja, L., et al. "*Vision based text recognition using raspberry PI*," National Conference on Power Systems, Industrial Automation (NCPSIA 2015).
[7] Rajkumar N, Anand M.G, Barathiraja N, "*Portable Camera Based Product Label Reading For Blind People*.",IJETT, Vol. 10 Number 11 - Apr 2014.
[8] Ezaki, Nobuo, et al. "*Improved text-detection methods for a camera-based text reading system for visually impaired persons*," Eighth International Conference on Document Analysis and Recognition (ICDAR'05). IEEE, 2005.
[9] Chucai Yi, Yingli Tian and Aries Arditi, "*Portable Camera-Based Assistive Text and Product Label Reading from Hand-Held Objects for Visually impaired persons*," IEEE/ASME Transactions on Mechatronics, Vol. 19, No. 3, pp.808, June 2014.