

# RASPBERRY PI BASED OBJECT DETECTION AND READING FOR BLIND PERSON

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**Abstract** — Blind people are facing many problems in their day-to-day life . They find it very difficult to read books as well as to recognize the object in front of them. Previously braille method helped them to read using their fingers, this is completely eliminated by this method. We add some extra features to aid visually impaired persons. They can walk on their own as well as without blind stick..This method helps the blind people to read themselves without using their hands. Without touching the objects, they come to know about the things beside them. This technique acts as a third eye for the blind people. They can even walk across the road without the use of blind stick. By implementing this method, they will get a chance to overcome the problems faced by them in the present.

## I. INTRODUCTION

The power of vision is one of the most significant parts of human physiology. Our eyes are the key to our surroundings. Unfortunately, approx 285 million people are estimated to be visually impaired worldwide, of which 39 million are blind, according to a report published by the World Health Organization (WHO).82% of blind people are of the age of 50 and above. Moreover, 90% of visually impaired people belong to the developing countries. The earliest form of navigation tool for the blind has been in the form of

a walking stick[1-2]. But the drawbacks of using it are the lack of necessary skills, Cost and training period. With the advances in technology, it has become possible to design and develop technological solutions that can help a visually impaired person to navigate freely. We propose a camera-based assistive text reading framework to help blind persons read text labels. The Rpi based object detection and reader comes as a proposed solution to enable visually impaired people to find difficulties in detecting obstacles and dangers in front of them during walking and to identify the world around.

## II. EXISTING SYSTEM

In existing system, ultrasonic sensor is used in three directions for finding the object in front , left and right side of the person by using the distance of the object , which is detection within the range and using some external audio player we can play the predefined saved voices for the alert for blind person.

## III. PROPOSED SYSTEM

This paper shows assertive content perusing model. The framework structure practical parts: scene catch, information handling, and sound yield. The catch part gathers scenes containing enthusiastic objects for pictures or video types. In model, it compares to a camera connected to a couple of shades.

The information handling segment convey proposed calculations, including

- 1) object-of-interest identified specifically remove the item held by the visually impaired client from the jumbled foundation or other impartial articles in the camera view
- 2) Content limitation to get picture districts, and content acknowledgment to change picture based content data into meaningful codes.

#### IV METHODOLOGY

This paper presents a prototype system of camera-based assistive object reading. This system consists of three functional components, screen capture, image processing, audio output. The screen capture component collects the objects of interest in the form of image or video. The Data processing system is used for our proposed algorithms, including

- 1) Region-of-interest to collect the objects from the cluttered backgrounds or from other surroundings;
- 2) image localization to attain the object regions to containing grey scale and object recognition to transform the image-based readable codes. The audio output component is to inform the visually impaired persons of recognised text codes. The 3.5 mm audio jack is interfaced with the Rpi board which receives as a speech.

#### V LITERATURE SURVEY

##### An electronic walking stick for blinds

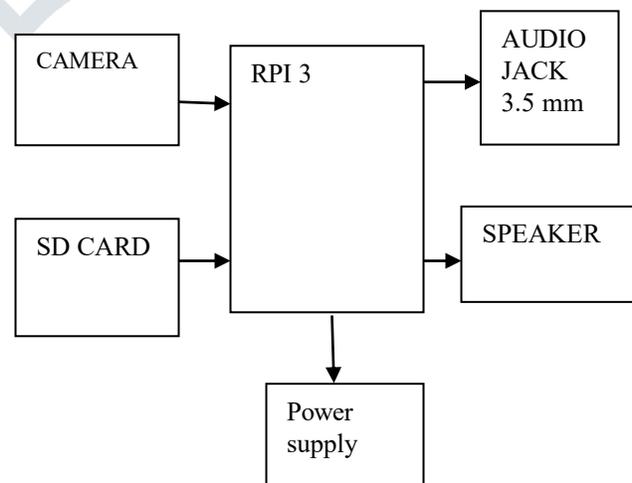
Independence is the building methodology in achieving dreams, goals and objectives in life. Visually impaired persons find themselves challenging to go out independently. There are millions of visually impaired or blind people in this world who are always in need of

helping hands. For many years the white cane became a well-known attribute to blind person's navigation and later efforts have been made to improve the cane by adding remote sensor. Blind people have big problem when they walk on the street or stairs using white cane, but they have sharp haptic sensitivity. The electronic walking stick will help the blind person by providing more convenient means of life. The main aim of this paper is to contribute our knowledge and services to the people of blind and disable society.

##### Smart Stick for Blind Man

Smart stick for blind man is a machine that can follow a path. The path can be visible like a black line on a white surface (or vice-versa) or it can be invisible like a magnetic field. Sensing a line and manoeuvring the robot to stay on course, while constantly correcting wrong moves using feedback mechanism forms a simple yet effective closed loop system. As a programmer you get an opportunity to 'teach' the robot how to follow the line thus giving it a human property of responding to stimuli

##### VI. BLOCK DIAGRAM



## VII.HARDWARE COMPONENTS

Several generations of Raspberry Pi have been released. All models feature a Broadcom system on a chip (SoC) with an integrated ARM-compatible central processing unit (CPU) and on-chip graphics processing unit (GPU). Processor speed ranges from 700 MHz to 1.4 GHz for the Pi 3 Model B+; on-board memory ranges from 256 MB to 1 GB RAM. The first generation (**Raspberry Pi 1 Model B**) was released in February 2012, followed by the simpler and cheaper **Model A**. In 2014, the Foundation released a board with an improved design, **Raspberry Pi 1 Model B+.****Raspberry Pi 3 Model B** was released in February 2016 with a 1.2 GHz 64-bit quad core processor, on-board Wi-Fi, Bluetooth and USB boot capabilities.



### OPERATING SYSTEM:



Various operating system for the Raspberry pi can be installed on a Microsd, Mini SD or SD card depending on the board and available adapters.

Reception and use:



NASA's *Open Source Rover* powered by a Raspberry Pi 3.

### CAMERA:

Blind people are unable to perform visual tasks. For instance, text reading requires the use of a braille reading system or a digital speech synthesizer (if the text is available in digital format). The majority of published printed works does not include braille or audio versions, and digital versions are still a minority. On the other hand, blind people are not able to read the simple warnings in walls or signals that surround us. Thus, the development of a mobile application that can perform the image to speech conversion, whether it's a text written on a wall, a sheet of writing paper or in another support, has a great potential and utility

### Text to speech overview:

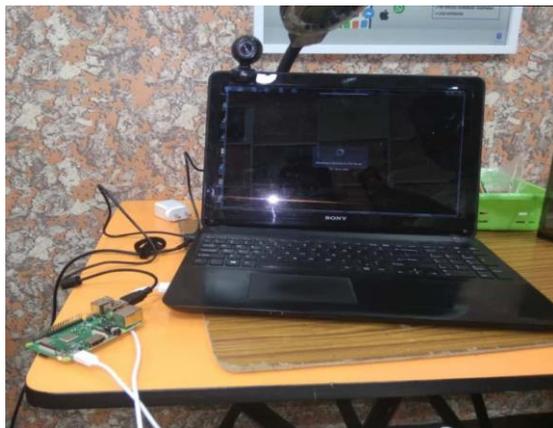
Voice synthesis, defined as TTS (acronym for Text-To-Speech), is a computer system that should be able to read aloud any text, regardless of its origin [5]. The use of TTS aims to produce human voice artificially. Voice synthesis is a complex process and complex algorithms are needed to produce an intelligible and natural result. TTS synthesis makes use of techniques of Natural Language Processing. Since the text to be synthesized is the first entry of the system, it must be the first to be processed.

There are several techniques to create a synthesized voice :

- Articulatory synthesis
- Formant synthesis
- Concatenation synthesis
- Hidden Markov models synthesis.

## VIII.RESULTS

## VII.DESCRPTION

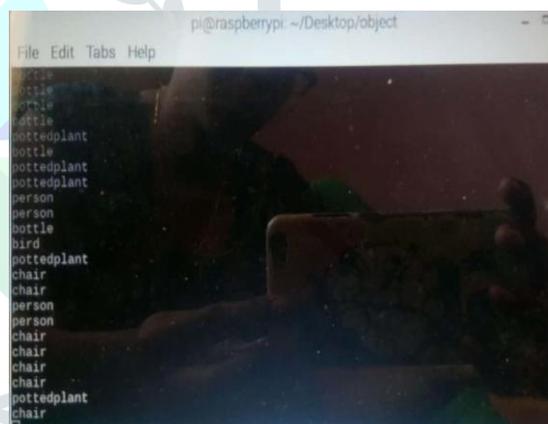
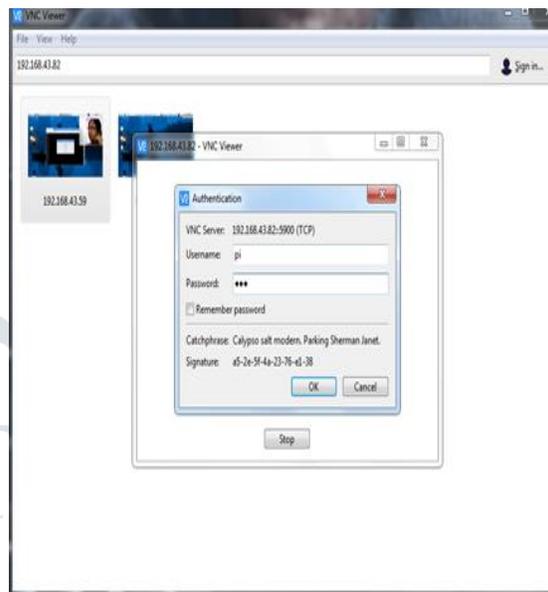


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## IX.CONCLUSION

\*By implementing this method, they will get a chance to overcome the problems faced by them in the present. This technique act as a third eye for the blind people

\*They can even walk across the road without the use of blind stick and to read themselves without using their hands.

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