

Effective Fast Response Smart Stick for the Blind and Visually Impaired People

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Abstract-This paper proposed mainly concentrate on visually impaired people to make their life easier because blindness snatches the visual beauty of the world from an individual's life. In this system one part contains detect obstruct in front of visually impaired people and alert them. And another part is it can captured the image and read the text which are available on the image. With the help of "Google text to speech converter", it converts the Text into Speech. This is the new innovation described in given paper.

Key words: Smart Stick; Sensors; GPS module; RF module; Microcontroller; OCR module; Google text converter; Raspberry Pi; Buzzer; Keypad;

I. INTRODUCTION

There are several issues over which humans have no control. Blindness is one kind of such issue. Main purpose to work on this project is to focus the blind population of the world and to support them in every walk of life through the aid of technology. Blind people are suffering lot to perform their day to day task due to this problem. One of their most leading problems is of transport, such as crossing roads, traveling in trains, or other public places also they are finding difficulties while detecting obstacles in front of them, during walking in the street, which makes it dangerous. They always need human assistance to do it. But sometimes they are helpless when no such assistance offered. Their dependencies deteriorate their confidence. Hence to overcome these kind of issue they can use trained dogs, but such dogs are very expensive and not very reliable. Some other products available in the market are the smart belt, smart ring. But these devices have very limited usability and lack approach due to more cost. The smart stick comes as a proposed solution to enable them to identify the world around. In this paper we propose a solution, represented in a stick with low cost, fast response, low power consumption light weight and ability to fold.

It consist of infrared sensor to detect stair-cases and pair of ultrasonic sensor to detect any other obstacles in front of the user, Water sensor is used to sense the water in path and vibrator sensor is used to notify the user about the hurdle arriving on his path. All Sensors serve as its eyes and the microcontroller, Raspberry 'Pi' serve as its brain, hence this device is efficient and unique in its capability in specifying the source and distance of the objects that may be encounter by the blind. It is able to scan areas left, right, and in front of the blind person regardless of its height or depth.

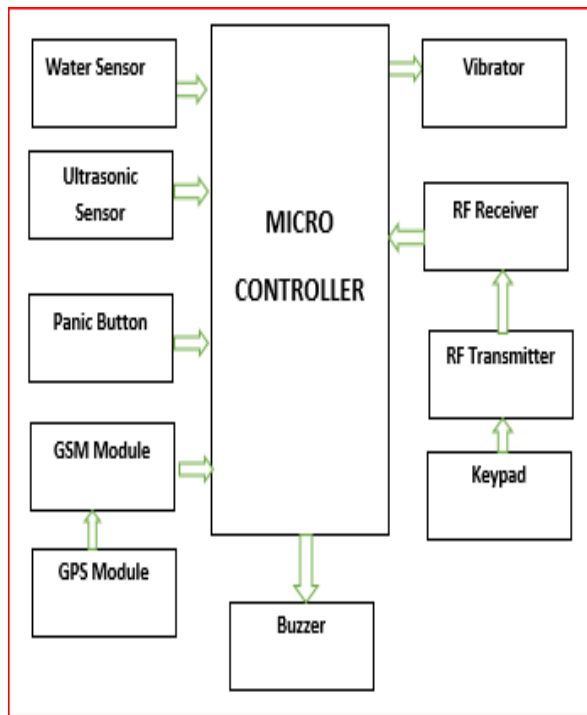
II. "GLOBAL STATUS REPORT OF BLIND PEOPLES 2019" PREPARED BY WORLD HEALTH ORGANIZATION [1, 2, 3, 4]

1. Globally, at least 2.2 billion people have a vision impairment or blindness, of whom at least 1 billion have a vision impairment that could have been prevented or has yet to be addressed.[1,2]
2. This 1 billion people includes those with moderate or severe distance vision impairment or blindness due to unaddressed refractive error, as well as near vision impairment caused by unaddressed presbyopia.[1,2]
3. Globally the number of people of all ages visually impaired is estimated to be 285 million, of whom 39 million are blind. According to the report by Times of India, India is now home to the world's largest number of blind people. Of the 39 million people across the globe who are blind, over 15 million are from India.[3]
4. Also on the other hand, India needs 2.5 lakh donated eye every year, the country's 109 eye banks manage to collect a maximum of just 25,000 eyes, 30% of which cannot be used.[4]

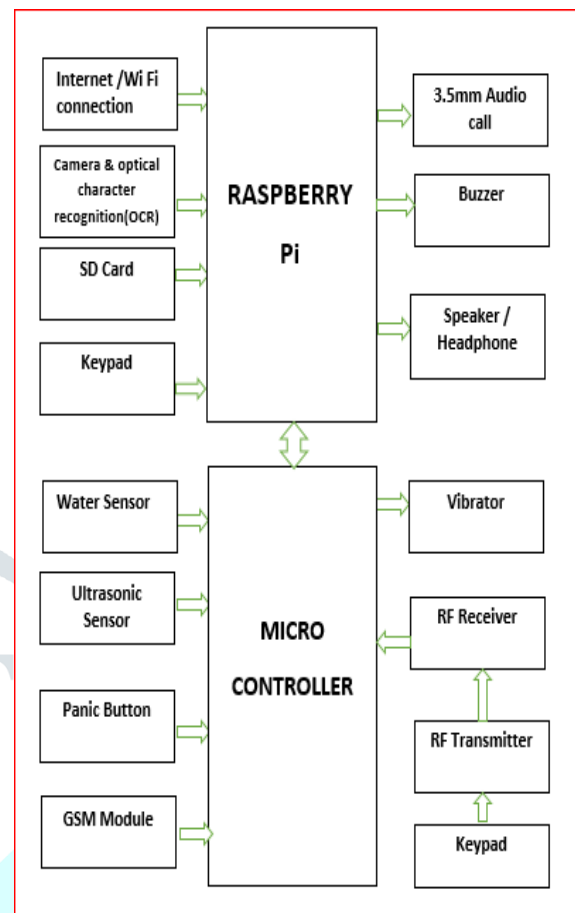
III. SMART STICK INNOVATION [5]

In this paper different development in Smart stick which can be helpful to avoid accidents of blind people. It focuses on blind people comfort increase safety is the important factors while doing the Transport from one place to other. Data is sent to the microcontroller when the stick encounters different obstacles in the path of blind person that means depending upon the type of obstacles data will sent to the microcontroller, Saved data is analysed by microcontroller based upon judgment command is sent to the output. Vibrations occur in predefined sequences set up during software implementation. No two vibration sequences will seem similar. Data sent by the microcontroller to the output is in electrical form and this electrical data is converted into vibrations and alerts goes to blind, this type of complete automation is used in smart stick. Smartly it's recognised the thinks and immediate massage goes to blind or visually impaired person. We are hoping to greatly impact the lives of blind people and console the general differently-abled population that even if we cannot medically heal them, we still can vastly improve their daily lives by utilizing advanced technology. This shows a new start in developing devices which can aid not only people with disabilities but even normal people in their day to day lives. Allowing humans to become much more efficient in their work.

- Block diagram of existing system :



- Block diagram of proposed system :



IV. PROPOSED METHODOLOGY OF IMAGE PROCESSING IN SMART STICK: [6]

In this paper author has been explained and outlines all developments of Image processing techniques in Smart stick such communication connected to text available in images and blind people. Intelligent smart stick based on Image processing is creatively described in given paper, this paper is also focus on the new and updating generation in the smart stick. Paper have described the connectivity of blind person and images available in front of them, it converts the all available text message on an image to speech and provide it to blind person with the help of headphone.

Images to text converter and Text to speech converter gives details about image and blind people communication system in given paper. Image processing is done with the help of optical character recognition, it can captured the image and read the text which are available on the image. With the help of "Google text to speech converter" it converts the Text into Speech.

VI. CONCLUSION

Effective fast response Smart stick is a very practical creation which helps to blind users by acting as his support. No heavy & costly machinery required for mass production. Based on the above facts we can confidently conclude that, the smart stick is a simple, cheap, easy to handle electronic guidance device, which is proposed to provide constructive subordinate and support for blind and visually impaired persons. The device is efficient and unique in its capability in specifying the source and distance of the objects that may be encounter by the blind. It is able to scan areas left, right, and in front of the blind person regardless of its height or depth. It can captured the image and read the text which are available on the image to converts the Text into Speech. It is a user-friendly device and can serve the purpose of potential beneficiaries. In this way this paper reviewed the smart stick innovation in brief.

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