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THIRD EYE FOR BLIND (Ultrasonic Vibrator Glove)

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ABSTRACT

In this high-tech era, technology has made it possible that everyone can live a comfortable life. But somehow the physically challenged people need to depend upon others in their daily life which ultimately makes them less confident in an unfamiliar environment. But nowadays the explosion of innovative technology provides many opportunities for them to live confidently without feeling as a burden. So, in this paper, an intelligent device is represented for visually challenged people to guide them to reach their destination place safely without facing any difficulties. It consists of Raspberry Pi controller, Global Positioning System (GPS) along with sensors like Ultrasonic and other supportive sensors.

1. INTRODUCTION

Blind people find it difficult to move in this world as they get distracted by the obstacles, they may even get lost.[15] So, in the proposed system the above-mentioned cases are taken into consideration and implementation is provided. In order to help the blind people for detecting object the proposed system make use of ultrasonic sensors to track the person. The system makes use of GPS module to find the location. The main objective of this project is to reduce the cost and to provide a better solution for the visually impaired.

2. LITERATURE SURVEY

Over the years, there has been an evolution of various techniques of guiding visually impaired persons, thus, toward attaining their self-independent by freely moving around their environment without guidance from others; some of these are:

- **Haptic shoe for the blind**: A haptic device that can be installed in a shoe vibrating alert feature benefit for deafness. This device receives GPS information from a smartphone and provides vibration feedback at the right, left, front and back for the shoe in order to provide guidance to a destination.[13] A proximity sensor in the front of the shoe can detect objects up to 3 metres and provide vibrational feedback.
- **Multi-dimensional walking aid by Olakanmi. O. Oladayo:** This system uses ultrasonic detection technology and the voice module, the obstacle is detects by the ultrasonic sensor and the direction of the obstacle is communicates to the user through voice output[15]
- **3D ultrasonic stick for the blind by the Osama Bader Al-Barm (2014):** The system uses ultrasonic sensor for detecting the obstacle in three directions (i.e front, left and the right sides of the visually impaired), and the vibration motor which vibrate with the intensity depending on the obstacle‟s distance.[14] It also uses GPS and GSM for localization of the visually impaired [6]. In this paper, design and development of intelligent electronic travelling aid for visually impaired is presented. The device employs ultrasonic detection,

3. EXISTING SYSTEM

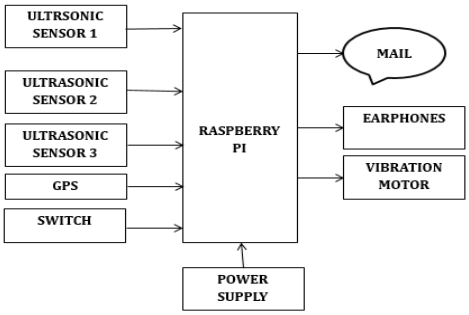
The existing system consists of the devices or the supports like white cane for helping them to detect the obstacles and travel to places, pet dogs, and smart devices like vision a torch for blinds. But, there were many limitations and problems in this existing systems like in the white cane, it may easily break or crack. The white cane may get stuck at the pavement cracks of the different objects. Whereas the pet dogs cost is huge and need a lot of training.

4. PROPOSED SYSTEM

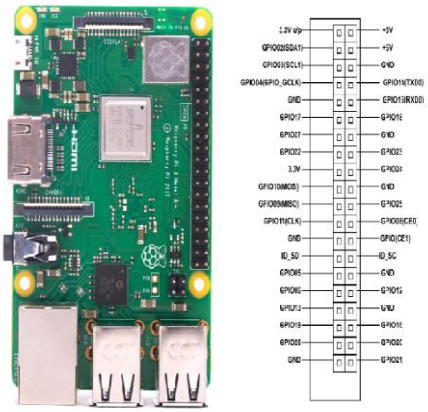
The working behind this blind stick is that it is used for special purpose as a sensing device for the blind people. It is used widely to detect objects using Ultrasonic sensor.[16] If any object is present, the ultrasonic sensor detects the object by measuring the distance between the object and the user and sends the

data to the raspberry Pi. To determine the distance of an object, calculate the distance between sending the signal and receiving back the signal.[3]

BLOCK DIAGRAM



5. METHODOLOGY

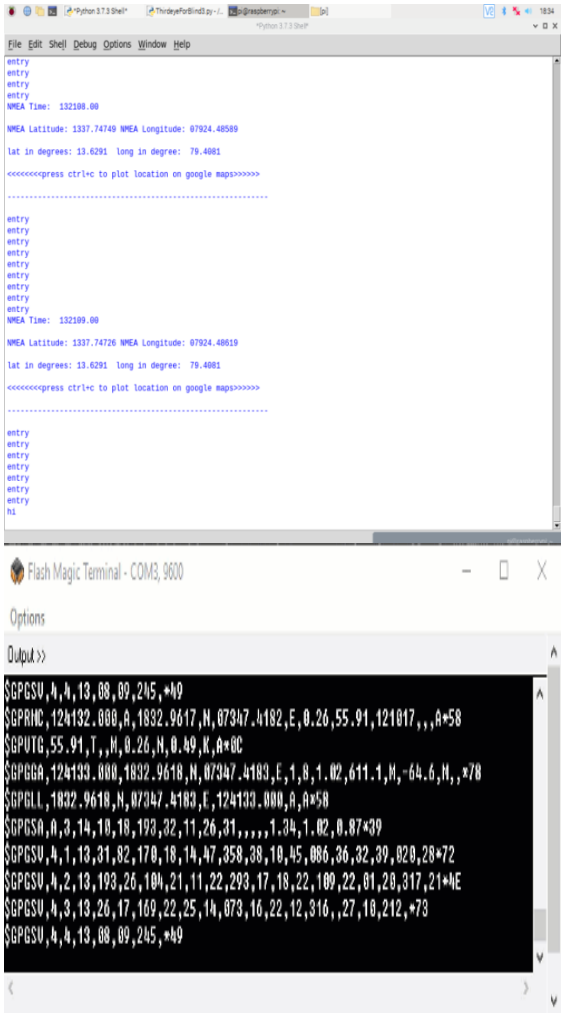


Raspberry Pi-3 Pin Configuration:

PIN GROUP	PIN NAME	DESCRIPTION
POWER SOURCE	+5V, +3.3V, GND and Vin	+5V -power output +3.3V -power output GND – GROUND pin
COMMUNICATION INTERFACE	UART Interface(RXD, TXD) [(GPIO15,GPIO14)]	UART (Universal Asynchronous Receiver Transmitter) used for interfacing sensors and other devices.
SPI Interface(MOSI, MISO, CLK,CE) x 2 [SPI0-(GPIO10 ,GPIO9, GPIO11 ,GPIO8)] [SPI1--(GPIO20 ,GPIO19, GPIO21 ,GPIO7)]	SPI (Serial Peripheral Interface) used for communicating with other boards or peripherals.	
TWI Interface(SDA, SCL) x 2 [(GPIO2, GPIO3)] [(ID_SD,ID_SC)]	TWI (Two Wire Interface) Interface can be used to connect peripherals.	
INPUT OUTPUT PINS	26 I/O	Although these some pins have multiple functionsthey can be considered as I/O pins.
PWM	Hardware PWM available on GPIO12, GPIO13, GPIO18, GPIO19	These 4 channels can provide PWM (Pulse Width Modulation) outputs. *Software PWM available on all pins
EXTERNAL INTERRUPTS	All I/O	In the board all I/O pins can be used as Interrupts.

HC-SR04 Sensor Features:
Operating voltage: +5V
Theoretical Measuring Distance: 2cm to 450cm
Practical Measuring Distance: 2cm to 80cm
Accuracy: 3mm
Measuring angle covered: <15°
Operating Current: <15mA

6. OUTPUT



7. CONCLUSION

The system is giving approximate obstacle distance from three sides that is from front, left and right side in the form of audio as well as vibration sense. The intensity of vibration motor changes inversely as distance between obstacle and system changes inversely.

When person feels panic situation, he/she/it can press the emergency button, after pressing of emergency button within seconds a mail is sanded to particular person with exact location link for Google map.

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