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Third Eye for Blind Person using Node MCU Microcontroller and GPS

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ABSTRACT: With the improvement of the living standards of the people, we have become so materialistic that we have forgotten how the blind people live a tough life. They undergo rigorous, apathetic and indifferent behaviour towards them for being physically disabled. Blind and impaired persons always depend on other people for their locomotion. Eyes are prime sense of organ in perceiving the outside environment; dysfunction of such prime sense organ severely effects the knowledge perceiving capability of the outside environment. Therefore, blind people face many difficulties in their life.

The objective of this project, The Third Eye for the Blind People is to design a product which is very much useful to those people who are visually impaired and those who often have to rely on others.

Third eye for Blind person using node mcu microcontroller and gpsproject is an innovation which helps the visually impaired people to move around and go from one place to another with speed and confidence by knowing the obstacles which comes on the way, by using the wearable hand gloves which produces the ultrasonic waves and notify them with buzz sound as well as vibrations. It helps the people those who are visually impaired to walk comfortably by detecting the obstacles. They only need to wear this device as a band or hand gloves.

KEYWORDS: Ultrasonic Sensors, Detecting Obstacles.

I.INTRODUCTION

Third eye for blinds is the device, helps to the blind people to walk or move easily with speed and confidence by detecting the obstacles on the way using the help of ultrasonic waves and which grasp and quickly notify them with buzzer sound or vibration. They only need to wear this device as a band or cloth.

According to World Health Organization39 million peoples are estimated as blinds worldwide. They are suffering a lot of harder ship in there daily life.SO, aim of the project is to develop a cheap and more efficient way to help visually impaired to navigate with greater comfort, speed and confidence.

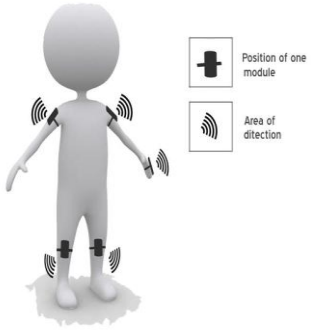

Figure 1: Position of the modules

II.SYSTEM DESIGN

We have designed a special wearable device based on the Arduino board which can be useful for blinds. This device is equipped with two ultrasonic sensors, Among them, one for the hand and another is for shoes. Using

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the ultrasonic sensors blind can detect obstacles and the person can walk comfortably. When the ultrasonic sensor detects obstacles the device will notify to the user through vibrations and sound beeps. The intensity of buzzer beeping rate and vibrations of the vibrator motor increases with decrease in distance. it is totally automated device.
It consists of Node MCU microcontroller, Ultrasonic sensor, GPS module, Buzzer,Vibrator motor etc. The ultrasonic sensor, GPS module are interfaced with Node MCU microcontroller.

For obstacle detection we have used ultrasonic sensor while sensor will detects the any object very near to blind person it will provides the input to controller then controller will enable the buzzer and also vibrator motor for indication purpose.
To track the exact location of blind person when we send the request to controller for location it will enable the GPS then, by taking longitude and latitude values it will send it to user. By placing that values on Google map we can get exact location of person.

III.HARDWARE DESIGN

GPS :-Global Positioning System is a satellite navigation system that furnishes location and time information in all climate conditions to the user. In this device the GPS tracks the location of the blind person. So, the benifit is family or close people of blind person can track the location, to find them if they miss the road.
To track blind person by using longitude and latitude values putting these google map,we can get current location of blind person.

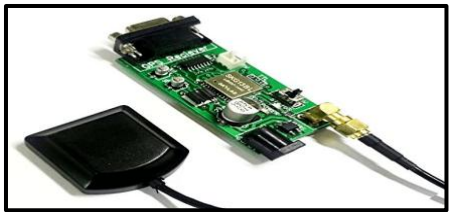

Fig.1 : GPS Module

Ultrasonic Sensor :

The HC-SR04 ultrasonic sensor uses sonar to determine distance to an object. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package. It comes complete with ultrasonic transmitter and receiver modules.

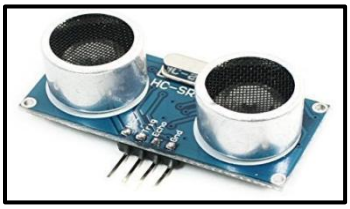

Fig. 2 Ultrasonic Sensor

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets detected by any material or obstacles on the way it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module. And it informs the buzzer and vibrator motor.

Node MCU Microcontroller:

Node MCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "Node MCU" by default refers to the firmware rather than the development kits.
The ESP8266 is the name of a micro controller designed by Espress if Systems. The ESP8266 itself is a self-contained WiFi networking solution offering as a bridge from existing micro controller to WiFi and is also capable of running self-contained applications.

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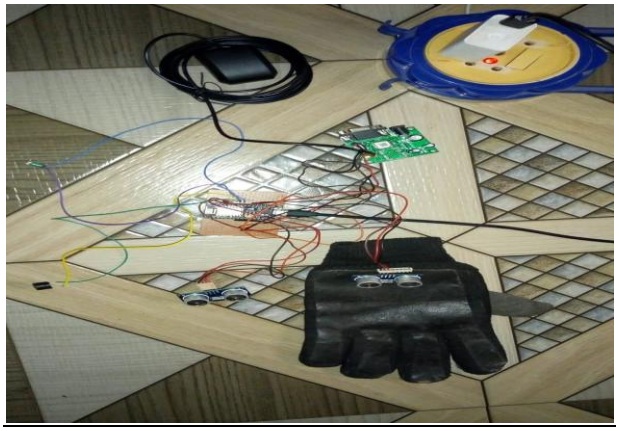
Fig .3 Node MCU

Vibrator motor:-

Vibrator motors are the main actuators for haptic feedback which is an inexpensive way to increase a product's value and differentiate it from the competition. In this device vibrator motor vibrates when the obstacles or object detected by ultrasonic sensors.

IV.RESULTS



ADVANTAGES:-

- Device is easy for visually impaired people and convenient as it will be a wearable device and thus will help the user in travelling and detecting the obstacles while walking.
- Light weight, so the blind person can carry everywhere, so the person can move anywhere with speed and confidence.

APPLICATIONS:-

- The third eye for blind is a device, which gives the stick free and comfortable walk to blind people.
- The blind person can walk with confidance and independently.

IV.CONCLUSION

Thus, design and architecture of the project is anew concept of Arduino based Virtual Eye for the blindpeople. It is a simple, light weight machine, cheap, efficient, easy to carry, configurable,easy to handle electronic system with amazing properties and advantages is proposed to provideconstructive assistant and support for the blind persons. It is able to scan ,senceanddetect the obstacles in the areas like left, right, and in front ofthe blind person regardless of its height or depth. so, with the help of our device the blind person can walk with confidence and without any problem.

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