

THIRD EYES FOR BLIND

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Abstract

God's essential and beautiful gift to all of his creatures, especially humans is vision. But there is more human are lack this beauty and are unable to see the wonders of the world through their own eyes. Third eye for the blind is a project involving more than a few fields such as software program engineering, hardware design, and science that lets in visually impaired human beings to confidently and independently see and explore the world by means of recognizing nearby objects using ultrasonic waves and informing the man or woman with a beep sound or vibration. According to the WHO (World Health Organization), there are 285 million visually people in the world, 39 million of whom are blind, and 246 million who have low vision. They are having difficulties with their way of life. This device is an innovation for the blind person with lot of benefits. We are building a wearable helmet to detect nearby object and made with in a limited price.

Keywords – Blind, WHO, Daily life, Connect, Ultrasonic Sensor.

1. Introduction

The third eye for blind is to create a product that will be extremely valuable to persons who are vision impaired and frequently depend on others. The Third Eye for Blind project is a development that allows externally disabled people to move around and go from one place to another with confidence and speed by notifying them to nearby obstacles using a wearable band that emits ultrasonic waves that they are alerted to with a buzz sound or vibrations. According to the definition of blindness, we are referring to a person who is unable to see. A person who is blind is unable to see anything. While battling for various type of comfort for the normal people, we have come to the point we have begun to utterly disregard those who are living in misery without of vision. They confront significant challenges in their day to day lives, and as a result, they become dependent. They live a life that is very different from that of the general public, and they are treated in a disconnected and indifferent manner because they are physically disabled. They require the assistance of others in order to move from one place to another. Sight is the most basic sense of existence, therefore a person's travel from place to place is governed by it. The goal of this project, The Third Eye for the Blind, is to create a product that will be extremely Valuable to persons who are vision impaired and frequently depend on others. The Third Eye for Daze venture is an advancement that permits outwardly disabled

individuals to move around and go from one put to another with speed and certainty by cautioning them to adjacent impediments employing a wearable band that emits ultrasonic waves that they are alerted to with a buzz sound or vibrations. It helps vision challenged people to walk around freely by recognizing obstructions. They merely need to wear this device on their bodies as a band or fabric.[1-10]

The goal of this project, The Third Eye for the Blind, is to create a product that will be extremely valuable to persons who are vision impaired and frequently depend on others. The Third Eye for Daze venture is an advancement that permits outwardly disabled individuals to move around and go from one put to another with speed and certainty by cautioning them to adjacent impediments employing a wearable band that emits ultrasonic waves that they are alerted to with a buzz sound or vibrations. It helps vision challenged people to walk around freely by recognizing obstructions. They merely need to wear this device on their bodies as a band or fabric.[7-18]

According to the WHO (world health organization), there are 39 million of whom are blind, 39 and 246 million who have low vision, in the world total 285 million people visually impaired. They face numerous difficulties in their daily life. This technology could be a game-changer for people who are physically crippled or blind. People with physical disabilities formerly relied on the common method of using a white cane, which was effective but had a number of drawbacks.

The second option is to have a pet dog, which is more costly.

As a result, this activity, Third eye for the blind, will be designed as a moderate, very effective technique to assisting the blind person in traversing with confidence and greater interest. The device is a blinds invention that aids in the removal of the blinds. According to the WHO (World Health Organization), there are 285 million visually impaired people in the world, 39 million of whom are blind, and 246 million who have low vision. They face numerous difficulties in their daily life.

2. Motivation

The third eye for blind people is a technological advancement that allows blind individuals to navigate with speed and confidence by detecting surrounding impediments using ultrasonic waves and alerting them with a buzzer sound or vibration. This device can simply be worn as a band or fabric.

According to the World Health Organization, 3.9 crore people in world are blind. They have a lot of difficulties in their daily lives. For many years, those affected have relied on the traditional white cane, which, while useful, has a number of drawbacks. Another option is to have a pet animal, such as a dog, however this is extremely costly. As a result, the project's goal is to create a low-cost and effective system.

3. Objective

The objective of this project, The Third Eye for the Blind, is to create a product that will be extremely valuable to persons who are vision impaired and frequently depend on others. The Third Eye for Daze venture is an advancement that permits outwardly disabled individuals to move around and go from one put to another with speed and certainty by cautioning them to adjacent impediments employing a wearable band that emits ultrasonic waves

that they are alerted to with a buzz sound or vibrations. It helps vision challenged people to walk around freely by recognizing obstructions. They merely need to wear this device on their bodies as a band or fabric.

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4. Component use

- Arduino Nano
- Ultrasonic sensor
- Buzzer
- Beard board
- 5mm LED: Red
- Slide Switch
- Male & Female Header
- Vibration sensor
- Connecting Wire
- Battery
- Battery cap
- Some elastics and Stickers
- Soldering iron
- Soldering wire
- Helmet

5. Application and Major contribution

This technology will aid vision challenged people in recognizing obstacles in all directions.

- If the object is on the person's left side, the left side gadget vibrates and rings to alert the person to the presence of the obstruction.
- If the object is on the person's right side, the gadget will vibrate and the buzzer will sound to alert the person that the obstruction is on the right side.
- If the object is directly in front of the user, it will vibrate and ring to alert the user to the presence of an obstruction. Similarly, the person will be aware of the obstruction from all sides, including the back, left, and right.
- The proposed system deals with the cheaper and effective obstacle detection with a wide range of coverage

6. Equation

The US sensor is a transducer that works in tandem with the Trans receiver. If impediments are present in the path, the US waves hit the barriers and are reflected back to the transmitter, where the reflected wave is received by the receiver. The sensor used in the United States consists of a single transmitter and receiver. It is estimated the time interval between transmitting and receiving the US signal.

The distance between the sensor and the obstruction is calculated using this time period.

$$S = (H*V)/2$$

Where S is the distance in centimeters, H is the high duration of pulse width, and V is the sound velocity in centimeters per second = 343 mis m arr.

The sensors in the center portion belt should be placed in a location where the sensor's US beats are not confused. For a 1.2 meter draw out, sensors have a field view of roughly $\pi/3$ radians; as the distance from the sensor grows, the inclusion edge shrinks.

As a result, the goal is to blanket a large area with ultrasonic sensors to identify obstructions, allowing the blind to roam around freely.

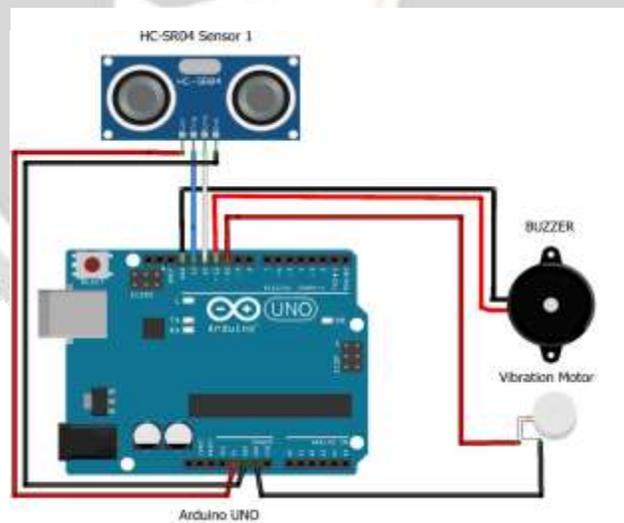


Fig 1: - Circuit Connection

7. Working Principle

For obstacle detection, the suggested system includes components such as an Arduino Nano and ultrasonic sensor, vibrating motor, buzzers, bread board, helmet as well and few other components such as red colored LED, switches, connecting wire, male and female header pins, and a 3.3-volt battery. To make the device wearable like a band, some rubber is employed. The following is a list of the gadget's connections the -ve terminals of buzzer, and vibration motor are all connected to Arduino's ground. The Arduino's pin number 5 is connected to the +ve terminal of the LED and the central terminal of the switch. The +ve terminal of the buzzer must be linked to the 1st terminal and +ve terminal of the switch. The VCC pins of the sensor module and the Arduino are now linked, as are the GND pins of both the sensor module and the Arduino. The ultrasonic sensor's triggering pin and Arduino pin 12 are wired together. The ultrasonic sensor's echo pin is connected to Arduino pin number 12. A switch is linked to select the mode, which is either buzzer mode or vibration mode. Cut the PCB to a 5x3 cm size and solder the female headers for Arduino to the board. Solder the buzzer now. The motor is connected with glue and wires are soldered to it. Connect the LED now. Connect the switch once you've connected the LED. Connect the headers for ultrasonic sensors and battery input. Connect the Ultrasonic sensor and Arduino to the PCB after soldering all of the components. Each module should have an elastic band attached to it. Attach the ultrasonic sensor to the board with 4 jumper wires so that a module for the hand may be built, and connect a 3.7 volt mobile battery to this module. The ultrasonic sensor fix in the front side of the helmet, battery and led connected in helmet right side. And all other equipment connected under the helmet. The US sensor is a transducer that works in tandem with the Trans receiver. If impediments are present in the path, the US waves hit the barriers and are reflected back to the transmitter, where the reflected wave is received by the receiver. The sensor used in the United States consists of a single transmitter and receiver. It is estimated the time interval between transmitting and receiving the US signal.



Fig 2. Outside design



Fig 3. Circuit Connection (Inside)

8. Code

```
const int pingTrigPin = A4; //Trigger connected to PIN 7
const int pingEchoPin = A5; //Echo connected yo PIN 8
int buz=13; //Buzzer to PIN 4
int buz1=9;
void setup() {
  Serial.begin(9600);
  pinMode(buz, OUTPUT);
  pinMode(buz1, OUTPUT);
}
void loop()
{
  long duration, cm;
  pinMode(pingTrigPin, OUTPUT);
  digitalWrite(pingTrigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(pingTrigPin, HIGH);
```

```

delayMicroseconds(5);
digitalWrite(pingTrigPin, LOW);
pinMode(pingEchoPin, INPUT);

duration = pulseIn(pingEchoPin, HIGH);
cm = microsecondsToCentimeters(duration);
if(cm<=100 && cm>0)
{
int d = map ( cm, 1, 100, 20, 2000 );
digitalWrite(buz, HIGH);
digitalWrite(buz1, HIGH);
delay(50);
digitalWrite(buz, LOW);
digitalWrite(buz1, LOW);
delay(d);
}
Serial.print(cm);
Serial.print("cm");
Serial.println();
delay(40);
}
long microsecondsToCentimeters(long microseconds)
{
return microseconds / 29 / 2;
}

```

9. RESULT AND DISCUSSION

9.1 Advantages

- The benefit of having your third eye open is that you become more aware of the existence of other realms, which can motivate you to continue your spiritual practice.
- They can completely avoid using a white cane or other similar gadgets by using this device. This device will assist the blind in navigating without the use of a stick, which is inconvenient for them. They can simply wear it as a ring or a cloth, and it will perform quite accurately with very little training.

9.2. Disadvantage

- Typical disadvantages (Including the the smart devices) It is difficult to transport and requires extensive training to use.
- Power source (Battery) need to replace after certain interval of time.
- User may face some problem due to circuit failure.

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11. Conclusion

As a result, the Third Eye for Blind People project has enabled blind people to live freely, allowing them to carry out their everyday activities with ease and confidence while maintaining a high level of safety. To supply valuable help and bolster for the daze and outwardly disabled, a straightforward, cheap, proficient, simple to carry, versatile, simple to handle electronic directing framework with numerous more surprising qualities and focal points is proposed.

This technology can search for and detect obstructions in all directions, regardless of the object's height or depth. If the project is completed properly, the blind will be able to move from one location to another without the assistance of others.

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