# THIRD EYE FOR BLINDS

Final report

Submitted by

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# ACKNOWLEDGEMENT

This opportunity gave us a great chance for learning new things. Therefore, we consider ourselves very lucky as we were provided with an opportunity like this.

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We perceive as this opportunity as a big milestone in our career development. We will strive to use gained skills and knowledge in the best possible way, and we will continue to work on their improvement, in order to attain desired career objectives.

## DECLARATION

We, Srishti Jaiswal and Anant Mittal declare that the work in this project report was carried out in accordance with the rules and regulations of SRM Institute of Science and Technology; NCR Campus. It is original and is the result of my own work with the help of organization, lecturers and other references. This project report has not been submitted to any other academic or non-academic institution for any other qualification. Any form of publishing, copying and so forth is prohibited and requires the consent of the student.

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# ABSTRACT

Third eye for blinds is an innovation which helps the blinds people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration. They only need to wear this device as a band or cloth.

According to WHO 39 million peoples are estimated as blinds worldwide. They are suffering a lot of harder ship in their daily life. The affected ones have been using the traditional white cane for many years which although being effective, still has a lot of disadvantages. Another way is, having a pet animal such as a dog, but it is really expensive. The 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.

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# Chapter no. 1

## Introduction

This is the first wearable technology for blinds which resolves all the problems of existing technologies. Now a days there are so many instruments and smart devices for visually impaired peoples for navigation but most of them have certain problems for carrying and the major drawbacks is they need a lot of training to use. The one of the main peculiarities of this innovation is, it is affordable for everyone, the total cost being less than $25 (~1500INR). There are no such devices available in the market that can be worn like a cloth and having such a low cost and simplicity. When used on a large scale, with improvements in the prototype, it will drastically benefit the community.

# Chapter no. 2

## Literature Survey

People who are completely blind or have impaired vision usually have a difficult time navigating outside the spaces that they're accustomed to. In fact, physical movement is one of the biggest challenges for blind people. Traveling or merely walking down a crowded street can be challenging. Because of this, many people with low vision will prefer to travel with a sighted friend or family member when navigating unfamiliar places.

We decided to make this project as an initiative to contribute a little bit of help to the blind people.

Third eye for people who are blind is an innovation which helps the blind people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration.

This is the first wearable technology for blind people which resolves all the problems of existing technologies.

# Chapter no. 3

# Problem Statement

## EXISTING SYSTEMS

- White cane
- Pet dog
- Smart devices (eg. : Vision a torch for blinds)

## PITFALLS IN EXISTING SYSTEMS

- White cane - May easily crack/break. The stick may get stuck at pavement cracks of different objects.
- Pet dog - Huge cost (~$42,000 / 280000Rs )
- Common Disadvantages (Including the smart devices) Cannot be carried easily, needs a lot of training to use.

# Chapter no. 4

## Proposed Work

We have designed a special wearable device based on the Arduino board which can be worn in the hand like a **GLOVE**.

This device is equipped with **ultrasonic sensors.**

Using the ultrasonic sensor, blind can detect the objects around them and can easily travel anywhere.

When the ultrasonic sensor detects obstacle the device will notify the user through **vibrations and sound beeps**.

The **intensity** of vibration and rate of beeping **increases with decrease in distance** and this is a fully automated device.

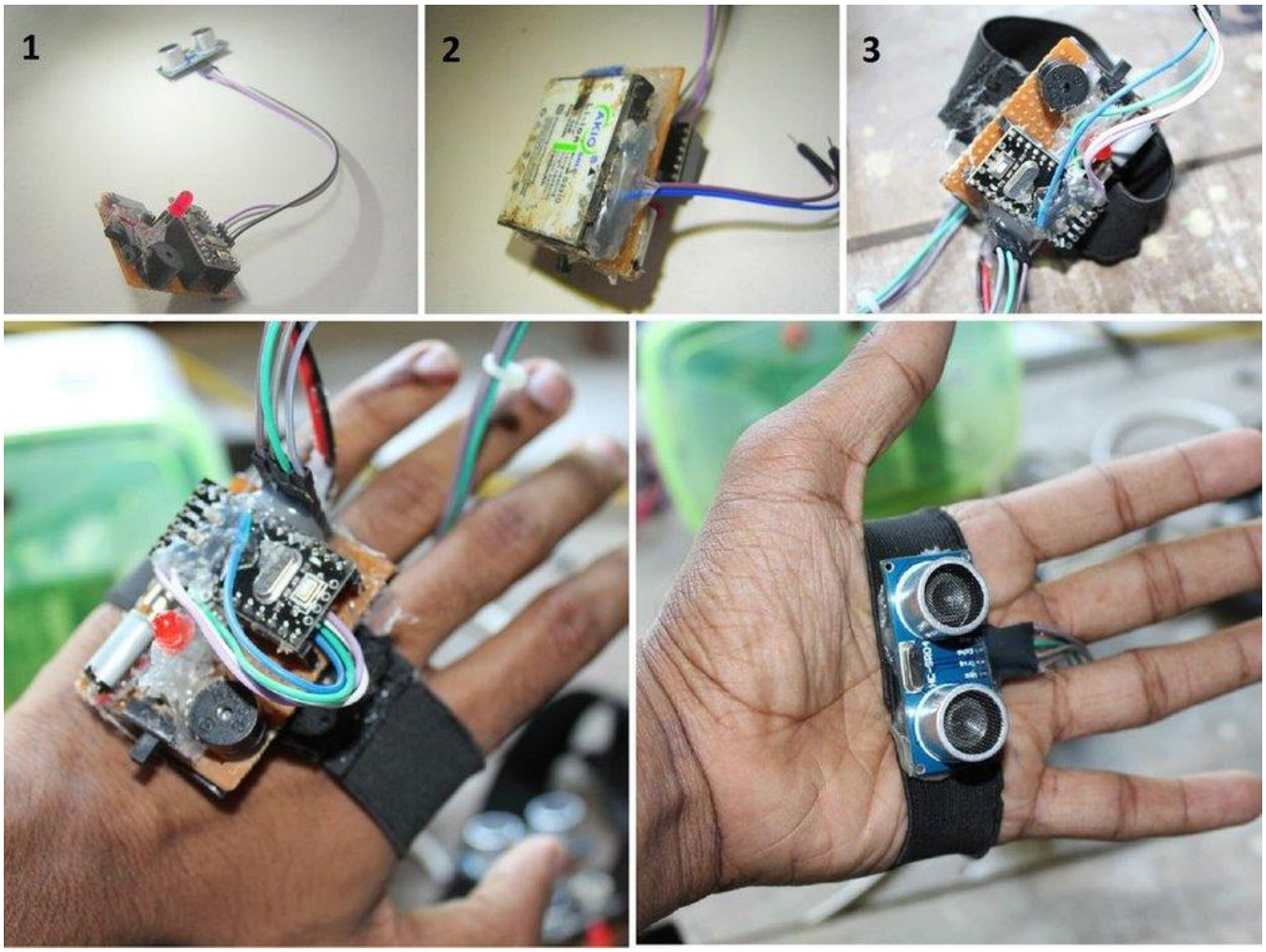
## MATERIALS USED

- Arduino Nano
- Ultrasonic sensor
- Pref board
- Vibrating motor
- LED light
- Buzzer
- Switch
- Male Female header pins
- Power bank
- Glove (to stick on it for wearing)

## PROPOSED SOLUTION

By wearing this device they can fully avoid the use of white cane and such other devices. This device will help the blind to navigate without holding a stick which is a bit annoying for them. They can simply wear it as a band or cloth and it can function very accurately and they only need a very little training to use it.

The 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.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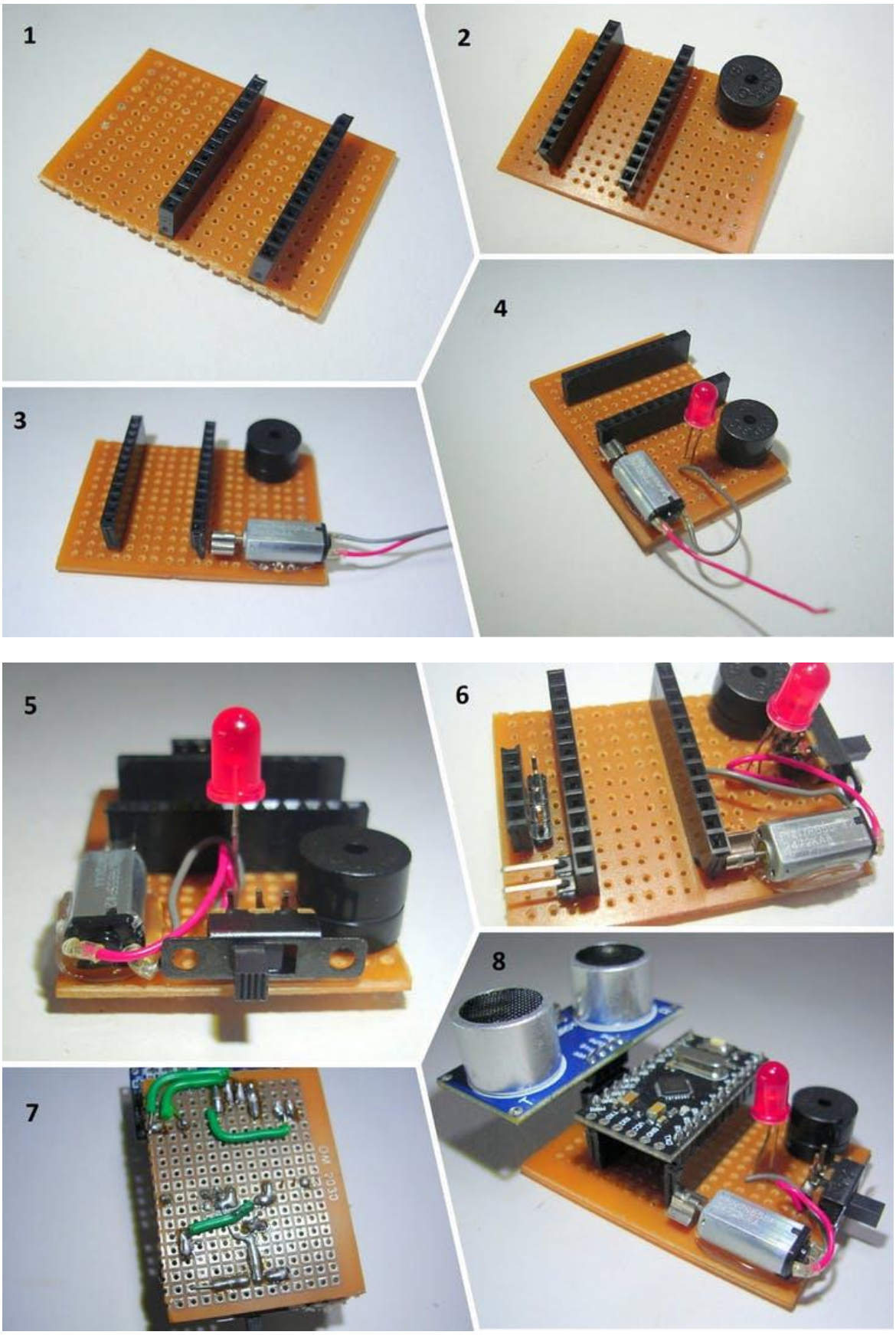
# Chapter no. 5

# Methodology

## WIRING INSTRUCTIONS

- Ground of LED, buzzer and vibration motor to GND of Arduino
- +ve of LED and middle leg of switch to Arduino pin 5
- +ve of Buzzer to first leg of switch
- +ve of Vibration motor to third leg of switch
- Ultrasonic sensor
- Ultrasonic sensor pin VCC - Arduino pin VCC
- Ultrasonic sensor pin GND - Arduino pin GND
- Ultrasonic sensor pin Trig - Arduino pin 12
- Ultrasonic sensor pin Echo - Arduino PIN 12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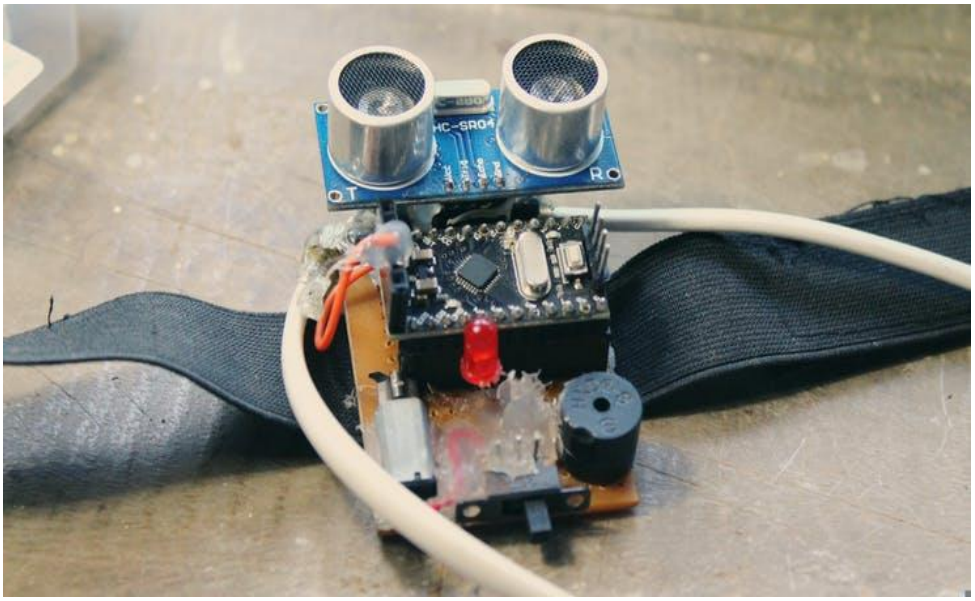
# MAKING THE MODULE

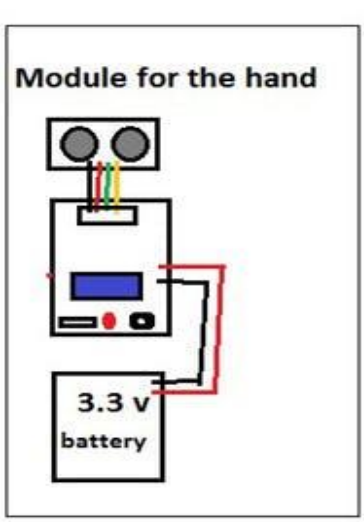
- First cut the pref board in 5 X 3 cm dimension and solder the female headers for the arduino to the board.
- Then solder the buzzer.
- Then connect the vibrating motor using the glue gun and solder wires to it.
- Then connect the LED.
- Then connect the switch.
- Then connect header pins for ultrasonic sensors and for battery input.
- Then solder everything as shown in the circuit diagram.
- Now connect the Arduino and ultrasonic sensor to the board
- Now stick it to the glove

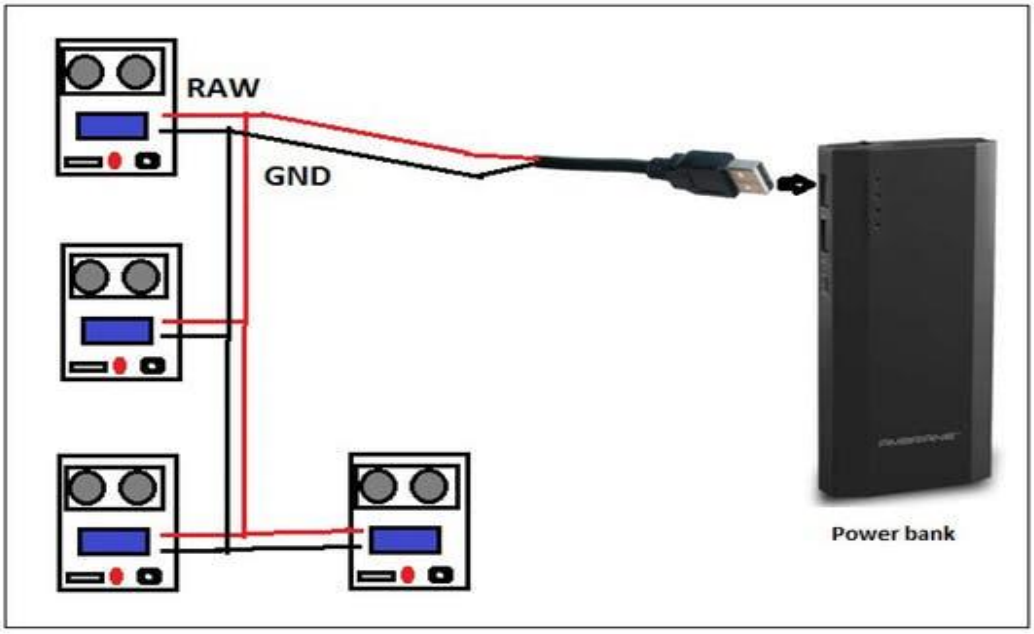


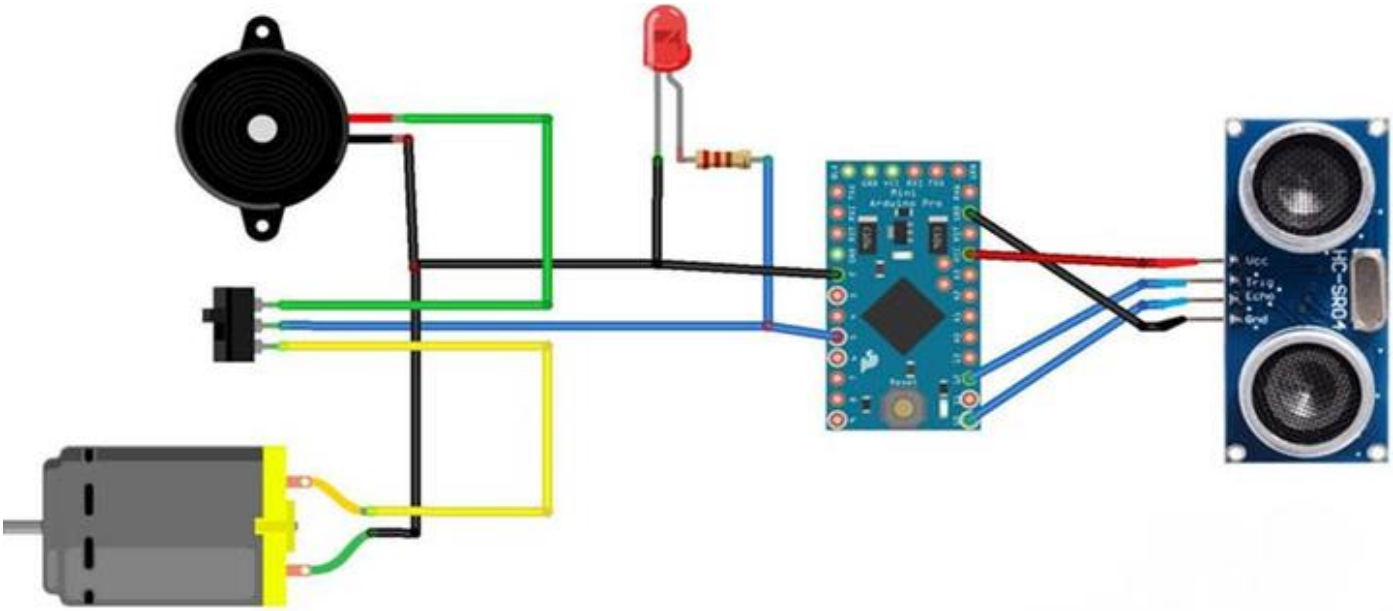
## CODE OF ARDUINO

```
const int pingTrigPin = 12;
const int pingEchoPin = 10;
int buz=5;
void setup() {
Serial.begin(9600);
pinMode(buz, 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);
delay(100);
digitalWrite(buz, LOW);
delay(d);
}
Serial.print(cm);
Serial.print("cm");
Serial.println();
delay(100);
}
long microsecondsToCentimeters(long microseconds)
{
return microseconds / 29 / 2;   }
```

# Chapter no. 6
# Circuit Diagrams



# Chapter no. 7

## Implementation & Result

We have designed a special wearable device based on the arduino board which can be worn like a glove for blinds. This device is equipped with ultrasonic sensor, consisting of module which is connected to the hand. Using the ultrasonic sensor, blind can detect the objects around them and can easily travel anywhere. When the ultrasonic sensor detects obstacle the device will notify the user through vibrations and sound beeps. The intensity of vibration and rate of beeping increases with decrease in distance and this is a fully automated device.

# Chapter no. 8

# Conclusion

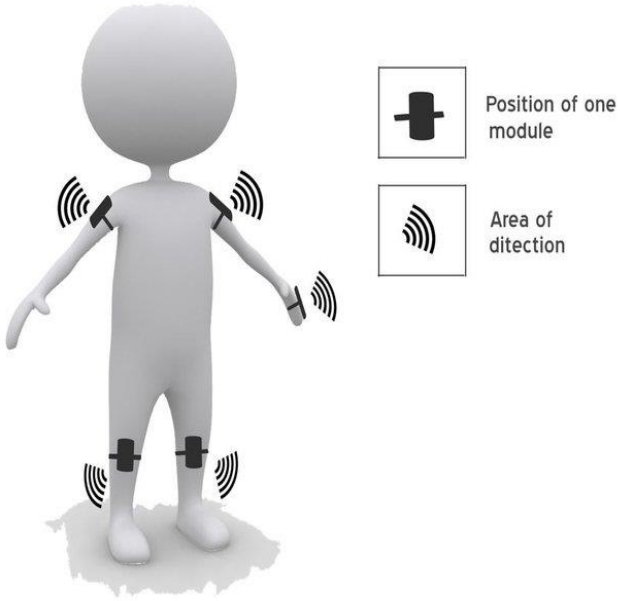
Third eye for blinds is an innovation which helps the blinds people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration. They only need to wear this device as a band or cloth.

This is the first wearable technology for blinds which resolves all the problems of existing technologies. Now a days there are so many instruments and smart devices for visually impaired peoples for navigation but most of them have certain problems for carrying and the major drawbacks is those need a lot of training to use.

# Chapter no. 9

## Future Work

The entire project can be made in the form of jacket by using multiple modules at different locations of the body, so that the device doesn't need to be wear in hand.




Use of specially designed boards instead of Arduino and high quality ultrasonic sensors make faster response which make the device capable of working in crowded.

# Chapter no. 10

## References

https://www.hackster.io/muhammedazhar/third-eye-for-the-blind-8c246d

https://www.instructables.com/id/THIRD-EYE-FOR-BLINDS-an-Innovative-Wearable-Techno/