NEW GOVERNMENT POLYTECHNIC
PATNA-13

SMART GLOVES

A NEW SENSE FOR BLIND

Group Members:

O Priya kumari

O Aditi kumari

O Prity Raj Singh

O Mahima kumari

Guide: Prof. Ambul Prakash

Co-Guide: Prof. Anushka Pradhan

INTRODUCTION

The objective of this project is to share the immense advantage of a technology with those persons who are in a great need of this. Globally, at least 2.2 billion people have a vision impairment or blindness so the aim of this project is to make their life easier by providing them with this smart gloves. This gloves can make their life easier by providing them with this smart gloves. This gloves can tell us if there is any obstacle in the way by vibrations and a GPS trackerthat tracks the record of the location of person that will help them to move across the road and also help them if they get lost. The gloves with the integration of Ultrasonic Sensor. Arduino Uno microcontroller will help them to facilitate movement and give alert to user if there are obstacle in front of them.

ACKNOWLEDGMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have got this all along the completion of our project. All that we have done is only due to such supervision and assistance and we would not forget to thank them.

We respect and thank our honourable principal Mr.Chandrashekhar singh for providing us an opportunity to do the project work in "Bihar Council on Science and Technology" and giving us all support and guidance which made us complete the project duty. We are extremely thankful to him for providing such a nice support and guidance, although he had busy schedule managing the corporate affairs.

We owe my deep gratitude to our project guide Mrs.Ambul Prakash and co-guide Mrs.Anushka Pradhan who took keen interest on our project work and guided us all along, till the completion of our project work by providing all the necessary information for developing a good system.

We are thankful to and fortunate enough to get constant encouragement, support and guidance from all Teaching staffs of electronics department which helped us in successfully completing our project work. Also, we would like to extend our sincere esteems to all staff in laboratory for their timely support.

Thank you.

PROJECT OBJECTIVE

This project titled as **"SMART GLOVES FOR BLIND"** focuses on providing benefits of technology to those who are in great need of this.

The main objective of this project is to use the enormous development of growing technology specially the semiconductor technology to build a device that can favour the differently abled section of our society. This gloves consists of components like Ultrasonic sensor, Arduino UNO, servo vibrator motor and a GPS module. This gloves helps a blind person to navigate safely from one place to another as the ultrasonic sensor takes care of the obstacle which is in the front and alerts the user. With the Global Positioning System the user can be easily traced in case he/she got lost. Above all it can be easily put on like any other clothes, so user hands are not occupied.

At the end, this project is a small step which aims of making "a part of our society" self-dependent without making any compromise in their safety and security.

LITERATURE SURVEY

NIKOLA Krystic a graduate from the electrical engineering school in Belgrade. has create a smart gloves prototype called Anora - that helps the blind and visually impaired move unaided without a service dog or white cane. The glove is equipment with ultrasonic sensor that explore the surrounding : It provides vibrotactile feedback on the possition of the closest obstacles in range and lets user know by a vibrating motor and voice app. The Anora smart glove has many different multi functions.

colour recognition-thrugh a click of a Button. the glove will be able to say allowed the colour of the object the user has in their hand.

Detection of light intensity - the user can be told whether they are in a room present with light, and at same time, whether the light is natural or artificial.

The glove will be able to say the date and time to the user.

Panic bbutton - If the user is lost, through a combination of buttons, the glove will be able to send the location via text message to a guardian or friends, whose contact details are Stored in the app connected to the glove.

Recognition of money - One of the most sought after functions, the glove is able to say the value of the notes and change the user holds in their hand.
The glove also has a small camera installed, which provides information on the imotion of the person the user is talking to.

Most recently, Mr.Krstic has signed a cooperation contract, which will enable further development, promotion and implementation of the Anora smart glove domestically in Serbia. eg tech and the ' alliance of the blind ' Serbia, signed a co-operation agreement on the 10th of April 2019 . The signed agreement means a collaboration that will result in a large number of blind people being able to try in innovative product.The contract was signed at the science technology park in belgrade, by NIKOLA krstic and Milan stosic, the president of alliance of the blind ' .

Thus far , the Anora smart gloves has been tested un 30 blind individuals in Serbia - and the reception has been positive.

EQUIPMENT DESCRIPTION

ARDUINO UNO :- The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller. The board is equipped with sets of digital ana analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.

It can be powered by the USB cable or by an external 9-volt battery, though it voltages between 7 and 20 volts.

The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programme.

Pin diagram:-
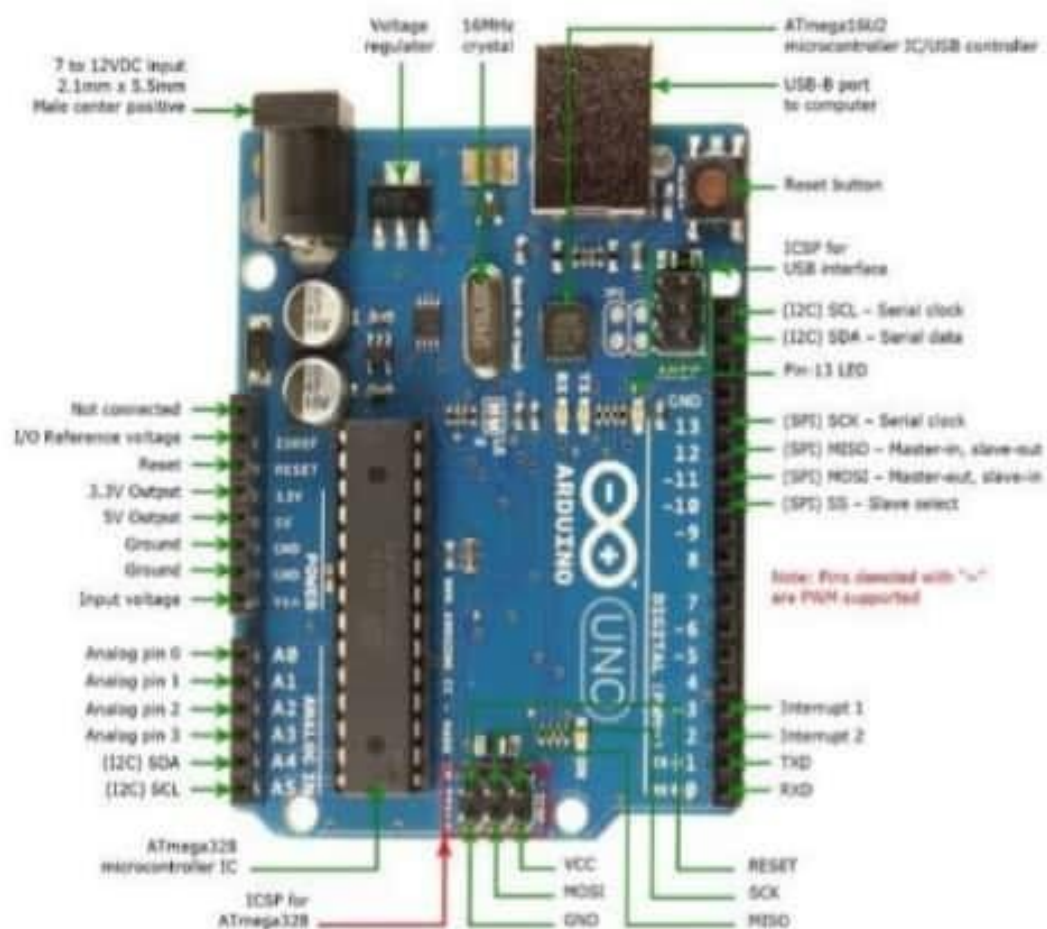
(6)

GSM MODULE:- A GSM modem duly interfaced to the MC through the level shifter IC Max232. The SIM card mounted GSM modem upon receiving digit command by SMS from any cell phone send that data to the MC through serial communication. While the program is executed, the GSM modem receives command 'STOP' to develop an output at the MC, the contact point of which are used to disable the ignition switch. The command so sent by the user is based on an intimation received by him through the GSM modem 'ALERT' a programmed message only if the input is driven low. The complete operation is displayed over 16×2 LCD display.

CIRCUIT DIAGRAM :-
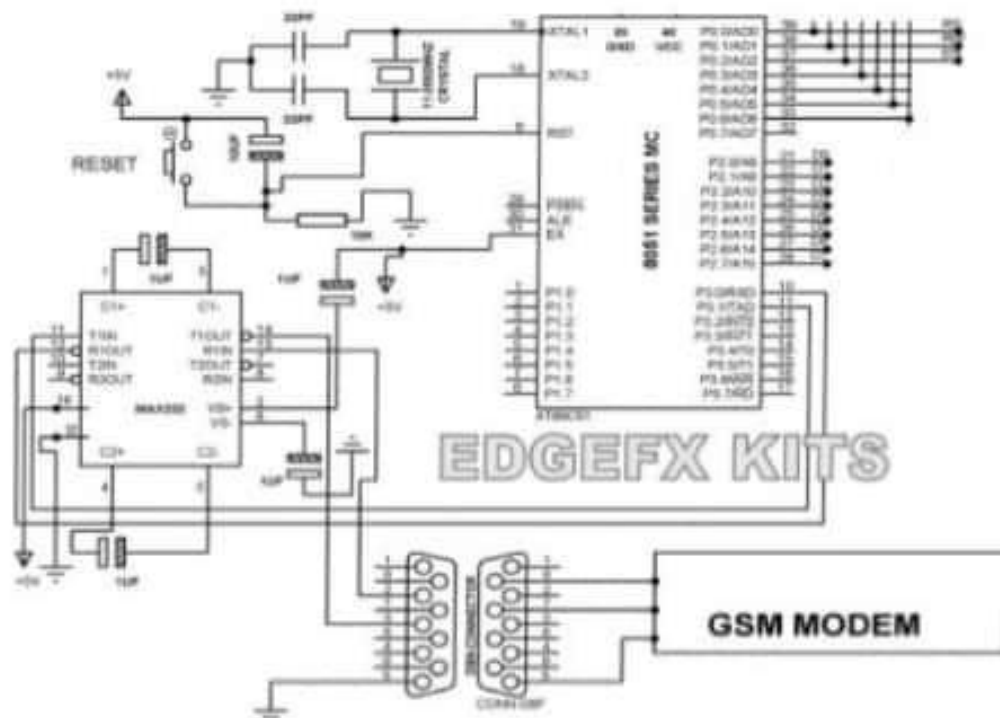
(7)

Ultrasonic Sensor(HC-SR04)   (6)

Ultrasonic sensor emits waves at frequency too high for humans to hear. They then
wait for the sound to be repeated back calculating distance based on the time required.
This is similar to how radar measures the time it takes a radio wave to return after
hitting an object.
The glove is equipped with the Ultrasonic Sensor HC-SR04 that explore the
surroundings; it provides vibrotactile feedback on the position of the closest obstacles
in range and lets user known by vibrating motor and voice app. This type of Ultrasonic
Sensor has anability todetermine the distance of objects with high accuracy and
provide stable reading of data. The sensor widely used for the blind because it does not
affected by environmental noise.

GPS Module

(7)

The GPS network is made up of 24 satellites that orbit the Earth in
prprecise,predefined trajectories while broadcasting radio signals that contains data
about the satellites precise location.
 We connect GPS receiver to a 5V power from the Arduino and ground pin.Connected
the receiver an transmitter pins on the GPS to serial pins on the Arduino.The initial
serial output give information about what kind ofdata is being coded.The letter code is
followed by a string of numbers,that represent in order:-
            timestamp: latitude:longitude.

By installing an Arduino GPS library these raw data are transformed into readable information in a format like this:-
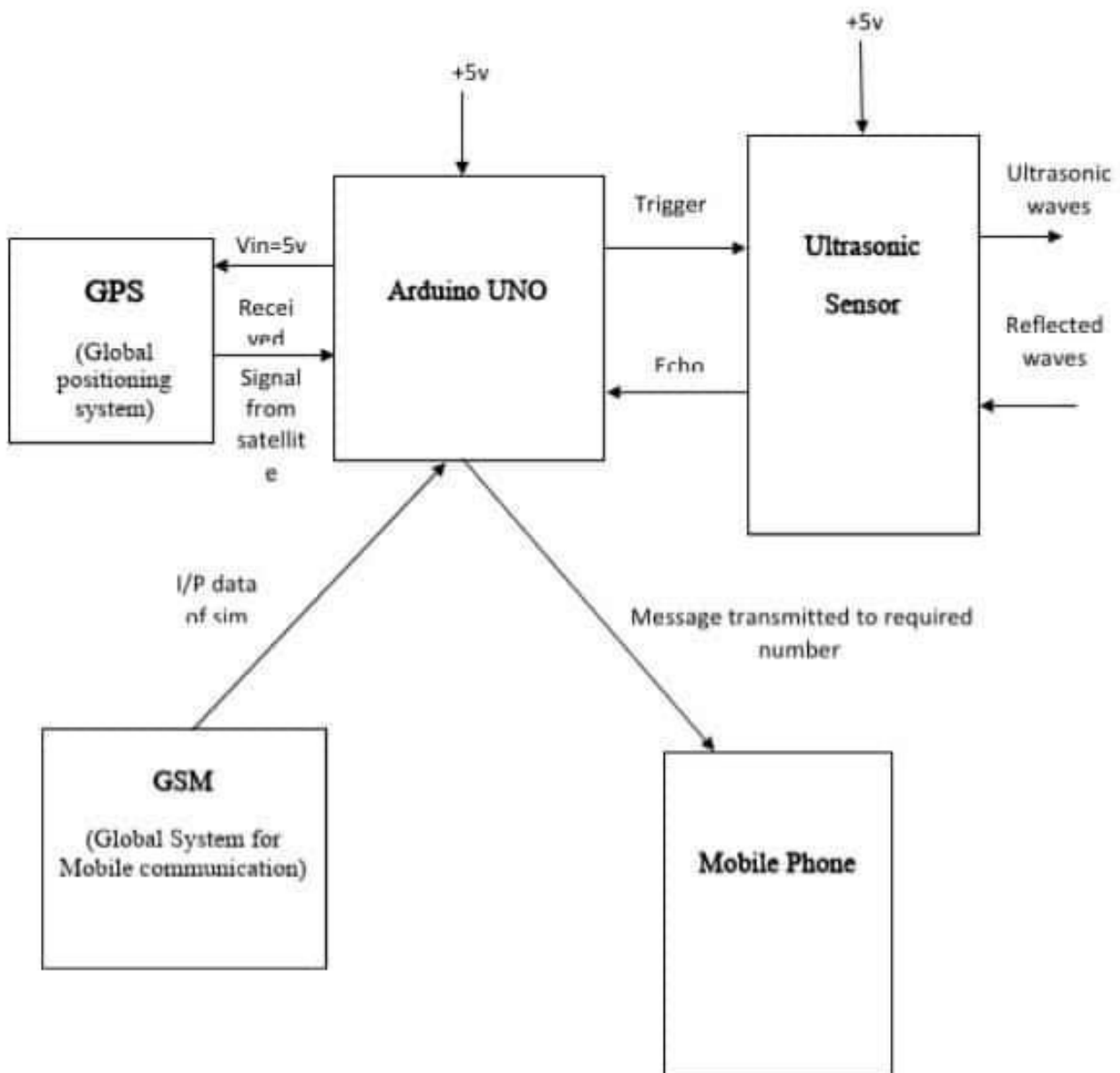
location:-latitude,longitude

Date/Time:-xx/xx/xxxx xx:xx:xx:xx

CIRCUIT DIAGRAM
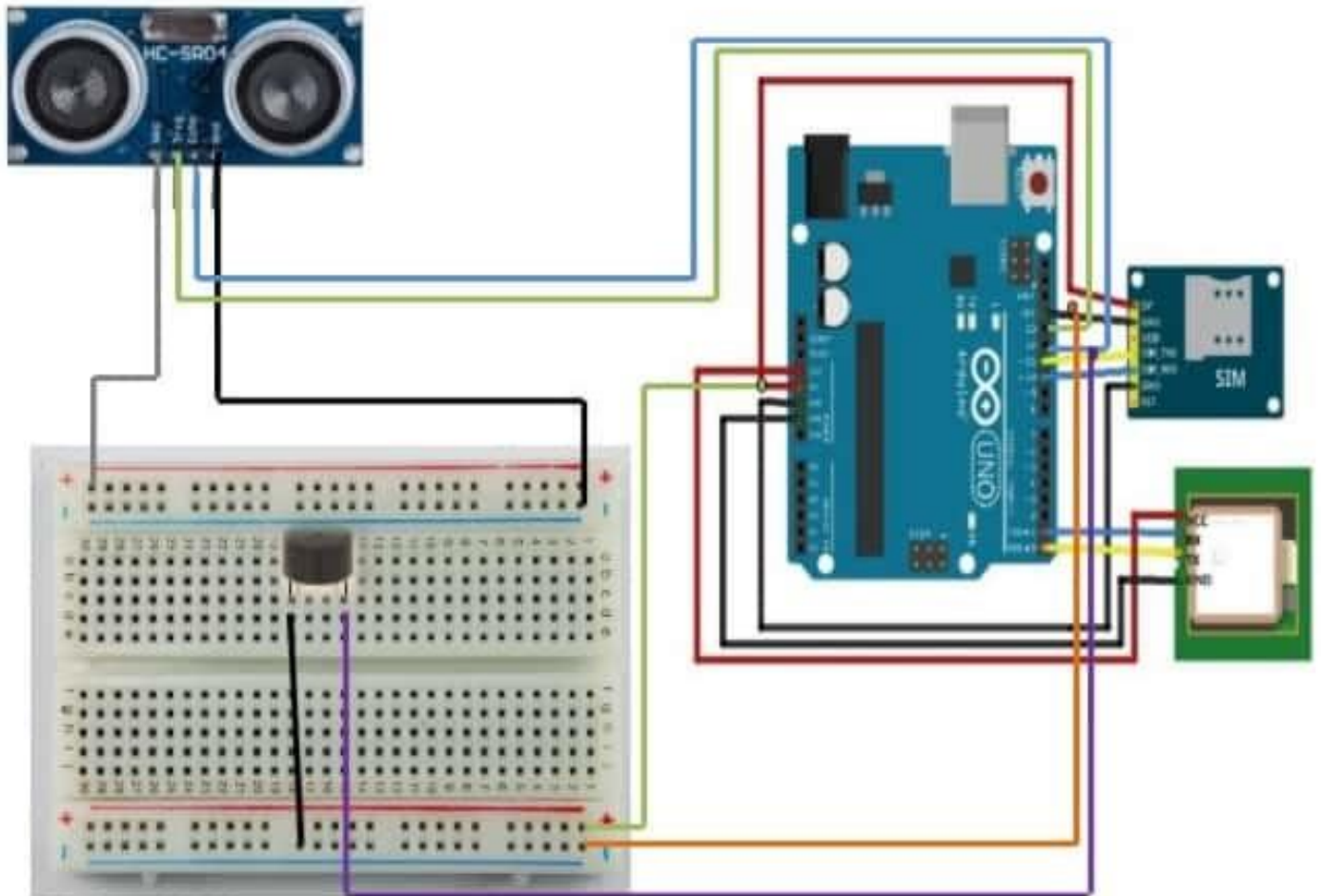
METHODOLOGY

The functioning of the SMART GLOVES can be easily understood with the help of a block diagram-

The working of the circuit is explained below:

> Ultrasonic sensor HCSR04 transmits ultrasonic waves this wave travels in air and when it gets objected by any material it gets reflected back towards the sensor. Ultrasonic sensor consists of 4 pin Vcc, Trigger, Echo and ground.

> Ultrasonic sensor works on the formula of Distance =speed *time . This distance sensor works with a microcontroller which is Arduino in our case.

> When a pulse of at least 10 microsecond in duration is applied to the trigger pin of sensor , the sensor transmits a sonic burst of eight pulses of 40 khz. The eight ultrasonic pulses travel through the air away from the transmitter. Meanwhile the Echo pin goes HIGH and it continues to be in that state until it receives the pulse back. The time for which the echo pin was high accounts the time the wave took to come back. So, the distance of the obstacle is calculated from the basic formula:

Distance = speed * (travel time)/2

Where   speed = speed of sound in air

> The distance is calculated by the Arduino and the buzzer starts ringing.

➤ Moreover since this gloves can also be used to trace a person in case if he/she got lost so for this NEO-6M GPS module is used . GPS module is used to get the required location of the user which is further processed by the Arduino to get the location in terms of latitudes and longitudes.

➤ This gloves also consists of a GSM module which consists of a SIM so when this GSM module is interfaced by the ardino then the location of the user can be directly sent to the number registered for that SIM. So, if a user got lost he just have to press the panic button and his location would be sent to his family or friends.

Conclusion

The objective of this project is to design and develop a device for blind people to avoid accident by using Ultrasonic Sensor with Arduino Uno and Vibrator motor.Arduino Uno will help in analyzing echo signal from nearby object and vibrator motor will produce vibration based upon the strength of signals.

The project also applies the function Ultrasonic sensor,which is programmed to sense the objects and produces signal in response.

Besides that,the objective of this project is also to understand working of different electronics component.

BILL OF MATERIAL

Project Title : SMART GLOVES(A new Sense for blind)				
BCST Grant Letter No : BCST PSC – 01/2018- 858				
Sl. No.	Items	Technical specification	Manufacturer	Minimum price in market (including GST)
1	Ultrasonic sensor	HC-SR04	Easyelectronics	2*100=200/-
2	Arduino UNO	ATmega 328P	Easyelectronics	1*600=600/-
3	Servo vibrator motor	3V coreless High speed	Makershala warehouse	2*50=100/-
4	GPS module	Ublox Neo-6M	Easyelectronics	1*500=500/-
5	PCB	Small dot Board(10*7.5)cm	Easyelectronics	2*75=150/-
6	Battery	9v	Easyelectronics	5*20=100/-
7	Switch	2 pin tactile switch micro	Olatus	2*10=20/-
8	Buzzer	5v passive buzzer	Robocraze	2*20=40/-

9	Resistor	220 Ω	Easyelectronics	5*2=10/-
10	Soldering iron	25 w	PCB Power	1*400=400/-
11	Gloves	Half-finger	Easyelectronics	2*250=500/-
12	GSM module	SIM 900A 5V, 2A	Easyelectronics	1*1990=1990/-
13	Adapter	5v, 2A	Easyelectronics	1*280=280/-
14	Multi--meter	DT830L Digital Multimeter	Easyelectronics	1*900=900/-
15	Glue gun	40 w	Easyelectronics	1*200=200/-
16	Jumper wires	M-M (10 Wires) M-F (10 Wires)	Easyelectronics	20*2=40/-
17	Bread Board	Size- 175*67*8mm	Easyelectronics	2*100=200/-
	TOTAL			6,230/-

FUTURE SCOPE

To achieve the objectives, the scope of this project are determined. For the hardware, ultrasonic sensors will be used as a sensor to detect obstacles at the front and it will send signal to Arduino UNO which act as microcontroller. The microcontroller will then process data and send the signal to Servo Motor which will guide through its vibrating feedback. For the software, the design of the circuit is done using Fritzing software and the program will be done using Arduino software by installing through Arduino library. This will also produce:

- Independent Mobility

- Easy to access location

- Easy to call in emergency

- Better way to explore surrounding

- Low cost device to handle with ease

- System is flexible and secure to use

- Saves times and reduce interdependency

References

For this presentation we got help from :

1. https://dl. can. Org

2. https://www.researchgate.net

3. https://www.iriet.net

4. https://www.iosrjournals.org

5. https://www.ijitee.org

6. https://components101.com

7. www.elprocus.com