A Project Report

on

"SMART STICK FOR BLIND PEOPLE"

Submitted in partial fulfillment of the
requirement for the award of the degree of

Bachelor of Technology in Computer and Engineering

Under The Supervision of

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CANDIDATE'S DECLARATION

I/We hereby certify that the work which is being presented in the thesis/project/dissertation, entitled **"SMART STICK FOR BLIND PEOPLE"** in partial fulfillment of the requirements for the award of the B-TECH in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of March, 2023 to May, 2023, under the supervision of **Mr. B. Thillaieaswaran** (Assistant Professor), Department of Computer Science and Engineering, Galgotias University, Greater Noida.

The matter presented in the thesis/project/dissertation has not been submitted by me/us for the award of any other degree of this or any other places.

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The Final Thesis/Project/ Dissertation Viva-Voce examination of **ROHAN KUMAR GUPTA (19SCSE1010853)** and **RAHUL PATEL (19SCSE1010868)** has been held on 15 May, 2023 and his work is recommended for the award of Bachelor of Computer Science and Engineering.

Signature of Examiner(s) **Signature of Supervisor(s)**

Signature of Program Chair **Signature of Dean**

Date : 15 May, 2023

Place : Greater Noida

ABSTRACT

Humans are not disabled. A person can never be broken. Our built environment, our technologies, is broken and disabled. We the people need not accept our limitations, but can transfer disability through technological Innovation. This Smart stick will have an Ultrasonic sensor to sense distance from any obstacle, LDR to sense lighting conditions and a RF remote using which the blind man could remotely locate his stick. The smart stick for blind people helps them to go anywhere or do their work easily and comfortably. In normal stick, no obstacles or problem occurred for blind people are not detected or searched. Normal stick is not comfortable for blind people to use it. Blind people don't know about the materials or obstacles in front them and they cannot calculate the distance and size of material or obstacles in front them. It is very difficult problem to move from here and there easily. Due to smart stick for blind people, it help to provide the detailed information about the materials or obstacles which helps them to move from here and there easily and comfortably. Smart stick detects objects with the help of sensors and measured the distance using ultrasonic sensors. It also can talk with the person who control it. It also give about the object which come near to the blind people who is using it while moving from here and there by using voice. It helps the people who need help from others to move anywhere.

1. Existing Problem

Nowadays, some of the people born with disability, in which blindness is most affective problem in the world. So, the list of blind people is increases day by day. And most of them are from poor family. Due to poor family, blind people are unable for treatment which may help to back their eye sight because of high money for eye transfer or transplant and lack of donner of eyes. They are unable to move or go anywhere easily. Most of the blind people died due to accident while crossing the road. Most of them are do sucide due to blindness.

2. Proposed Solution

S. NO.	Items	Quantity	Rate	Amount
1.	Arduino Uno (Any version will work)	1.	389	389
2.	Ultrasonic Sensor HC-SR04	1	395	395
3.	LDR	1	195	195
4.	Buzzer	1	130	130
5.	LED 7805	1	25	25
6.	433MHz RF transmitter and receiver Resistors	1	329	329
7.	Push Button	1	25	25
8.	Perf Board	1	65	65
9.	Soldering Kit	1	250	250
10.	9v Battery	1	280	280
11.	Connecting Wires	25	2.69	67.25
Grand Total				2150.25

3. Tools and Technology

The component required for the implementation of the proposed design of the smart stick for blind people are :

- Ardino Uno
- Infrared Sensor
- Water Sensor

- GPS Module
- GSM Module
- Ultrasonic Sensor

4. Result and Output

This gadget will operate to help all the blind people in the world to make them easier to walk everywhere they want. And the navigation system helps them with voice command. It will detect the obstacle coming on the way of blind people. The most important feature will be panic button on the gadget, whenever the blind person stuck or in emergency, his location will be sent to the predefine person. The gadget will be portable and can be use in other blind sticks also. And the moisture detector easily detects the soil moisture and will give command to the blind person.

5. Conclusion and Future Scope

The smart stick for blind people is act as a basic platform which is useful for upcoming generation of much more aiding devices to help the blind people to become more safe and secure from accidents. It is more effective and affordable for rich or poor family. It give good result in detecting the materials or obstacles are available in a range of 3 meters, it also detects stairs, ditch fillup with water.

This stick is available or offered in a low cost, reliable, durable, low power consumption, reusable. The stick consist of hard wired with sensors and other components. It is light in weight which is easy to take anywhere. While setup of this device, blind people are the priority for this device.

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STUDENT DATA

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Acronyms

B.Tech.	Bachelor of Technology
M.Tech.	Master of Technology
BCA	Bachelor of Computer Applications
MCA	Master of Computer Applications
B.Sc. (CS)	Bachelor of Science in Computer Science
M.Sc. (CS)	Master of Science in Computer Science
SCSE	School of Computing Science and Engineering

CHAPTER-1

Introduction

Vision is one of the most important aspect of universe. We should be thankful to god for making us self-dependent and physically well. So now it is our duty to help those people who are visually impaired. Visually impaired people are those who suffer a severe reduction in vision which cannot be corrected with convention means, such as refractive correction and medication. Usually they use a wooden stick or a white stick. But we can transfer this disability through technological innovations. The main problem faced by physically impaired people is mobility. They can't see the surroundings, the world around them. They don't know what is happening and how the things are changing around them, the only way they get to know about things happening around them is the sense of feel but in that too they take some time to realize it. The best way to help them it to make a smart blind stick for the people, it will make blind people self-dependent and they can move and can control their movements. Usually blind people have to rely on their relatives, family members, and some other people for making them move from one place to another, financial issues and even for the small works that one needs to do daily in their day to day living. The stick will provide an ease to them, as the stick available in market now a days are very costly and every class of people can't afford. The stick that we are making is of low-cost, easy to carry (hold and fold), light-weighted, reliable, portable. This system consist of various devices such as ultrasonic sensor, water sensor, Arduino Uno, GPS module. The various passive sensors used are for the purpose of detecting the various deflected, emitted or transmitted electromagnetic radiations provided by various natural energy sources while the active sensors determine the exact distance or the measurement of the distance between the person and the hurdle and to avoid and detect the various obstacles coming in the way of the visually impaired person or while he is moving on road or some pathway. The main objective of our research is to help blind people by making a smart blind stick which can avoid hurdles and provide GPS navigation to visually impaired people so they can walk independently in familiar environments. In this technology controlled world where each and every person strive to live independently and on their own terms. This smart blind stick will work as an artificial vision provider or just a way for the visually impaired people to become self-dependent Smart walking stick is specially designed to detect obstacles which may help the blind to navigate care-free. The audio messages will keep the user alert. Most people die in various accidents while crossing roads or some do suicide because they feel because of this inability they will not be able to

survive in this challenging world. We people only let blind people feel unsafe and make their surroundings not worthy for living. Moreover, looking to the food habits and they polluted environment in which we are living, it is most likely that number of impaired people will grow in future. The use of engineering facilities in the medical – In various areas of medical research is being a great boon for the visually impaired people. This paper describes the various features of smart blind stick such as detection of obstacles, taking the person to the destination, guiding the person about various obstacles, directions and tells them which area or path is safe to go and which is not safe. It uses GPS navigation that tells the write path, buzzer and vibrating sensors alert the person that some danger is there. The blind stick is integrated with three ultrasonic sensors, panic switch, navigation switch, and Bluetooth and soil moisture detector along with Arduino UNO. The three ultrasonic sensors are used to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the person through the microphone device. The navigation process is implemented by smart stick with Global Positioning Nowadays, visually impaired person suffer from serious visual impairments preventing them from travelling independently. As As these people rely on some others self for their mobility and also they are in need of number of tools and techniques. Like there are people known as orientation and mobility specialist that will give training to the visually impaired people and will also teach them how to move on their own independently and safely depending on their other remaining senses. This article presents the adaptive handlebar for visually impaired individuals, focused on Arduino and ultrasonic sensors. There are millions of people all over the world who are visually impaired, they depend of someone else or can be given some support by some external means such as trained dogs, some systems that make decision themselves.

Formulation of Problem

Now a days, list of blind people are increases day by day. So, we want to help them by making smart blind stick. Most of the blind people are from middle or poor family. So, they can’t provide treatment which may help to back their eye sight. So, we make our device easier to handle and cheaper which helps to buy any family. The smart stick is built on Arduino Pro Mini. This Arduino board is small enough to install on a regular stick and has buzzer, LDR sensor, Ultrasonic sensor and a water detector sensor interfaced to it. The stick also has an RF receiver which connects with an RF transmitter that acts as a remote for finding the stick on

missing. The remote built on RF transmitter has a switch pressing which, the buzzer installed on the stick is triggered and by the sound of the buzzer a blind person can find the stick.

Tools and Technology Used

The component required for the implementation of the proposed design of the smart stick for blind people are :

- Ardino Uno
- Infrared Sensor
- Water Sensor
- GPS Module
- GSM Module
- Ultrasonic Sensor

CHAPTER-2

Literature Survey

Smart Blind Stick, gives a more effective solution to this problem. The system uses ultrasonic sensors, RasberryPI,, Smart belt, It tells the blind people about the various obstacles in the path and also alerts them. Whenever any object comes in the range of ultrasonic sensors it is detected and thus it helped the person to become selfdependent. It also has a camera embedded in it. It uses pictures or it clicks the pictures of the object and can easily detect the obstacles. Effective Fast Response Blind Stick for Blind People, The following system uses microcontroller 18F46k80 embedded system, vibration motor and ISD1932 flash memory. The stick is made in such a way that all the obstacles coming in the range of 4 meter can be detected in some seconds and so now the blind people can increase their normal speed. This stick has following features such as low cost, quick response, light weight, and having the capability to fold. A wearable ultrasonic obstacle sensor for visually impaired. This project can detect the intruder in front of the blind person who is wearing the goggles. This system is very easy and reliable as it can also detect heavy objects, coming in the way and also vehicles and various devices also. Pothole detection for visually impaired which uses a camera that captures image very fast and may at some frames per second, and according after processing the image the obstacle is detected. Problem with this system is use of camera makes it expensive, and also a lot of images captured per second increases overhead and storage requirement. Smart Stick for the Blind a complete solution to reach the destination. This system uses IR sensor, Ultrasound sensor and water sensor to detect the obstacle. However, this system just gives an alert if any one of the sensor is triggered, it uses a buzzer to alert the blind person. This system does not use any location identifier or location indicator. This stick is used by blind people outdoors and indoors. As the stick has a GPS that allows the visually impaired people to go to their desired location. The GPS also has a SI memory card, that can hold different memory locations. Throw GPS the person can hit his/her location that too safely and without being dependent on anyone else. Further review is done to make the system low-cost and efficient. Every class of people can afford and use it. A user friendly android system is crested. Google map has a sound search system which is absolutely correct and people can rely on it and be confident about whatever path they are taking, and also the map will detect barriers also. This article presents the adaptive handlebar for visually impaired individuals, focused on Arduino and ultrasonic sensors. According to the World Health Organization, there are around 37 million blind people worldwide. Those

with visual impairments also rely on external assistance, which can be provided as decision-making support systems by those, trained dogs or special electronic instruments. We were therefore inspired to create an elegant white cane that would transcend these constraints. In certain locations, we attached ultrasound sensors to the cane that fitted users with ambient information via a buzzer toning system. To visually impaired people, a smart stick has been built to help identify obstacles using infrarot, ultrasonic and water sensors. With the assistance of these sensors, obstacles within the distance of around 3 m can be observed . The main purpose of this research paper is to provide a simple, economical and effective solution for the visually impaired. The concept behind the stick's nature was to make it structurally identical, i.e. compact, lightweight and easy to handle, yet provide the consumer with a constructive perspective on the hazards along their walking path. The smart white cane is fitted with ultrasonic sensors that detect holes, bumpers, downfalls, ramps, lying low and knee-level threats and even those above the tail.

Proposed Model

The proposed model provides improvement to the existing device design, It tries to make the device more efficient, comfortable, convenient, The problem with the blind people in their life is the dependency on the other people for their movement and keeping them safe from various obstacles in their path and also it is easy to use and economically good and familiar. This Smart stick will have an Ultrasonic sensor to sense distance from any obstacle, LDR to sense lighting conditions and a RF remote using which the blind man could remotely locate his stick. These are the things which are already present in market in blind smart stick, so my innovation to this project is adding a Jarvis virtual assistant**,** which will talk to blind person like a companion. The assistant will crack jokes, by using AI AND ML, it will analyze things happening around and narrate in interesting way to the person. . It can talk with the person as siri or alexa or google.

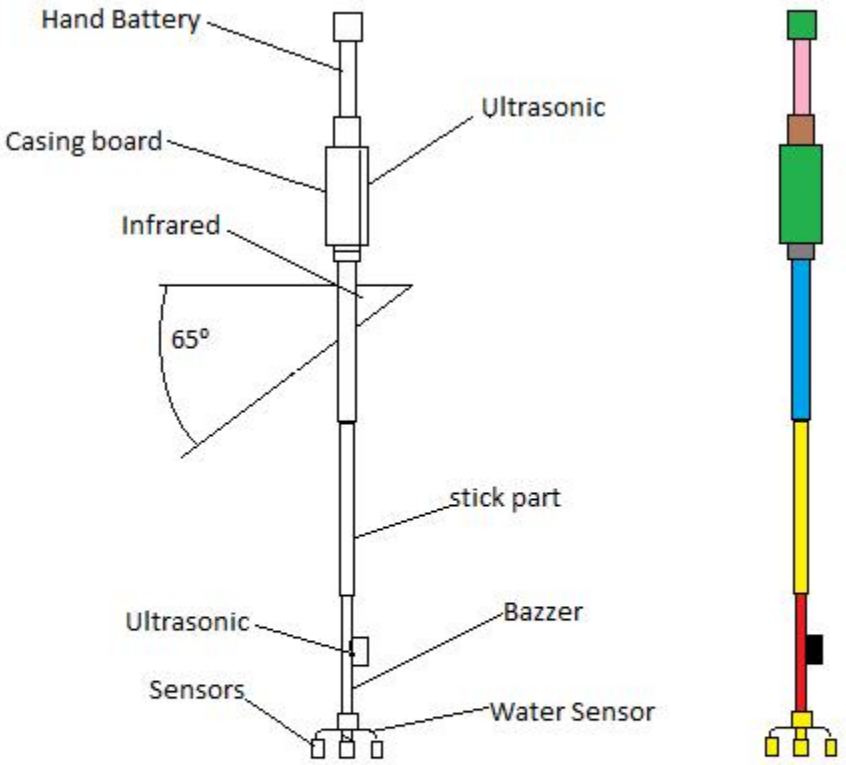


Fig: Design of Smart Stick For Blind People

The devices used for the proposed design of the smart stick for blind people are:;

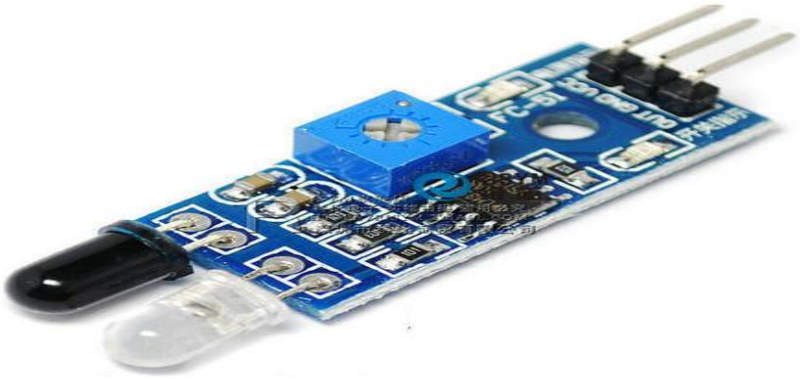
- Arduino Uno
- Infrared Sensor
- Water Sensor
- GPS Module
- GSM Module
- Ultrasonic Sensors

a) Arduino Uno

Arduino uno is a open source microcontroller board based on microchip ATmega328P microcontroller and developed by Arduino.cc. The board has 14 digital (I/O) pins, 6 analog (I/O) pins, and is programmable with Arduino IDE, via a type B USB cable. It can be powered the USB cable or by 9-volts battery, through it accepts voltage between 7 and 20 volts.

b) Infrared Sensor

Infrared sensor recognize small obstacle but with less accuracy than laser sensors. However using laser sensor is costly which contradicts to our aim in obtaining affordable aiding devices. Infrared sensor includes a transmitter and a receiver. The IR transmitter is an IR LED (Light Emitting Diode) and the receiver is an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, its resistance and correspondingly its output voltage change in proportion to the magnitude of the IR light received. This is the principle of working of Infrared sensors. It can detect obstacles in a range within 50 cm at an angle of +/- 45 degrees accurately.

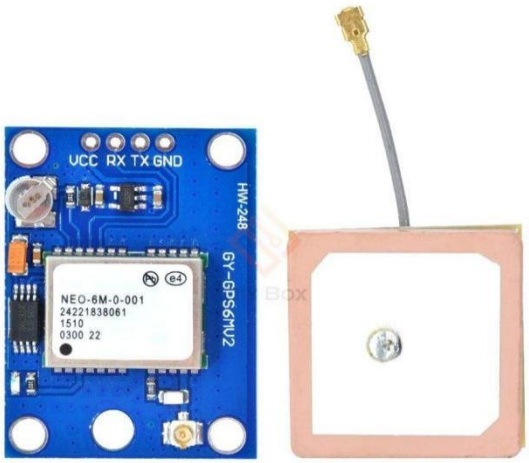


c) Water Sensors

Water sensors available are used to detect water levels inside tanks and very expensive. Our objective is to detect water existence regardless its level. So we used a costless alternative. Three wire probes fit at the bottom of the stick to sense obstacle like water pits, puddles and water spread. Two wires are used to complete the circuit and another one wire is used to short circuit. Once wires touch water, the circuit is shorted, this interrupts the microcontroller, and beep sound is produced by the speaker to warn the blind person about the puddle.

d) GPS Module

PS module: The GPS based device proposed, with user input interfacing get alert the blind person when he reaches the destination by voice. A GPS module consists of GPS receiver and an antenna. GPS antenna is a device that helps to boost the reception signal to a GPS unit. GPS (Global Positioning System is a satellite system originally developed by the United States Department of Defense. It utilizes more than two dozen satellites orbiting the Earth to allow receivers to tell exactly where they are. Using this location, devices can detect not just latitude and longitude, but also altitude and even speed. A GPS unit is used in the smart stick to obtain the latitude and longitude of the location of the blind person. The data obtained are used to find the address of the blind person's location. While the person navigates with the stick, the latitude and longitude data are updated. Thus, these data are helpful to keep track of the blind person.



e) GSM module

GSM (Global System for Mobile communications) or GPRS (General Packet Radio Service) module is an embedded piece of hardware which can be integrated with an equipment to make use of the module's functionalities. GSM module requires a registered SIM card to be inserted into it in order operate. It facilitates

making and receiving voice calls, sending SMS messages wirelessly. GPRS is an extension to GSM data transmission capabilities. GPRS enables data transmission with higher speed than GSM. It provides inter-networking facility through internet.

CHAPTER-3

Working of Project

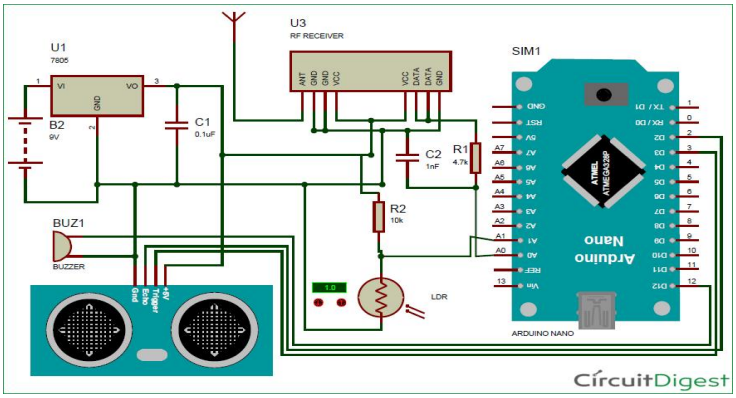
Humans are not disabled. A person can never be broken. Our built environment, our technologies, is broken and disabled. We the people need not accept our limitations, but can transfer disability through technological Innovation.This Smart stick will have an Ultrasonic sensor to sense distance from any obstacle, LDR to sense lighting conditions and a RF remote using which the blind man could remotely locate his stick.These are the things which are already present in market in blind smart stick,so my innovation to this project is adding a Jarvis virtual assistant,which gonna talk to blind person like a companion.The assistant gonna crack jokes,by using AI AND ML it gonna analize things happening around and narrate in a interesting way to the person.

Materials Required

1. Arduino Nano (Any version will work)
2. Ultrasonic Sensor HC-SR04
3. LDR
4. Buzzer and LED
5. 7805
6. 433MHz RF transmitter and receiver
7. Resistors
8. Push button
9. Perf board
10. Soldering Kit
11. 9V batteries

Circuit Diagram

This **Arduino Smart Blind Stick Project** requires two separate circuits. One is the main circuit which will be mounted on the blind man's stick. The other is a small remote **RF transmitter circuit** which will be used to locate the main circuit. The main board's circuit diagram is shown below:



Arduino Program for Smart Blind Stick

Like all programs we start with **void setup() to initialise Input Output pins**. In our program the Buzzer and Trigger pin is an Output device and the Echo pin is an Input device. We also initialise the serial monitor for debugging.

```
void setup()

{

Serial.begin(9600);

pinMode(Buzz,OUTPUT);

digitalWrite(Buzz,LOW);

pinMode(trigger, OUTPUT);

pinMode(echo, INPUT);

}
```

Inside the **main loop we are reading all the sensors data**. We begin with reading the sensor data of Ultrasonic sensor for distance, LDR for light intensity and RF signal to check if the button is pressed. All these data is saved in a variable as shown below for future use.

```
calculate_distance(trigger,echo);

Signal = analogRead(Remote);

Intens = analogRead(Light);
```

We start with checking for the Remote signal. We use a variable called similar_count to check how many times the same values are being repeated from the RF receiver. This repetition will occur only when the button is pressed. So we trigger the Remote pressed alarm if the count exceeds a value of 100.

```
//Check if Remote is pressed

int temp = analogRead(Remote);

similar_count=0;

while (Signal==temp)

{

 Signal = analogRead(Remote);

 similar_count++;

}



//If remote pressed

if (similar_count<100)

{

  Serial.print(similar_count); Serial.println("Remote Pressed");

  digitalWrite(Buzz,HIGH);delay(3000);digitalWrite(Buzz,LOW);

}
```

Next we **check for the intensity of light around the blind man**. If the LDR gives a value of less than 200 it is assumed to be very dark and we give him the warning

through buzzer with a specific tone of delay with 200ms. If the intensity is very bright that is more than 800 then also we give a warning with another tone. The alarm tone and intensity can be easily varied by changing the respective value in the below code.

```
//If very dark

if (Intens<200)

{

  Serial.print(Intens); Serial.println("Bright Light");

  digitalWrite(Buzz,HIGH);delay(200);digitalWrite(Buzz,LOW);delay(200);digitalWrite(Buzz,HIGH);delay(200);digitalWrite(Buzz,LOW);delay(200);

  delay(500);

}



//If very bright

if (Intens>800)

{

  Serial.print(Intens); Serial.println("Low Light");

  digitalWrite(Buzz,HIGH);delay(500);digitalWrite(Buzz,LOW);delay(500);digitalWrite(Buzz,HIGH);delay(500);digitalWrite(Buzz,LOW);delay(500);

}
```

Finally, we **start measuring the distance** from any obstacle. There will be no alarm if the measured distance is more than 50cm. But, **if it is less than 50cm the alarm will start by beeping the buzzer**. As the object gets closer to the buzzer the beeping interval will also decrease. The closer the object is the faster the buzzer will beep. This can be done by creating a delay that is proportional to the distance

measured. Since the delay () in Arduino cannot accept variables we have to use a for loop which loop based on the measured distance as shown below.

```
if (dist<50)

{

 Serial.print(dist); Serial.println("Object Alert");

 digitalWrite(Buzz,HIGH);

 for (int i=dist; i>0; i--)

  delay(10);

 digitalWrite(Buzz,LOW);

 for (int i=dist; i>0; i--)

  delay(10);

}
```

The program can be easily adapted for your application by changing the value which we use to compare. You use the serial monitor to debug if a false alarm is trigger. If you have any problem you can use the comment section below to post your questions.

Arduino Blind Stick in Action

Finally it's time to test our project. Make sure the connections are done as per the circuit diagram and the program is successfully uploaded. Now, power both the circuits using a 9V battery and you should start to see results. Move the Ultra Sonic sensor closer to object and you will notice the Buzzer beeping and **this beeping frequency increases as the stick goes closer to object**. If the LDR is covered in dark or if there is too much light the buzzer will beep. If everything is normal the buzzer will not beep.

When you press the button on the remote the buzzer will give a long beep. The **complete working of this Smart Blind Stick is shown in the Video** given at

the end of this page. I also use a small stick to mount the complete assembly you can use a larger one or an actual blind stick and put it in action.

If your buzzer is always beeping it means the alarm is being false triggered. You can open the serial monitor to check for the parameters and check which is falling in critical and adjust that. As always you can post your problem in the comment section to get help. Hope you understood the project and enjoyed building something.

Code

```
const int trigger = 3; //Trigger pin of 1st Sesnor
const int echo = 2; //Echo pin of 1st Sesnor
const int Buzz = 13; //Echo pin of 1st Sesnor
const int Remote = A0; //Echo pin of 1st Sesnor
const int Light = A1; //Echo pin of 1st Sesnor

long time_taken;
int dist;
int Signal;
int Intens;
int similar_count;

void setup() {
Serial.begin(9600);
pinMode(Buzz,OUTPUT);
digitalWrite(Buzz,LOW);
pinMode(trigger, OUTPUT);
pinMode(echo, INPUT);

}

/*###Function to calculate distance###*/
void calculate_distance(int trigger, int echo)
{
digitalWrite(trigger, LOW);
delayMicroseconds(2);
digitalWrite(trigger, HIGH);
delayMicroseconds(10);
digitalWrite(trigger, LOW);

time_taken = pulseIn(echo, HIGH);
dist= time_taken*0.034/2;
if (dist>300)
```

```
dist=300;
}

void loop() { //infinite loopy
calculate_distance(trigger,echo);
Signal = analogRead(Remote);
Intens = analogRead(Light);

//Check if Remote is pressed
int temp = analogRead(Remote);
similar_count=0;
while (Signal==temp)
{
 Signal = analogRead(Remote);
 similar_count++;
}

//If remote pressed
if (similar_count<100)
{
  Serial.print(similar_count); Serial.println("Remote Pressed");
  digitalWrite(Buzz,HIGH);delay(3000);digitalWrite(Buzz,LOW);
}

//If very dark
if (Intens<200)
{
  Serial.print(Intens); Serial.println("Bright Light");
  digitalWrite(Buzz,HIGH);delay(200);digitalWrite(Buzz,LOW);delay(200);digitalWrite(Buzz,H
IGH);delay(200);

  digitalWrite(Buzz,LOW);delay(200);
  delay(500);
}

//If very bright
if (Intens>800)
{
  Serial.print(Intens); Serial.println("Low Light");
  digitalWrite(Buzz,HIGH);delay(500);digitalWrite(Buzz,LOW);delay(500);digitalWrite(Buzz,H
IGH);delay(500);

  digitalWrite(Buzz,LOW);delay(500);
}

if (dist<50)
{
  Serial.print(dist); Serial.println("Object Alert");
```

```
 digitalWrite(Buzz,HIGH);
 for (int i=dist; i>0; i--)
   delay(10);

 digitalWrite(Buzz,LOW);
 for (int i=dist; i>0; i--)
   delay(10);

}
```

CHAPTER - 4

Results and Discussion

An individual should be considered for blind people for the purpose of the title if they have central visual acuity of 20/200 or less in the better eyes with the use of a correcting lens. An eye help the people to see the nature and world as it is. But some of them are unable to see that things which are provided for us by nature or as god gift. So, we want that if he/she can't see. Humans are not disabled. A person can never be broken. Our built environment, our technologies, is broken and disabled. We the people need not accept our limitations, but can transfer disability through technological Innovation. A stick which help to the blind people to move anywhere easily is smart stick for blind people. For the blindness problem, we are working in smart stick for blind people which help them to move or go anywhere easily. In the world, most of the blind people died due to accident while crossing the road. It will reduce accident cases or suicide cases. It guides to blind people as their sensing power. It helps to make their life easier and faster. It helps to convert disable to able. Most of the smart stick are available in the market. They are available at higher cost and with less feature. It is provided in low cost which helps to buy anyone either he or she is rich or poor. Blind Smart Stick is a cheap and helpful device. We use Arduino Board, Sensors, GSM, Speaker, Motor, etc. to make as a smart device. It can sense right path to move and its operating system is easy to control. It indicates if any problem sense from it. The proposed model provides improvement to the existing the device design. It tries to make the device more efficient, comfortable, convenient and user-friendly.

The Arduino uno is a open source microcontroller board based on microchip ATmega328P microcontroller and developed by Arduino.cc. The Arduino uno is used for the setting or connecting the sensors and the devices used to make the smart stick for the blind people. It is used by uploading program on it according to the required things.it is combination of digital and analog input/output (I/O).

Infrared sensor is also used in smart stick to sense the obstacle. Infrared sensor recognized small obstacle but with less accuracy than laser sensors. However, using laser sensor is costly which contradicts to our aim in obtaining affordable aiding devices. Infrared sensor includes a transmitter and a receiver. The IR transmitter is an IR LED (Light Emitting Diode) and the receiver is an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, its resistance and correspondingly its output voltage change in proportion to the magnitude of the IR

light received. This is the principle of working of Infrared sensors. It can detect obstacles in a range within 50 cm at an angle of +/- 45 degrees accurately.

This Smart stick will have an Ultrasonic sensor to sense distance from any obstacle, LDR to sense lighting conditions and a RF remote using which the blind man could remotely locate his stick. These are the things which are already present in market in blind smart stick, so my innovation to this project is adding a Jarvis virtual assistant**,** which gonna talk to blind person like a companion. The assistant gonna crack jokes, by using AI AND ML, it gonna analyze things happening around and narrate in interesting way to the person. It can talk with the person as Siri or Alexa or google.

In it, water sensor is also fitted which give the information about the water or hole fill up with water about 3-4m distance away. It safe the blind people or who use this electronic device from the injuries from the gutter or broomstick, if he/she fall down on it. Water sensors available are used to detect water levels inside tanks and very expensive. Our objective is to detect water existence regardless its level. So, we used a costless alternative. Three wire probes fit at the bottom of the stick to sense obstacle like water pits, puddles and water spread. Two wires are used to complete the circuit and another one wire is used to short circuit. Once wires touch water, the circuit is shorted, this interrupts the microcontroller, and beep sound is produced by the speaker to warn the blind person about the puddle

PS module: The GPS based device proposed, with user input interfacing get alert the blind person when he reaches the destination by voice. A GPS module consists of GPS receiver and an antenna. GPS antenna is a device that helps to boost the reception signal to a GPS unit. GPS (Global Positioning System is a satellite system originally developed by the United States Department of Defense. It utilizes more than two dozen satellites orbiting the Earth to allow receivers to tell exactly where they are. Using this location, devices can detect not just latitude and longitude, but also altitude and even speed. A GPS unit is used in the smart stick to obtain the latitude and longitude of the location of the blind person. The data obtained are used to find the address of the blind person's location. While the person navigates with the stick, the latitude and longitude data are updated. Thus, these data are helpful to keep track of the blind person.

GSM (Global System for Mobile communications) or GPRS (General Packet Radio Service) module is an embedded piece of hardware which can be integrated with an equipment to make use of the module's functionalities. GSM module requires a registered SIM card to be inserted into it in order operate. It facilitates making and receiving voice calls, sending SMS messages wirelessly. GPRS is an extension to GSM data transmission capabilities. GPRS enables data transmission with higher speed than GSM. It provides inter-networking facility through internet.

CHAPTER - 5

Conclusion and Future Scope

Conclusion

Smart stick a very much satisfying and working solution to the people who can't see. It will help them to move from one place to another without the help of anyone else. The stick we are making uses various devices as well as has various features also such as it is low cost, reliable, durable, it will have low power consumption and is reusable. The smart stick for blind is very useful for upcoming generations of much more aiding devices to help the visually impaired people. The stick will be user-friendly as it is easy for the blind people to hold and can be easily folded. It can detect obstacles in the range of 4 meters and has sensors that detect the obstacles and various Hurdles coming in the path of blind people. It also has water sensors that can detect water also. Further aspects of this system can be improved by wireless connectivity between the system components, it will ultimately increase the range of ultrasonic sensors and also will help in determining the speed of upcoming obstacles and accordingly the person can change the path or reach to a safe place. While developing this device the visually impaired people were our top priorities as well as their safety is.

Future Scope

After we designed and programmed the Modern Blind Stick to the needed standard, this innovation product has been functioning well. We tested the Modern Blind Stick with certain obstacles, hazard , range and distance and it work successfully as we programed the Modern Blind Stick. Analysis about the point of view about the visually impaired person walk at the public. First analysis is the visually impaired person to walk at the public independently. Second, the real time location of the visually impaired person at the public. Third, the safety of the visually impaired person at the public. The analysis shows the problems as the visually impaired person the risk when walking at the public . It is necessary that visually impaired people get access to an efficient and comfortable object in order to live their daily life comfortably. In the nation like India, where we are moving towards development it is necessary to have such a solution so that most of the people can have an effective product as proposed in this paper rapidly, similar to that the case in most online business benefits, the exhibition of a substance based framework diminishes.

CHAPTER - 6

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