

FINAL PROJECT REPORT
at
Sathyabama Institute of Science and Technology
(Deemed to be University)

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering Degree in Computer Science and Engineering

By

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

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JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI– 600119

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **Vyash.N (38110656)** and **Yogeshwaran.M (38110674)** who carried out the project entitled “**Smart Stick for Blind People using IOT**” under my supervision from November 2021 to March 2022.

Internal Guide

Dr. Aroul Canessane M.E., Ph.D.,

Head of the Department

Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I **Vyash. N (38110656)** and **Yogeshwaran.M (38110674)** hereby declare that the Project Report entitled **Smart Stick for Blind People using IOT** done by me under the guidance of **Dr. Aroul Canessane M.E., Ph.D.**, is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Computer Science and Engineering.

DATE: 01/03/2022

Vyash. N and Yogeshwaran. M

PLACE: CHENNAI

SIGNATURE OF THE CANDIDATE

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ABSTRACT

The world is overwhelmed by its new technologies and inventions. As we see, every piece in this world is combining with technology to upgrade itself to be more productive and powerful. As a part of this generation to contribute more to the society through technology, we would like to present an automated model of blind stick used by the blind people to facilitate and create a safe and secured environment for the blind. This model is developed with the concept of Internet of Things, using necessary sensors and the Arduino UNO processor.

Blind person finds it difficult to detect the presence of any obstacles in their way while moving from one place to another and it is very difficult to find the exact location of the stick if it have been misplaced. Thus, the smart stick comes as a proposed solution to help the visually impaired people in their day to day living without the help of others. In this paper we proposed a solution for the blind people by using an ultrasonic sensor in the blind stick. The instrument stands used to perceive the obstacles at the range of four meters and infrared instrument is castoff to perceive the nearer complications in front of the blind people.

Thus, the radio frequency transmitter and receiver help the user to find the exact location of the smart stick with the help of buzzer. The buzzer which is placed in the smart stick gets activated and produces a sound when any obstacle is detected. This proposed method uses the Arduino UNO as controller. The branch is accomplished of sensing all difficulties in front of the user. The smart stick is of user friendly, quick response, very low power consumption, lighter weight and it is easy to hold and fold by the user.

CHAPTER 1

INTRODUCTION

Our main aim to work on this project is to focus the blind population of the world and to assist them in every walk of life through the aid of technology. According to the procured data from World Health Organization (WHO) and National Federation of the Blind , there are around 253 million people who are visually impaired out of which 36 million people are blind worldwide.

According to the report by Times of India, India is now home to the world's largest number of blind people. Of the 36 million people across the globe who are blind, over 15 million are from India. On the other hand, while India needs 2.5 lakh donated eye every year, the country's 109 eye banks (five in Delhi) manage to collect a maximum of just 25,000 eyes, 30% of which cannot be used.

According to a survey conducted by an NGO, 98% blind people have met with accidents while traveling. Also, there are no special facilities provided to blind people in local transports resulting in the high number of accidents involving blind people. We found that the main aids that blind people use are trained dogs, but such dogs are very expensive and not very reliable.

Some other products available in the market are the smart belt, smart ring, smart cane etc. But these devices have very limited usability and lack approach due to more cost. So blind people are not interested in buying such products. Some innovators also tried to assist the blind people using IR sensor, but our research found that IR sensor cannot work in sunlight because it also contains some amount of infrared rays which can be detected by photodiode present in IR sensor, our device overcomes this limitation as well.

In order to address all above-defined problems and to empower 36 million blind people worldwide, we are introducing a solution of what is christened as

“Smart Stick”. The stick is integrated with sensors like ultrasonic sensor, infrared sensor and with microcontroller etc. Sensors serve as its eyes and the microcontroller as its brain, which will retrieve data from the surroundings and pass on commands to the user notification setup. GPS keeps on monitoring the location of the blind person. RF module will help the blind person to locate the stick easily.

This proposed system apparatus a new technique for backing of blind people by means of the ultrasonic sensors and a global positioning system modem. The system will make available the obstacles evading feature and vehicle dash prevention to the blind people.

CHAPTER 2

LITERATURE SURVEY

LPC1764 microcontroller connected with Ultra sonic sensors and OV7076 Arduino camera sensor built in a walking shoe. The shoe feels heavy for a person to carry and its fragile. The shoe feels heavy for a person to carry and its fragile. [1]

Implementation is carried in three different phases with 3 vibrator motor fixed with LED beep connected to the Arduino UNO controller. GSM and GPS attached. The system is not minimalist. It creates a mess with connections. Not much durable. [2]

SKG13BL GPS Module with SIM 800 GSM Module is used with IR and Ultrasonic sensors connected to the Arduino UNO controller. Rechargeable battery feels heavy and the product is not balanced. [3]

Two smartphones are interconnected with microcontroller connected with one. Ultrasonic sensors are used for detection with vibration warning. Warning and vibration increase as obstacle approach closer. 84% in 500 cm 97% in 10cm. Product is fragile. [4]

Triangular method for distance detection using IR emitting diode and IR sensor for fall detection in the model of a smart glass. Glasses and stick both should be used which is not comfortable. [5]

RF modules with infra-red and ultra sonic sensors connected with Arduino UNO micro controller. The stick is heavy and hardware components are transparent to nature. [6]

Humidity detector and 3 Ultrasonic sensor and alerting vibrator connected

with Arduino UNO. Sensor reading shows an error of 2 to 5 cm constantly. [7]
Servo motors wheels, mini camera and image sensors connected to the Arduino UNO and the sensors are connected with device. Surface should be without obstacles for the device to be rolled up. [8].

1. SURVEY WALKTHROUGH:

Researchers have made many researches and proposals to provide a solution for visually impaired people to overcome obstacles and alert the blind person in case of any danger. The implementation of our proposal has done after referring some previous innovations of visually impaired people assisting devices. As referred in Wearable Difficulty Finding Structure intended for visually reduced public the blind person is alerted of the obstacles on his way. This system figure out the nearby obstacles by using stereoscopic sonar system and determines the location of the obstacles through vibrio tactile feedback.

A 3D Ultrasonic stick is discussed in the paper “Osama Bader AL-Barrm International Journal of Latest Trends in Engineering and Technology (IJLTET)” for blind people. In this the stick contains of instruments towards inspect 3 dissimilar guidelines, a microcontroller, beeper and direct current pulsation motorized. The beeper then pulsation motorized stands triggered once slightly barrier stands sensed. In adding, the baton is outfitted through global positioning system and short message service system. global positioning system provides the in sequence concerning the place of the blind people consuming the pole toward his personal memberships. Short message service system is secondhand by the blind to guide short message service toward the kept records in the microcontroller fashionable circumstance of urgent situation. Computer recreation stands complete toward heart the concert of the structure consuming Porteous software then Relaxed pic equipment. Though, this structure consume interruption though sensing the complications amid 3 to 5 second. The holdup aimed at the global positioning system towards become the position used for the pole is approximately 25

second to 1 minute. Trendy accumulation towards that, global positioning system cannot remain consumed internal since of the global positioning system indicator determination be too weedy.

This proposed system apparatus a new technique for backing of blind people by means of the ultrasonic sensors and a global positioning system modem. The system will make available the obstacles evading feature and vehicle dash prevention to the blind people. The voice playback and pulsation motors will provide instant alert for blind people in case of any obstacle detected in their alleyway. In addition, we have a global positioning system modem related to the microcontroller. It gives the emergency let go by sending a memorandum to the matching care takers of that person all the way through global positioning system modem.

The major parts used in this proposed system Wearable steering assistance - a tool for the blind, stand: a multisensing structure (comprise audio hallucination, audio assortment sentence then lobby group instruments), a map, a counsel structure as well as concrete human-machine boundary. But menace is with the uneven performance of the instruments owing toward the proposal of the individual and maximum schemes usage hearing yield. This restricts through normal noises, then accordingly decreases the intelligence of inquiry: it disrupts a significant steering suspicion of the screen. A different problematic remains the extended exercise retro that stands required.

Another learning on the paper “Ankit Agarwal, Deepak Kumar, Abhishek Bhardwaj- worldwide Journal of Engineering and Computer Science ISSN:2319-7242 Volume 4 Issue 4 (April 2015), Page No. 11375-11378”, analyze the prevailing electronic supports aimed at blind public as well as do not debate slightly completing outcomes. Created happening the boundaries trendy obtainable assistances, this proposed system an superior secondary electronic assistance consuming recent equipment comparable Ultrasonic waves, Camera, global positioning system, global system for mobile communication for the real impair public, In adding toward that, wherever global positioning system organization cannot stand cast-off they made use of

the camera with some algorithm for to identify the difficulties. Similarly, this proposed system objectives towards progress disaster activate aware scheme lengthwise through propose.

CHAPTER 3

3.1 Aim:

Visually impaired people find difficulties detecting obstacles in front of them, during walking in the street, which makes it dangerous. The smart stick comes as a proposed solution to enable them to identify the world around.

3.2 Objective:

- I. To develop a prototype hardware for modern blind stick.
- II. To help the blind people navigate the route at their best.
- III. To reduce the risk of injuries and lost for the visually impaired person.
- IV. To creating a suitable software for the visually impaired person.

3.3 Problem Statement:

- I. Blind people can't easily recognize obstacles or stairs while using normal blind stick .
- II. No safety features on the normal blind stick .
- III. Can't locate the location of the normal blind stick user when they are having an emergency problem or lost in a public area .

III.4 Significant of the Project:

- I. To prevent and reduce the risk of injuries and lost of the visually impaired person

III.5 Overview:

The purpose of this project is to detecting the obstacle and route by using ultrasonic sensor that can detect a hole or stair with maximum range about 100cm. With our idea, we want to help this kind of people to live their life freely. This modern blind stick have a several feature that surely can help this blind people to navigate and detect an obstacle that surely can make their life routines easier. The user just need to use the blind the

normal blind stick , the different is , visually impaired person can detect a hole or stair more faster and easily.

III.6 Hardware used:

I. Ultrasonic sensor:

Ultrasonic transducers and ultrasonic sensors are devices that generate or sense ultrasound energy. They can be divided into three broad categories: transmitters, receivers and transceivers. Transmitters convert electrical signals into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound.

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e., the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target).

Ultrasonic Sensors also known as transceivers when they both send and receive work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object. This technology can be used for measuring: wind speed and direction (anemometer), fullness of a tank and speed through air or water. For measuring speed or direction a device uses multiple detectors and calculates the speed from the relative distances to particulates in the air or water. To measure the amount of liquid in a tank, the sensor measures the distance to the surface of the fluid. Further applications include: humidifiers, sonar, medical ultrasonography, burglar alarms and non-destructive testing. Systems typically use a transducer which generates sound waves in the ultrasonic

range, above 18,000 hertz, by turning electrical energy into sound, then upon receiving the echo turn the sound waves into electrical energy which can be measured and displayed. The technology is limited by the shapes of surfaces and the density or consistency of the material. For example foam on the surface of a fluid in a tank could distort a reading.

In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula for this calculation is $D = \frac{1}{2} T \times C$ (where D is the distance, T is the time, and C is the speed of sound ~ 343 meters/second). For example, if a scientist set up an ultrasonic sensor aimed at a box and it took 0.025 seconds for the sound to bounce back, the distance between the ultrasonic sensor and the box would be:

$$D = 0.5 \times 0.025 \times 343$$

or about 4.2875 meters.

Ultrasonic sensors are used primarily as proximity sensors. They can be found in automobile self-parking technology and anti-collision safety systems. Ultrasonic sensors are also used in robotic obstacle detection systems, as well as manufacturing technology. In comparison to infrared (IR) sensors in proximity sensing applications, ultrasonic sensors are not as susceptible to interference of smoke, gas, and other airborne particles (though the physical components are still affected by variables such as heat).

Specifications

- Power Supply: +5V DC
- Quiescent Current: <2mA
- Working Current: 15mA
- Effectual Angle: <15°
- Ranging Distance: 2cm – 400 cm/1" – 13ft
- Resolution: 0.3 cm
- Measuring Angle: 30 degrees

- Trigger Input Pulse width: 10uS
- Dimension: 45mm x 20mm x 15mm

II.Infrared Sensor:

An infrared (IR) sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each color of light (separated by a prism), he noticed that the temperature just beyond the red light was highest. IR is invisible to the human eye, as its wavelength is longer than that of visible light (though it is still on the same electromagnetic spectrum). Anything that emits heat (everything that has a temperature above around five degrees Kelvin) gives off infrared radiation.

There are two types of infrared sensors: active and passive. Active infrared sensors both emit and detect infrared radiation. Active IR sensors have two parts: a light emitting diode (LED) and a receiver. When an object comes close to the sensor, the infrared light from the LED reflects off of the object and is detected by the receiver. Active IR sensors act as proximity sensors, and they are commonly used in obstacle detection systems (such as in robots).

III.Arduino UNO:

Arduino UNO is a microcontroller board based on the **ATmega328P**. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

IV.9v Battery:

9v Hi- Watt battery is used.

V.Light Emitting Diode (LED):

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor.[5] White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

VI.Buzzer:

A buzzer is a small yet efficient component to add sound features to our project/system. It is very small and compact 2-pin structure hence can be easily used on breadboard, Perf Board and even on PCB which makes this a widely used component in most electronic applications. This Buzzer can be used by simply powering it using DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6V DC supply.

Buzzer Features and Specifications:

- Rated Voltage: 6V DC.
- Operating Voltage: 4-9V DC.
- Rated current: <30mA
- Sound Type: Continuous Beep.
- Resonant Frequency: ~2300 Hz.
- Small and neat sealed package.
- Breadboard and Perf board friendly.

CHAPTER 4

4. Methodology:

IV.1 Background:

The methodology is the general research strategy that outlines the way in which research is to be undertaken and among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes how a specific result is to be calculated.

For our project the information about the visually impaired people has been collected throughout every source that leads to our project. All of this information has been used to do our project which is Modern Blind Stick.

IV.2 Planning:

In ensuring the Modern Blind Stick can be done appropriately, a project planning by using Gantt charts has been prepared. In this Gantt chart, schedule of plan and subsequently report progress within the project environment has been stated clearly. Initially, in this project, the scope is defined with the appropriate methods for completing the project are determined.

No	Task	Week											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Do schematic circuit in proteus	■											
2	Troubleshoot problem		■	■	■								
3	Make a connection between all the components			■	■	■							
4	Make more research on the project				■	■	■						
5	Make a questionnaires about the project					■	■	■					
6	Slide present to our supervisor						■	■	■	■			
7	Make a survey about visually Impaired person						■	■	■	■	■		
8	Identify & solve the problems of the programs						■	■	■	■	■	■	
9	We searching a suitable casing & stick for our project									■	■	■	
10	We apply all of the components to the stick										■	■	■

Table 1.1

IV.3 Flow Chart:



IV.4 Proposed System:

Our proposed system is the smart stick using IoT for the blind people, the normal stick carried by the blind people is replaced by the new smart stick with automated technology. The system provides a solution to identify the obstacle coming on the people's way and also to identify wet surfaces for safety reasons.

The obstacles and wet surfaces are dangerous for the blind people to cross and identify, so we decided to present a model as a solution for this issue. This system is completely controlled by the Arduino UNO microprocessor.

The Arduino UNO acts as a brain of the system and it receives the instructions and also passes the information to other sources as well. Ultrasonic sensors and Infrared sensors are attached to identify the obstacle and to identify the range of

the obstacle. Both the sensors are used in order to get the best result with more positive accuracy.

Furthermore, the water sensor is also added to identify the wet surface areas. The water sensor is placed on the lower tip of the device which can feel the surface well.

All the sensors are altogether connected with the Arduino UNO and each sensors play its role which is given to them. The data are received by the sensors and processed by the microprocessor and signals the sensors back. When any obstacle is detected, the microprocessor signals the buzzers to activate and warn the person about the obstacle

4.5 System Architecture:

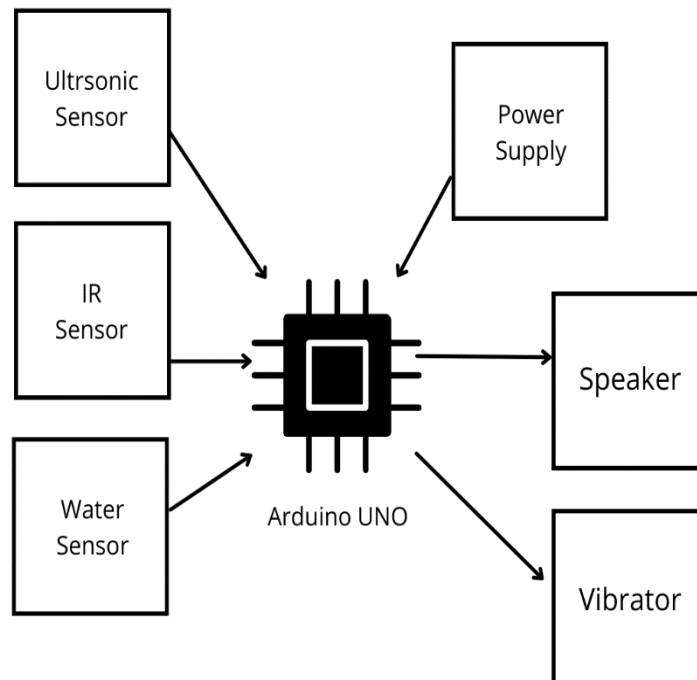


Figure 1.1 System architecture

The Arduino Uno acts as central unit for every function in the smart stick, the sensors and the vibrators are connected with the Arduino uno.

4.6 Steps to set up the physical architecture:

1. Take Arduino Uno, Buzzer, Ultrasonic sensor, Vibrating motor, battery, switch, and a wooden stick or plastic pipe.
2. Take stick and place ultrasonic sensor on it. Connect the Jumper wires on it.
3. Then place Buzzer and Vibrating motor on the stick.
4. Connect the jumper wires to buzzer and Vibrating motor.
5. Do connections from circuit diagram.
6. Place the Arduino Uno, Battery and switch on the stick.
7. Upload the code.
8. After Uploading now check for the Blind stick.

CHAPTER 5

5. Implementation:

5.1 Pre-implementation:

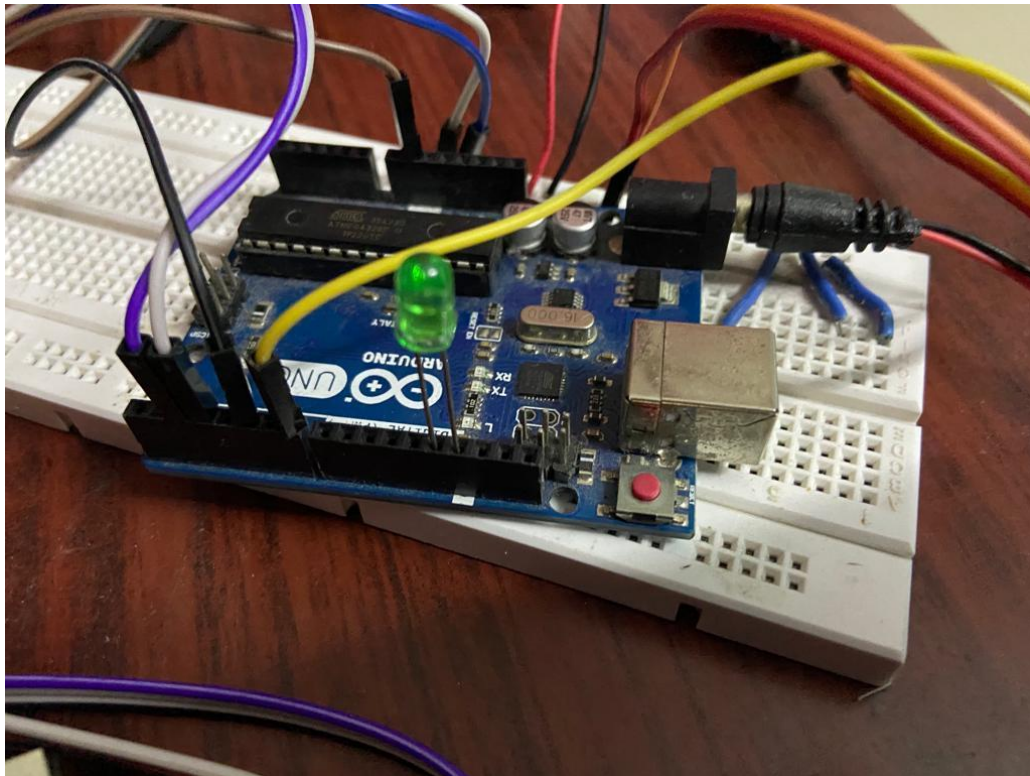


Figure 1.2 Pre-implementation diag.1

The whole working procedure is done in a bread board before fixing it on the pipe or the stick. This will create a hassle free implementation in the stick. After successfully implementing in this phase, it can be proceeded for the next phase for implementing in the stick. All the testing is to be done in pre-implementation phase and the final testing and results are to be calculated in the final phase of the implementation. In the figure above we can see that all the sensors, buzzer and the LED is connected with the Arduino UNO.

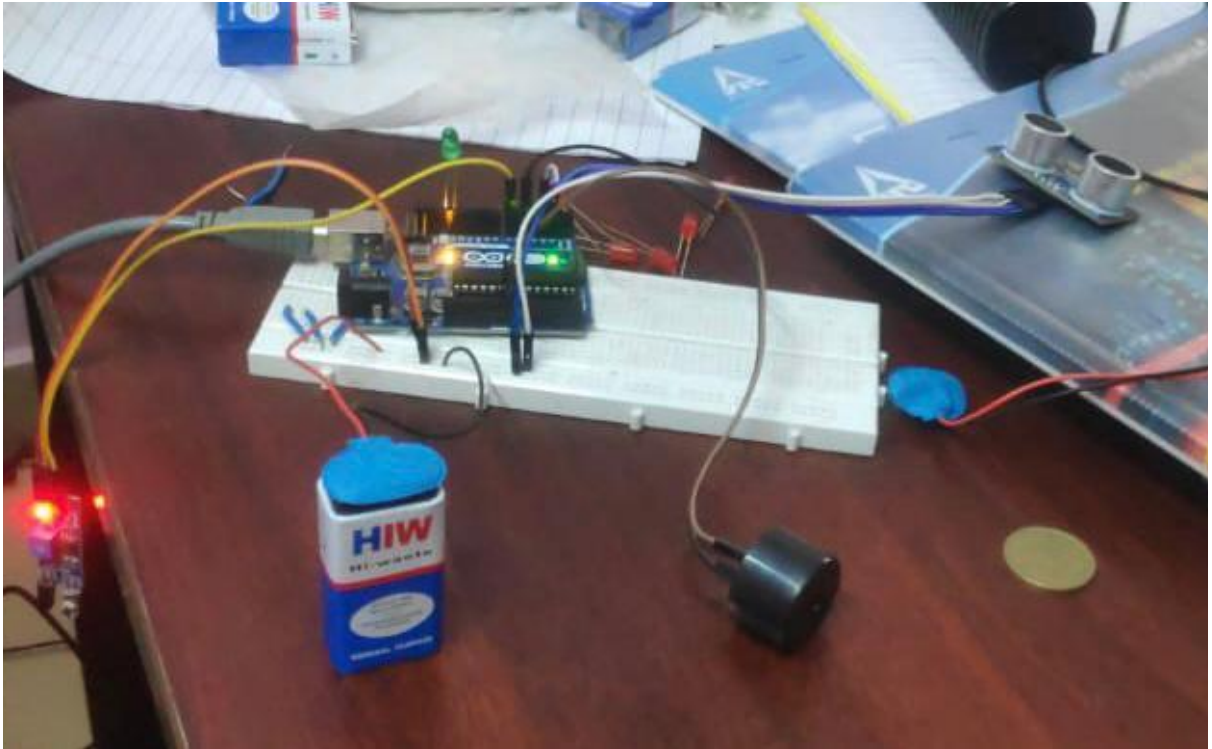


Figure 1.3 Pre-implementation working

In the above diagram, we can see that the pre-implementation process is done successfully. The power input is 9v for Arduino UNO, buzzer, LED, ultrasonic sensor and infra-red sensor. This is done after uploading the coding to the Arduino UNO. We can see that the model is working. After this process, this same method is followed in the main phase of implementation.

In the next phase all the implementation will be done in the stick. And all the hardware components are transferred to the stick.

5.2 Implementation:



Figure 2. smart stick

All the implementation are done in the stick, the hardware components are fixed to the stick. The hardware components are fixed on basis of its weight and angle. The weight of the stick is to be equally distributed so that the stick doesn't feel heavy.

The sensors and the battery packages fixed on one side of the stick to handle it in an easy way and the wiring part is done on the other side.



Figure 2.1. smart stick wiring



Figure 2.2. Ultrasonic sensor

The ultrasonic sensor is placed in the bottom of the smart stick facing the North direction of the stick. It detects the obstacles coming in front of the blind person. Any kind of obstacle on their way which is solid, semi-solid and liquid is found using the ultrasonic sensor. It is directly connected with the Arduino Uno and 9v battery.

The ultrasonic sensor is the important sensor in the smart stick, it detects the important cause for the blind. The ultrasonic sensor used has the potential to detect the obstacle up to 100cm. The accuracy peaks at 97% within the range and

100% within a range below 50cm.

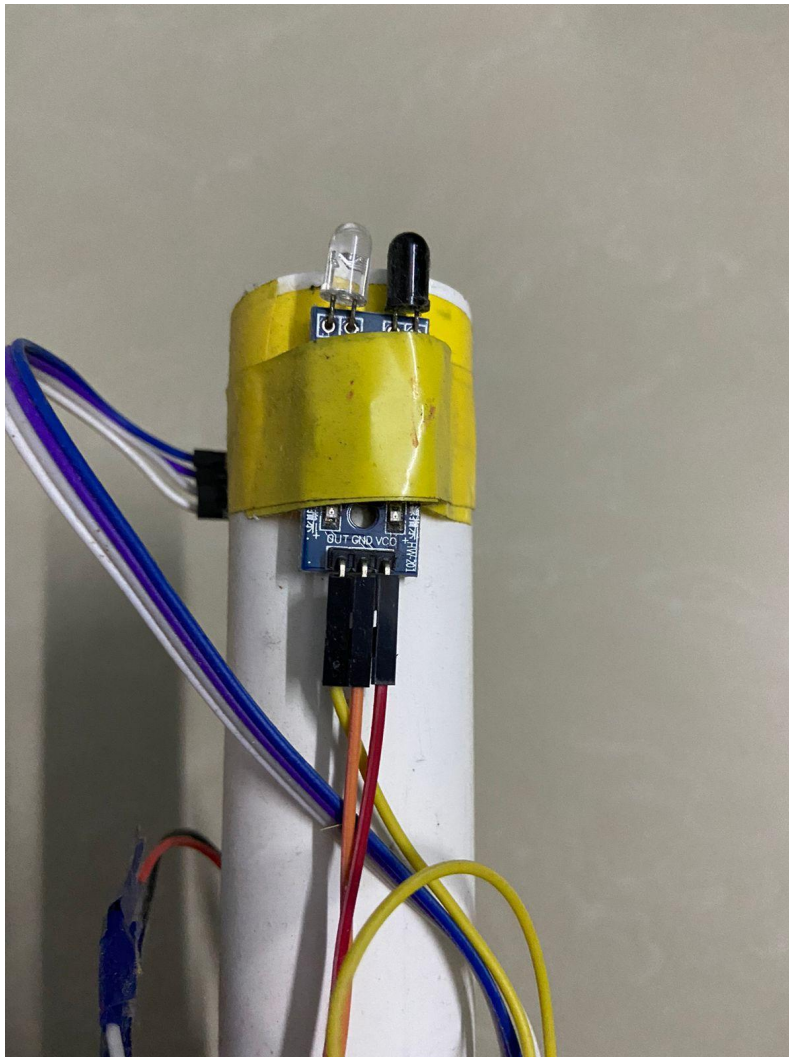


Figure 2.3 infrared sensor

The infrared sensor is other sensor used in the implementation and it is also placed in the bottom of the smart stick exactly back of the ultrasonic sensor. It detects the unparallel surfaces and any lower surfaces in the path of the blind person.

The infrared sensor is another important sensor as it finds the unparallel surface in the ground level. The accuracy peaks at 92% within a range of 100cm and 100% within a range of 50cm.

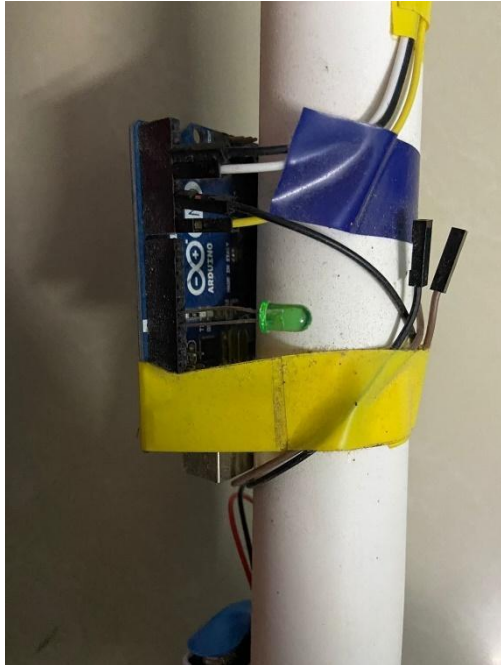


Figure 2.4 Arduino UNO-left

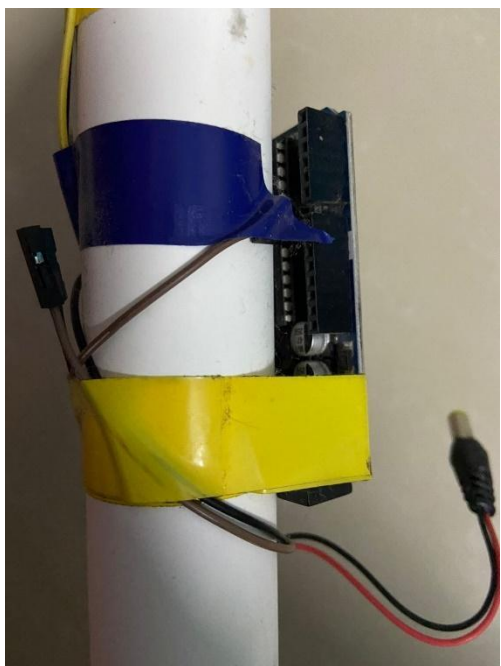


Figure 2.5 Arduino UNO-right



Figure 2.6 Arduino UNO

5.3 Source Code:

```
const int trigPin = 3;

const int echoPin = 2;

const int buzzer = 5;

const int ledPin = 13;

const int IRpin= 7;


long duration;

int distance;

int safetyDistance;
```

```
void setup() {  
  
  pinMode(trigPin, OUTPUT);  
  
  pinMode(echoPin, INPUT);  
  
  pinMode(buzzer, OUTPUT);  
  
  pinMode(ledPin, OUTPUT);  
  
  pinMode(IRpin, INPUT);  
  
  Serial.begin(9600);  
  
}
```

```
void loop() {  
  
  long duration,distance;  
  
  int ir= digitalRead(IRpin);  
  
  
  digitalWrite(trigPin, LOW);  
  
  delayMicroseconds(2);  
  
  
  
  digitalWrite(trigPin, HIGH);  
  
  delayMicroseconds(10);
```

```
digitalWrite(trigPin, LOW);
```

```
duration = pulseIn(echoPin, HIGH);
```

```
distance= duration*0.034/2;
```

```
safetyDistance = distance;
```

```
if (safetyDistance <= 100 or ir==HIGH ){
```

```
    digitalWrite(buzzer, HIGH);
```

```
    digitalWrite(ledPin, HIGH);
```

```
}
```

```
else{
```

```
    digitalWrite(buzzer, LOW);
```

```
    digitalWrite(ledPin, LOW);
```

```
}
```

```
Serial.print("Distance: ");
```

```
Serial.println(distance);
```

```
}
```

CHAPTER 6

6. Results and Discussion:

6.1 Results:

Sensor to obstacle detection	Type of warning
>100cm	Nil
<100cm	Buzzer activates
<50cm	Buzzer activates

6.2 Analysis:

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.

6.3 Discussion:

Based on the theory, Visual impaired person or also known as vision impairment or vision loss, is a decreased ability to see to a degree that causes problems not fixable by usual means, such as glasses Some also include those who have a decreased ability to see because they do not have access to glasses or contact lenses. Visual impairment is often defined as a best corrected visual acuity of worse than either 20/40 or 20/60. The term blindness is used for complete or nearly complete vision loss.[6] Visual

impairment may cause people difficulties with normal daily activities such as driving, reading, socializing, and walking. The most common causes of visual impairment globally are uncorrected refractive errors (43%), cataracts (33%), and glaucoma (2%). Refractive errors include nearsightedness, far-sightedness, presbyopia, and astigmatism. Cataracts are the most common cause of blindness. Other disorders that may cause visual problems include age-related macular degeneration, diabetic retinopathy, corneal clouding, childhood blindness, and a number of infections. Visual impairment can also be caused by problems in the brain due to stroke, premature birth, or trauma among others. These cases are known as cortical visual impairment. Screening for vision problems in children may improve future vision and educational achievement. Screening adults without symptoms is of uncertain benefit. Diagnosis is by an eye exam. The World Health Organization (WHO) estimates that 80% of visual impairment is either preventable or curable with treatment. This includes cataracts, the infections river blindness and trachoma, glaucoma, diabetic retinopathy, uncorrected refractive errors, and some cases of childhood blindness. Many people with significant visual impairment benefit from vision rehabilitation, changes in their environment, and assistive devices. As of 2015 there were 940 million people with some degree of vision loss. 246 million had low vision and 39 million were blind. The majority of people with poor vision are in the developing world and are over the age of 50 years. Rates of visual impairment have decreased since the 1990s. Visual impairments have considerable economic costs both directly due to the cost of treatment and indirectly due to decreased ability to work. The solution for visually impaired person to walking is by using 'White Cane'. A white cane is a device used by many people who are blind or visually impaired. A white cane primarily allows its user to scan their surroundings for obstacles or orientation marks, but is also helpful for onlookers in identifying the user as blind or visually impaired and taking appropriate care. The latter is the reason for the cane's white color, which in many jurisdictions is mandatory. While the white cane is commonly accepted as a "symbol of blindness", different countries still have different rules concerning what constitutes a "cane for the blind". In the United Kingdom and also in Malaysia, the white cane indicates that the

individual has a visual impairment but normal hearing; with red bands added, it indicates that the user is deafblind. 22 Based on our research, many visually impaired person suffer from serious visual impairments preventing them from travelling independently. They need to use a wide range of tools and techniques to help them in their mobility. One of these techniques is orientation and mobility specialist who helps the visually impaired and blind people and trains them to move on their own independently and safely depending on their other remaining senses. Nowadays, as a parent or guardian, we don't want our children or our care's get into trouble when walking at public or somewhere else. Vision loss has a significant impact on their lives for those who experience it as well as on their families, their friends, and society. The complete loss or the deterioration of existing eyesight can feel frightening and overwhelming, leaving those affected to wonder about their ability to maintain their independence, pay for needed medical care, retain employment, and provide for themselves and their families. It's a high risk to live in a lifetime. So, we create a product that can help the visually impaired person to walk at the public independently. The Modern Blind Stick function is to help the visually impaired person walk more easier and more independent. Modern Blind Stick also can help this blind people to navigate routes and detect an obstacle that surely can make their life routines easier. The user just needs to use the blind the normal blind stick, the different is, blind people can detect a hole or stair faster and easily. Besides that, guardian or parent also can locate the location of the stick user using Global Positioning System (GPS) and Global System for Mobile Communication (GSM) module. To assist in tracking the location, this Modern Blind Stick utilizes GPS to determine the location and send it via SMS to locate the location of the user Modern Blind Stick.

CHAPTER 7

7. Conclusion:

In the end of our project, we can conclude that our project can reduce the number of risk and injuries for the visually impaired person when walking at public. Nowadays, even at young age experience the visually impairment. This thing cannot be taken so lightly as they know how much risk could it be. If the number of risk and injuries increasing rapidly, the kid or the person will loss their spirit to walk independently. The Modern Blind Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to navigate safely both indoor and outdoor. It is effective and affordable. It leads to good results in detecting the obstacles on the path of the user in a range of two meters. Though the system is hard-wired with sensors and other components, it's light in weight. Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacles.