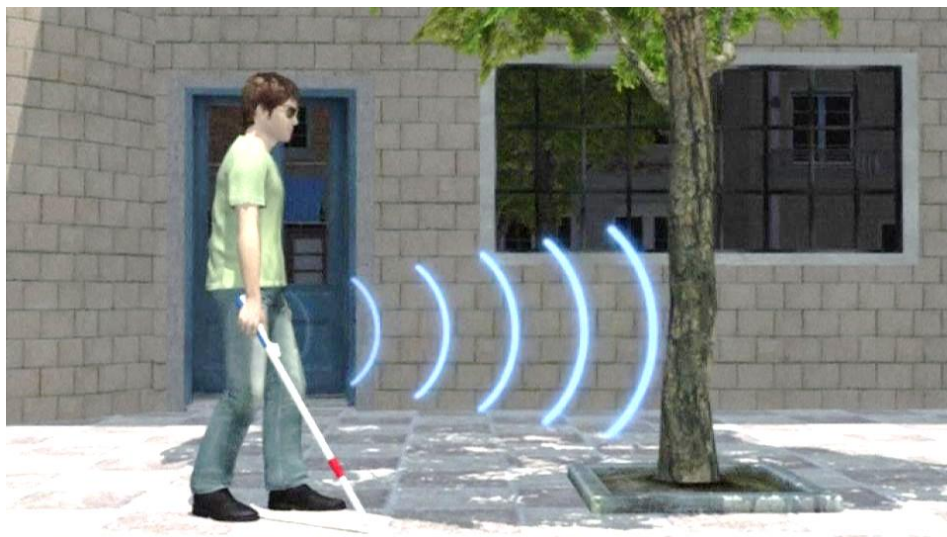




SMART WALKING STICK

For Blind People



Module	-	System Fundamentals
Coerce director	-	Dr. Chandana Perera
Year	-	2 nd year
Batch	-	16.2 computer science

Group Members

Achini D Rathnayake	BSC-UGC-MIS-16.2-042
W.L. Dhananja Y. S. Lekamge	BSC-PLY-COM-16.2-157
W.A.C.D. Wickramasinghe	BSC-PLY-COM-16.2-304

INTRODUCTION

We are in the age of science and technology which have made our daily life easier and comfortable.

So using the smart technology we aim to help visually impaired people for navigation. The main objective is to offer blind and visually impaired communities a smart device that gives them independent personal mobility outside the home. Smart blind stick is an innovative high-tech stick that will help visually impaired people to detect obstacles near them and navigate their way.

Blind stick is an innovative stick designed for visually disabled people for improved navigation. We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advanced technology. The blind stick is integrated with ultrasonic sensor along with light and water sensing. Our proposed project first uses ultrasonic sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the microcontroller. The microcontroller then processes this data and calculates if the obstacle is close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is close the microcontroller sends a signal to sound a buzzer. It also detects and sounds a different buzzer if it detects water and alerts the blind. One more feature is that it allows the blind to detect if there is light or darkness in the room. The system has one more advanced feature integrated to help the blind find their stick if they forget where they kept it. A wireless rf based remote is used for this purpose. Pressing the remote button sounds a buzzer on the stick which helps the blind person to find their stick. Thus this system allows for obstacle detection as well as finding stick if misplaced by visually disabled people..

MATERIALS NEEDED

- An ultrasonic sensor
- Moisture sensor
- Arduino Uno board
- 9V battery supply
- Tip top switch
- Buzzer
- Jumper Wires
- Bread Board
- Stick

LIMITATIONS

- We can't measure the size of the obstacle from the ultrasonic sensor
- Since we are using 9V battery it's not easy to charge all the time. So it's better to use a rechargeable battery
- It is bulky to carry

ADVANTAGES

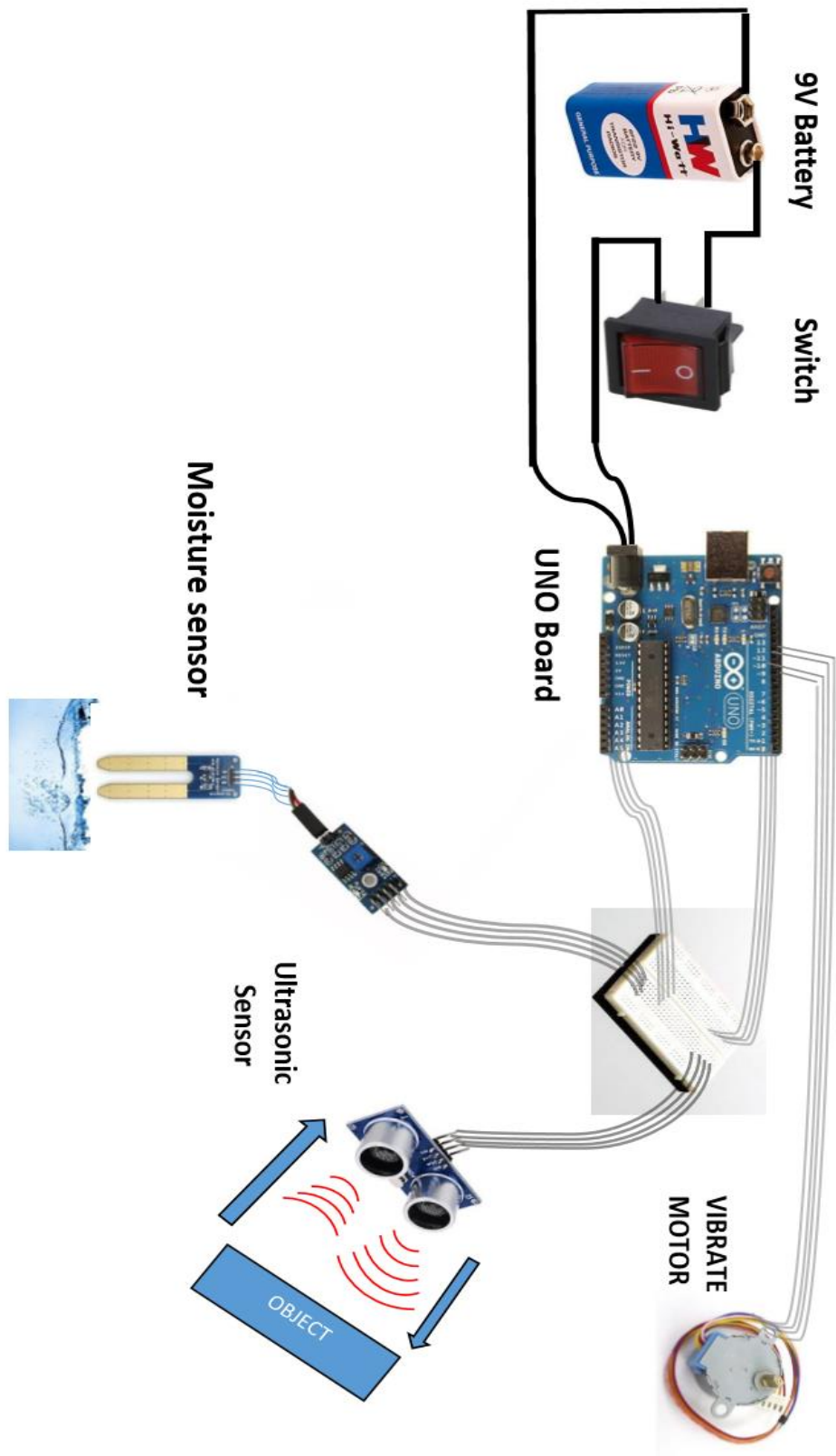
- This helps to recognize the obstacles in their path for visually disabled people.
- Not only the obstacles but also it helps to avoid the places with water through the moisture sensor.

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IJCSI

Design Process

The design process is based on the architecture. Basically the smart blind cane functions like ordinary blind canes. The difference is that the Smart Cane is equipped with ultrasonic sensor, water sensor and circuit box can be placed. Also the smart blind cane is designed to be foldable so that it is easy for the user to keep.

HARDWARE BLOCK DIAGRAM



CODE

```
int trigPin = 9;

int echoPin = 10;

int motor=7;


void setup() {
  Serial.begin(9600);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);

  // put your setup code here, to run once:
  pinMode(motor,OUTPUT);

}


void loop() {
  int mois=analogRead(A0);
  Serial.print("the moisture is ");
  Serial.println(mois);
  delay(100);

  long duration, distance;
  digitalWrite(trigPin,HIGH);
  delayMicroseconds(1000);
  digitalWrite(trigPin, LOW);
  duration=pulseIn(echoPin, HIGH);
  distance =(duration/2)/29.1;
  Serial.print(distance);
```

```
Serial.println("CM");
```

```
if((distance<50) || (mois<600))
```

```
{
```

```
digitalWrite(motor, HIGH);
```

```
}
```

```
else if(distance>=50 || (mois>600))
```

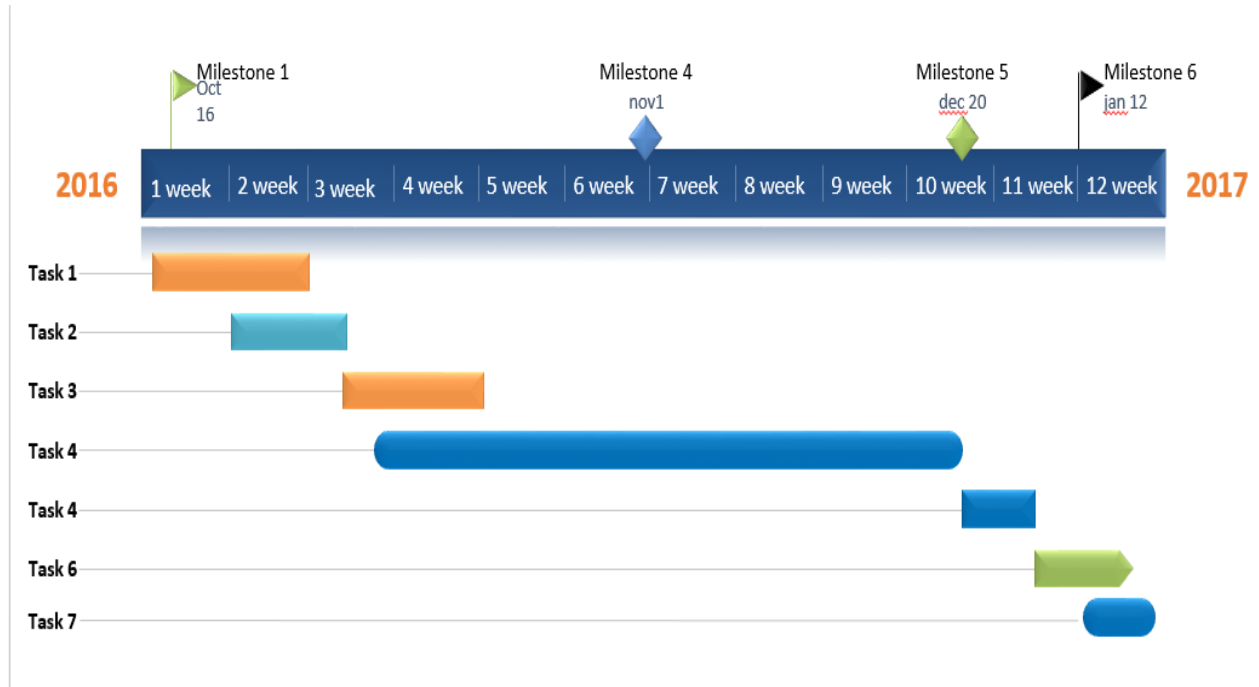
```
{
```

```
digitalWrite(motor, LOW);
```

```
}
```

```
}
```


MILESTONES



- Task 1 - Decide a Project
- Task 2 - Plan How to get resources
- Task 3 - Purchase equipment
- Task 4 - Combined to bread board
- Task 5 - Develop code
- Task 6 - Testing & QA
- Task 7 - Solve Error

PROPOSED BUDGET

Equipment	Price
1. Ultrasonic sensor	270.00 LKR
2. Moisture sensor	255.00 LKR
3. Arduino Uno board	1000.00 LKR
4. 9V battery supply	160.00 LKR
5. Tip top switch	50.00 LKR
6. Buzzer	100.00 LKR
7. Jumper wires	150.00 LKR
8. Bread board	350.00 LKR
9. Stick	200.00 LKR

Total=2535.00LKR

CHALLENGES

- Requirement of power source.
- Because of the circuits the weight will increase of the cane. So it will be hard to carry than the normal white cane.
- It gives the same vibration for obstacles and water. So it's hard to recognize whether it's obstacle or water.
- Sensor can't decide the distance between the obstacle and the cane. So it's better if we can put a beep sound or a different kind of vibration pattern when the cane is closer by the obstacle.
- Can't detect the depth of the water level.

CONCLUSION

We have create this smart blind stick for visually disabled people. The main purpose of this study is to produce a prototype that can detect objects or obstacles in front of users and feeds warning back, in the forms of vibration, to users. From the tests carried out on its functions reveal that the developed prototype which is named Smart Cane has achieved its objectives. And through the moisture sensor can detect the places with water. So easily can avoid the wet places. This study would recommend that a power supply meter reading can be installed to monitor its power status. An alarm system also can be incorporated for use in a situation of very congested areas and replace PVC with steel so that it will be more durable and robust. In addition, a buzzer timer can be added so the buzzer will activate at a specific duration.

References

- You Tube - <https://www.youtube.com/>
- mechstuff - <http://mechstuff.com/>
- Arduino site - <http://arduino.lk/>
- Lankatronics - <http://www.lankatronics.com/>