



BANNARI AMMAN INSTITUTE OF TECHNOLOGY

SMART SHOE FOR VISUALLY IMPAIRED PEOPLE



❖ ABSTRACT

Vision is considered the most important sense and the blind people are observed upon with pity by others. Technology helps the blind people to communicate with the environment and make their lives better. This project will define smart shoes which would be providing a hearing sensation to the person wearing that shoes which will inform them where the obstacle is, and providing them a secure way to reach destination. Blind people are part of our society, so the technology must leave a significant impact on their lives to make what was impossible for them as possible and available to them today. The challenges faced by impaired/blind people in their daily lives are not well understood. In this project, we try to present an application called “SMART SHOES” where it's a way to give hand to blind people with the aid of technology in order to solve some of their faced problems. The Application results enhance the understanding of the problems facing blind people daily, and may help encourage more projects targeted to help blind people to live independent in their daily lives. It will make the blind people more happier and enthusiastic.

❖ OUTLINE

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❖ INTRODUCTION

- ❖ According to survey of WHO (World Health Organization) held out in 2011 we come to know that in world about 1% of the human population is visually impaired and amongst them about 10% is fully blind. The main concern for blind people is mobility. They need to depend on other for mobility. This approach present a tool for visually impaired people that will help them to navigate.
- ❖ Now android mobile is commonly used by everyone. With help of Android application, wearable device is to be made navigate path. The system we have designed consists of sensors for sensing the surrounding environment and giving feedback to the blind person of the position of the nearest obstacles in range. Electronic component is fixed in shoes of users. User will wear shoes for easy mobility. Sensors will sense obstacles, vibrators will vibrate for left/right turn through path.
- ❖ Using smart shoe,blind people need not to be depend on others for mobility. This project describes the architecture and discusses the possible benefits of the system designed

❖ EXISTING SYSTEM

- ❖ In the past, the visually impaired used to face difficulties in moving and transporting from a place to another. Some of them used to have a guide dog to help them walk around and to avoid collisions. Some of them used to ask for someone else's help. This inspired a lot of developers to develop products to assist the visually impaired and to make them feel more independent. Two of these popular products are: White Cane, and SonicGuide.
- ❖ White cane also known as a "Hoover" cane, named after Dr. Richard Hoover who designed it. White cane is designed primarily as a mobility tool used to detect objects in the path of a user. Using a cane is difficult in a crowded restaurant, or in placing it into a car or a plane or even a bus. The White Cane is made from metal, which makes it heavy and inflexible and susceptible for snapping or cracking. SonicGuide is a smart head mounted device that uses a camera that takes pictures and analysis them based on an algorithm to find the abnormal objects in the way and warns the user by sending alarms to a connected earphone. But also this device has some problems on its own. It is heavy and wearing a device on the head all the time may cause pain and some neck injuries.

❖ PROPOSED SYSTEM

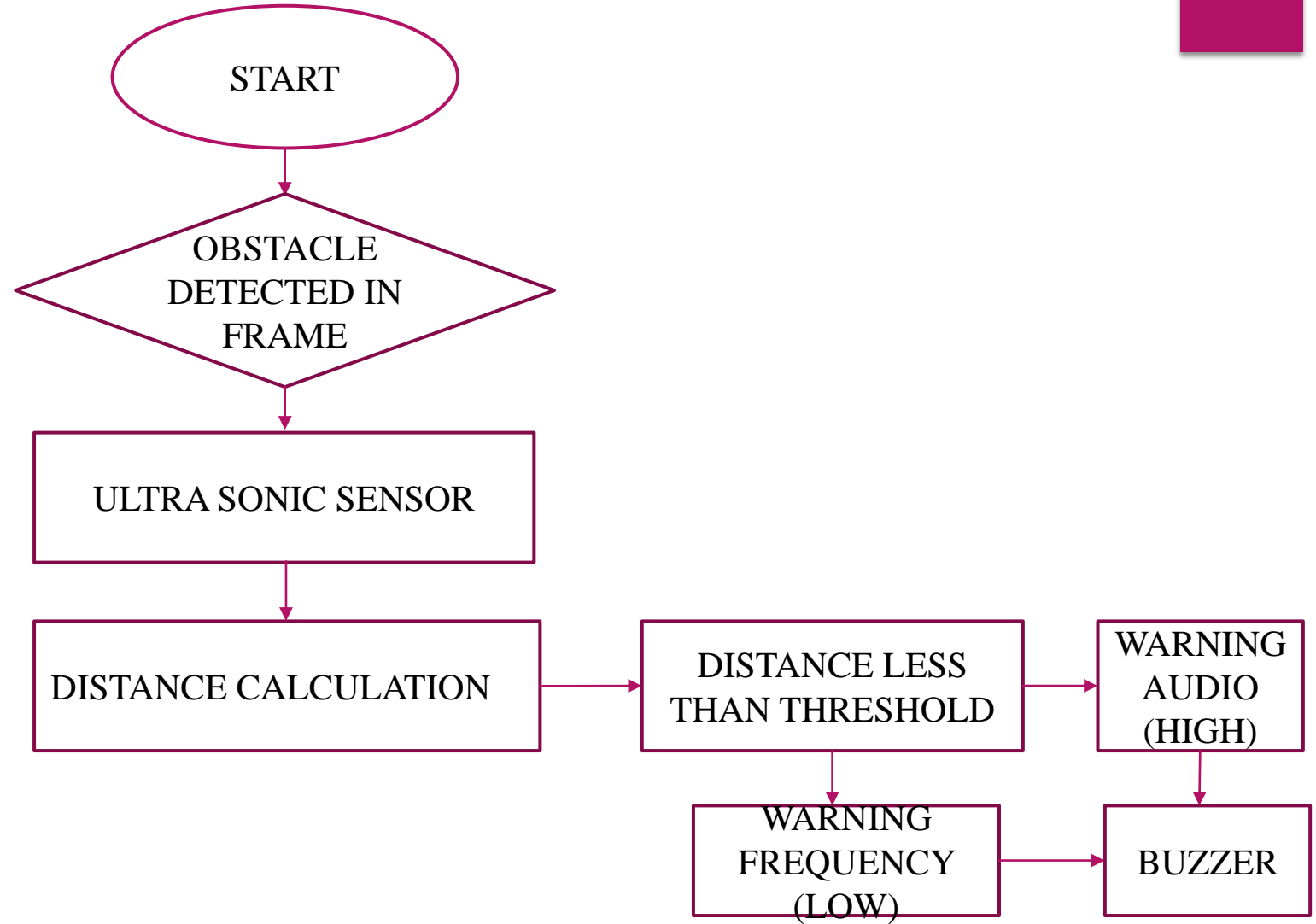
This system is of higher accuracy and better comprehensibility,
easy to carry.

- ❖ Navigation Assistance while travelling.
- ❖ Distraction-free travel.
- ❖ User friendly system.

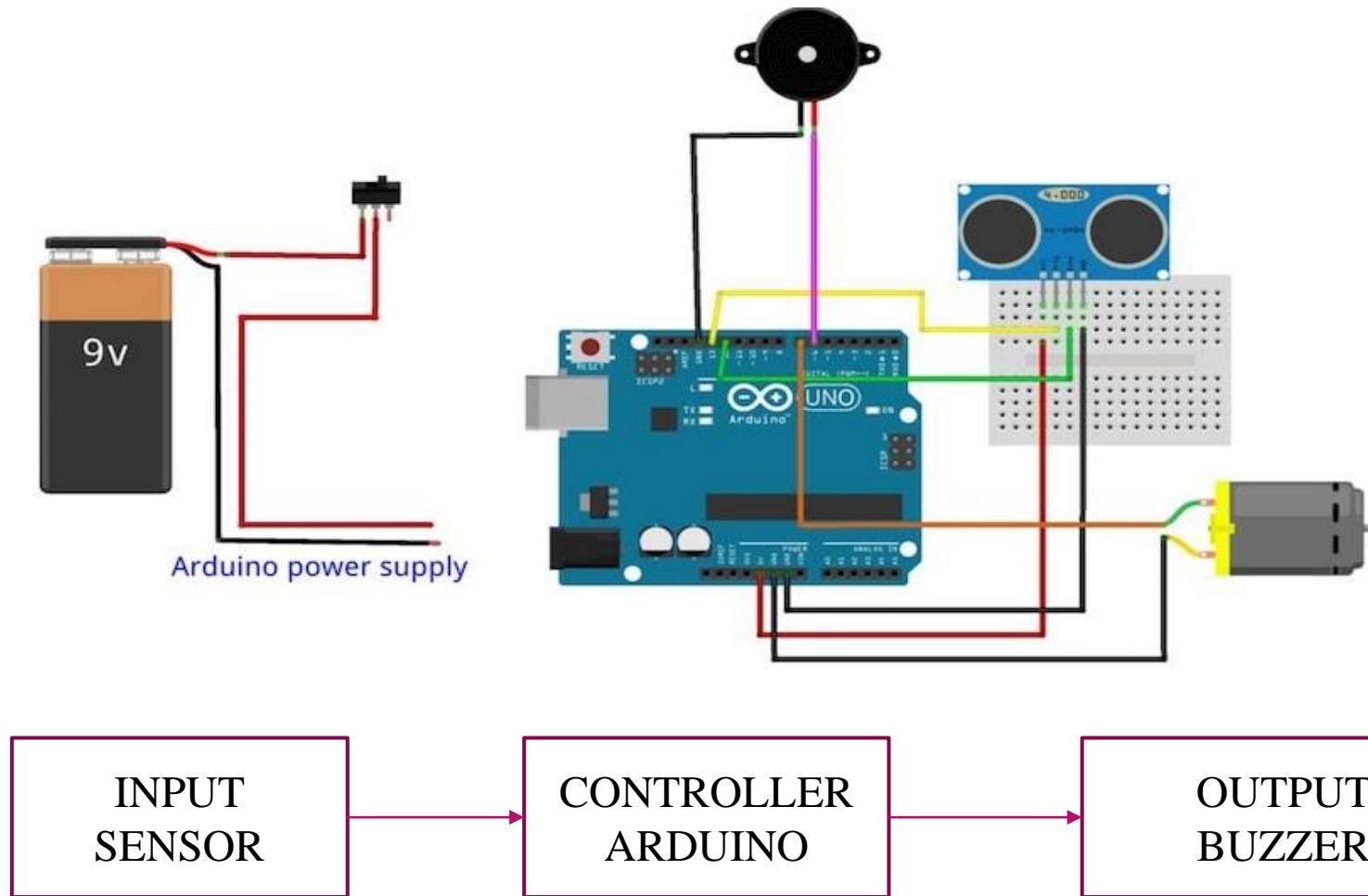


This system defines Smart Shoes that enable the visually impaired users with mobility impairment to avoid obstacles. By leveraging existing robotics technologies, this system will detect obstacles such as curbs, and staircases in the ground or even moving objects, and transmits obstacle information through haptic feedback (vibrations and beeps). Initial experiments show that this device enables human users to navigate safely in indoor and outdoor environments.

❖ FLOW CHART



❖ BLOCK DIAGRAM



❖ WORKING METHODOLOGY

- ❖ When the object is detected near to the shoe and if any person coming in front it alerts them with the help of vibratory circuit and also in advancement with help of speakers or head phones that is voice command.
- ❖ To implement, the ultrasonic sensors, Arduino microcontroller are used. Based on signals, decision is made in Arduino to manage and give timely signals. The input string is from the ultrasonic sensors which 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. Ultrasonic sensor can measure distances in centimeters and inches.
- ❖ When the obstacle is located in far distance sensor will detect and intimate with the low frequency buzzer sound .When the obstacle is located in the short distance less than the sensor will detect and intimate with high frequency buzzer sound

❖ HARDWARE REQUIREMENTS

ARDUINO NANO

Arduino Nano is a microcontroller board. Arduino nano consists of 14 pins which are classified as input and output pins of which 6 are pwm output and 6 are analog inputs. It has all the specifications that a microcontroller should have and a charging port to power it.

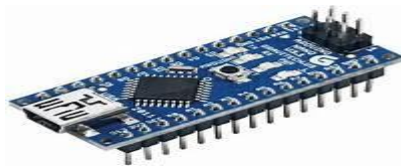


Fig 1 ARDUINO NANO

ULTRA SONIC SENSOR

Ultrasonic sensor is used to measure the obstacle distance. It is done by using sound waves generation so that they detect the obstacles nearby. The time for wave to return back is noted down and then the distance is defined. It is possible to calculate the distance between the sonar sensor and the object.(distance up to 30cm till now)

RIGHT Obstacle Sensor- The trigger pin and echo pin of ultrasonic sensor used for detecting sideward obstacle is connected to digital pin 7 & 8 of microcontroller respectively.

LEFT Obstacle Sensor -The trigger pin and echo pin of ultrasonic sensor used for detecting sideward obstacle is connected to digital pin 12 & 13 of microcontroller respectively. The trigger pin is used to trigger the sensor for sending the ultrasonic pulse, while echo pin is used to receive the echo pulse from obstacle, the time duration between transmitted pulse and received pulse (echo pulse) is then used to calculate the distance of obstacle. Burst of short ultrasonic pulse can be sent from two sensors by putting the trigger pin high for appropriate time.



Fig 2 ULTRA SONIC SENSOR

BUZZER

To allow the blind person get aware about the presence of Obstacle.



Fig 3 BUZZER

❖ PROTOTYPE



Working model

❖ CONCLUSION

A shoe that help visually impaired person in walking has been designed. The shoe proposed here can be wear by visually impaired person while walking. The prototype was implemented with the minimum resources. The circuitry was kept simple. To ensure fast and easy charging, wireless charging is added. A 9V 600mah rechargeable battery is used to power the circuitry. The Shoe can be used for nearly 3-4 hour once the rechargeable battery gets fully charged.

In order to make use of latest technology, we have proposed arduino based navigational shoes system. Wearable electronic kit is proposed. Main goal of this proposed system is to provide navigation assistance for this visually impaired person. Sensors will detect obstacles and vibrators will vibrate according direction. Buzzer beeps when right swing should be taken and when left swing should be taken. Our approach is to make visually impaired person to live independently.

❖ REFERENCE

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❖ DEMO VIDEO

```
File Edit Sketch Tools Help
watch_per04c
1 #include <ESP8266WiFi.h>
2 #include <WiFiClient.h>
3 #include <ESP8266WebServer.h>
4 // Replace with your network credentials
5 const char* ssid = "IOT LAB";
6 const char* password = "IoT$2020";
7 const int trigPin = D0;
8 const int echoPin = D1;
9 const int trigPin1 = D4;
10 const int echoPin1 = D3;
11 int buzzer1=D6;
12 int buzzer2=D7;
13 // defines variables
14 long duration;
15 int distance;
16 long duration1;
17 int distance1;
18 ESP8266WebServer server(80); //instantiate server at port 80 (http port)
19 String page = "";
20 double data;
```



THANK YOU