



**END SEMESTER ASSESSMENT (ESA)
B.TECH. (CSE)
IV SEMESTER**

**UE20CS252 – MICROPROCESSOR AND COMPUTER
ARCHITECTURE LABORATORY**

**PROJECT REPORT
ON
SMART CANE**

SUBMITTED BY

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ABSTRACT OF THE PROJECT:

Obstacle detection is one of the major concerns for a blind person. Presented here is a smart blind stick using Arduino Uno and Ultrasonic sensors. The primary goal of this project is to assist blind people to walk with ease and to alert them whenever their walking path is obstructed by other objects or people. As a warning signal, a voice module is connected in the circuit, that gives a voice warning according to the direction of the object, for example, if the object is in Left then it will say '(alert sound) Object to the Left'.

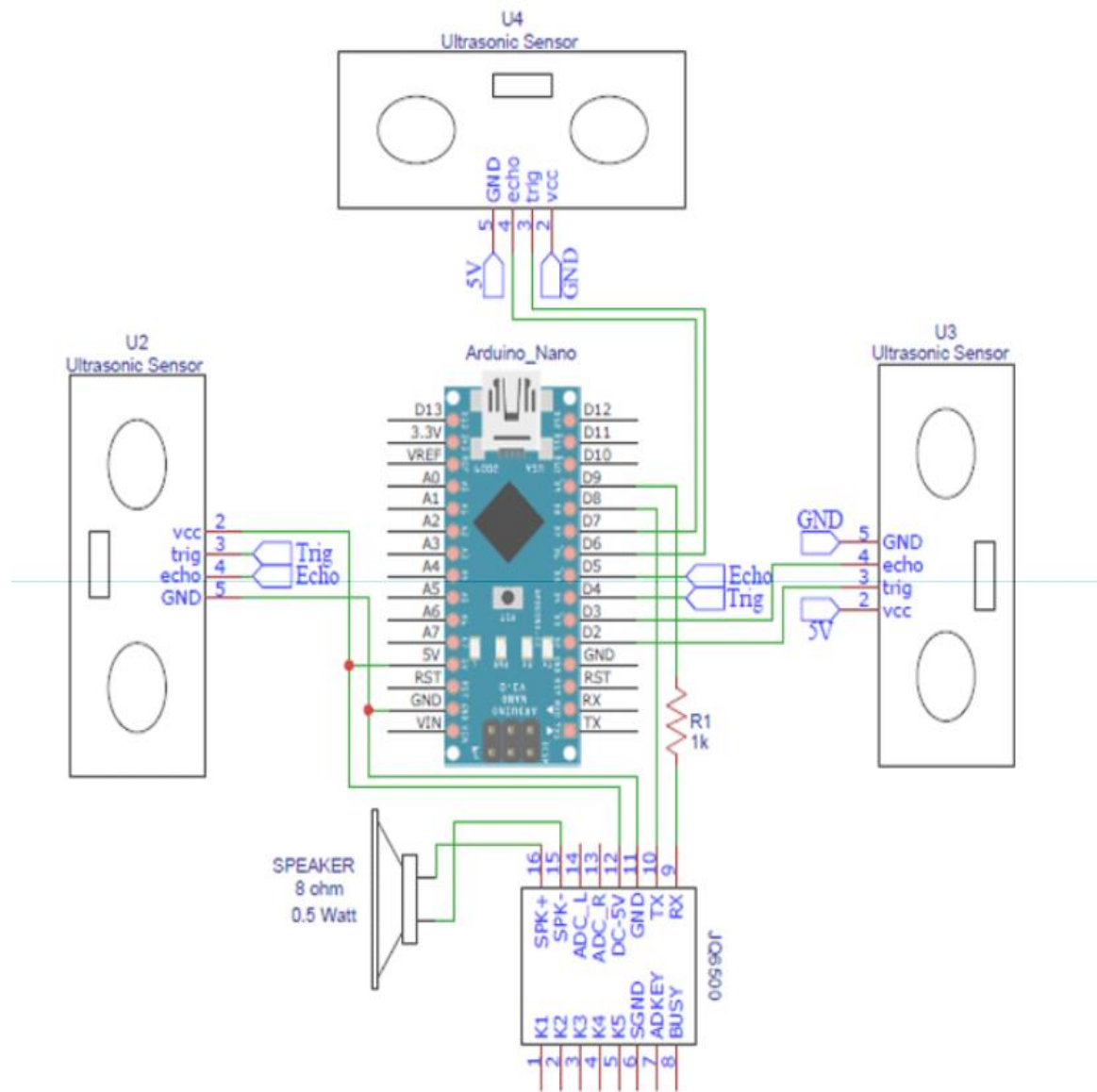
This Smart stick will have three Ultrasonic sensors connected in left, right, and center to sense distance from any obstacle, a JQ6500 Voice Sound Module to give warning signal, and a 9V battery to power the setup.

As an alternative to JQ6500 Voice Sound module, we can also use buzzers. Buzzers don't tell the direction which has the obstacle, but gives an alarm (a beeping sound) when an object is detected by the sensor.

COMPONENTS USED:

- Arduino nano
- 3 x Ultrasonic Sensors
- JQ6500 Voice Sound Module
- 8 ohm Speaker
- 1 kilo-ohm resistor
- Jumper wires
- Bread board (generic)
- Blind people's cane

CIRCUIT DIAGRAM:



ARDUINO CODE:

```
#include <Arduino.h>
#include <SoftwareSerial.h>
#include <JQ6500_Serial.h>

SoftwareSerial mySerial(8,9);
JQ6500_Serial mp3(mySerial);
int left_trigPin = 7;
int left_echoPin = 6;
int right_trigPin = 2;
int right_echoPin = 3;
int center_trigPin = 4;
int center_echoPin = 5;
int motorPin=10;

void setup()
{
  pinMode(left_trigPin, OUTPUT);
  pinMode(left_echoPin, INPUT);
  pinMode(right_trigPin, OUTPUT);
  pinMode(right_echoPin, INPUT);
  pinMode(center_trigPin, OUTPUT);
  pinMode(center_echoPin, INPUT);
  pinMode(motorPin,OUTPUT);
  Serial.begin(9600);
  mySerial.begin(9600);
  mp3.reset();
  mp3.setVolume(100);
  mp3.setLoopMode(MP3_LOOP_NONE);
}

void loop()
{
  left();
  right();
  center();
}

void left()
{
  delay(100); // reading will be taken after ....milliseconds
  Serial.println("\n");
  int duration, distance;
  digitalWrite (left_trigPin, HIGH);
  delayMicroseconds (10);
  digitalWrite (left_trigPin, LOW);
```

```

duration = pulseIn (left_echoPin, HIGH);
distance = (duration / 2) / 29.1;
//distance= duration*0.034/2;
if (distance < 10) {
digitalWrite(motorPin, HIGH); //vibrate
delay(1000); // delay one second
digitalWrite(motorPin, LOW); //stop vibrating
delay(1000); //wait 50 seconds.// Change the number for long or short
distances.
Serial.print("Left Distance");
Serial.print(distance);
mp3.playFileByIndexNumber(1);
}
}

void right()
{
delay(100);// reading will be taken after ....milliseconds
Serial.println("\n");
int duration, distance;
digitalWrite (right_trigPin, HIGH);
delayMicroseconds (10);
digitalWrite (right_trigPin, LOW);
duration = pulseIn (right_echoPin, HIGH);
distance = (duration / 2) / 29.1;
if (distance < 10) {
digitalWrite(motorPin, HIGH); //vibrate
delay(1000); // delay one second
digitalWrite(motorPin, LOW); //stop vibrating
delay(1000); //wait 50 seconds.
// Change the number for long or short distances.
Serial.print("Right Distance");
Serial.print(distance);
mp3.playFileByIndexNumber(2);
}
}

void center()
{
delay(100);// reading will be taken after ....milliseconds
Serial.println("\n");
int duration, distance;
digitalWrite (center_trigPin, HIGH);
delayMicroseconds (10);
digitalWrite (center_trigPin, LOW);
duration = pulseIn (center_echoPin, HIGH);
distance = (duration / 2) / 29.1;
if (distance < 10) {

```

```
digitalWrite(motorPin, HIGH); //vibrate
delay(1000); // delay one second
digitalWrite(motorPin, LOW); //stop vibrating
delay(1000); //wait 50 seconds.// Change the number for long or short
distances.
Serial.print("Center Distance");
Serial.print(distance);
mp3.playFileByIndexNumber(3);
}
}
```

REFERENCES

<https://www.youtube.com/watch?v=opCbZIfVBK4>

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