

## **Experiment:**

### **Aim:**

The aim of the Smart Blind Stick project is to assist visually impaired individuals in navigating safely by detecting obstacles and providing real-time alerts.

### **Overview:**

The Smart Blind Stick is a device designed to aid visually impaired individuals in navigating their environment independently and safely. It uses sensors, like ultrasonic or infrared, to detect obstacles and alerts the user through vibrations or sound signals. The stick can also incorporate GPS tracking for location assistance and emergency support. With its compact and user-friendly design, it enhances mobility and confidence for visually impaired users.

### **Required Components:**

#### **1. Hardware components:**

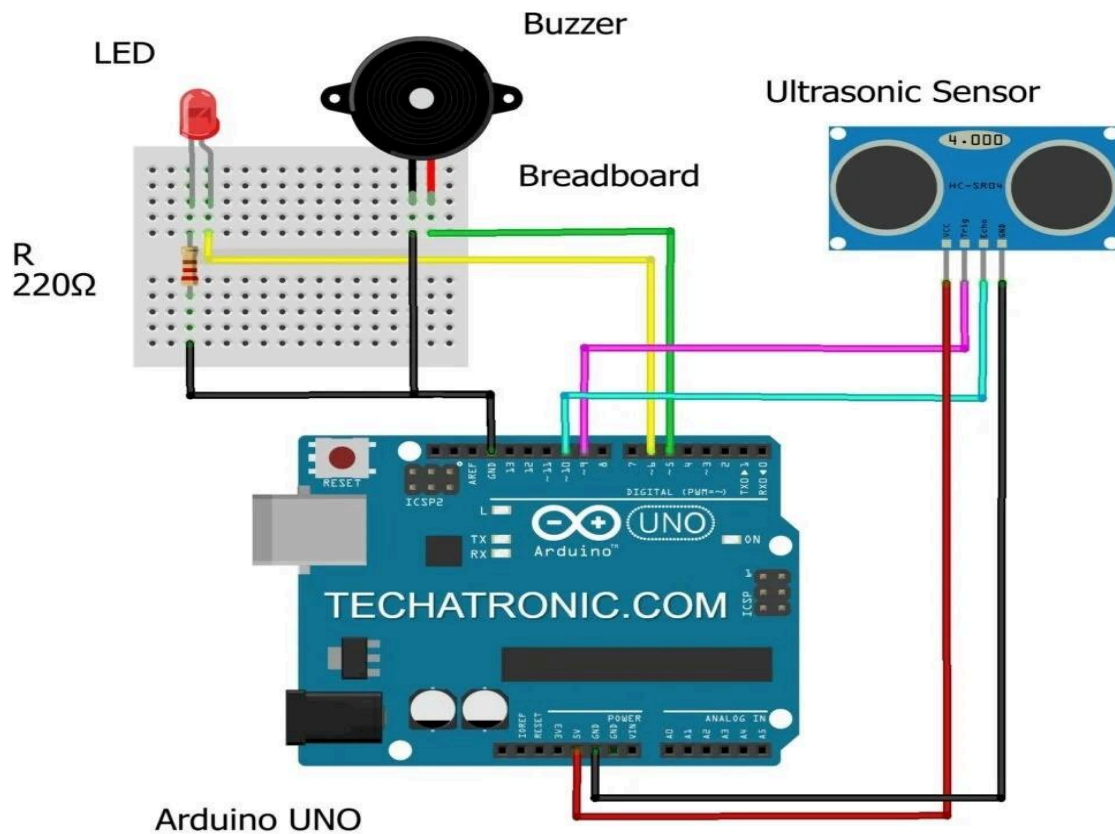
- ❖ Arduino UNO
- ❖ Ultrasonic sensor
- ❖ Buzzer
- ❖ Battery (9V or 5V Power Supply)
- ❖ Resistors (220-ohm)
- ❖ Connecting Wires
- ❖ Stick or Frame
- ❖ LED light
- ❖ Bread Board

#### **2. Software components:**

- ❖ Arduino IDLE
- ❖ Laptop

## Pin Diagram:

Follow the circuit diagram and hook up the components on the breadboard as shown in the image given below:



**Fig:** Circuit Diagram of Smart blind Stick using Arduino UNO

## Code:

```
const int trigPin = 9;
const int echoPin = 10;
long duration;
int distanceCm, distanceInch;

void setup()
{
  Serial.begin(9600);
  pinMode(trigPin, OUTPUT); // Ultrasonic Trigger Pin
  pinMode(echoPin, INPUT); // Ultrasonic Echo Pin
```

```

pinMode(6, OUTPUT); // Connect LED to Pin D6
pinMode(5, OUTPUT); // Connect Buzzer to Pin D5
}

void loop()
{
// Clear the trigger pin
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
// Trigger the sensor with a 10 microsecond pulse
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
// Read the echo pin and calculate the distance
duration = pulseIn(echoPin, HIGH);
distanceCm = duration * 0.034 / 2; // Convert to centimetres
distanceInch = duration * 0.0133 / 2; // Convert to inches
// Display the distance in the Serial Monitor
Serial.print("Distance (cm): ");
Serial.println(distanceCm);
delay(100); // Short delay for stability

// If the distance is less than 25 cm, turn on LED and Buzzer
if (distanceCm < 50)
{
digitalWrite(5, HIGH); // Buzzer ON
digitalWrite(6, HIGH); // LED ON
}

// Otherwise, turn off LED and Buzzer
else
{
digitalWrite(5, LOW); // Buzzer OFF
digitalWrite(6, LOW); // LED OFF
}
}

```

## Output:

