Department of Electronics and Communication Engineering

IV B .Tech I Semester Mini Project Work

Presentation for AY: 2023-24

BATCH NO : 2013

SMART BLIND STICK USING ARDUINO

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Outline of Presentation:

- Justification of the Title
- Introduction
- Components
- Circuit
- Simulation
- Uses
- Conclusion

Justification of the Title:

- A smart blind stick using Arduino is a device that uses an ultrasonic sensor to detect obstacles in front of the user and then alerts the user to their presence. The alert can be in the form of a vibration, a sound or a combination of both.

- The development of smart blind sticks using Arduino is an exciting area of research that has the potential to make a significant difference in the lives of visually impaired people.

- To help visually impaired people to detect obstacles in their path.To provide a warning signal to the user when an obstacle is detected.

Introduction:

- The Arduino is a small, open-source microcontroller board that can be programmed to perform a variety of tasks. In this project, the Arduino is used to control the ultrasonic sensor and to generate the alert signal.

- The ultrasonic sensor works by emitting a soundwave and then measuring the time it takes for the wave to bounce back from an object. The distance to the object is then calculated based on the speed of sound.

- The alert signal is generated by the Arduino by either vibrating a motor or by playing a sound. The vibration or sound is triggered when the ultrasonic sensor detects an object within a certain distance.

There are a variety of ways that a blind person often uses,such as a white cane or a walking stick. But thereare many restrictions on this such as the length of the cane as well. Blind people cannot cross a road signal on their own and rely on others to cross the roadwith a road signal . Therefore, we have decided to create a product that will help blind people This module consists of ultrasonic sensors that detects the obstacle in any side of the blind people and indicate them by buzzering and safeguard them before they get hit by something and prevent from issues.

Components:

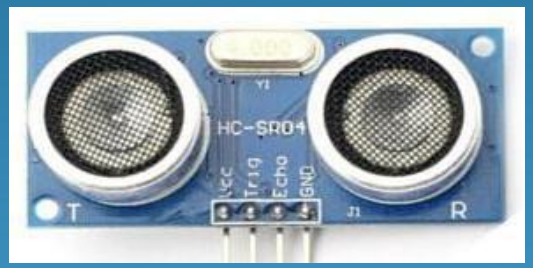
- Arduino UNO R3
- Piezo buzzer
- Ultrasonic sensors – 3
- Resistor
- Connecting Wires

Arduino UNO R3:Arduino UNO is a microcontroller board based on the ATmega328P microcontroller. 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.

Piezo buzzer: A piezoelectric speaker (also known as a piezo bender due to its mode of operation, and sometimes colloquially called a "piezo", buzzer, crystal loudspeaker or beep speaker) is a loudspeaker that uses the piezo electric effect for generating sound. The initial mechanicalmotion is created by applying a voltage to a piezoelectric material, and this motion is typically converted into audible sound using diaphragms and resonators.

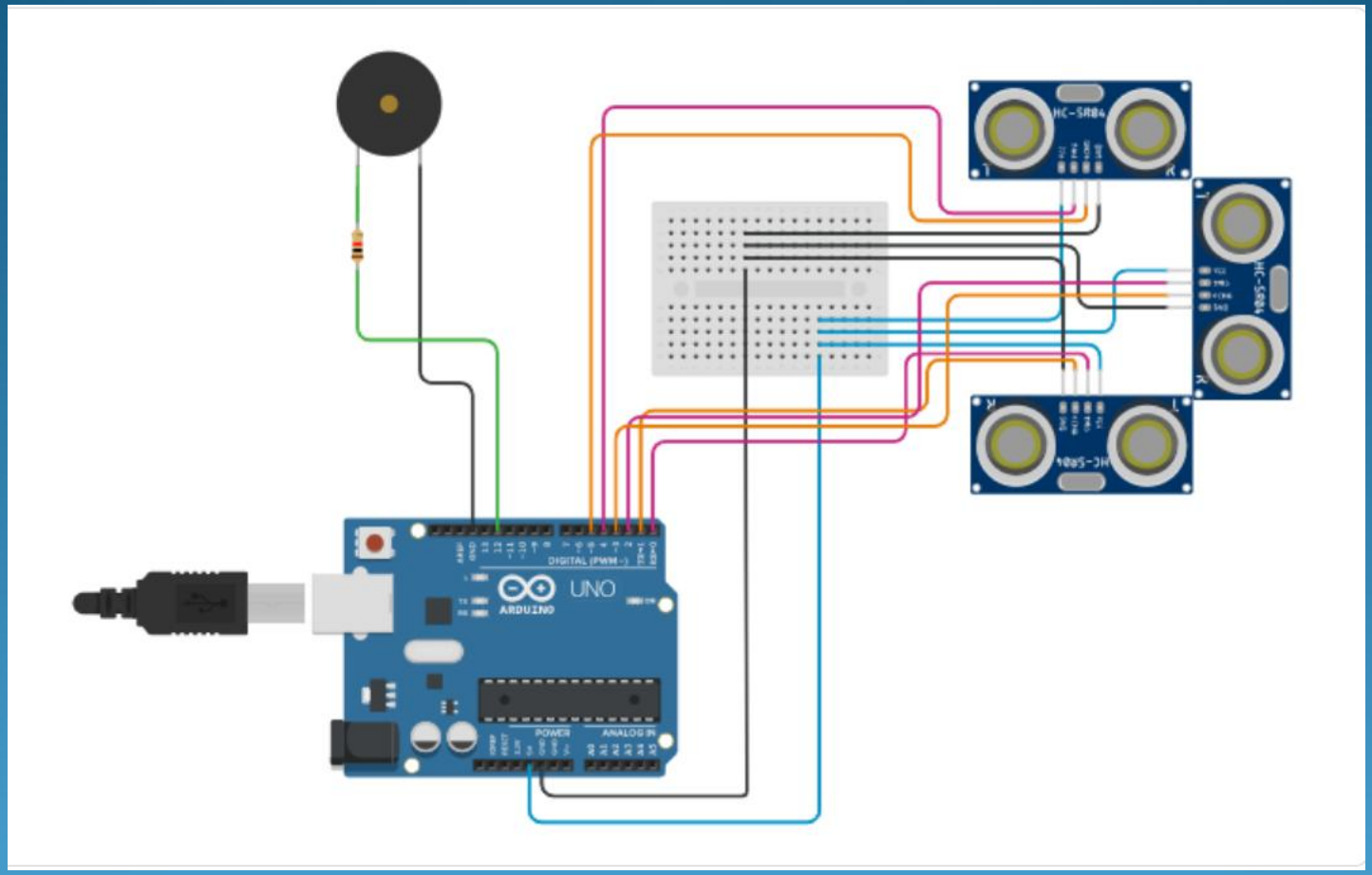
Connecting Wires : Connecting wires allows an electrical current to travel from one point on a circuit to another, because electricity needs a medium through which to move.

Ultrasonic sensors :Ultrasonic sensor HC-SR04 is used to measure the distance to an object by using ultrasonic waves. TRIG pin this pin receives the control signal (pulse) from Arduino. ECHO pin this pin sends a signal (pulse) to Arduino. Arduino measures the duration of pulse to calculate distance.



Resistor :A resistor (also known as an electrical resistor) is defined as a two-terminal passive electrical element that provides electrical resistance to current flow.

Circuit Diagram:



Coding:

```
void setup()
{
pinMode(12, OUTPUT);
}
long duration1, dis1,duration2, dis2,duration3, dis3;
void loop(){
noTone(12);
pinMode(0, OUTPUT);
digitalWrite(, LOW);
delayMicroseconds(2);
digitalWrite(0, HIGH);
delayMicroseconds(2);
digitalWrite(0, LOW);
pinMode(1, INPUT);
duration1=pulseIn(1, HIGH);
dis1= (duration1*0.034)/2;
if (dis1<100)  {
tone(12, 500);
}  else  {
 noTone(12);
 } pinMode(2, OUTPUT);
 digitalWrite(2, LOW);
```

```
delayMicroseconds(2);
digitalWrite(2, HIGH);
delayMicroseconds(2);
digitalWrite(2, LOW);
pinMode(3, INPUT);
duration2=pulseIn(3, HIGH);
dis2= (duration2*0.034)/2;
if (dis2<100)  {
tone(12, 700);
}  else  {
noTone(12);  }
pinMode(4, OUTPUT);
 digitalWrite(4, LOW);
delayMicroseconds(2);
digitalWrite(4, HIGH);
delayMicroseconds(2);
 digitalWrite(4, LOW);
pinMode(5, INPUT);
 duration3=pulseIn(5, HIGH);
dis3= (duration3*0.034)/2;
if (dis3<100)  {
tone(12, 700);  }  else  {
 noTone(12);  }  delay(100);}
```

Uses:

- To help blind people avoid obstacles.
- To provide guidance. The smart stick can be programmed to provide directional guidance to the user.
- To improve the user's independence. The smart blind stick can give blind people more independence and confidence when they are moving around
- The use of multiple ultrasonic sensors to provide a more accurate and complete picture of the user's surroundings.
- To be low-cost, portable, and easy to use,it enhances functionality,increased safety. .

Conclusion:

Overall, smart blind sticks using Arduino are a promising new technology that has the potential to make a significant positive impact on the lives of blind people. As the technology continues to develop, it is likely that these devices will become even more sophisticated and user-friendly. This will make them even more accessible to a wider range of people, and will help to ensure that blind people can live independent and fulfilling lives.


Thank
You