

Automatic Door Opening System

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Introduction

The Automatic Door Opening System is an Arduino UNO based project that automatically opens and closes a door using an ultrasonic sensor and servo motor. The ultrasonic sensor detects nearby objects or persons, and the Arduino UNO controls the servo motor to open the door automatically.

This project is useful for smart homes, automatic entrances, and touch-free automation systems. It is simple, efficient, and suitable for beginners learning Arduino and automation concepts.

Principle

This project works on the principle of ultrasonic distance detection. The ultrasonic sensor continuously measures the distance between the sensor and nearby objects.

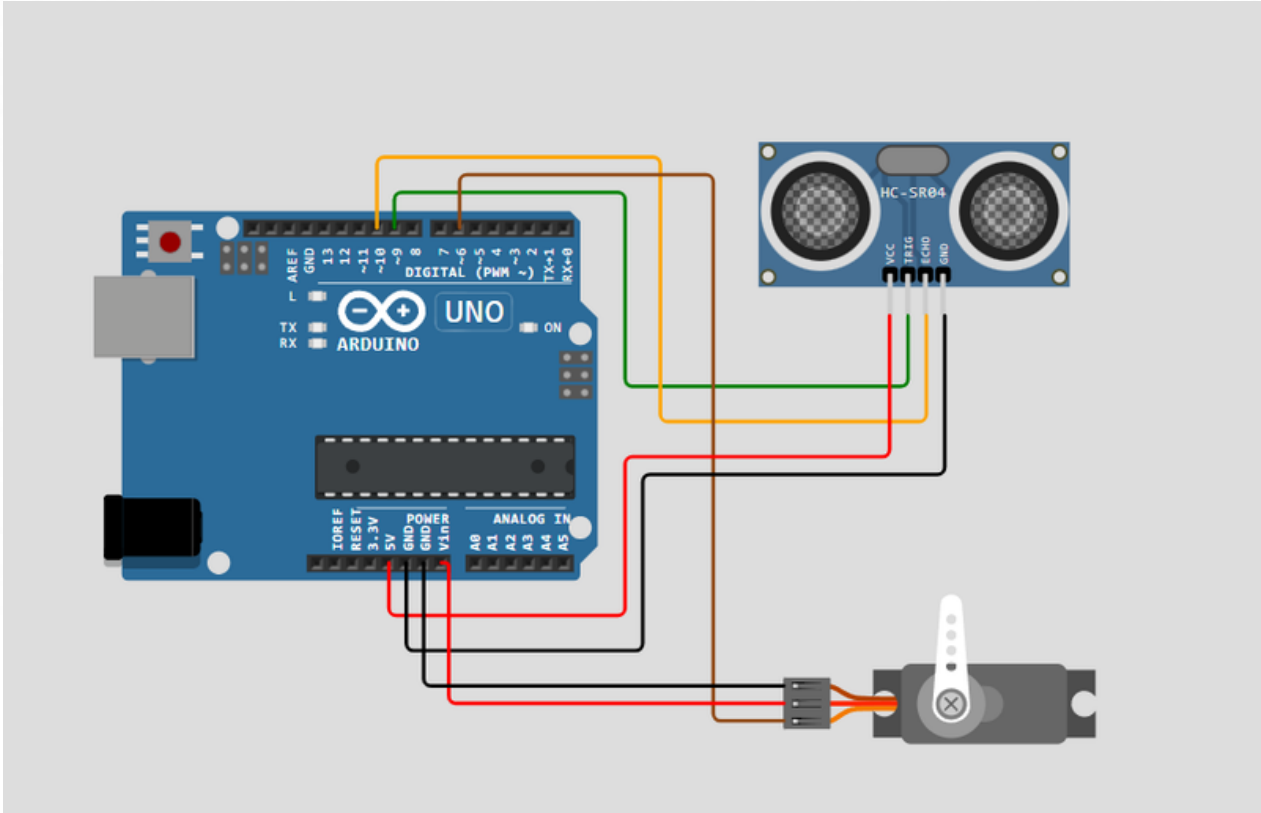
When a person or object comes near the sensor, the Arduino UNO detects the distance and rotates the servo motor to open the door automatically. After a few seconds, the servo motor returns to its original position and closes the door.



Components Required

- 1) Arduino UNO
- 2) Ultrasonic Sensor
- 3) Servo Motor
- 4) Jumper wires
- 5) Arduino UNO Port (For uploading code)

Circuit Diagram



Code

```
#include <Servo.h>
#define trigPin 9
#define echoPin 10
Servo doorServo;

long duration;
int distance;

void setup() {
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  doorServo.attach(6);
  Serial.begin(9600);
}

void loop() {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = duration * 0.034 / 2;

  if (distance < 25) {
    doorServo.write(90);
    delay(3000);
    doorServo.write(0);
  }
  delay(200);
}
```



Code Explanation

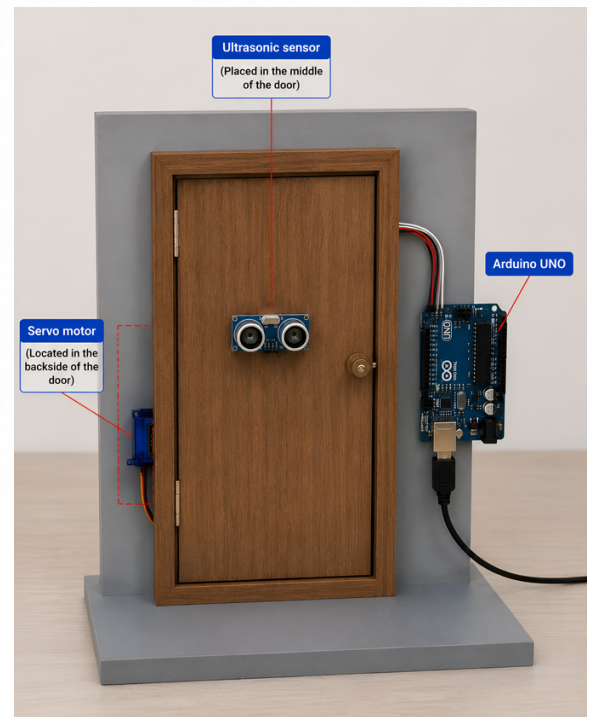
The Arduino UNO controls the ultrasonic sensor and servo motor. The ultrasonic sensor detects nearby objects by sending and receiving ultrasonic waves.

The Arduino calculates the distance using the echo signal received from the sensor. If the detected distance becomes less than 25 cm, the Arduino rotates the servo motor to open the door.

After a short delay, the servo motor returns to its original position and closes the door automatically. The process continuously repeats inside the loop function.

Project Setup Reference

Note: This image is only for setup reference and is AI generated. Do not make connections based on this image. Follow the circuit diagram for proper connections.



Applications of this Project

- Automatic door systems
- Smart home automation
- Touch-free entrance systems
- Office automation systems
- Industrial automation projects

Conclusion

The Automatic Door Opening System using Arduino UNO was successfully designed and tested. The system automatically opens and closes the door using an ultrasonic sensor and servo motor.

This project is simple, reliable, and useful for automation applications. It also helps beginners understand ultrasonic sensing, servo motor control, and Arduino programming concepts.

Thank You.....!

