ODD 2022

Computer Organization and Architecture Lab

15B17CI373

Project Title: Smart Dustbin

Course Name: Semester: Vth

Batch: F7

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Problem Statement

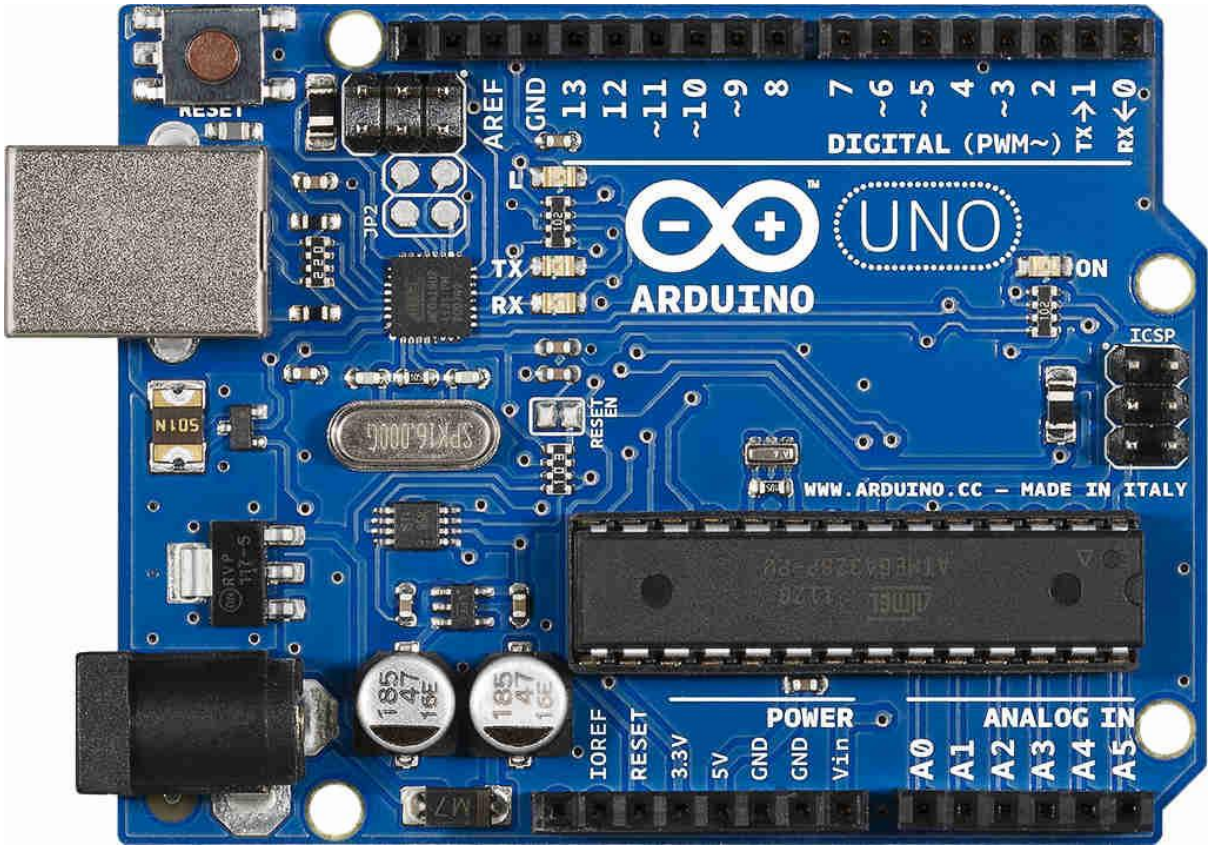
In today's smart and technologically advanced world, When every working object from a car, door, washing machine, etc. is moving towards IoT and connecting to the internet to give easier access to the user. In our effort for this project, we tried to make the everyday object used in every household smart. A dustbin requires you to press a peddle or open it by the hand leading to many hygiene issues and bacteria.

Introduction

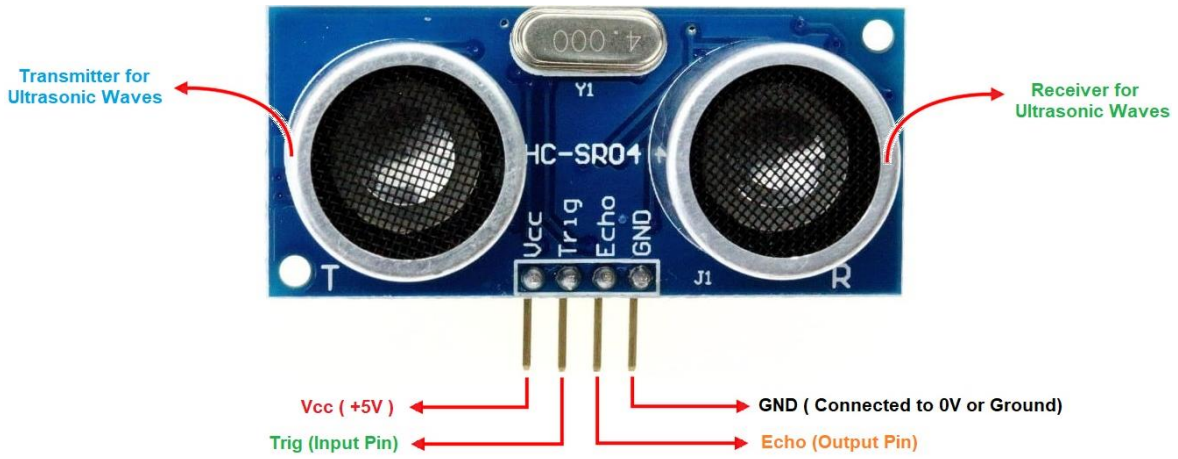
We made a simple self-opening dustbin that detects the presence of any object in-front of it within a specified distance. This helps the consumer with a seamless, no interactive experience for their dustbin and also avoids any hygienic issues.

List of Technology/Data Structures used in the project

The main component for this project lies in the Arduino Uno Board which is easily programmable with C language. The pins can be easily assigned and the board can be programmed using the Arduino IDE which provides easy debugging for the program and function to upload the program to the Uno board via USB.

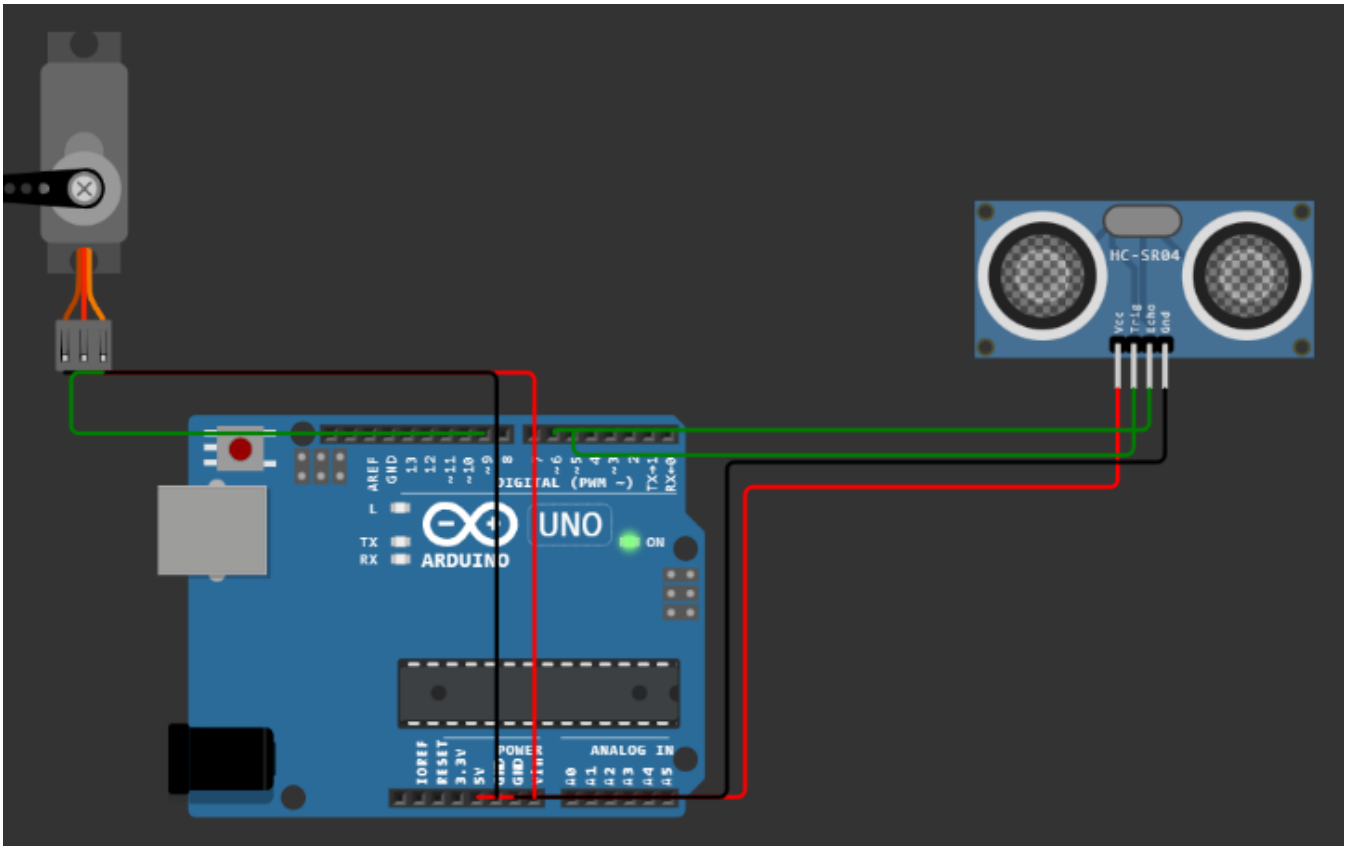


The Ultrasonic sensor, also known as HC-SR04. Its working is based on a transmitter and receiver and is mainly used to determine the distance from the target object. The amount of time it takes to send and receive waves will determine how far the object is placed from the sensor. This acts as an input for our Arduino



The third component is the Servo Motor, which rotates 180 on input from the ultrasonic sensor the Arduino signals the servo. The servo is attached to the dustbin lid to lift it.

Detailed Design of the project



Ultrasonic sensor:

TRIG Pin: 5

ECHO Pin: 6

Servo Motor:

Signal Pin: 9

Implementation details and results

The following is the code used for implementation:

```
#include <Servo.h>

Servo servoMain;

int trigpin = 5;

int echopin = 6;

int distance;

float duration;

float cm;

void setup()

{

    servoMain.attach(9);

    pinMode(trigpin, OUTPUT);

    pinMode(echopin, INPUT);
}

void loop()

{
```

```
    digitalWrite(trigpin, LOW);

    delay(2);

    digitalWrite(trigpin, HIGH);

    delayMicroseconds(10);

    digitalWrite(trigpin, LOW);

    duration = pulseIn(echopin, HIGH);

    cm = (duration / 58.82);

    distance = cm;

    if (distance < 30)

    {

        servoMain.write(180);

        delay(3000);
    }

    else
    {

        servoMain.write(0);

        delay(50);
    }
}
```

Result:

https://wokwi.com/projects/348025084842082899

Conclusion

A Smart dustbin that detects presence using sound waves was made and it can be further innovated to connect to a mobile app to prevent unnecessary opening at odd times this can be achieved using a Wi-fi Module or Bluetooth Module.