



Industrial Project Report
Submitted in partial fulfilment of the degree
of



B-tech in Information Technology

By

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THIS IS SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF
AFFILIATED TO

Maulana Abul Kalam Azad University of Technology

StartWith a Dream, V•noh withasuccess

Under the supervision
of:Mr. Sumit Halder
PROJECT ON: IOT BASED SMART DUSTBIN (USING
ARDUINIO UNO)

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UNDER THE GUIDANCE OF

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Department of Information Technology

I hereby forward the documentation prepared under my supervision by Mr. Sumit Halder entitled Siliguri Institute Of Technology to be accepted as fulfilment of the requirement for the Degree of Bachelor of Technology in Information Technology ,Siliguri Institute Of Technology affiliated to Maulana Abul Kalam Azad University of Technology (MAKAUT).

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Certificate of Approval

The foregoing project is hereby approved as a creditable study for the B. Tech in Information Technology presented in a manner of satisfactory to warrant its acceptance as a prerequisite to the degree for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approved any statement made, opinion expressed or conclusion therein but approve this project only for the purpose for which it is submitted.

Final Examination for
Evaluation of the Project

Signatures of Examiners

ABSTRACT

A smart dustbin is a waste container that uses 10T (Internet of Things) technology to monitor its fill level and automatically open its lid when someone approaches. This helps to reduce litter and keep public spaces clean.

This project will build a smart dustbin using Arduino Uno, an ultrasonic sensor, and a servo motor. The ultrasonic sensor will be used to measure the distance between the dustbin and the object (e.g., a person). When the distance is less than a certain threshold, the sensor will send a signal to the Arduino Uno. The Arduino Uno will then activate the servo motor to open the lid of the dustbin.

The smart dustbin can also be programmed to send alerts when the bin is full. This can be done by connecting the Arduino Uno to a Wi-Fi network and using a cloud-based service such as IFTTT.

This project is a good way to learn about 10T technology and how it can be used to solve real-world problems. It is also a relatively simple project that can be completed by beginners.

ACKNOWLEDGEMENT

It is a great pleasure for me to acknowledge the assistance and participation of a large number of individuals in this attempt. Our project report has been structured under the valued suggestion, support, and guidance of Mr. Subhajit Das. Under his guidance, we have accomplished the challenging task in a very short time.

Finally, we express our sincere thankfulness to our family members for inspiring me all throughout and always encouraging us.

Signature

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INTRODUCTION

10T is a technology that allows objects to communicate and exchange data with each other.

Smart dustbins are 10T devices that use sensors to measure the level of waste in a bin and send notifications when the bin is full.

Smart dustbins can help to reduce litter and improve waste management. The main components of a smart dustbin are a NodeMCU microcontroller, an ultrasonic sensor, and an IFTTT webhook.

The ultrasonic sensor measures the distance between the bin and the waste, and the NodeMCU microcontroller uses this data to send notifications when the bin is full.

The IFTTT webhook is a server that sends the notifications to the user's mobile phone.

The main disadvantage of smart dustbins is that they rely on mobile phone signals, so notifications may not be sent if the user's phone does not have a good signal.

HARDWARE REQUIRED

We will need the following components for making the smart dustbin

- 1 . Arduino Uno - It is a development board used to do all the processing.
2. Ultrasonic Sensor- HC-SR-04 - It is used as an object detection sensor. It is used to measure the distance of the object from the sensor.
3. SG-90 Servo — A Servo motor is used for moving the dust bin lid.
4. Jumper Wires — Used to do circuit connections between different components.

If you don't have any of the hardware then you can click on the required component name and buy it from our store.

WORKING PRINCIPLE

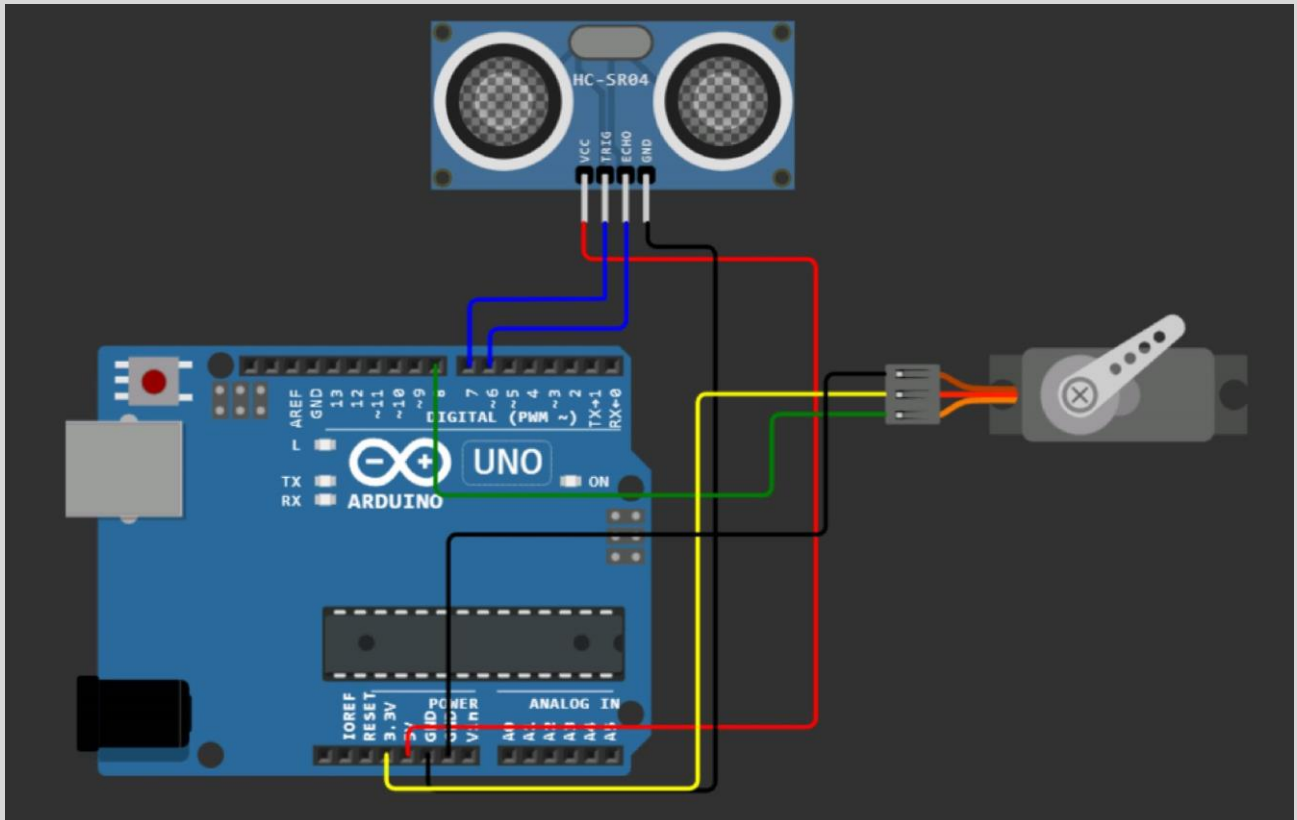
A smart dustbin is a waste container that uses IoT (Internet of Things) technology to monitor its fill level and automatically open its lid when someone approaches. This helps to reduce litter and keep public spaces clean.

The working principle of a smart dustbin using Arduino Uno and ultrasonic sensor is as follows:

1. The ultrasonic sensor is used to measure the distance between the dustbin and the object (e.g., a person).
2. When the distance is less than a certain threshold, the sensor sends a signal to the Arduino Uno.
3. The Arduino Uno then activates a servo motor to open the lid of the dustbin.
4. Once the person has deposited their waste, the lid closes automatically.

The Arduino Uno is a microcontroller board that can be programmed to control electronic devices. The ultrasonic sensor is a device that emits sound waves and measures the time it takes for the waves to reflect back. The servo motor is a device that can be rotated to a specific angle.

Circuit Diagram



PROGRAM CODE

```
#include <Servo.h>
int trigPin = 7;  // Trigger
int echoPin = 6;  // Echo
long duration, cm, inches;
int pos = 0;
Servo servo_9;

void setup()
{
  Serial.begin (9600);
  servo_9.attach(9, 500, 2500);
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
}
void loop()
{
  digitalWrite(trigPin, LOW);
  delayMicroseconds(5);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(90);
  digitalWrite(trigPin, LOW);
  pinMode(echoPin, INPUT);
  duration = pulseIn(echoPin, HIGH);

  cm = (duration/2) / 29.1;

  Serial.print(cm);
  Serial.println("cm");

  if (cm<60){
    servo_9.write(100);
  }else{
    servo_9.write(0);
  }
  delay(700);}
}
```

CONCLUSION

We have learned building a Smart Dustbin using Arduino is a fun and creative project that not only helps keep your surroundings clean but also enhances your tech skills. With the help of ultrasonic sensors and wireless communication, you can make your daily chores more efficient and ecofriendly. So why wait? Grab your Arduino kit and start building your own Smart Dustbin today! So, take your first step towards becoming a techsavvy and environmentally conscious individual. Start your journey towards a cleaner and smarter future today with this exciting project.