Smart Waste Collector

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Abstract- *The main objective is to design a smart dustbin which will help in keeping our environment clean, hygienic and eco-friendly. Our inspiration comes from Swachh Bharat Mission. Nowadays technologies are getting smarter day by day, so as to clean the environment we are designing a smart dustbin using Arduino. This smart dustbin is built on the microcontroller based system having ultrasonic sensors and a servo motor on the dustbin.*

Keywords- Arduino, Sensor, Servomotor

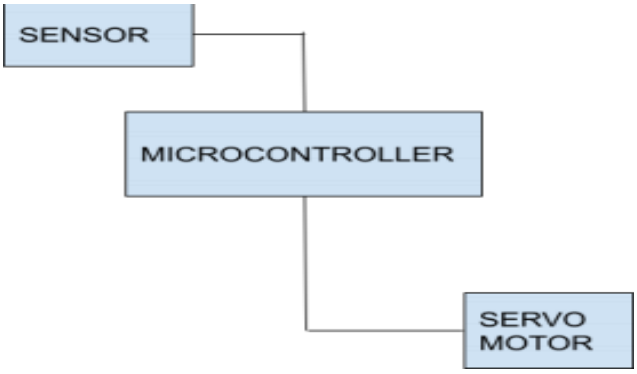
I. INTRODUCTION

The rate of increase of population is ever increasing and so is the garbage produced. Due to the terror of COVID-19, it has become the need of the hour to use touch free devices and to maintain social distancing even from objects. Hence, we have designed a smart waste collector using an arduinouno, ultrasonic sensor which will sense the item to be thrown in the dustbin and open the lid with the help of the motor. And hence making it touch free and safe to use.

II. METHODOLOGY

SMART DUSTBIN USING ARDUINO is anIOT based project. Here we are using an arduino for code execution, for sensing we used an ultrasonic sensor which will open the lid and wait for a few moments. It will bring drastic changes in turn of cleanliness with the help of technology. Everything is getting smart with technology for the betterment of human beings. So this helps in maintaining the environment clean with the help of technology. It is a sensor based dustbin so it would be easy to access/use for any age group.

III. BLOCK DIAGRAM



IV. HARDWARE DESCRIPTION

ULTRASONIC SENSOR: It's a device used to indicate distance using ultrasonic waves. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target.

ARDUINO UNO: The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits .

SERVO MOTOR**:** It's DC motors that allow for precise control of angular position. They are actually DC motors whose speed is slowly lowered by the gears.

V. CODE

```
#include Servo
servoMain; // Define our Servo
inttrigpin = 4; // Trigger pin(D4)
intechopin = 3; // Echo pin(D3)
int distance;
float duration;
float cm;
void setup() {
servoMain.attach(5); //servo on digital pin 10
pinMode(trigpin,OUTPUT); //OUTPUT==5V
pinMode(echopin,INPUT); //INPUT==0V }
```

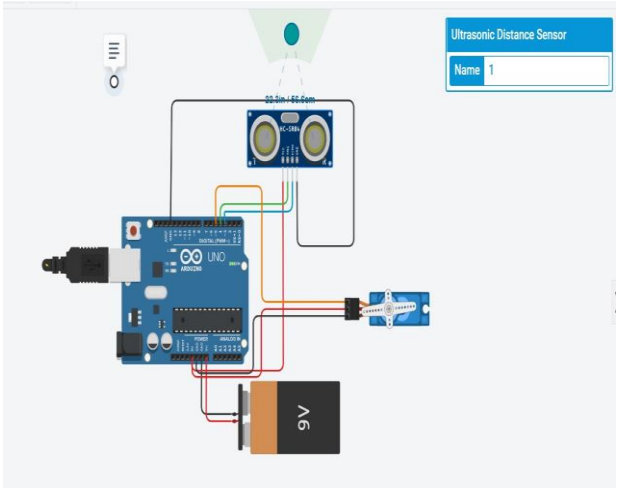
```
void loop() {
digitalWrite(trigpin, LOW); //LOW==0V
delay(2); //DELAY==2 millisec.
digitalWrite(trigpin, HIGH); //HIGH==5V
delayMicroseconds(10); //DELAY
digitalWrite(trigpin, LOW);
duration =pulseIn(echopin,HIGH) ; //PulseIn==scanf
cm = (duration/58.82); // Range for sensor
distance = cm; //Distance of the object
 if(distance<30) {
servoMain.write(180); // Turn Servo to position
delay(5000); //Hold for 5 sec }
else{
servoMain.write(0); // Back to initial position.
delay(50); } }
```

VI. WORKING

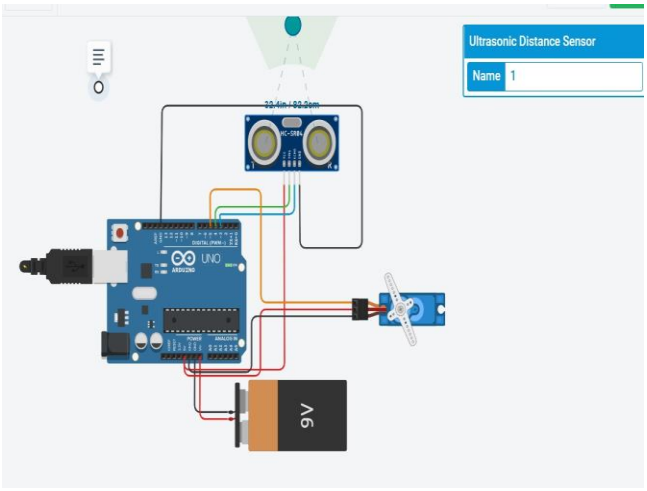
After wiring and attaching, observe all the important setup whether they are well connected or something missed. After the connection is set up now the next step is to submit/upload code in Arduino and supply power to the circuit. When the system is powered ON, Arduino keeps monitoring for any things that come near the sensor at a given range. When Ultrasonic sensors detect any object for example like a hand or others, here Arduino calculates its distance and if it is less than a certain predefined value then servo motors get activated first and with the support of the extended arm of the lid. Lid will open for a given time then it will automatically close.

VII. OUTPUT IMAGES

Initial Condition: Before the sensor detects an object. The servo is in rest position.



Final Condition: After the sensor detects an object, the servo moves and therefore the lid of the dustbin opens.



VIII. CONCLUSION

In view of intelligent waste monitoring and trash compact technologies, smart dustbins are better and have an advantage over traditional garbage dustbin. It is equipped with smart devices like sensor Arduino etc. Lid of the dustbin will automatically open when an object comes near to the dustbin and after a certain time period it will close the lid.

For society it will help toward health and hygiene. Normal people to rich people can take benefit from it in terms of its affordability because of its low price and gain monetary benefits. We believe that this will bring some changes in terms of cleanliness as well as technology in the lives of people.

IX. FUTURE SCOPE

1. Solar panel can be used
2. Virtual server can be used
3. Waterproof circuit design
4. Human machine interface

REFERENCES

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[3] Narayan Sharma, NirmanSingha, Tanmoy Dutta International Journal of Scientific & Engineering Research, Volume 6, Issue 9, September-2015 ISSN 2229-5518
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[7] https://www.researchgate.net/publication/316700582
[8] https://www.researchgate.net/publication/320688914
[9] https://create.arduino.cc/projecthub/aakaash11/how-to-make-smart-dust bin-7340cb?ref=search&ref_id=dustbin&offset=0
[10] https://youtu.be/9yrP1CN3Ds
[11] https://www.tinkercad.com/things/3HyKZ5mfr0-copy-of-smart-dustbin- -arduino/editel?tenant=circuit