Smart dustbi

A Project By:

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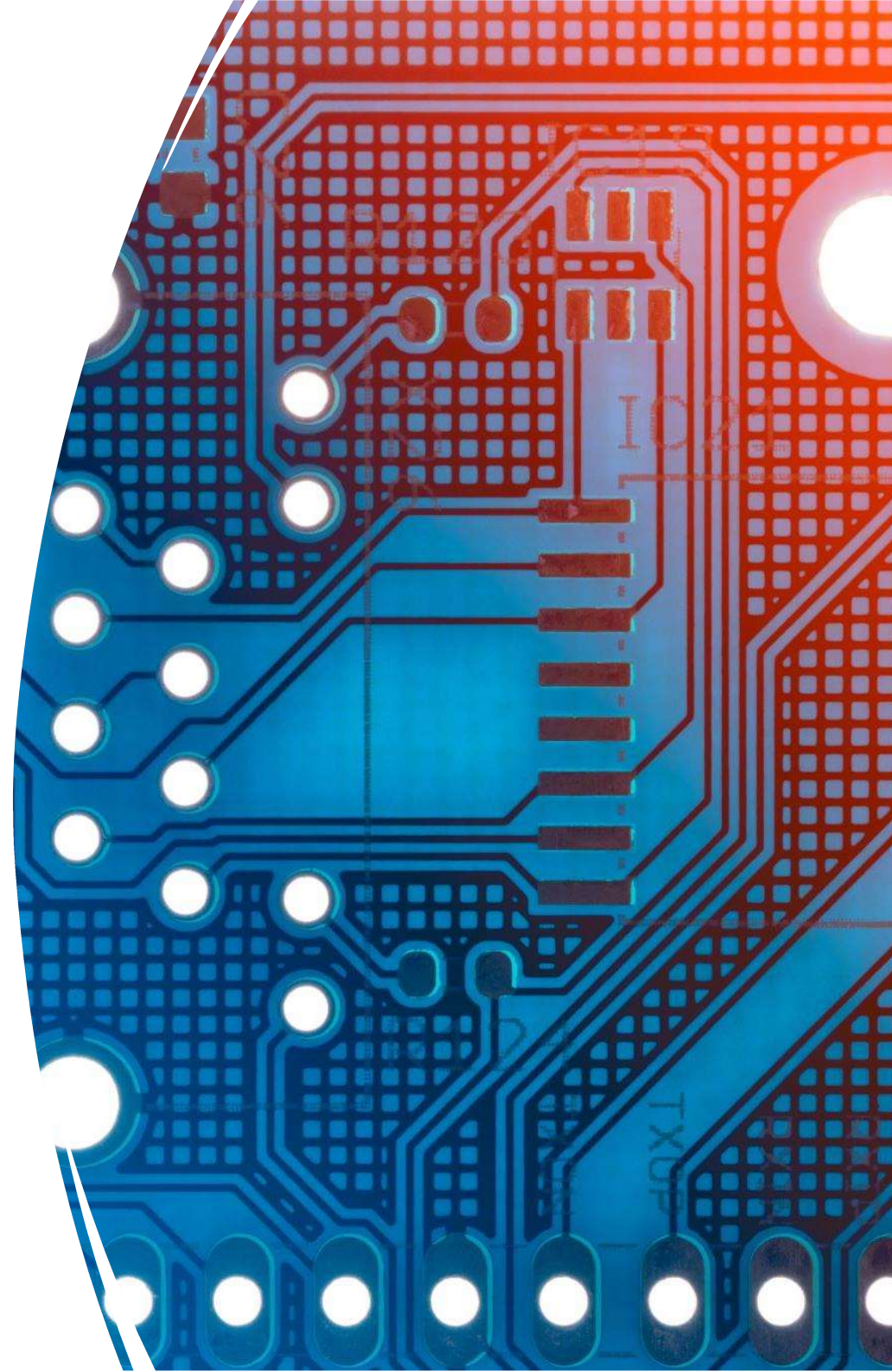
INTRODUCTION

- The rate increasing population in our country has inc
and also we have increase in garbage which have
increased environmental issue. Dustbin is a container
garbage's or stores items which recyclable or non-
recyclable, decompose and non-decompose. They are
homes, office etc, but in case they are full no one is there
the garbage are spilled out.
The surrounding of a dustbin is also conducive
for increasing the pollution level.
Therefore, we have designed a smart dustbin using AI
UNO, ULTRASONIC SENSOR and a SG90 SERVO MC
which will sense the item to be thrown in the
dustbin and open the lid with the help of the motor
based project that will bring a new
and smart way of cleanliness. It is a decent
gadget to make your home clean, due to
practically all offspring of home consistently make
it grimy and spread litter to a great extent
by electronics, rappers and various other things. Sinc
smart dustbin is additionally intriguing
and children make fun with it so it will help to
maintain cleanliness in home. It will be applied
for various type of waste. Dustbin will open its
lid when someone/object is near at some range then
given time period than it will close automatically. Here l
you don't want to use and it will only open when it

APPARAT

- To complete our project, we have used some **so**
  some **hardware**.

- **1.1. Required Software:**

- 1.ARDUINO IDE

- **1.2 Required Hardware**:

- 1. ARDUINO UNO

- 2. ULTRASONIC SENSOR

- 3. SERVO MOTOR

- 4. 9V BATTERY

- 5. DUSTBIN

- 6. JUMPER WIRES
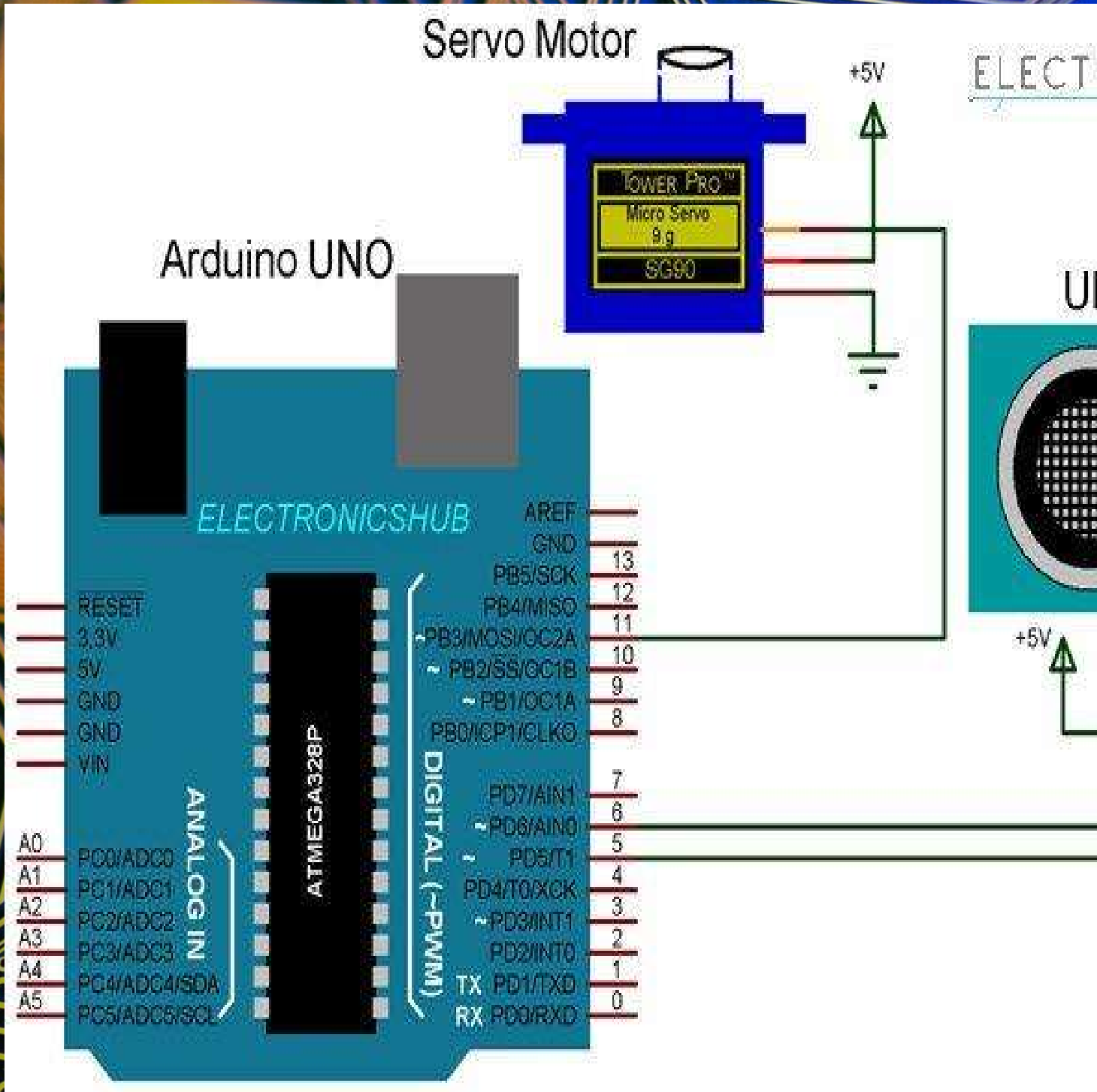
PROCEDURE

- **SERVO MOTOR CONNECTION SETUP:**

- Now, let us take you through the actual setup and build process of the Smar using Arduino. First, I will start with the mechanism to open the lid. As you r already guessed, I have used a Servo Motor for this purpose. To open the lid a small plastic tube (like an empty refill of a ball-point pen) to the servo hor ended horn) using instant glue. For this mechanism to be able to open the li dustbin, it must be placed near the lid, In this the actual setup of dustbin de build the system by using Arduino. Starting with the mechanism of opening dustbin, for this purpose Servo motor has been used. To open. the lid, I hav small plastic tube (like an empty refill of a ball-point pen) to the servo horn ended horn) using instant glue.

- **ULTRASONIC SENSOR CONNECTING:**

- After successfully servo motor is placed now it's time for sensor, so HC-SR04 Ultras placed at the front of the dustbin. To complete our project, we require some.

- **WIRING UP THE COMPONENTS**: The final step in the build process is to make the ne connections using long connecting wires as per the circuit diagram and securing these they don't hang around. All the wires from both the components i.e. Ultrasonic Senso Motor are connected to respective pins of Arduino. This finishes up the build process Dustbin. In Arduino Code has been submitted, and with all hardware and software con dustbin.

CIRCUIT DIAGRAM

Servo Motor

+5V

ELECT

U

Arduino UNO

+5V

ELECTRONICSHUB

TOWER PRO™
Micro Servo
9.g
SG90

AREF
GND
PB5/SCK — 13
PB4/MISO — 12
~PB3/MOSI/OC2A — 11
~ PB2/SS/OC1B — 10
~ PB1/OC1A — 9
PB0/ICP1/CLK0 — 8

PD7/AIN1 — 7
~PD6/AIN0 — 6
~ PD5/T1 — 5
PD4/T0/XCK — 4
~PD3/INT1 — 3
PD2/INT0 — 2
TX PD1/TXD — 1
RX PD0/RXD — 0

RESET
3.3V
5V
GND
GND
VIN

A0 PC0/ADC0
A1 PC1/ADC1
A2 PC2/ADC2
A3 PC3/ADC3
A4 PC4/ADC4/SDA
A5 PC5/ADC5/SCL

ANALOG IN

ATMEGA328P

DIGITAL (~PWM)

PROGRAM USED IN ARDUIN

```
//define Pins
int led = 13;
int trigPin = 9;
int echoPin = 8;

// defines variables
long duration;
int distance;

void setup()
{
  //Sets the Led as an Output
pinMode(led, OUTPUT);
// Sets the trigPin as an Output
pinMode(trigPin, OUTPUT);
// Sets the echoPin as an Input
pinMode(echoPin, INPUT);
// Starts the serial
communication
Serial.begin(9600);
```

```
}
void loop()
{
// Clears the trigPin
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
// Sets the trigPin on HIGH state
for 10 micro seconds
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
// Reads the echoPin, returns the
sound wave travel time in
microseconds
duration = pulseIn(echoPin,
HIGH);
// Calculating the distance
distance = duration*0.034/2;
// Prints the distance on the
Serial Monitor
```

```
Serial.print
Serial.print
if ( distance
Distance ac
Sensor Plac
{
digitalWrit
delay (5000
}
else
{
digitalWrit
}

}
```

PROGRAM USED IN SERVO MO

```
//define Pins
#include <Servo.h>

Servo servo;

int trigPin = 9;
int echoPin = 8;

// defines variables
long duration;
int distance;

void setup()
{
  servo.attach(7);
  servo.write(0);
  delay(2000);

// Sets the trigPin as an Output
pinMode(trigPin, OUTPUT);
```
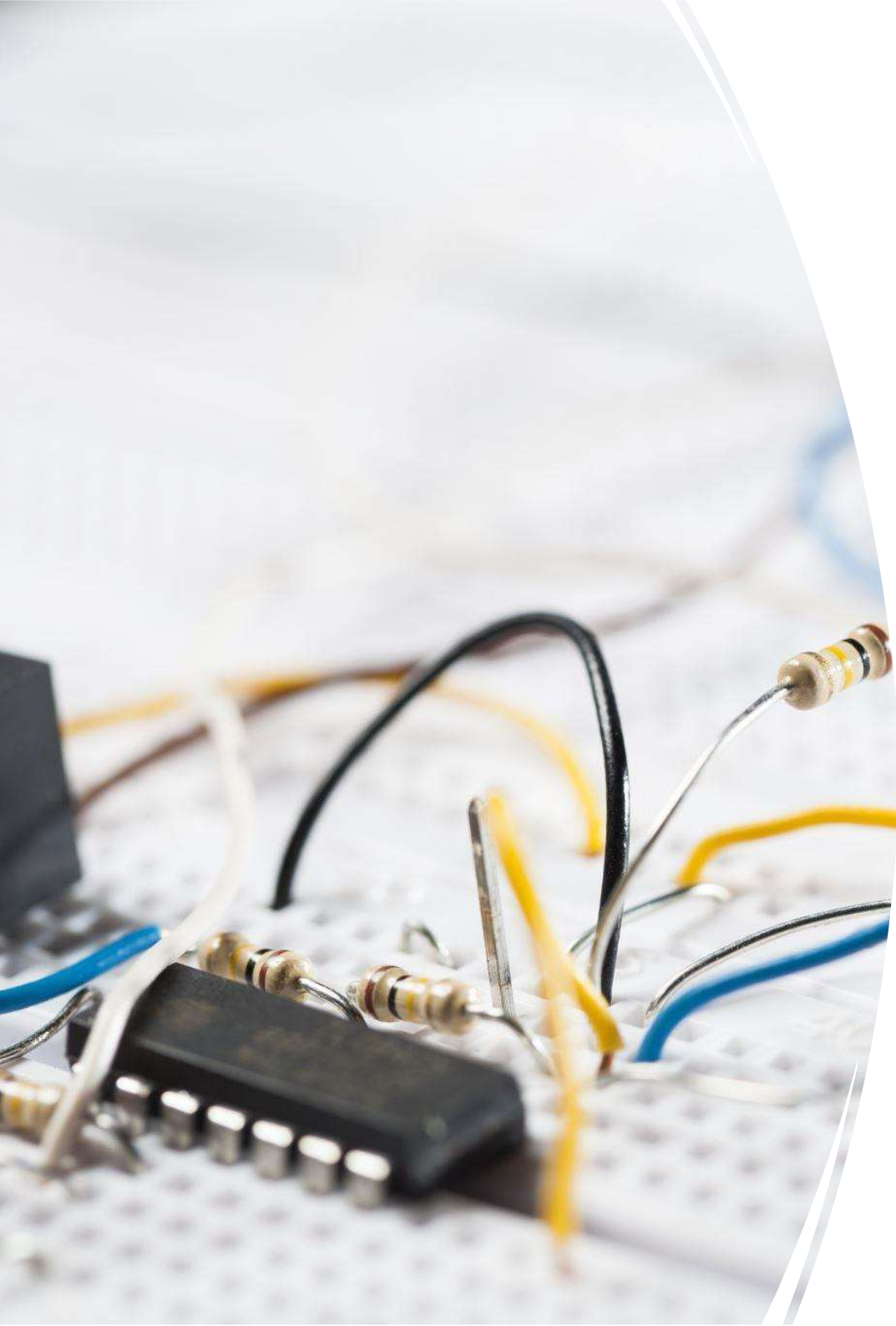
```
// Sets the echoPin as an Input
pinMode(echoPin, INPUT);
// Starts the serial
communication
Serial.begin(9600);
}
void loop()
{
// Clears the trigPin
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
// Sets the trigPin on HIGH state
for 10 micro seconds
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
// Reads the echoPin, returns the
sound wave travel time in
microseconds
```

```
duration = p
HIGH);
// Calculatin
distance = d
// Prints the
Serial Moni
Serial.print(
Serial.printl
if ( distance
Distance ac
Sensor Plac
{
servo.write(
delay(3000)
}
else
{
servo.write(
}
}
```

WORKING

After wiring and attaching all the devices and Smart Dustbin, now observe all the important they are well connected or something missed

After connection set up now next step is to s code in Arduino and supply power to the circu

When system is powered ON. Arduino keeps n any things that come near the sensor at give

When Ultrasonic sensor detect any object for hand or others, here Arduino calculates its di less than a certain predefines value than serv activate first and with the support of the ext lid. Lid will open for a given time than it will a close.

ADVANTAGES

Following are the advantages of a smart dustbin:

- A reduction in the number of waste collections needed by up to 80%.resulting in less manpower, emissions, fuel use and traffic congestion.

- A reduction i of waste bi

- Maintain environment hygiene (i.e. no overflowing of waste and less unpleasant odour).

- It will help in bringing evolution by technology in term of cleanliness.

CONCLUSION & SUGGESTIONS

Here we are going to make an evolution changes. tow
The combination of intelligent waste monitoring and t
technologies, smart dustbins are better and shoulders
traditional garbage dustbin. It is equipped with smart
sensor Arduino etc. Lid of the dustbin will automatica
object comes near to the dustbin and after certain tin
close the lid.

For social it will help toward health and hygiene, for b
to make it affordable to many as many possible. So th
to rich people can take benefit. from it. Believe this w
something changes in term of cleanliness as well tech
next work will be adding one more sensor which will s
dustbin is full or not. And there will be a display will be
user can notify that dustbin is full or not.