# Obstacle avoiding robot

GROUP – 8(E)

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# MATERIAL REQUIRED

: Arduino UNO: The Arduino Uno is an open-source microcontroller board for building electronic projects. It uses the ATmega328P microcontroller, offers digital and analog pins, and is programmed using a simplified version of C++. It's widely used for prototyping and interacting with the physical world through various sensors and actuators

: Motor Driver: A motor driver is a device that controls the speed and direction of an electric motor. It manages power to the motor, enabling precise control. Commonly used in robotics and automation, motor drivers receive control signals and provide the necessary power for motor operation, with built-in protection.

: Servo Motor: A servo motor is a precise rotary actuator used in robotics and electronics. It includes a motor, feedback system, and control circuit, allowing accurate control of angular position. Servos are commonly

employed for controlled movements in applications like robotics and automation.

: Ultrasonic Sensor: A UV sensor detects ultraviolet light, commonly used for measuring UV intensity in applications like health monitoring, industrial processes, and water purification.

: Wheels

: Gear Motor: A gear motor is a combination of an electric motor and a gearbox. The electric motor generates rotational motion, and the gearbox, equipped with gears of various sizes, modifies and controls the speed, torque, and direction of the motor's output.

: Motor battery: it provides a DC supply to the robot

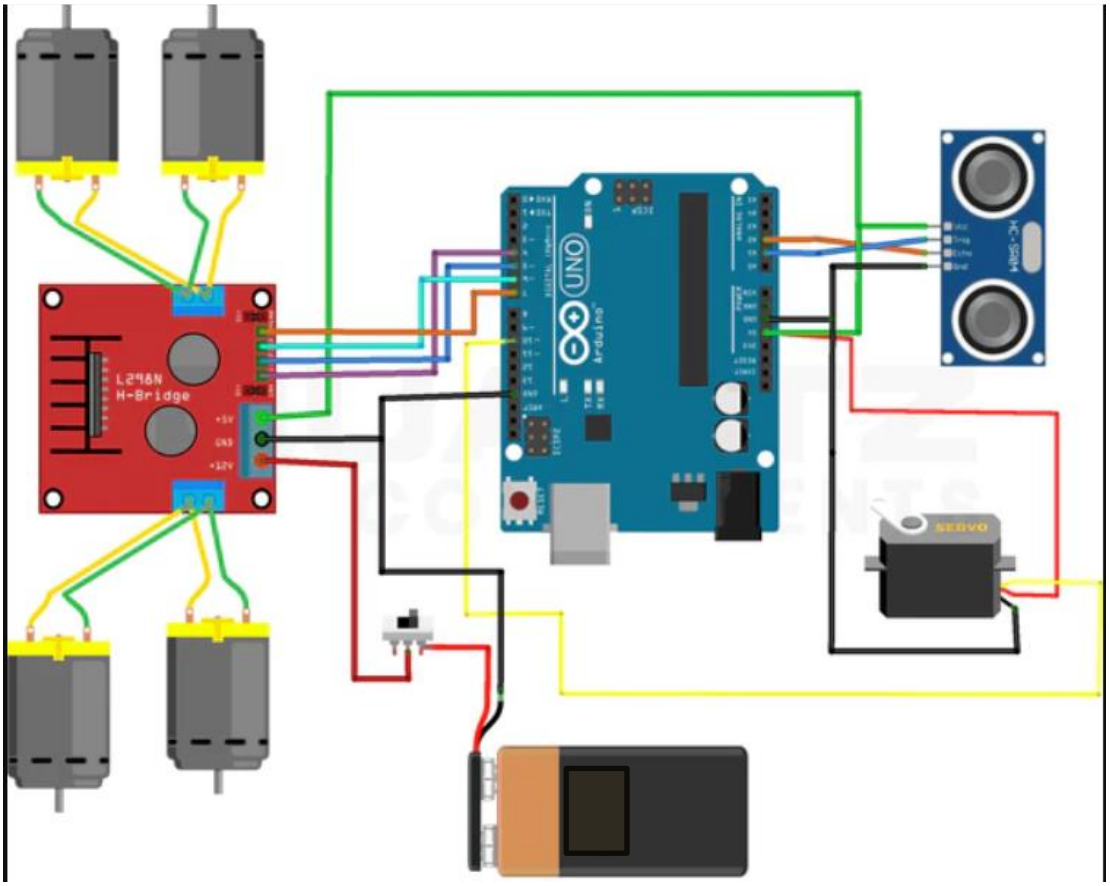
: Acralin Sheet: it provides a surface to be worked upon

: Connecting Wires

# INTRODUCTION

Here is the brief introduction of the project" OBSTACLE AVOIDING CAR". This is a car that acts like your smart sidekick, travelling through traffic and avoiding obstacles as if it has a mind of its own. We're diving into the world of these cool cars that drive themselves without crashing into things. This report is all about the magic behind these obstacle-avoiding cars – how they see, think, and navigate through the chaos of real-life situations. This car not only avoids obstacles above the surface but also is able to sense the pits and stop the vehicle from falling into it. Our project uses Arduino UNO as the brain of the robot, an Arduino motor driver shield for the motor, Ultrasonic sensor as the eyes of the system. This is the futuristic car that will prevent the daily life accidents on the road and will provide safer travelling.

# CIRCUIT DIAGRAM



# DETAILED WORKING

Sensor input:

The ultrasonic sensor has two parts: receiver and emitter. The emitter part emits UV rays and emitter senses it back.

It emits UV light and calculates distance between itself and the object in front of it.

We have also used one UV sensor in downward direction which will measure the depth of the upcoming surface.

In this view, it can also sense depths and can avoid if depth is deep

Decision making:

The UV sensors give inputs to the Arduino UNO and it analysis the data to decide in which direction the vehicle should move to avoid the upcoming obstacle.

If the obstacle is on the left, the controller may decide to increase the speed of the left wheel to move rightwards and vice versa.

Working of motor driver

The motor driver is used to provide sufficient power to wheels since Arduino can provide only a limited power to them.

It is connected directly with DC power supply of 12V source

It receives messages from microcontroller (Arduino UNO) and then adjusts wheels to change direction.

Continuous adjustments:

The robot continuously adjusts itself to avoid obstacles and depths. In this way it can continuously move without getting damaged.

Use of

It is used to help the UV sensor to sense in different directions.

Feedback

Microcontrollers continuously receive data from UV sensors and provide it to motor drivers. This process works in real time to keep the robot going without getting damaged

# CODE FOR THE WORKING OF ROBOT

```
#include <Servo.h>
Servo Myservo;
#define trigPin 9          // Trig Pin Of HC-SR04
#define echoPin 8        // Echo Pin Of HC-SR04
#define depthTrigPin 11
#define depthEchoPin 12
#define MLa 4                 //left motor 1st pin
#define MLb 5                 //left motor 2nd pin
#define MRa 6               //right motor 1st pin
#define MRb 7               //right motor 2nd pin
long duration, distance, depth;

void setup() {
  Serial.begin(9600);
  pinMode(MLa, OUTPUT);     // Set Motor Pins As O/P
  pinMode(MLb, OUTPUT);
  pinMode(MRa, OUTPUT);
```

```
  pinMode(MRb, OUTPUT);
  pinMode(trigPin, OUTPUT);          // Set Trig Pin As O/P To Transmit Waves
  pinMode(echoPin, INPUT);       //Set Echo Pin As I/P To Receive Reflected Waves
  pinMode(depthTrigPin, OUTPUT);       // Set Trig Pin As O/P To Transmit Waves
  pinMode(depthEchoPin, INPUT);        //Set Echo Pin As I/P To Receive Reflected Waves
  Myservo.attach(10);
}
void loop()
{
  Serial.begin(9600);
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);       // Transmit Waves For 10us
  delayMicroseconds(10);
  duration = pulseIn(echoPin, HIGH);         // Receive Reflected Waves
  distance = duration / 58.2;                  // Get Distance
```

```
 digitalWrite(depthTrigPin, LOW);
 delayMicroseconds(2);
 digitalWrite(depthTrigPin, HIGH);        // Transmit Waves For 10us
 delayMicroseconds(10);
 duration = pulseIn(depthEchoPin, HIGH);          // Receive Reflected Waves
 depth = duration / 58.2;                  // Get Depth
 Serial.print("Distance : ");
 Serial.println(distance);
 Serial.print("Depth : ");
 Serial.println(depth);
 delay(10);
 if (distance > 15 && depth<10)          // Condition For Absence Of Obstacle
 {
  Myservo.write(90);
  digitalWrite(MRb, HIGH);      // Move Forward
  digitalWrite(MRa, LOW);
  digitalWrite(MLb, HIGH);
  digitalWrite(MLa, LOW);
```

```
  }
  else if ((distance < 10)&&(distance > 0))          // Condition For
Presence Of Obstacle
  {
    digitalWrite(MRb, LOW);    //Stop
    digitalWrite(MRa, LOW);
    digitalWrite(MLb, LOW);
    digitalWrite(MLa, LOW);
    delay(100);

    Myservo.write(0);
    delay(500);
    Myservo.write(180);
    delay(500);
    Myservo.write(90);
    delay(500);

    digitalWrite(MRb, LOW);    // Move Backward
    digitalWrite(MRa, HIGH);
    digitalWrite(MLb, LOW);
    digitalWrite(MLa, HIGH);
```

```
  delay(500);
  digitalWrite(MRb, LOW);       //Stop
  digitalWrite(MRa, LOW);
  digitalWrite(MLb, LOW);
  digitalWrite(MLa, LOW);
  delay(100);
  digitalWrite(MRb, HIGH);    // Move Left
  digitalWrite(MRa, LOW);
  digitalWrite(MLa, LOW);
  digitalWrite(MLb, LOW);
  delay(500);
 }

}
```

# Bibliography

•https://circuitdigest.com/microcontroller-projects/arduino-obstacle-avoding-robot

•https://www.youtube.com/watch?v=kPSBpfUpHt0&t=337s

•https://robu.in/product-tag/obstacle-avoiding-robot-using-arduino/

•https://www.instructables.com/Obstacle-Avoiding-Robot-Arduino-1/

# Conclusion

In conclusion making an obstacle avoiding car has unveiled a realm of innovation and practical application. We have used U.V sensors, Arduino UNO, servomotor which allows this car to detect path by its own.

Through this course of report we learned, how to use Arduino, working of servomotor, working of U.V sensors and a lot more things.

This technique is helpful in making driverless cars where we need to detect obstacle in front of a car, nowadays we are using this U.V sensor technique in submarines to detect obstacle in the path of it.

# CONTRIBUTION

## > Prince Raj-2023eeb1236

Researched the working of the project and the working of servo motor

Contribution in assembling project material

Helped in designing the working model of the project

## >Princi-2023eeb1237

Researched the working of the project and the working of gear motor

Contribution in assembling project material

Helped in designing the working model of the project

## >Rahul-2023eeb1238

Researched the working of the project and the working of motor driver

Contribution in assembling project material

Helped in designing the working model of the project

## >Riya-2023eeb1239

Researched the working of the project and the working of ultrasonic sensor

Contribution in assembling project material

Helped in designing the working model of the project

## >Sahil Lakra-2023eeb1240

Researched the working of the project and the working of Arduino UNO

Contribution in assembling project material

Helped in designing the working model of the project