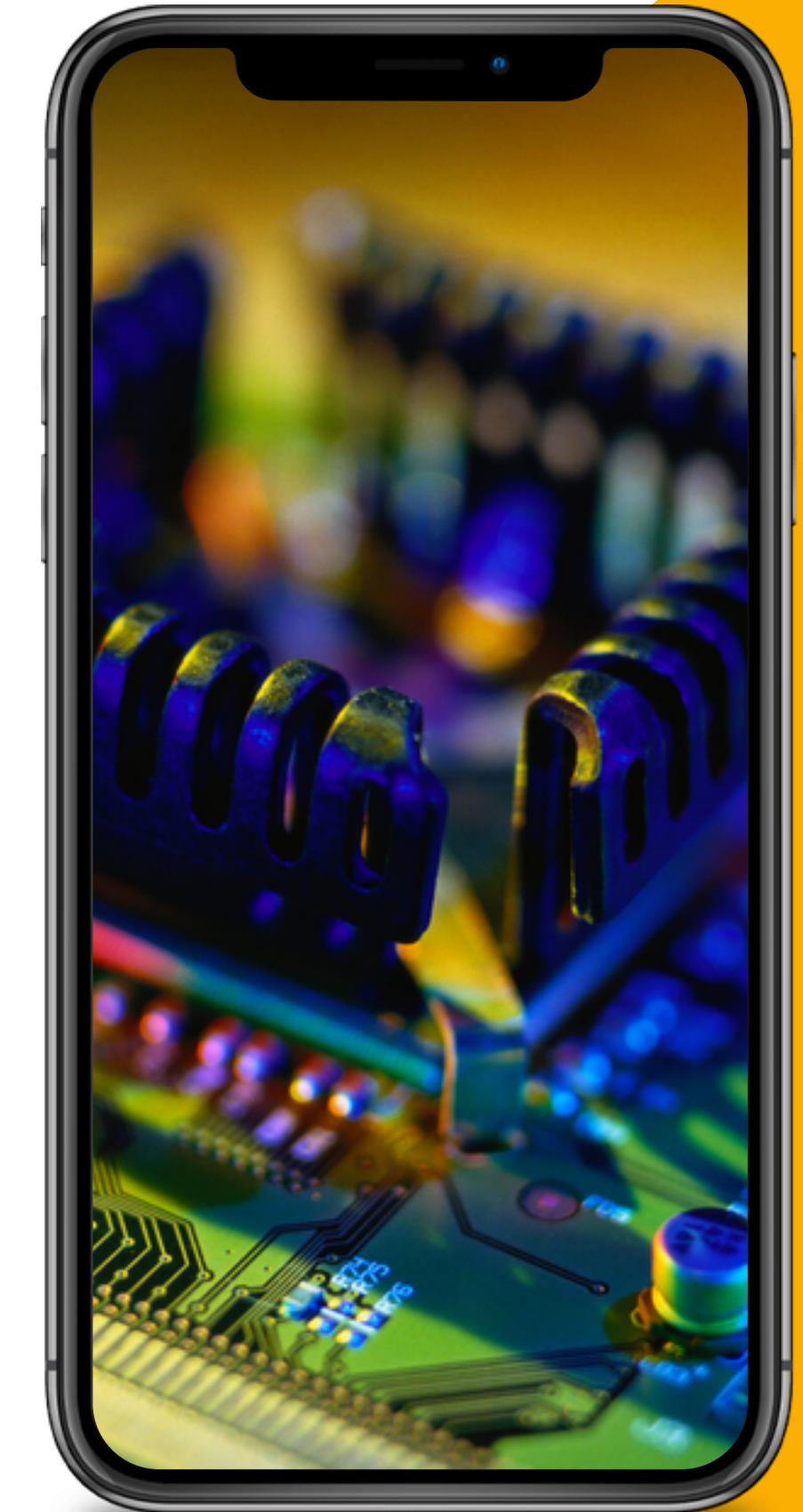


SEM 1

# Introduction to Electrical Engineering



19AIE104

# Group 10 Members

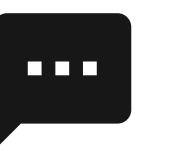
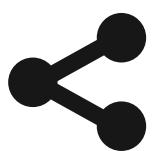
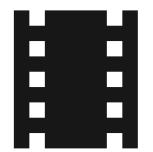
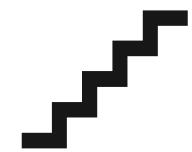
**Adithya Krishna**

**Adithya S Nair**

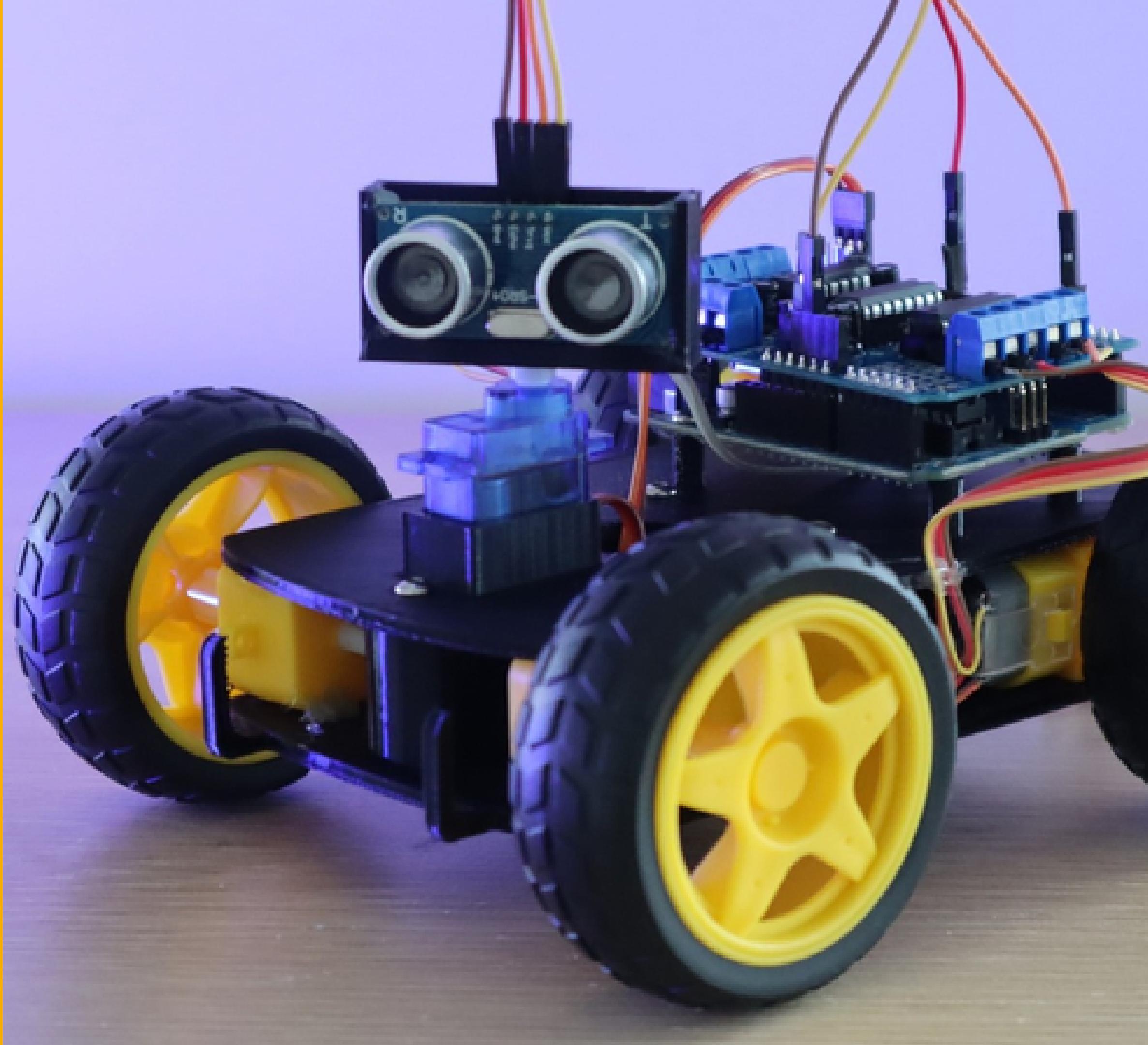
**Anoop Boby Manuel**

**Athul Gireesh**

**Navneeth Krishna**



# OBSTACLE AVOIDING CAR



# ABSTRACT

- ↑ Our project aims at creating an obstacle-avoiding car that can automatically sense the obstacle in its way and avoid it by changing the direction.
- ↓ This design allows the robot to navigate in an unknown environment by avoiding collisions which is the primary requirement for autonomous mobile vehicles.
- ↓ It's designed as a four-wheeled car having a board at its top and an ultrasonic sensor at the front to avoid obstacles.

# In this Presentation

Here's what we'll cover:

**INTRODUCTION**

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**REQUIRED COMPONENTS**

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**CIRCUIT DIAGRAM**

---

**WORKING OF SYSTEM**

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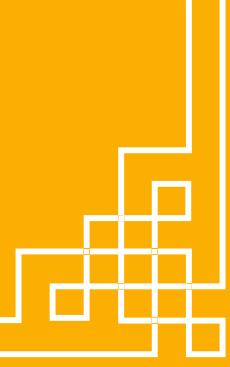
**RESULT**

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**CONCLUSION**

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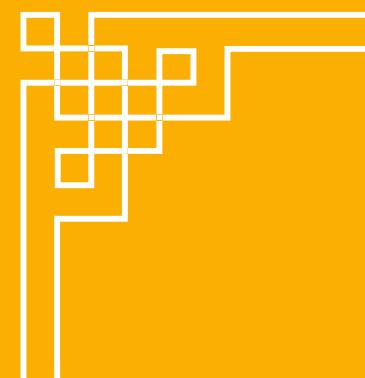
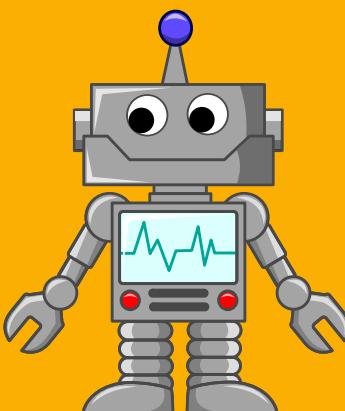
**REFERENCE**



# INTRODUCTION

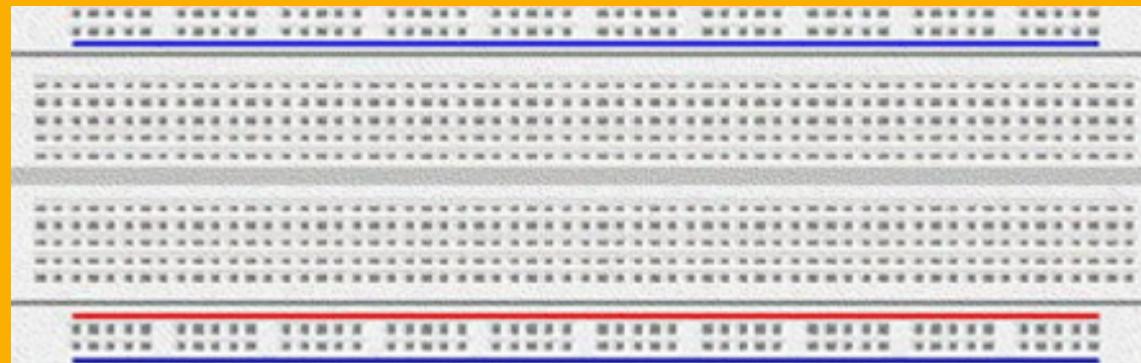
**Going by the basic definition of obstacle avoidance, it means to be able to identify and detect any kind of interference, which can also be termed as obstacles, and either avoid collision into it or even manoeuvre its path around it.**

**Such a project would be very helpful in helping robots in factories, warehouses, or even in day to day house chores.**



# COMPONENTS REQUIRED

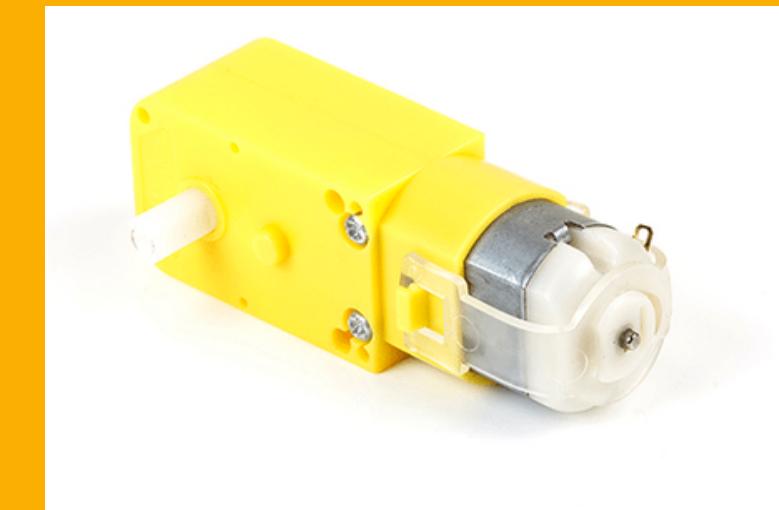
1 BREADBOARD



2 MOTOR DRIVER IC



3 GEAR MOTOR



4 ULTRASONIC SENSOR



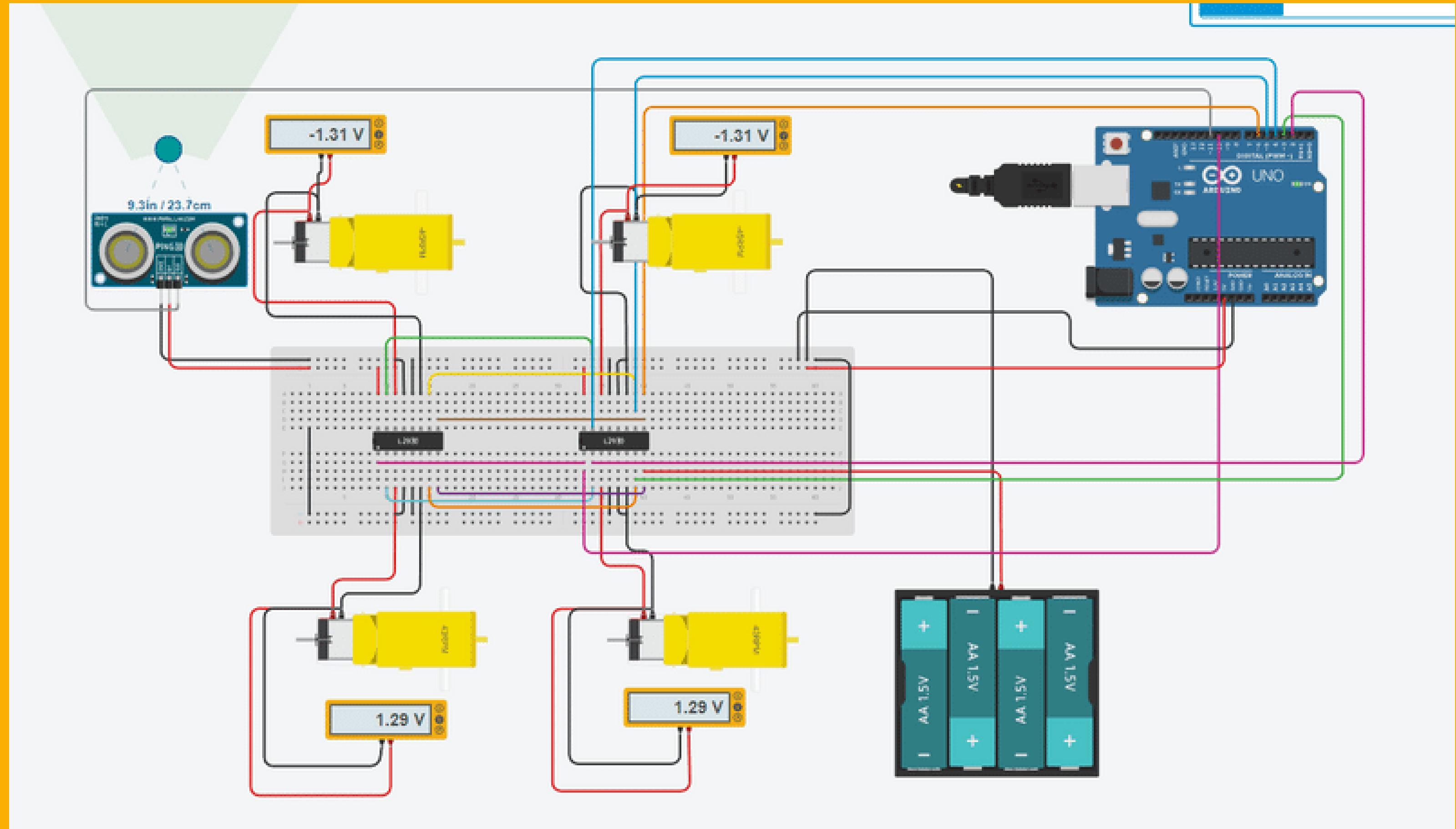
5 BATTERY



6 ARDUINO UNO R3



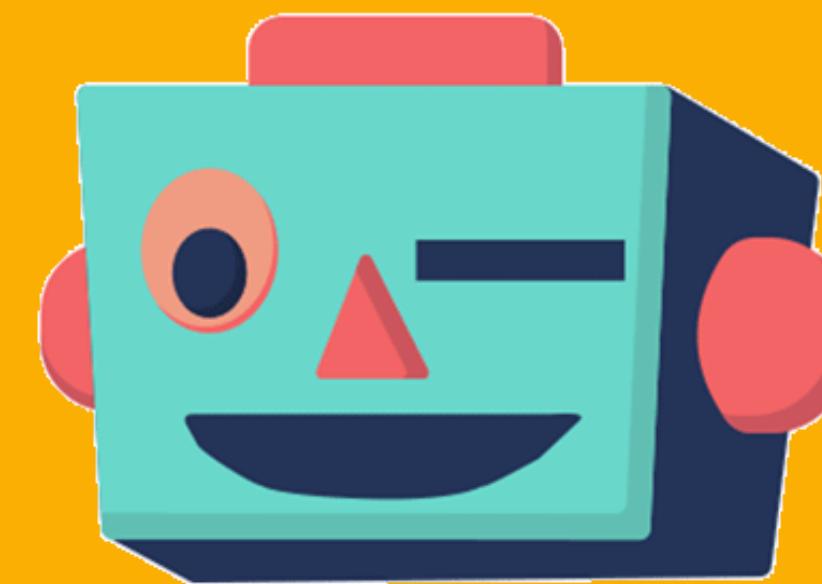
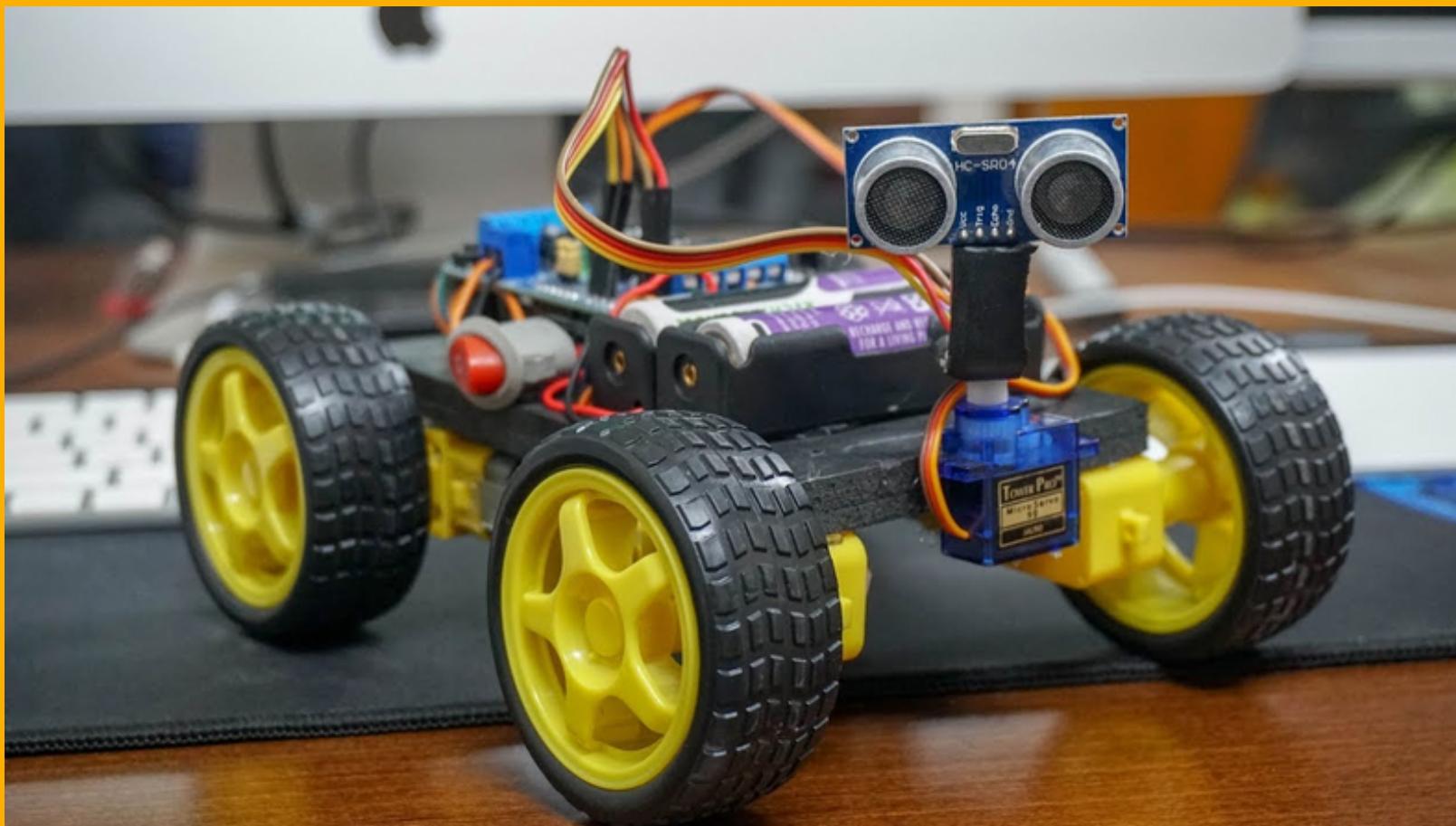
# CIRCUIT DIAGRAM



# WORKING OF THE SYSTEM

**When the robot is powered on, both the motors of the robot will run normally and the robot moves forward.**

**During this time, the ultrasonic sensor continuously calculates the distance between the robot and the reflective surface.**



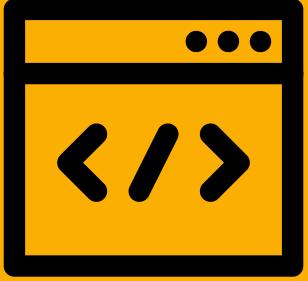
**This information is processed by the Arduino. If the distance between the robot and the obstacle is less than 15cm,**

**The Robot Turns Right and scans again.**

**If no obstacle is found under 15 cm from the sensor it moves forward.**

**Similarly if it finds another obstacle it will turn another 90 degrees .**

# CODE



```
int distance = 0;

long readUltrasonicDistance(int triggerPin, int echoPin)
{

    pinMode(triggerPin, OUTPUT); // Clear the trigger
    digitalWrite(triggerPin, LOW);
    delayMicroseconds(2);

    // Sets the trigger pin to HIGH state for 10 microseconds
    digitalWrite(triggerPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(triggerPin, LOW);
    pinMode(echoPin, INPUT);

    // Reads the echo pin, and returns the sound wave travel time in microseconds
    return pulseIn(echoPin, HIGH);
}

void setup()
{
    pinMode(5, OUTPUT);
    pinMode(4, OUTPUT);
    pinMode(3, OUTPUT);
    pinMode(2, OUTPUT);
    pinMode(6, OUTPUT);
    pinMode(10, OUTPUT);
}
```

# CODE



```
void loop()
{
    distance = 0.01723 * readUltrasonicDistance(11, 11);
    if (distance > 15) {

        // MoveForward
        digitalWrite(5, LOW);
        digitalWrite(4, HIGH);
        digitalWrite(3, LOW);
        digitalWrite(2, HIGH);
        analogWrite(6, 255);
        analogWrite(10, 255);
    } else {

        // TurnRight
        digitalWrite(5, HIGH);
        digitalWrite(4, LOW);
        digitalWrite(3, LOW);
        digitalWrite(2, HIGH);
        analogWrite(6, 80);
        analogWrite(10, 80);
    }
    delay(10); // Delay a little bit to improve simulation performance
}
```

# RESULT

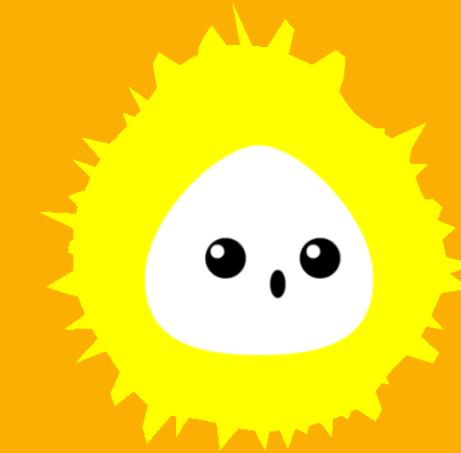
**The outcome of this project is a simple, Arduino-controlled robot car which moves around detecting obstacles in its way and avoiding them.**

**During operation of the robot, the ultrasonic sensor sends out an ultrasound wave to the front position (90 degrees).**

**When the wave strikes an obstacle, it bounces back and the distance is stored for the front position.**

**After this, the microcontroller compares the values based on its algorithm and determines whether to move forward or change path**

# HOW TO IMPROVE



 To implement a car which will detect multiple obstacles and avoid them, more sensors have to be used in order to cover a wider range for obstacle detection.

 The use of servo Motor to change the direction of the ultrasonic sensor .



# REFERENCES

Link to the sites we have used for our project :

<https://create.arduino.cc/projecthub/Isaac100/getting-started-with-the-hc-sr04-ultrasonic-sensor-036380>

<https://create.arduino.cc/projecthub/adam/obstacle-avoiding-car-a192d9>

<https://www.tinkercad.com/things/gTk0bxDJ7Fa-obstacle-avoiding-robotic-car-adu>



# THANK YOU!

Don't have a good day, Have a  
great day!