OBSTACLE AVOIDANCE ROBOT USING ARDUINO

AIM: To build an obstacle avoiding robotic car using arduino.

INTRODUCTION:

We proposed a robot that avoids the obstacle which comes in its path. Obstacle avoidance robot is design to allow robot to navigate in unknown environment by avoiding collisions. Obstacle avoiding robot senses obstacles in the path, avoids it and resumes its running. We have used sensors to achieve this objective. We have used two D.C.MOTORS i.e battery operated motors. The main component behind this robot is ArduinoUNO R3 microcontroller which is a brain of this robot.

MATERIAL REQUIRED:

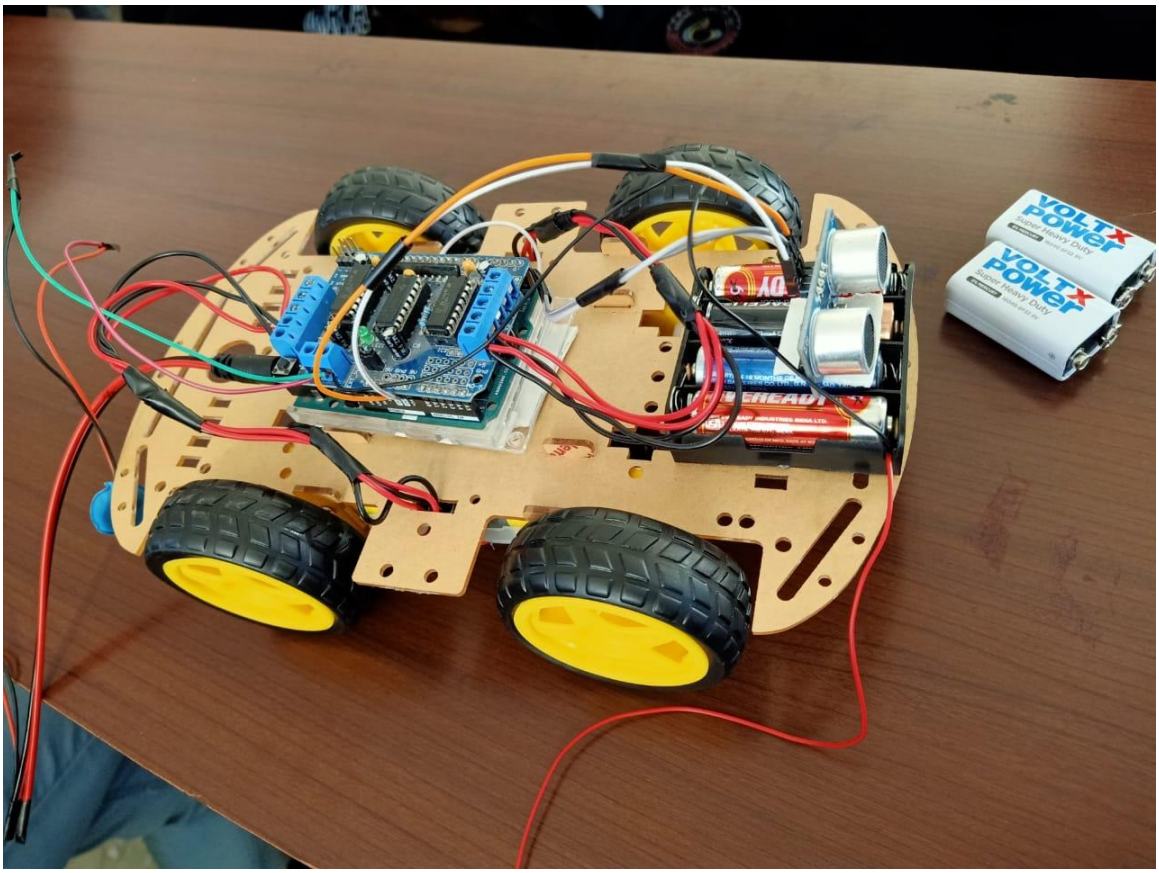
-Hardware

Chasis
Ultrasonic Sensor
Arduino UNO
H-Bridge Motor Driver L293D
Jumper Wires
Batteries

-Software

Arduino IDE

SYSTEM OVERVIEW:



ARDUINO CODE:

```
//Obstacle Avoiding Robot

#include <AFMotor.h>
#define trigPin 12
#define echoPin 13
AF_DCMotor motor1(1,MOTOR12_64KHZ);
AF_DCMotor motor2(2, MOTOR12_8KHZ);

void setup() {
  Serial.begin(9600);
  Serial.println("Motor test!");
   pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  motor1.setSpeed(255);
  motor2.setSpeed (255);
}

void loop() {

   long duration, distance;
  digitalWrite(trigPin, LOW);
```

```
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);

  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = (duration/2) / 29.1;
  if (distance < 15)
  {
Serial.println ("Close Obstacle detected!" );
Serial.println ("Obstacle Details:");
Serial.print ("Distance From Robot is " );
Serial.print ( distance);
Serial.print ( " CM!");
Serial.println (" The obstacle is declared a threat due to close distance. ");
Serial.println (" Turning !");
    motor2.run(BACKWARD);
    motor1.run(BACKWARD);

}
  else {
   Serial.println ("No obstacle detected. going forward");
   delay (15);
   motor1.run(FORWARD);
    motor2.run(FORWARD);
  }

}
```

THE CHASSIS AND THE BODY:

Some good materials can be used for designing robot chassis such as wood, plastic, aluminum and brass alloys. We must pay attention to the resistance, weight and mechanical ability for choosing one of them.

ARDUINO UNO R3:

Arduino is an open-source platform used for building electronics projects. Arduino consists of roboth a physical programmable circuit board and IDE that runs on your computer, used to write and upload computer code to the physical board. The Arduino IDE uses a simplified version of C++, making it easier to learn to program.

MOTOR DRIVER (H-BRIDGE):

Driver section consists of Motor driver and four DC motors. Motor driver is used for driving motors because Arduino does not supply enough voltage and current to motor. Arduino sends commands to this motor driver and then it drives motors in any direction as we want. Working of obstacle avoidance robot is very interesting. Then Arduino drives the

motor according to sensors' output. L293D motor driver is used. L293D can rotate the motor in the forward and reverse direction.

Sensor section:

This section contains Ultrasonic sensors. These section is used to sense the particular obstacle which comes in between its path.

Control section:

Control section consists of Arduino UNO R3 which is used for controlling whole process of obstacle avoidance. Arduino reads every pin from each component and acts accordingly.

FUTURE WORK:

This paper is all about Obstacle Avoidance Robot using Arduino which avoids obstacles which it encounters. In future this project can be enhance by connecting Bluetooth module and a camera so that the user can see the detected obstacle on his screen by sitting at just one place.