PROJECT-2

Obstacle Avoidance Robot

EXTRACT

This project belongs to robotics and embedded system domain.

Obstacle detection and avoidance can be considered as the central issue in designing robots. This technology provides the robots with senses which it can use to traverse in unfamiliar environments without damaging itself. In this project an Obstacle Avoiding Robot is designed which can detect obstacles in its path and maneuver around them without making any collision.

In this project our focus is on making an obstacle avoidance robot with the help of 2 dc gear motor, ultrasonic sensor and Arduino

We successfully built this project by making connections and by writing coding part in tinkercad software

This project can be very handy in many aspects

INTRODUCTION

The concept behind this project is that whenever any object comes in front of the robot in the range of 50 cm it should turn in any of direction and move ahead and if the object is out of the 50 cm range then the robot should carry on moving

For achieving the goal of the project we use ultrasonic sensor in it. The ultrasonic sensor uses transducer to send sound waves and then waves reflects by obstructing with objects and then ultrasonic sensor receives waves thus it calculates the distance of the object from the robot and further instructions can be given to robot

This project can be very useful for making such gadgets that can help blind persons to guide them from obstacles coming in front of them.

METHODOLOGY

First of all we did all the connections as

First we took an Arduino,two dc gear motors,one breadboard,one L293D and one ultrasonic sensor

Then connect ultrasonic sensor with Arduino. Connect vcc to 5v and Gnd with Gnd and trig and eco pins with two pins of Arduino .now ultrasonic sensor is connected

Now connect L293D with breadboard and then do connections with dc motors and Arduino

Now connection part is over . following is the connection diagram:
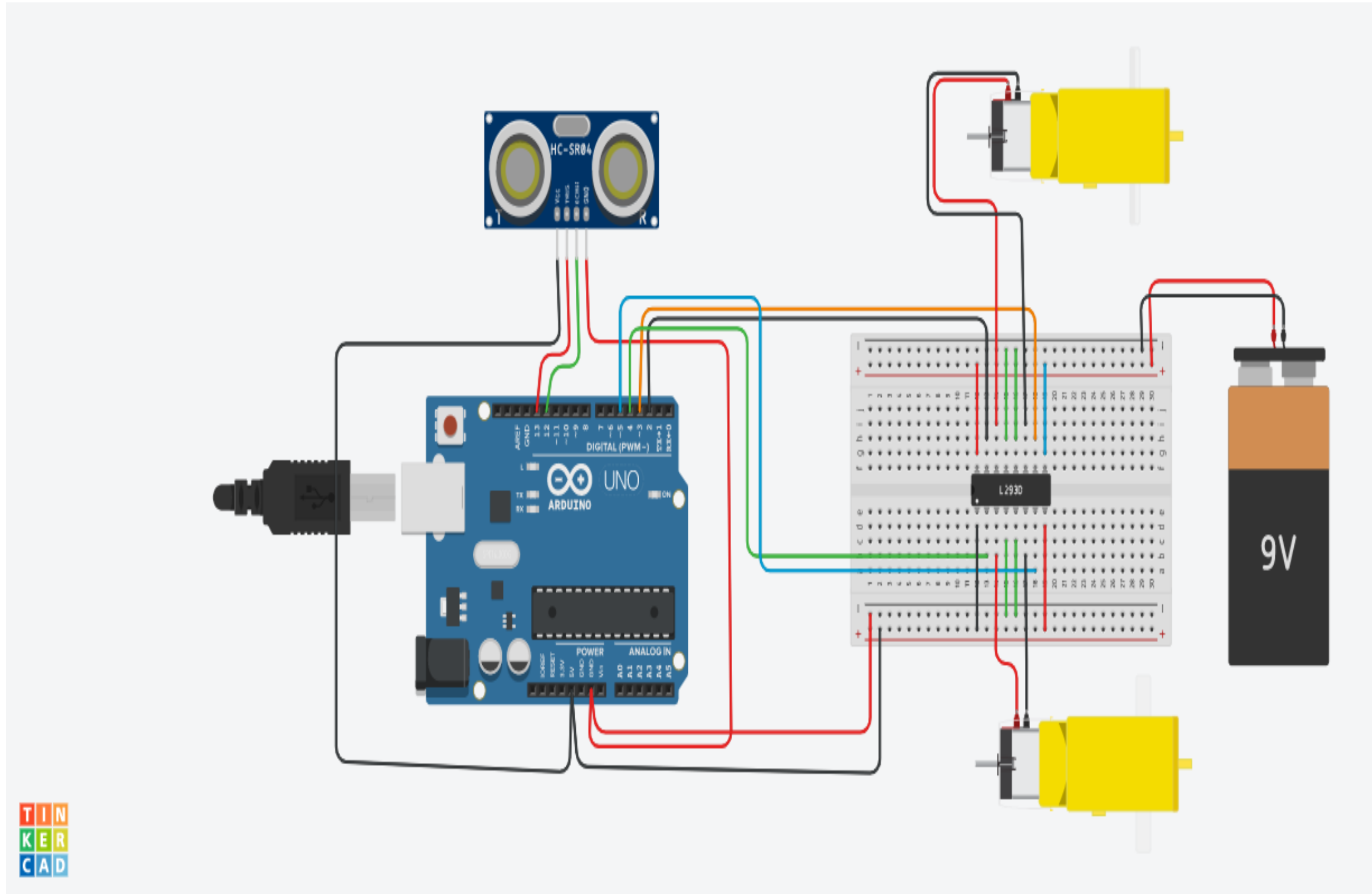
Now coming to the coding part

First of all, Code for measuring the distance between obstacle and robot is written
And then with the help of if statement, instruction are given to to robot.
If the distance is less than 50cm then one dc motor will rotate clockwise and other one will be stop
Or one will rotate clockwise and other one will rotate anticlockwise
And if distance is greater than 50 cm than both will rotate clockwise or anticlockwise .
Delay time of 5 sec. given
Code

```
const int trigPin= 13;
const int echoPin=12;

long duration;
int distance;
void setup()
{
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(2,OUTPUT);
pinMode(3,OUTPUT);
pinMode(4,OUTPUT);
pinMode(5,OUTPUT);
Serial.begin(9600);
}
```

```cpp
void loop(){

  digitalWrite(trigPin, LOW);
  delay(2);
  digitalWrite(trigPin, HIGH);
  delay(10);
  digitalWrite(trigPin,LOW);

  duration= pulseIn(echoPin, HIGH);

  distance=duration*0.034/2;

  Serial.print("Distance: ");
  Serial.println(distance);
  delay(500);

  if(distance<=50){
    digitalWrite(2,1);
    digitalWrite(3,0);
    digitalWrite(4,0);
    digitalWrite(5,0);
    delay(5000);
  }
  if(distance>50){
    digitalWrite(2,1);
    digitalWrite(3,0);
```

```
  digitalWrite(4,1);
  digitalWrite(5,0);
  delay(5000);
 }


}
```

CONCLUSION:
This project developed an obstacle avoiding robot to detect and avoid obstacles in its path. The robot is built on the Arduino platform for data processing and its software counterpart helped to communicate with the robot to send parameters for guiding movement.

 LINK OF TINKERCAD :
https://www.tinkercad.com/things/0EMDPkTIFz6-obstacle-avoidance-robot/editel