

OBSTACLE AVOIDANCE ROBOT

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PROJECT 2

- **ABSTRACT:**

Obstacle avoidance robot is a 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 make use of ultrasonic distance sensors to achieve this objective. We have also used two gear D.C.MOTORS i.e. battery operated motors.

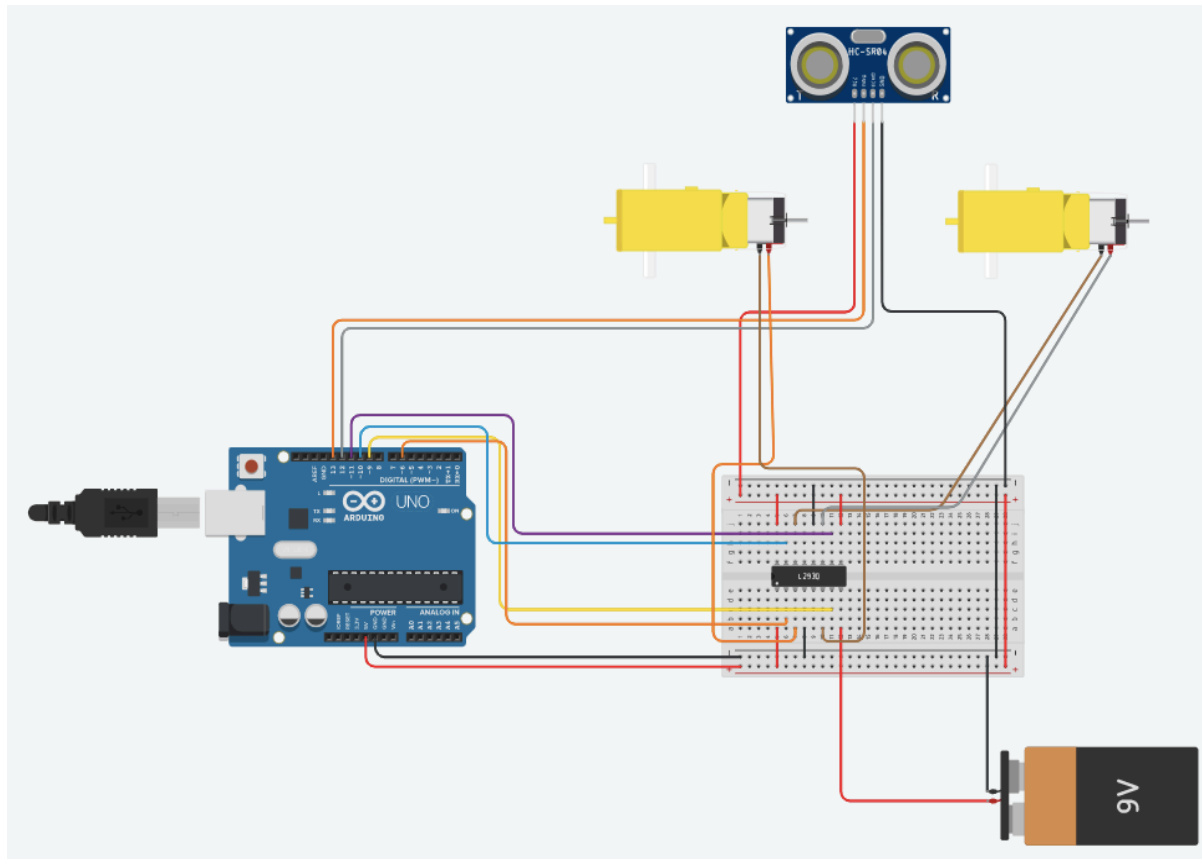
- **INTRODUCTION:**

The term “obstacle avoidance” is used in modern robotics to denote the capability of robot to navigate over an unknown environment without having any collision with surrounding objects. Obstacle avoidance in robots can bring more flexibility in maneuvering in varying environments and would be much more efficient as continuous human monitoring is not required.

In this project I developed an obstacle avoiding robot which can move without any collision by sensing obstacles on its course with the help of an ultrasonic distance sensor. Robots guided with this technology can be put into diversified uses, e.g., surveying landscapes, driverless vehicles, autonomous cleaning, automated lawn mower and supervising robot in industries.

- **METHODOLOGY:**

CIRCUIT DIAGRAM:



CODE:

```
1  #define ePin 12
2  #define tPin 13
3  long duration;
4  int distance;
5  int fwd1 = 9;
6  int rev1 = 6;
7  int fwd2 = 10;
8  int rev2 = 11;
9
10
11 void setup(){
12   pinMode(tPin,OUTPUT);
13   pinMode(ePin,INPUT);
14   Serial.begin(9600);
15   pinMode(fwd1,OUTPUT);
16   pinMode(rev1,OUTPUT);
17   pinMode(fwd2,OUTPUT);
18   pinMode(rev2,OUTPUT);
19
20 }
21
22 void loop(){
23   digitalWrite(tPin, LOW);
24   delayMicroseconds(2);
25   digitalWrite(tPin, HIGH);
26   delayMicroseconds(10);
27   digitalWrite(tPin, LOW);
28   duration = pulseIn(ePin,HIGH);
29   distance = duration*0.034/2;
30
31   if (distance >= 20){
32     digitalWrite(fwd2, HIGH);
33     digitalWrite(rev2, LOW);
34     digitalWrite(fwd1, HIGH);
35     digitalWrite(rev1, LOW);
36     delay(1000);
37   }
38
```

```
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2  #define tPin 13
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6  int rev1 = 6;
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11 void setup(){
12   pinMode(tPin,OUTPUT);
13   pinMode(ePin,INPUT);
14   Serial.begin(9600);
15   pinMode(fwd1,OUTPUT);
16   pinMode(rev1,OUTPUT);
17   pinMode(fwd2,OUTPUT);
18   pinMode(rev2,OUTPUT);
19
20 }
21
22 void loop(){
23   digitalWrite(tPin, LOW);
24   delayMicroseconds(2);
25   digitalWrite(tPin, HIGH);
26   delayMicroseconds(10);
27   digitalWrite(tPin, LOW);
28   duration = pulseIn(ePin,HIGH);
29   distance = duration*0.034/2;
30
31   if (distance >= 20){
32     digitalWrite(fwd2, HIGH);
33     digitalWrite(rev2, LOW);
34     digitalWrite(fwd1, HIGH);
35     digitalWrite(rev1, LOW);
36     delay(1000);
37   }
38
```

- **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. For obstacle detection, one ultrasonic distance sensors were used that provided a field of detection.

The work done in this project can act as a base for further improvements to increase accuracy and adaptability of obstacle detection in diverse environments.

LINK:

<https://www.tinkercad.com/things/09hKVjyQn7r>