Academic year: 2020-21
Project Report
Department of ECE, II YR I Semester

Reg No: 190340026

Project Title

OBSTACLE AVOIDING ROBOT

Components:

1) Arduino Uno

2) Ultrasonic sensor

3) DC servo motor

4) Motor Driver(L293D)

5) Battery

6) Bread Board and jumper Cables

7) Wheels

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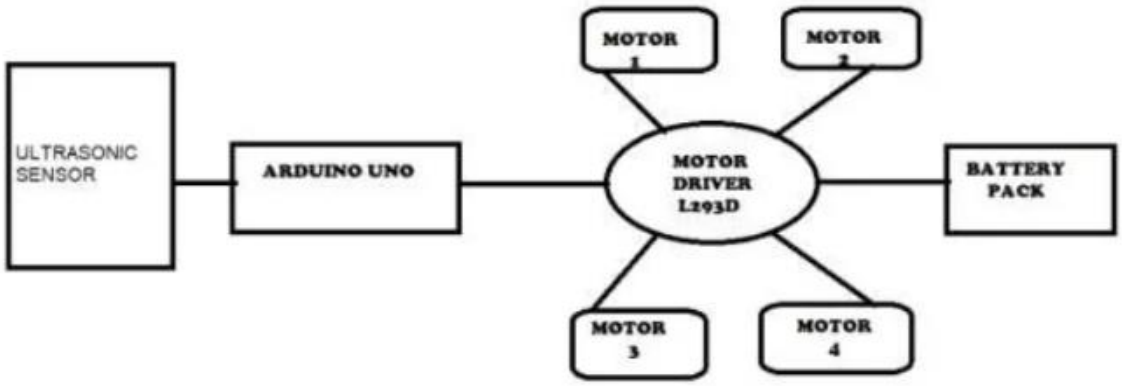
Description:

Obstacle avoidance s one of the most important aspects of mobile robotics. Without it, robot movement would be very restrictive and fragile. This project proposes robotic vehicle that has intelligence built in it such that it directs itself whenever an obstacle comes in its path. So, to protect the robot from any physical damages. An ultrasonic sensor is used to detect any obstacle ahead of it and sends a command to the micro-controller. Depending on the input signal received, the micro-controller redirects the robot to move in an alternate direction by actuating the motors which are interfaced to it through a motor driver.

Block Diagram:



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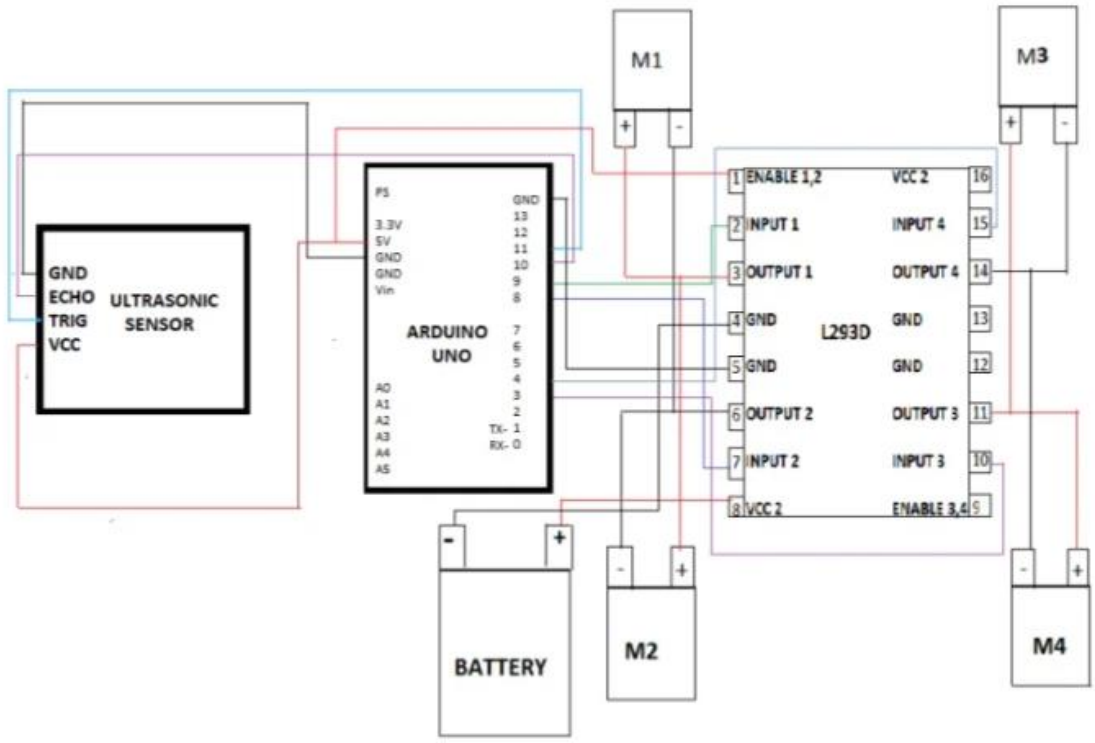
Design:



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CODE:

```
#include <AFMotor.h>                          //Import library to control motor shield
#include <Servo.h>                            //Import library to control the servo

AF_DCMotor rightBack(1);                      //Create an object to control each motor
AF_DCMotor rightFront(2);
AF_DCMotor leftFront(3);
AF_DCMotor leftBack(4);
Servo servoLook;                              //Create an object to control the servo

byte trig = 2;                                //Assign the ultrasonic sensor pins
byte echo = 13;
byte maxDist = 150;                           //Maximum sensing distance (Objects further than this distance are ignored)
byte stopDist = 50;                           //Minimum distance from an object to stop in cm
float timeOut = 2*(maxDist+10)/100/340*1000000;  //Maximum time to wait for a return signal

byte motorSpeed = 55;                         //The maximum motor speed
int motorOffset = 10;                         //Factor to account for one side being more powerful
int turnSpeed = 50;                           //Amount to add to motor speed when turning


void setup()
{
  rightBack.setSpeed(motorSpeed);             //Set the motors to the motor speed
  rightFront.setSpeed(motorSpeed);
  leftFront.setSpeed(motorSpeed+motorOffset);
  leftBack.setSpeed(motorSpeed+motorOffset);
  rightBack.run(RELEASE);                     //Ensure all motors are stopped
  rightFront.run(RELEASE);
  leftFront.run(RELEASE);
  leftBack.run(RELEASE);
  servoLook.attach(10);                       //Assign the servo pin
  pinMode(trig,OUTPUT);                       //Assign ultrasonic sensor pin modes
  pinMode(echo,INPUT);
}
```

CONCLUSION:

The goal of the project is to create an autonomous robot which intelligently detect the obstacle in the path and navigate according to the actions I set for it

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