



# Practicum-IV

**Project Aim :- Obstacle detecting and avoiding car**

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## Equipment Used In This Project :-

**01**

Dc Motor  
Adruino UNO Board

**02**

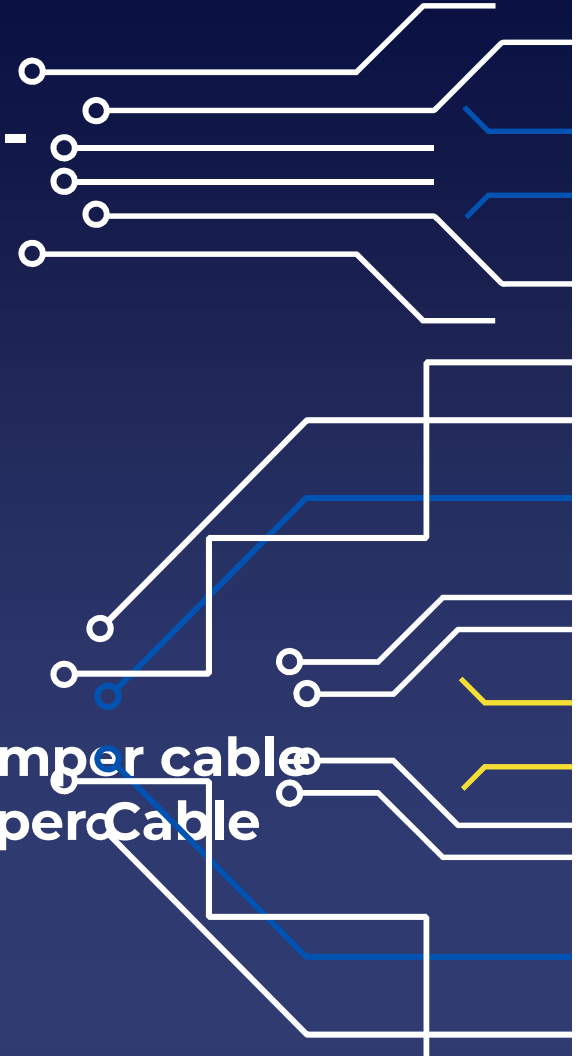
Motor Driver  
Castol Wheel

**03**

Wheel  
Ultrasonic Sensor

**04**

Male to Female Jumper cable  
Male to Male Jumper Cable





## Arduino Uno

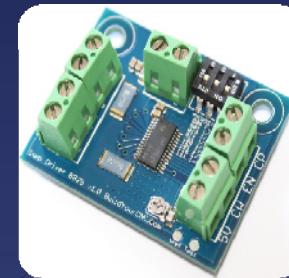


- The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.
- The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.
- The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.
- It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts.

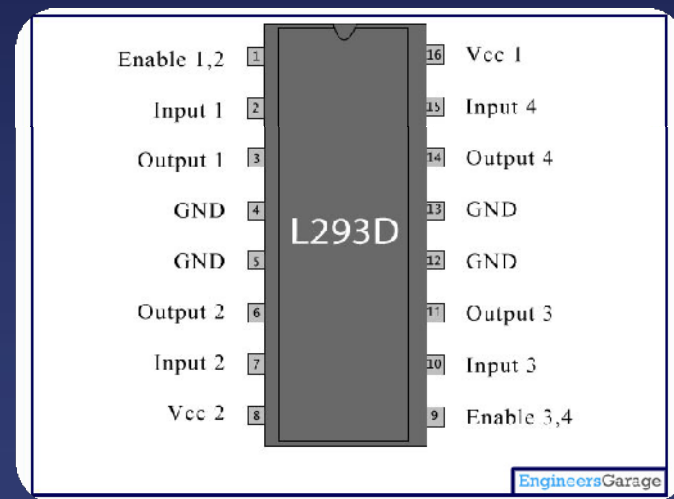


## L293D Motor Driver

- Here in these car I have used L293D Motor Driver. It is a 16 pins IC used for running Motor.
- It turn Low current signal to High current signal for driving the motor.
- As we now Arduino board used for automation and it work on 5V but this voltage is not sufficient to run Motor so, we required Motor Driver
- It's voltage range is 9V to 12V.



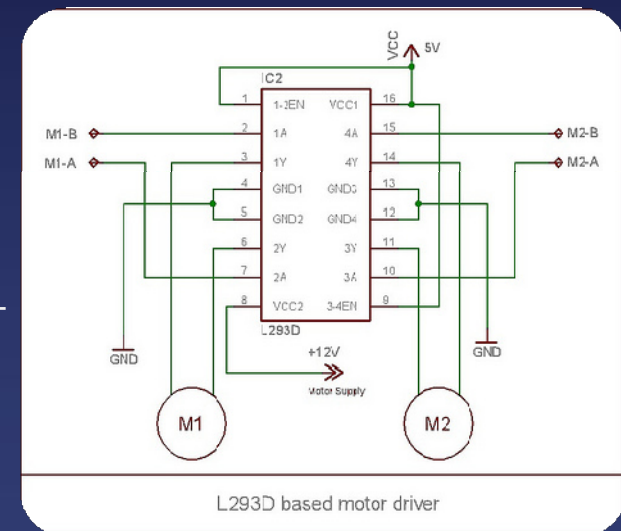
# Pin Configurations of L293D Motor Driver





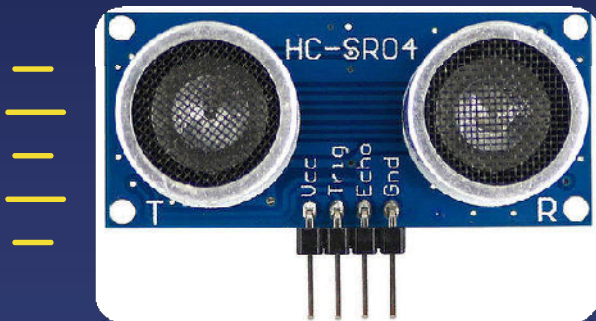
## Connections of different pins of L293D Motor Driver with Motor and power supply source(Battery)

- Here we can say that o/p1 and o/p2
  - connected with Left Motor, here it is M1 and
  - M1-B, M1-A are i/p1 and i/p2 respectively.
- Now o/p4 and o/p3 connected with Right Motor and M2-B, M2-A are i/p4 and i/p3 respectively.
- Here this Motor Driver works only when all enable pins are high and VCC pin at 16 given voltage of 5V and VCC pin at 8 given 12V.



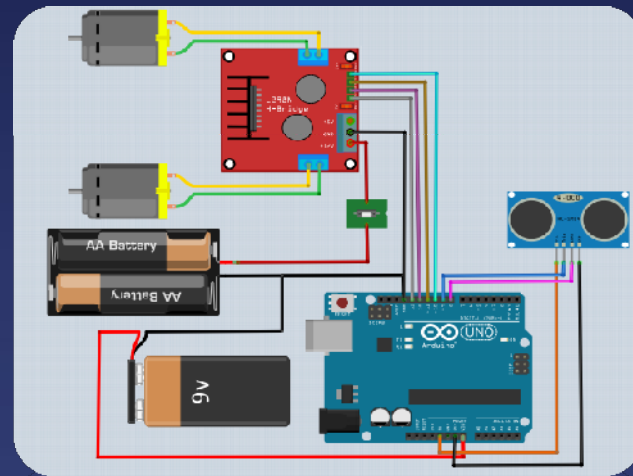


## Ultrasonic Sensor



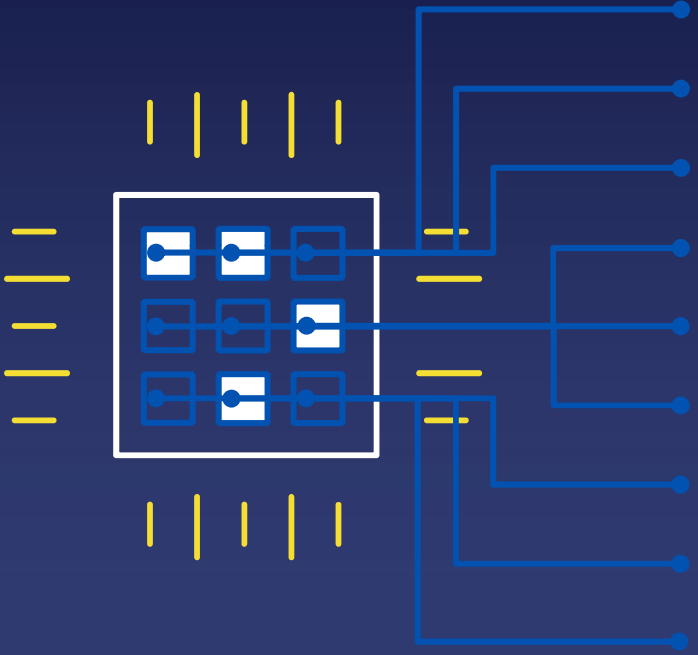
- Instrument that measures the distance to an object using ultrasonic sound waves.
- An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.
- Here VCC connected to 5V in Arduino board.
- Trig used as transmitter and connected to Digital pin of Arduino for giving o/p signal.
- Echo pin used for i/p and connected to Digital pin of Arduino.
- GND connected to ground pin.

# Schematic Diagram





# Arduino Uno code



```
#define trigPin 6
#define echoPin 7
#define MLa 8
#define MLb 9
#define MRa 10
#define MRb 11
long duration,distance;
void setup()
{
  Serial.begin(9600);
  pinMode(MLa,OUTPUT);
  pinMode(MLb,OUTPUT);
  pinMode(MRa,OUTPUT);
  pinMode(MRb,OUTPUT);
  pinMode(trigPin,OUTPUT);
  pinMode(echoPin,INPUT);
}
void loop()
{
  digitalWrite(trigPin,LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin,HIGH);
  delayMicroseconds(10);
  duration = pulseIn(echoPin,HIGH);
  distance = duration/58.2;
  delay(10);
```

```
if (distance>15)
{
  digitalWrite(MRb,HIGH);
  digitalWrite(MRa,LOW);
  digitalWrite(MLb,HIGH);
  digitalWrite(MLa,LOW);
  delay(3000);
}
if (distance<10)
{
  digitalWrite(MRb,LOW);
  digitalWrite(MRa,LOW);
  digitalWrite(MLb,LOW);
  digitalWrite(MLa,LOW);
  delay(500);
  digitalWrite(MRb,LOW);
  digitalWrite(MRa,HIGH);
  digitalWrite(MLb,LOW);
  digitalWrite(MLa,HIGH);
  delay(500);
  digitalWrite(MRb,LOW);
  digitalWrite(MRa,LOW);
  digitalWrite(MLb,LOW);
  digitalWrite(MLa,LOW);
  delay(100);
  digitalWrite(MRb,HIGH);
  digitalWrite(MRa,LOW);
  digitalWrite(MLa,HIGH);
  digitalWrite(MLb,LOW);
  delay(500); }
```

# THANKS 😊

