Advanced Traffic Light Sensor

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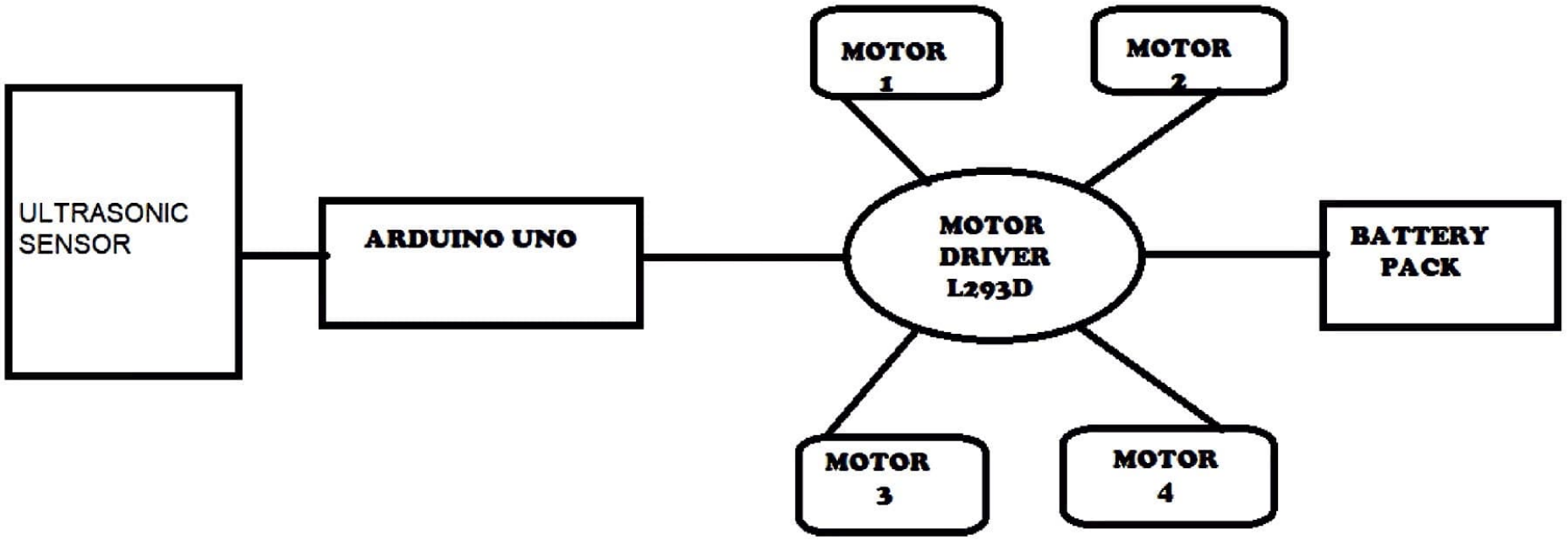
INTRODUCTION

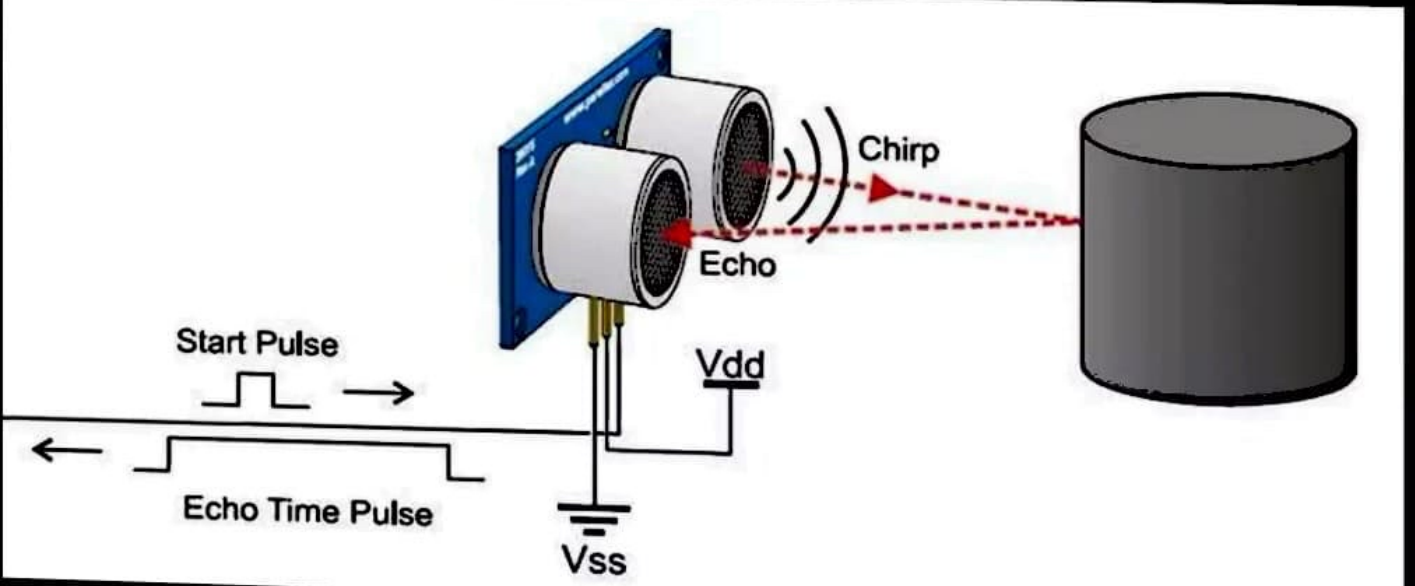
- Robotics is part of Todays communication. In today's world ROBOTICS is fast growing and interesting field.
- Robotic field and design something which will make human life simpler in day today aspect. Thus we are supporting this cause.
- An obstacle avoiding robot is an intelligent device, which can automatically sense and overcome obstacles on its path.
- Obstacle Avoidance is a robotic discipline with the objective of moving vehicles on the basis of the sensorial information.

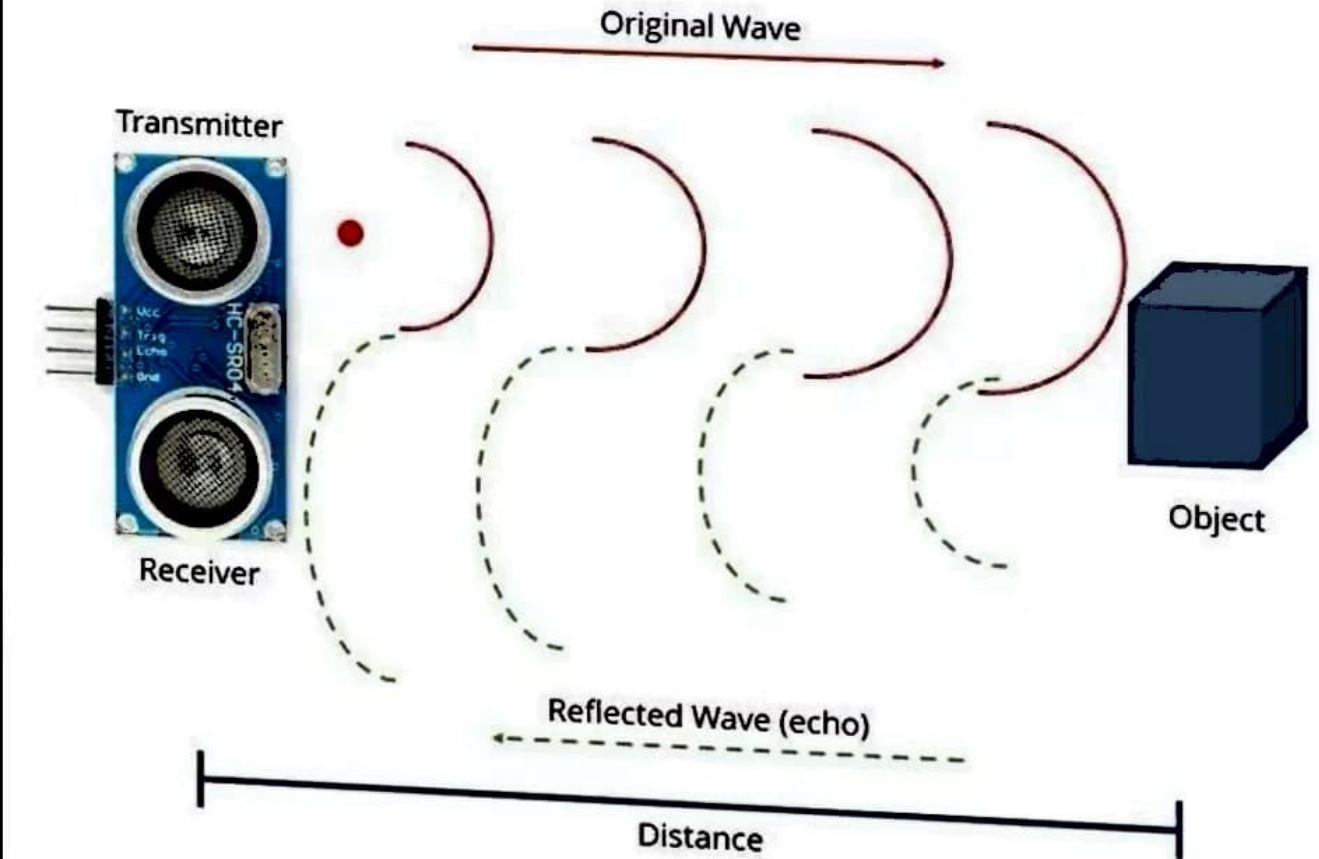
BLOCK DIAGRAM

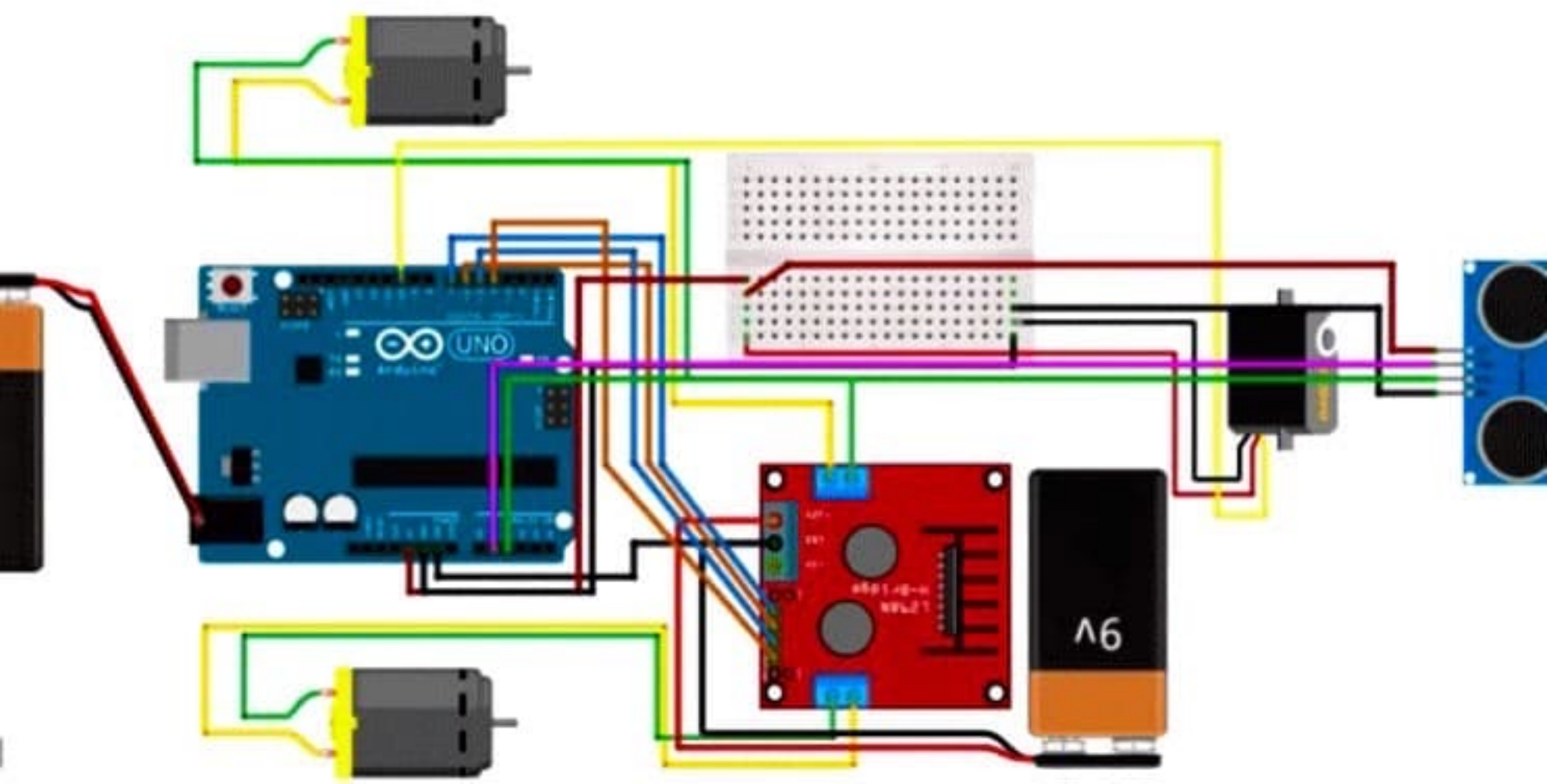


KEY ELEMENTS

- **Arduino UNO**
- **Ultrasonic sensor**
- **Motor driver(L293D)**
- **DC MOTOR**
- **BATTERY PACK**

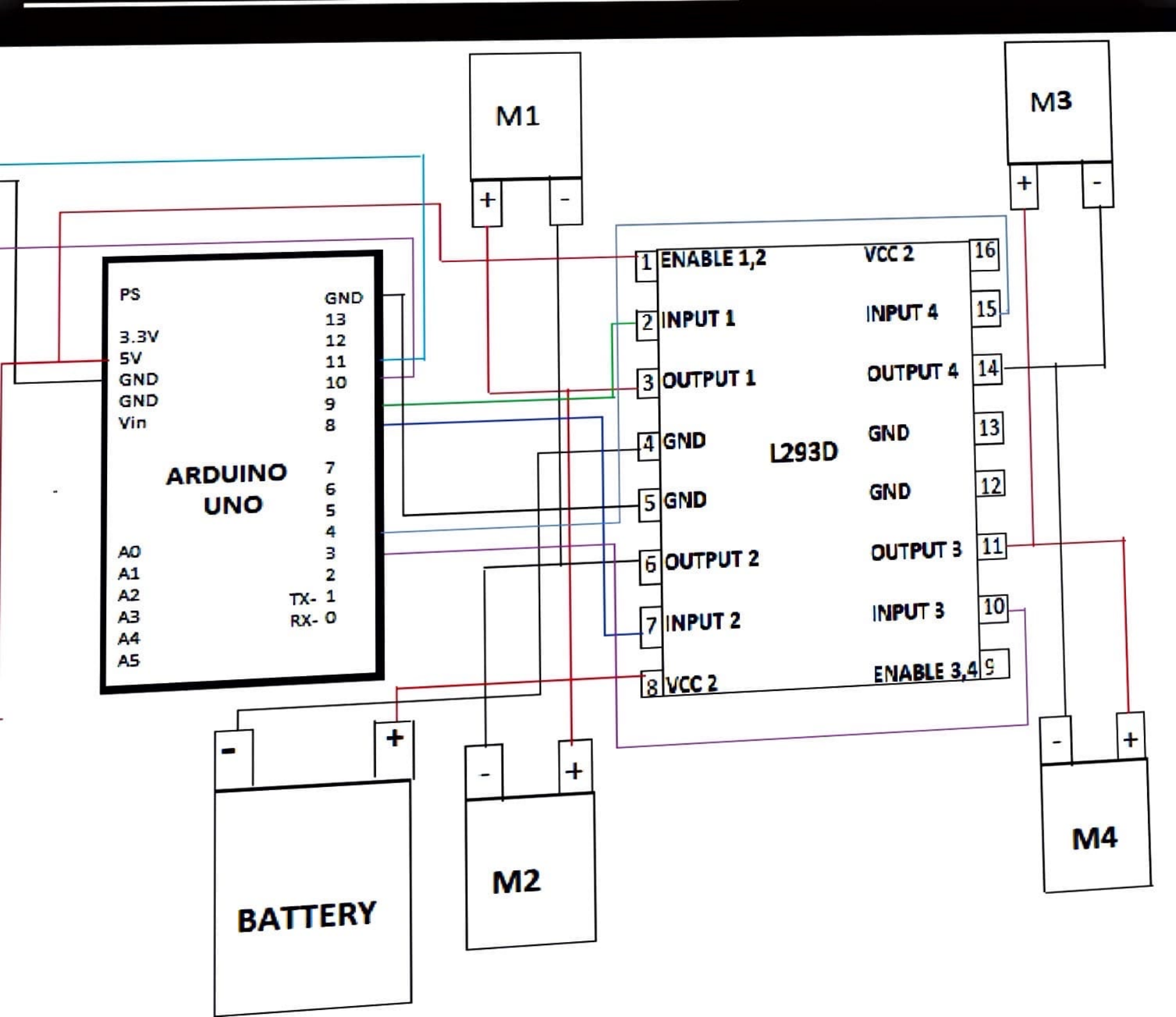

Chirp
Echo
Start Pulse
Vdd
Echo Time Pulse
Vss


Original Wave
Transmitter
Receiver
Object
Reflected Wave (echo)
Distance


UNO
9V

WORKING

- The obstacle avoidance robotic vehicle uses ultrasonic sensors for its movements. Arduino is used to achieve the desired operation.
- The motors are connected through motor driver IC to Arduino. The ultrasonic sensor is attached in front of the robot.
- Whenever the robot is going on the desired path the ultrasonic sensor transmits the ultrasonic waves continuously from its sensor head.
- Whenever an obstacle comes ahead of it the ultrasonic waves are reflected back from an object and that information is passed to the arduino uno.


M1
M3
+
-
+
-
PS
3.3V
5V
GND
GND
Vin
GND
13
12
11
10
9
8
ARDUINO
UNO
7
6
5
4
3
2
1
0
A0
A1
A2
A3
A4
A5
TX-
RX-
1 ENABLE 1,2
2 INPUT 1
3 OUTPUT 1
4 GND
5 GND
6 OUTPUT 2
7 INPUT 2
8 VCC 2
L293D
VCC 2 16
INPUT 4 15
OUTPUT 4 14
GND 13
GND 12
OUTPUT 3 11
INPUT 3 10
ENABLE 3,4 9
-
+
BATTERY
-
+
M2
-
+
M4

- The Arduino controls the motors left, right, back, front, based on ultrasonic signals. In order to control the speed of each motor pulse width modulation is used (PWM).

- When ultrasonic sensor detect the object which is kept inside the path it will send the signal toward the arduino uno and according to that it will rotate the motor.

- M3 & M4 in forward direction and rotate the motor M1 & M2 in reverse direction such way that the car get moving in left direction.

- Similarly in every time when ever an obstacle in found to be in path of car it will detect it and rotate the car in left direction to avoid the obstacle.

ADVANTAGES

- It can be used as a movable Surveillance System.
- It can be controlled remotely.
- It does not require Man Power.
- It can be used for critical application like flood, bomb disposal, Fire, Terrorist attack, Earth quake, Spying.

APPLICATIONS

- Automated lawn mover.
- Smart room cleaner etc.
- Obstacle avoiding robots can be used in almost all mobile robot navigation systems.
- They can also be used in dangerous environments, where human penetration could be fatal.
- Unmanned vehicle driving
- Mining Vehicle that uses Obstacle Detection

CONCLUSION

- The goal of our project is to create a autonomous robot which intelligently detects the obstacle in his path and navigate according to the actions we set for it.

REFRENCES

BOOKS:

- D. Floreano and J. Urzelai. “Evolutionary Robots with Online Self-Organization and Behavioral Fitness”
- Oussama Khatib. “Real-Time Obstacle Avoidance for Manipulators and Mobile Robots”,
- Marija Seder. “Hierarchical Path Planning of Mobile robots in Complex Indoor Environments”

WEBSITES:

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