Automatic obstacle detection car with color sensor

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Project Description

- We will be making a battery-powered automatic obstacle detection car that can turn right when it detects an obstacle and continues until the obstacle is removed.

- We will also be using color sensor for stopping and moving the car.

Understanding of the Project

- The Arduino UNO will be the prime driver for motor, ultrasonic sensors, clap detectors / color sensors.

- The car will be able to detect obstacles with the help of ultrasonic sensors that will be mounted in front of the car. On detecting an obstacle, it turns right.

- The color sensor will be programmed to detect red and green colors. Based on the color, the car stops or moves.

Approach

1. The motors which are powered by battery through L293D chip will be the base of the project.

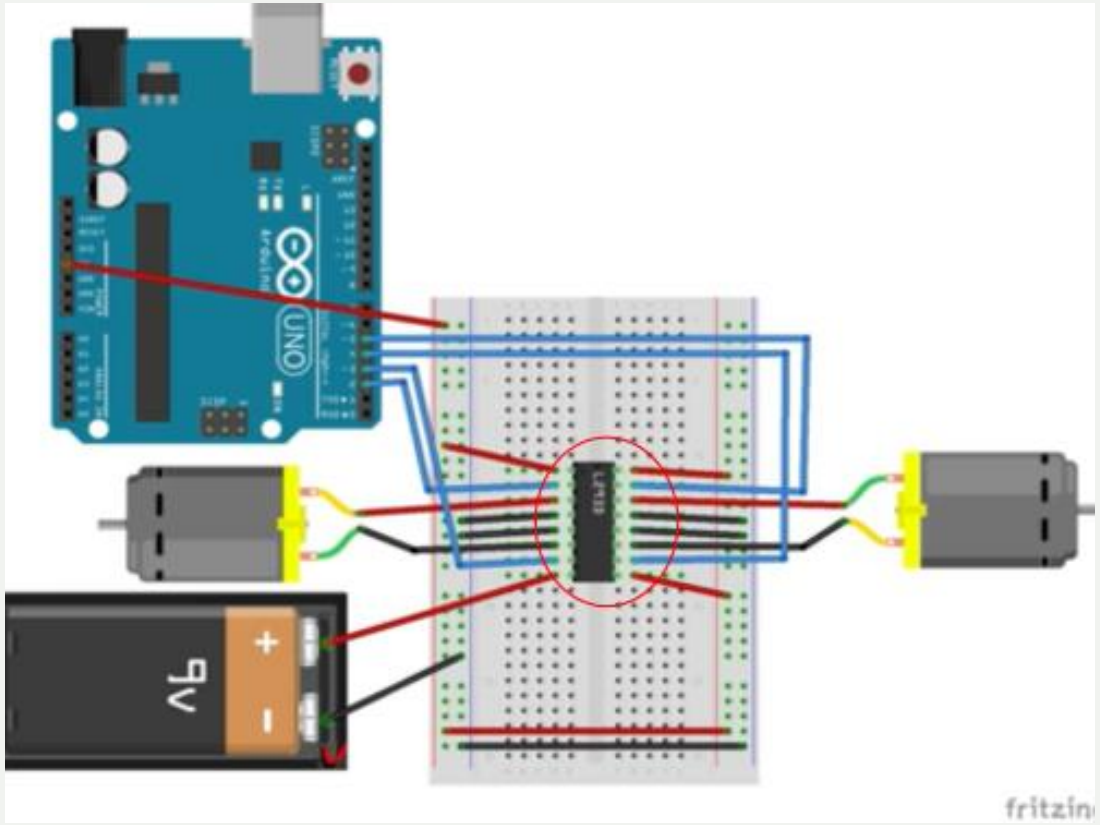
2. Obstacles will be detected with the help of Ultrasonic Sensor placed in front of the car.

3. It will detect the distance of anything ahead of it with the help of sound waves and then function according to us.

4. The TCS3200 Color Sensor will be mounted on the car, and on detecting red color, it will stop and move on detecting green.

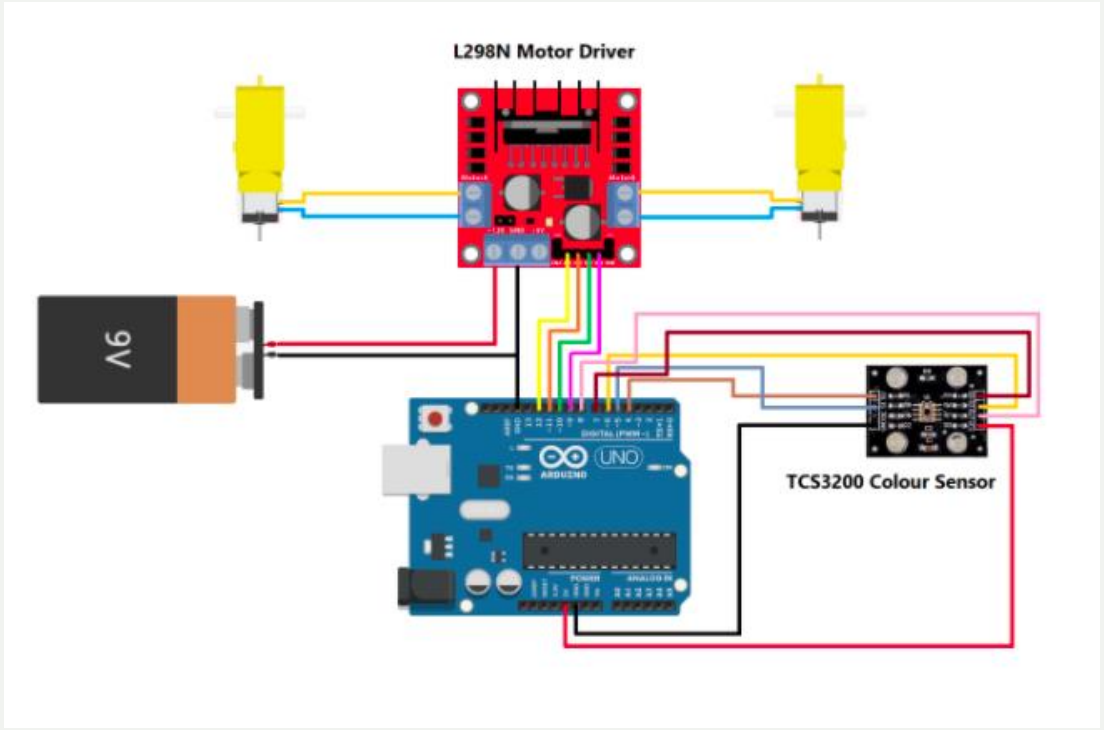
Components

1. Arduino UNO
2. Transistor
3. Ultrasonic sensor
4. L293D IC
5. TCS3200 Color Sensor
6. Motors
7. Wheels
8. Breadboard
9. Batteries

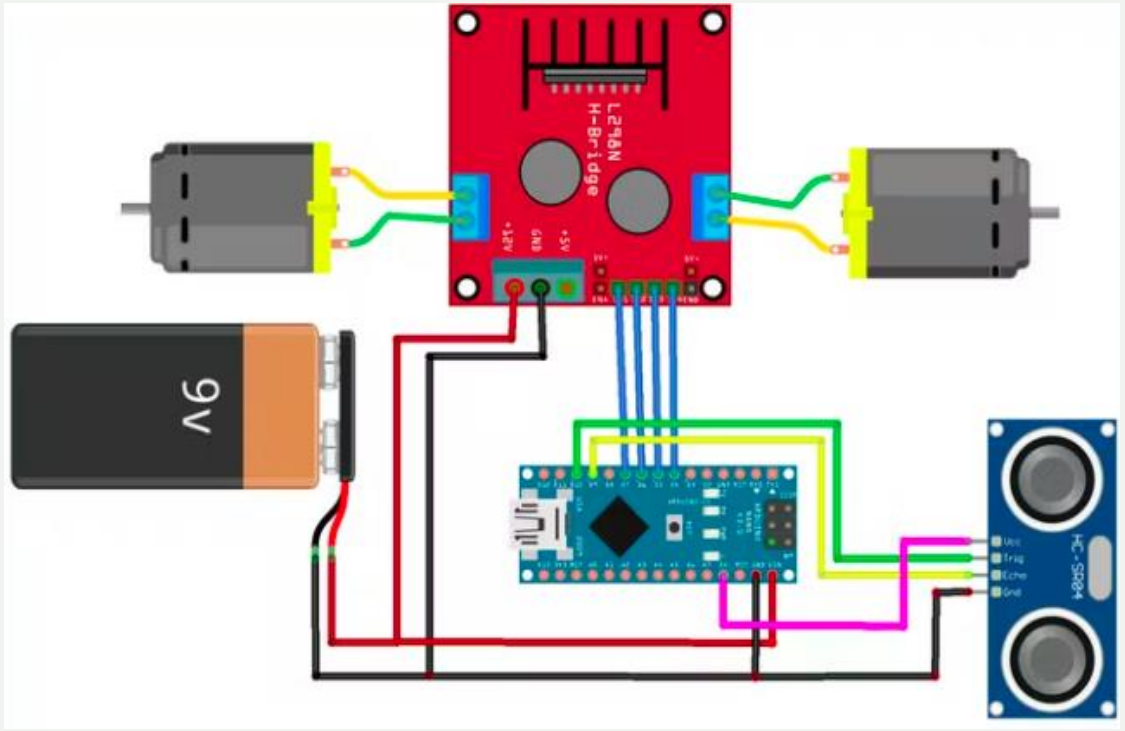


Circuit Diagram

Motor module



Color sensor module



Ultrasonic sensor module

Applications/uses

1. With the help of ultrasonic sensors it will help protect the vehicle from obstacles and make sure the vehicle remains unharmed.

2. The color sensor will make sure the vehicle stops on a red color and moves again on seeing green. This will help in following of traffic rules and thus, help in preventing road accidents.

Further modifications that can be made

- Using an accelerometer to detect the speed of the car..

- Using a buzzer, such that it beeps on detecting an obstacle or when over-speeding.

- Programming the color sensor to detect more colors and increase the operations for the car.

- Using a clap detector to control the car. The car will be able to detect clap sound with the help of sound sensing circuit which will consist of high pass filter and microphone.

Timeline

- We make the motor module first using the L293D IC, 9V battery, motors and Arduino by 18th April.

- We will try to implement the ultrasonic sensor part for obstacle detection by 25th April.

- We'll try to implement the color sensor by 2nd May.

Conclusion

1. So we will try to implement an obstacle detecting car that turns right on detecting an obstacle and stops immediately on seeing red color and starts again on seeing green color for our project.

2. Extra functionalities can be added by adding a clap sensor or a buzzer.