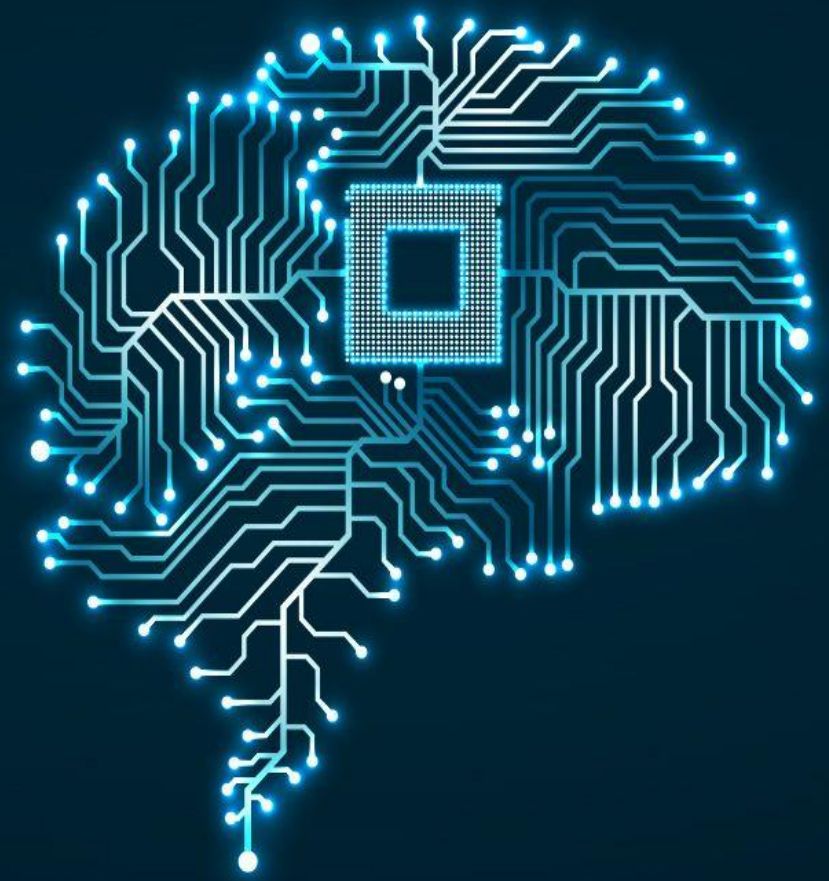

# Electronic Parts

COSMIC TEAM

# Content

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- **Arduino Mega 2560**
- **L298N Motor Driver**
- **Raspberry Pi Camera**
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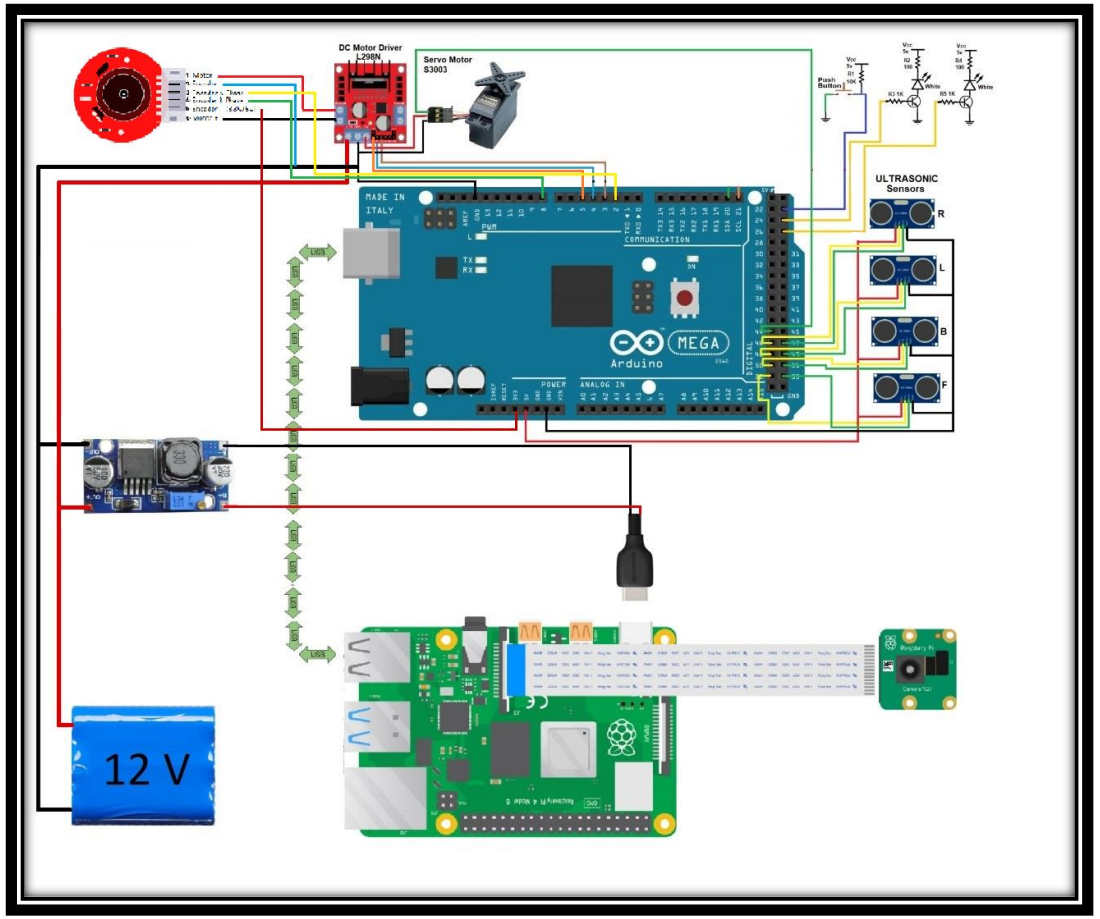
- **DC Encoder Motor**
- **Servo Motor**

# Main Diagram

**The electronic diagram shows the mechanism of connecting the controllers with each other and connecting the Arduino controller to the Ultrasonic sensors, the motor driver, which is used to control the DC motor and the servo. In addition to that, the diagram shows the electric feeding mechanism which reduces the voltage by using the buck Raspberry Pi power supply, and how feeds the electronic parts with power. Also, how to connect the Raspberry Pi controller to the camera .**



# Raspberry Pi 4

**The Raspberry Pi controller is used for three main purposes :**

**The first is to program the Arduino microcontroller.**

**The second is reading and processing the camera using the Python language built in its operating system.**

**Third, sending commands according to what the camera sees of pillars according to their colours to the Arduino controller.**

# Arduino Mega 2560

**The Arduino microcontroller is used as the main controller for the electronic parts as follows:**

**First, control the movement of the servo motor and DC motor throw send commands to the motor driver.**

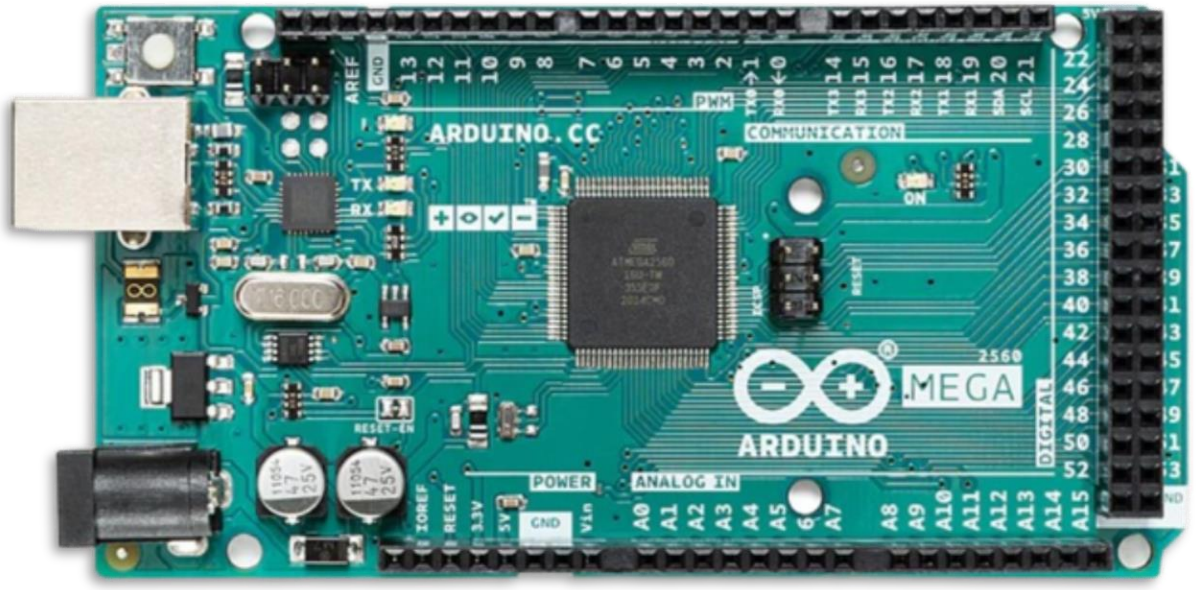
**Second, reading the distance of the front, back and side ultrasonic sensors.**

**Third, read the commands sent by the Raspberry Pi controller and take the appropriate action according to the situation.**

**Fourth, control the colours of RGB LEDs.**

**Fifth, read the push button to start the vehicle.**

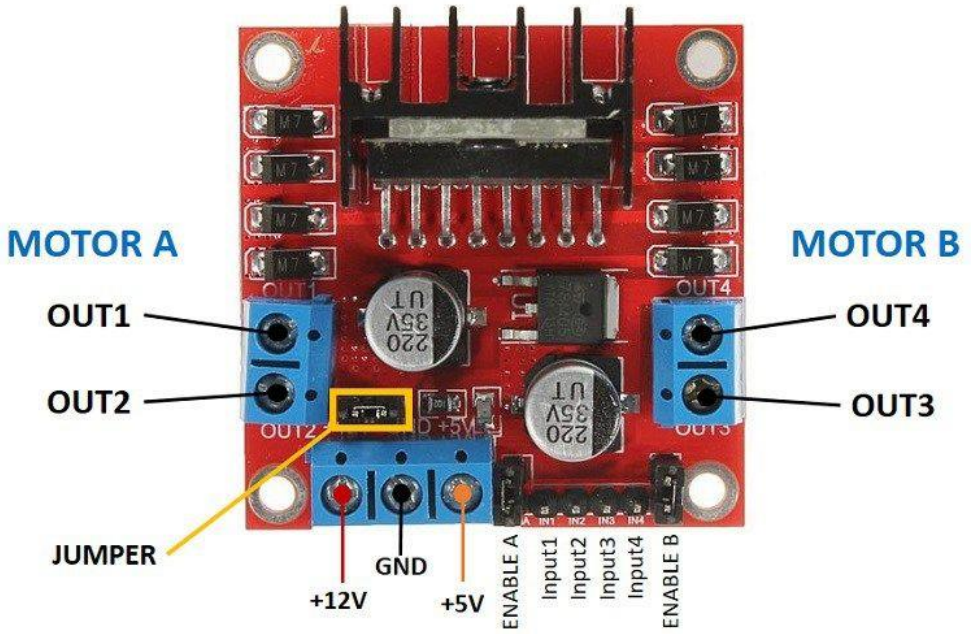
**Sixth, read the swich to change the code.**




- **It is worth noting that the Arduino Nano has been replaced by the Arduino Mega, why?** Because each port work alone without multiplexing, that allows to use PWM in effect way.

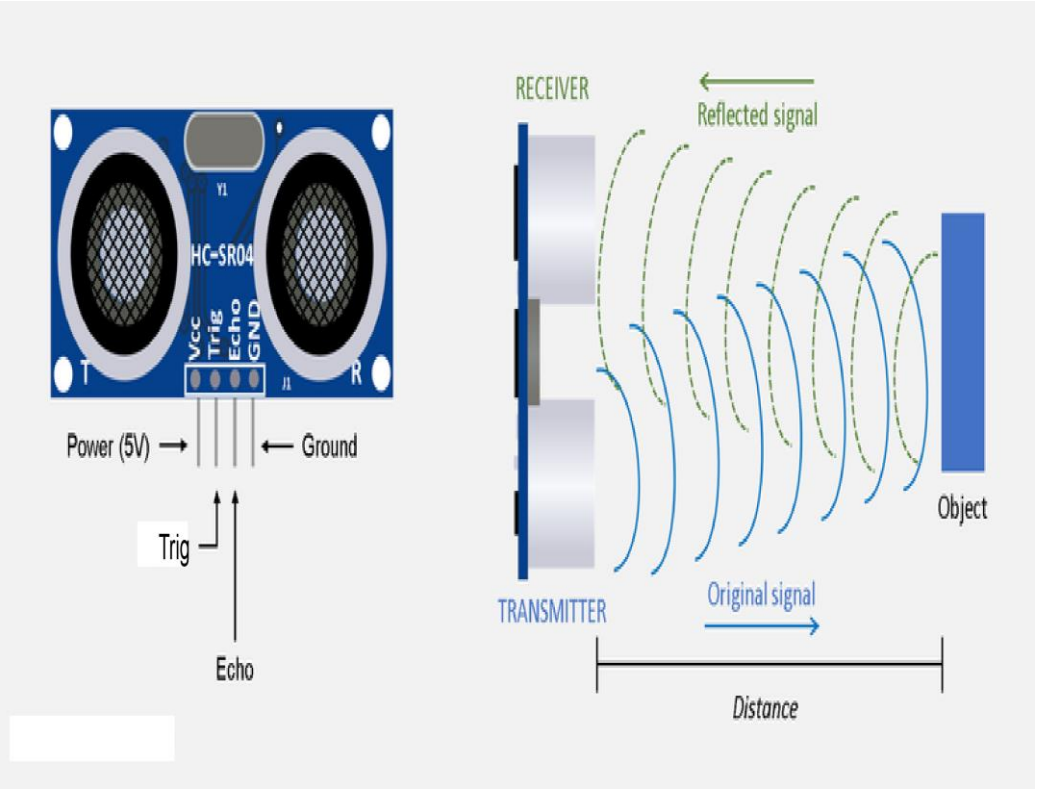
# L298N Motor Driver

**The motor driver used to determine the speed of the DC motor and to move forward and backward, in addition to controlling the movement of the servo motor.**



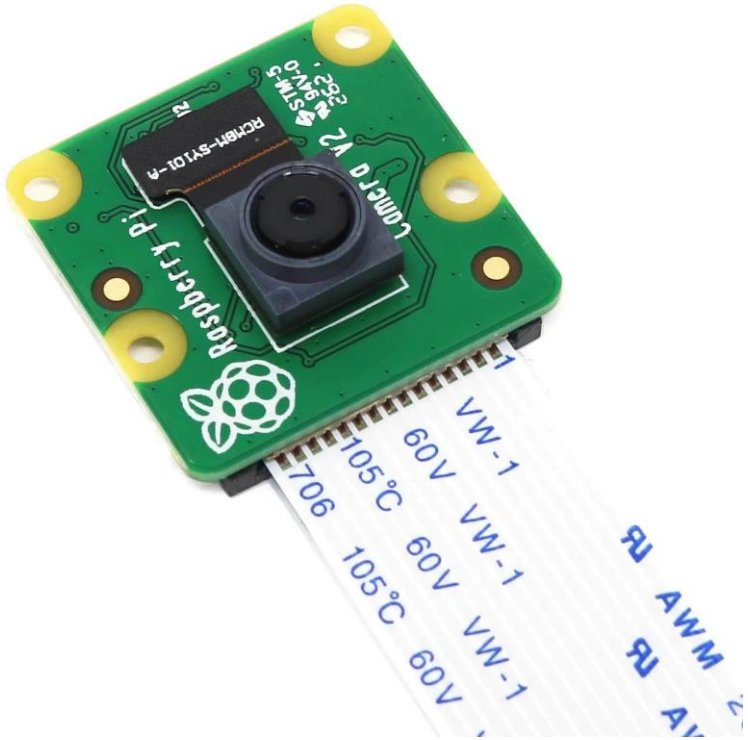
# Ultrasonic Sensors

**Four sensors are used to determine the distance, a sensor for the front, and two sensors for the sides, these sensors are implementing to determine the direction of the vehicle's movement and other things.**



# Raspberry Pi Camera

**An 8-megapixel camera with a Raspberry Pi controller is used.**



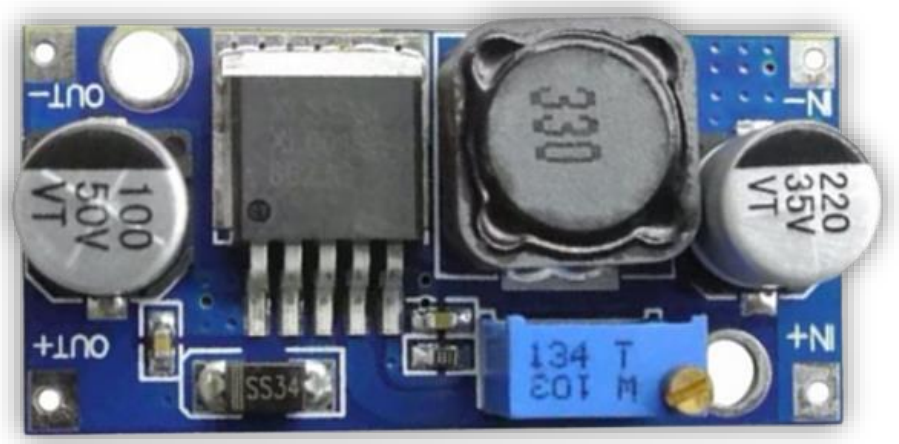
# Battery

**The battery is used to provide the vehicle with the necessary power, as it consisted of three lithium batteries connected together in series with an internal voltage regulator of 12 volts.**

# DC voltage Buck

**This circuit is designed to reduce voltage, as it was used to supply power to the Raspberry Pi controller .**

- **It is worth noting that the Arduino microcontroller is powered by the Raspberry Pi through a USB cable.**



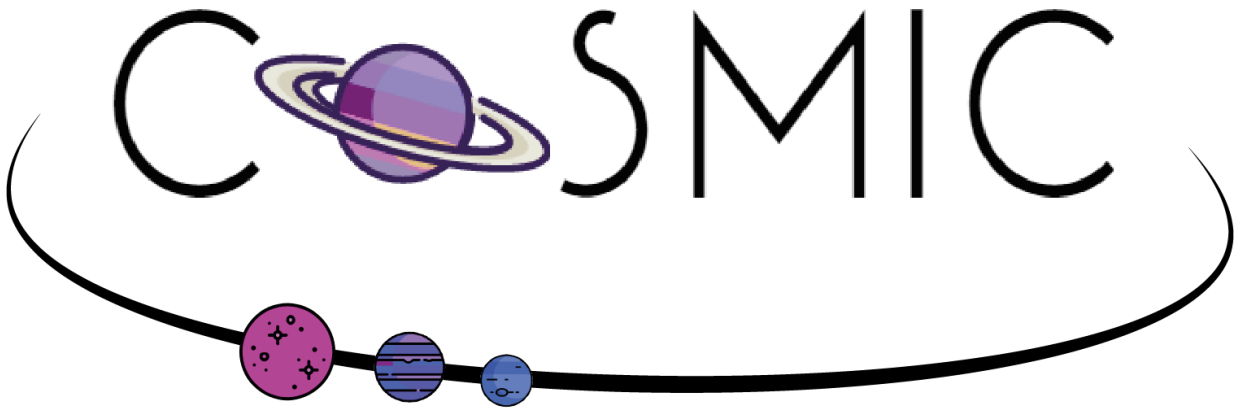
# DC Encoder Motor

**The DC motor is mechanically connected to the back wheels for the vehicle movement .**

**Why we used the Encoder?**
To tracking the direction and movement of motor, that helps to control the vehicle's movement

# Servo Motor

**The servo motor is used to control the direction of the vehicle by turning the steering wheel.**




# THANK YOU

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