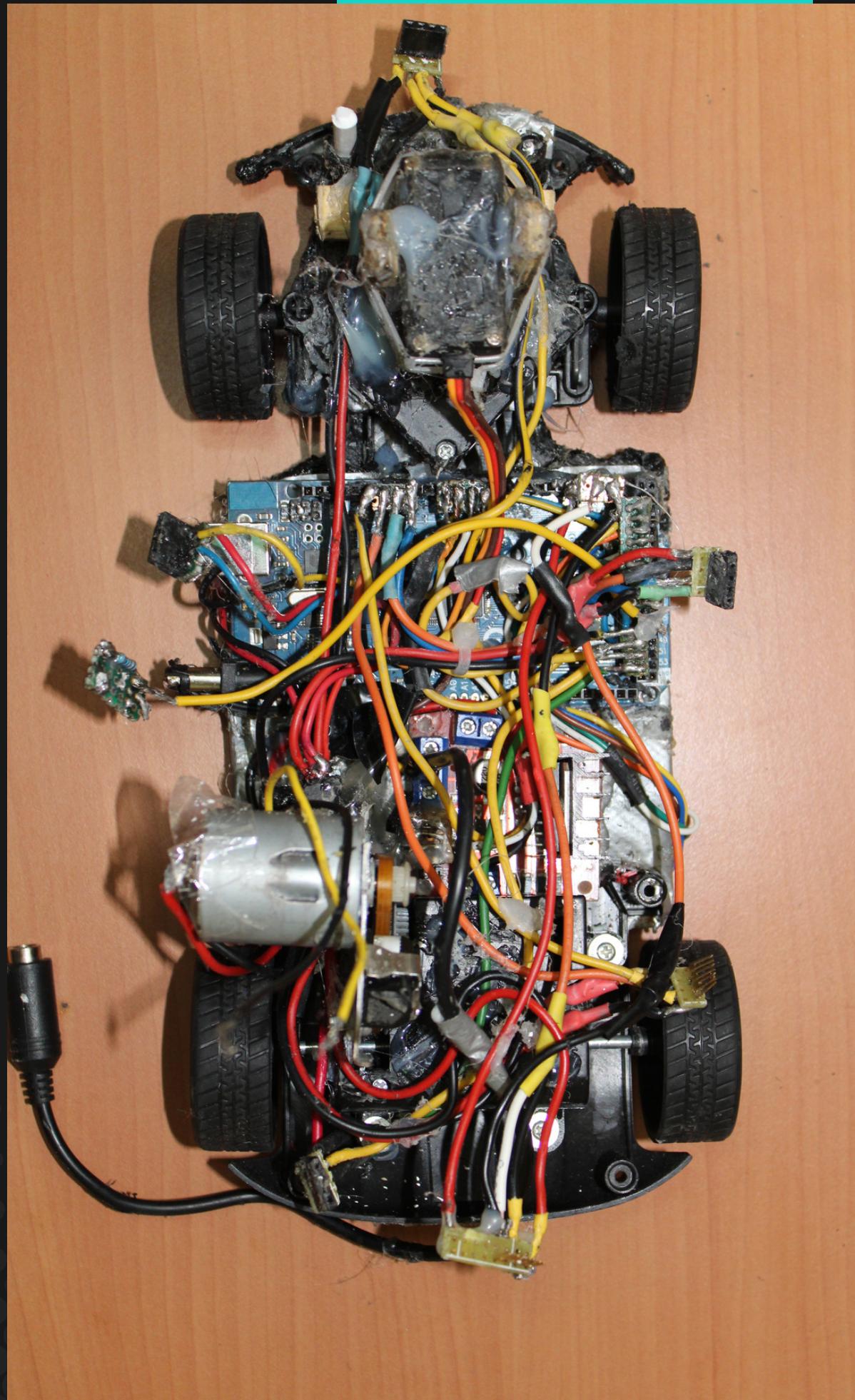


ELECTRONIC PARTS



MARS TEAM

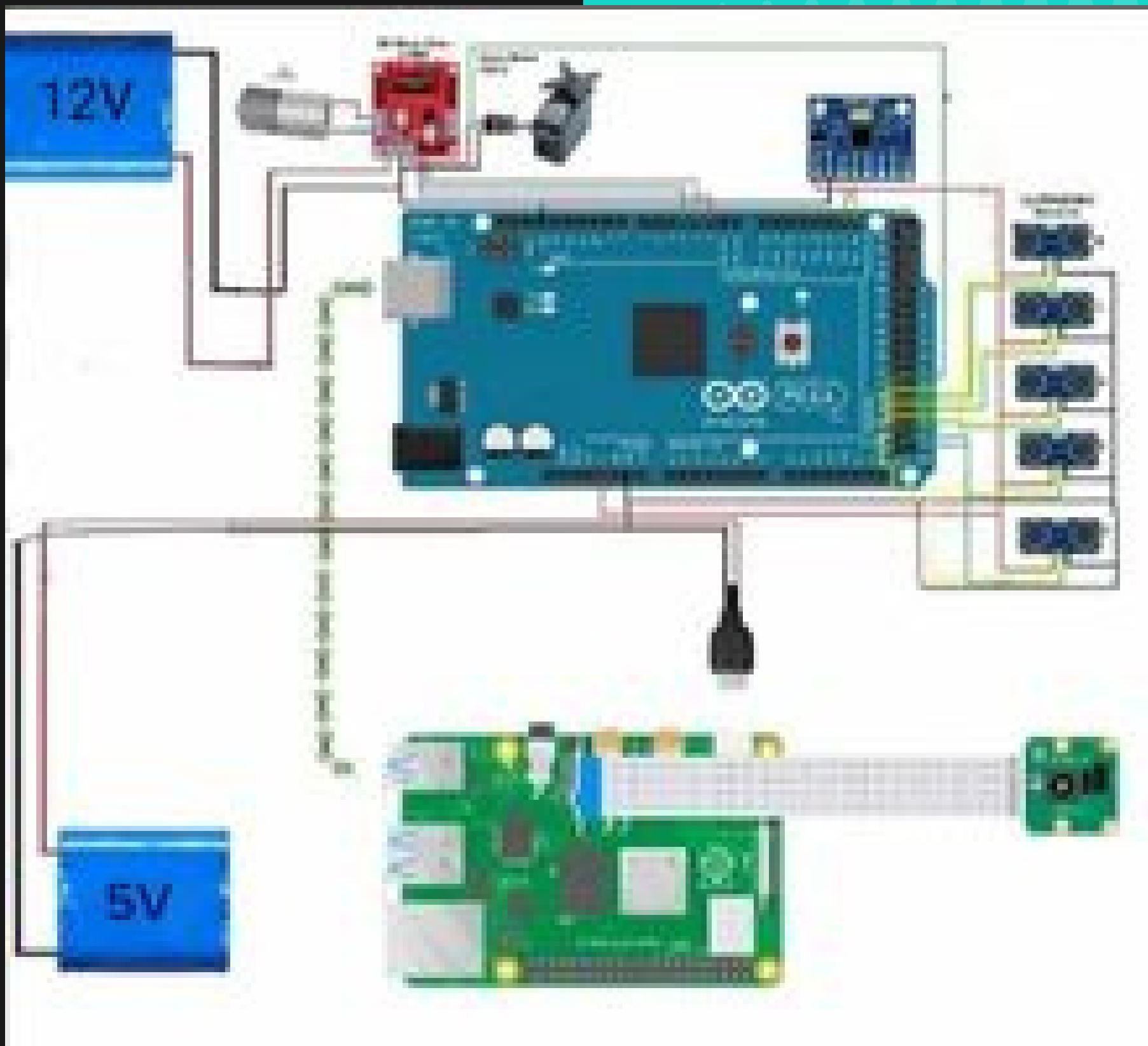


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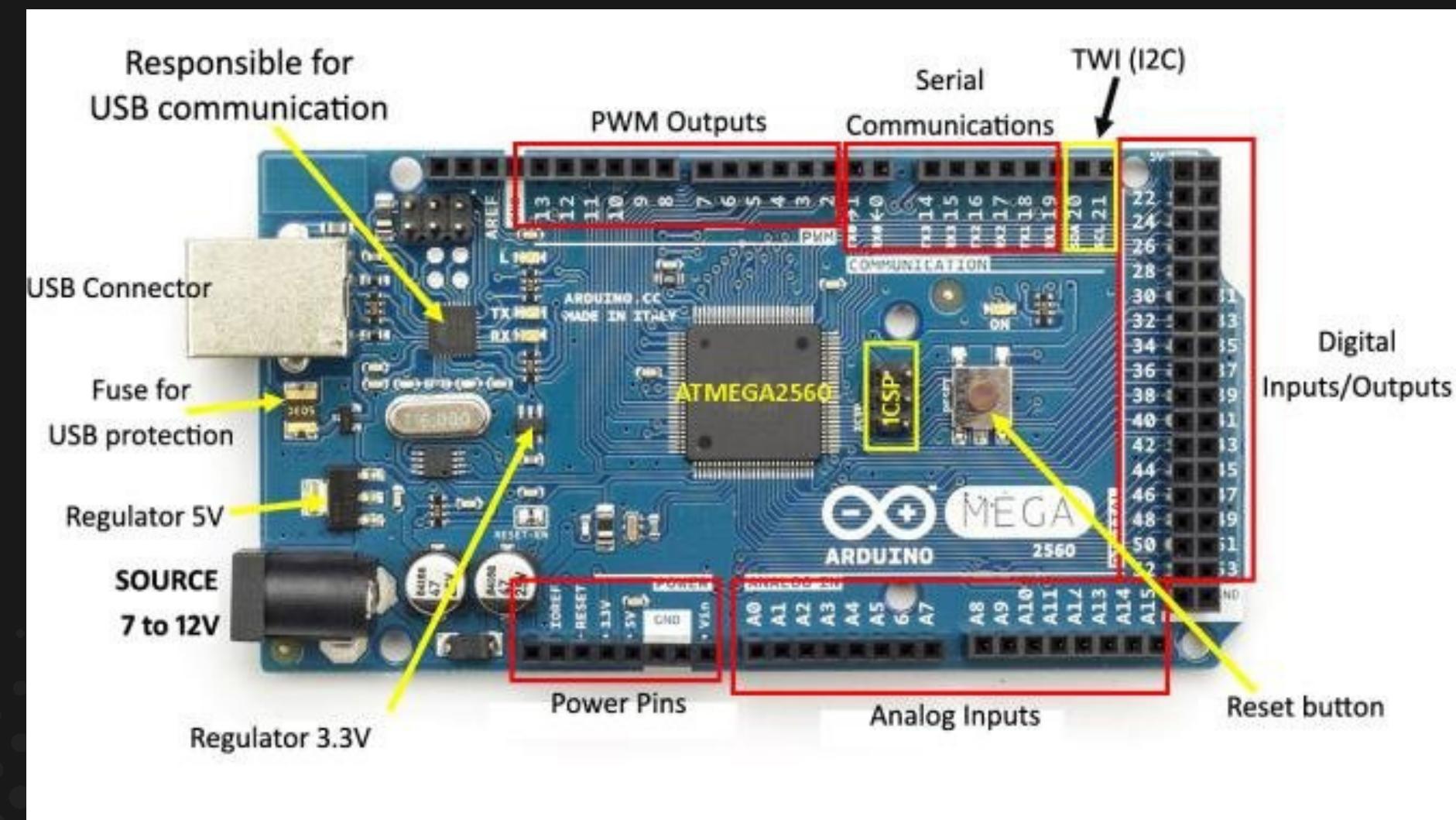
- The Diagram
- Arduino Mega
- Raspberry PI 4
- Ultrasonic Sensor
- L298N Motor Driver
- Raspberry Pi 4 Camera
- DC Motor
- Servo Motor
- Battery
- Power Circuit
- Gyroscope

THE DIAGRAM

- The diagram illustrates how we connect various controllers. It shows how the Arduino controller links up with Ultrasonic sensors, a gyroscope, and a driver for controlling both a DC motor and a servo. Additionally, it demonstrates how the Raspberry Pi controller is connected to a camera for its operation



ARDUINO MEGA



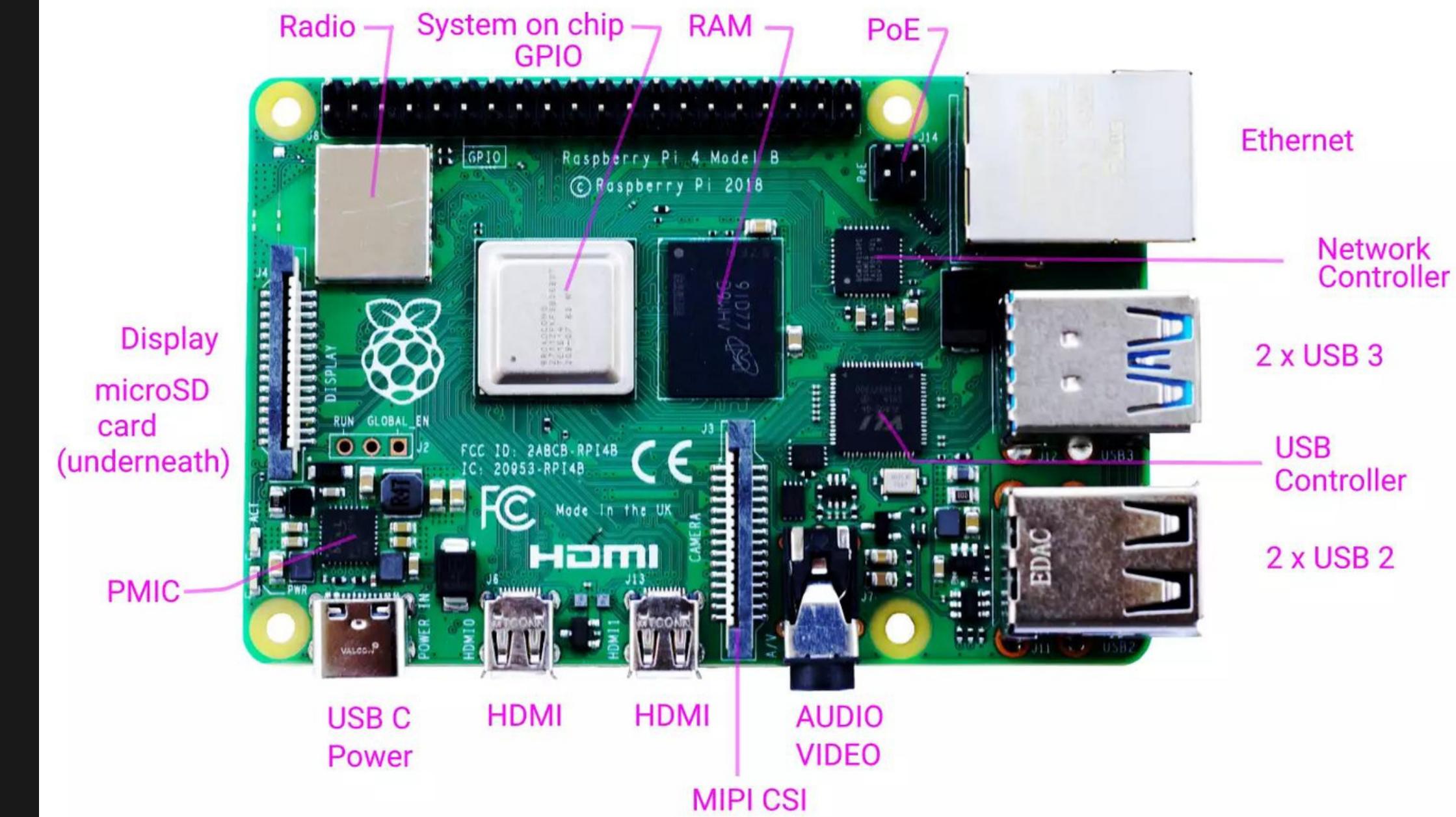
The Arduino microcontroller serves as the central brain for our electronics, with these key functions:

1. Motor Control: It directs the servo and DC motors through a motor driver, controlling how the vehicle moves.
 2. Sensor Data: It reads distance data from various ultrasonic sensors, helping us navigate and avoid obstacles.
 3. Steering Adjustment: The Arduino uses data from a gyroscope to fine-tune steering wheel movements, ensuring the vehicle stays on track.
 4. Raspberry Pi Communication: It communicates with the Raspberry Pi, executing commands and actions as needed for different situations.
 5. User Start: It also detects a push button press, allowing users to easily start the vehicle.
- Additionally, we can opt for the Arduino Mega for added computational power and versatility

RASPBERRY PI 4

The Raspberry Pi controller serves three primary functions:

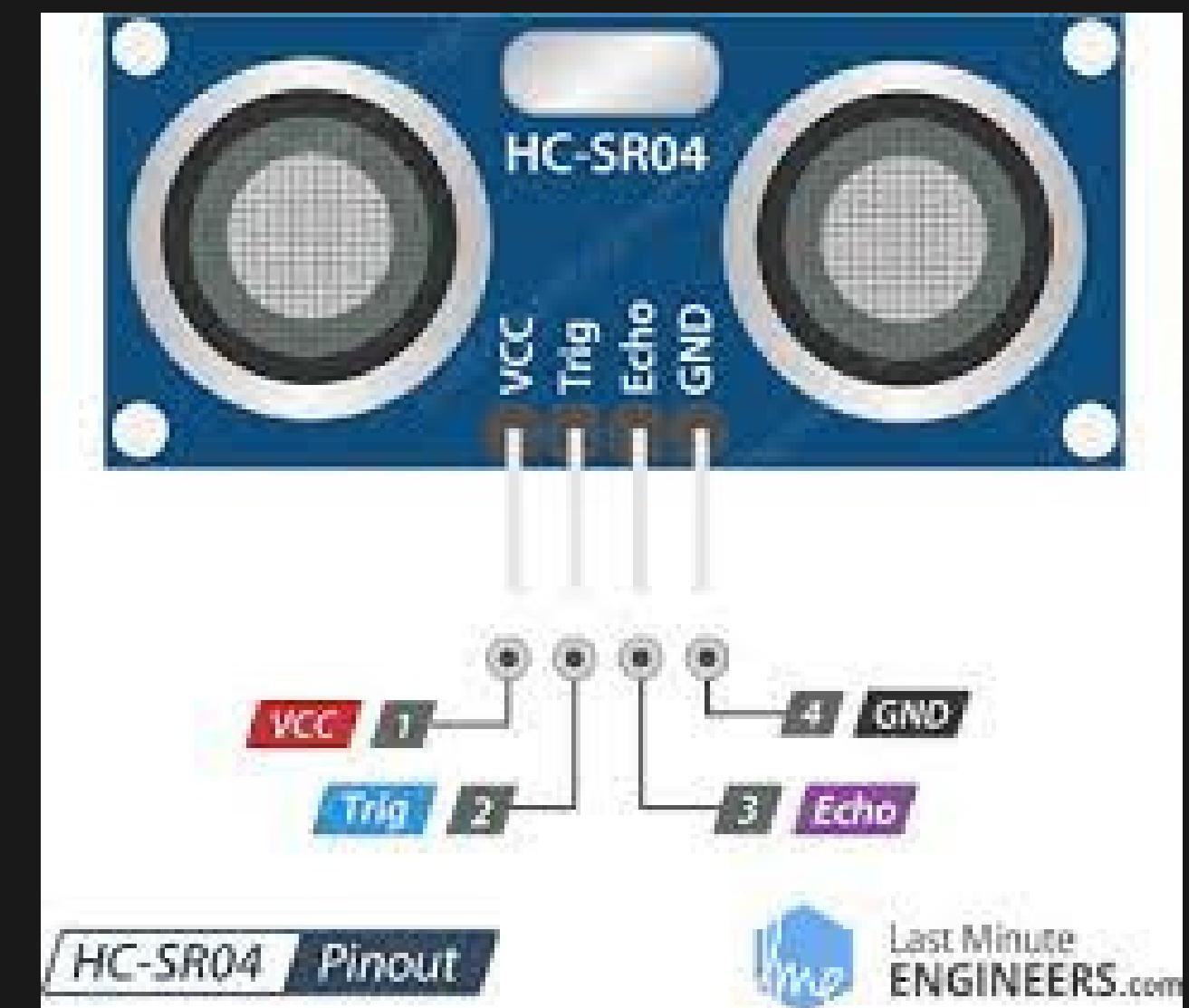
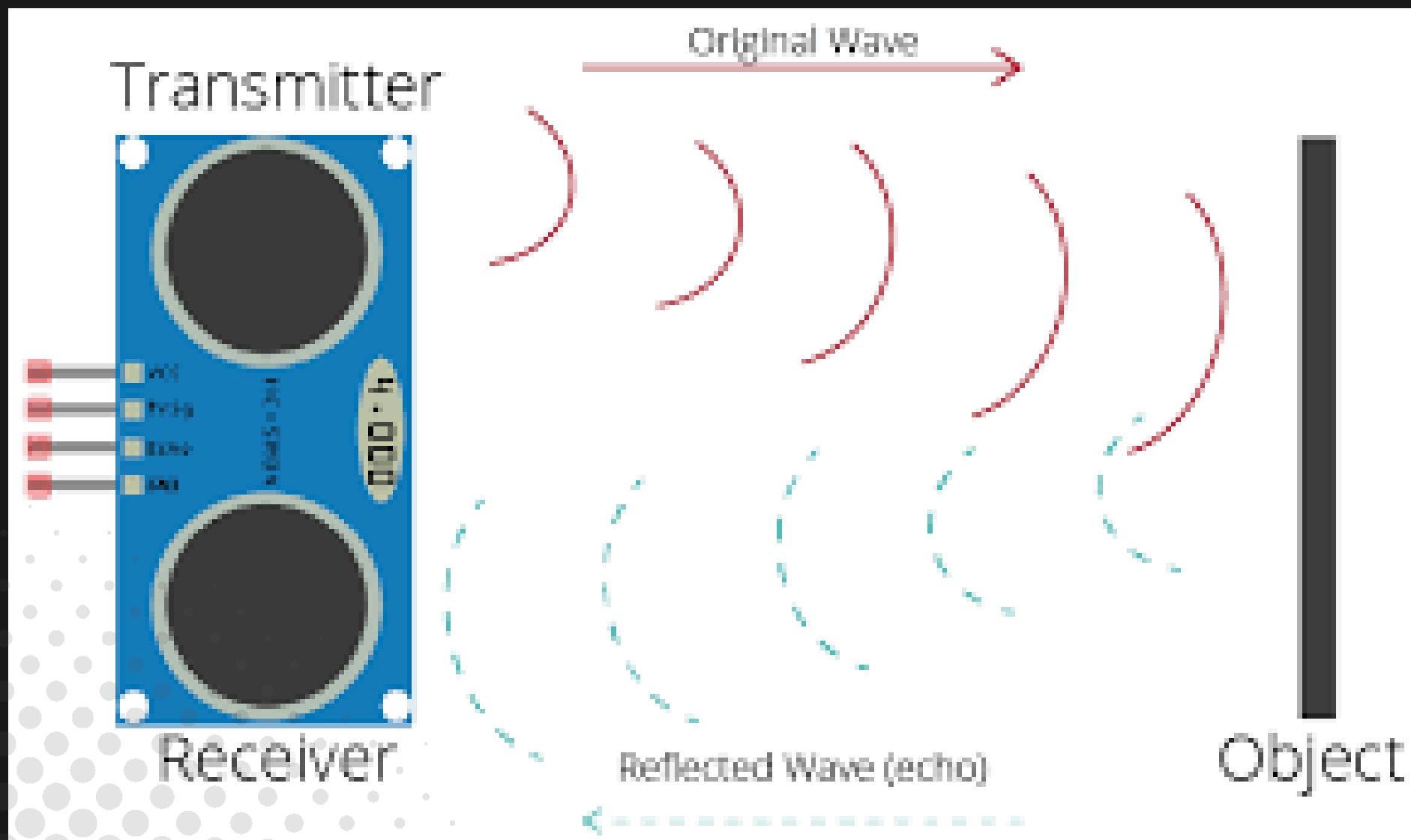
1. Initially, it's employed for programming the Arduino MEGA microcontroller.
2. Secondly, it's utilized to capture and process camera data using Python, which is integrated into its operating system.
3. Lastly, it sends commands to the Arduino controller based on the camera's recognition of pillars by their color.





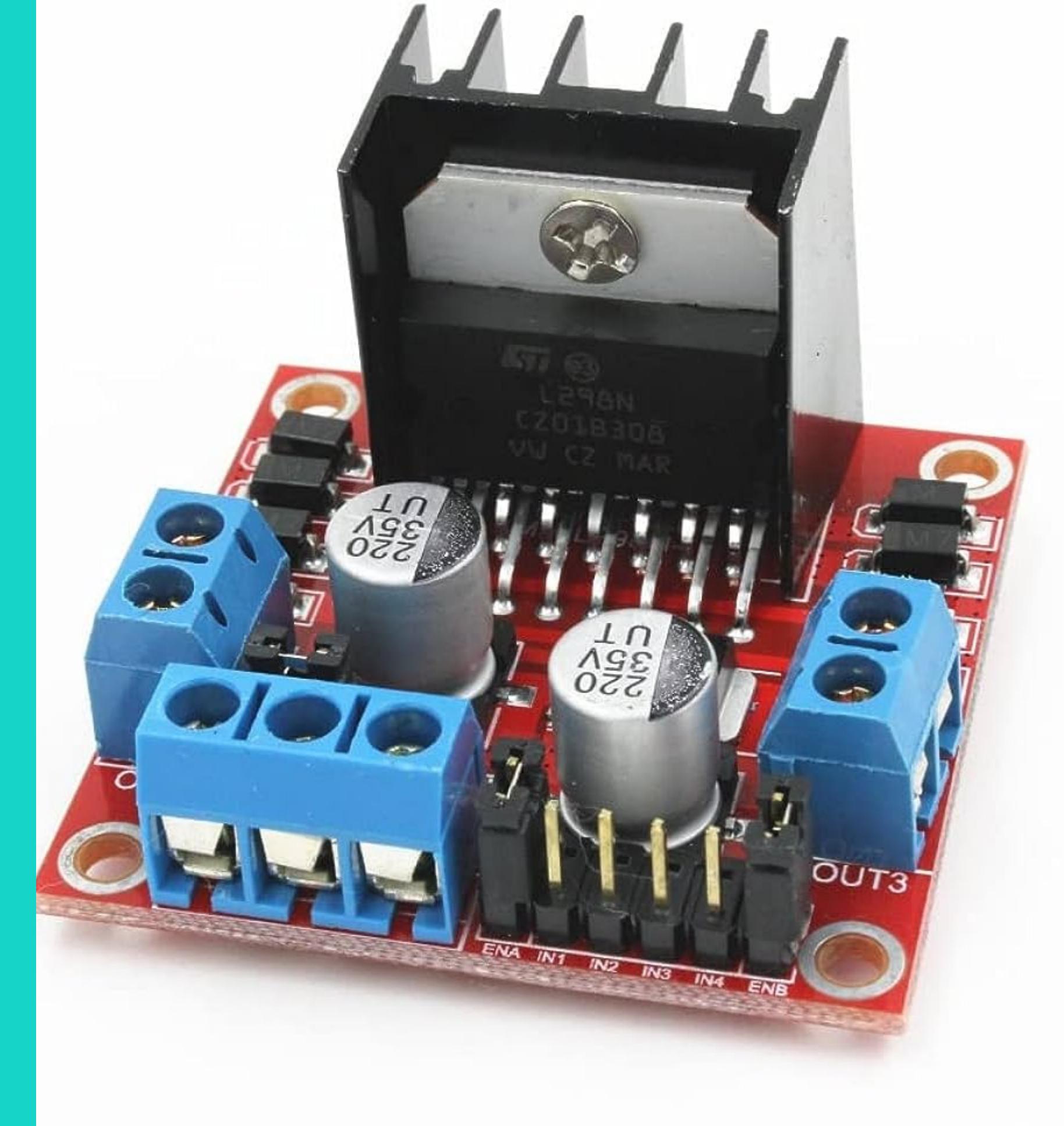
ULTRASONIC DISTANCE SENSOR

The Ultrasonic Distance Sensor system comprises five sensors: one for the front, two for the sides, and two for the back right and the back left. These sensors play a crucial role in ascertaining both the vehicle's direction of movement and various other factors.



• L298N MOTOR • DRIVER

The L298N Motor Driver is employed for regulating the speed of the DC motor, facilitating both forward and reverse movement, while also managing the motion of the servo motor.



RASPBERRY PI CAMERA

The system features an 8-megapixel camera connected to a Raspberry Pi controller.



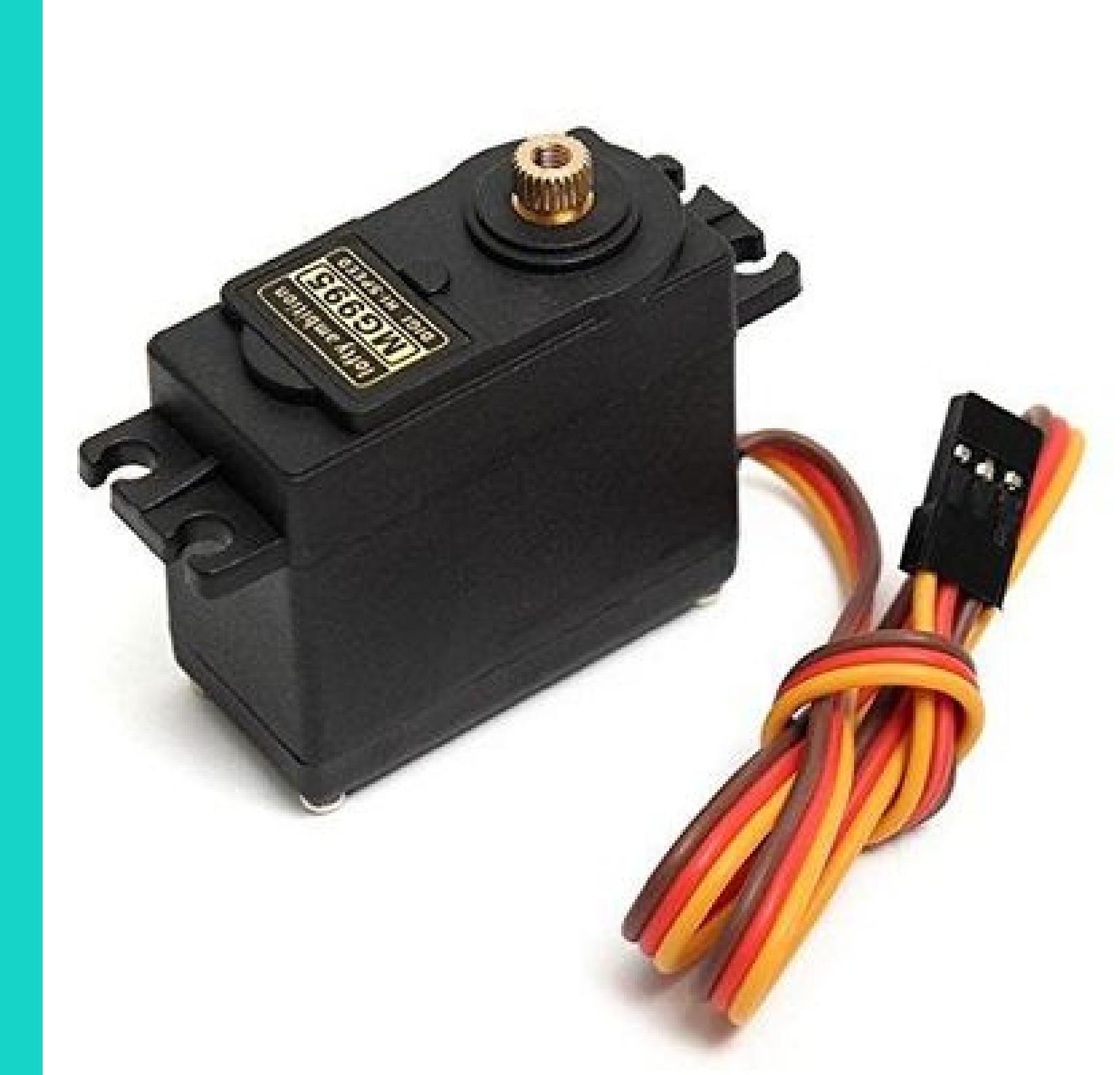
DC MOTOR

The DC motor is mechanically linked to the rear wheels to propel the vehicle.



• SERVO MOTOR :

The servo motor is employed to manage the vehicle's steering direction by rotating the steering wheel.



BATTERY 12V

The battery serves as the power source for the vehicle, comprising a series connection of three lithium batteries with an internal voltage regulator set at 12 volts. It is specifically dedicated to supplying power to the DC motor.

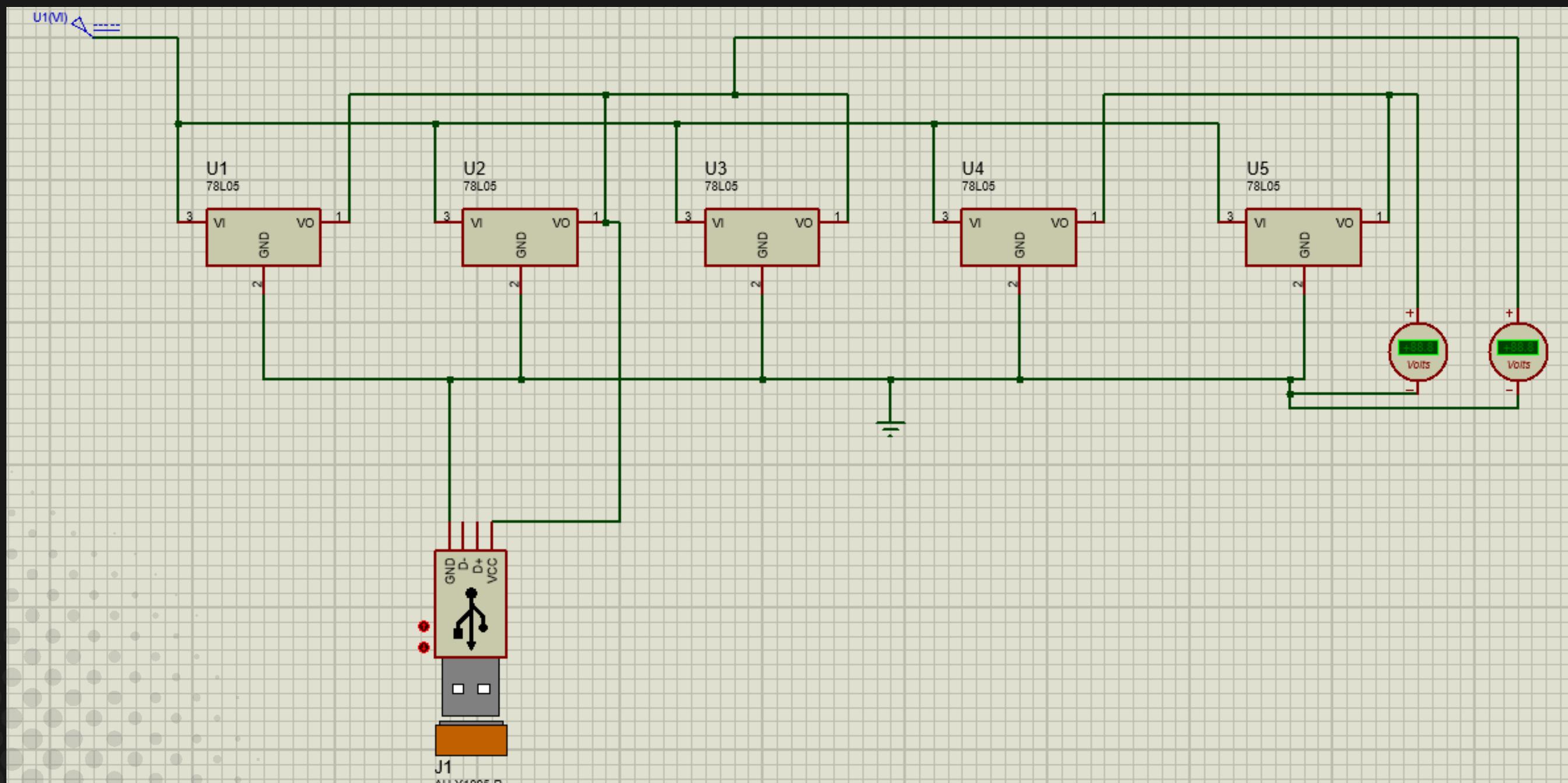


BATTERY 5V

The second battery functions as the dedicated power source for various vehicle components. It consists of lithium batteries, each equipped with an internal voltage regulator set to 5 volts. This specific configuration is intended to provide power to critical components such as the Raspberry Pi 4, Arduino Mega, and other essential elements of the vehicle's electronic system.

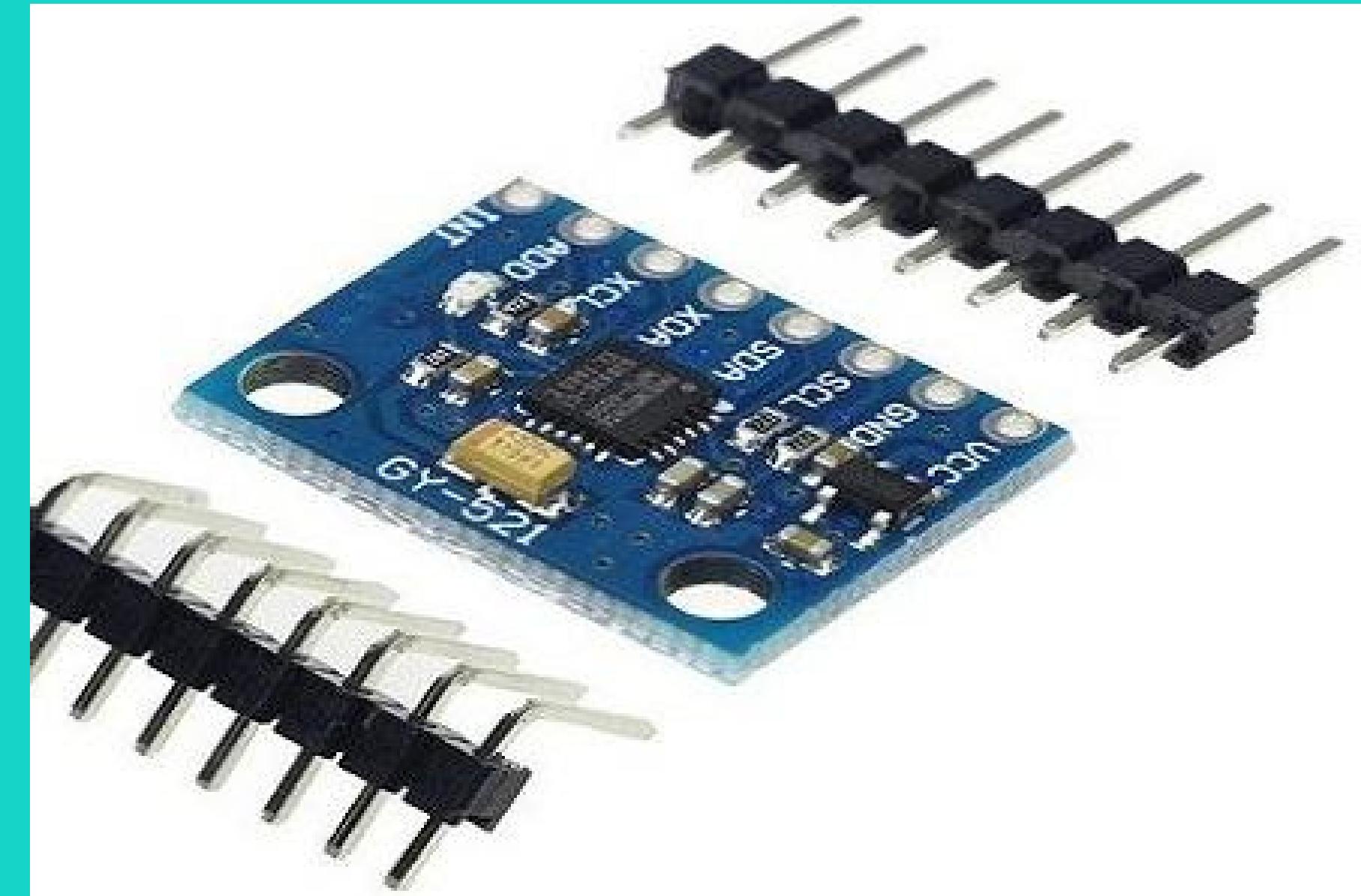
POWER CIRCUIT

This component functions as a transformer, adapting the 12-volt battery's power into the precise voltage and current needed for the sensors and Raspberry Pi. It comprises an integrated circuit (IC) and capacitors that effectively control and stabilize the power output.



Gyroscope

The gyroscope is designed for determining the initial angle, starting from zero degrees, and it calculates any alterations in this angle. This functionality aids in the control of the vehicle's motion.



THANK YOU



MARS

made by : rayan and adam