Autonomous Robot

Theory

https://github.com/bandasaikrishna/Autonomous_Mobile_Robot.git

https://www.youtube.com/watch?v=Uz_i_sjVhIM

https://www.flipkart.com/invento-2pcs-80mm-x-25mm-plastic-robotic-wheel-durable-rubber-tire-6mm-hole-automotive-electronic-hobby-kit/p/itmc61c2e4e29fcb?pid=EHKGJZTSTXHUW4SD&lid=LSTEHKGJZTSTXHUW4SDL4GKB6&marketplace=FLIPKART&fm=productRecommendation1d55-11f0-87bf-73a945bf21de%3B.EHKGJZTSTXHUW4SD&ppt=pp&ppn=pp&ssid=pum5k0jcg000000017450912453 29&otracker=pp_reco_all&cid=EHKGJZTSTXHUW4SD

https://www.flipkart.com/invento-4-wheel-car-kit-metal-chassis-260×130×45mm-1000-rpm-dc-motor-80×25-mm-automotive-electronic-hobby/p/itme9dfe7ea2dd92

Hardware Connections 1:

Component	Connects To
Motor A Red	L298N OUT1
Motor A White	L298N OUT2
Motor B Red	L298N OUT3
Motor B White	L298N OUT4
L298N IN1	Arduino D6 (LEFT_BACKWARD)
L298N IN2	Arduino D10 (LEFT_FORWARD)
L298N IN3	Arduino D9 (RIGHT_FORWARD)
L298N IN4	Arduino D5 (RIGHT_BACKWARD)
L298N ENA	Arduino D13 (LEFT_ENABLE)
L298N ENB	Arduino D12 (RIGHT_ENABLE)
Encoder A Green	Arduino D2
Encoder A Yellow	Arduino D3
Encoder B Green	Arduino A4
Encoder B Yellow	Arduino A5
Encoder Vcc (Blue)	Arduino 5V
Encoder GND (Black)	Arduino GND
L298N GND	Arduino GND
L298N 12V	12V Battery or Power Source

You have:

- **Arduino Uno**
- **L298N Motor Driver**
- **2x Rhino GB37 12V 60RPM Motors with Encoders (6 wires each)**

📦 Encoder Wires (per motor):

Wire Color	Function	Connect To
Red	Motor + (M1)	L298N Motor Output
White	Motor - (M2)	L298N Motor Output
Yellow	Encoder B (C2)	Arduino Digital Pin
Green	Encoder A (C1)	Arduino Digital Pin
Blue	Vcc (5V)	Arduino 5V
Black	GND	Arduino GND

🔌 Step 1: Motor to L298N Connections

You'll connect each motor's **Red and White** wires to the **OUT terminals** of the L298N motor driver:

Motor A (Left motor):

- Red → **L298N OUT1**
- White → **L298N OUT2**

Motor B (Right motor):

- Red → **L298N OUT3**
- White → **L298N OUT4**

⚡ Step 2: L298N to Arduino (based on `motor_driver.h`)

From the README:

Arduino Pin	L298N Pin
5	RIGHT_MOTOR_BACKWARD
6	LEFT_MOTOR_BACKWARD
9	RIGHT_MOTOR_FORWARD
10	LEFT_MOTOR_FORWARD
12	RIGHT_MOTOR_ENABLE
13	LEFT_MOTOR_ENABLE

So connect:

- Arduino D5 → L298N IN4
- Arduino D6 → L298N IN1
- Arduino D9 → L298N IN3
- Arduino D10 → L298N IN2
- Arduino D12 → L298N ENB (Right Motor Enable)
- Arduino D13 → L298N ENA (Left Motor Enable)

> ⚠️ Note: Some L298N boards have jumper caps on ENA/ENB. If they are present, remove them to control via Arduino pins.

🧭 Step 3: Encoder Signal Connections

From the README for **on-board encoder counter** (no RoboGaia):

Left Motor Encoder:

- Green (C1) → Arduino D2 (INT0)
- Yellow (C2) → Arduino D3 (INT1)

Right Motor Encoder:

- Green (C1) → Arduino A4
- Yellow (C2) → Arduino A5

Also:

- Blue (Vcc) → Arduino 5V
- Black (GND) → Arduino GND

🧪 Step 4: Power Supply

- Power L298N with 12V input (your motors are 12V rated).
- Connect **GND of L298N** to **GND of Arduino**.
- **Do NOT power motors from Arduino 5V** — only use Arduino 5V for the **encoders**, not the motors.

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