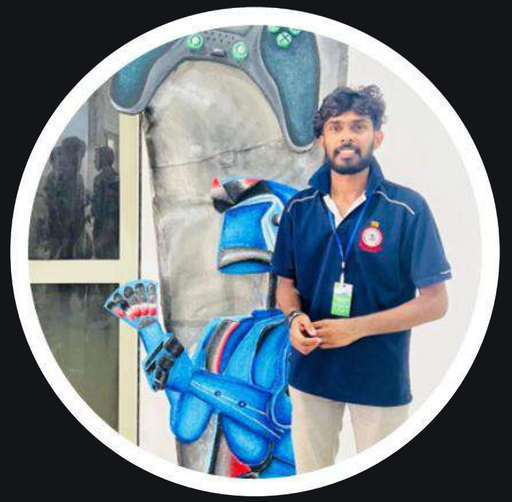
Remote Control Car With Cutting Wheel

Electrical and Electronics Engineering
HNDE - Labuduwa

Presented by Group No o5

Our Team Members

A.M.A.Sanjula
GAL/EE/2021/F/0089

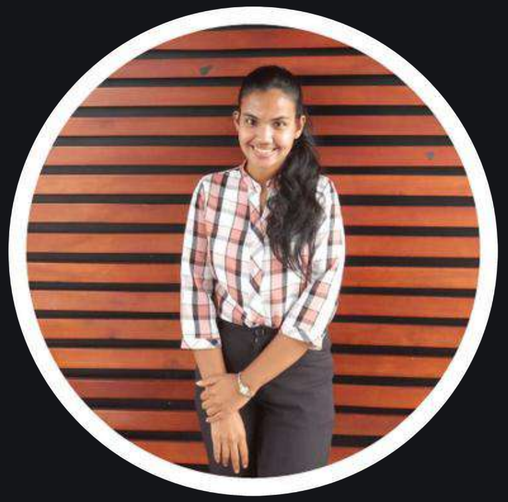


A.I.N.Hatharasinghe
GAL/EE/2021/F/0066

A.D.Madushan
GAL/EE/2021/F/0113

J.W.S.Lakshitha
GAL/EE/2021/F/0043

D.K.M.Y.Rathnasena
GAL/EE/2021/F/0097



M.G.D.Poornima
GAL/EE/2021/F/0011

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Introduction

1 Wireless Control

Controlled via Wi-Fi or Bluetooth using the ESP32

2 Cutting Edge

The cutting wheel adds an offensive capability for competitive robotic combat.

3 High Performance

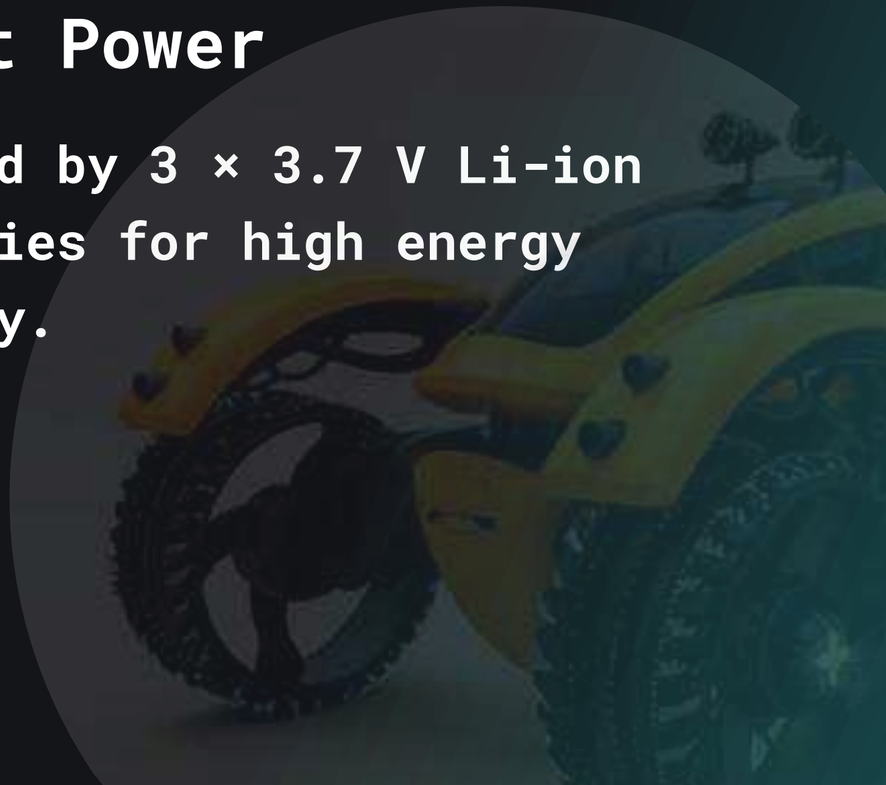
Uses high-speed motors for battle maneuvers.

4 Smart Power

Powered by 3 × 3.7 V Li-ion batteries for high energy density.

5 Durable Build

Strong chassis and balanced weight for stability.



Key Features and Capabilities

High-Speed Drive

- Rapid acceleration and smooth turns in battle.

Durable Frame

- Built with strong metal or fiber board to resist impacts.

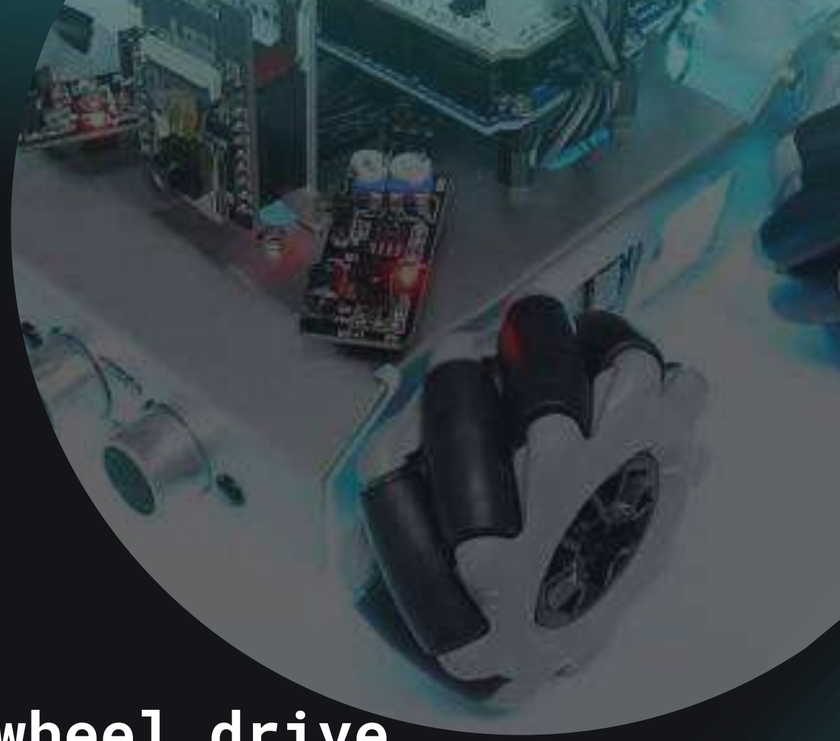
Smart Wireless Control

- ESP32 provides dual Wi-Fi + Bluetooth connectivity.

Compact Design

- Lightweight body for better control and agility.

Components



1. Microcontroller - ESP32
2. Motor Drive - L298N
3. Motors - TT DC gear motors for wheel drive
4. Power Source - 3 × 3.7 V Li-ion batteries
5. Chassis - Metal or acrylic base plate

ESP32 Microcontroller

Dual Core MCU

- Provides fast processing for motor control and communication.

GPIO Control

- Controls direction, speed, and sensors.

Wi-Fi + Bluetooth

- Enables flexible remote operation.

Compact Design

- Its easily on small robotic platforms.

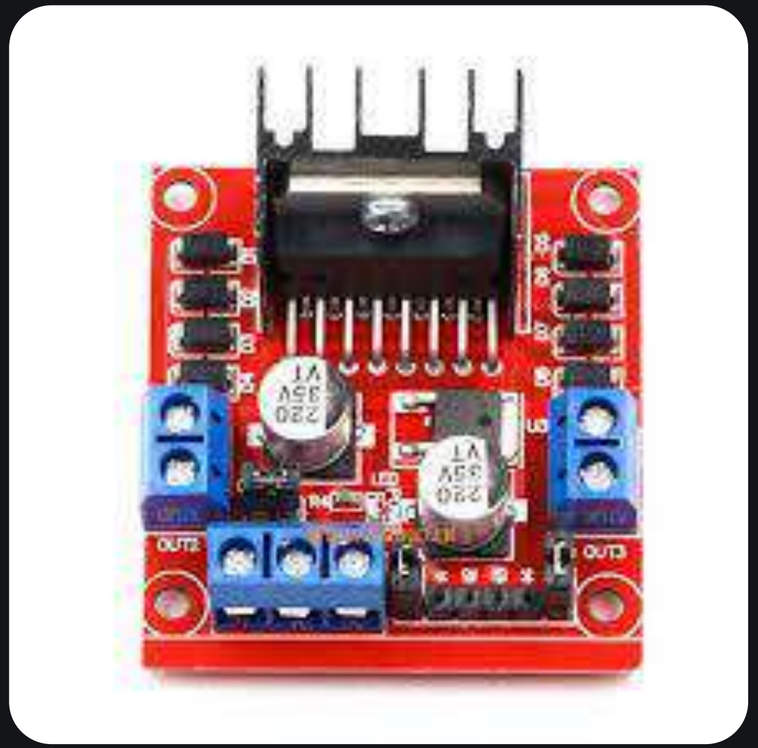
Motor Driver (L298N)

H-Bridge Control

- Allows forward and reverse rotation.

Dual Channel

- Drives two DC motors independently.



Over-Current Protection

- Prevents motor overload.

Simple Interface

- Controlled easily with ESP32 pins.

Power System

Battery Pack

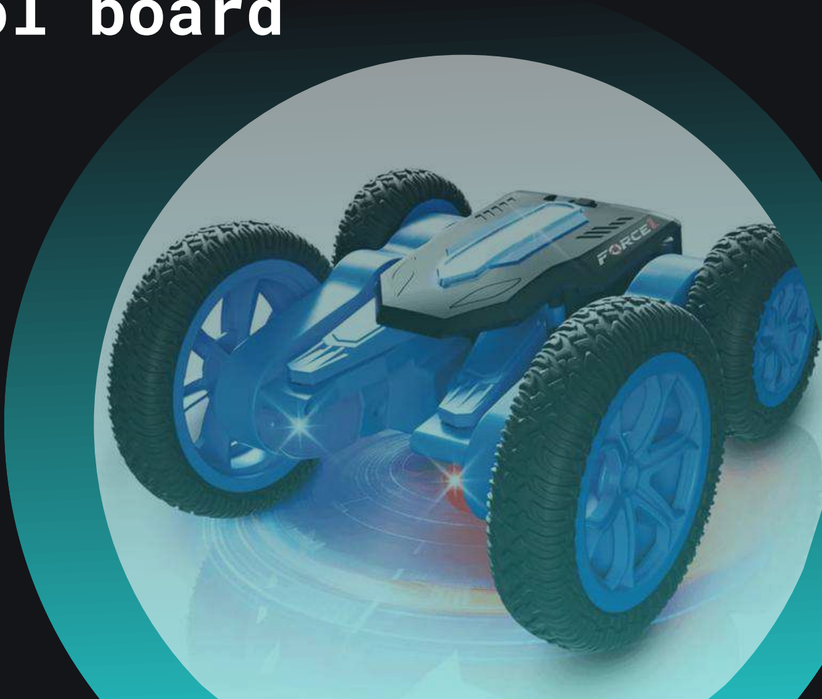
- 3 × 3.7 V Li-ion cells (≈ 11.1 V total)

Efficient Power Supply

- Delivers stable current for motors and control board

Charging Circuit

- Optional BMS for safe charging and discharging



Gear Motors and Drive System

High Torque TT DC Gear Motors

- **Provide strong rotation and mobility**

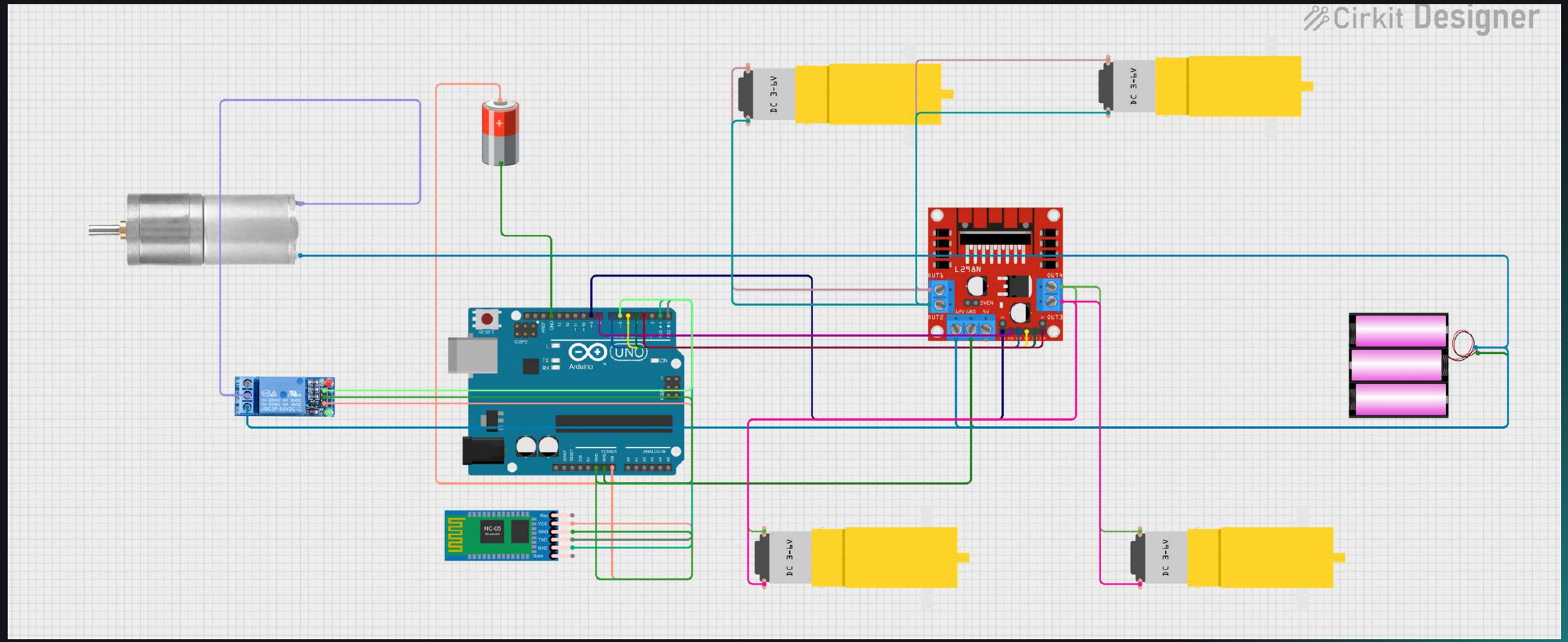
Chassis Integration

- **Balanced design for equal weight distribution**

Wheel System

- **Offers traction and control during battle**

Circuit Design



BT Car Controller App Interface

Control Functions:

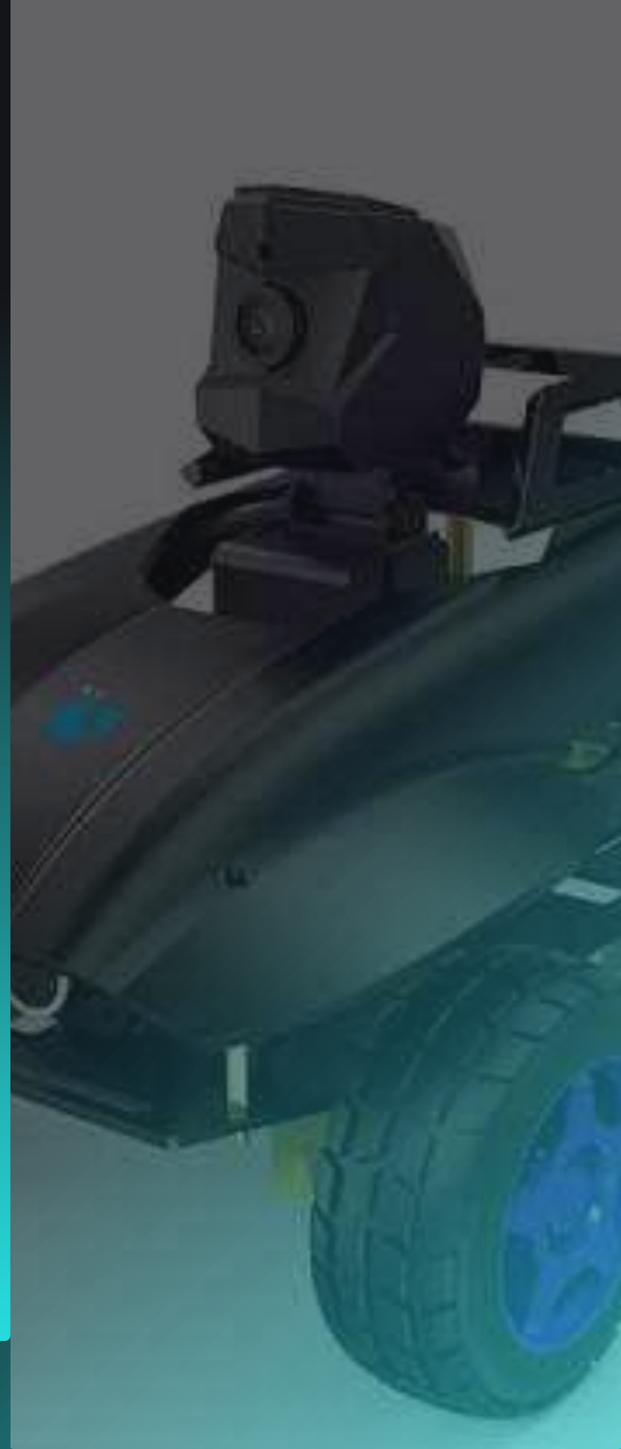
- Forward: Moves the robot car ahead.
- Backward: Moves the robot car in reverse.
- Left: Turns the robot to the left.
- Right: Turns the robot to the right.
- Wheel ON: Starts the cutting wheel motor.
- Wheel OFF: Stops the cutting wheel motor.

Methodology

1. Assemble ESP32 with L298N and motor connections
2. Configure power supply from Li-ion pack
3. Upload control code to ESP32
4. Connect via Bluetooth
5. Test robot in battle arena

Future Development

- Autonomous Mode : Add sensors for obstacle detection and AI navigation.
- Weapon System : Add rotating blades or electromagnetic pushers.
- Camera Module : FPV view via ESP32-CAM.
- Battery Monitoring: Real-time voltage display for safety.



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Q & A Session


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