# GESTURE DRIVE

# INTRODUCTION

Embark on an innovative journey with a hand gesture-controlled car project, seamlessly integrating Arduino Nano, GY-521 gyroscope, NRF24L01 wireless modules, and an L298N Motor Drive.

The transmitter captures hand gestures through the gyroscope and transmits wireless commands via NRF24L01. On the receiver side, an Arduino Nano and L298N decode gestures, translating them into motor control for the car.

This compact project not only showcases an interactive fusion of sensor technology and wireless communication but also opens avenues for creative customization in the exciting realm of gesture-based vehicle manipulation.

# OBJECTIVES

The project aims to create a hand gesture-controlled car using Arduino Nano, GY-521 gyroscope, NRF24L01 wireless modules, and L298N Motor Drive.
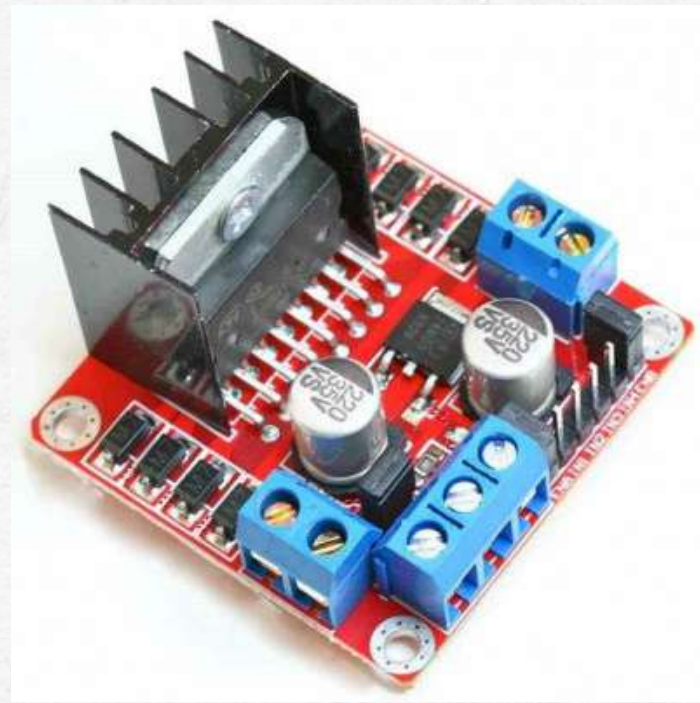
Objectives include accurate gesture recognition, reliable wireless communication, seamless hardware integration, precise motor control, and fostering a foundation for further exploration and customization in gesture-based vehicle manipulation.
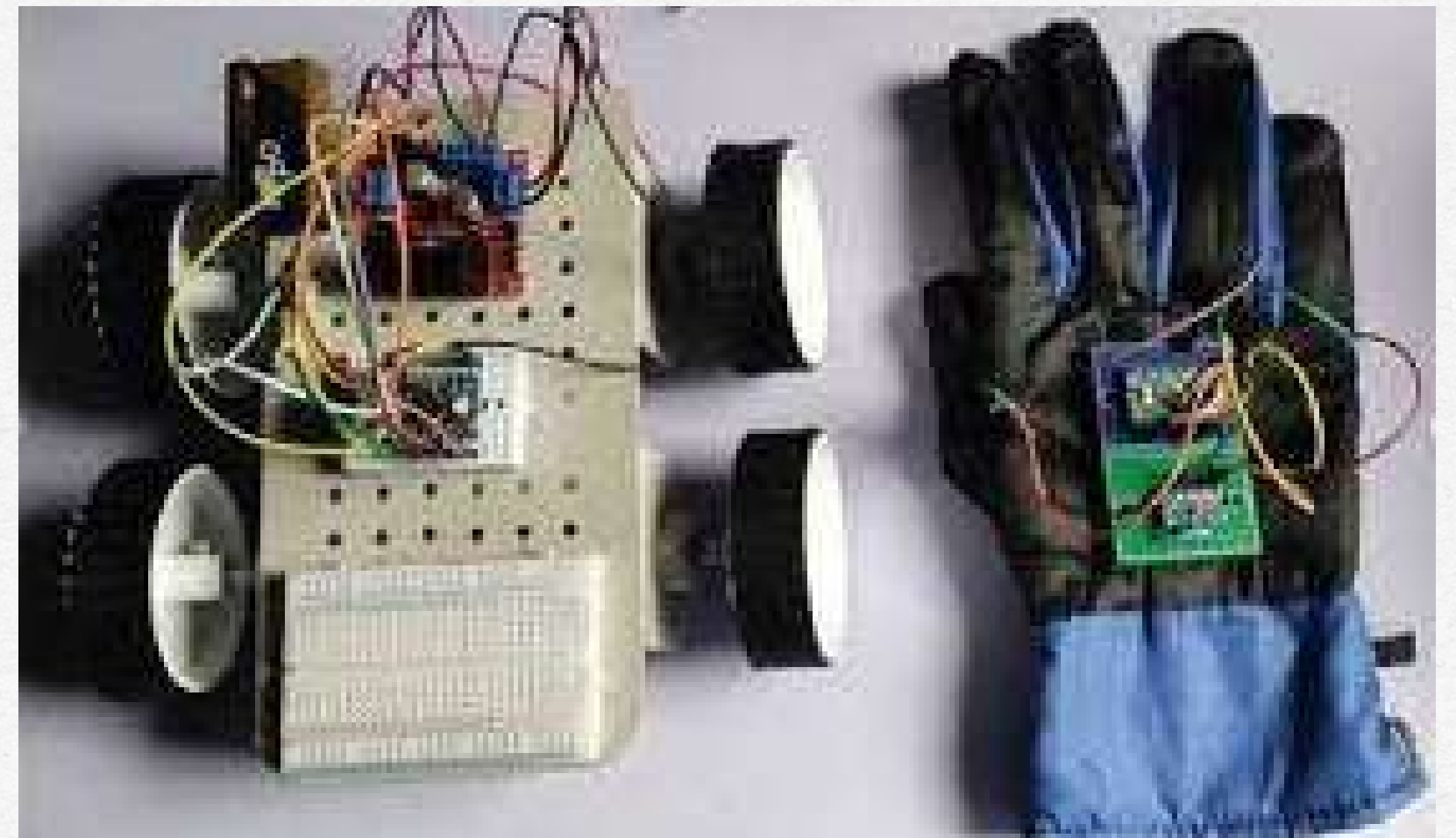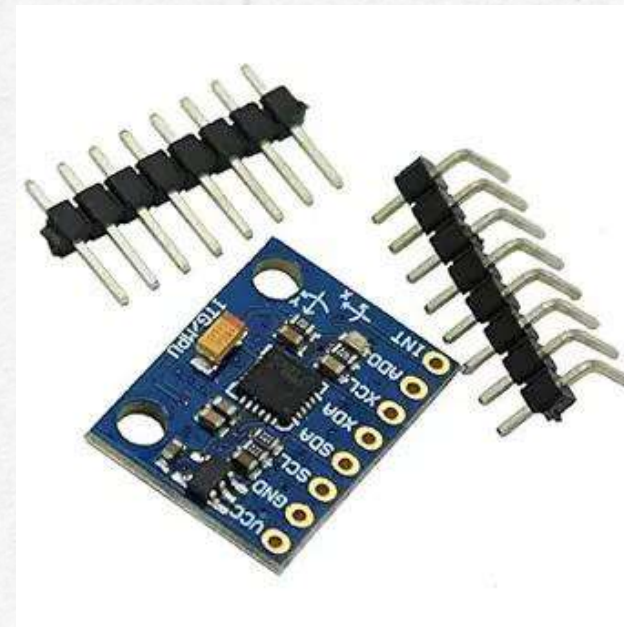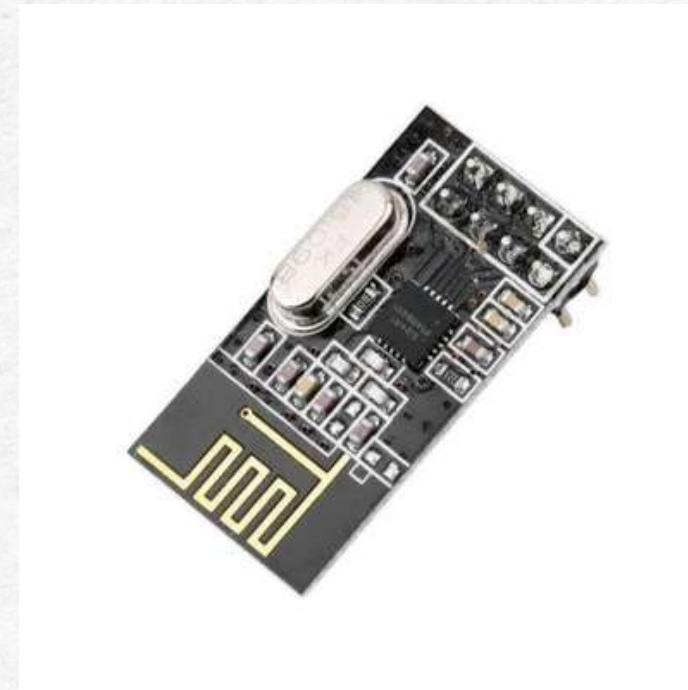
# COMPONENTS USE
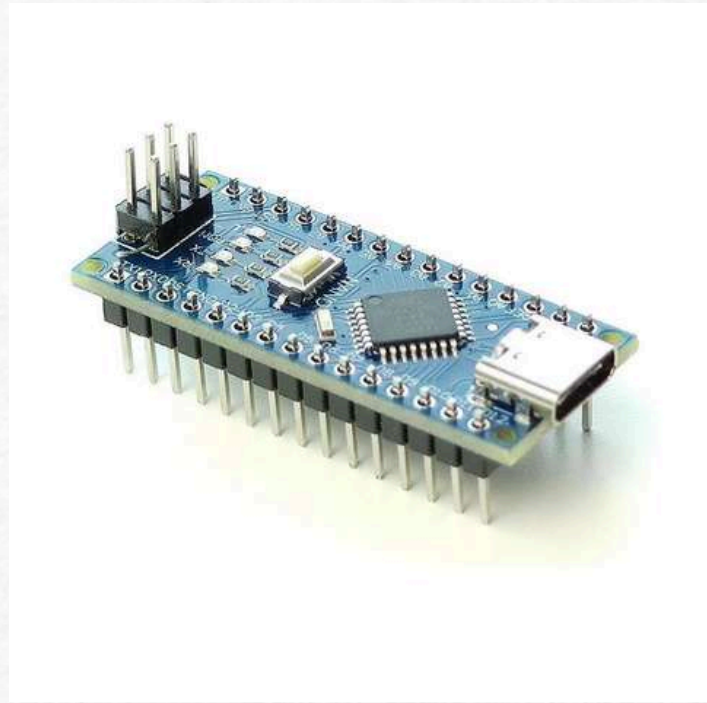
Arudino Nano

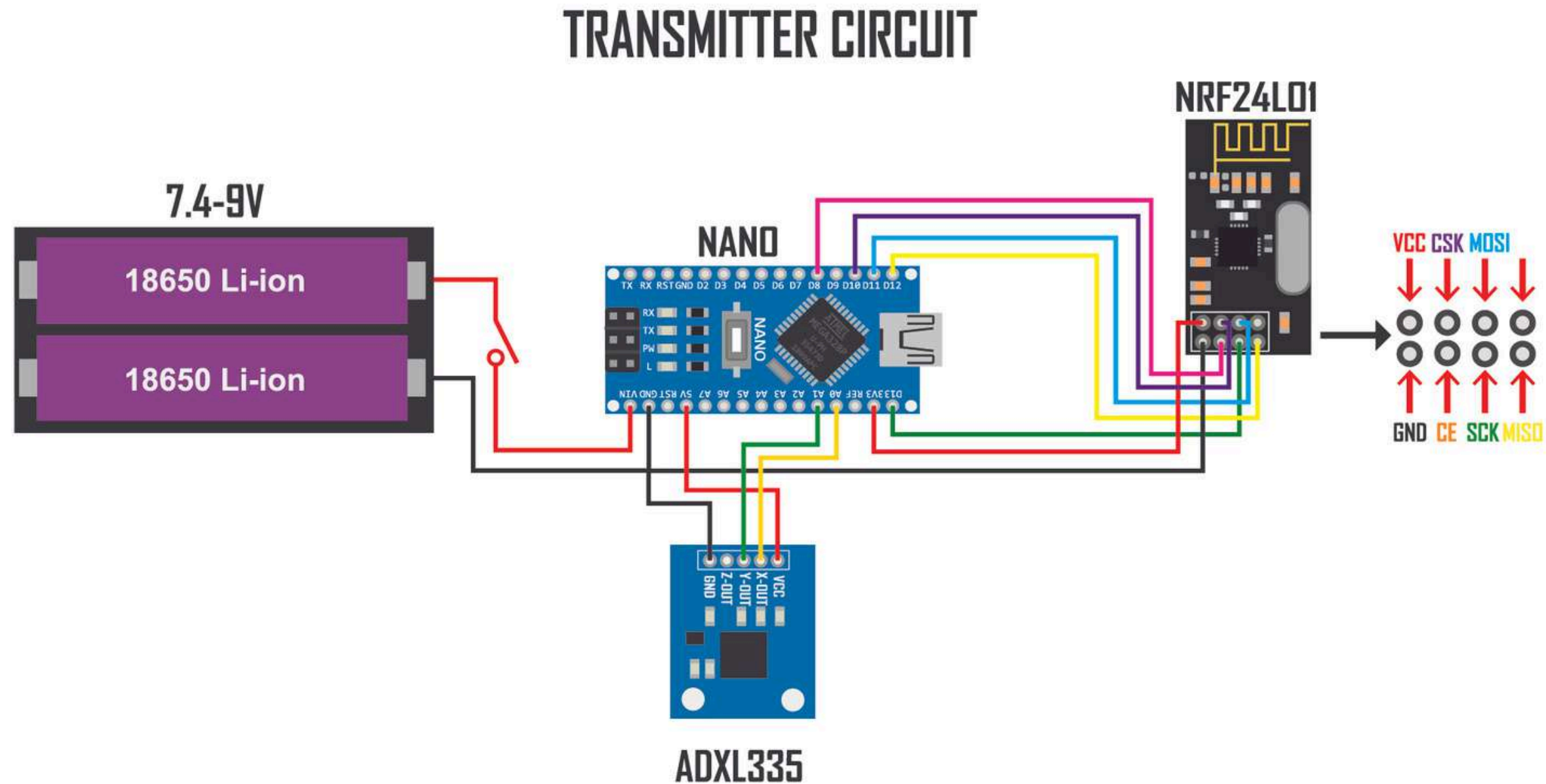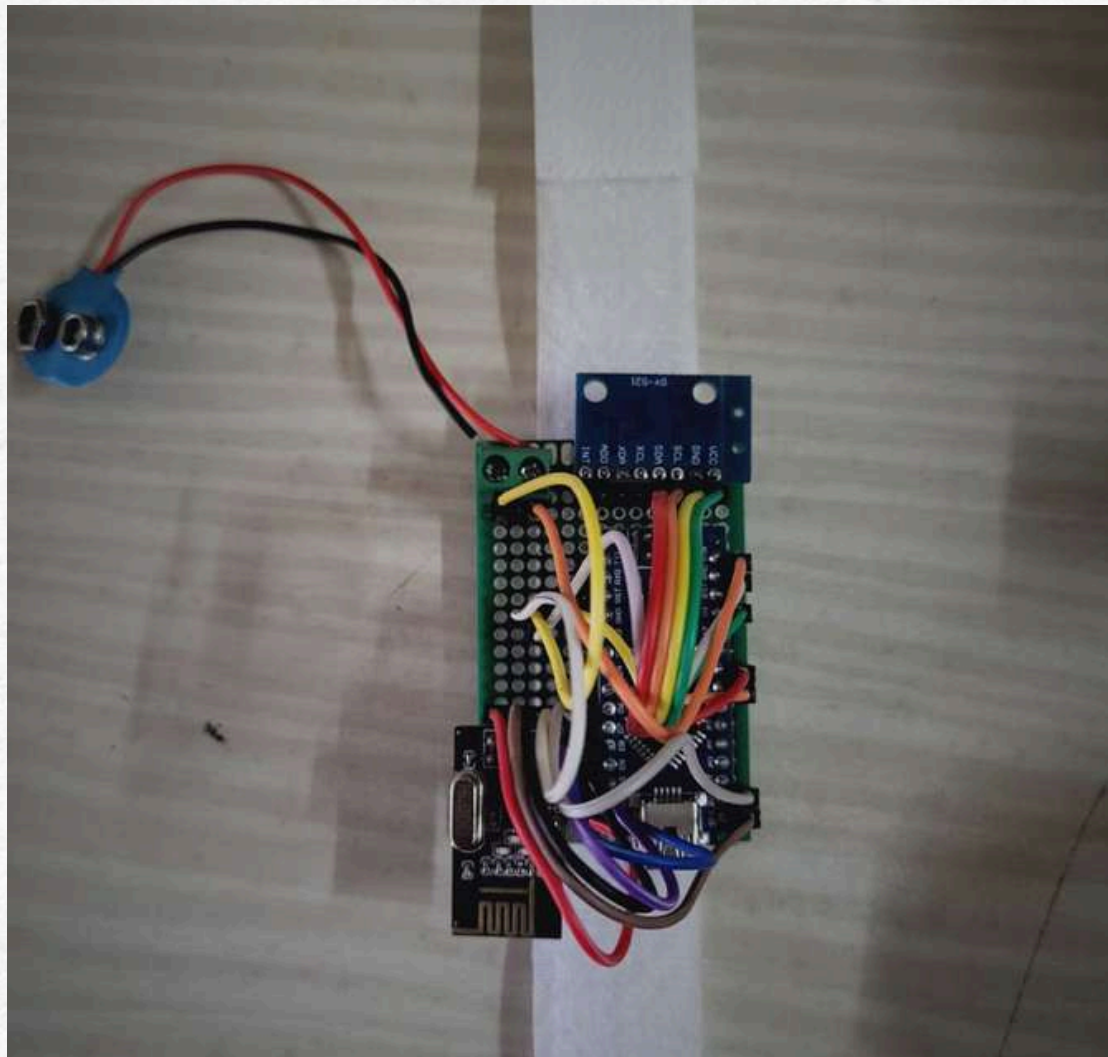L298N Motor Drive

GY - 521

NRF24L01 Module

Lithium Ion Battery

# TRANSMITTER CIRCUIT



TRANSMITTER CIRCUIT

NRF24L01

7.4-9V

18650 Li-ion

18650 Li-ion

NANO

VCC CSK MOSI

GND CE SCK MISO

ADXL335

DIY Builder

ARDUINO GESTURE CONTROL ROBOT

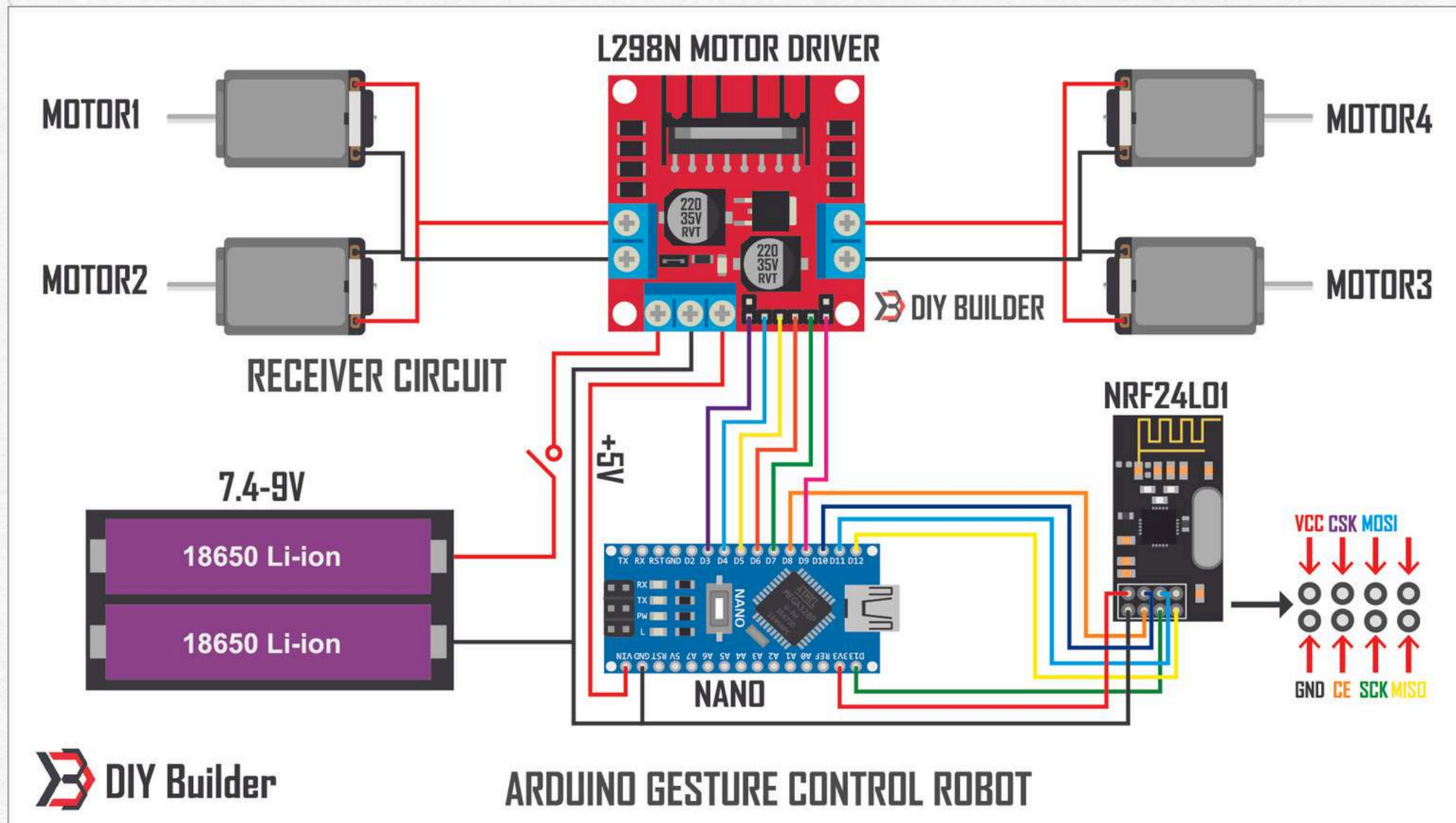# TRANSMITTER



```
#include<SPI.h>
#include<nRF24L01.h>
#include<RF24.h>

const int x_out = A0;
const int y_out = A1;
RF24 radio(8,10);
const byte address[6] = "00001";
struct data{
int xAxis;
int yAxis;

};
```
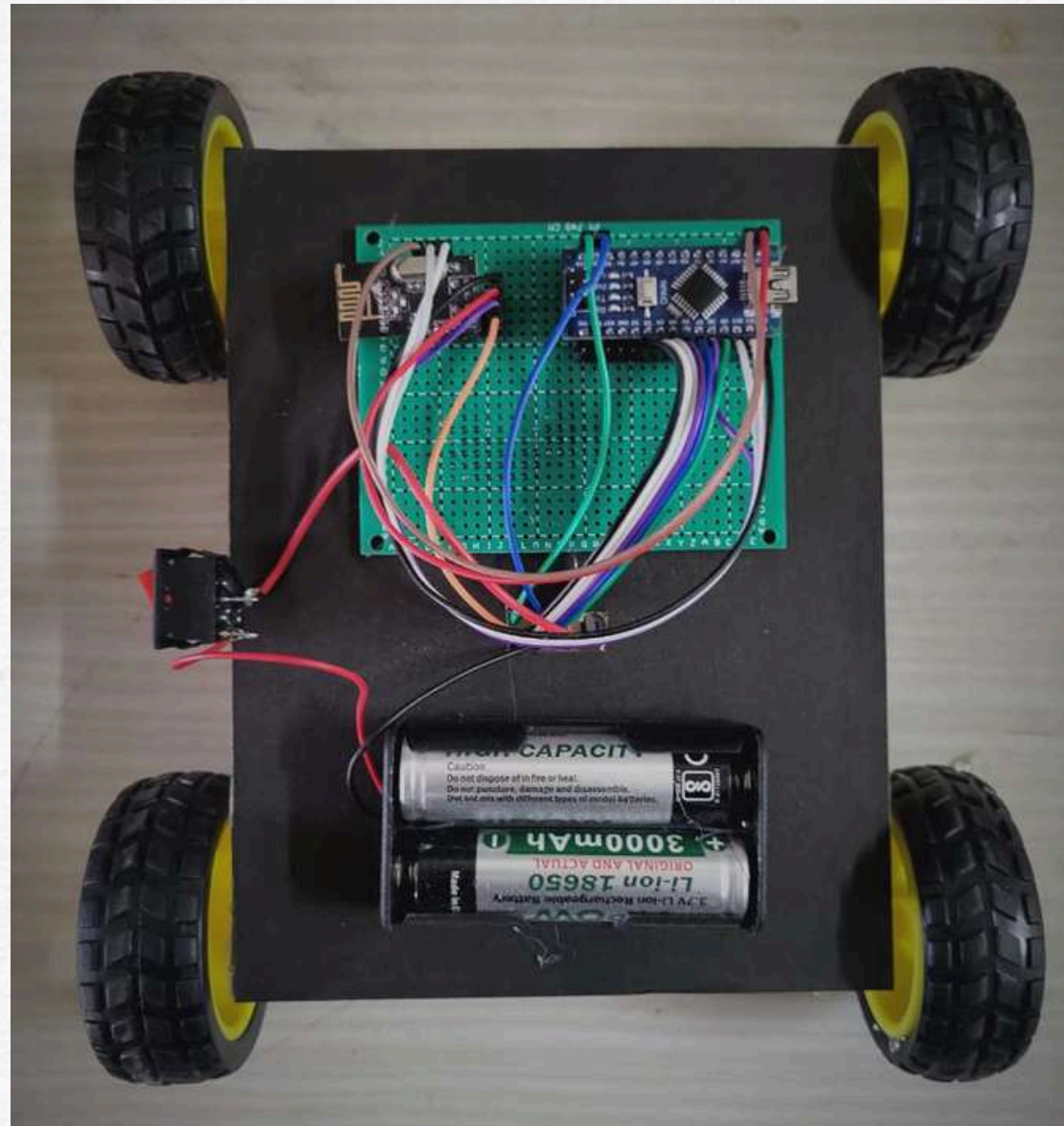
# RECIVER CIRCUIT



RECIVER CIRCUIT

# RECIVER



```
#include<SPI.h>
#include<nRF24L01.h>
#include<RF24.h>

int ENA = 3;
int ENB = 9;
int MotorA1 = 4;
int MotorA2 = 5;
int MotorB1 = 6;
int MotorB2 = 7;

RF24 radio(8, 10);

const byte address[6] = "00001";

struct data {
    int xAxis;
    int yAxis;

};
```

# ADVANTAGES

Intuitive Control: Users can control the car's movements naturally through hand gestures, providing an intuitive and interactive experience.

Wireless Convenience: NRF24LO1 wireless modules facilitate seamless communication between the transmitter and receiver, eliminating the need for physical connections.

Innovative User Interface: Gesture recognition based on the gyroscope enables a unique and innovative user interface, demonstrating the potential for creative applications of sensor technology.

Expandability: The project lays the groundwork for further customization, encouraging exploration and development in the domain of gesture-based vehicle control.

Real-time Responsiveness: Precise motor control ensures real-time responsiveness to recognized gestures, enhancing the overall user experience.

# FUTURE ASPECTS

Advanced Gesture Recognition: Continuous advancements in sensor technology may lead to more sophisticated gesture recognition algorithms, enabling the detection of a broader range of gestures with increased accuracy.

Integration with AI: Integration with artificial intelligence (AI) algorithms could enhance the system's ability to learn and adapt to users' unique gestures, making the interaction even more personalized and intuitive.

Gesture-Based Interfaces in Vehicles: This technology may extend beyond hobbyist projects to influence the development of gesture-based interfaces in mainstream automotive applications, potentially revolutionizing how users interact with vehicles.

IoT Connectivity: Integration with the Internet of Things (IoT) could allow remote control and monitoring of the car, opening avenues for enhanced functionality and connectivity.

Educational Tool: Similar projects could serve as educational tools, inspiring students and enthusiasts to explore the intersections of electronics, programming, and human-computer interaction.

# CONCLUSIONS

Innovative Interaction: The hand gesture-controlled car project successfully integrates sensor technology, wireless communication, and motor control, offering an innovative and intuitive means of interacting with the vehicle.

Seamless Hardware Integration: The combination of Arduino Nano, GY-521 gyroscope, NRF24L01 wireless modules, and L298N Motor Drive demonstrates effective hardware integration, providing a robust foundation for future developments.

User-Centric Design: The project prioritizes user experience by allowing users to control the car through natural hand movements, showcasing the potential for more intuitive interfaces in technology.

Customization Potential: With expandability in mind, the project invites further exploration and customization, encouraging enthusiasts to push the boundaries of gesture-based vehicle control.

Future Applications: The project hints at a future where such technologies could influence mainstream automotive interfaces, making gestures a viable and engaging method for interacting with vehicles.

THANK YOU