

# FINAL REPORT

## ECE281- Arduino for The Beginners



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Title:

WI-FI AND HAND GESTURE CAR USING NODE MCU

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# **TITLE**

WI-FI AND HAND GESTURE CAR USING NODE MCU

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Secondly, we would also like to thank our parents and friends who helped us a lot in this project within the limited time frame.

I am thankful and fortunate enough to get constant encouragement, support, and guidance from all teaching staffs of " School of Computer Applications " which helped us in successfully completing our project work.

## **COMPONENTS**

1. Node MCU
2. MPU6050
3. Motor Driver
4. Breadboard
5. Jumper Wires Kit
6. DC Motor
7. 9v Power Supply
8. USB Cable Type A/B

# **INTRODUCTION**

The WI-FI Hand Gesture Car using ESP32 is an innovative and interactive project that combines advanced technologies to create a remote-controlled car controlled by hand gestures. This project leverages the power of the Node MCU (ESP8266) microcontroller with wi-fi module, a versatile and powerful development board, along with components like a motor driver, DC motors and gesture recognition sensor. By integrating these components, the car can be wirelessly controlled using hand gestures, providing a unique and engaging user experience.

The Node MCU (ESP8266) microcontroller serves as the central processing unit, orchestrating the functionality of the car. It communicates with both the gesture recognition sensor, which captures hand movements, and the wi-fi module, which establishes a wireless link between the car and a mobile device. The motor driver interfaces with the ESP8266 to control the movement of the car's wheels, allowing it to move forward, backward, turn left, and turn right in response to the user's gestures.

## **WORKING**

An accelerometer based hand gesture controlled car responds to hand movements when the accelerometer is placed on the hand.

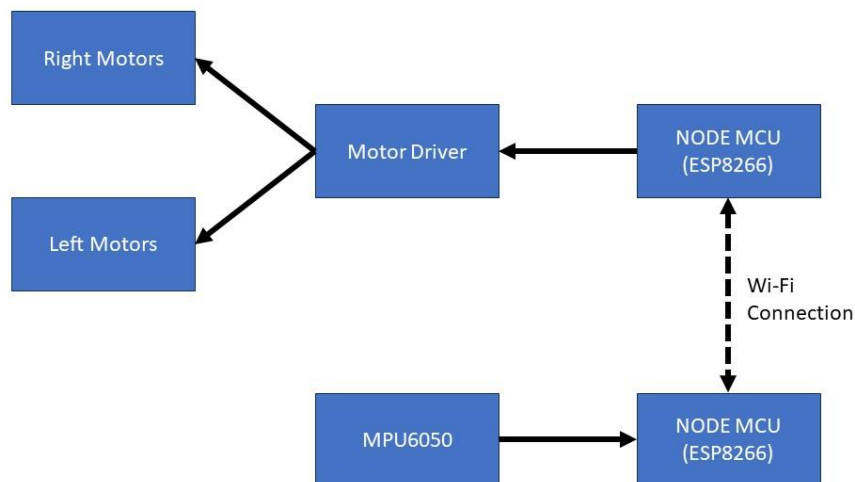
Tilting the hand forward with the accelerometer in front of the car causes it to move forward until the next movement command is given.

Tilting the hand backward changes, the car direction and state, making it move backward until the next signal is provided.

Tilting the hand to the left results in the car moving to the left until the next signal is given.

In a similar manner, tilting the hand to the right makes the car move to the right.

## BLOCK DIAGRAM



## DESCRIPTION ABOUT THE COMPONENTS

1. **Node MCU:** - Node MCU is a low-cost open-source IOT (Internet of Things) platform that is based on the ESP8266 WIFI module. It incorporates a micro-controller unit (MCU) and allows or easy programming and connection to the internet.
2. **MPU 6050:** - The MPU-6050 is a popular integrated circuit (IC) that combines a 3-axis accelerometer and a 3-axis gyroscope in a single package.

3. **Motor Driver:** - The motor driver takes input signals from a micro-controller or other control circuitry and uses them to control the direction and speed of the connected motors.
4. **4 DC Motor:** - A 4DC motor typically refers to a system that involves four Direct Current (DC) motors. These motors run on DC electrical power and are commonly used in various applications, including robotics, automation, and vehicles.
5. **9V Power Supply:** - A 9V power supply refers to a device or system that provides a stable output voltage of 9 volts. This power supply can be used to power various electronic devices or components that require a 9V DC power source.

## **RESULT**

Users can control the car using natural hand gestures, providing an interactive and user-friendly experience. The car is capable of wireless movement, allowing it to be controlled from a distance without the need for physical connections. The car responds promptly to gestures, providing a seamless and dynamic control experience

## **FUTURE SCOPE**

Ultrasonic sensor can be incorporated, which can measure the distance to obstacles and avoid collisions. And we can also use the sensor to implement features such as parking assist.

Camera can also be used with ultrasonic sensor to incorporate safety feature, such as obstacle detection or emergency stop mechanism, to prevent collisions and accident.

This project can also be adapted to enable smart control of the wheelchair for people with disabilities.

## **CONCLUSION**

This project uses an accelerometer sensor to detect the orientation and acceleration of the hand, and a Node MCU (ESP8266) module to transmit the data wirelessly to another Node MCU (ESP8266) module on the car. The car can be controlled by predefined hand gestures, such as tilting the hand forward, backward, left, or right. The project is a fun and innovative way to learn about wireless communication, sensors, and motor control.



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