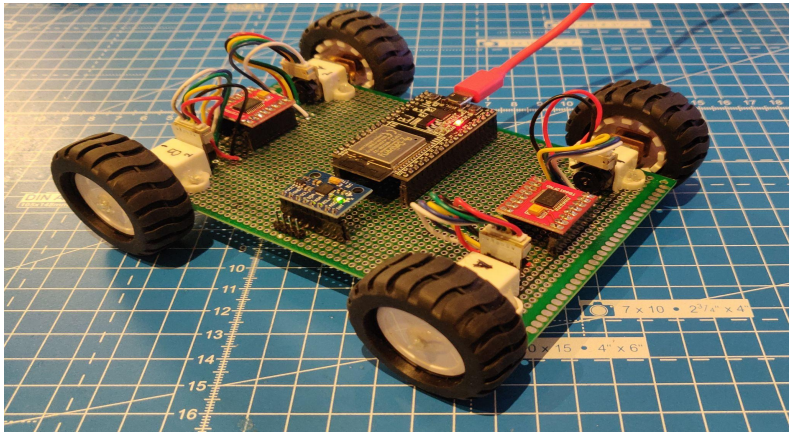
BLUETOOTH AND HAND GESTURE CAR USING ESP MODULE.



COMPONENT AND SOFTWARE USE :-

TRANSMITTER :-

1. *Node MCU:-* NodeMCU is a low-cost open-source IoT (Internet of Things) platform that is based on the ESP8266 WiFi module. It incorporates a microcontroller 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.

RECEIVER :-

1. *Motor Driver*:- The motor driver takes input signals from a microcontroller or other control circuitry and uses them to control the direction and speed of the connected motors.
2. *4DC 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.
3. *15v Power Supply:-*A 15V power supply refers to a device or system that provides a stable output voltage of 15 volts. This power supply can be used to power various electronic devices or components that require a 15V DC power source.

4.Bread Board:-A breadboard is a fundamental tool used in electronics for building and testing electronic circuits. It provides a convenient way to prototype circuits without the need for soldering. Here are some key features and information about breadboards.

SOFTWARE USED:-

1.Arduino IDE
2.MS.word
3.MS.slides

TABLE OF CONTENT

INTRODUCTION

- The Bluetooth Hand Gesture Car is a remote-controlled car that can be controlled using hand gestures via a Bluetooth connection.

- This project serves as an educational tool, demonstrating the integration of various technologies like IoT, gesture recognition, and wireless communication. It also offers an entertaining and engaging way to interact with robotics.

- The Bluetooth Hand Gesture Car showcases the potential for innovative and interactive solutions that bridge the gap between human gestures and machine control, contributing to advancements in user-friendly robotics.
- Gesture-based control provides a natural and intuitive way to interact with the car, making it user-friendly and accessible.

DESCRIPTION

1. The project aims to create a remote-controlled car that responds to hand gestures. It utilizes an ESP module microcontroller, gesture recognition sensor, motor driver.

2. The project serves as an excellent educational tool, providing practical experience in microcontroller programming.

3. The Bluetooth Hand Gesture Car project exemplifies the seamless integration of gesture recognition, wireless communication, and microcontroller programming to create an innovative and interactive remote-controlled vehicle.

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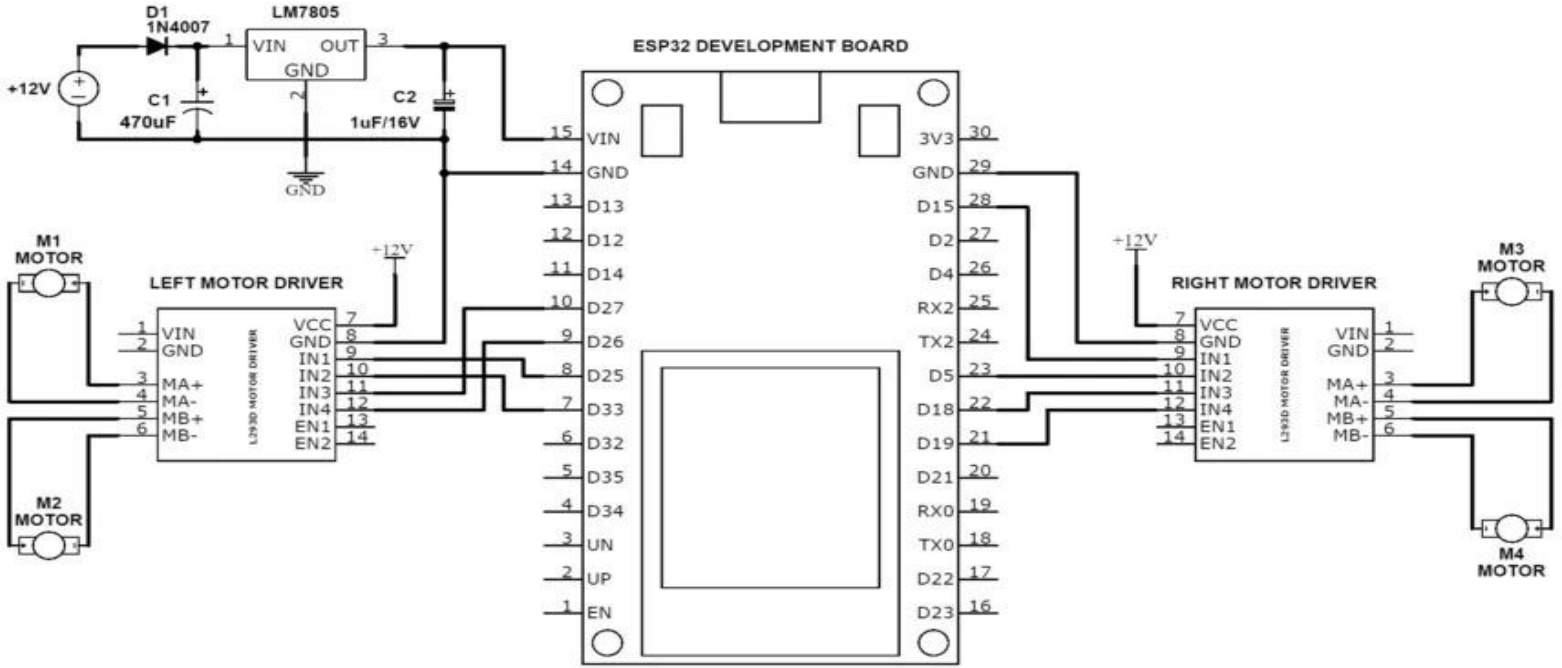
ADVANTAGE

- Intuitive Control: Gesture-based control offers a natural and easy way to interact with the car.
- Wireless Freedom: Bluetooth connectivity allows for untethered control, enhancing mobility.
- Real-Time Response: The car responds instantly to hand gestures, providing a dynamic user experience.
- Educational Tool: It serves as a hands-on learning experience in electronics, programming, and sensor integration.
- Customization Options: Enthusiasts can personalize the car's design and features to suit their preferences.
- Integration with IoT: Can be extended to integrate with IoT platforms for enhanced automation and control.

CIRCUIT DIAGRAM



CIRCUITDIAGRAMS.IN

ELECTRO GADGET

WORKING OF BLUETOOTH HAND GESTURE CAR.

1.An accelerometer-based gesture-controlled robot responds to hand movements when the accelerometer is placed on the hand.

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

3.Tilting the hand backward changes the robot's direction and state, making it move backward until the next signal is provided.

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

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

RESULT

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

CONCLUSION

The Bluetooth Hand Gesture Car using ESP Module howcases a user-friendly, wireless control system through intuitive hand gestures. This project not only provides an interactive and entertaining experience but also serves as an invaluable educational tool. Its potential applications in assistive technology and IoT ecosystems highlight its versatility and real-world relevance. Overall, this project stands as a testament to the seamless integration of cutting-edge technologies, making it an exciting and innovative addition to the world of remote-controlled vehicles.

FUTURE WORK

Camera Integration: Adding a camera module to provide a live video feed to the mobile app, allowing users to view the car's surroundings remotely.

Machine Learning for Gesture Recognition: Exploring machine learning techniques to improve gesture recognition accuracy and expand the range of recognized gestures.

Voice Commands: Integrate voice recognition capabilities to allow users to control the car using voice commands in addition to hand gestures

FUTURE SCOPE

1. *Assistive Technology:* The technology can be extended to assist individuals with mobility limitations, allowing them to control devices or navigate spaces using gestures.
2. *Educational Tools:* The project can serve as an educational platform to teach programming, electronics, and robotics, fostering interest and skills in STEM fields.
3. *Smart Home Integration:* Integrate the car with smart home systems, allowing it to perform tasks like fetching objects, turning on lights, or assisting with household chores.
4. *Autonomous Navigation:* Develop algorithms and sensors for autonomous navigation, enabling the car to move and interact with its environment independently.
5. *Security and Surveillance:* Equip the car with cameras and sensors for surveillance purposes, making it capable of patrolling and monitoring specific areas.

REFRENCE

[1] www.researchgate.net

[2] www.elprocus.com/accelerometer-based-gesture-control-robot/

[3] www.create.arduino.cc/projecthub.

[4] www.instructables.com/Hand-Gesture-Controlled-Car/