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BLUETOOTH CONTROLLED CAR USING ARDUINO

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ABSTRACT:

This project presents the design and implementation of a Bluetooth-controlled car utilizing Arduino Uno microcontroller, HC-05 Bluetooth module, and L293D motor driver. The primary objective of the project is to develop a remotely controllable vehicle prototype capable of forward, backward, left, and right movements through a Bluetooth interface. The system architecture involves connecting the Arduino Uno microcontroller to the L293D motor driver for controlling the direction and speed of two DC motors responsible for driving the car's movement. Additionally, the HC-05 Bluetooth module facilitates wireless communication between the car and a controlling device such as a smartphone or computer.

Key Word: Embedded System; Vehicle Automation;

Introduction :

Arduino Bluetooth RC cars are popular projects that allow you to control a small car using your smartphone via Bluetooth communication. These cars are typically built using an Arduino microcontroller board, a Bluetooth module like the HC-05, a motor driver IC such as the L298, and four gear motors for locomotion. The Arduino is programmed using C/C++ to receive commands from the Bluetooth module and control the motors accordingly

Material And Methods :

Hardware Components:

- Arduino board (e.g., Arduino Uno, Arduino Nano)
- Motor driver IC (e.g., L298N)
- Bluetooth module (e.g., HC-05 or HC-06)
- Gear motors (usually four for each wheel)
- Wheels for the car
- Motor driver board for connecting the motors
- Jumper wires for connections
- Breadboard or PCB for circuit assembly
- Power source (battery pack or power supply)

Software Components:

- **Arduino IDE:** The Arduino Integrated Development Environment is essential for writing, compiling, and uploading the code to the Arduino board

B.Functional Block Diagram:

The functional block diagram of the Bluetooth controlled Arduino car project demonstrates how various components work together to enable wireless control of the car's movement. At the heart of the system is the Arduino board, which serves as the main controller, receiving commands from the Bluetooth module and processing them to control the motors accordingly.The Bluetooth module, typically an HC-05, acts as the communication

interface between the Arduino and the Bluetooth device, such as a smartphone or a Bluetooth remote control. The user interacts with the Bluetooth device to send directional commands (forward, reverse, left, right) to the car. These commands are then transmitted wirelessly to the Bluetooth module, which relays them to the Arduino board.The Arduino board processes the received commands and generates control signals for the motor driver. The motor driver, like the L298N, is responsible for amplifying these signals to drive the DC motors at the required voltage and current levels. The motorized wheels are connected to the DC motors and are responsible for the actual movement of the car based on the commands received from the Arduino.

C.Working Principle:

The working principle of the Bluetooth controlled Arduino car project involves the reception of commands from a Bluetooth-enabled device, such as a smartphone or remote control, which are then processed to control the movement of the car wirelessly. The Bluetooth module, typically an HC-05, facilitates this wireless communication between the Arduino board and the Bluetooth device, ensuring seamless data transfer.

Figure 1:Working Model

Result and Discussion

The Bluetooth-controlled car project using Arduino presents a fascinating intersection of technology and creativity. By integrating Arduino microcontrollers, Bluetooth communication, and motor control, this project offers a hands-on experience in electronics, programming, and robotics. The result of the Bluetooth-controlled car project using Arduino is a functional and interactive remote-controlled car that can be wirelessly controlled via a smartphone. Users can send commands such as forward, backward, left, and right to the car, which responds by moving in the specified direction.

Conclusion and Future Scope

A.Conclusion:

The Bluetooth-controlled car project using Arduino is a testament to the power of combining technology, creativity, and education. By leveraging the capabilities of Arduino microcontrollers and Bluetooth communication, this project offers a unique and engaging way to explore the world of electronics and robotics.

B.Future Scope:

The Bluetooth-controlled car project using Arduino holds immense potential for future development and expansion. One area of improvement could be enhancing the wireless communication range and reliability by exploring alternative technologies like Wi-Fi or long-range Bluetooth modules. Additionally, incorporating advanced sensors such as ultrasonic or infrared sensors could enable the car to detect obstacles and navigate autonomously, adding a new layer of complexity and functionality to the project. The integration of cameras and image processing algorithms could allow for live video streaming and object detection, opening up possibilities for applications in surveillance and monitoring.

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