Bluetooth Controlled Car - S Class

DOCUMENTATION

Design with Microprocessors

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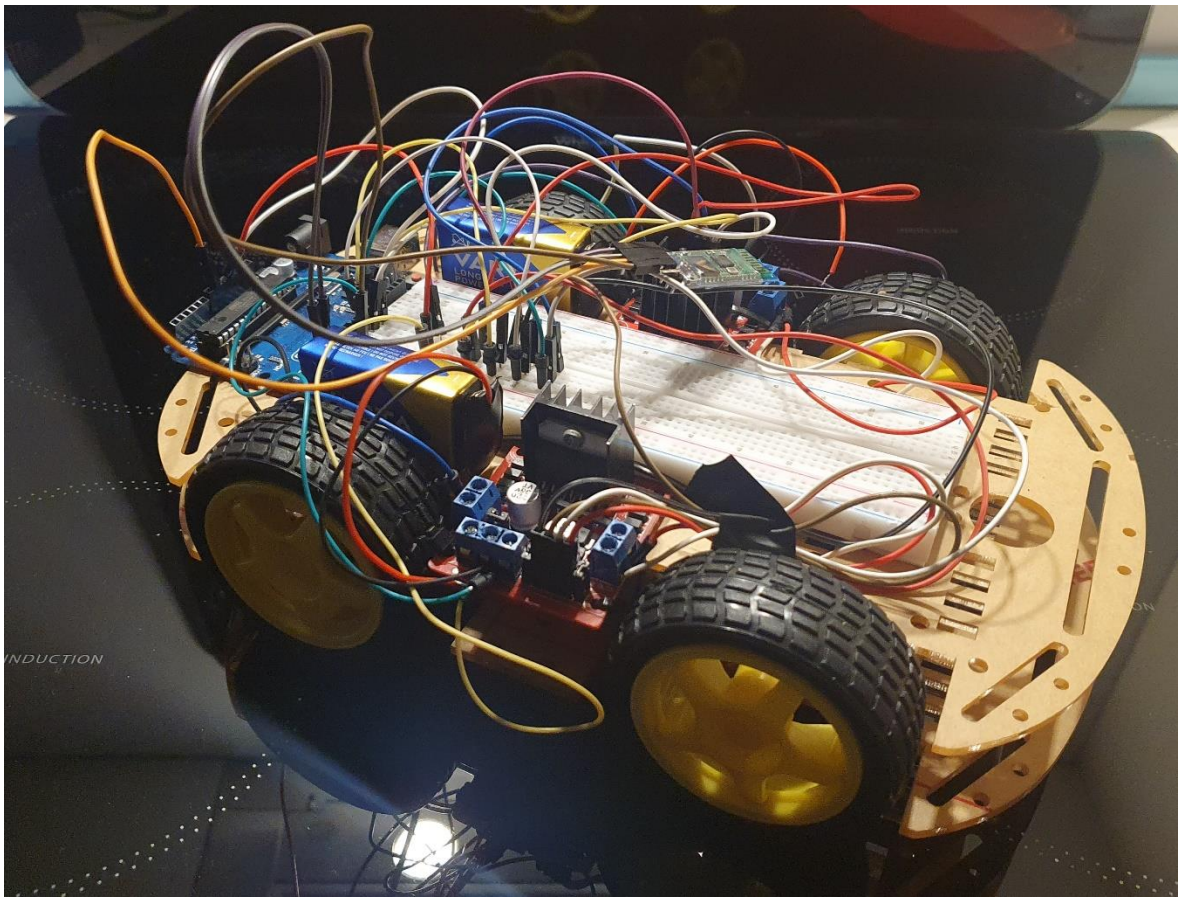
1. Introduction

A Bluetooth controlled car is a type of remote controlled vehicle that uses a Bluetooth module to receive commands from a remote device, such as a smartphone or computer. The car is equipped with a microcontroller that interprets the commands received via Bluetooth and translates them into actions for the car's movement, such as forward, backward, left, and right. This allows for remote control of the car's movement and navigation through various environments. Bluetooth controlled cars are popular in robotics and DIY projects, and can be used for a variety of applications, such as education, research, and entertainment.

For this specific project, the Bluetooth controlled car will be designed and built using a variety of hardware and software components. The microcontroller will be responsible for receiving commands via Bluetooth and controlling the car's movement. Additional components such as motors, wheels, and power supply will be required for the car's physical movement. The software for this project will include the programming of the microcontroller and any necessary code for the Bluetooth communication.

Testing and validation of the car's performance and functionality will also be an important aspect of the project. Overall, the project aims to demonstrate the capabilities of a Bluetooth controlled car and provide a useful reference for those interested in creating their own similar projects.



2. Overview

In this project, we will be using an Arduino Uno board, 4 DC motors, 2 H-bridge circuits, wires, a Bluetooth module, 4 wheels, and an extender. The combination of these components will allow us to create a functional Bluetooth controlled car that can be remotely controlled and navigated through various environments.

Components:

- 4 DC Motors

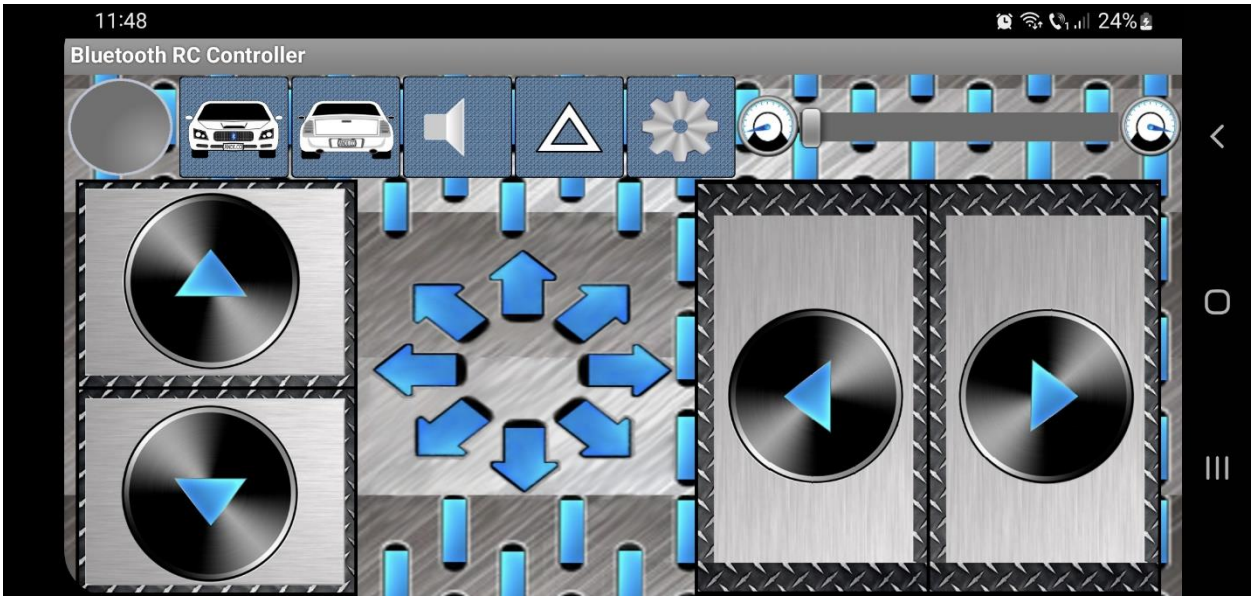
- 2 H-Bridges

- 4 Wheels

- Arduino Uno

- 2 9V power supplies

App used: Bluetooth RC Car



This Bluetooth controlled car project utilizes an Arduino Uno board as the microcontroller to receive commands via Bluetooth communication and control the car's movement. The car is equipped with 4 DC motors, which are used to drive the 4 wheels of the car. To control the speed and direction of these motors, 2 H-bridge circuits are used. The H-bridge allows for the car to move in different directions by reversing the polarity of the voltage applied to the motors.

To enable wireless communication, a Bluetooth module is integrated into the car. The Bluetooth module allows commands to be sent to the car from a remote device such as a smartphone or computer. This enables the user to remotely control the car's movement and navigation through various environments.

To connect all the components, wires are used to create the necessary connections between the Arduino board, motors, H-bridges, and Bluetooth module. To provide a stable power supply, an external power supply will be used to power the Arduino board and all other components of the car.

Finally, to be able to extend the car with other components, an extender is added to the project.

3. Design and implementation

The design and implementation of this Bluetooth controlled car project involves several key steps, including system design, hardware assembly, software development, and testing.

First, the system design involves determining the overall architecture of the car and the connections between the various components. This includes determining the specific components that will be used and how they will be connected to the Arduino board. This step also involves determining the necessary power requirements and selecting an appropriate power supply.

Next, the hardware assembly involves physically building the car by connecting all the components together. This includes connecting the motors and H-bridges to the Arduino board, connecting the Bluetooth module, and connecting the power supply. Careful attention should be paid to ensure that all connections are made correctly and securely.

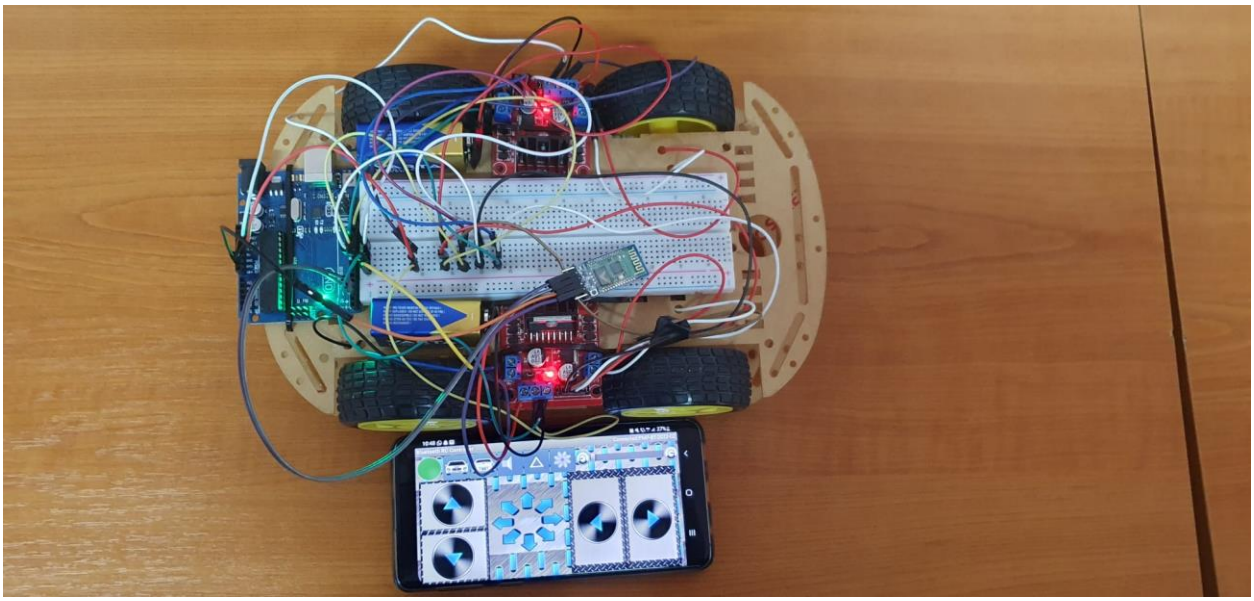
The software development involves programming the Arduino board to receive commands via Bluetooth and control the car's movement. This includes writing the necessary code to read data from the Bluetooth module and translate it into actions for the car's movement.

Finally, testing and validation are crucial to ensure that the car is functioning correctly and meets all performance requirements. This includes testing the car's movement, speed, and responsiveness to commands sent via Bluetooth. Any issues found during testing should be addressed and resolved before finalizing the project.

Overall, this project involves a combination of hardware and software skills to design and implement a functional Bluetooth controlled car that can be remotely controlled and navigated through various environments.

4. Testing and validation

In order to test this project, we have used a mobile application that sends signals through the Bluetooth module and the serial monitor like so: “FF” for moving forward, “BB” for moving backwards and “SS” to stop.



The car was able to receive the commands from the application and to execute them so it passed the expected tests. It is able to move forward and backwards and to stop on command.

5. Conclusion

In conclusion, this Bluetooth controlled car project demonstrates the capabilities of using Bluetooth communication to remotely control a vehicle. By utilizing an Arduino board, 4 DC motors, 2 H-bridge circuits, a Bluetooth module, 4 wheels, wires and an extender, we were able to create a functional car that can be controlled through a remote device. The project required a combination of hardware assembly, software development, and testing to ensure that the car functioned correctly and met all performance requirements. This project serves as a useful reference for anyone interested in creating their own Bluetooth controlled devices and can be used for educational, research, or entertainment purposes.

There are several ways in which this Bluetooth controlled car project could be further improved:

1. Add sensors: The addition of sensors such as ultrasonic sensors, infrared sensors, or cameras could enhance the car's ability to navigate and avoid obstacles.

2. Increase the range of Bluetooth communication: The range of the Bluetooth communication can be increased by using a more powerful Bluetooth module or adding an external antenna.
3. Improved control: The car control can be improved by using a joystick, accelerometer, or other input devices to control the car's movement.
4. Autonomous navigation: The car can be further improved by adding the ability for autonomous navigation, for example, using machine learning or computer vision algorithms.

These improvements would take the project to the next level, making the car more functional and adaptable for different environments and use cases.

6. Bibliography

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