Remote-Controlled Robotic Car

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Abstract

In the rapidly advancing field of robotics, 3D printing, and open-source software enable the creation of custom components and printed circuit boards (PCBs). This project focuses on developing a remote-controlled robotic car and a user-friendly PCB motherboard using KiCad, a free Electronic Design Automation software. The PCB will offer a "Plug and Play" experience, allowing users to easily connect motors and control their car remotely. Instead of traditional Radio Frequency (RF) modules, Bluetooth technology will be employed, enabling users to control the robotic car with their Android smartphones. A custom Android application will be developed for connecting and controlling the car via Bluetooth. The PCB will integrate a microcontroller for signal distribution and a Bluetooth module for communication with the Android app. Power distribution to all circuitry and motors will be managed through a single power input, and a motor control system will interpret signals from the smartphone controller. The project includes developing the code for the microcontroller to ensure seamless integration of the Bluetooth module and motor control system. This innovative approach to robotics aims to make custom remote-control cars more accessible and convenient. By utilizing Bluetooth technology and Android smartphones as controllers, this project pushes the boundaries of remote-controlled robotics.

# Introduction

In recent years, the field of robotics has witnessed remarkable growth, driven by advancements in 3D printing, open-source software, and the increasing accessibility of tools for creating custom components and printed circuit boards (PCBs). As these technologies become more prevalent, researchers and enthusiasts alike are exploring innovative ways to develop user-friendly, cost-effective, and versatile robotic systems. One such application is the creation of remote-controlled robotic cars, which have the potential to revolutionize not only the field of robotics but also adjacent industries, such as automotive, logistics, and entertainment.

This research paper presents the development of a remote-controlled robotic car and the design of a user-friendly PCB motherboard using KiCad, a free Electronic Design Automation software. Our approach aims to provide a "Plug and Play" experience, enabling users to easily connect motors to the board and control their car remotely. In contrast to traditional Radio Frequency (RF) modules, our design employs Bluetooth technology, allowing users to leverage their Android smartphones as intuitive and accessible controllers.

To achieve this level of user-friendliness, we developed a custom Android application that facilitates connection and control of the car via Bluetooth. The PCB integrates a microcontroller for signal distribution and a Bluetooth module for communication with the Android app. Power distribution to all circuitry and motors is managed through a single power input, and a motor control system interprets signals from the smartphone controller. We also developed the code for the microcontroller, ensuring seamless integration of the Bluetooth module and motor control system.

This research paper provides a comprehensive account of our innovative approach to remote-controlled robotic car development. We discuss the design and implementation of the PCB, the creation of the Android application, and the integration of Bluetooth technology. We also present experimental results that demonstrate the effectiveness and versatility of our design. By pushing the boundaries of remote-controlled robotics and making custom robotic cars more accessible and convenient, our research contributes to the ongoing evolution of the robotics field.

# Methods and Materials

-Component Selection

- Chassis

- Motors

- Motor Driver

- MCU

- PCB Schematic Design

- Noise Capacitors

- PCB Layout Design

- Trace Width

- App Development

# Results

[Results text]

# Conclusion

[Conclusion text]

References

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