

Bluetooth Controlled Arduino Car

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ABSTRACT

A remote controlled vehicle is any mobile machine controlled by means that is physically not connected with origin external to the machine. There are many types in it, based on the controls - radio control device, Wi-Fi controlled and even Bluetooth controlled. These devices are always controlled by humans and take no action autonomously. The main target in such vehicles would be to safely reach a designated point, maneuver the area and reach back to the point of origin.

INTRODUCTION

In this project we make use of the Bluetooth technology to control our machine car. We don't call this as a robot as this device doesn't have any sensors. Thereby, sensor less robots are machines. This machine can be controlled by any human using

his android mobile phone, by downloading an app and connecting it with the Bluetooth module present inside our car. User can perform actions like moving forward, backward, moving left and right by the means of command using his-her mobile phone app. The task of controlling our car is taken car by the Arduino UNO with micro controller ATMEGA32, 16 MHz processor, 2 KB SRAM (Static Random Accessible Memory) and 32 KB flash memory. Arduino play a major role in the control section and had made it easier to convert digital signals and analogue signals into physical movements. The major reason for using a Bluetooth based tech is that we can change the remote anytime - mobiles phones, tablets and laptops and physical barriers like wall or doors do not affect the car controls.

BACKGROUND STUDIES

At first, we didn't have any idea of this project. So, we use internet and find information about it. After that, we come to know that it is a very easy project. We also find out a tutorial of this project. This tutorial helps us a lot to understand the project. How the Arduino work, how the display work etc. We followed those instructions and build our project.

COMPONENTS

To build these Bluetooth Controlled Arduino Car we need these components:

1. Arduino UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be

powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.

2. HC05 Module (Receiver)

The HC05 Module is a Bluetooth transceiver module that provides wireless communication between two devices. It is compatible with standard Bluetooth protocols and can be used for establishing wireless links between a Bluetooth-enabled device, like a smartphone, a computer, or a tablet, and other devices, like microcontrollers and sensors. This module is highly versatile, allowing for a wide range of applications, including remote control and data logging.

3. L293D Motor Drive H-Shield

The Motor Driver is a module for motors that allows you to control the working speed and direction of two motors simultaneously. This Motor

Driver is designed and developed based on L293D IC. L293D is a 16 Pin Motor Driver IC. This is designed to provide bidirectional drive currents at voltages from 5 V to 36 V. Rotation of motor depends on Enable Pins.

4.Jumper cables

These wires are used to establish connection between the HC05 Module and L293D Motor Drive H-Shield.

5. 4-wheel car chassis

This 4-wheel drive car chassis is designed specifically for robotics projects and is made from high-quality aluminum alloy material for durability and reliability. It features four independent drive motors for smooth and efficient movement and is compatible with a variety of microcontrollers.

WORKING PROCEDURE

Take a closer look on the Wiring Diagram. We could notice the power source, four 1.5 volt batteries connected to the 12V power pin of L298 Motor Drive and ground of

Motor Drive and Arduino UNO. This supplies essential power to the circuit. A total of 6 volts is being supplied to this system, where the maximum permissible amount is 12 volts. Digital wires of Arduino are connected with the input1, input2, input3 and input4 of the motor drive. Motors are connected to the either side of Motor Drive which are the outputs terminals. To complete the power source circuit, 5V of Motor Drive is connected to Vin power pin of Arduino UNO. Followed by this, HC05 Bluetooth Module's Vcc is connected to 5V pin of Arduino UNO, which supplies power to Bluetooth Module. Ground to Ground connections are also made. Transistor logic pins, Transmitter (TX) and Receiver (RX) of Arduino UNO are connected to RXD and TXD of HC05 respectively. The program is uploaded to Arduino before connecting the Bluetooth module.

After all successful connections, switch on the power source. Lights at Motor

Drive, Arduino UNO and HC05 would indicate the correct connection. Upon successful connection of your Bluetooth module with any android device, we could control this device. By passing the command, for example, to move forward we pass 'F'. This command is transmitted by our device to Bluetooth module, which in turn transmits to Arduino UNO. Arduino receives it and passes the same to Motor Drive through its digital pins. Motor Drive will get this through their input pins and exercise them through their output pins where motor is connected.

SOURCE CODE

[https://github.com/Mahobub-Shahoriar-Siam/Arduino-Car/blob/main/BLUETOOTH CAR.ino](https://github.com/Mahobub-Shahoriar-Siam/Arduino-Car/blob/main/BLUETOOTH%20CAR.ino)

CONCLUSION

The final product we obtained is just the skeleton of those Remote-Control Cars we see in the market. The mechanical design of this product is also proposed, which could be

practically made to give much better-looking commercial product. For future plans, this product could be added with sensors like, accelerometer and humidity sensor, thereby widening their field of use.

Also, we could make use of this RC Motor Car as a surveillance system or rovers by adding a few more sensors and updating the code. This would make them into robots.

REFERENCES

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