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Project name

Remote control car controlled by android mobile using Bluetooth module

Groups Members

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Components Used

1. Arduino UNO
2. HC-06 Bluetooth Module
3. L298n motor driver
4. HC-SR04 Ultrasonic Sonar Sensor
5. Smart robot car chassis with 2 x toy car wheels and 1 x Universal wheel (or ball casters) Two DC motors

6. 2x 9V Batteries
7. 1K and 2K Resistors
8. Jumper wires (male-to-male, male-to-female)
9. Mini breadboard

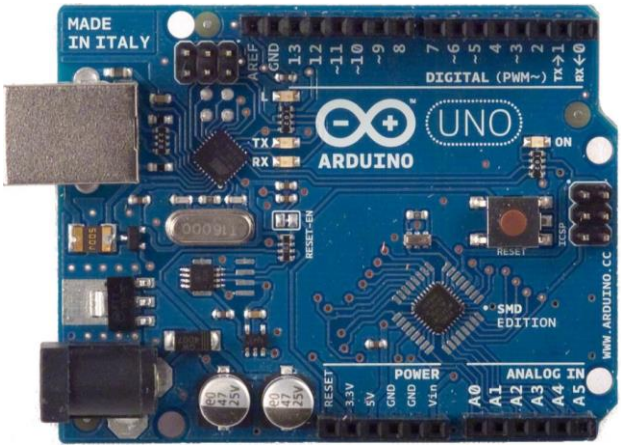
Description Of Project:

Bluetooth controlled car is controlled by using Android mobile phone instead of any other method like buttons, gesture etc. Here only needs to touch button in android phone to control the car in forward, backward, left and right directions. So here android phone is used as transmitting device and Bluetooth module placed in car is used as receiver. Android phone will transmit command using its in-built Bluetooth to car so that it can move in the required direction like moving forward, reverse, turning left, turning right and stop.

Introduction of components:

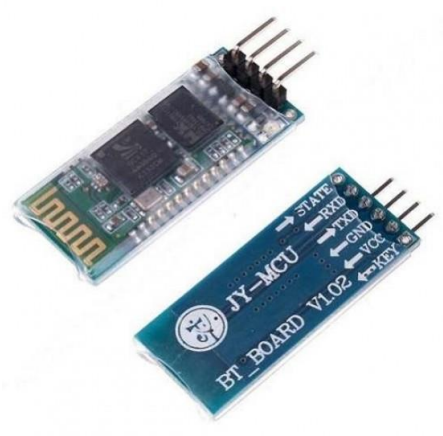
Arduino UNO:

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable.



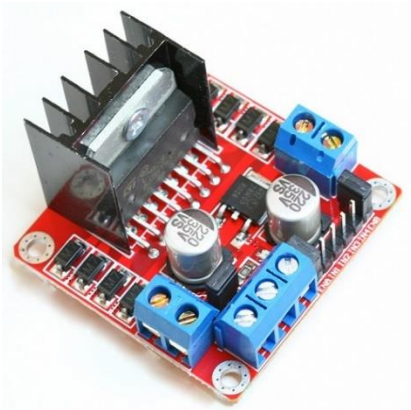
HC-06 Bluetooth Module:

The HC-06 is a class 2 slave Bluetooth module designed for transparent wireless serial communication. Once it is paired to a master Bluetooth device such as PC, smart phones and tablet, its operation becomes transparent to the user. All data received through the serial input is immediately...



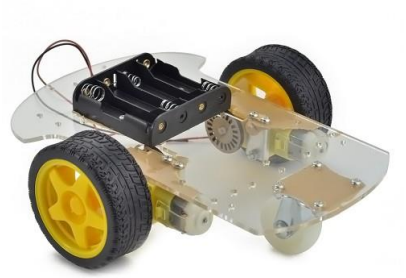
L298n motor driver

The L298N is a dual H-Bridge motor driver which allows speed and direction control of two DC motors at the same time. The module can drive DC motors that have voltages between 5 and 35V, with a peak current up to 2A. ... This depends on the voltage used at the motors VCC.



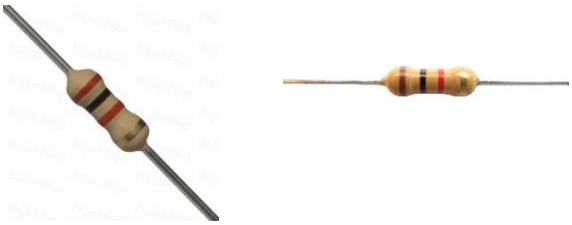
Smart robot car chassis with 2 x toy car wheels and 1 x Universal wheel (or ball casters) Two DC motors

Car Frame:



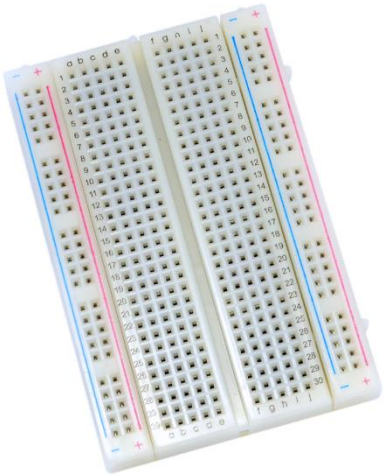
9V Batteries:

Some Resistors:

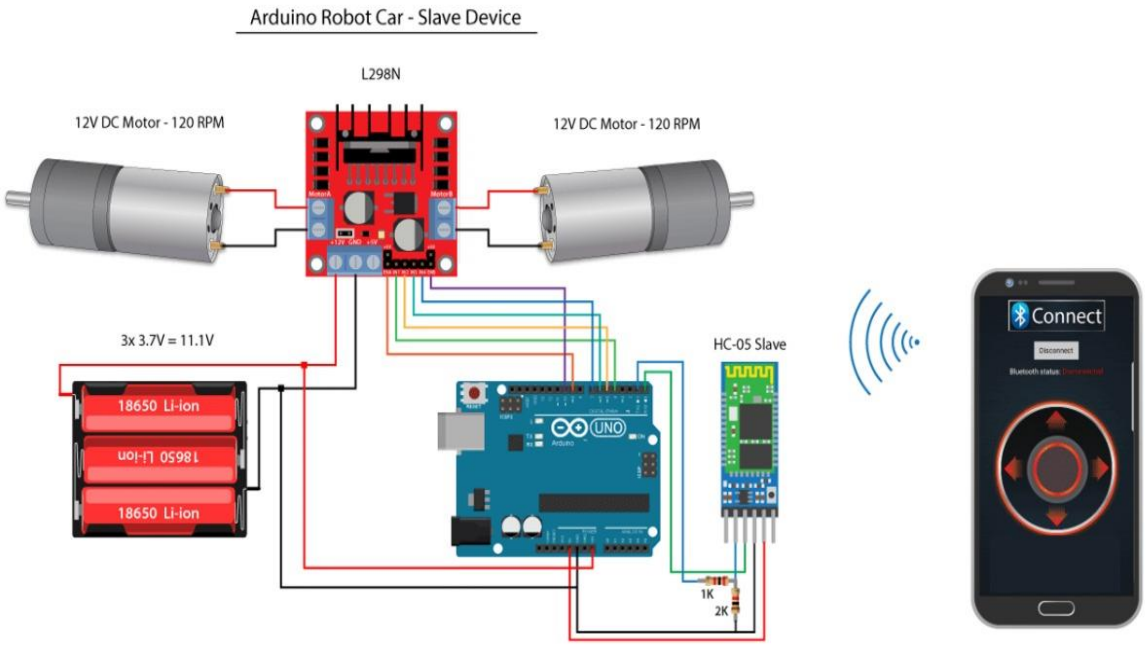


Jumper wires (male-to-male)

Mini breadboard

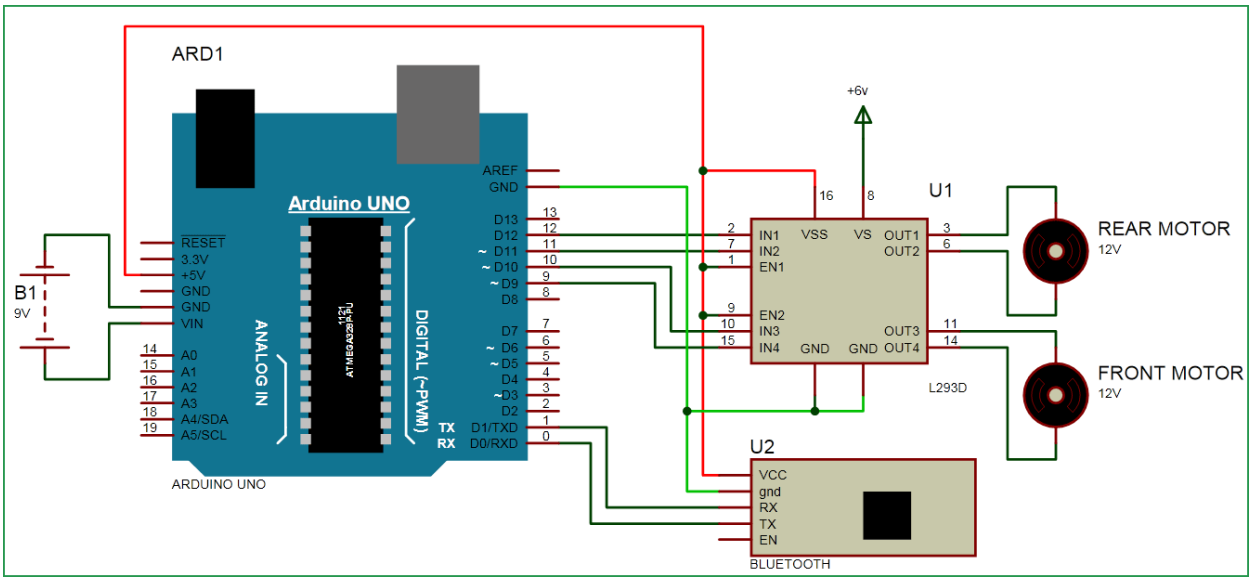


Configuration Steps



Step 1:

Make the connection according to the circuit diagram. we can use separate power for Arduino. Motor driver and 12v battery connected through the switch. As we can see in the circuit diagram there is 2.2k and 4.7 k resistor connected to the pins of the bluetooth module. the main reason for this is the HC-05 Bluetooth module uses a logic level of 3.3v. While transmitting data from HC-05 to Arduino there is no problem because Arduino is capable of receiving data from 3.3v logic, but while receiving any data from Arduino to HC-05 Arduino uses 5v logic which may damage our Bluetooth module, to convert 5v logic level to 3.3v we use a voltage divider method. Make sure that there is common ground between motor driver and Arduino otherwise motor not work.



Step 2:

Attatch aurdino with your pc and write the given code

Source Code

```
void setup() {
Serial.begin(9600);
pinMode(9,OUTPUT);
pinMode(10,OUTPUT);
pinMode(11,OUTPUT);
pinMode(12,OUTPUT);
}
void loop() {
```

```
if(Serial.available()>0)
{
  char data=Serial.read();
  Serial.println(data);
  if(data=='f')
  {
    digitalWrite(9,HIGH);
    digitalWrite(11,HIGH);
    digitalWrite(10,LOW);
    digitalWrite(12,LOW);
  }
  else if(data=='b')
  {
    digitalWrite(10,HIGH);
    digitalWrite(12,HIGH);
    digitalWrite(9,LOW);
    digitalWrite(11,LOW);
  }

  else if(data=='l')
  {
    digitalWrite(9,LOW);
    digitalWrite(11,HIGH);
```

```
    digitalWrite(10,LOW);
    digitalWrite(12,LOW);
  }
  else if(data=='r')
  {
    digitalWrite(9,HIGH);
    digitalWrite(11,LOW);
    digitalWrite(10,LOW);
    digitalWrite(12,LOW);
  }
  else
  {
    digitalWrite(9,LOW);
    digitalWrite(11,LOW);
    digitalWrite(10,LOW);
    digitalWrite(12,LOW);
  }
 }
}
```

Step 3:

Download app from:

https://play.google.com/store/apps/details?id=com.appsvalley.bluetooth.arduinocontroller&hl=en

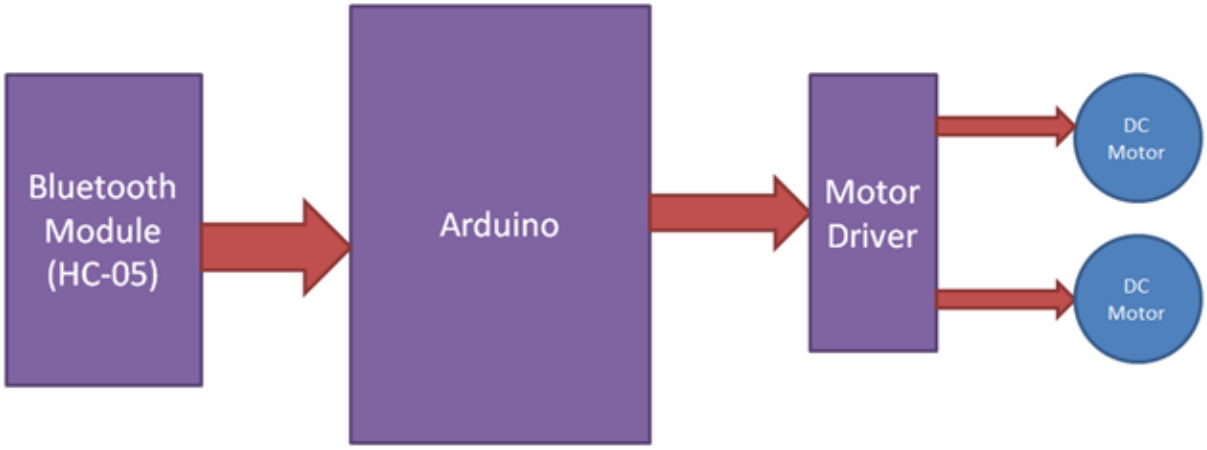
Step 4:

Steps for configuring bluetooth

- First turn on the switch of robot car
- Go to setting Click on the Bluetooth
- TabTurn Bluetooth on Wait for your phone to find the HC-05 Bluetooth module
- Once it has been found click it and input the password by default it should be either "1234" or "0000"
- Now open the application Bluetooth car Application and click the " Bluetooth image" button
- You should see the HC-05 Module (If not re-try the steps above) click on the Module
- The Application will then return automatically to the main screen and you can see the green text "connected"
- At this point, the HC-05 Modules Red LED should now be constantly on instead of pulsing meaning a device is currently connected.

Working explanation:

In this project we have used a toy car for demonstration. Here we have selected a RF toy car with moving left right steering feature. After buying this car we have replaced its RF circuit with our Arduino circuit. This car have two dc motors at its front and rear side. Front side motor is used for giving direction to car means turning left or right side (like real car steering feature). And rear side motor is used for driving the car in forward and backward direction. A Bluetooth module is used to receive command from android phone and Arduino UNO is used for controlling the whole system.



Bluetooth controlled car moves according to button touched in the android Bluetooth mobile app. To run this project first we need to download Bluetooth app form Google play store. We can use any Bluetooth app that supporting or can send data. Here are some apps' name that might work correctly.

Limitations

- As the range of the Bluetooth Communication is limited (a maximum of 10 meters for class 2 devices for example) the control range of Bluetooth Controlled Robot is also limited.
- Make sure that sufficient power is provided to all the modules especially the Bluetooth Module. If the power is not sufficient, even though the Bluetooth Module powers on, it cannot transmit data or cannot be paired with other Bluetooth devices.

Conclusion:

I hope I would guide you on making a robot car that control over Bluetooth from your android mobile phone. The robot car is fully based on arduino and I hope to do step by step guide on making this robot in very easy way. Hope you will enjoy it. Thank you!!

Video Link:

https://www.youtube.com/watch?v=X6IPGu7pURw