ESP32&UNO Mecanum Wheel Smart Car

(2024011010)

List

1. Product Introduction

1.1. Description

This product is based on ESP32 and UNO master control. It connects to the WiFi hotspot through ESP32, establishes a web service page, and transmits the camera screen to the web end. ESP32 communicates with UNO through the serial port, thereby controlling the movement of the smart car on the web end.

1.2. Important Notes

ESP32 has high requirements for voltage stability. During normal operation, its main power source is the VCC/GND port of the expansion board plugged into the UNO.

In special cases, when the ESP32 input does not reach about 5V, the WiFi connection will be disconnected. In this case, consider insufficient battery power or other line connection errors.

After downloading the tutorial file compressed package, please unzip the file to the desktop or a common computer disk. Otherwise, if you put it in the default download location and do not unzip it, the Arduino IDE on some newer computers cannot correctly identify the default downloaded compressed file storage path location, resulting in code compilation failure!

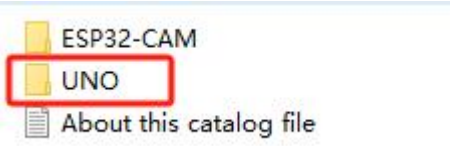
2. Experience product features

2.1. Description

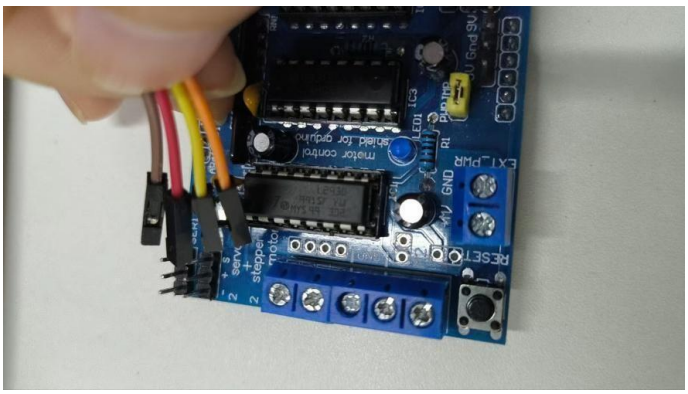
This section mainly introduces the use of UNO and ESP32 CAM, learns how to upload code and realize that after ESP32 CAM is connected to WiFi, it can display the captured images on the web side in real time and control the driving of the smart car on the web page.

2.2. Upload UNO code

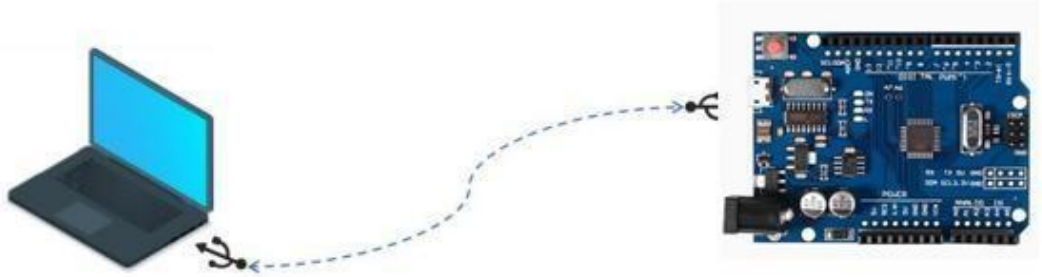
Open the code file (folder path: 2_Arduino_Code\UNO\UNO.ino)



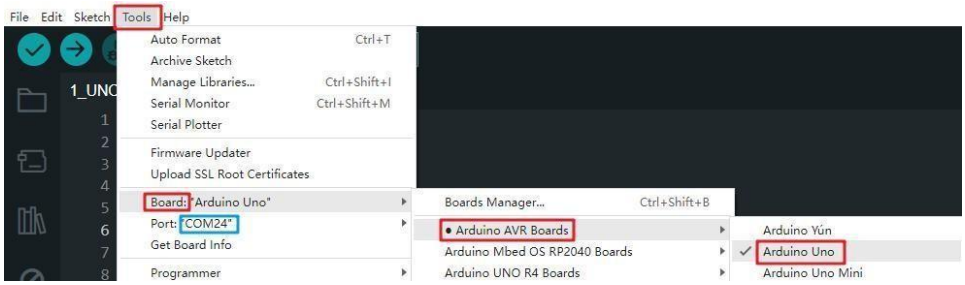
Before uploading the program, unplug the RX/TX and VCC GND wires (as shown below), and plug them back in after the upload is complete.



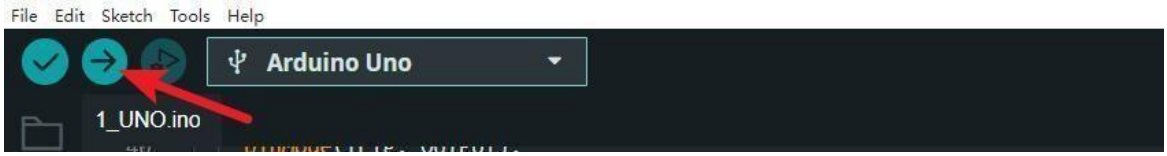
Connect the uno motherboard to the computer with a USB cable



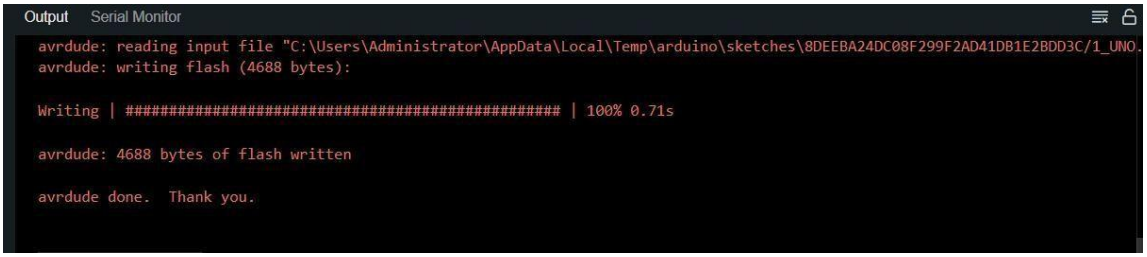
Select the board type as UNO and the serial port number as COM24



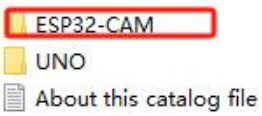
Note: In fact, the serial port displayed by each person is different. Although COM24 is selected here, it may be COM3 or COM4 on your computer. Click the "Upload" button and the program will start uploading.



After the upload is successful, the message “Done uploading” will be displayed.

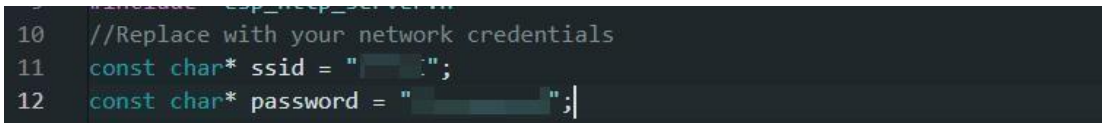


2.3. Upload ESP32 code



Open the code file (path: 2_Arduino_Code\SP32-CAM\ESP32_CAM.ino)

Change the WiFi network credentials account and password variables in the code to your own WiFi name and password!

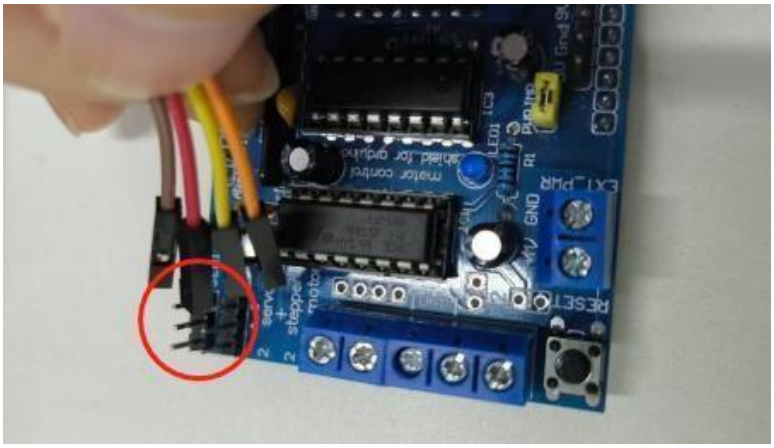


At the same time, you should check that the WiFi that ESP32 is connecting to is 2.4G instead of 5G band, otherwise the function will not work!

ssid="REDMI" √

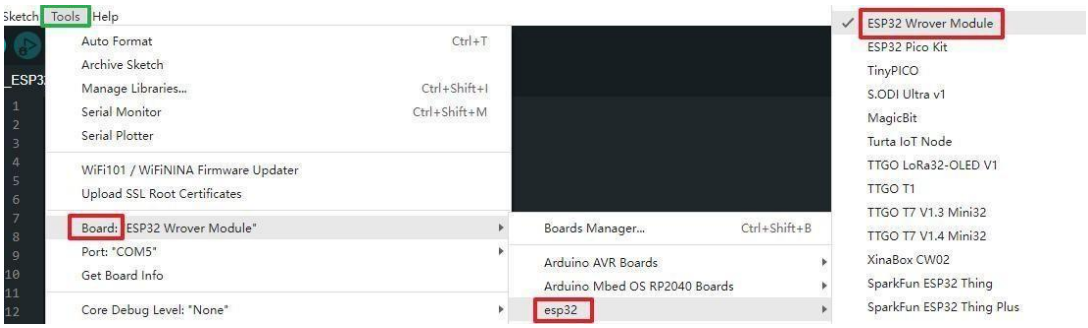
ssid="REDMI-5G" ×

Similarly, when the ESP32 is powered externally, it will affect the USB port program burning, so unplug the cable before uploading the program (as shown below), and plug it back in after the upload is complete.

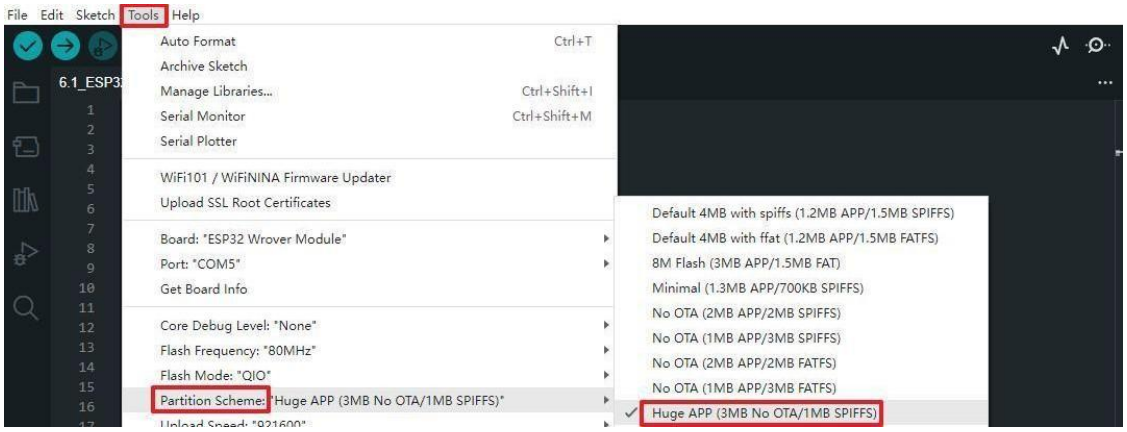


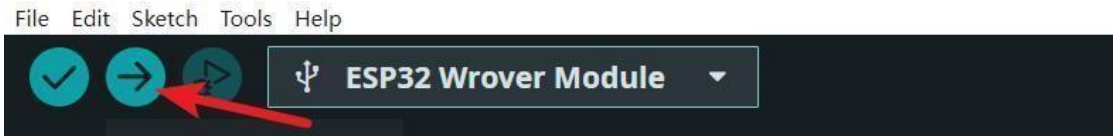
Connect the ESP32 board to your computer using a USB cable

Select the board type as ESP32 Wrover Module and the serial port number as COM5



Note: Select ESP32 Wrover as the board type and COM5 as the serial port. Actually, the serial port displayed by each person is different, it may be COM3 or COM4 on your computer.





Click the "Upload" button and the program will start uploading. After the upload is successful, the prompt "Done uploading" will appear.

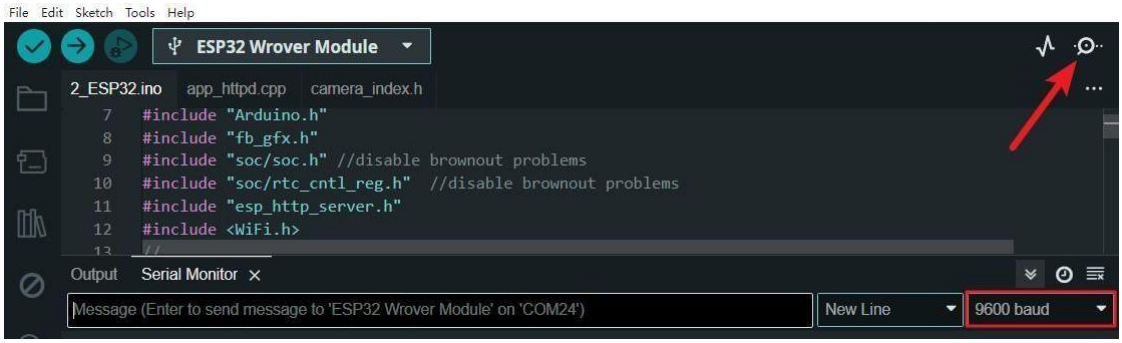
Note: During the burning process, since the ESP32 main control board does not have a built-in automatic burning circuit, you need to press the button to burn. As shown in the figure:

Press the RST reset button

During burning, long press the button and wait for burning.

2.4. Check IP address

Open the serial monitor and set the baud rate to 9600 in the lower right corner



Press the RST reset button

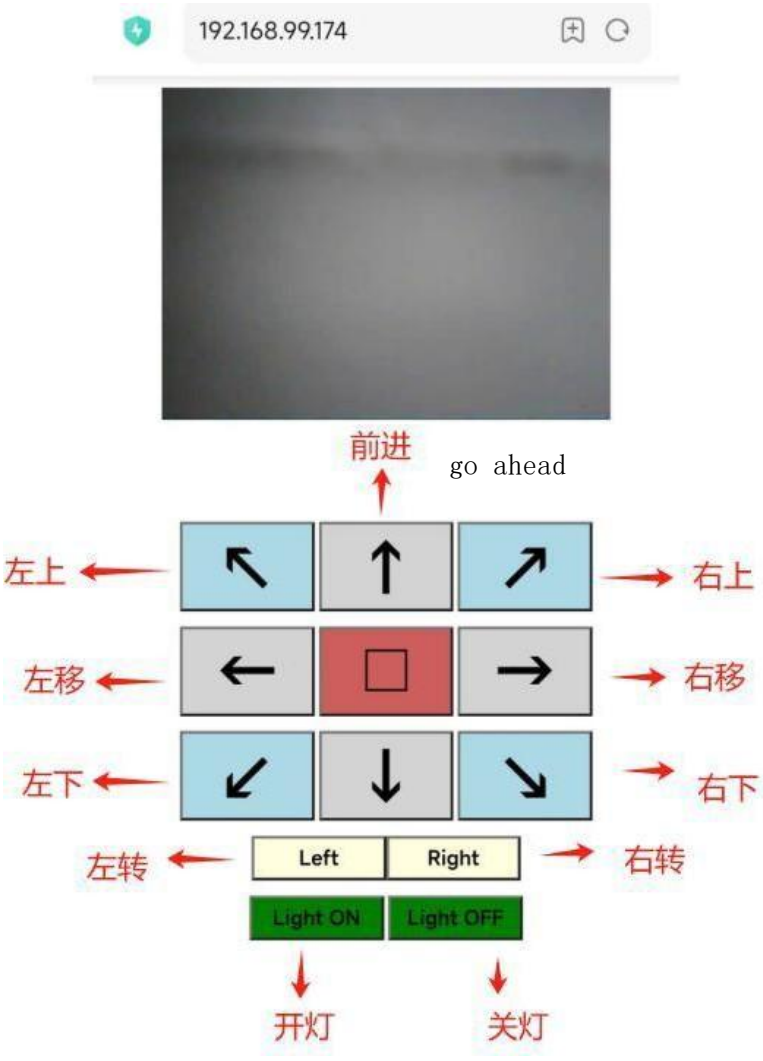
按下复位键

Press the reset button on the ESP32 CAM to reload the program. When it is just reset, the smart car will start to move by default, and will not stop until it successfully connects to WiFi. This is normal.
(Warm reminder: After successfully burning the ESP32 cam code, connect it to the expansion board)

When the program reloads and successfully connects to WiFi, the IP address will be displayed: http://xxx.xxx.xxx.xxx, please write it down.

Use your mobile phone to connect to the same WiFi (that is, the ssid filled in the code) and fill in the IP address into the device's browser to access the service. Note: Restart ESP32 after each power outage. If you cannot see the captured image on the browser, you need to press RST to reset it again to connect to WiFi faster.

2.4. Realize remote control function



Use your phone to connect to the same WiFi (that is, the ssid filled in the code) and fill in the IP address into the device's browser to access the service. While viewing the camera image, press the button to control the movement of the car. The bottom button controls the movement speed.

When you can't see the camera image:

1. 1. Please check whether the WiFi name and password in the ESP32 code have been modified correctly;

2. 2. Whether the network signal is good and the power supply of the car is normal;

3. 3. Avoid running in the sun, the high temperature of solar radiation affects the stability of ESP32 connecting to WiFi;

4. 4. Press the reset button on ESP32 and wait for WiFi to connect.

5.

6. 5. Press the reset button of UNO expansion board and then refresh the web interface to wait for WiFi connection. (The mobile phone and ESP32 should be connected to the same routing WiFi)

Wheel installation reminder:
There are two types of wheels: A and B, A represents left and B represents right:

The installation position of the Mecanum wheel is as follows: