# Raspberry Pi configuration camera

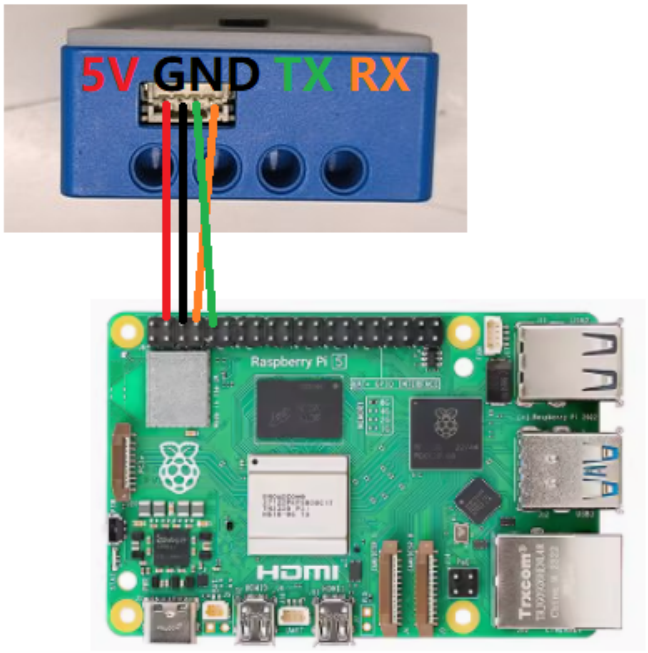


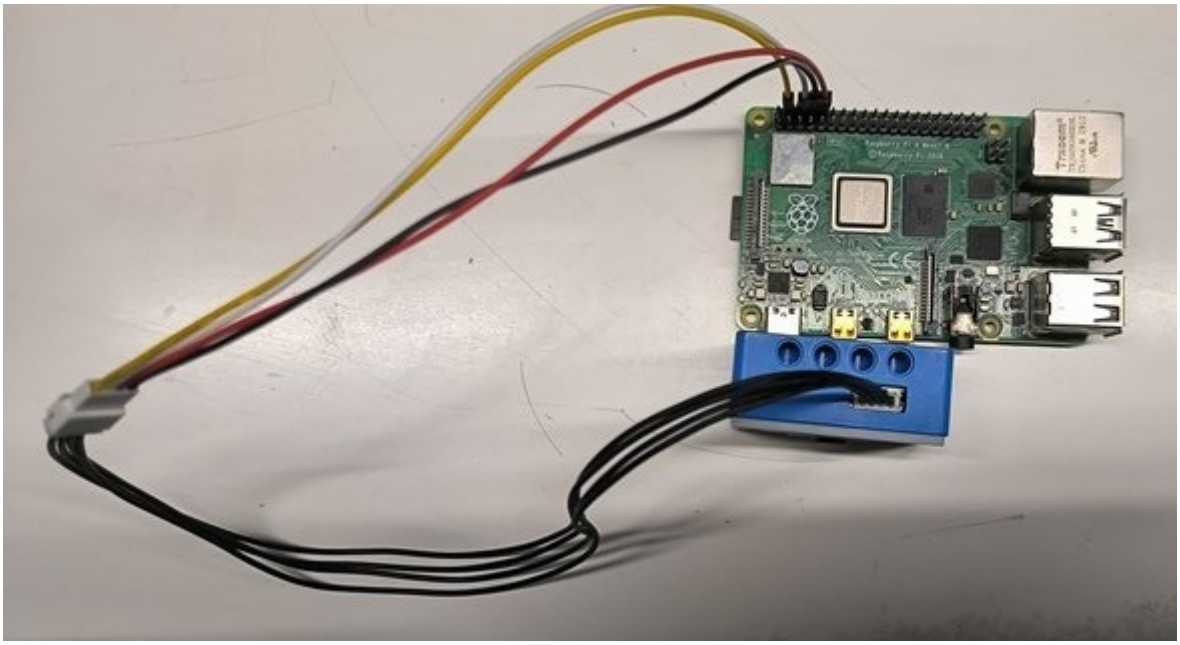
## 1. Experiment preparation

- raspberry pie
- wifi camera

## 2. Experimental wiring

as the picture shows



## 3. Open the Raspberry Pi hard serial port (this step is not required for Raspberry Pi 5)

- Configure the Raspberry Pi serial port first, because the hard serial port of the Raspberry Pi is used for Bluetooth, and the mini serial port is unstable to use. This experiment uses the hard serial port.

Raspberry Pi pin diagram

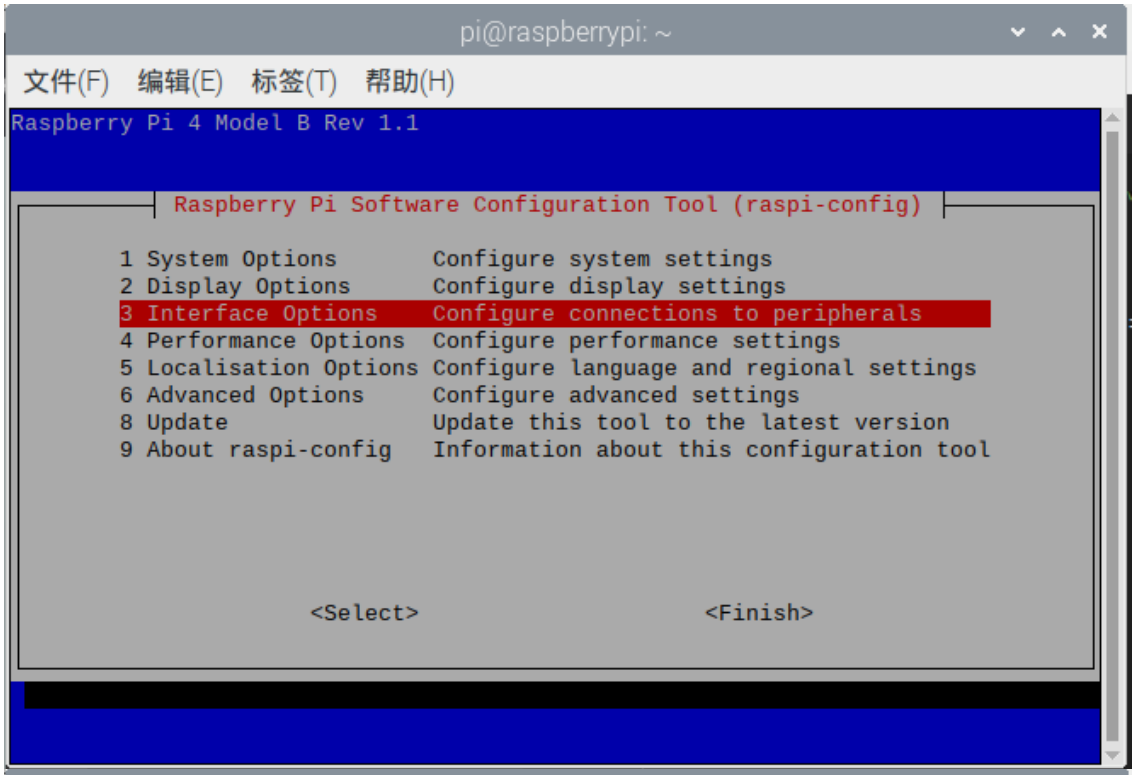
树莓派 40Pin 引脚对照表

| wiringPi 编码 | BCM 编码 | 功能名 | 物理引脚 BOARD编码 | | 功能名 | BCM 编码 | wiringPi 编码 |
|---|---|---|---|---|---|---|---|
| | | 3.3V | 1 | 2 | 5V | | |
| 8 | 2 | SDA.1 | 3 | 4 | 5V | | |
| 9 | 3 | SCL.1 | 5 | 6 | GND | | |
| 7 | 4 | GPIO.7 | 7 | 8 | TXD | 14 | 15 |
| | | GND | 9 | 10 | RXD | 15 | 16 |
| 0 | 17 | GPIO.0 | 11 | 12 | GPIO.1 | 18 | 1 |
| 2 | 27 | GPIO.2 | 13 | 14 | GND | | |
| 3 | 22 | GPIO.3 | 15 | 16 | GPIO.4 | 23 | 4 |
| | | 3.3V | 17 | 18 | GPIO.5 | 24 | 5 |
| 12 | 10 | MOSI | 19 | 20 | GND | | |
| 13 | 9 | MISO | 21 | 22 | GPIO.6 | 25 | 6 |
| 14 | 11 | SCLK | 23 | 24 | CE0 | 8 | 10 |
| | | GND | 25 | 26 | CE1 | 7 | 11 |
| 30 | 0 | SDA.0 | 27 | 28 | SCL.0 | 1 | 31 |
| 21 | 5 | GPIO.21 | 29 | 30 | GND | | |
| 22 | 6 | GPIO.22 | 31 | 32 | GPIO.26 | 12 | 26 |
| 23 | 13 | GPIO.23 | 33 | 34 | GND | | |
| 24 | 19 | GPIO.24 | 35 | 36 | GPIO.27 | 16 | 27 |
| 25 | 26 | GPIO.25 | 37 | 38 | GPIO.28 | 20 | 28 |
| | | GND | 39 | 40 | GPIO.29 | 21 | 29 |

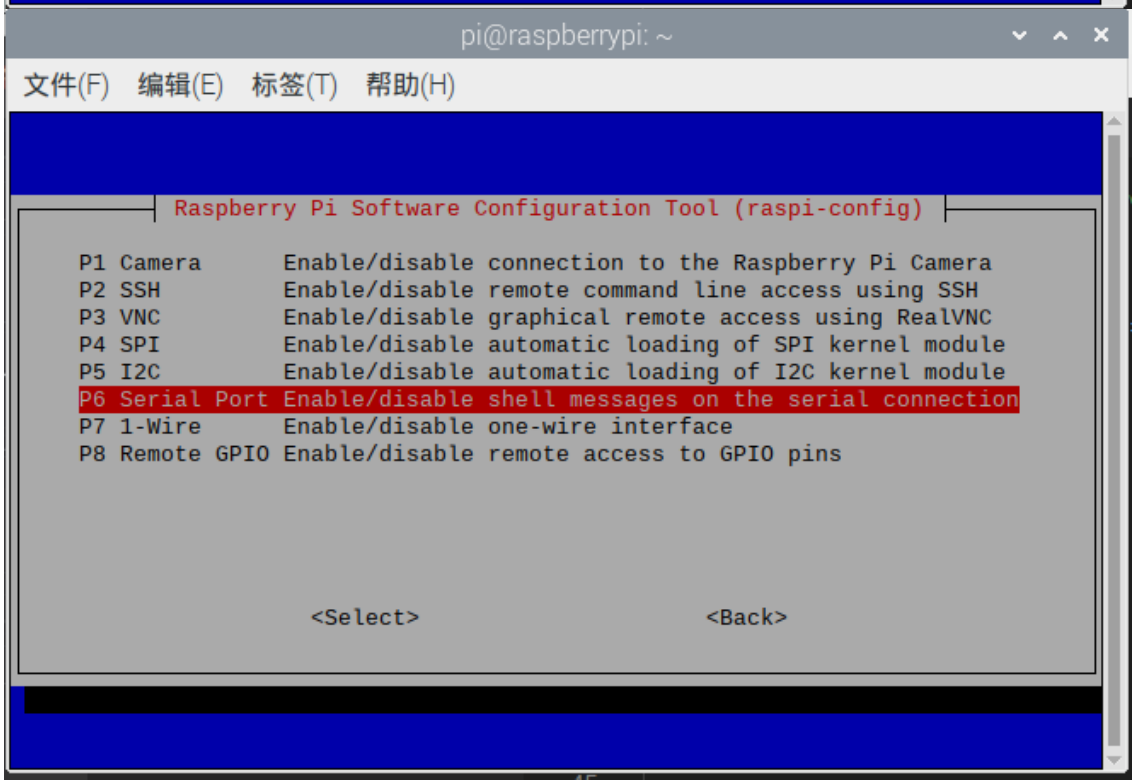


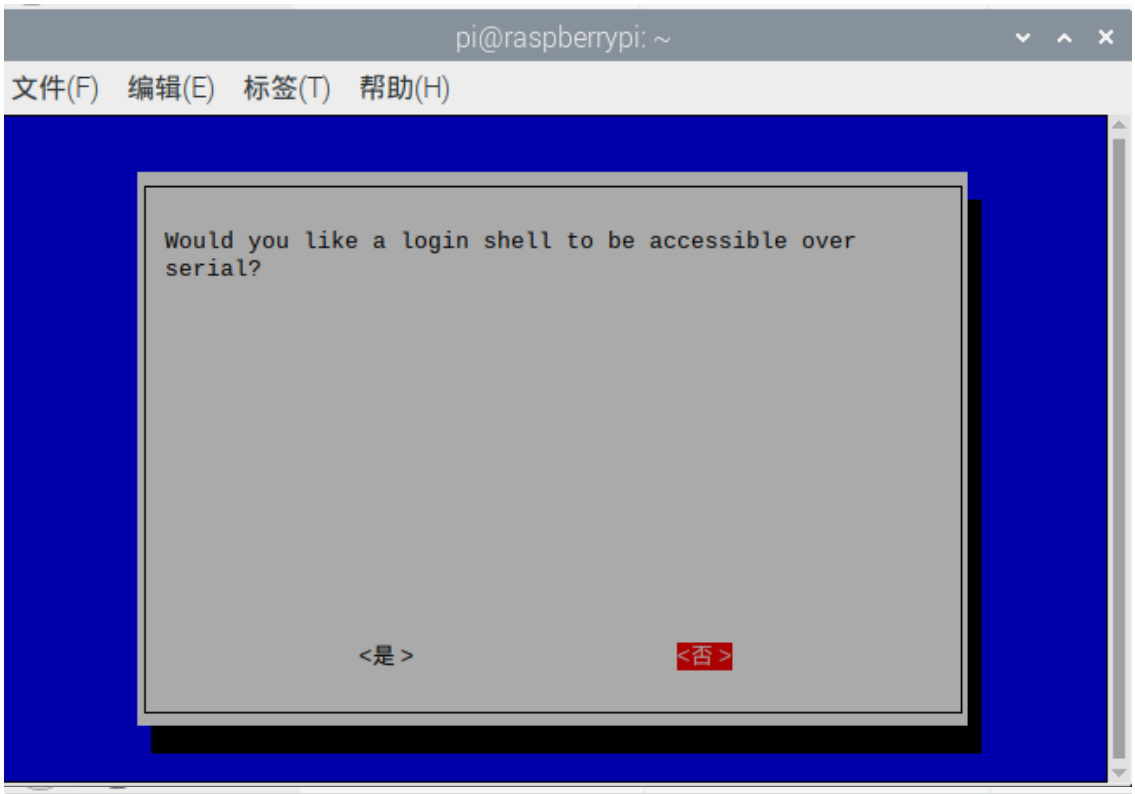
1. First perform the following operations to map the serial port
   Enter sudo raspi-config in the terminal

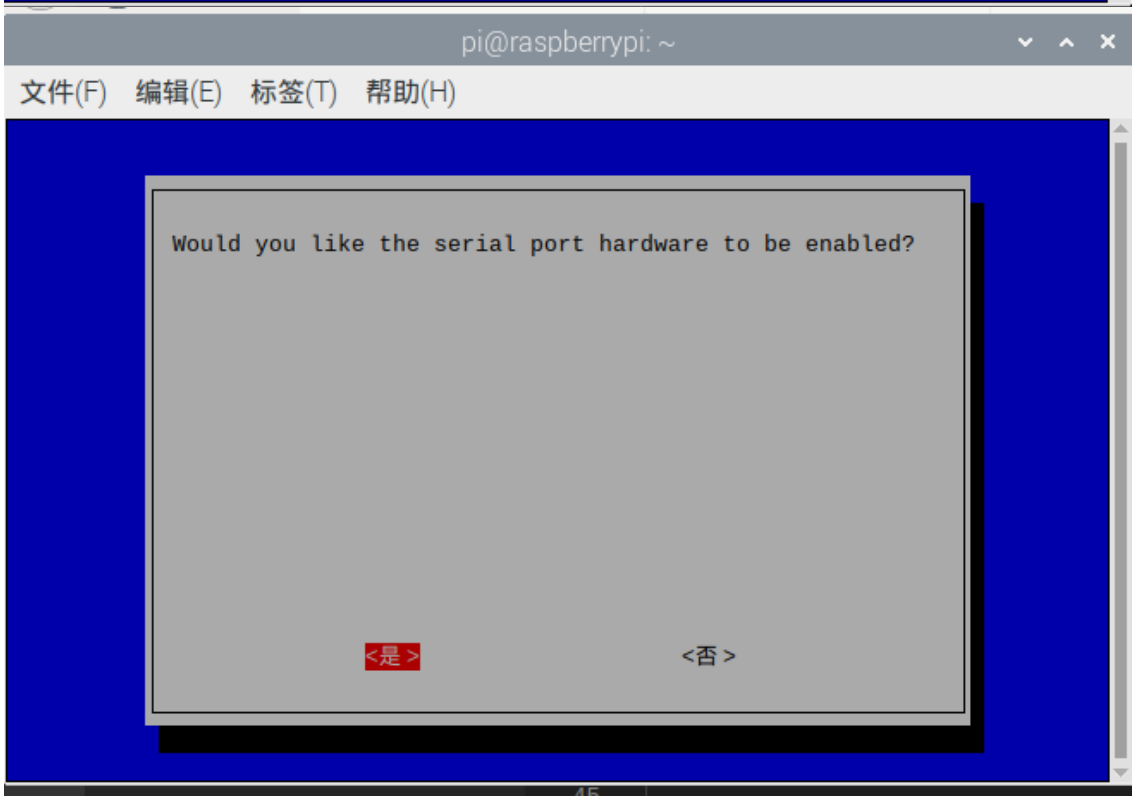
2.


pi@raspberrypi: ~
文件(F) 编辑(E) 标签(T) 帮助(H)
Raspberry Pi 4 Model B Rev 1.1
Raspberry Pi Software Configuration Tool (raspi-config)
1 System Options Configure system settings
2 Display Options Configure display settings
3 Interface Options Configure connections to peripherals
4 Performance Options Configure performance settings
5 Localisation Options Configure language and regional settings
6 Advanced Options Configure advanced settings
8 Update Update this tool to the latest version
9 About raspi-config Information about this configuration tool
<Select>
<Finish>

3.


pi@raspberrypi: ~
文件(F) 编辑(E) 标签(T) 帮助(H)
Raspberry Pi Software Configuration Tool (raspi-config)
P1 Camera Enable/disable connection to the Raspberry Pi Camera
P2 SSH Enable/disable remote command line access using SSH
P3 VNC Enable/disable graphical remote access using RealVNC
P4 SPI Enable/disable automatic loading of SPI kernel module
P5 I2C Enable/disable automatic loading of I2C kernel module
P6 Serial Port Enable/disable shell messages on the serial connection
P7 1-Wire Enable/disable one-wire interface
P8 Remote GPIO Enable/disable remote access to GPIO pins
<Select>
<Back>

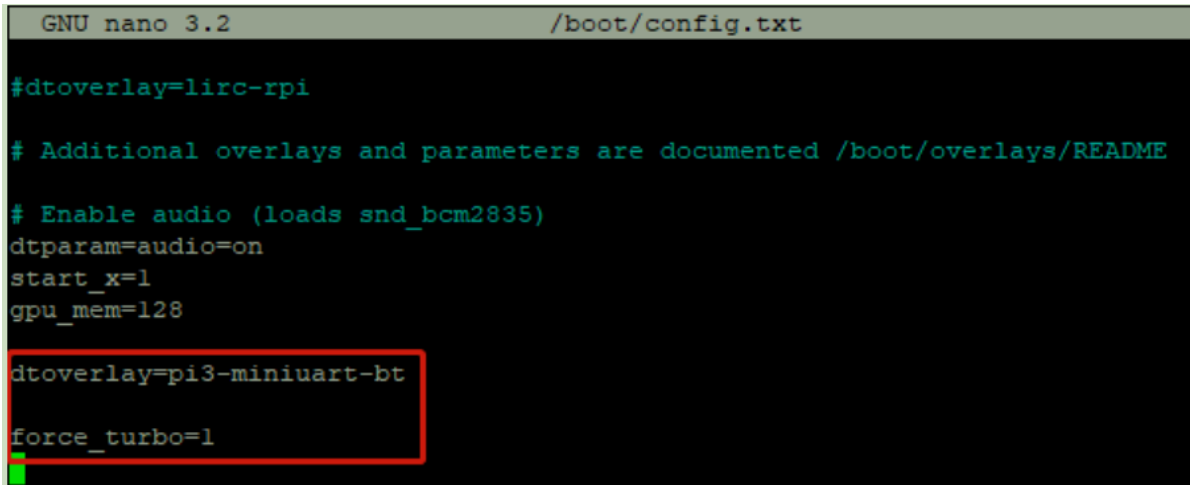
4. 


5. 


6. Set the hardware serial port to GPIO serial port and edit /boot/config.txt with root permissions
   That is, the command is:

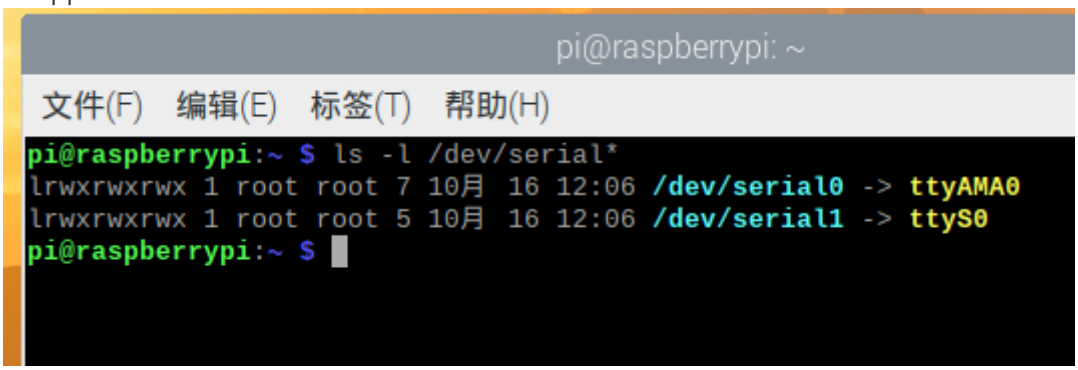
```
sudo nano /boot/config.txt
```

After opening the file, add two lines at the end
dtoverlay=miniuart-bt
force_turbo=1




Save: Ctrl+O, exit Ctrl+X.

7. After saving and exiting, restart the Raspberry Pi. You can see that the serial ports have been swapped.




Reference link: https://blog.iyatt.com/?p=1817

# 4. Experimental steps and experimental results

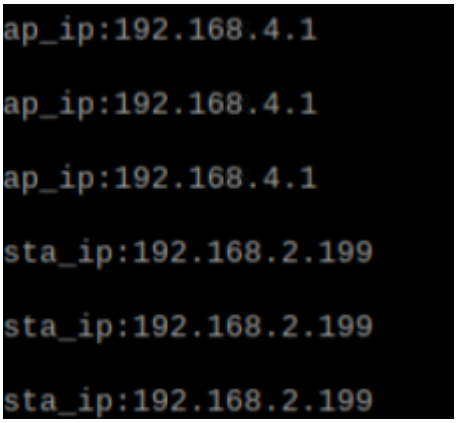
1. Open a new Raspberry Pi terminal and send the source code of this experiment to the Raspberry Pi.
2. Execute the following instructions

```
python3 PI_SET_WIFI.py
```

3. If it is opened successfully, the following results will appear


This information is related to configuring the camera wifi mode, reading version information and other related operations.

4. If the AP+STA mode is turned on, then the IP addresses of the AP+STA will have the correct IP address (this source code is in this mode)




**If only one mode is enabled, then sta_ip:null or ap_ip:null**

**When sta_ip:null occurs**, you need to check whether the connected wifi name and password are correct. If correct, whether only the AP mode is turned on and the STA mode is not turned on.

5. Transparent data transmission based on IP connection

- First open the **NetAssist.exe** software on your computer and make sure the computer and camera are on the same network segment.
- Then connect according to the obtained IP address. For example, the obtained sta_ip is: "192.168.2.199"/ap_ip is: "192.168.4.1"
- Then there are 2 ways

    1. Connect the computer to the camera's spontaneous wifi, and then connect through the ip 192.168.4.1. The port number is **8888** and cannot be changed.


    2. The computer is connected directly through the IP address 192.168.2.199. The port number is **8888** and cannot be changed. The following figure is a diagram of a

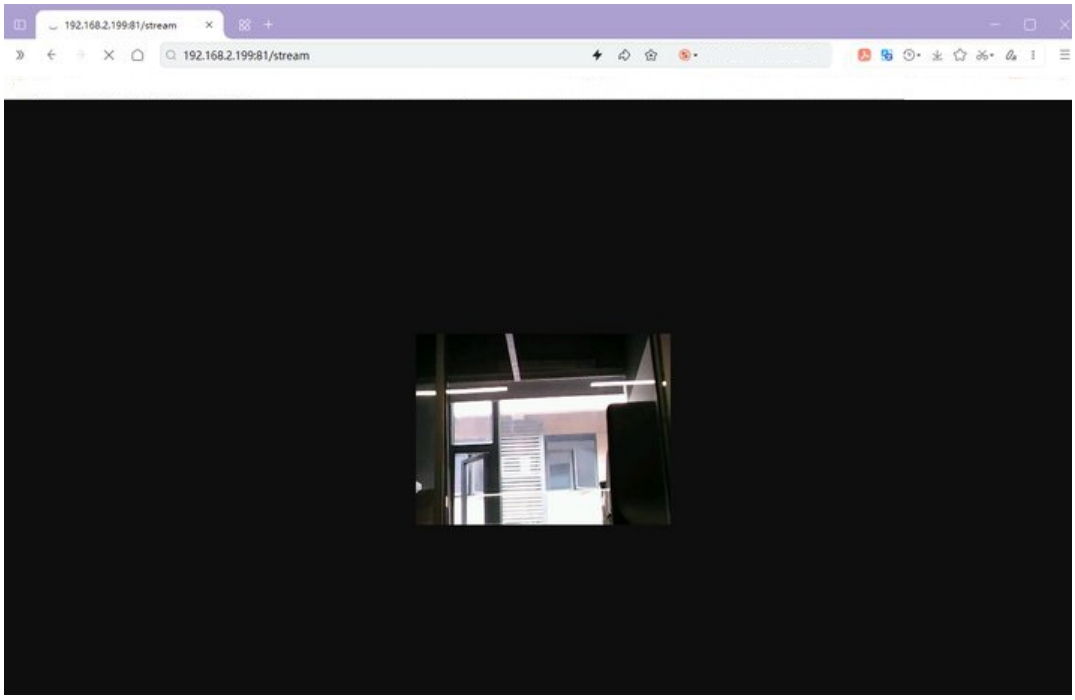
successful connection.


- Then by sending the information, the Raspberry Pi terminal will also print the relevant information


6. View camera footage

- Open the browser on your computer or mobile phone
- Then watch the video through the obtained IP address. For example, the obtained sta_ip is: "192.168.2.199"/ap_ip is: "192.168.4.1"
- Then you can watch the live camera footage in 2 ways

    1. Connect the computer to the camera's spontaneous wifi, and then enter **http://192.168.4.1:81/stream** through the browser to access the camera screen
    2. Directly enter **http://192.168.2.199:81/stream** on your computer to access the camera screen.




## 5. Analysis of wifi configuration source code

```
Sta_wifi_ssid = "Yahboom"
Sta_wifi_pd = "yahboom"

AP_wifi_ssid = "ESP_WIFI_TEST"
AP_wifi_pd = ""

wifi_mode = '2'
```

- **Sta_wifi_ssid**: The wifi name of sta is the name of the wifi to be connected
- **Sta_wifi_pd**: sta's wifi is the password of the wifi to be connected
- **AP_wifi_ssid**: The name of the wifi camera's spontaneous hotspot
- **AP_wifi_pd**: Password for wifi camera spontaneous hotspot
- **wifi_mode**: Working mode of wifi camera '0': AP mode '1': STA mode '2': AP+STA mode