Microbit remote control servo gimbal

1. Experimental preparation

- Module World expansion board
- microbit
- wifi camera

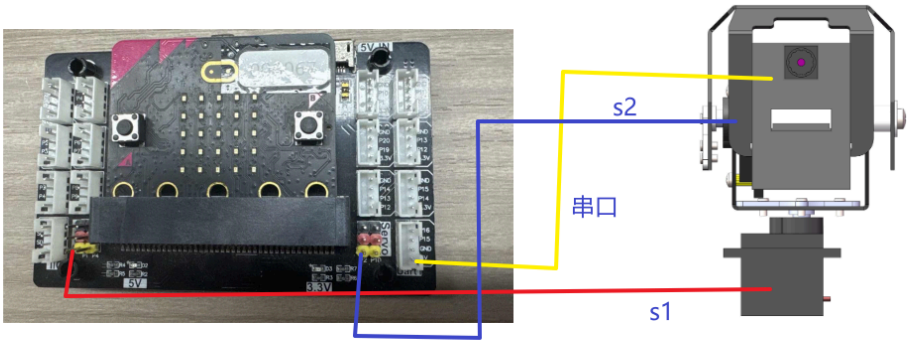
2. Experimental wiring

Note: Due to insufficient voltage, esp32 camera requires additional power supply via type-c data cable

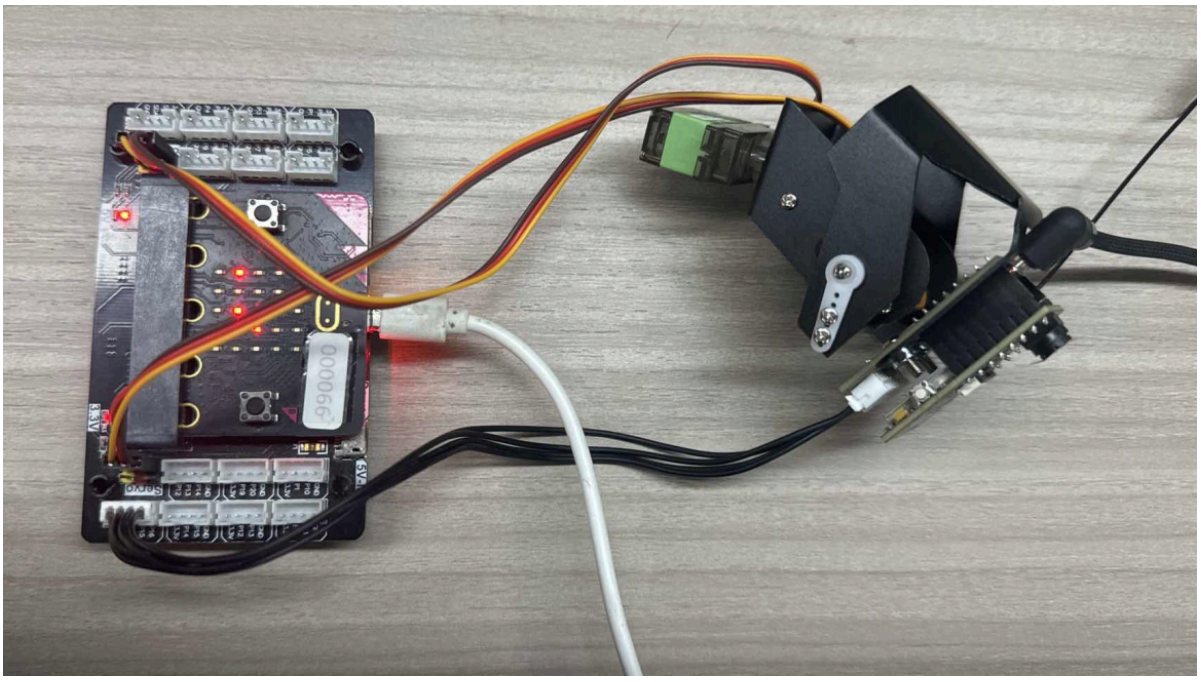
Expansion board	esp32 camera
P16	RX
P15	TX
GND	GND
5V	5V

Wiring instructions:

superkit	wifi camera
Servo interface P1	Vertical servo
Servo interface P2	Horizontal servo



Physical wiring diagram:

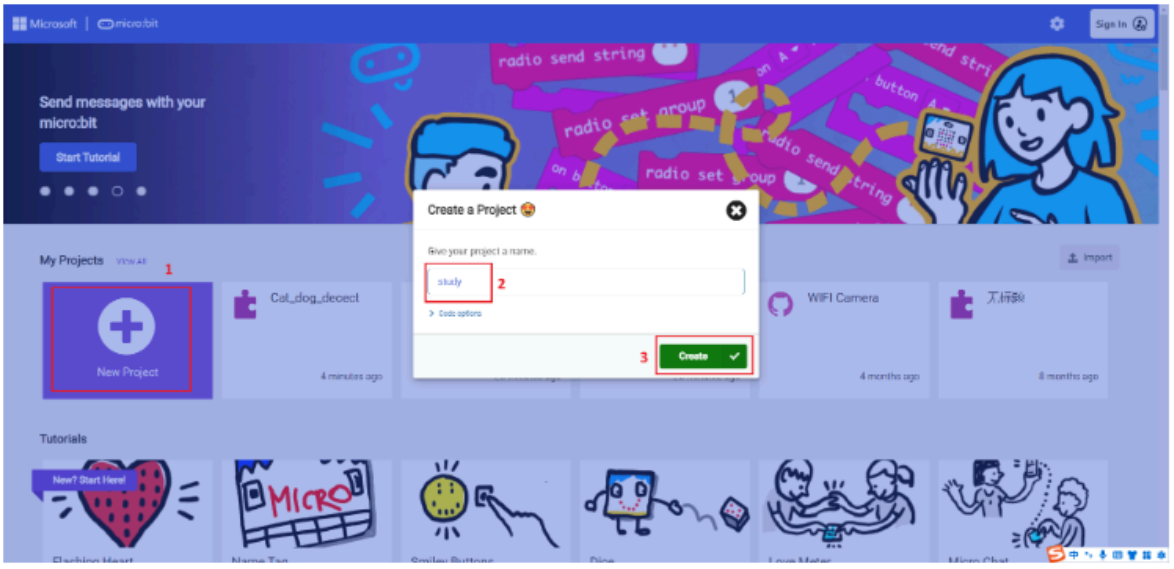


3. Import and briefly explain the building blocks of microbit

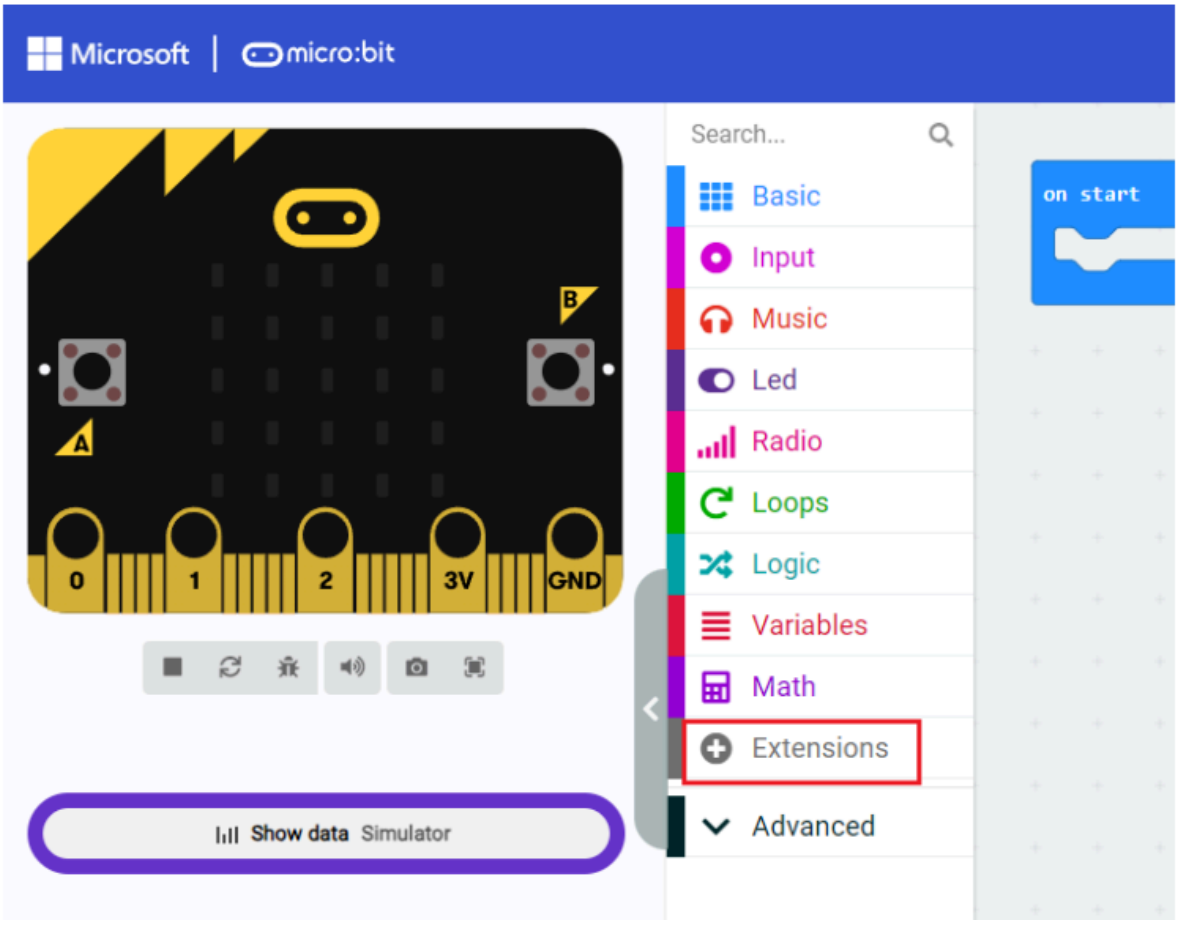
3.1 Open the programming website

https://makecode.microbit.org/#

3.2 Create a new project



3.3 Add the camera block



Block URL:

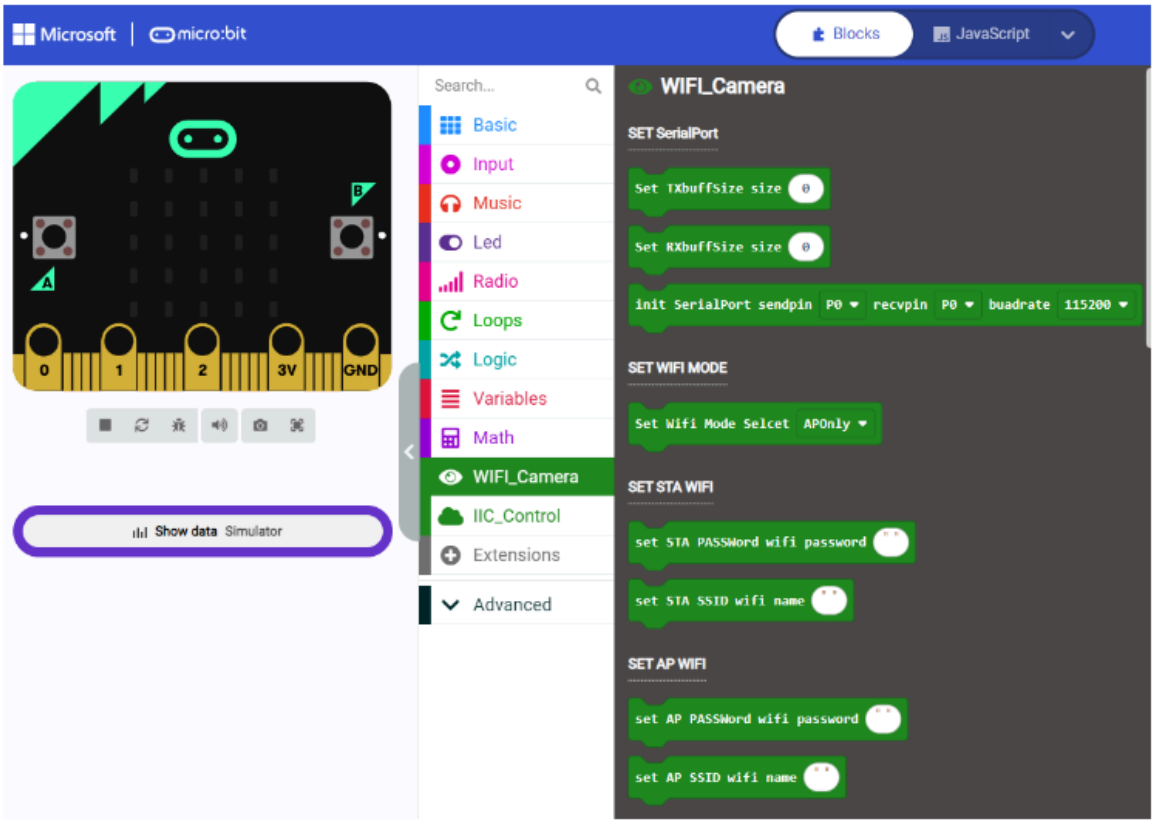
https://github.com/YahboomTechnology/ESP32-wifi-Microbit.git

Servo block URL:

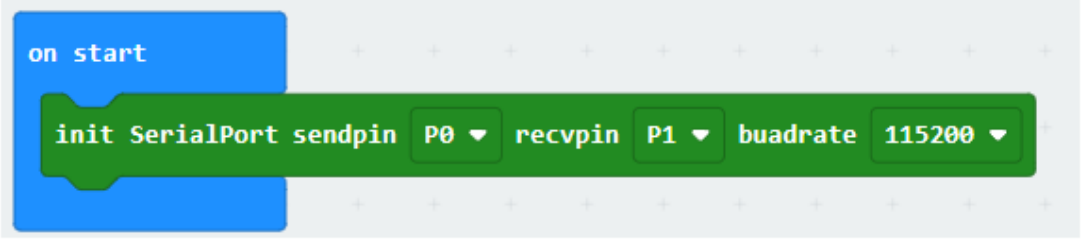
https://github.com/lzty634158/yahboom_mbit

3.4 Introduction to the main blocks

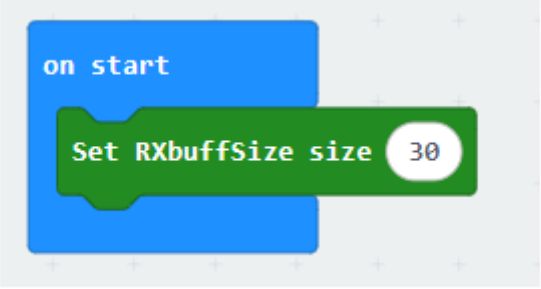
After successfully introducing the above blocks, the result will be displayed as shown in the figure below



- **Serial port initialization block** This is used to define the pins for serial communication, and communicate with the wifi camera. The baud rate is 115200 by default and cannot be changed



- **Set the size of the serial port receiving buffer** This block is used to define the size of a packet of data that can be accepted for transparent transmission, for example

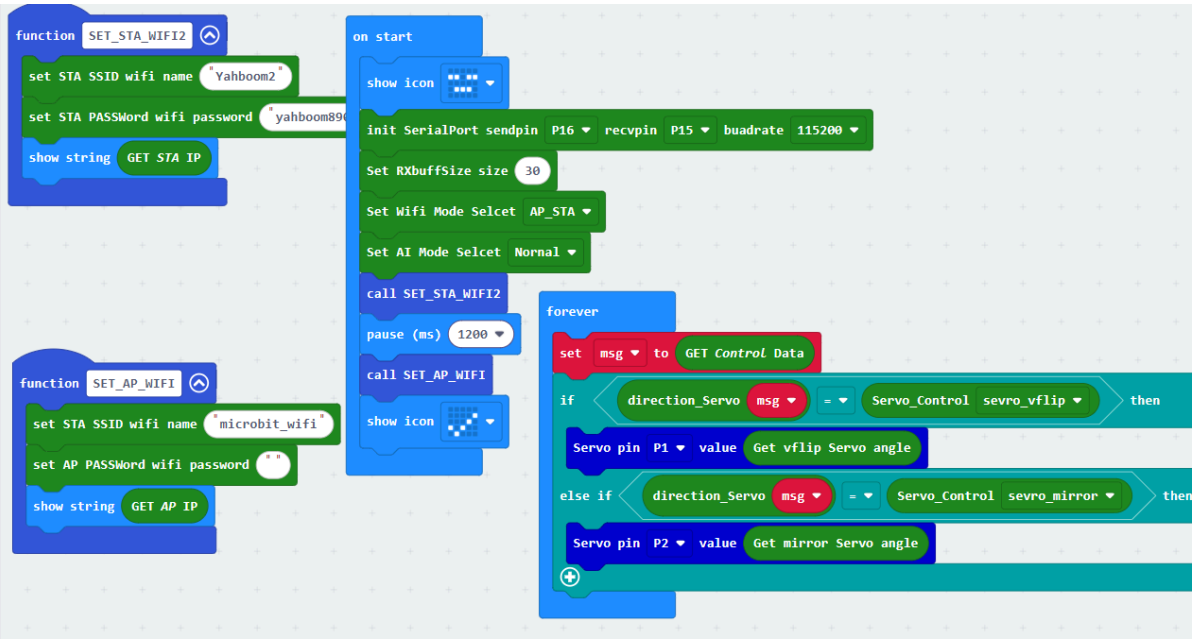


This defines that the maximum size of a packet is 30 characters. Exceeding this will result in incomplete data reception. **This value cannot be less than 25, otherwise the IP information will also be incomplete**

- Drive servo pin, followed by adjustable angle.

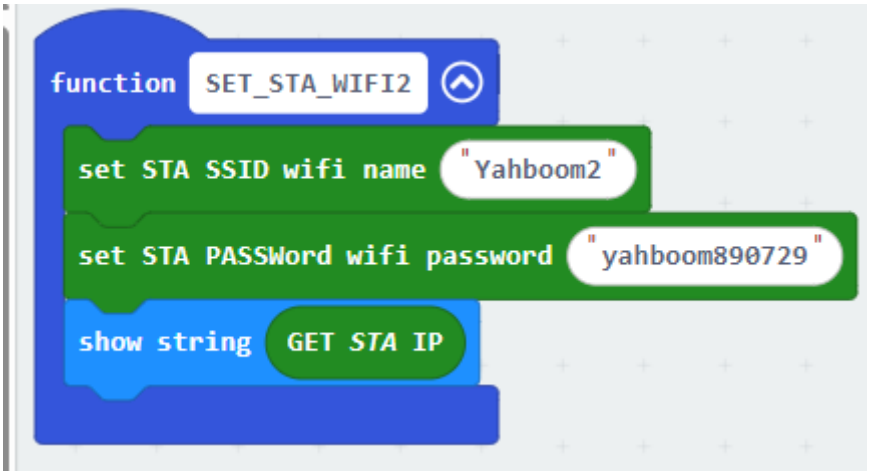
- You can know the functions of other building blocks by looking at their names. For how to use them, you can look at the source code provided in this tutorial. This tutorial will not explain **how to open the source code provided in the tutorial**

1. Open the URL https://makecode.microbit.org/# in the browser
2. Then drag the hex file provided in this experiment into the browser that opens the URL, and it will open automatically
3. The program diagram of the source code of this project



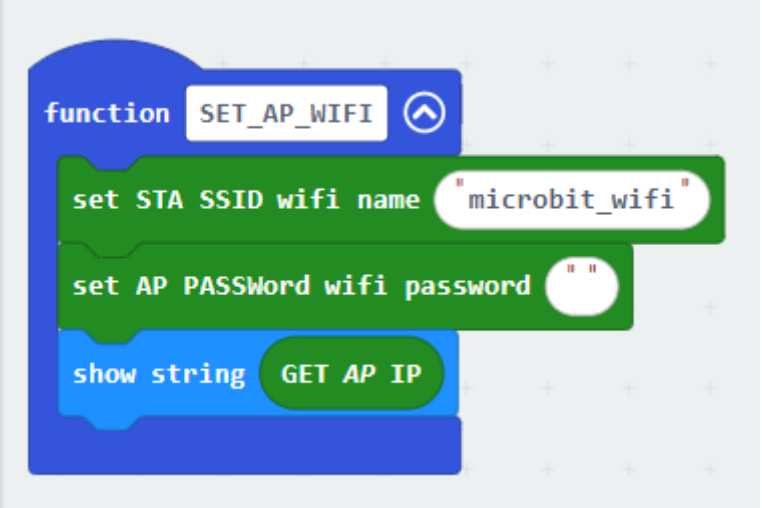
4. Experimental operation and experimental results

1. From the source code, we can see that microbit will first initialize the serial port and then configure the working mode of the wifi camera.
2. Then configure the Wif to be connected according to the settings



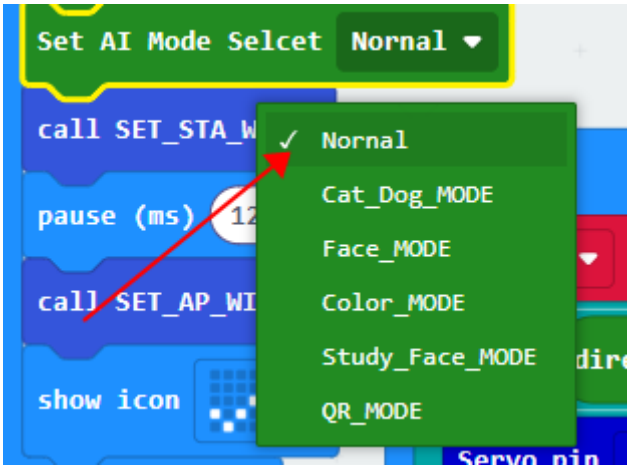
The Wifi here needs to be changed to a Wifi that can be connected

3. If the connection is successful, microbit will display **sta_ip:192.168.x.x** address. If the connection is unsuccessful, it will display **sta_ip:null**. If it is only configured as the self-heating point mode, it is also impossible to find the IP address of sta_ip, and it will also display **sta_ip:null** result
4. This is the configuration of the self-heating point

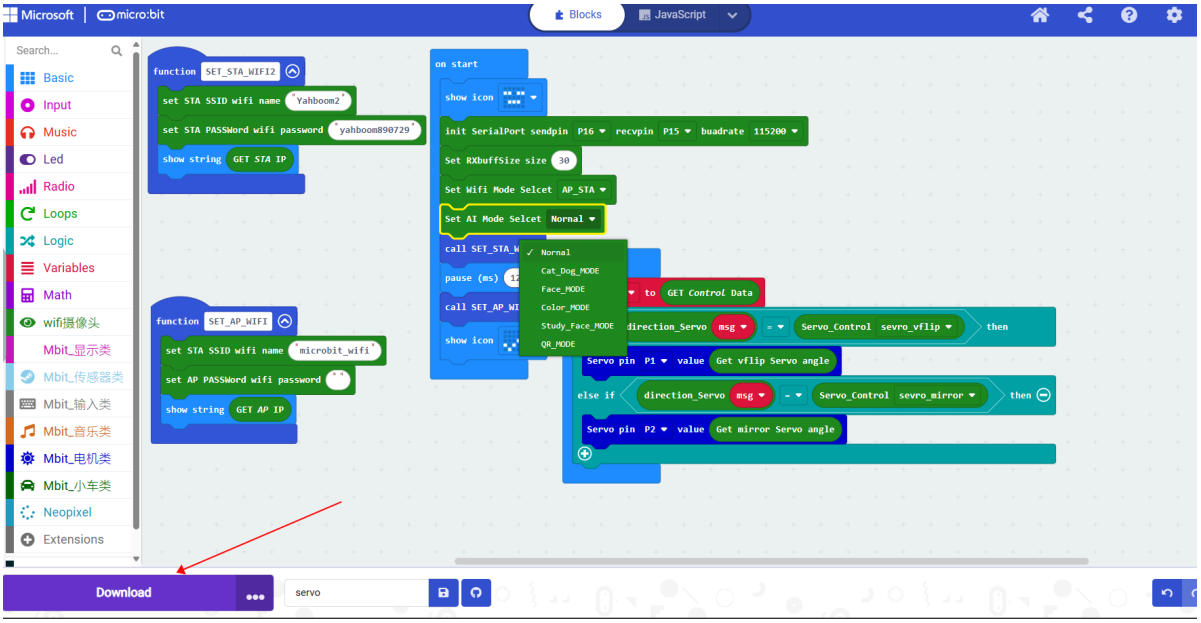


If the configuration is successful, the mobile phone can receive the **microbit_wifi** wifi hotspot, and can connect to this wifi by configuring a password or without a password, and microbit will display the ip of "ap_ip:192.168.4.1". If this name cannot be found, check whether it is configured to connect to wifi mode only (the mode in the figure below), and microbit will display the information of "ap_ip:null"

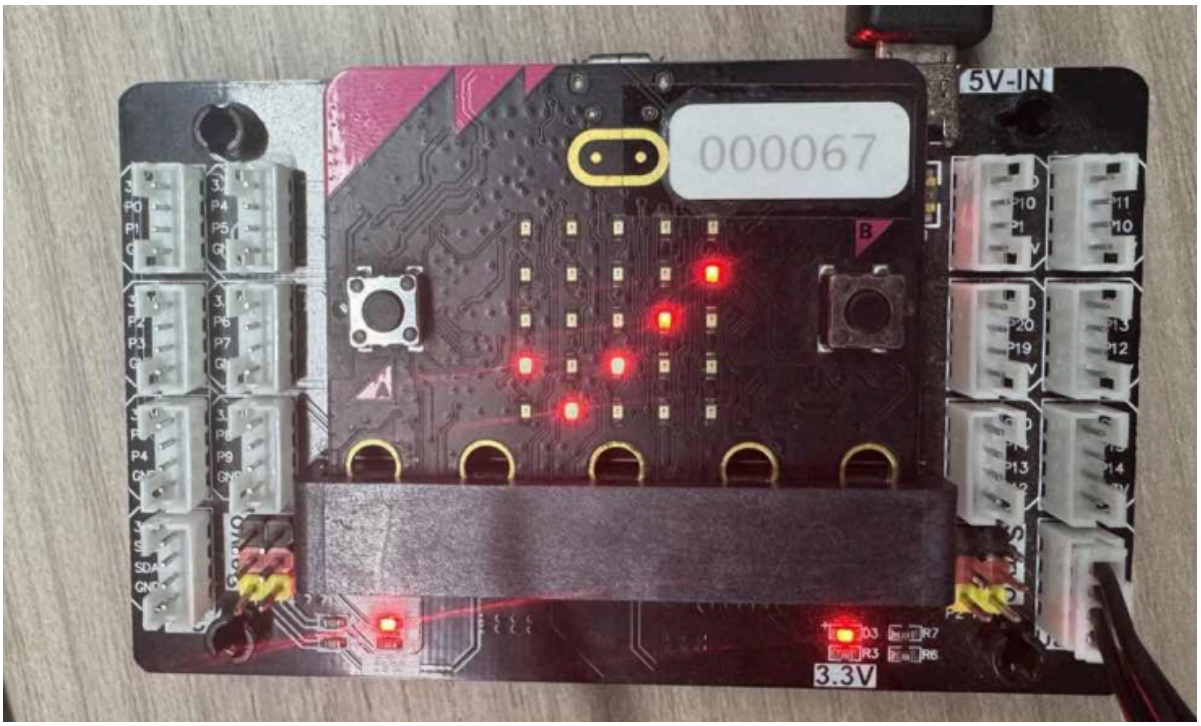
5. Set to normal mode



6. Download the program, you can directly pull the corresponding hex file of the source code to the recognized microbit drive letter. You can also click to download on the web

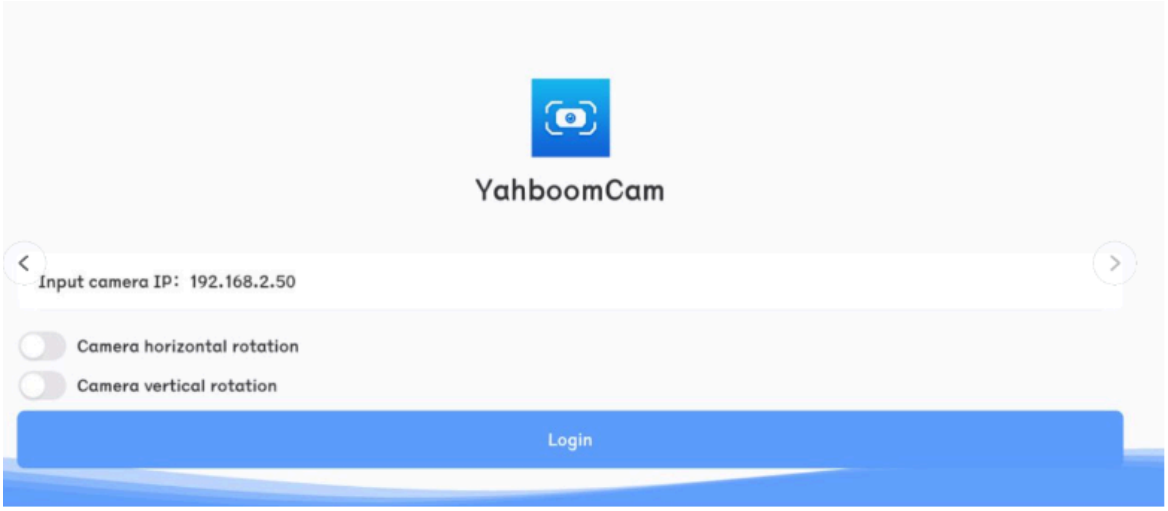


After downloading, microbit will display the sta_IP address and ap_ip address. Finally, a √ symbol is displayed, which means the download is successful.

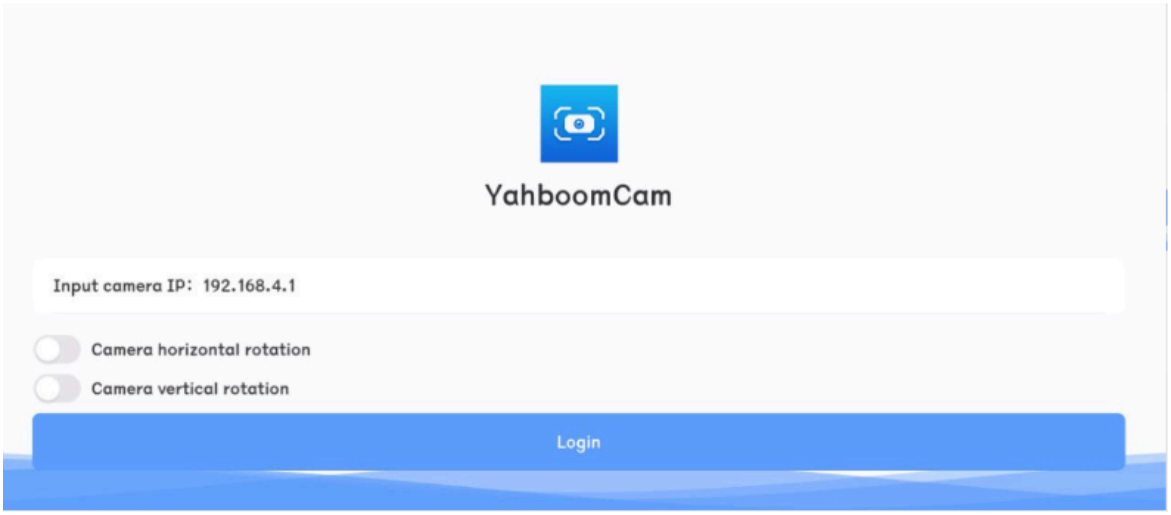


7. Use the app to control the movement of the car. After installing the "ESP32Cam" app, open it.

- On the login page, set it according to the IP obtained by the serial port assistant. If the IP obtained by the serial port assistant is "192.168.2.50", then configure it as follows

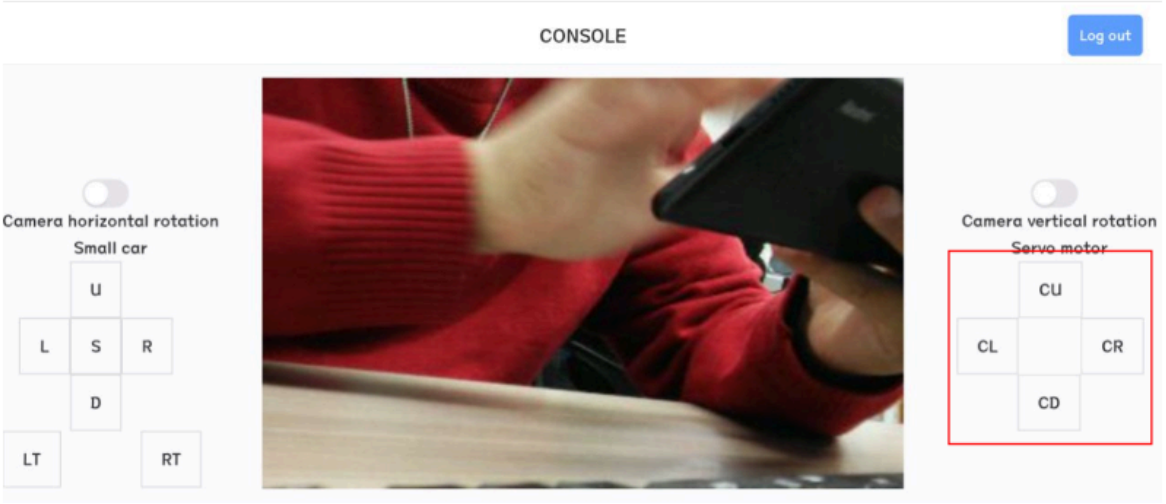


- Then click login directly
- (Optional) If you want to connect to the hotspot of the wifi camera, the IP address must be set to 192.168.4.1, as shown in the figure



- When the IP address is configured correctly and successfully connected, you can control the servo gimbal through the page of the app console

Horizontal screen



Note: Every time you restart the app, you need to click the exit button in the upper right corner, then exit and reconfigure the IP address information before logging in