STM32 camera configuration

Note: esp32 camera needs to be burned with factory firmware. If you have not flashed the firmware after receiving the esp32 camera, it is not necessary. The factory default firmware, before using iic communication, you can use the serial port to configure the esp32 camera to the network, and iic is used for data reading

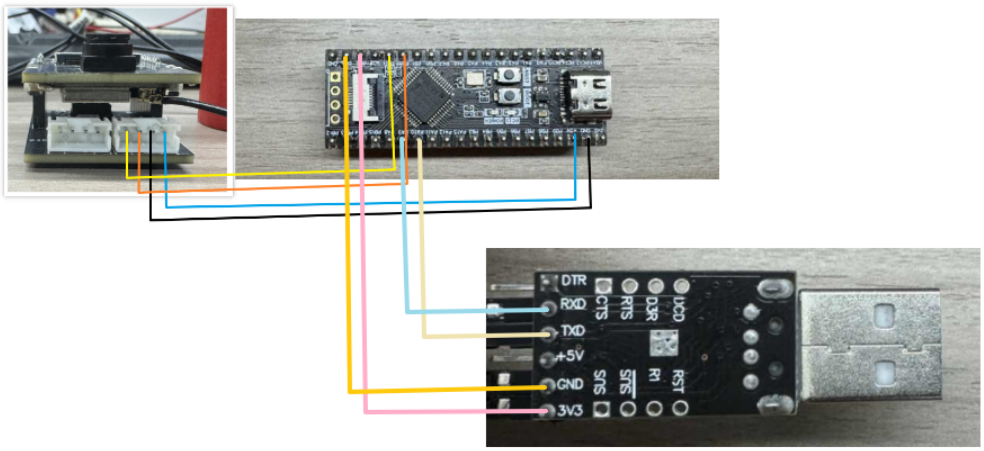
1. Experimental preparation

- stm32 series microcontroller
- wifi camera

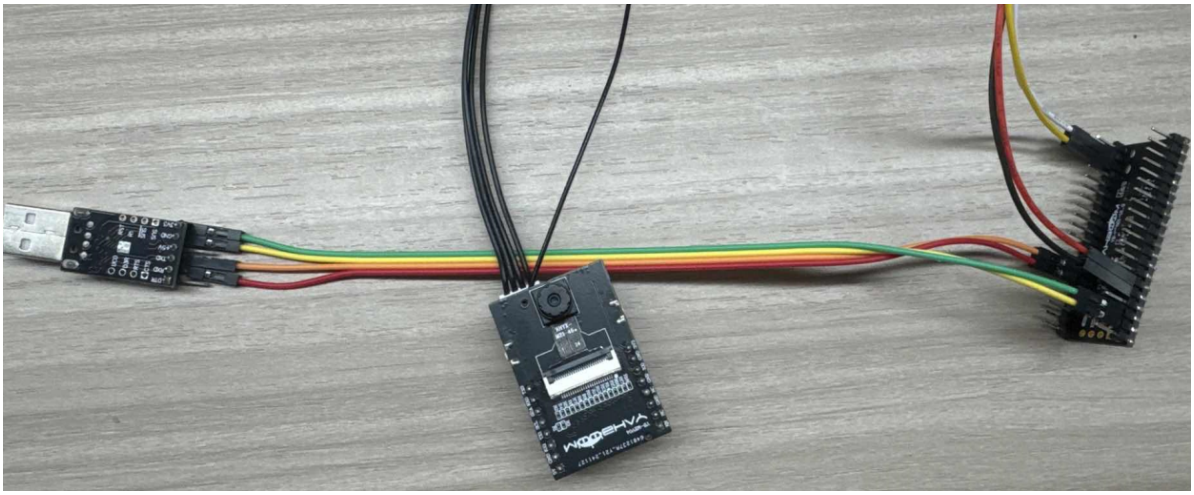
2. Wiring diagram

STM32	esp32 camera
PB10	SCL
PB11	SDA
GND	GND
5V	5V

STM32	ESP32 camera
PA9	RX
PA10	TX
GND	GND
5V	5V



Physical connection diagram:



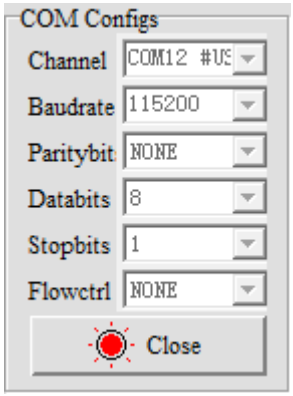
3. Experimental steps and experimental results

1. Check whether the program runs normally
2. In the main function, change to the corresponding ai mode.

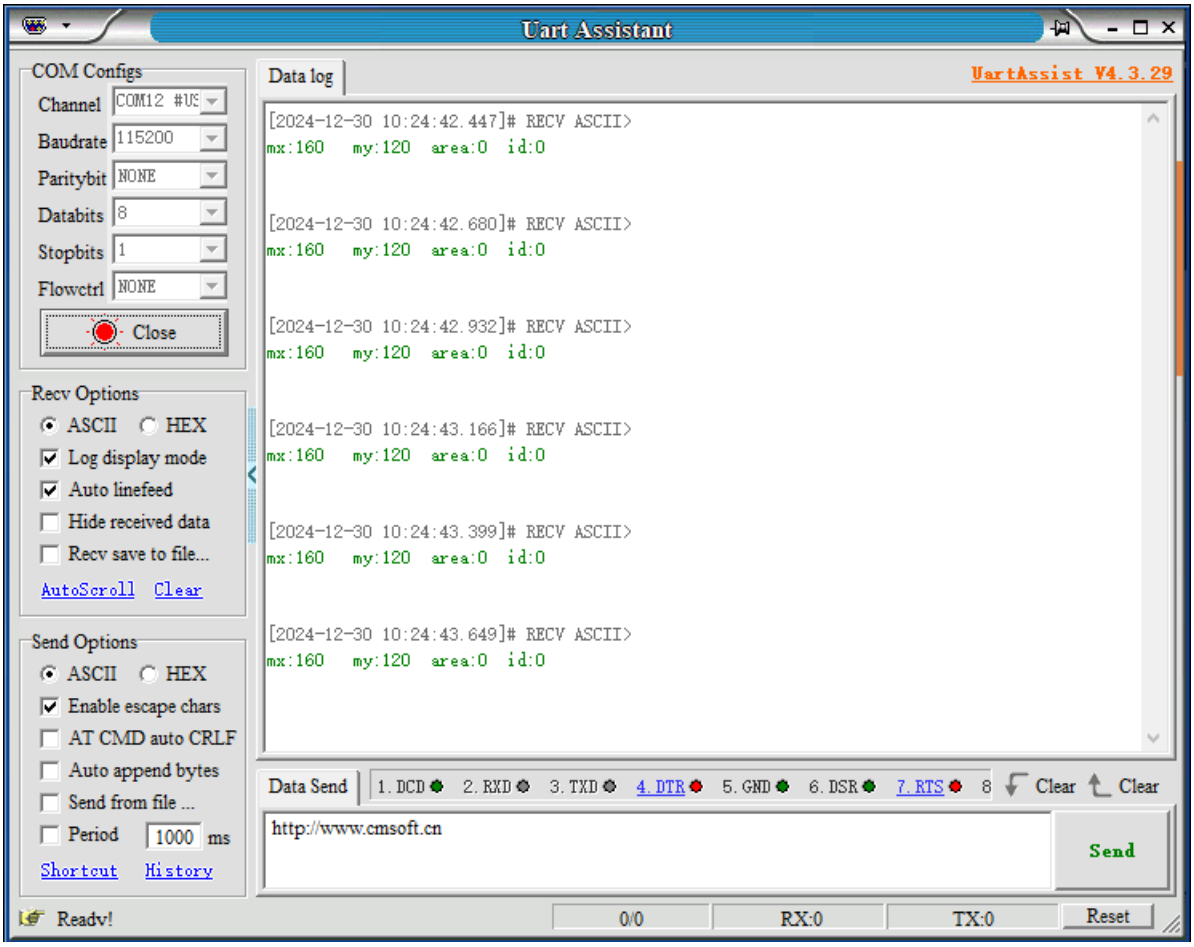
```
//模式选择 Model Select
typedef enum Model_state_t
{
  Normal=0x00,
  Cat_Dog_Model,
  Face_Detection,
  Color_identify,
  Face_identify,
  QR_code,
  MAX_ERROR
}Model_state;
```

```
Model_state model = Cat_Dog_Model;
```

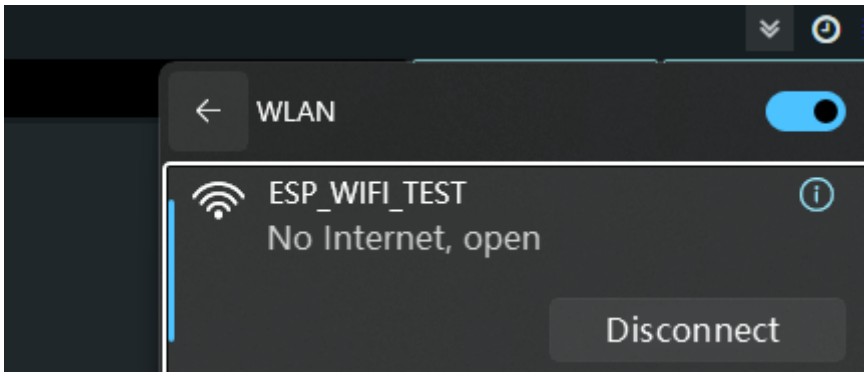
3. Download the program of this project to the STM32 board
4. Open the serial port assistant on the computer and detect the serial port of STM32, as shown below



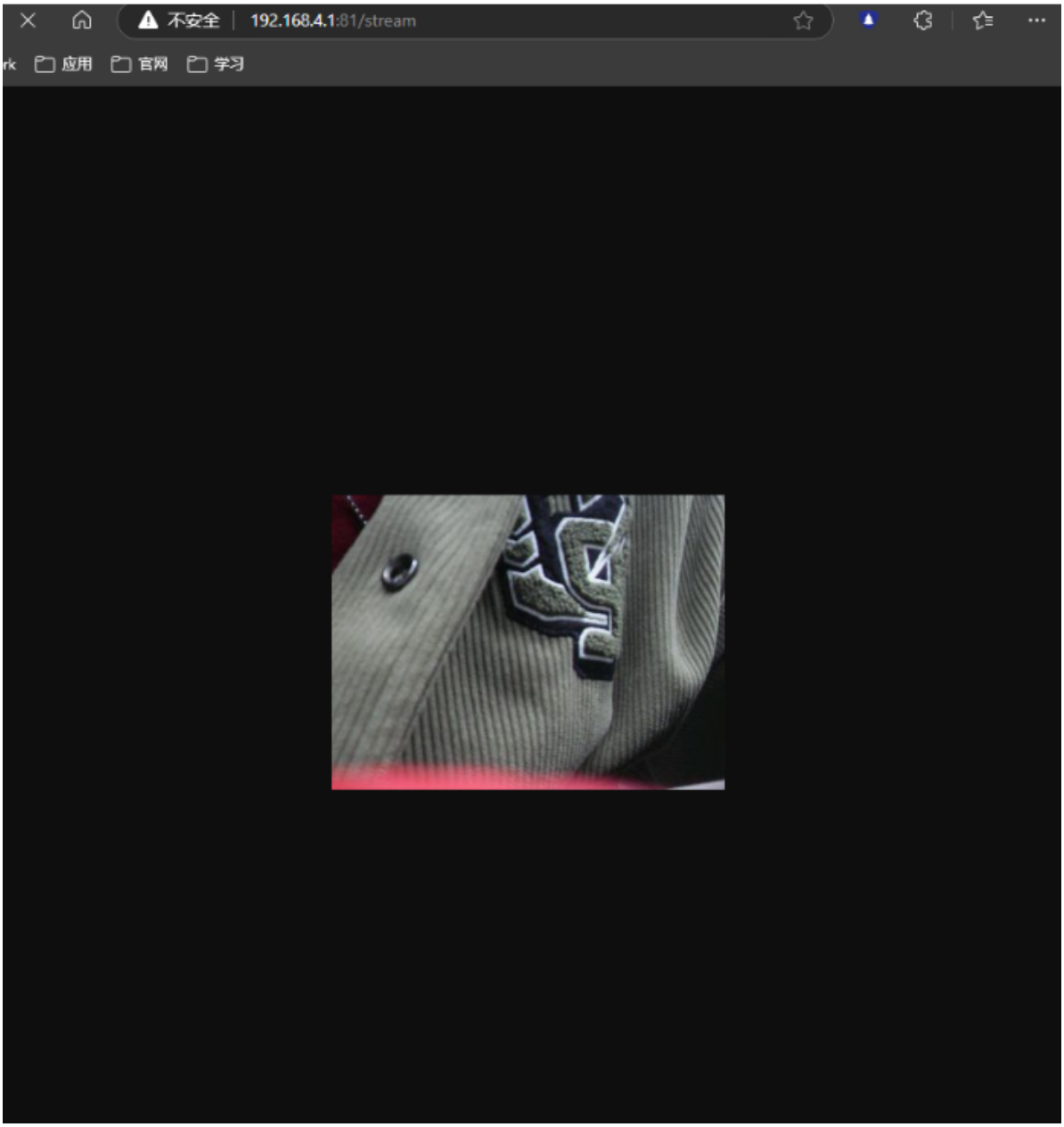
After pressing the reset button of STM32, the serial port assistant will print out the corresponding information



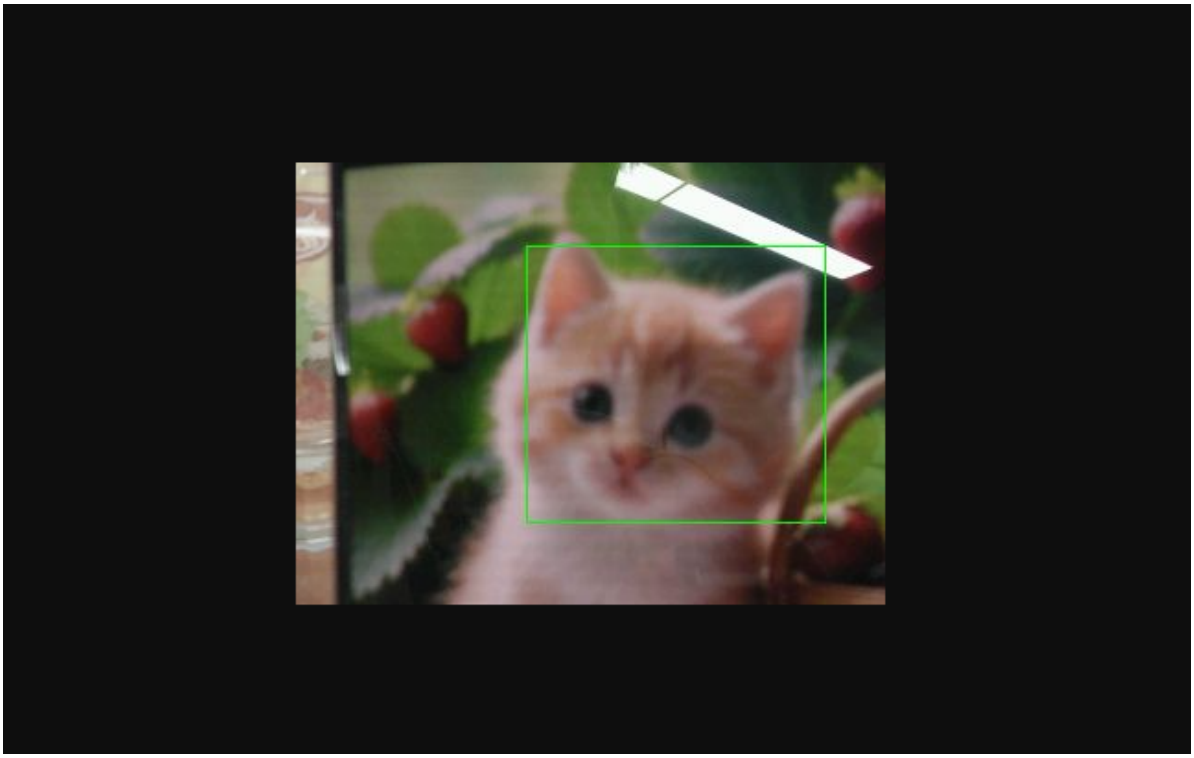
4. Open the camera and connect to the hotspot released by esp32



Then enter http://192.168.4.1:81/stream through the browser This access camera screen



5. Identify cats and dogs. If the recognition is successful, the current center coordinates will be printed out, and the cat image will be placed in front of the previous screen.



At the same time, the terminal will print out the current coordinates,

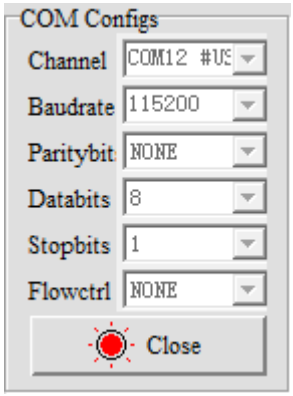
```
[2024-12-27 19:37:46.944]# RECV ASCII>
mx:189   my:104  area:16300     id:0


[2024-12-27 19:37:47.241]# RECV ASCII>
mx:189   my:105  area:16564     id:0


[2024-12-27 19:37:47.520]# RECV ASCII>
mx:190   my:106  area:16335     id:0


[2024-12-27 19:37:47.814]# RECV ASCII>
mx:192   my:108  area:14256     id:0


[2024-12-27 19:37:48.094]# RECV ASCII>
mx:203   my:112  area:14926     id:0


[2024-12-27 19:37:48.395]# RECV ASCII>
mx:204   my:111  area:27982     id:0
```

Face recognition mode

When switching to face recognition mode,

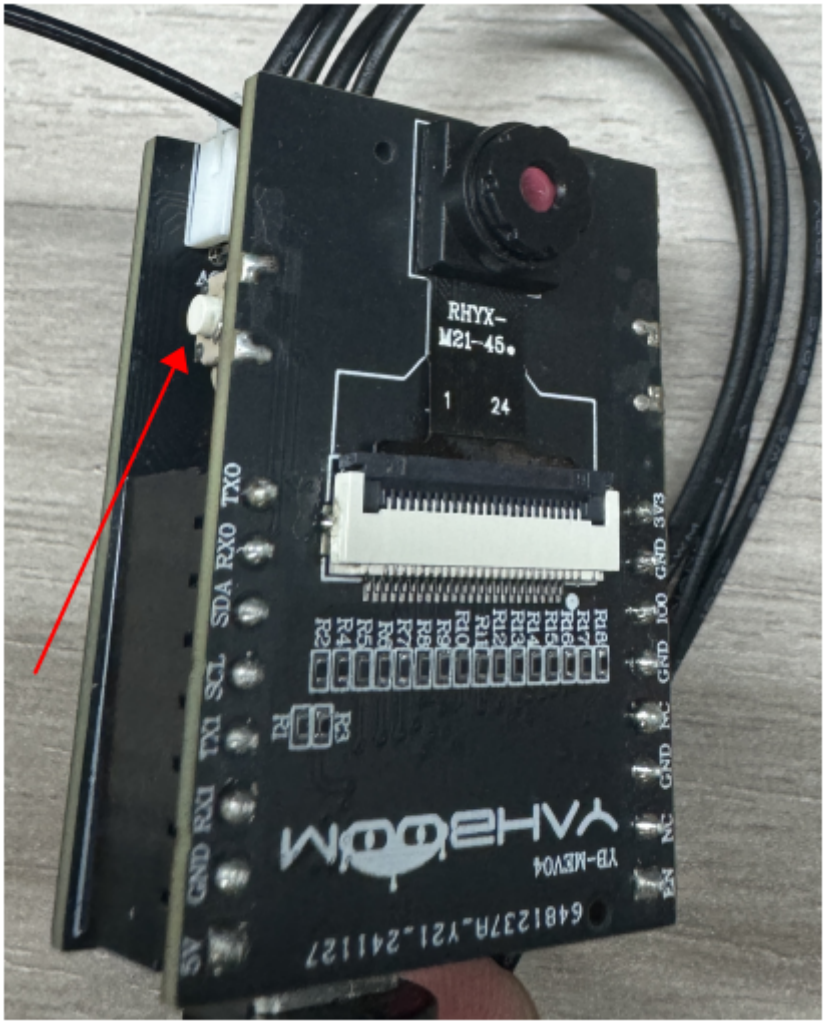
```
#include "AllHeader.h"

Model_state model = Face_identify;
```

Compile and download to the STM32 motherboard, open the serial port debugging assistant

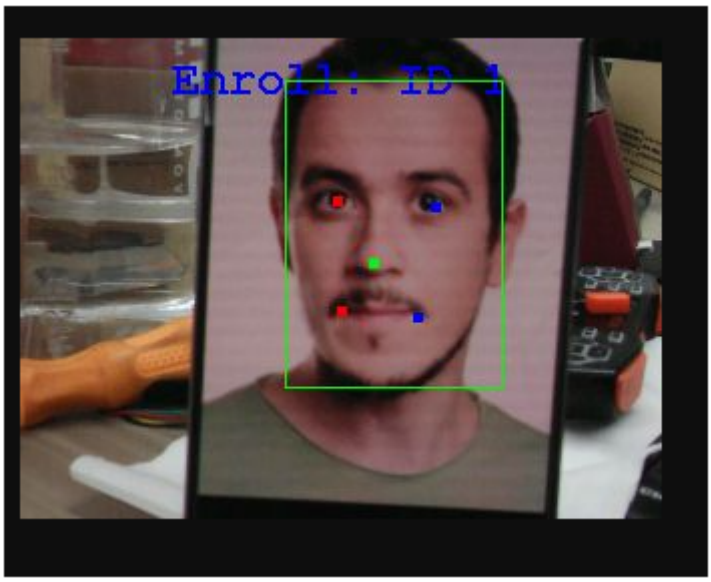



```
[2024-12-30 10:24:46.757]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.008]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.242]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.475]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.726]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.962]# RECV ASCII>
mx:160   my:120  area:0  id:0
```

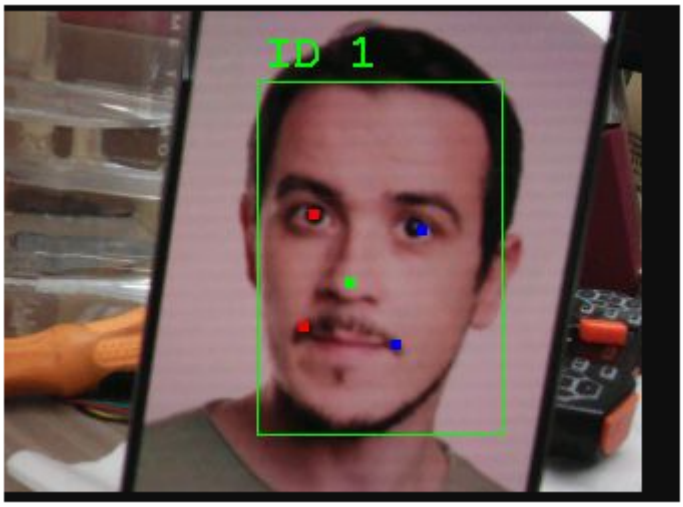
Recognize face. When you see a face, press the key button to record the face



The following picture appears, which means the recording is successful, and the face 1 is recorded



At this time, you can press and hold the button for two seconds, then release it and press the button again to recognize the current face



At the same time, the terminal will print out the current center coordinates and the recognized face.

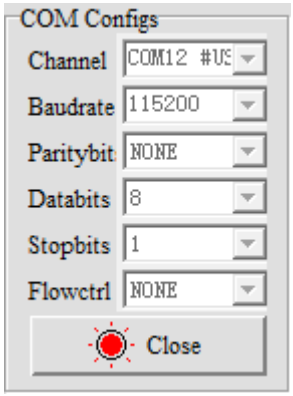
```
[2024-12-30 10:46:41.234]# RECV ASCII>
mx:134   my:135  area:25821      id:1


[2024-12-30 10:46:41.566]# RECV ASCII>
mx:134   my:135  area:25821      id:1


[2024-12-30 10:46:41.877]# RECV ASCII>
mx:134   my:135  area:25821      id:1


[2024-12-30 10:46:42.191]# RECV ASCII>
mx:134   my:135  area:25821      id:1


[2024-12-30 10:46:42.520]# RECV ASCII>
mx:134   my:135  area:25821      id:1


[2024-12-30 10:46:42.834]# RECV ASCII>
mx:134   my:135  area:25821      id:1
```

Color detection mode

When switching to color detection mode,

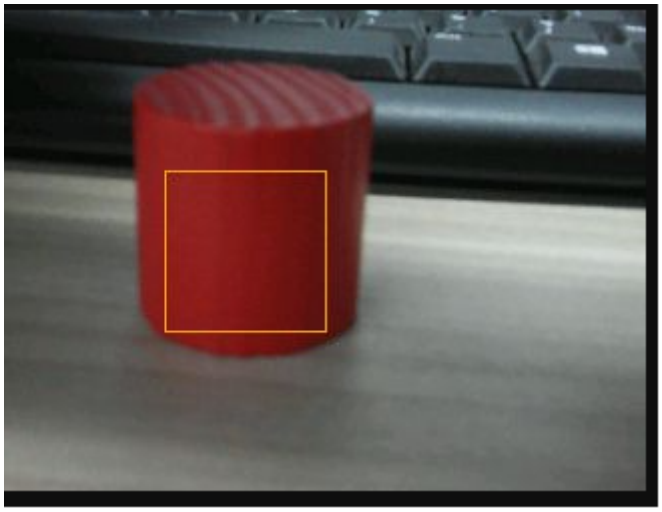
```
Model_state model = Color_identify;
```

Compile and download to the STM32 motherboard, open the serial port debugging assistant

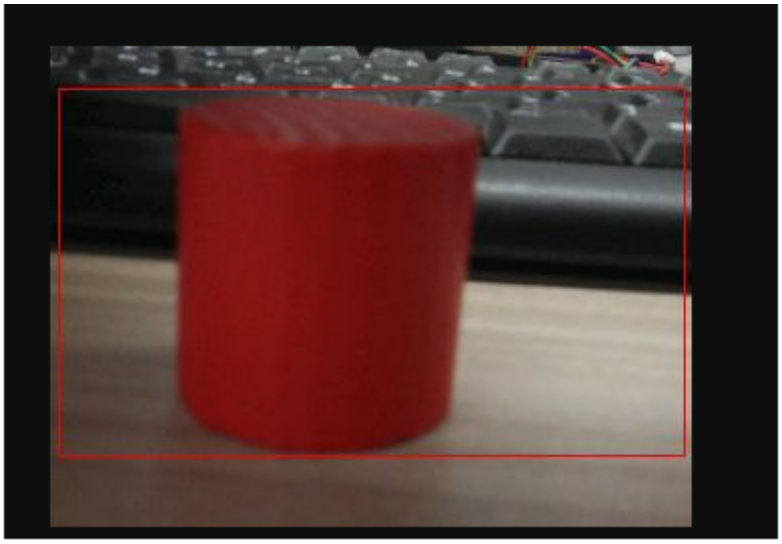



```
[2024-12-30 10:24:46.757]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.008]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.242]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.475]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.726]# RECV ASCII>
mx:160   my:120  area:0  id:0


[2024-12-30 10:24:47.962]# RECV ASCII>
mx:160   my:120  area:0  id:0
```

Identify the color. Press the button and a box will appear. You can use this box to select the color you want to use.



Press and hold the button for two seconds, release it and press it again to identify the currently selected color, and a red frame will appear.



At the same time, the terminal will print out the current center coordinates.

```
[2024-12-27 19:37:46.944]# RECV ASCII>
mx:189   my:104  area:16300      id:0


[2024-12-27 19:37:47.241]# RECV ASCII>
mx:189   my:105  area:16564      id:0


[2024-12-27 19:37:47.520]# RECV ASCII>
mx:190   my:106  area:16335      id:0


[2024-12-27 19:37:47.814]# RECV ASCII>
mx:192   my:108  area:14256      id:0


[2024-12-27 19:37:48.094]# RECV ASCII>
mx:203   my:112  area:14926      id:0


[2024-12-27 19:37:48.395]# RECV ASCII>
mx:204   my:111  area:27982      id:0
```