

Color Tracking

Quick use

1. Power on DOGZILLA

First, we turn on the switching power supply of the mechanical dog and start the mechanical dog



After starting, we can view the IP address on the small screen of the robot dog.

2. Start DOGZILLA chassis

PI4 version steps:

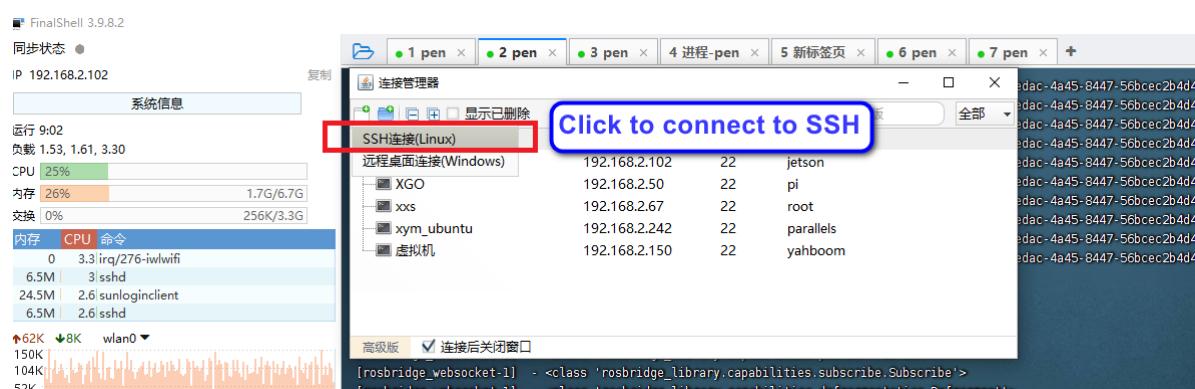
Then use the ssh terminal to connect to the robot dog.

Note: The IP address used when writing this tutorial: 192.168.2.102 User name: pi Password: yahboom The actual IP address shall prevail when used.

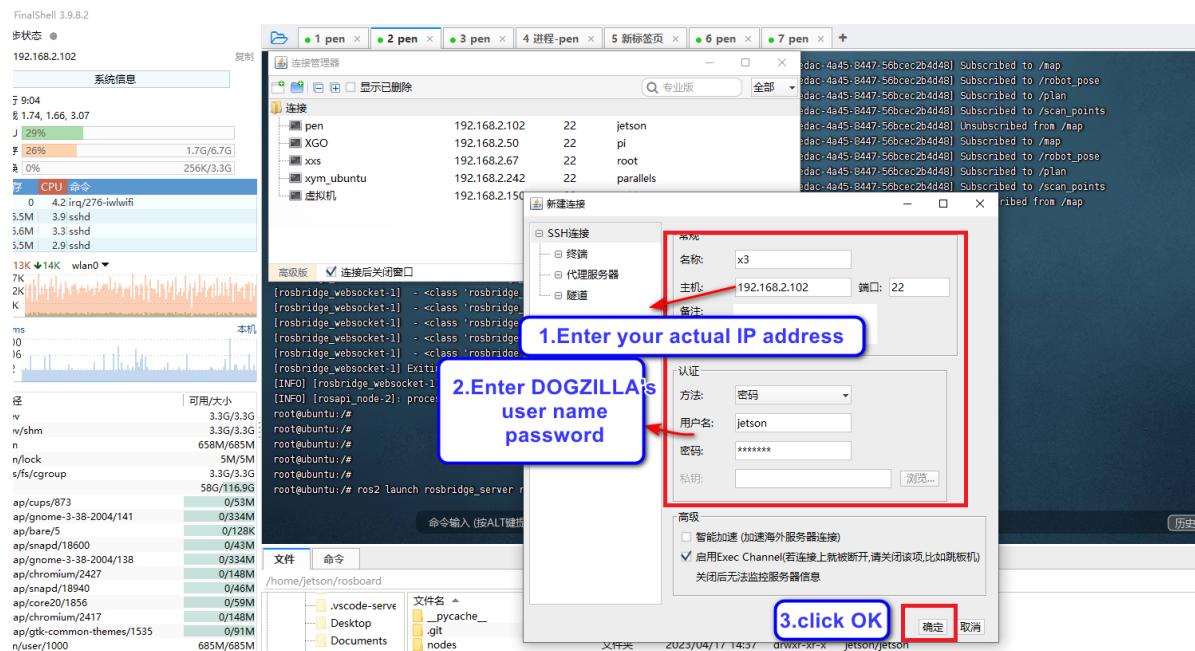
Open the shell tool. The shell tool I use here is FinalShell. Enter username, password, port, connection name and other information.



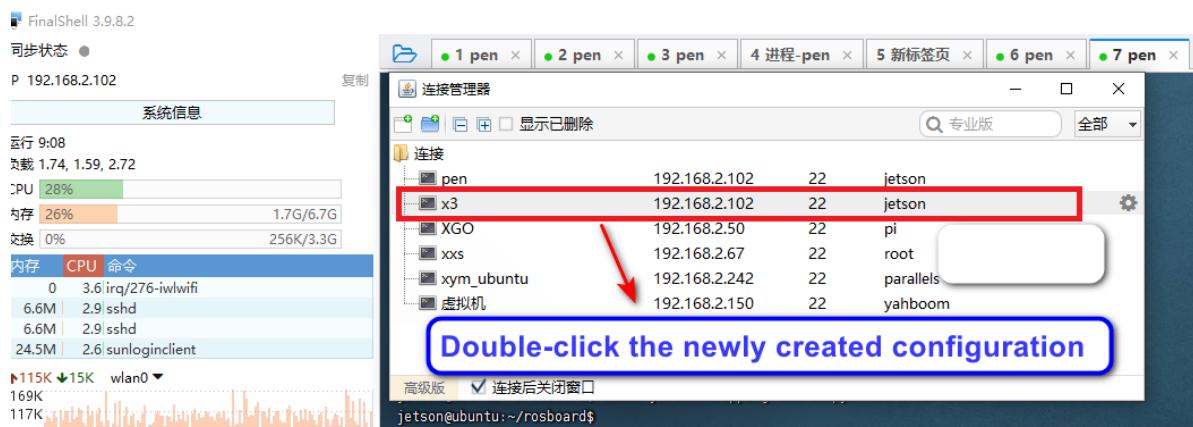
Select ssh connection to create a new ssh connection



Here the username is pi, the password is yahboom, and the ip address is the IP address of the real robot dog.



Select the ssh connection you just created here.



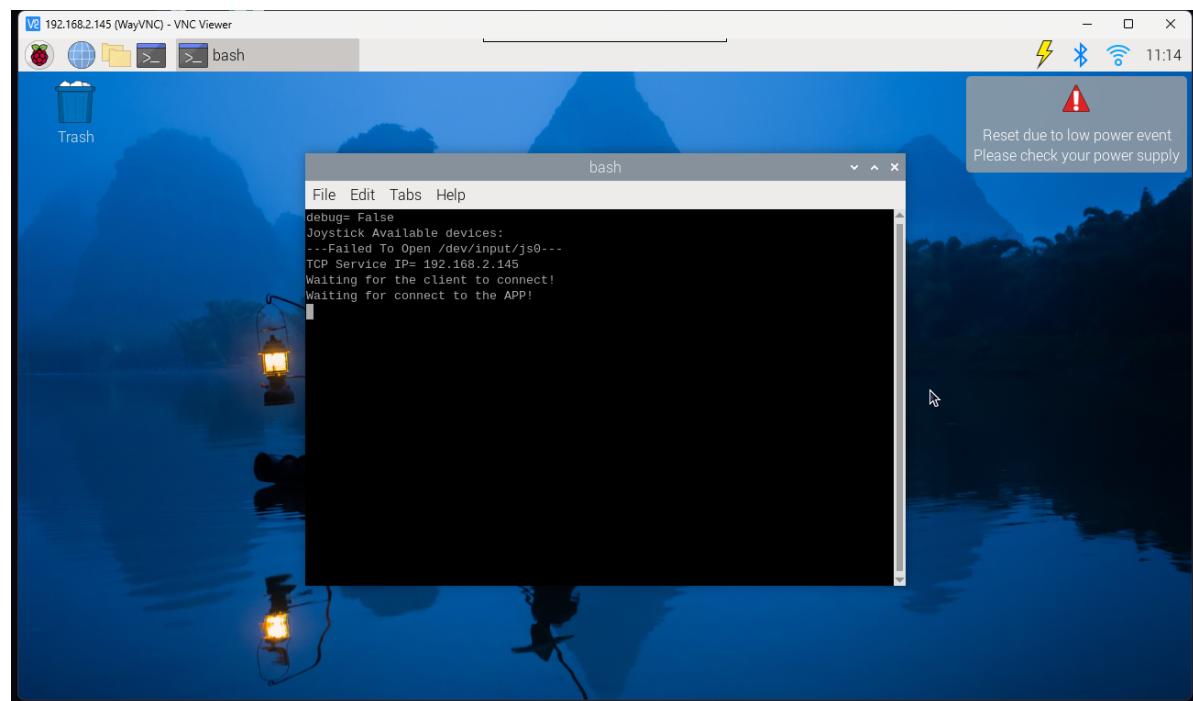
Enter the command in the terminal to start the chassis task.

```
sudo systemctl restart YahboomStart.service
```

```
pi@yahboom:~$  
pi@yahboom:~$  
pi@yahboom:~$  
pi@yahboom:~$  
pi@yahboom:~$ sudo systemctl restart XgoStart.service
```

PI5 version steps:

After the mechanical dog is started, use the vnc software to remotely connect to the mechanical dog through the IP address on the OLED (**For specific steps, please see "Remote Login Operation"**).



Then **ctrl+c** closes the large program and enter the following command to enter docker:

```
./run_humble.sh
```

```

TCP Service IP= 192.168.2.145
Waiting for the client to connect!
Waiting for connect to the APP!
^CKeyboardInterrupt
2024-04-28T10:17:27Z
-----program end-----
pi@raspberrypi:~ $ ./run_humble.sh
access control disabled, clients can connect from any host
root@raspberrypi:/#

```

Then enter the following commands in the docker terminal to start the car radar, imu, and mechanical dog joint status nodes.

```
ros2 launch bringup Navigation_bringup.launch.py
```

```

root@raspberrypi: /
File Edit Tabs Help
at 0x7fff363522f0>
[yahboomcar_joint_state-3] [13.16, 45.61, 1.34, 10.1, 44.36, -1.09, 10.1, 51.85,
2.55, 6.53, 51.22, -0.36]
[yahboomcar_joint_state-3] &&&&&&&&&&&&&&&&& 0.10927200317382812
[yahboomcar_joint_state-3] #####
[yahboomcar_joint_state-3] [-0.17585449218750002, -0.13996582031250002, -9.72702
63671875, -1.0365853658536586, -0.426829268292683, -0.6097560975609757, 0.010487
360583411322, -0.02726797640323639, 5.983139933268229]
[yahboomcar_joint_state-3] ***** <rclpy.timer.Timer object
at 0x7fff363522f0>
[yahboomcar_joint_state-3] [13.16, 45.61, 1.34, 10.1, 44.36, -1.09, 10.1, 51.85,
2.55, 6.53, 51.22, -0.36]
[yahboomcar_joint_state-3] &&&&&&&&&&&&&&&& 0.10969948768615723
[yahboomcar_joint_state-3] #####
[yahboomcar_joint_state-3] [-0.14475097656250002, -0.131591796875, -9.7401855468
75, -1.0975609756097562, -0.3658536585365854, -0.6097560975609757, 0.01022947788
9007993, -0.02749979310565525, 5.983139933268229]
[yahboomcar_joint_state-3] ***** <rclpy.timer.Timer object
at 0x7fff363522f0>
[yahboomcar_joint_state-3] [13.16, 45.61, 1.34, 10.1, 44.36, -1.09, 10.1, 51.85,
2.55, 6.53, 51.22, -0.36]
[yahboomcar_joint_state-3] &&&&&&&&&&&&&&&& 0.10920882225036621
[yahboomcar_joint_state-3] #####

```

3. Start the image publishing node

Pi4 version steps:

Enter the following command in the terminal

```
cd cartographer_ws2/
```

```
source install/setup.bash
```

```

pi@yahboom:~$ cd cartographer_ws2/
pi@yahboom:~/cartographer_ws2$ 
pi@yahboom:~/cartographer_ws2$ 
pi@yahboom:~/cartographer_ws2$ source install/setup.bash
pi@yahboom:~/cartographer_ws2$ 

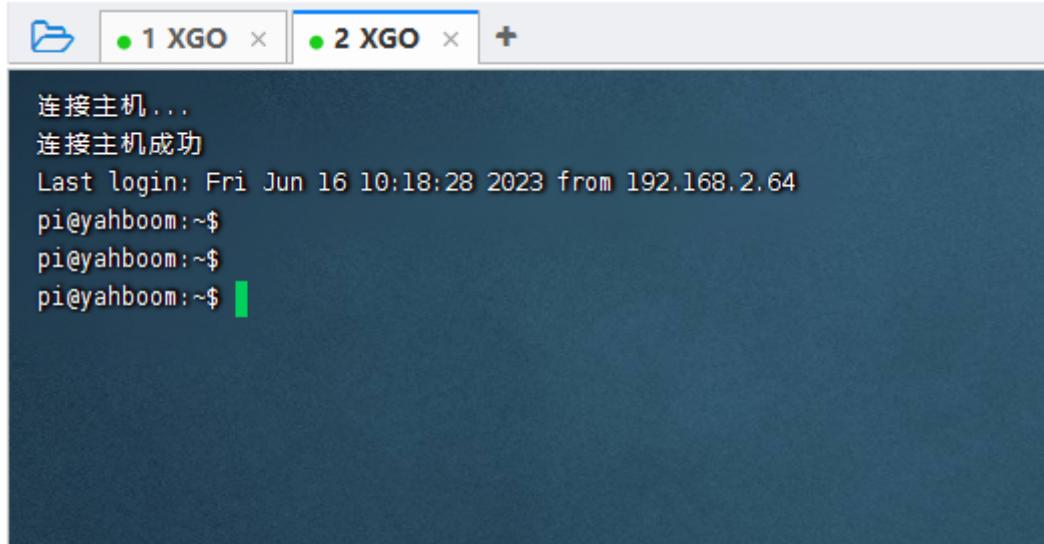
```

Then enter the following command

```
ros2 run yahboom_image_publisher_c yahboom_image_publish_c
```

```
pi@yahboom:~/cartographer_ws2$ source install/setup.bash  
pi@yahboom:~/cartographer_ws2$  
pi@yahboom:~/cartographer_ws2$  
pi@yahboom:~/cartographer_ws2$  
pi@yahboom:~/cartographer_ws2$ ros2 run xgo_image_publisher_c xgo_image_publish_c  
[ WARN:0] global ..../modules/videoio/src/cap_gstreamer.cpp (1758) handleMessage OpenCV | GStreamer warning: Embedded video playback halted; mod  
[ WARN:0] global ..../modules/videoio/src/cap_gstreamer.cpp (888) open OpenCV | GStreamer warning: unable to start pipeline  
[ WARN:0] global ..../modules/videoio/src/cap_gstreamer.cpp (480) isPipelinePlaying OpenCV | GStreamer warning: GStreamer: pipeline have not bee
```

Restart a terminal in the same way as in item 2.



Enter the following command in a new terminal

```
cd cartographer_ws2/
```

```
source install/setup.bash
```

```
ros2 run yahboom_color_tracking yahboom_color_tracking
```

```
pi@yahboom:~$  
pi@yahboom:~$ cd cartographer_ws2/  
pi@yahboom:~/cartographer_ws2$ source install/setup.bash  
pi@yahboom:~/cartographer_ws2$ ros2 run xgo_color_tracking xgo_color_tracking  
ddddddddd
```

PI5 version steps:

Enter in the root directory of the Raspberry Pi and enter the same terminal

```
docker ps  
docker exec -it id /bin/bash
```

```
pi@raspberrypi:~ $ docker ps
CONTAINER ID   IMAGE   COMMAND      CREATED
STATUS          PORTS     NAMES
c06cd712e14e   yahboomtechnology/ros-humble:3.1   "/bin/bash"   24 minutes ago
Up 24 minutes           nice_keldysh
pi@raspberrypi:~ $ docker exec -it c06c /bin/bash
root@raspberrypi:/#
```

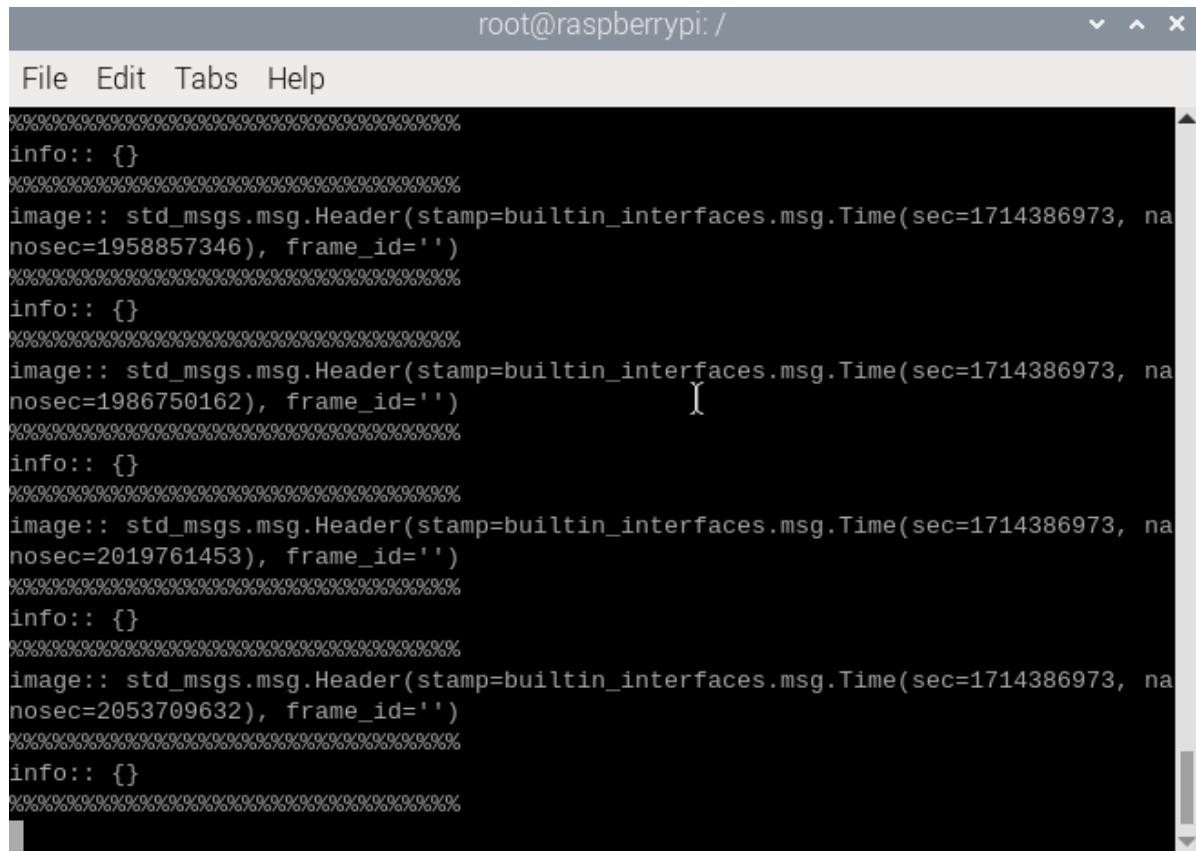
Then enter the following command

```
ros2 run yahboom_publish pub_color
```

```
root@raspberrypi:~# ros2 run yahboom_publish pub_color
[ WARN:0] global ./modules/videoio/src/cap_gststreamer.cpp (2075) handleMessage OpenCV | GStreamer warning: Embedded video playback halted; module source reported : Could not read from resource.
[ WARN:0] global ./modules/videoio/src/cap_gststreamer.cpp (1053) open OpenCV | GS treamer warning: unable to start pipeline
[ WARN:0] global ./modules/videoio/src/cap_gststreamer.cpp (616) isPipelinePlaying OpenCV | GStreamer warning: GStreamer: pipeline have not been created
```

Reopen the same docker terminal and enter the command:

```
ros2 run yahboom_qrcode_tracking yahboom_qrcode_tracking
```



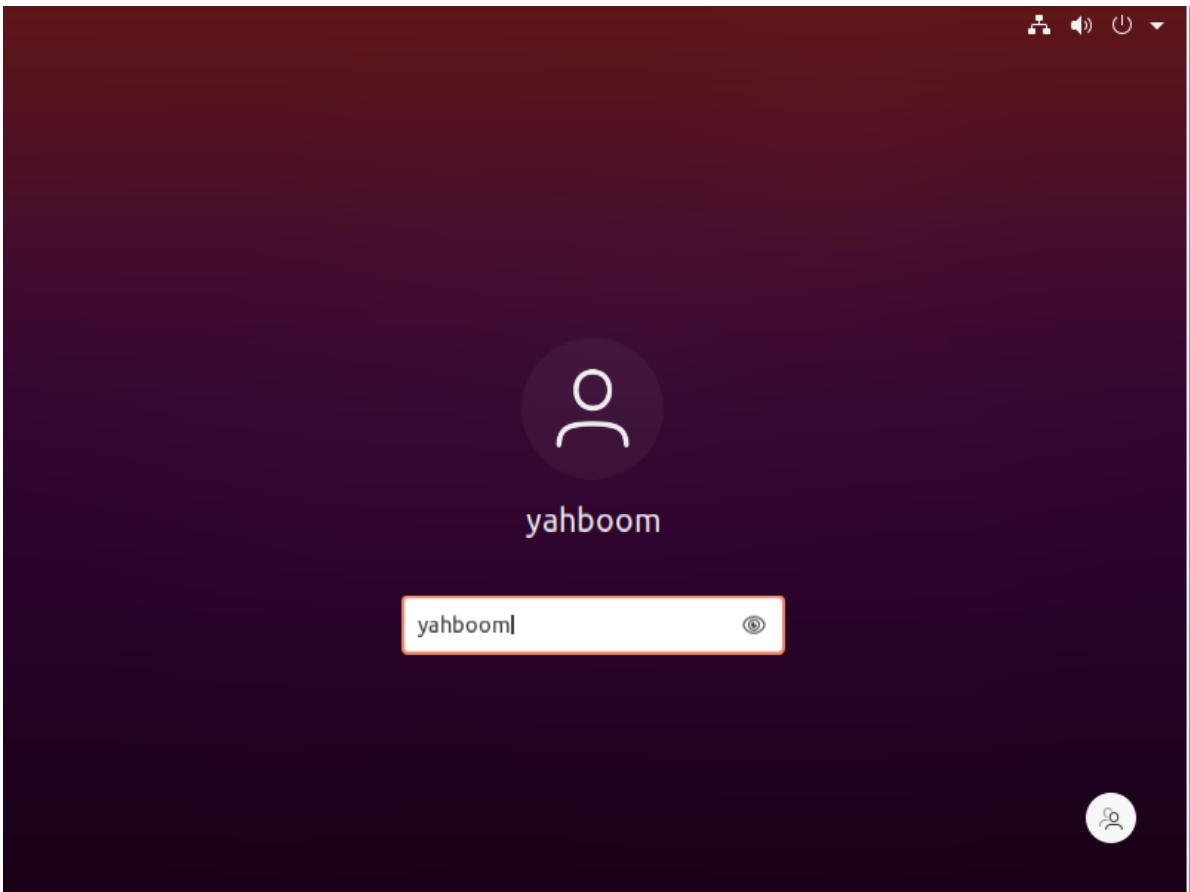
The screenshot shows a terminal window titled 'root@raspberrypi: /'. The window has a menu bar with 'File', 'Edit', 'Tabs', and 'Help'. The main area displays ROS 2 log messages. The messages are timestamped and show the creation of multiple 'image' messages with different 'stamp' values (e.g., 1714386973, 1986750162, 2019761453, 2053709632) and frame IDs. Each message is preceded by an 'info:: {}' log entry.

```
root@raspberrypi: /
File Edit Tabs Help
%%%%%
info:: {}
%%%%%
image:: std_msgs.msg.Header(stamp= builtin_interfaces.msg.Time(sec=1714386973, na nosec=1958857346), frame_id='')
%%%%%
info:: {}
%%%%%
image:: std_msgs.msg.Header(stamp= builtin_interfaces.msg.Time(sec=1714386973, na nosec=1986750162), frame_id='')
%%%%%
info:: {}
%%%%%
image:: std_msgs.msg.Header(stamp= builtin_interfaces.msg.Time(sec=1714386973, na nosec=2019761453), frame_id='')
%%%%%
info:: {}
%%%%%
image:: std_msgs.msg.Header(stamp= builtin_interfaces.msg.Time(sec=1714386973, na nosec=2053709632), frame_id='')
```

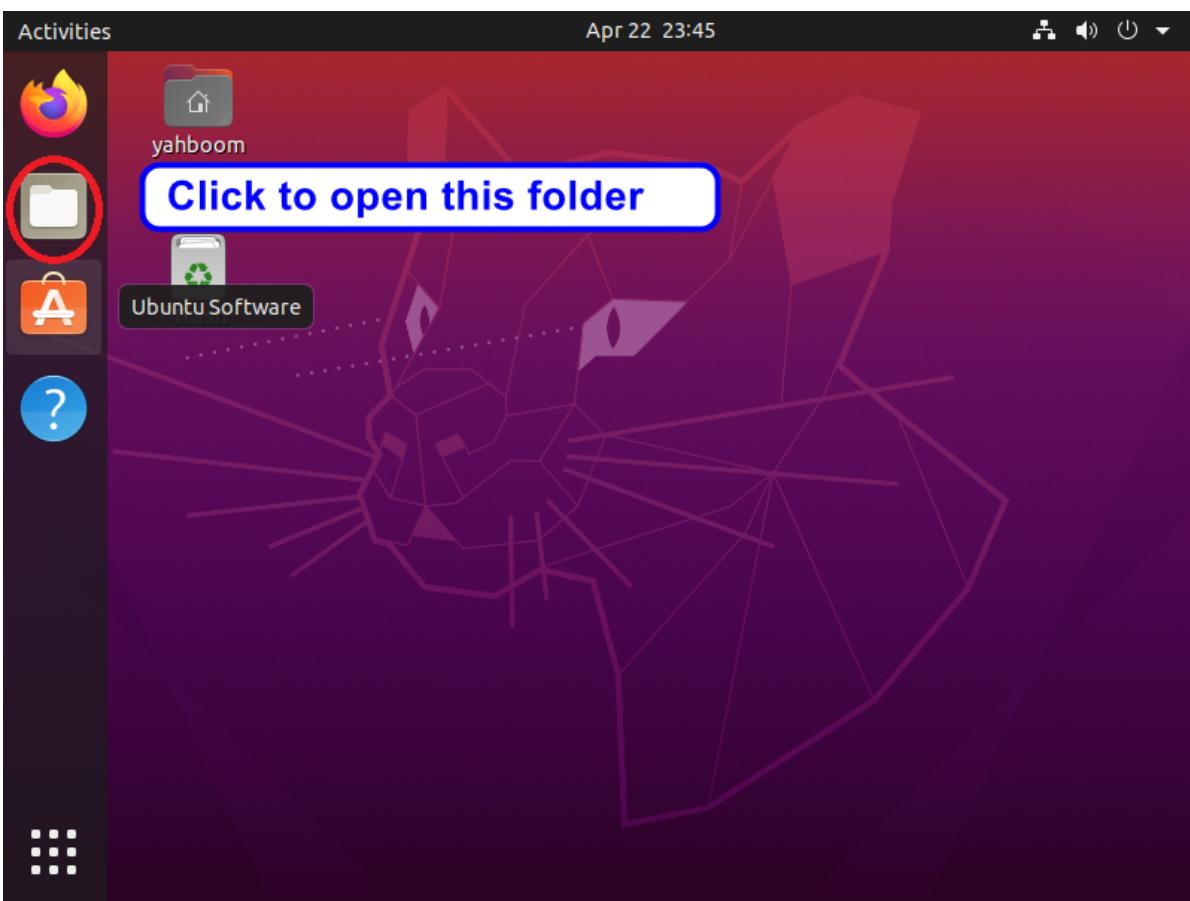
5. Set the recognition color through the web interface

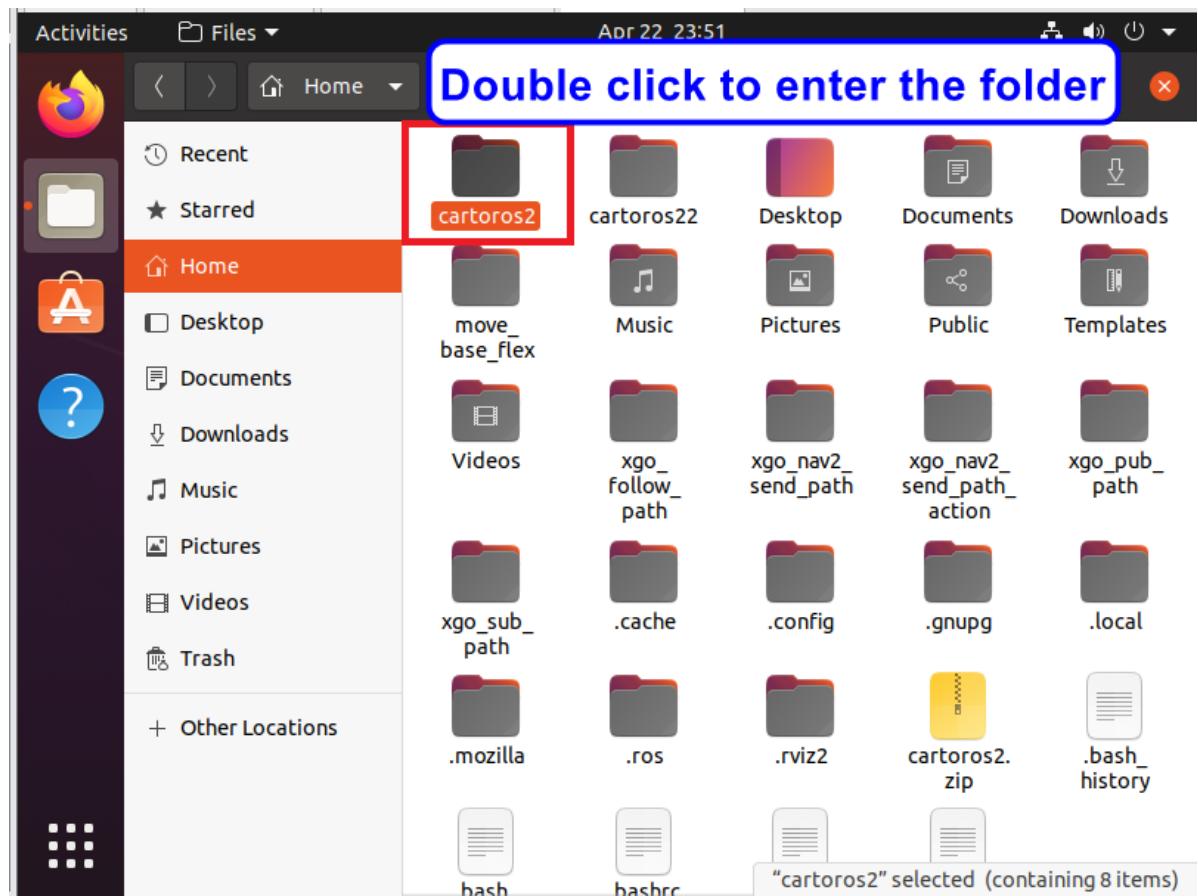
The steps are the same for PI4 and PI5 versions:

Open the virtual machine and enter the user name yahboom and the password yahboom.

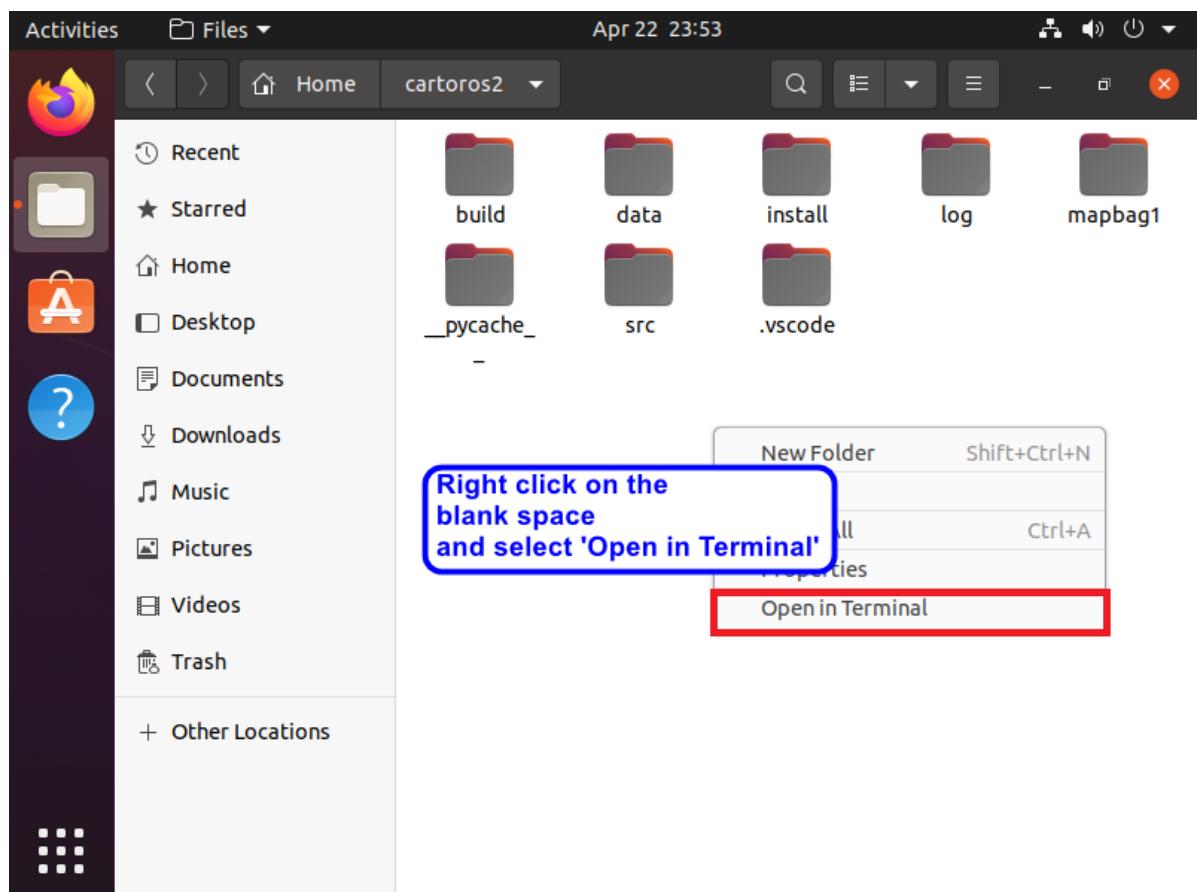


Click on the folder to open the cartoros2 folder.



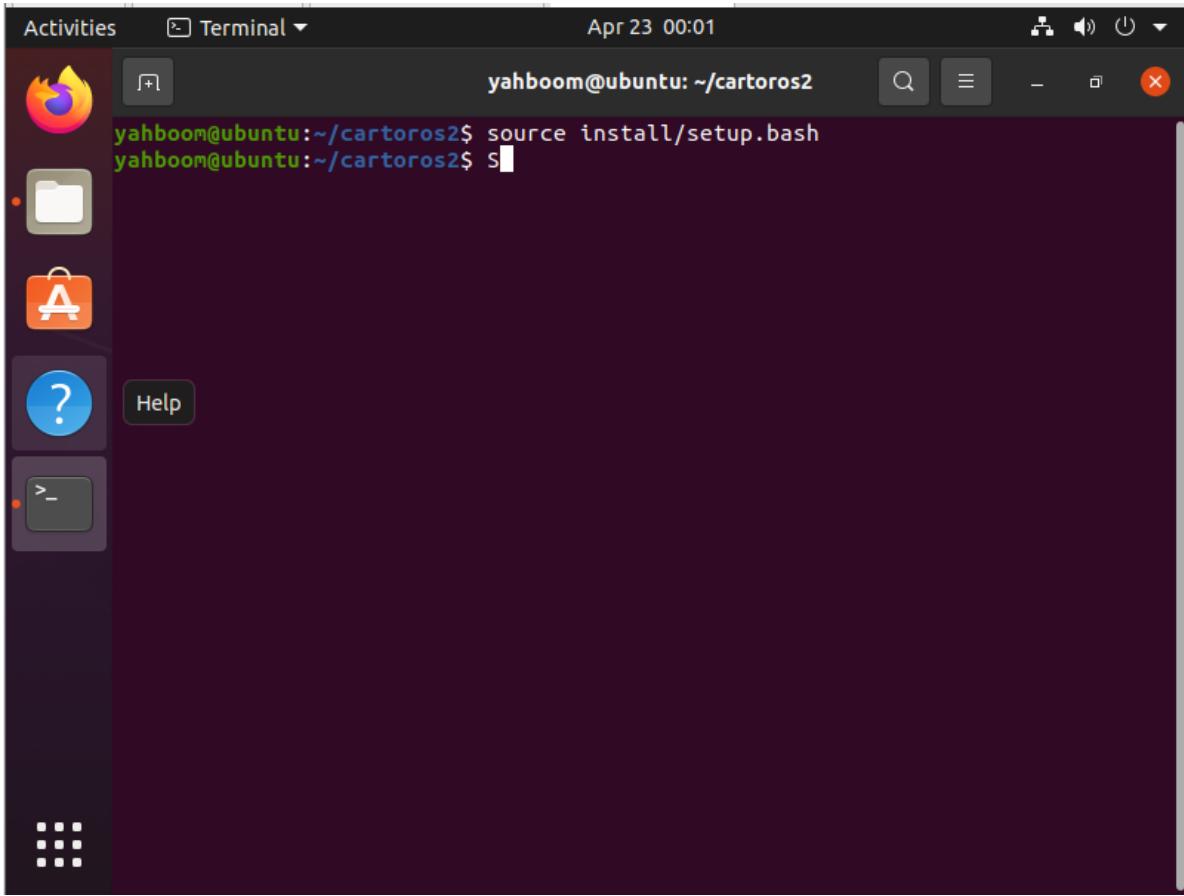


Open the terminal under the folder



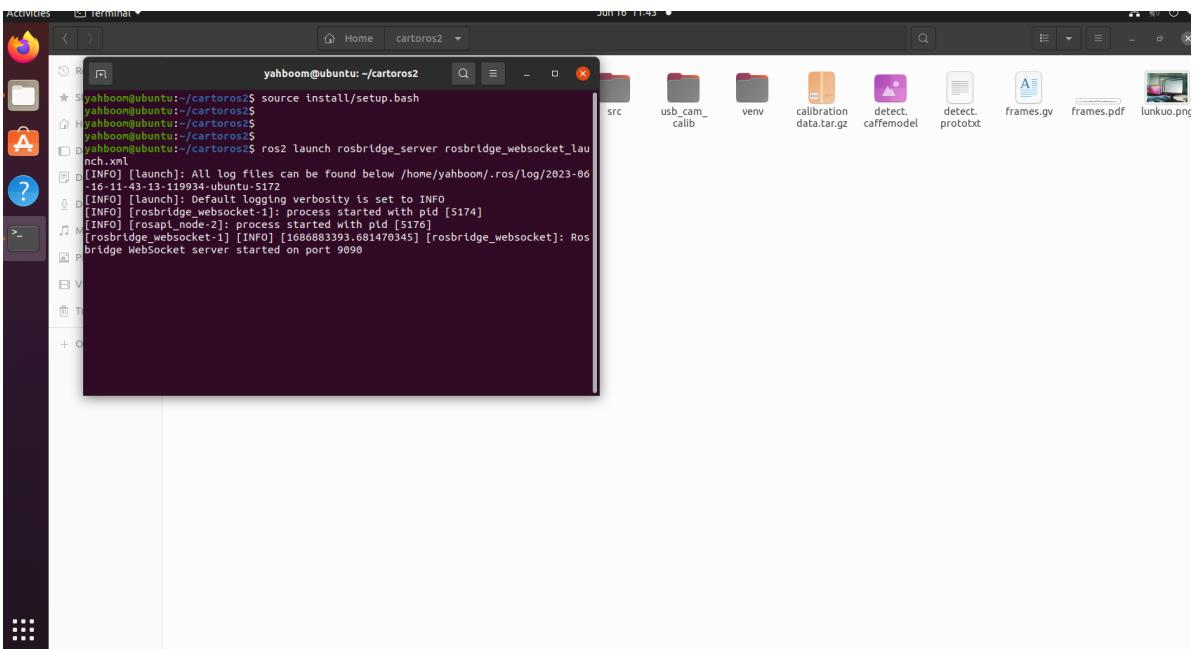
Then enter the following command

```
source install/setup.bash
```



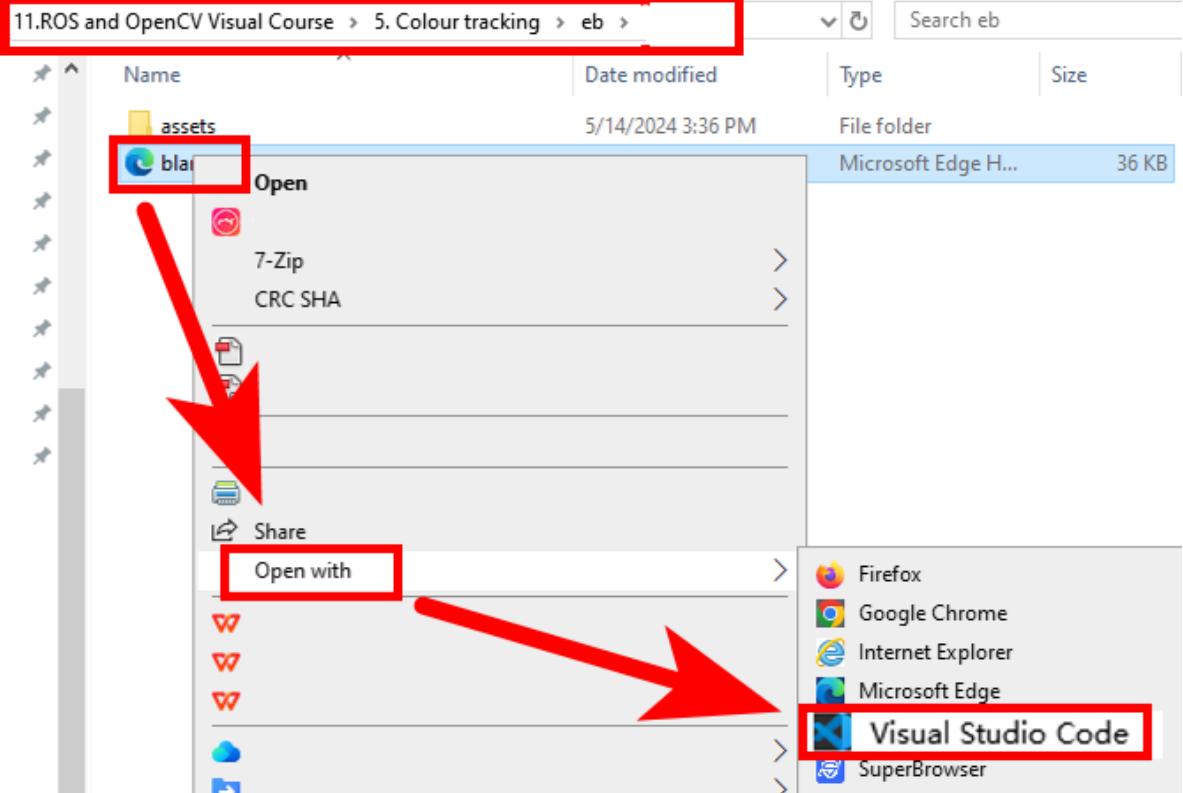
Then start rosbridge and enter the following command

```
ros2 launch rosbridge_server rosbridge_websocket_launch.xml
```



Find the blank.html file in the eb folder in the updated directory of this tutorial and open it with Google Chrome.

Note: The IP address of rosbridge needs to be set here. Obtain the IP address of the virtual machine, then open the blank.html file, modify the IP address of line 363 and save it, as shown in the figure below.



blank.html

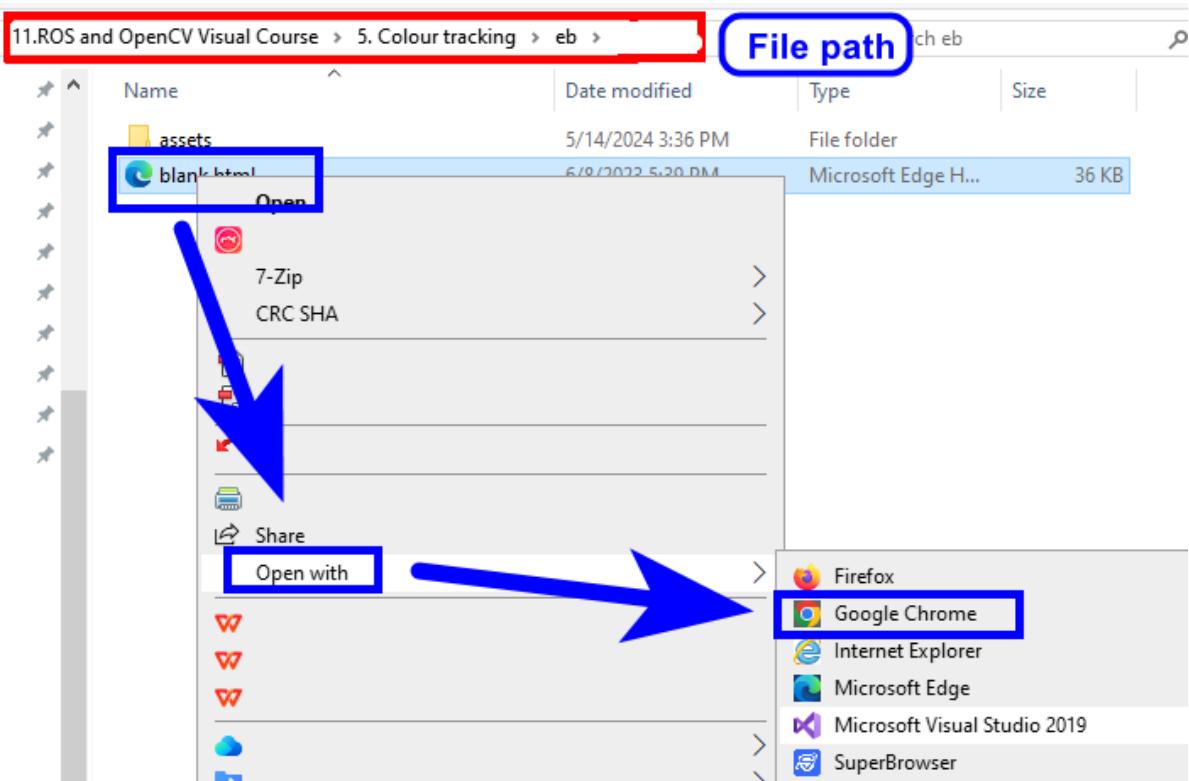
```

C:\> Users > Admin > Desktop > git > XGO > ROS2教程 > ROS+OpenCV视觉课程 > 标签追踪 > eb > blank.html > html > body > script
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363 var ros = new ROSLIB.Ros({
364   url : 'ws://192.168.2.117:9090'
365 });
366
367 ros.on('connection', function() {
368   console.log('Connected to websocket server.');
369 });
370
371 ros.on('error', function(error) {
372   console.log('Error connecting to websocket server: ', error);
373 });
374
375 ros.on('close', function() {
376   console.log('Connection to websocket server closed.');
377 });
378
379 var imagerender_compressed= new ROSLIB.Topic({
380   ROS : ros,
381   name : '/image_raw/compressed',
382   messageType : 'sensor_msgs/msg/CompressedImage',
383   throttle_rate : 100
384 });
385 var that = this;
386 imagerender_compressed.subscribe(function(data) {
387   // Update the robot's position on the map
388 });
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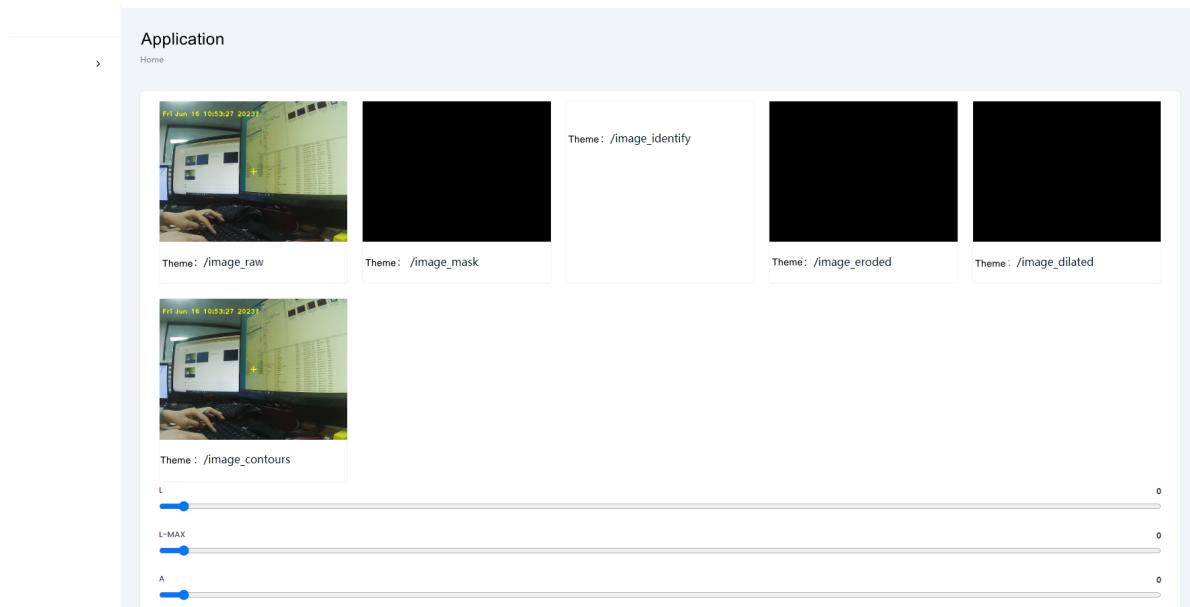
```

Change the IP address here to the actual IP address of the RoboRidge

在工作区的文件夹或打开的文件中找到了 git 存储库。是否要打开存储库？
来源: Git 扩展
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As shown in the picture below, you can see the pictures transmitted by the camera.



Then we set the LAB value of the color through the slider.

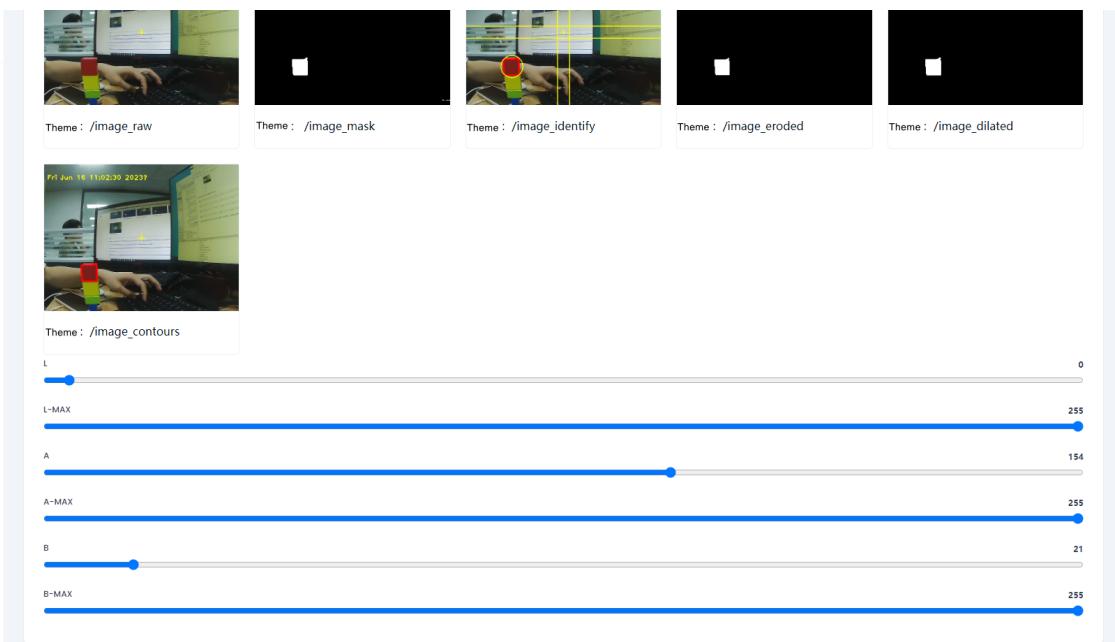
```
Yellow: {"l":96, "a": 55, "b":188, "l_max": 252 , "a_max": 141, "b_max": 255}
```

```
Red: {"l":0, "a": 155, "b":21, "l_max": 255 , "a_max": 255, "b_max": 255}
```

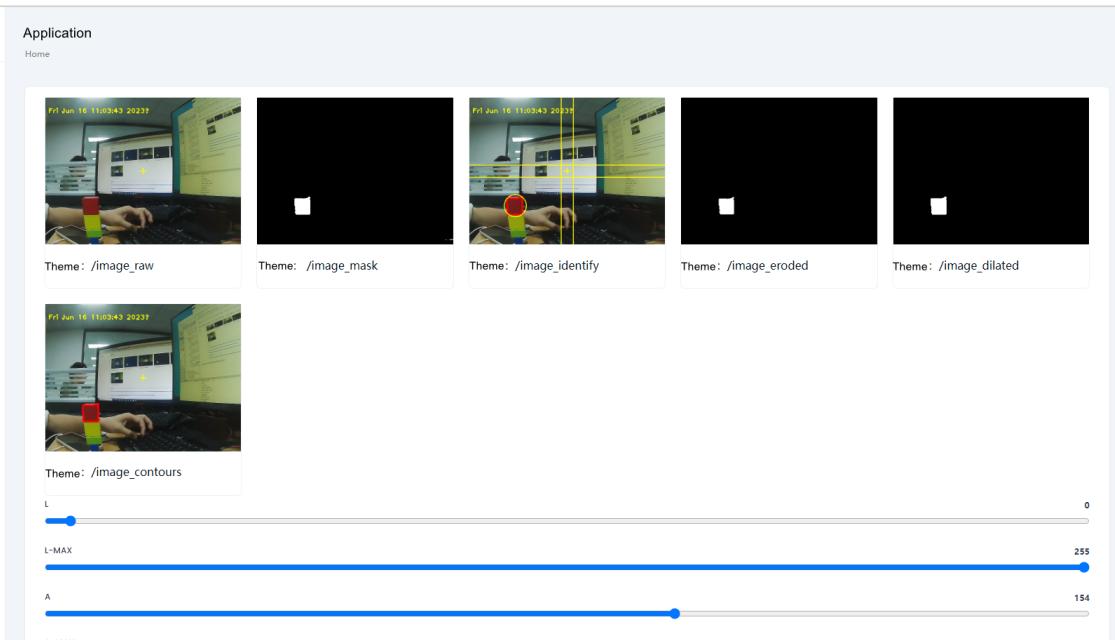
```
Green: {"l":26, "a": 7, "b":170, "l_max": 143 , "a_max": 110, "b_max": 255}
```

```
Blue: {"l":0, "a": 0, "b":0, "l_max": 255 , "a_max": 255, "b_max": 102}
```

Above are the LAB values of several colors. We can choose one to set. For example, we set red, as shown in the figure below, and move the slider.



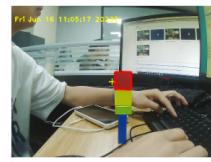
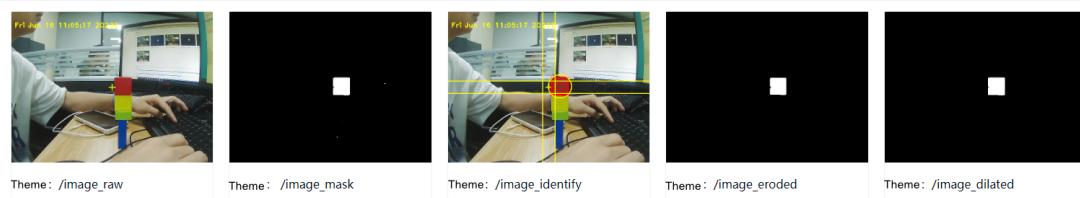
In the picture we can see that the red square has been identified.



Then the mechanical dog will adjust its attitude so that the red block is near the center of the screen.

Application

Home



Theme: /image_contours

L 0

L-MAX 255

A 154

A-MAX 255