ROS2 entity robot dog APP mapping

Quick use

1. Power up the robot dog

Press the power switch on the side of the robot dog and wait for the robot dog to finish starting up. And connect the WiFi of the robot dog to the same LAN environment as your computer.

After the robot dog startup is complete, the lidar, imu, and robot dog joint status nodes have been automatically started.

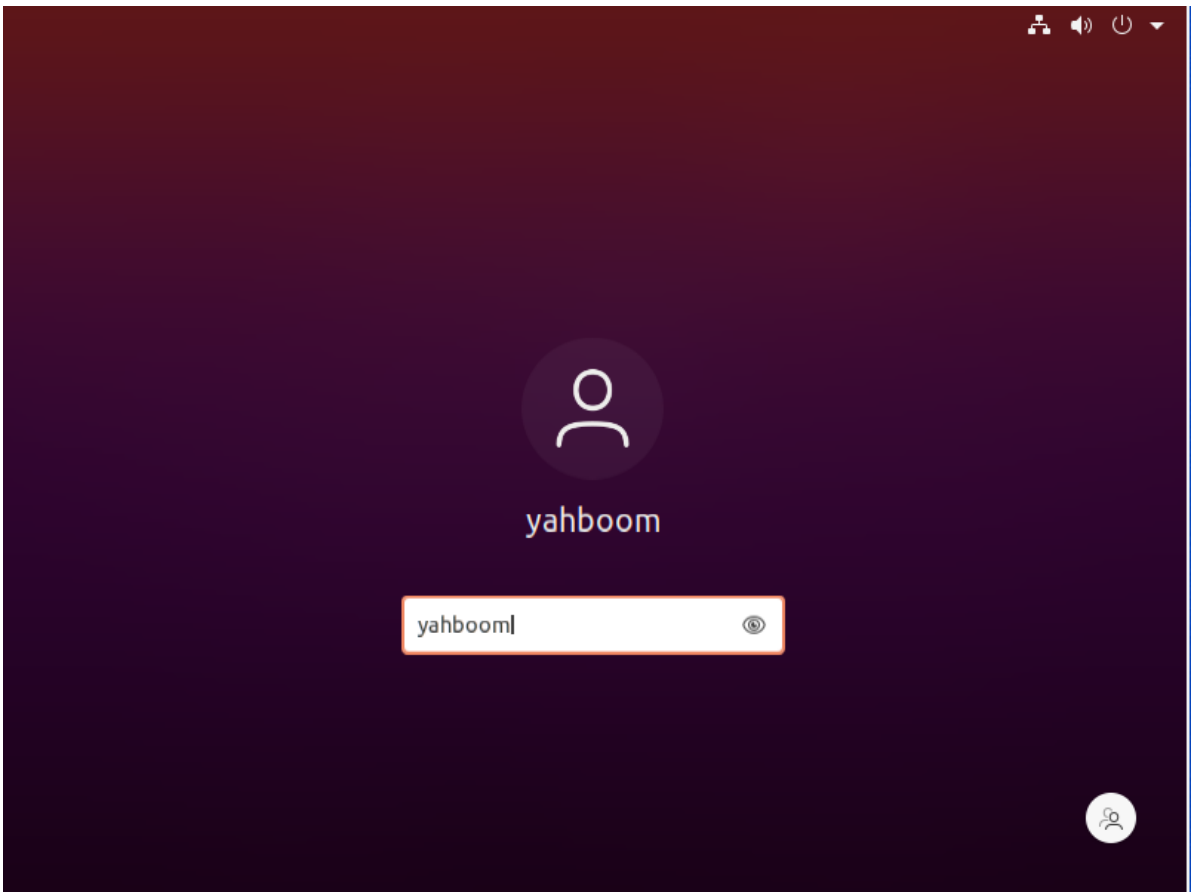
If you find that you are unable to obtain data such as LIDAR, please close the Mechanical Dog Large programme and restart the chassis programme.

Close the big programme, restart the chassis as well as multi-level communication id modification can refer to the tutorial: 14. Lidar maping navigation \6. ROS2 environment entity robot dog state acquisition \ ROS2 environment to obtain the real joints of the robot dog data.pdf

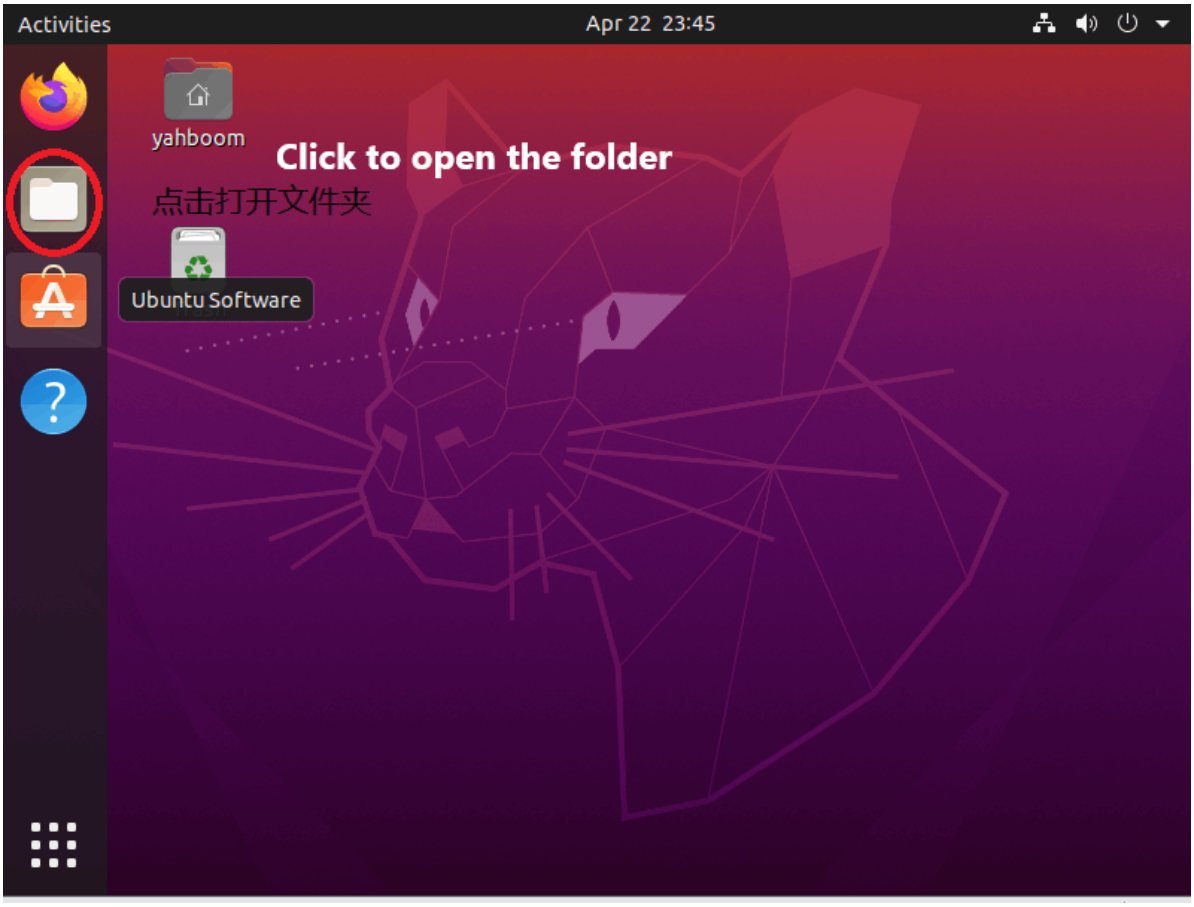
2. Open the virtual machine

Note: Here the default virtual machine has been installed.

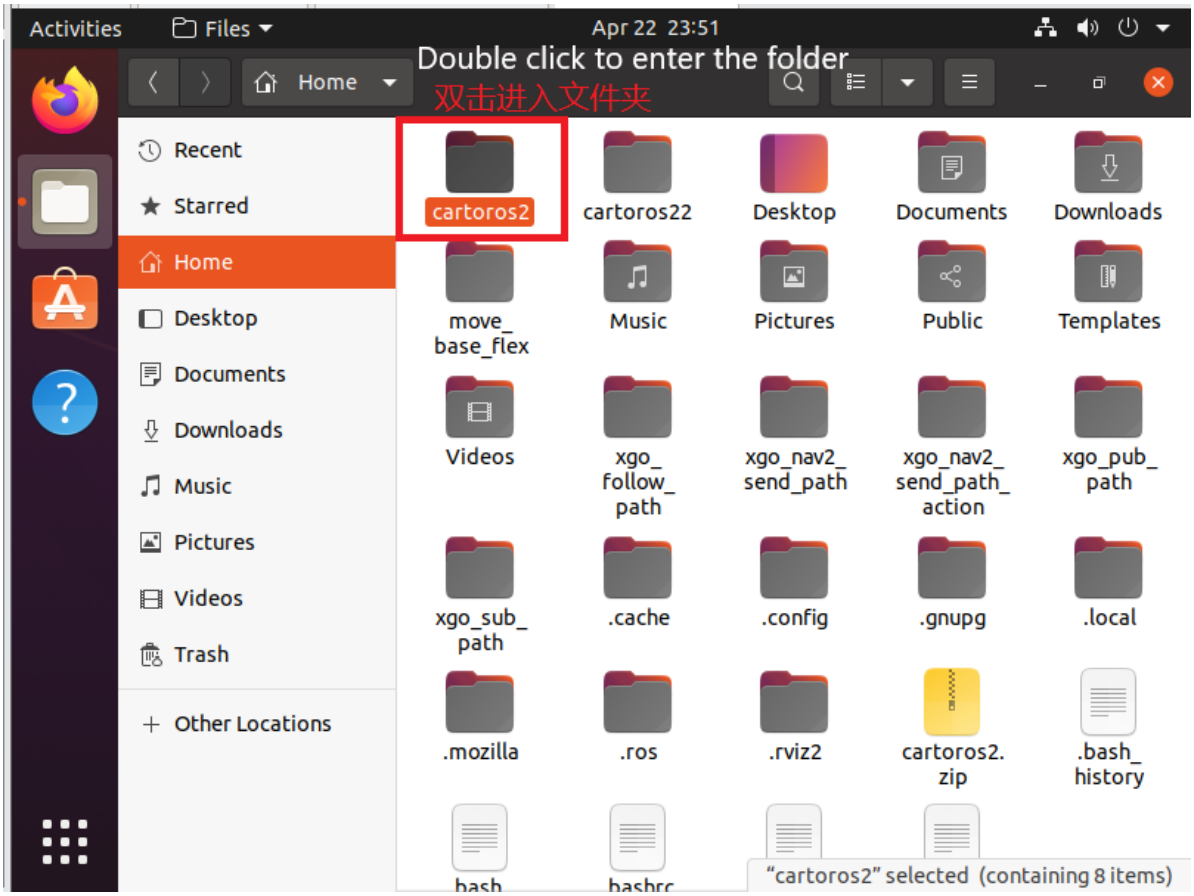
Open the virtual machine, enter the password: yahboom and then press the Enter key to enter the system desktop.



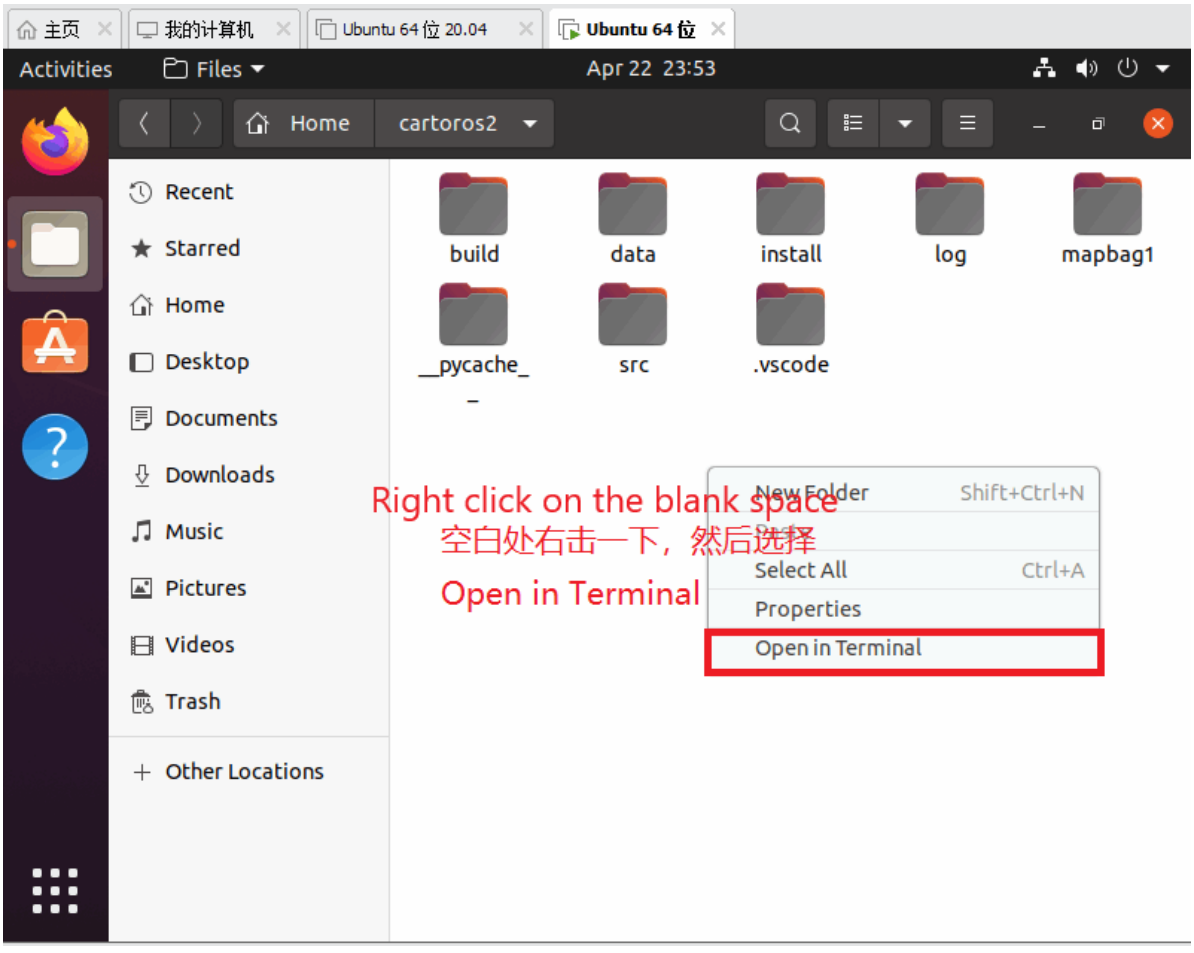
3. Starting ROSBridge



Then double click on the cartoros2 folder



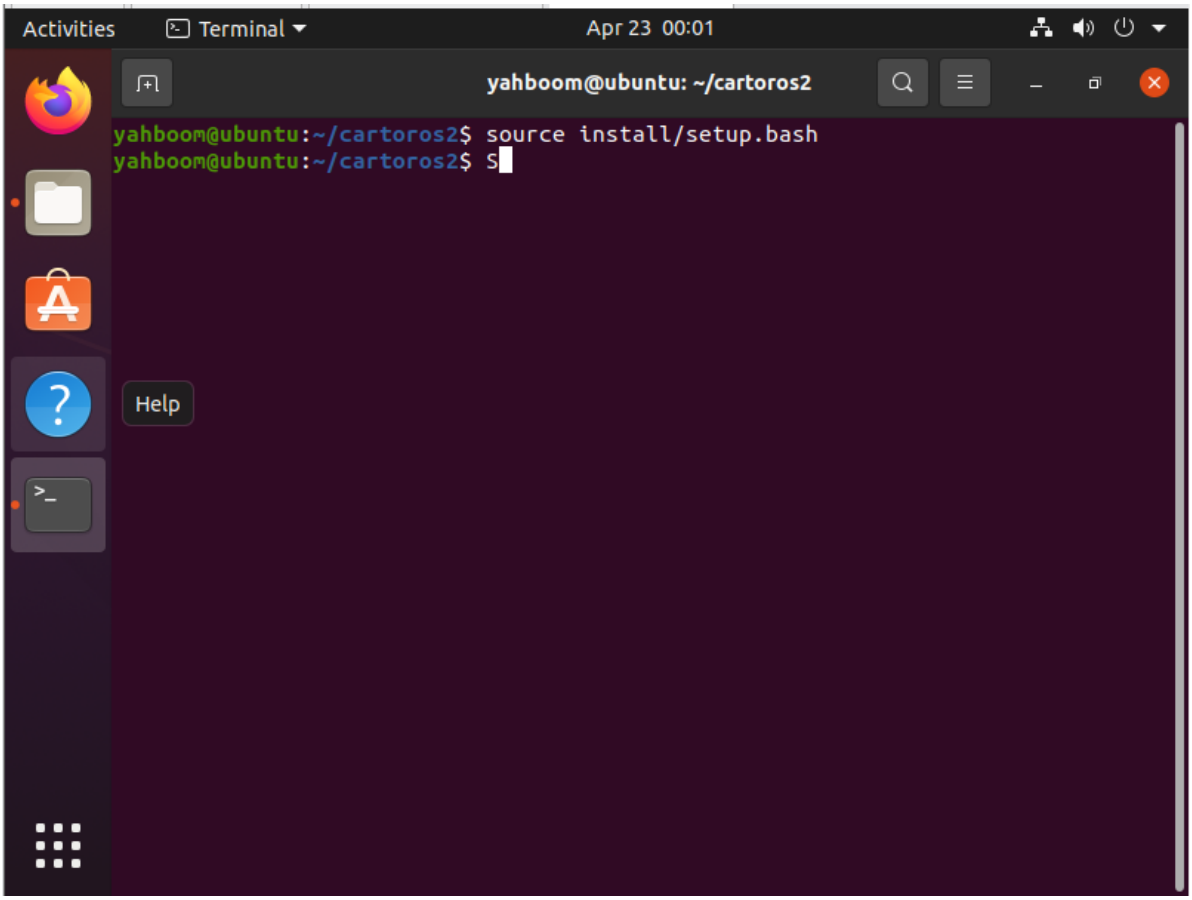
Then right-click in a blank space in the folder and select Open in Terminal



Then activate the environment by typing the following command in the terminal

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

Press the Enter key when you have finished typing.



Then type the following command and press enter to start rosbridge

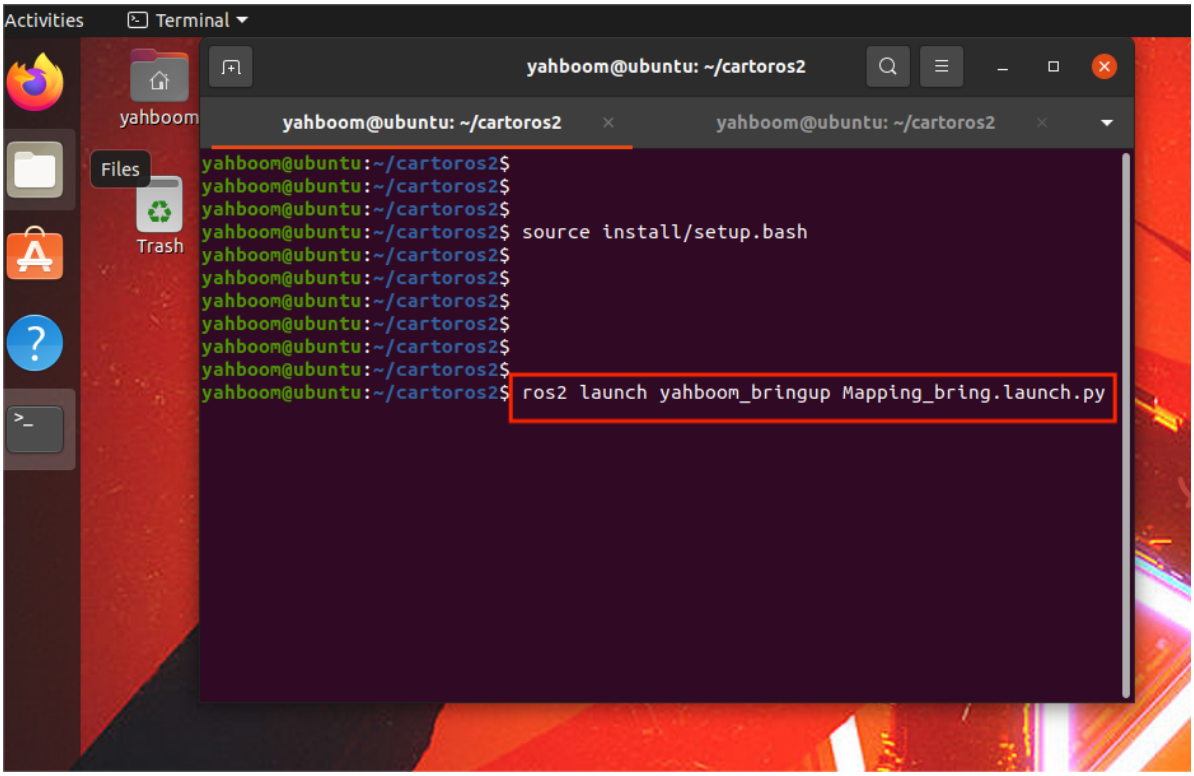
```
ros2 launch rosbridge_server rosbridge_websocket_launch.xml
```

Then press the shortcut keys: ctrl + shift + t

In the newly opened terminal, enter the command

```
source install/setup.bash
ros2 launch yahboom_bringup Mapping_bring.launch.py
```

Then press enter you can and you can build the diagram.

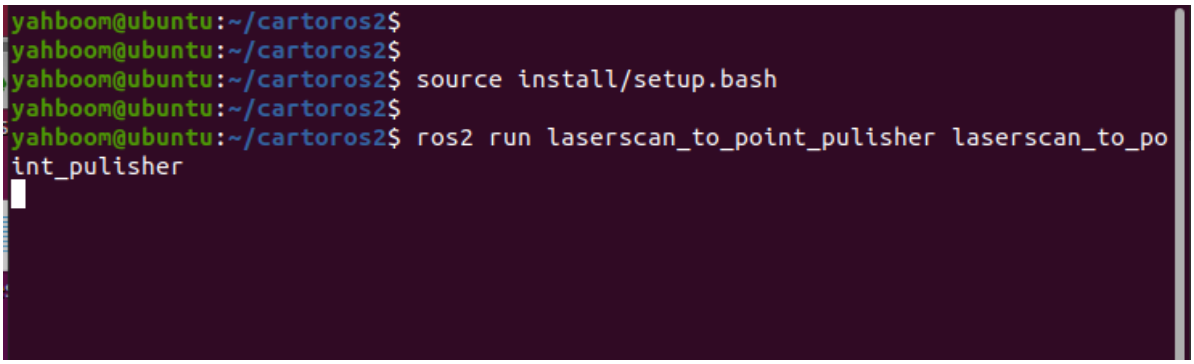


4. Control the robot dog to walk and build a diagram

Click on the terminal and press the shortcut key: ctrl + shift + t

Enter the command in the terminal to launch the Point Cloud Publishing node:

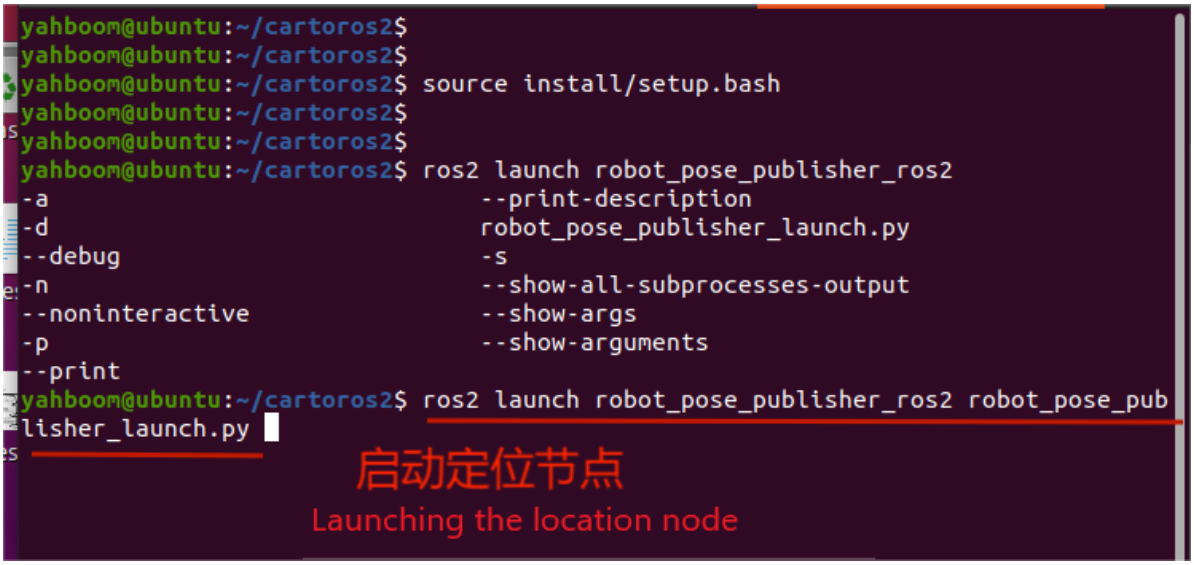
```
source install/setup.bash
ros2 run laserscan_to_point_pulisher laserscan_to_point_pulisher
```



Click on the terminal and press the shortcut key: ctrl + shift + t

Enter the command in the terminal to launch the Locate Publishing node:

```
source install/setup.bash
ros2 launch robot_pose_publisher_ros2 robot_pose_publisher_launch.py
```

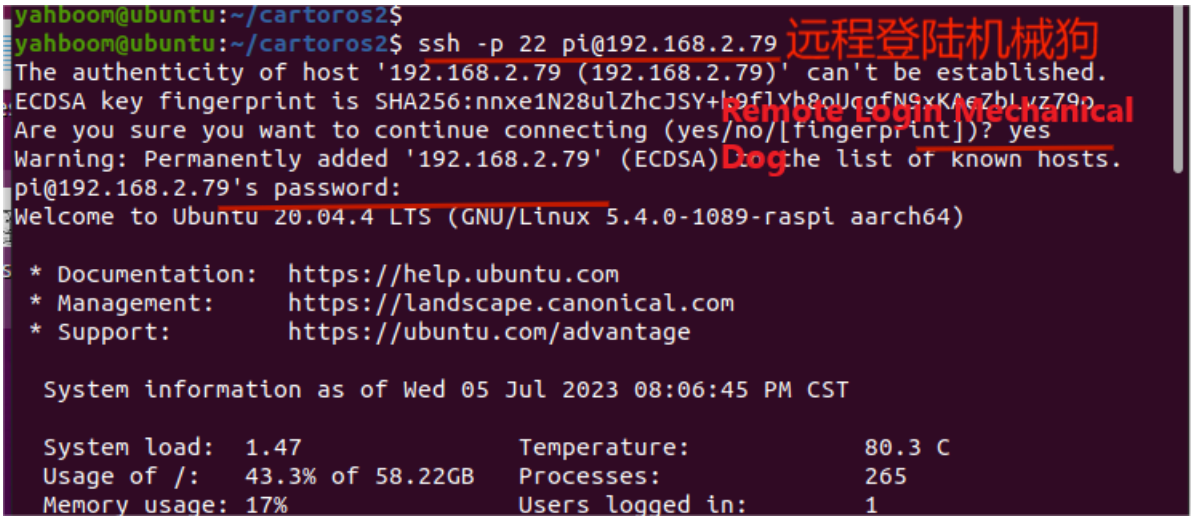


Click on the terminal and press the shortcut key: ctrl + shift + t.

In the terminal, enter the command to remotely connect to the Mechanical Dog, the current Mechanical Dog and the virtual machine are in the same LAN, the IP of the Mechanical Dog is: 192.168.2.79, in practice, it depends on the specific IP address of your own Mechanical Dog.

```
ssh -p 22 pi@192.168.2.79
```

Press enter and type yes, then enter the login password of Robotics Dog: yahboom.



Then enter the command to start the camera in the terminal:

```
ros2 launch usb_cam demo_launch.py
```

```
pi@yahboom:~$
pi@yahboom:~$ ros2 launch usb_cam demo_launch.py
[INFO] [launch]: All log files can be found below /home/pi/.ros/log/2023-07-05-2
0-13-03-911670-yahboom-89445
[INFO] [launch]: Default logging verbosity is set to INFO
'opt/ros/foxy/share/usb_cam/config/params.yaml
 INFO] [usb_cam_node_exe-1]: process started with pid [89529]
[usb_cam_node_exe-1] [INFO] [1688559184.442941567] [usb_cam]: camera_name value:
 test_camera
[usb_cam_node_exe-1] [WARN] [1688559184.443275107] [usb_cam]: framerate: 30.0000
00
[usb_cam_node_exe-1] [INFO] [1688559184.461739301] [usb_cam]: camera calibration
 URL: package://usb_cam/config/camera_info.yaml
[usb_cam_node_exe-1] [INFO] [1688559184.464124605] [usb_cam]: Starting 'test_cam
era' (/dev/video0) at 640x480 via mmap (mjpeg2rgb) at 30 FPS
[usb_cam_node_exe-1] [swscaler @ 0xaaaaf30867f0] No accelerated colorspace conve
rsion found from yuv422p to rgb24.
[usb_cam_node_exe-1] [INFO] [1688559184.545634240] [usb_cam]: This devices suppr
```

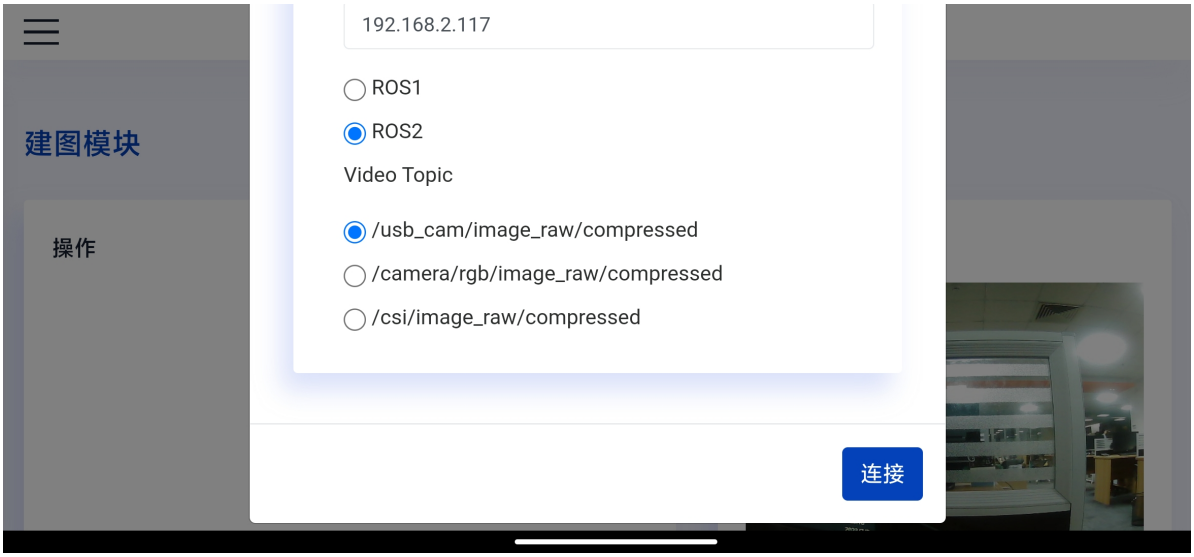
启动相机节点

Starting the camera node

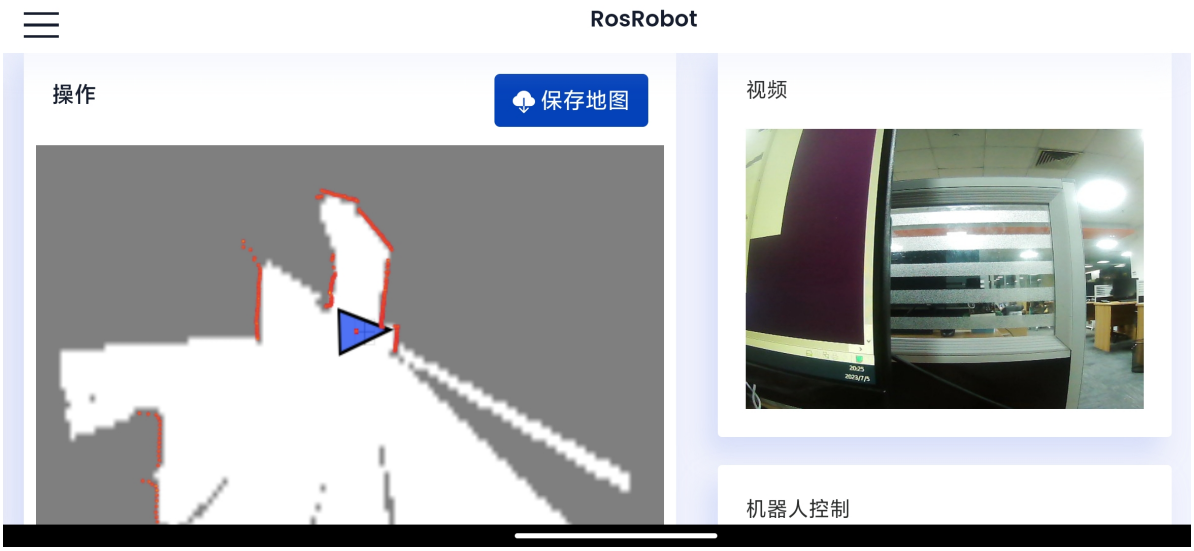
Open mobile app ROS Robot

Enter the IP address of the virtual machine, take the current virtual machine IP as: 192.168.2.117 as an example, and at the same time, select the camera topic of the robot dog as /usb_cam/imge_raw/compress, and select ros2.

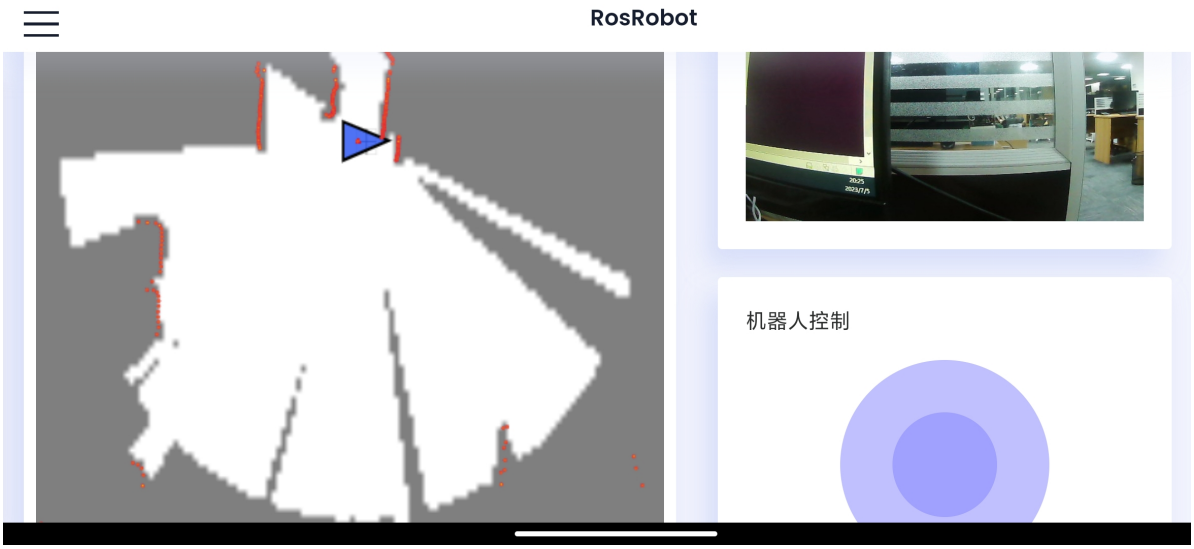
Then scroll down a bit and click Connect.



Once you enter the map screen, you can see the map of the radar scan as well as the camera feed.



Swipe down to see the bottom right corner to control telemetry, which can be used to control the robot dog to build maps.



5. Save the map

Once the map has been scanned, we reopen a terminal window by pressing the shortcut Ctrl shift t in the terminal and enter the following command

Activate the environment by typing the following command

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

Then stop building the diagram by entering the following command.

```
ros2 service call /finish_trajectory cartographer_ros_msgs/srv/FinishTrajectory "
{trajectory_id: 0}"
```

Then save the pbstream file by entering the following command again

```
ros2 service call /write_state cartographer_ros_msgs/srv/WriteState "{filename:
'/home/yahboom/cartoros2/data/maps/mymap.pbstream'}"
```

The path to the parameter filename is the path where the pbstream file of the map is saved.

Finally, enter the following command to convert the pbstream file to a pgm file.

```
ros2 run cartographer_ros pbstream_to_ros_map_node -
map_filestem=/home/yahboom/cartoros2/data/maps/mymap -
pbstream_filename=/home/yahboom/cartoros2/data/maps/mymap.pbstream -
resolution=0.05
```