Voice control multi-point navigation

Quick use

1. DOGZILLA POWER UP

First of all, we switch on the switch power of the robot dog and start the robot dog.

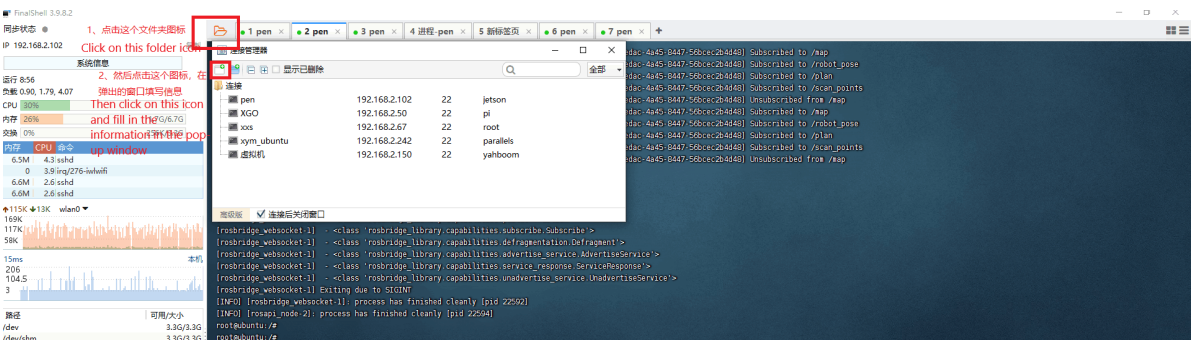
After startup, we can view the IP address on the robot dog's small screen.

2. Open shell to connect to DOGZILLA

Then use the ssh terminal to connect to robot dog.

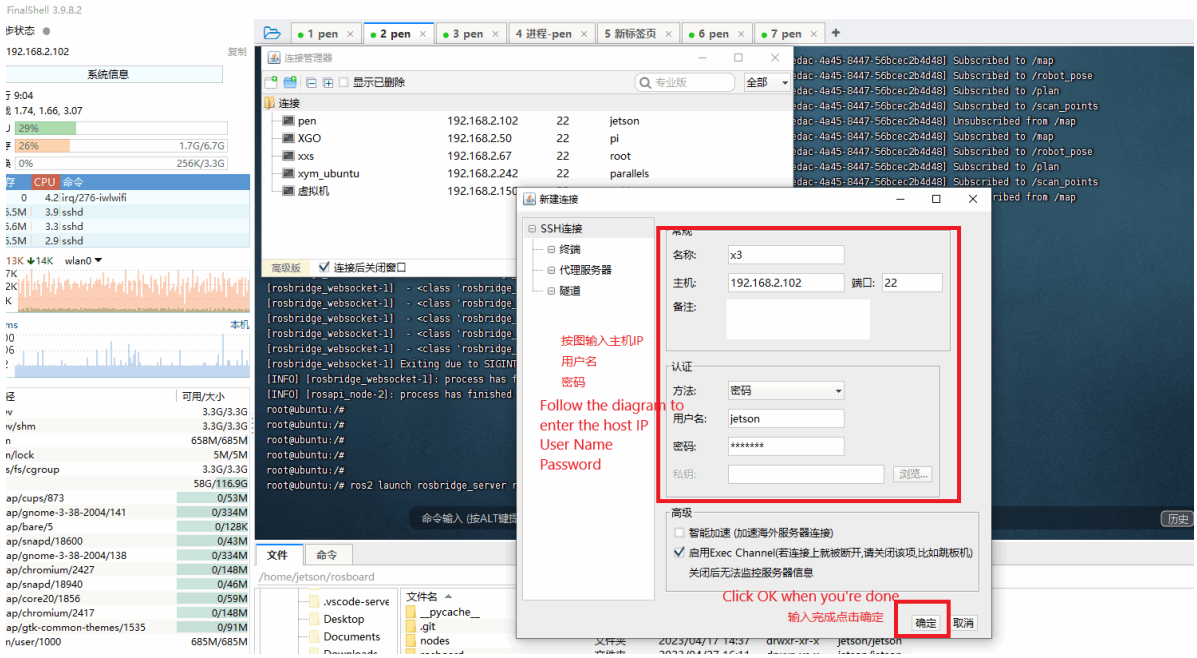
Note: At the time of writing this tutorial, the IP address used is 192.168.2.102 and the username is pi and the password is yahboom, so the actual IP address will prevail.

Open the shell utility, here I use FinalShell, enter the username, password, port, connection name and other information.

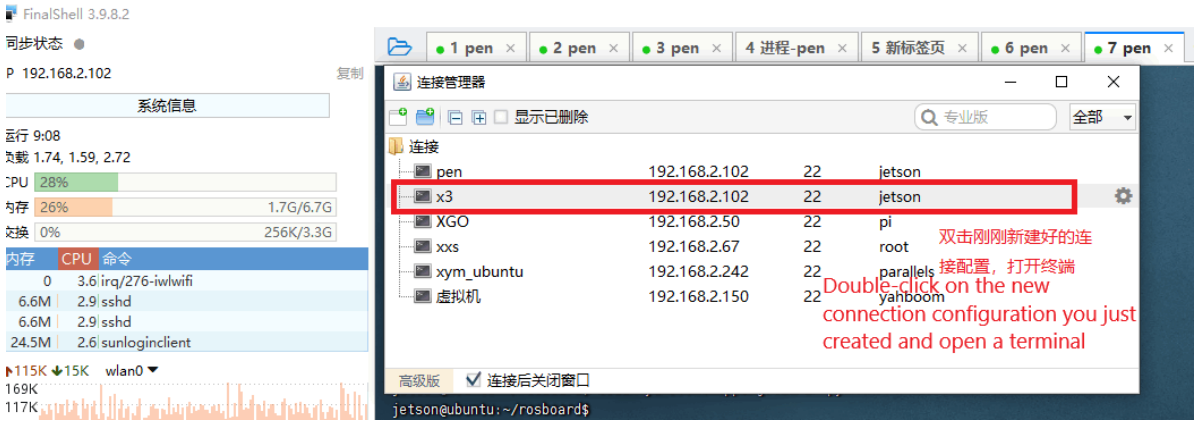


Select ssh connection to create a new ssh connection

Here username fill in pi, password fill in yahboom, ip address fill in the real robot dog's IP address.



Here select the new ssh connection you just created.

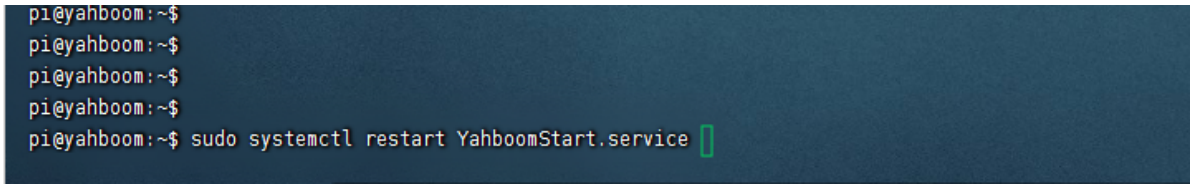


3. Starting the DOGZILLA chassis

Multi-computer communication id modification can refer to the tutorial: 14. Lidar mapping navigation \6. ROS2 environment entity robot dog state acquisition \ ROS2 environment to obtain the real joints of the robot dog data.pdf

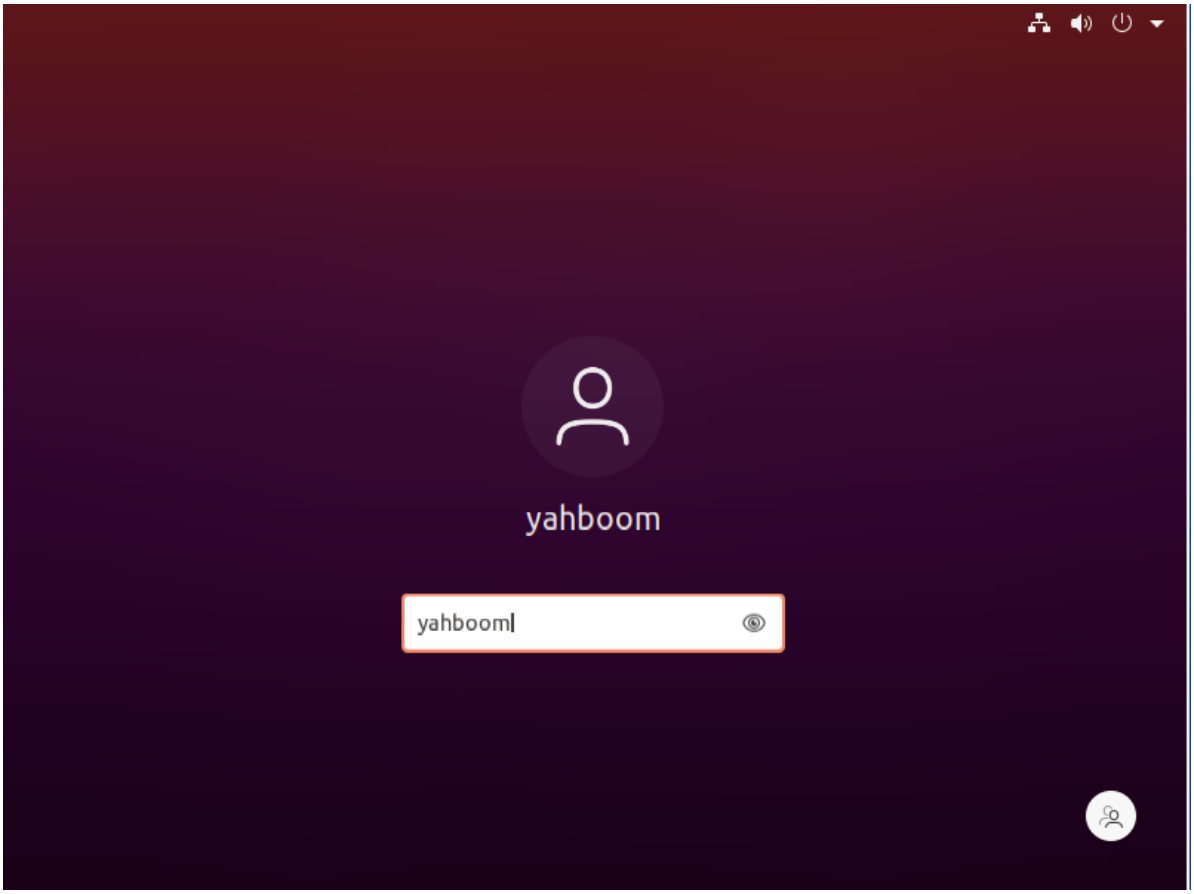
Start the chassis task by entering the command in the terminal.

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

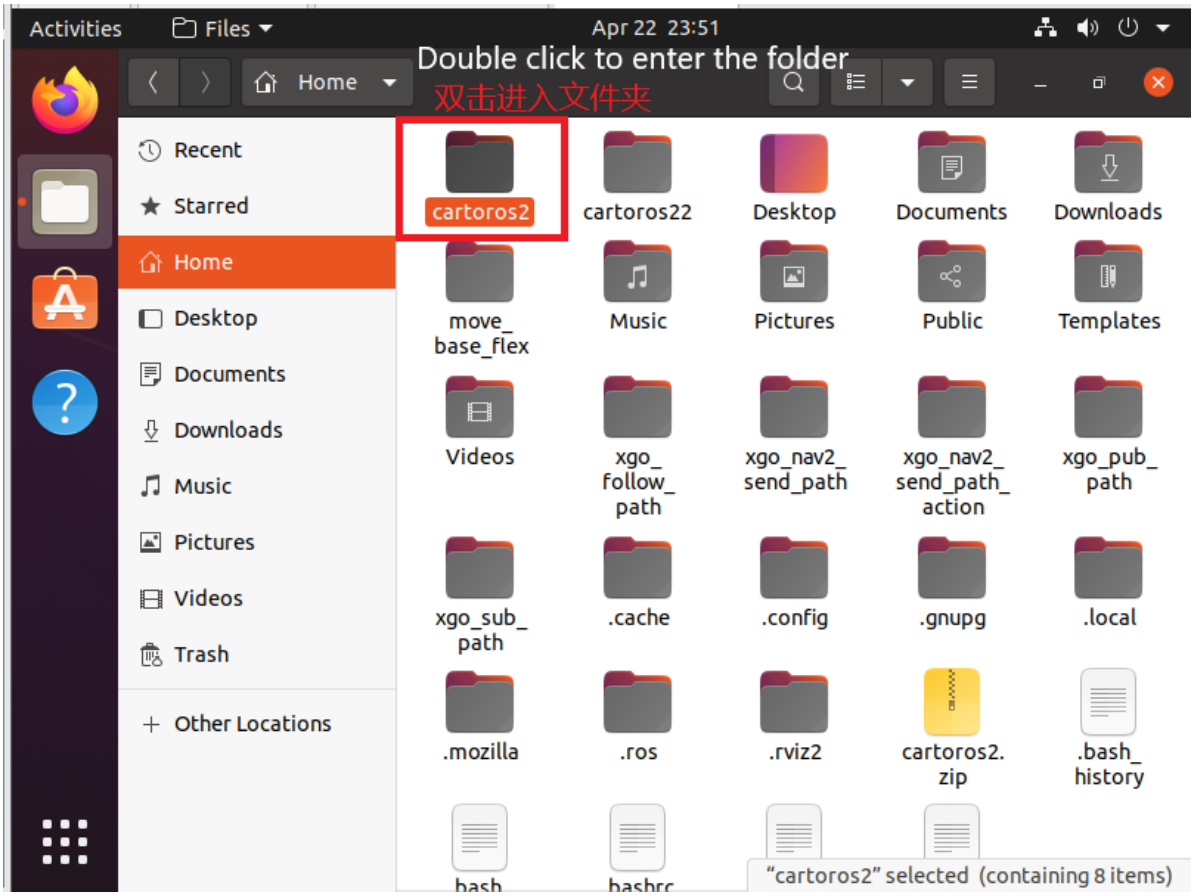


4. Start the navigation programme

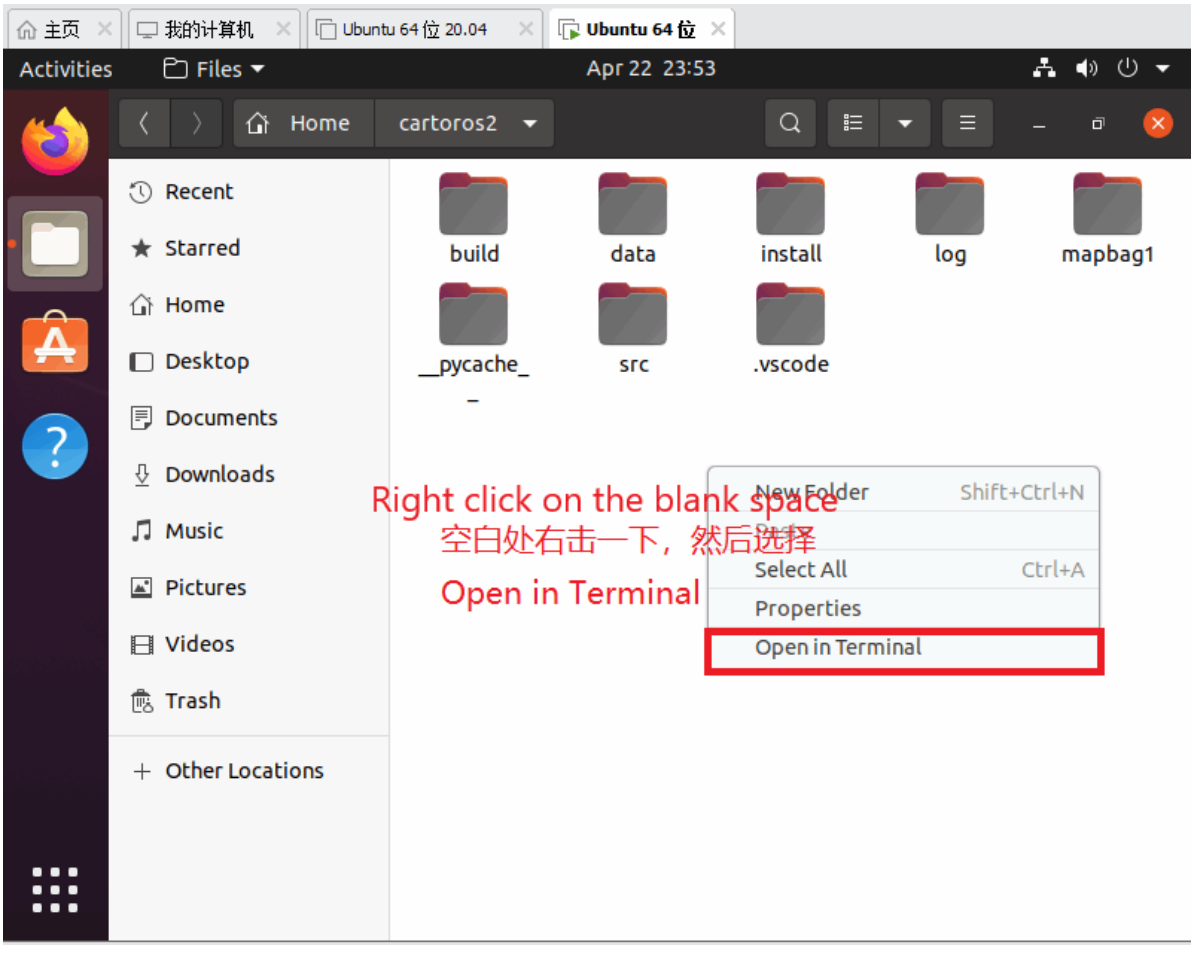
Open the virtual machine and enter the username yahboom, password yahboom.



Click on the folder to open the cartoros2 folder.

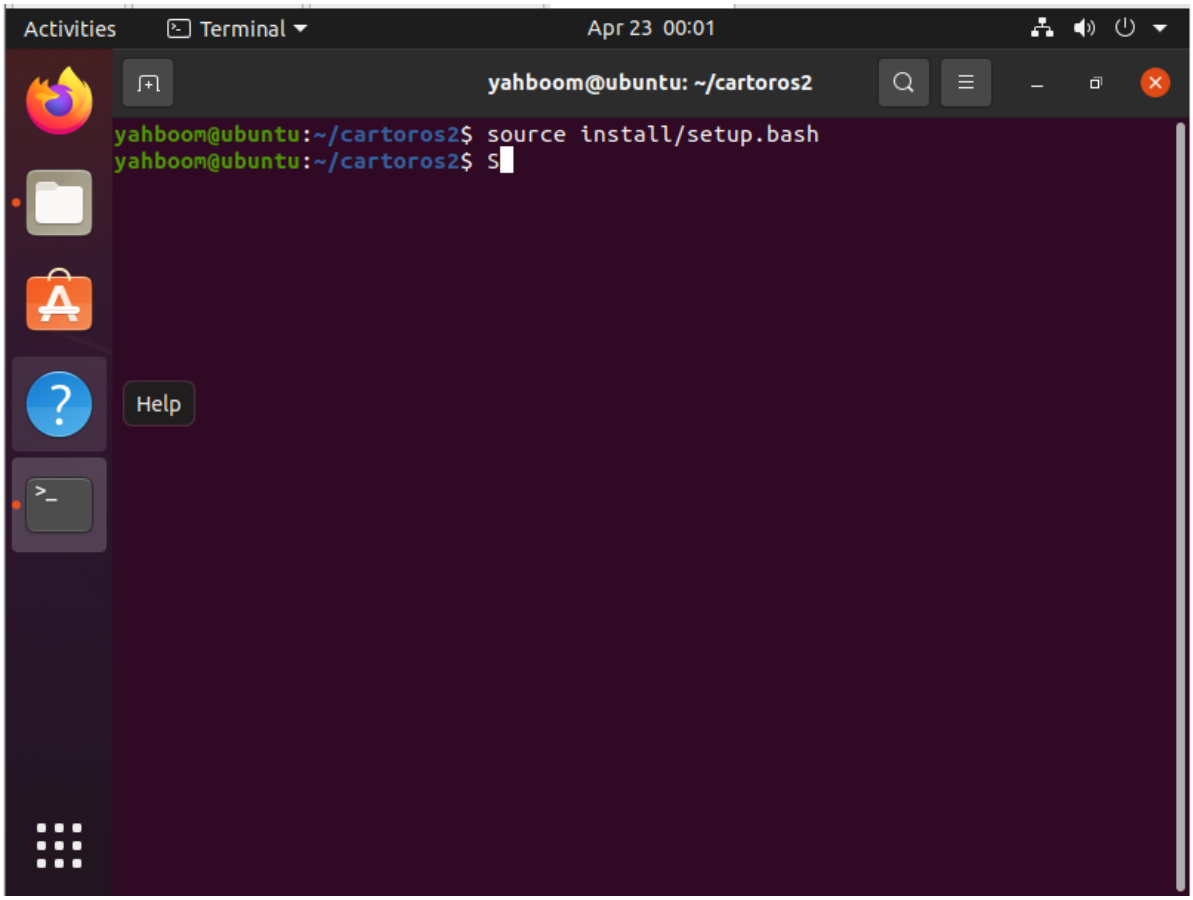


Open a terminal under the folder



Then enter the following command

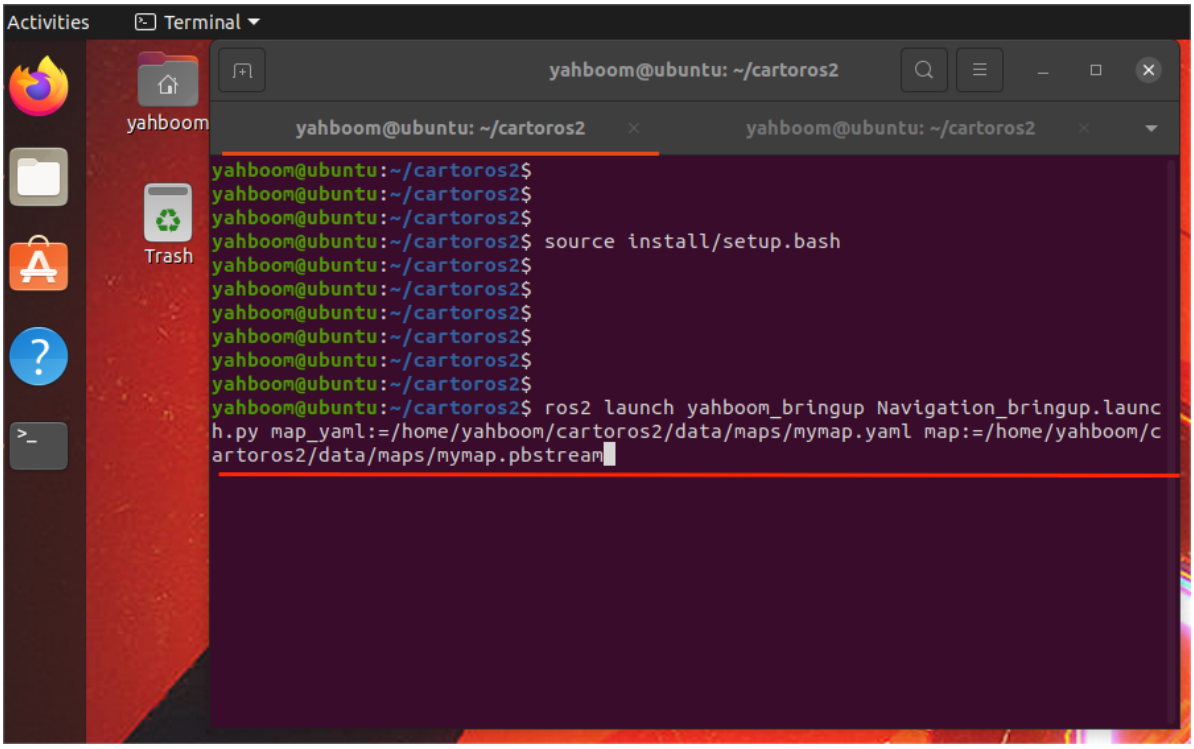
```
source install/setup.bash
```



Then start the navigation programme, this is the first thing to do is to place the robot dog at the build map origin. Then enter the command in the VM terminal:

```
ros2 launch yahboom_bringup Navigation_bringup.launch.py
map_yaml:=/home/yahboom/cartoros2/data/maps/mymap.yaml
map:=/home/yahboom/cartoros2/data/maps/mymap.pbstream
```

Note: The map files xxx.yaml and xxx.pbstream are the two files here that we saved in the previous map building tutorial.

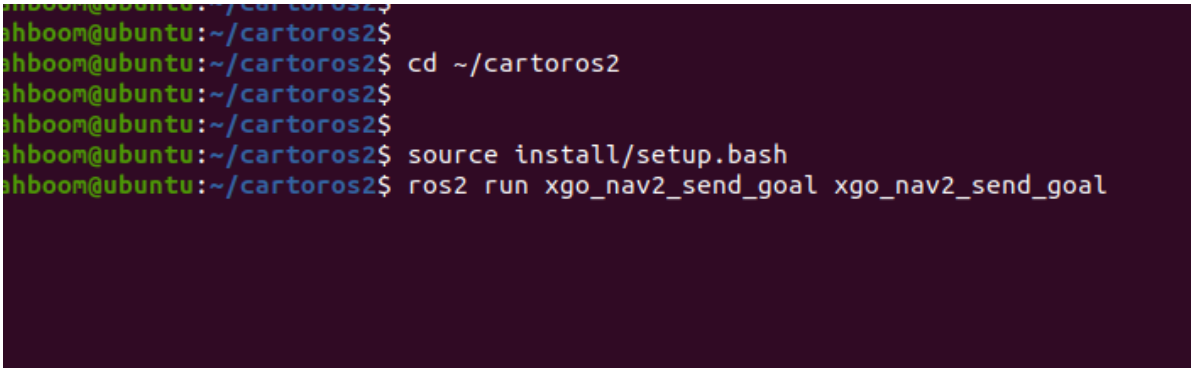


After the navigation module is started, we open another terminal to start the node for multipoint navigation. Enter the command in the newly opened terminal:

```
cd ~/cartoros2
```

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

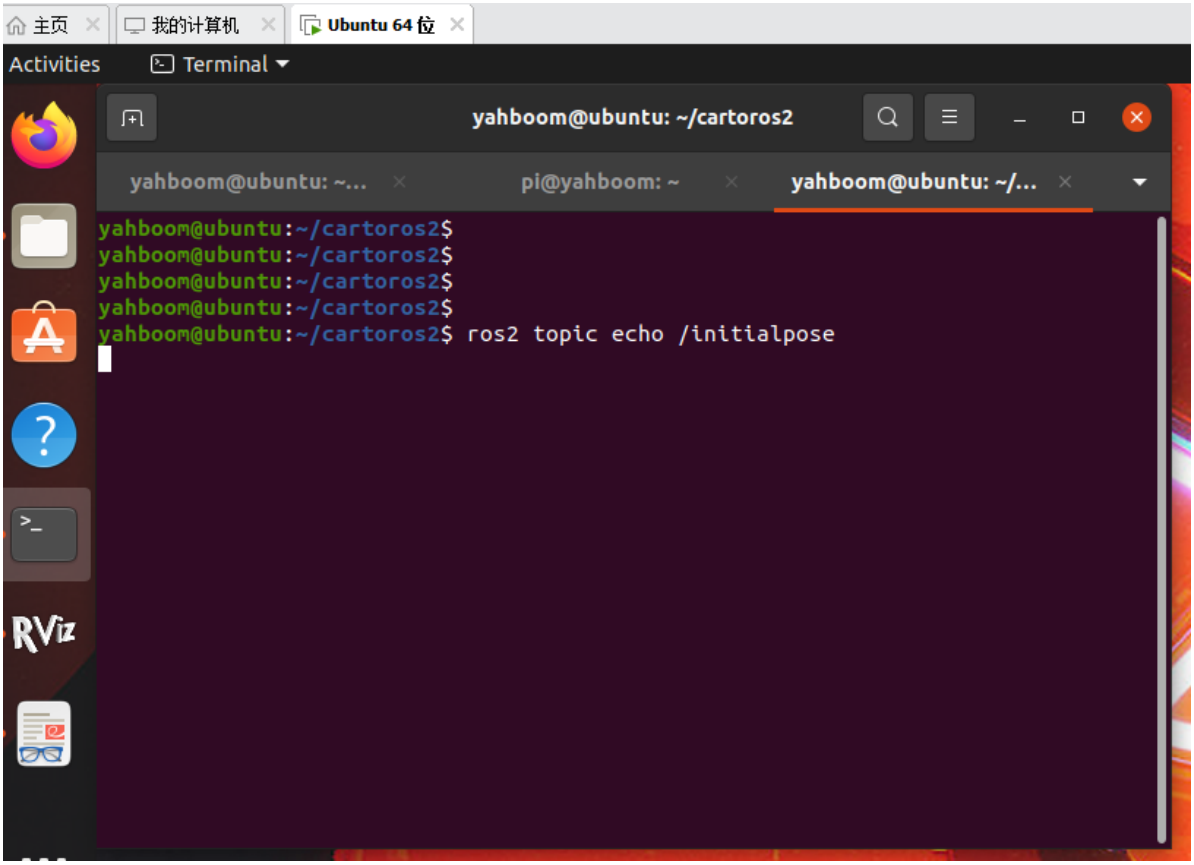
```
ros2 run xgo_nav2_send_goal xgo_nav2_send_goal
```



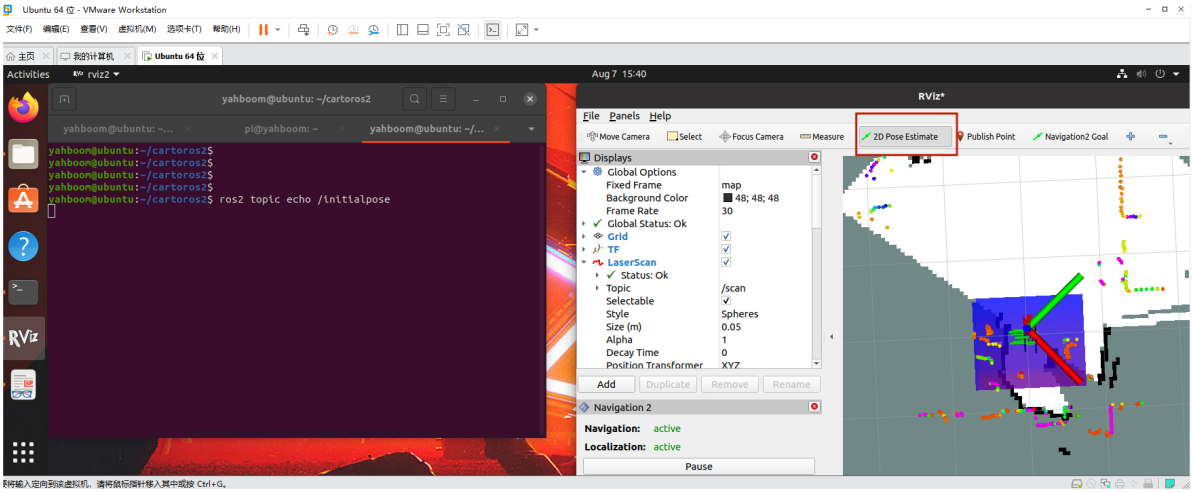
5. Getting the position of the navigation point

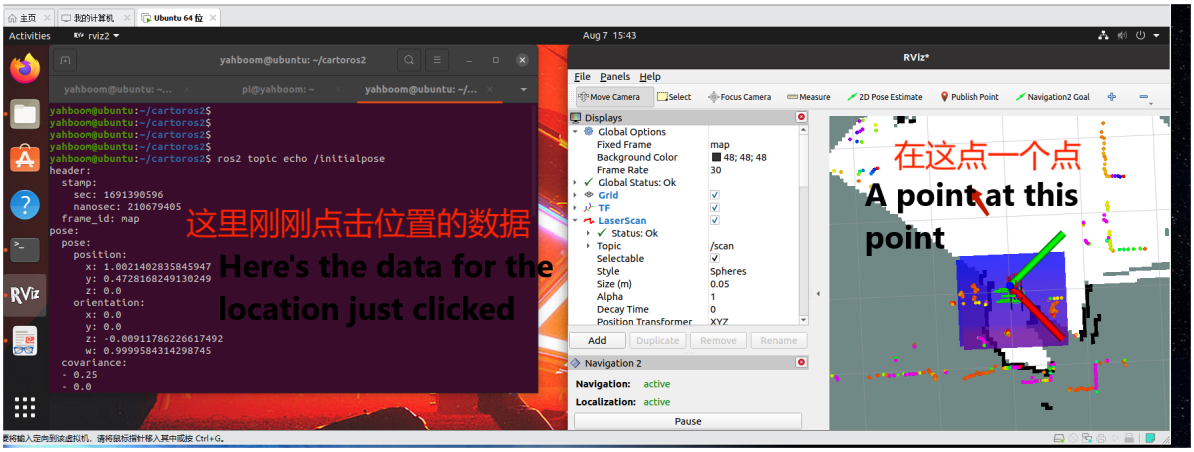
Inside the VM terminal, press the shortcut key: ctrl + alt + T to reopen a terminal, and subscribe to the /initialpose topic in the terminal to get, the point we set in rviz. The command is as follows:

```
ros2 topic echo /initialpose
```



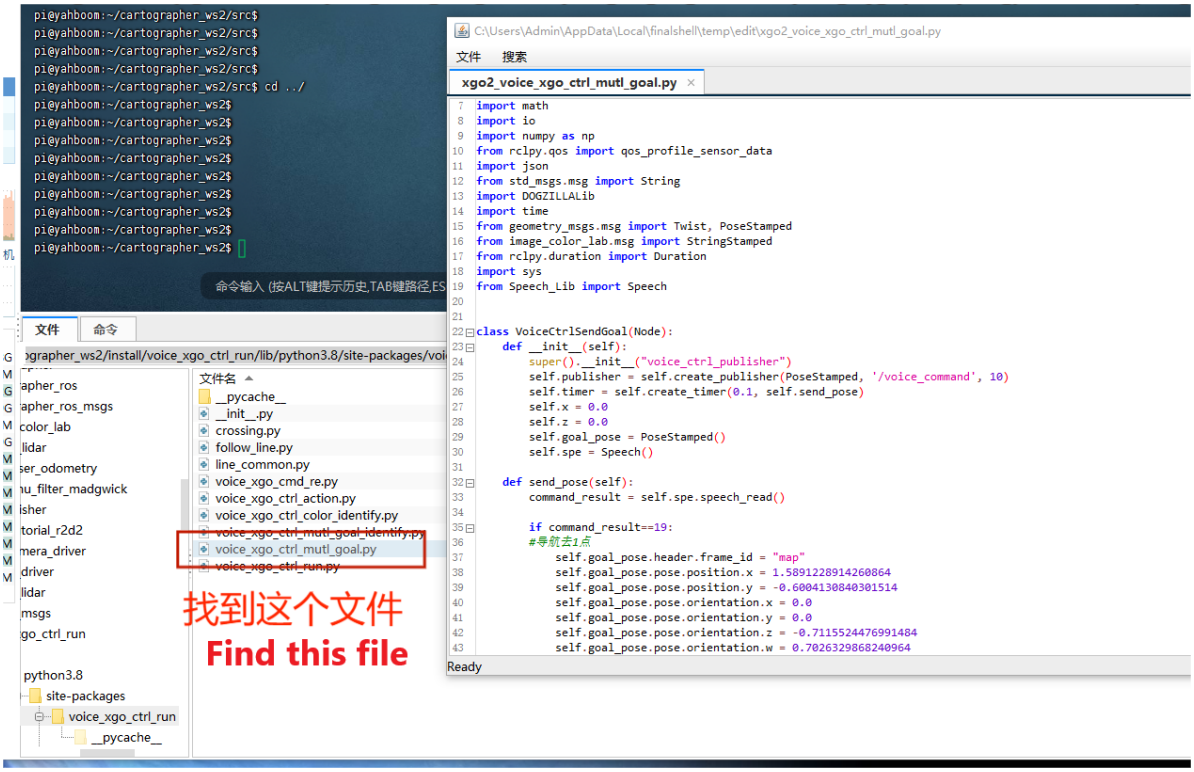
Click on the button " 2D Pose Estimate " in rviz and click on a point on the map where you can walk, then the position of the point you have just clicked will be printed in the terminal.





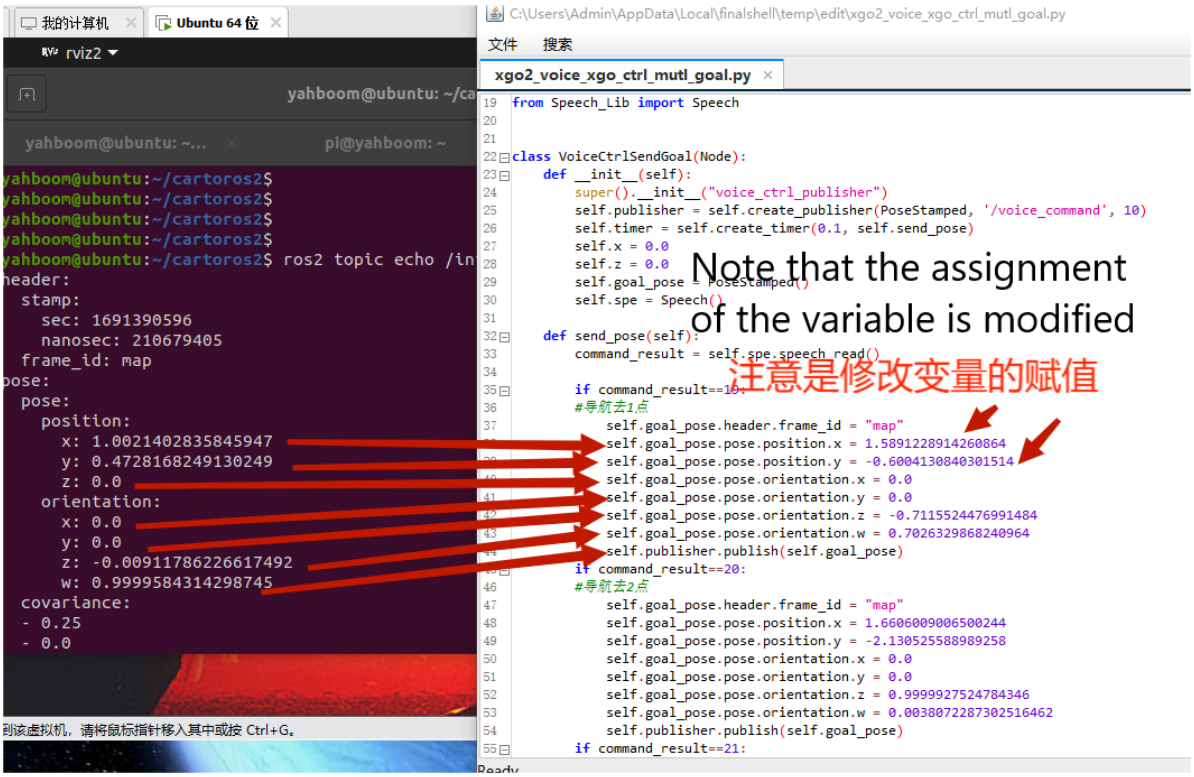
According to the second step, open a new shell terminal, connect to robot dog and we open the file with the following path.

```
/home/pi/cartographer_ws2/install/voice_xgo_ctrl_run/lib/python3.8/site-packages/voice_xgo_ctrl_run
```



Then we modify the annotated part by modifying the corresponding position.x, position.y ,position.z , orientation.x, orientation.y, orientation.z.orientation.w values according to the subscribed to data in rviz. This is shown in the following figure:

```
self.goal_pose.pose.position.x = 1.5891228914260864
self.goal_pose.pose.position.y = -0.6004130840301514
self.goal_pose.pose.orientation.x = 0.0
self.goal_pose.pose.orientation.y = 0.0
self.goal_pose.pose.orientation.z = -0.7115524476991484
self.goal_pose.pose.orientation.w = 0.7026329868240964
```



We can see that there are 5 points, but we only need to modify 4 as per the above method, as the fifth point is the origin position.

6. Start the voice control multi-point navigation node

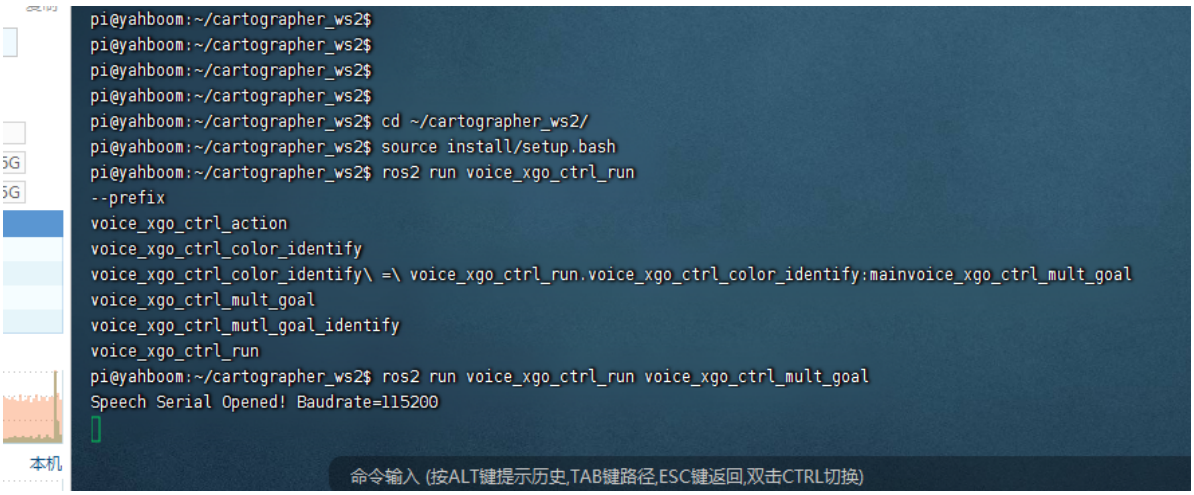
Open another shell terminal and enter the following command in the terminal:

Note: This terminal is the terminal that opens the remote connection to robot dog.

```
cd ~/cartographer_ws2/
```

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

```
ros2 run voice_xgo_ctrl_run voice_xgo_ctrl_mult_goal
```

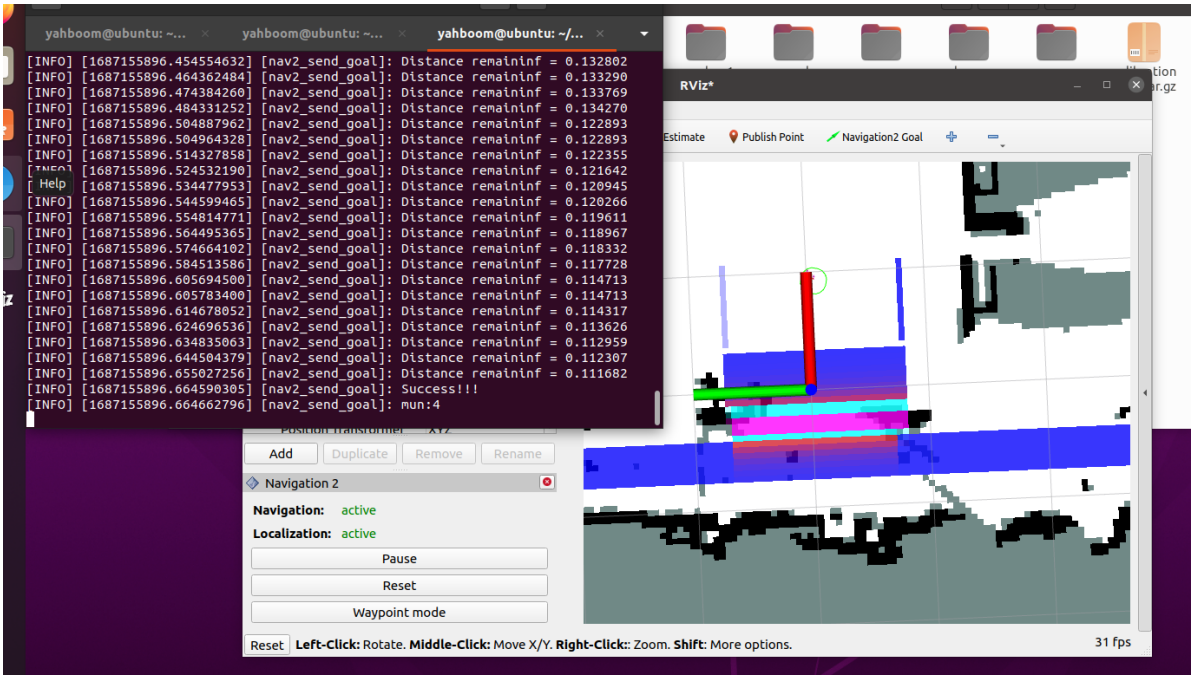


Then to the robot dog he says, "Hi, Yahboom."

The robot dog replies, "Hi, I'm here."

Then say to the robot dog, "Go to the point A"

As shown in the picture below, the robot dog will automatically navigate to position A.



The internal commands: Go to the point A, Go to the point B, Go to the point C, Go to the point D.