

1. 在 ROS2 环境下打开摄像头查看实时视频

1.1 准备工作

① 首先确保轮趣小车已连接到网络，并且 IP 地址为 192.168.0.100。如果出现了不能 ping 通小车 IP 的情况，可以查看【资料包\WHEELTEC ROS 机器人通用资料\4.ROS 相关的 ubuntu 基础教程\4.远程命令行控制：SSH\远程命令行控制：SSH_2024.07.27.pdf】。而且需要确保有权限通过 SSH 访问轮趣小车。

② 安装好 rqt 工具，将相机连接到小车，用于查看摄像头视频。

③ 确认你的相机的型号，如和默认型号不符，可以在【源码 \wheeltec_ros2\src\turn_on_wheeltec_robot\launch\wheeltec_camera.launch.py】中选择具体型号。

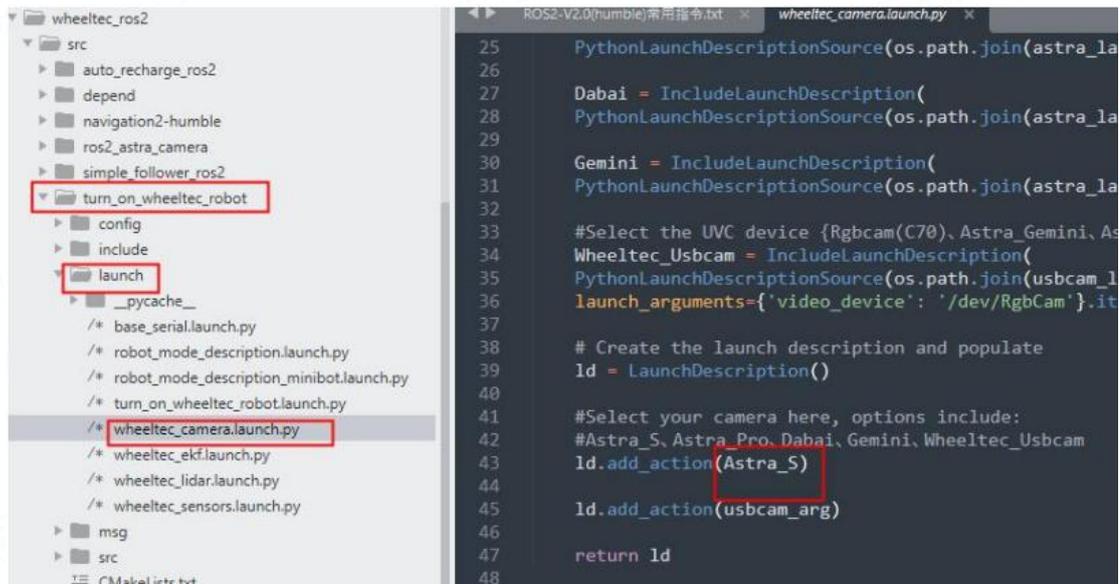


图 1-1-1 /turn_on_wheeltec_robot/launch/wheeltec_camera.launch.py

选择匹配的相机型号

1.2 操作步骤

① 打开一个终端

在虚拟机 ubuntu 系统桌面下，键盘同时按下 Ctrl+alt+T，即可打开终端，如下图所示：

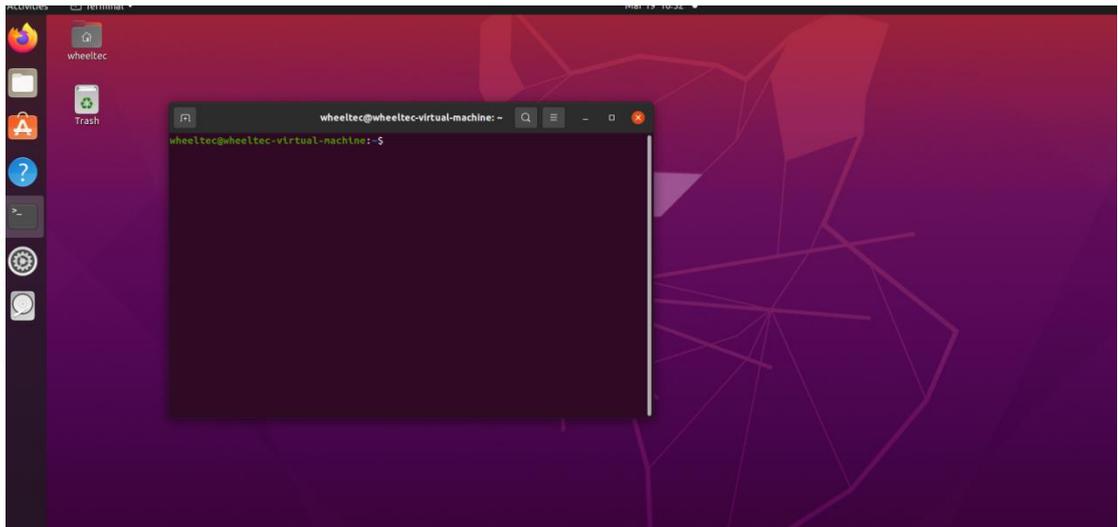


图 1-2-1 Ctrl+alt+T 显示终端

② 打开 SSH 终端

在终端中输入 `ping 192.168.0.100`, 如果可以 ping 通, 代表可以使用 SSH 进行远程登录, 再打开一个终端并输入: `ssh -Y wheeltec@192.168.0.100`, 输入密码: `dongguan`。可以出现如下界面, 可以发现用户名变成了小车用户名。

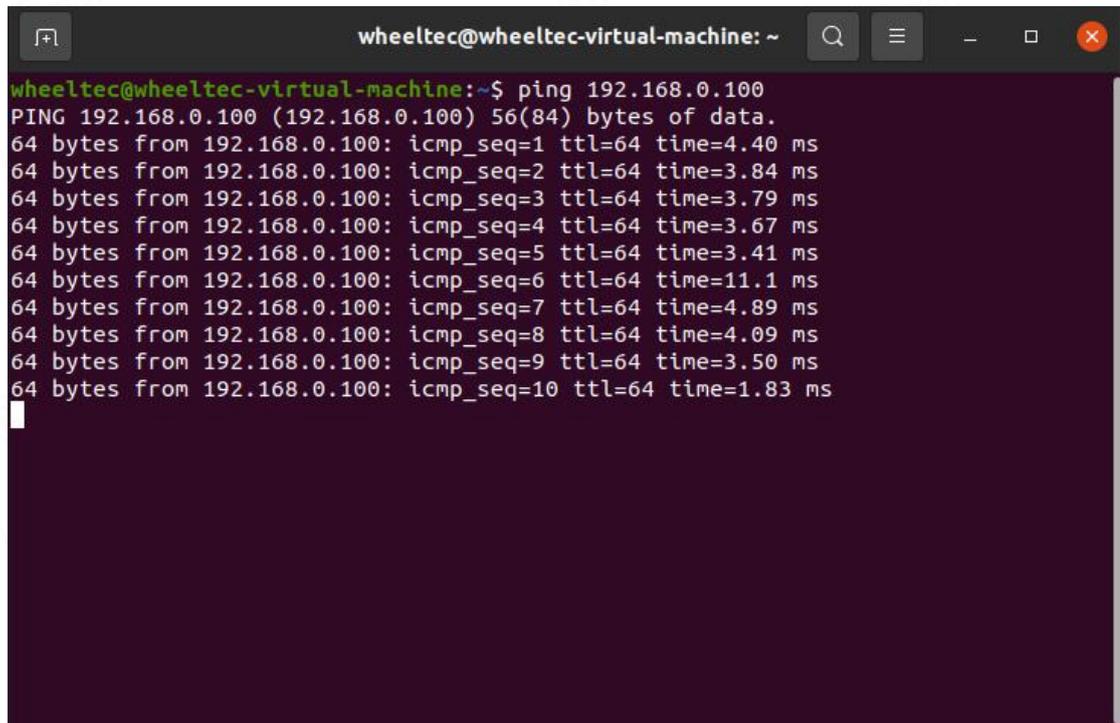
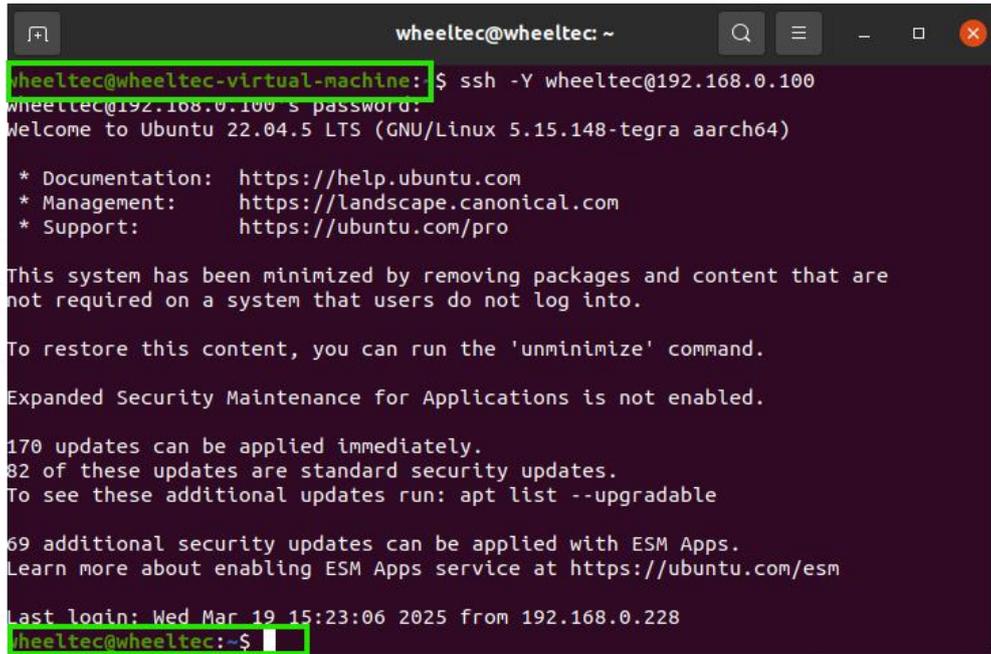


图 1-2-2 终端中输入 ping 192.168.0.100

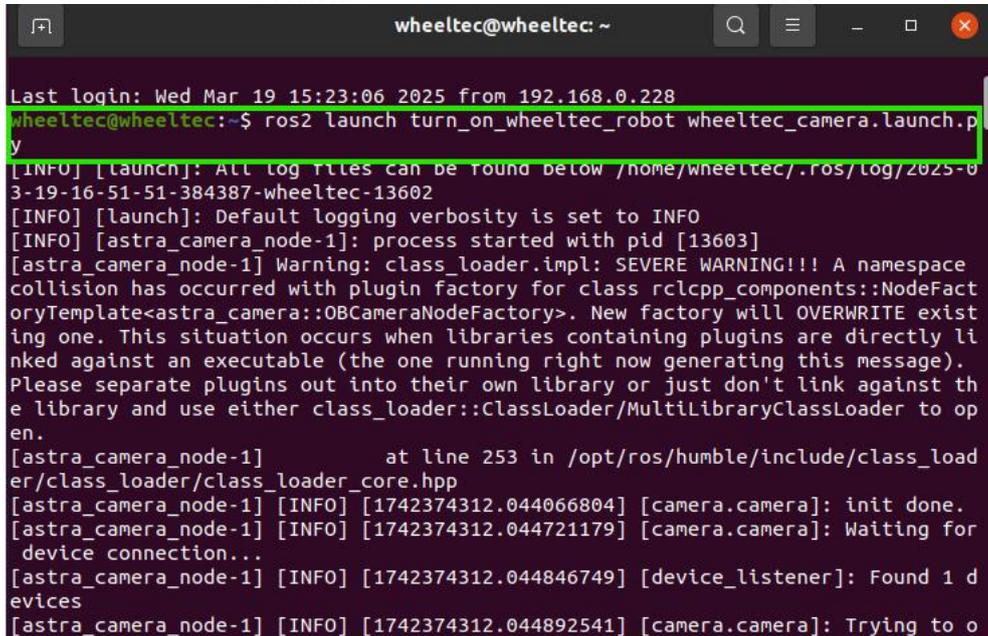


```
wheeltec@wheeltec: ~  
wheeltec@wheeltec-virtual-machine:~$ ssh -Y wheeltec@192.168.0.100  
wheeltec@192.168.0.100's password:  
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.148-tegra aarch64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/pro  
  
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.  
  
To restore this content, you can run the 'unminimize' command.  
  
Expanded Security Maintenance for Applications is not enabled.  
  
170 updates can be applied immediately.  
82 of these updates are standard security updates.  
To see these additional updates run: apt list --upgradable  
  
69 additional security updates can be applied with ESM Apps.  
Learn more about enabling ESM Apps service at https://ubuntu.com/esm  
  
Last login: Wed Mar 19 15:23:06 2025 from 192.168.0.228  
wheeltec@wheeltec:~$
```

图 1-2-3 ssh 成功界面

③ 打开相机 launch 文件

终端输入：`ros2 launch turn_on_wheeltec_robot wheeltec_camera.launch.py`，即可完成 camera 打开，可以看到如下界面。



```
wheeltec@wheeltec: ~  
Last login: Wed Mar 19 15:23:06 2025 from 192.168.0.228  
wheeltec@wheeltec:~$ ros2 launch turn_on_wheeltec_robot wheeltec_camera.launch.py  
[INFO] [launch]: All log files can be found below /home/wheeltec/.ros/log/2025-03-19-16-51-51-384387-wheeltec-13602  
[INFO] [launch]: Default logging verbosity is set to INFO  
[INFO] [astra_camera_node-1]: process started with pid [13603]  
[astra_camera_node-1] Warning: class_loader.impl: SEVERE WARNING!!! A namespace collision has occurred with plugin factory for class rclcpp_components::NodeFactoryTemplate<astra_camera::OBCameraNodeFactory>. New factory will OVERWRITE existing one. This situation occurs when libraries containing plugins are directly linked against an executable (the one running right now generating this message). Please separate plugins out into their own library or just don't link against the library and use either class_loader::ClassLoader/MultiLibraryClassLoader to open.  
[astra_camera_node-1] at line 253 in /opt/ros/humble/include/class_loader/class_loader/class_loader_core.hpp  
[astra_camera_node-1] [INFO] [1742374312.044066804] [camera.camera]: init done.  
[astra_camera_node-1] [INFO] [1742374312.044721179] [camera.camera]: Waiting for device connection...  
[astra_camera_node-1] [INFO] [1742374312.044846749] [device_listener]: Found 1 devices  
[astra_camera_node-1] [INFO] [1742374312.044892541] [camera.camera]: Trying to o
```

图 1-3-1 打开相机 launch 文件

④ 打开 rqt_image_view

再打开一个终端，输入 `ros2 run rqt_image_view rqt_image_view`，即可打开 rqt_image_view 显示工具。

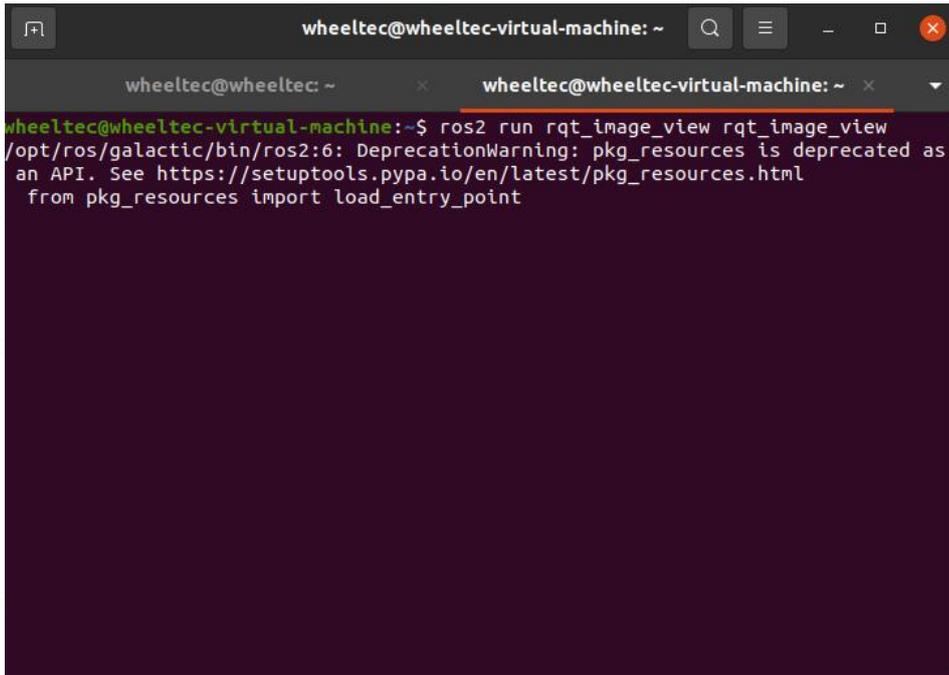


图 1-4-1 打开 rqt_image_view

此时，系统会自动弹出显示图像工具，可以在上面的下拉按钮选择不同的图像类型，如下图选择 /camera/color/image_raw，即可显示彩色图像。选择 depth 话题对应深度图像，部分图像无法查看为正常现象。

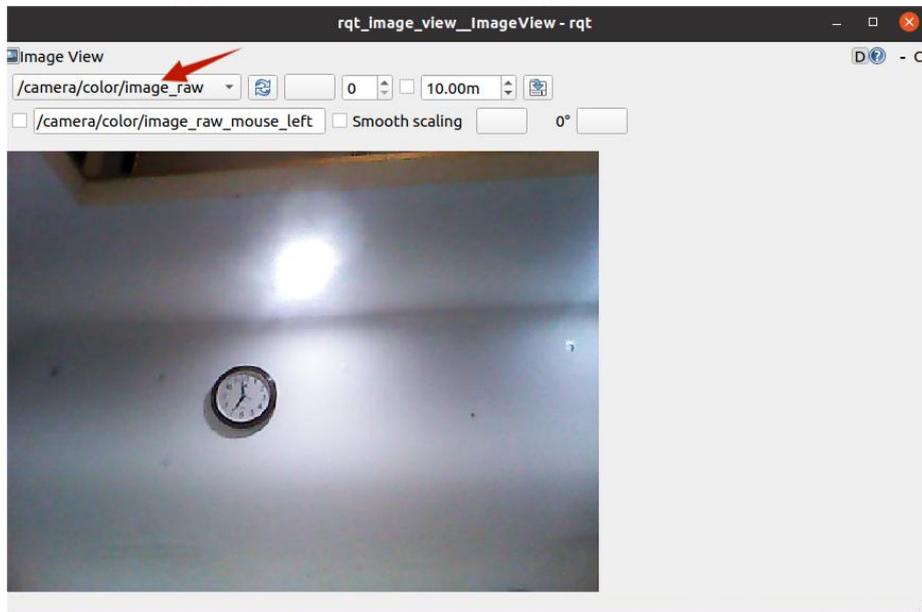


图 1-4-2 彩色图像显示

1.3 关闭终端

在 rqt 图像显示工具点击右上角红色叉号即可关闭界面，终端关闭可在终端输入 Ctrl+C 暂停运行后，点击终端右上角红色叉号关闭终端。