astra_s相机驱动安装与ROS查看图像

环境

```
相机：  Astra_s
ROS melodic
Ubuntu 18.04
开发板：  nvidia jetson nano
```

初始化rosdep（ROS 装好了其实不需要这步，可以无视）

```
sudo rosdep init
```

Bug1 - 会出现错误：这个错误是因为网络无法连接，无法下载20-default.list文件

```
ERROR: cannot download default sources list from:
https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/sources.list.d/20-default.list
Website may be down.
```

Solution1 - 我们参考清华源处理方法，也有其他更改下载链接方法，请自行百度。

```
# 手动模拟 rosdep init
sudo mkdir -p /etc/ros/rosdep/sources.list.d/
sudo curl -o /etc/ros/rosdep/sources.list.d/20-default.list https://mirrors.tuna.tsinghua.edu.cn/github-raw/ros/
# 为 rosdep update 换源
export ROSDISTRO_INDEX_URL=https://mirrors.tuna.tsinghua.edu.cn/rosdistro/index-v4.yaml
rosdep update
# 每次 rosdep update 之前，均需要增加该环境变量
# 为了持久化该设定，可以将其写入 .bashrc 中，例如
echo 'export ROSDISTRO_INDEX_URL=https://mirrors.tuna.tsinghua.edu.cn/rosdistro/index-v4.yaml' >> ~/.bashrc
```

```
#更新
rosdep update
```

出现以下输出：

```
reading in sources list data from /etc/ros/rosdep/sources.list.d
Hit https://mirrors.tuna.tsinghua.edu.cn/github-raw/ros/rosdistro/master/rosdep/osx-homebrew.yaml
Hit https://mirrors.tuna.tsinghua.edu.cn/github-raw/ros/rosdistro/master/rosdep/base.yaml
Hit https://mirrors.tuna.tsinghua.edu.cn/github-raw/ros/rosdistro/master/rosdep/python.yaml
Hit https://mirrors.tuna.tsinghua.edu.cn/github-raw/ros/rosdistro/master/rosdep/ruby.yaml
Query rosdistro index https://mirrors.tuna.tsinghua.edu.cn/rosdistro/index-v4.yaml
Skip end-of-life distro "ardent"
Skip end-of-life distro "bouncy"
Skip end-of-life distro "crystal"
Skip end-of-life distro "dashing"
Skip end-of-life distro "eloquent"
Skip end-of-life distro "foxy"
Skip end-of-life distro "galactic"
Skip end-of-life distro "groovy"
```

```
Add distro "humble"
Skip end-of-life distro "hydro"
Skip end-of-life distro "indigo"
Add distro "iron"
Skip end-of-life distro "jade"
Skip end-of-life distro "kinetic"
Skip end-of-life distro "lunar"
Skip end-of-life distro "melodic"
Add distro "noetic"
Add distro "rolling"
updated cache in /home/msj/.ros/rosdep/sources.cache
```

安装Astra 相机驱动

部分问题可以参考博客：

ROS melodic+Astra s编译运行ros_astra_camera实录（踩坑没填完

ROS_ Melodic + Astra S(如何在该环境下打开摄像机获取rgb/深度图/点云)

初始化ROS 工作空间并下载`astra`驱动源码

```
#初始化ROS 工作空间      在之前创建好的工作空间进行可以忽略这步
mkdir -p ~/ws_astra/src
cd ~/ws_astra/src
catkin_init_workspace
cd ~/ws_astra
catkin_make
source devel/setup.bash


# 下载astra驱动
cd src
git clone git@github.com:orbbec/ros_astra_camera.git
```

> **我从官网github 下载的驱动最终编译会有boost相关链接报错，网上查找问题相关的方法都无法解决，使用老师提供的驱动压缩包则没有问题**

下载依赖

```
sudo apt-get install ros-melodic-uvc-camera
sudo apt-get install ros-melodic-image-*
sudo apt-get install ros-melodic-rqt-image-view
```

编译

```
cd ..
catkin_make
```

成功：

```
[ 98%] Linking CXX executable /home/hitrobot822/ws_astra/devel/lib/astra_camera/
astra_camera_node
[100%] Linking CXX shared library /home/hitrobot822/ws_astra/devel/lib/libastra_
camera_nodelet.so
/usr/bin/ld: warning: libboost_thread.so.1.65.1, needed by /home/hitrobot822/ws_
astra/devel/lib/libastra_driver_lib.so, may conflict with libboost_thread.so.1.8
0.0
[100%] Built target astra_camera_node
[100%] Built target astra_camera_nodelet
```

部分可能遇到的编译报错解决

1. `/usr/bin/ld: cannot find -luvc`

```
/usr/bin/ld: cannot find -luvc
collect2: error: ld returned 1 exit status
ros_astra_camera/CMakeFiles/astra_camera.dir/build.make:365: recipe for target '
/home/hitrobot822/astra_ws/devel/lib/libastra_camera.so' failed
make[2]: *** [/home/hitrobot822/astra_ws/devel/lib/libastra_camera.so] Error 1
CMakeFiles/Makefile2:1703: recipe for target 'ros_astra_camera/CMakeFiles/astra_
camera.dir/all' failed
make[1]: *** [ros_astra_camera/CMakeFiles/astra_camera.dir/all] Error 2
Makefile:145: recipe for target 'all' failed
make: *** [all] Error 2
```

解决：

```
sudo apt-get install libuvc-dev
```

2. `/usr/include/opencv` not found

```
CMake Error at /opt/ros/melodic/share/cv_bridge/cmake/cv_bridgeConfig.cmake:113
(message):
  Project 'cv_bridge' specifies '/usr/include/opencv' as an include dir,
  which is not found.  It does neither exist as an absolute directory nor in
  '${{prefix}}//usr/include/opencv'.  Check the issue tracker
  'https://github.com/ros-perception/vision_opencv/issues' and consider
  creating a ticket if the problem has not been reported yet.
Call Stack (most recent call first):
  /opt/ros/melodic/share/catkin/cmake/catkinConfig.cmake:76 (find_package)
  ros_astra_camera/CMakeLists.txt:14 (find_package)
```

解决：

我安装了 `opencv4` 在 `/usr/include/opencv4`

建立一个软链接使 `cv_bridge` 可以找到相关库：

`sudo ln -s /usr/include/opencv4 /usr/include/opencv`

3. 系统自带的 `opencv3.2` 有相关库找不到？

```
make[2]: *** No rule to make target '/usr/lib/aarch64-linux-gnu/libopencv_objdet
ect.so.3.2.0', needed by '/home/hitrobot822/astra_ws/devel/lib/astra_camera/clea
nup_shm_node'.  Stop.
CMakeFiles/Makefile2:2471: recipe for target 'ros_astra_camera/CMakeFiles/cleanu
p_shm_node.dir/all' failed
make[1]: *** [ros_astra_camera/CMakeFiles/cleanup_shm_node.dir/all] Error 2
make[1]: *** Waiting for unfinished jobs....
```

再装一下：

```
sudo apt install libopencv3.2
```

4. ROS中catkin_make的OpenCV冲突的解决（cv_bridge）

我没遇到，但遇到可以参照：ROS中catkin_make的OpenCV冲突的解决（踩坑小记，报错分析）_/usr/bin/ld: warning: libopencv_imgcodecs.so.3.2, -CSDN博客

建立Astra udev规则

```
roscd astra_camera
./scripts/create_udev_rules
```

```
hitrobot822@hitrobot822-desktop:~/ws_astra/src/ros_astra_camera$ ./scripts/create_udev_rules

This script copies a udev rule to /etc to facilitate bringing
up the astra usb connection as /dev/astra*

[sudo] password for hitrobot822:

Restarting udev
```

再次编译工作空间

```
cd ../..
catkin_make
```

运行 launch

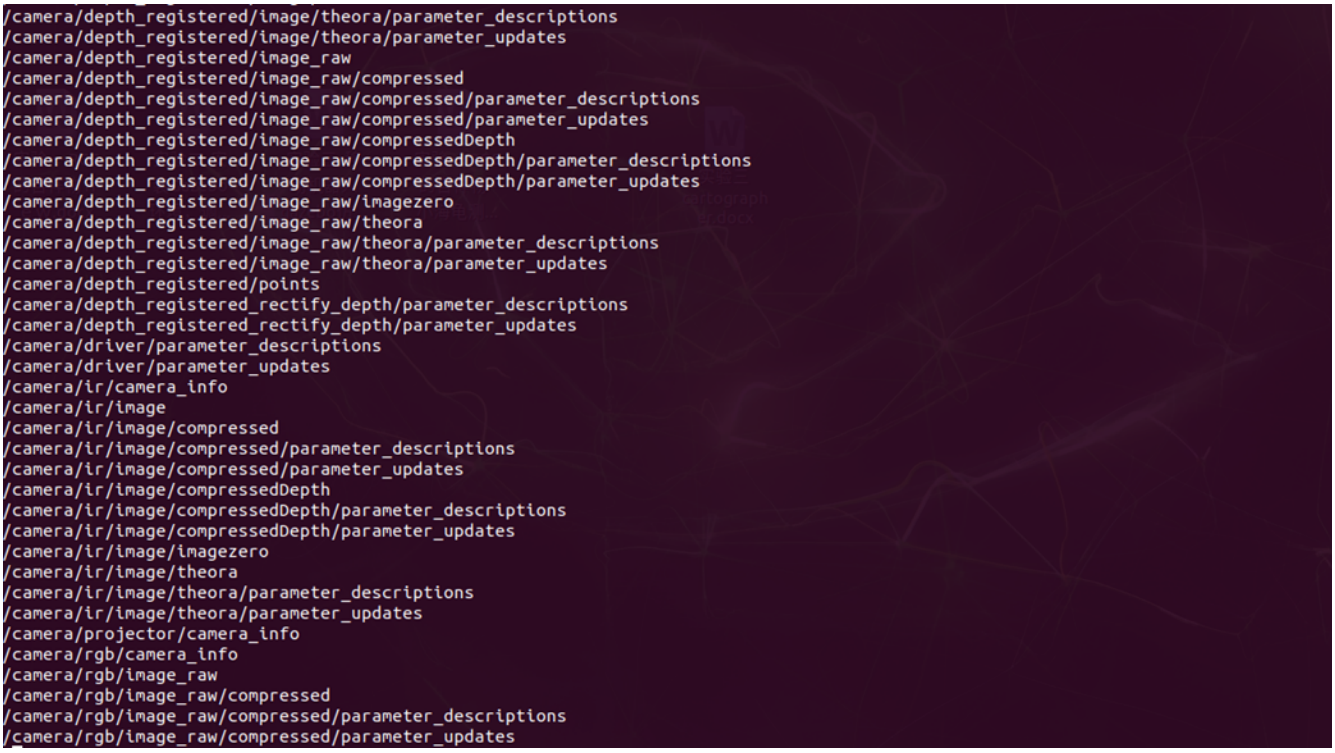
相机是 `Astra s` 型号，运行 `./launch/astra.launch`，如果型号是 `Astra Stereo S (w/ UVC)` 就运行 `stereo_s.launch`。

```
roslaunch astra_camera astra.launch
```

```
hitrobot822@hitrobot822-desktop:~/ws_astra$ roslaunch astra_camera astra.launch
... logging to /home/hitrobot822/.ros/log/3f4f82f0-087d-11ef-b39f-3c9c0f46321e/roslaunch-hitrobot822-desktop-25470.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://hitrobot822-desktop:36945/

SUMMARY
========

PARAMETERS
 * /camera/camera_nodelet_manager/num_worker_threads: 4
 * /camera/depth_rectify_depth/interpolation: 0
 * /camera/depth_registered_rectify_depth/interpolation: 0
 * /camera/driver/auto_exposure: True
 * /camera/driver/auto_white_balance: True
 * /camera/driver/bootorder: 0
 * /camera/driver/color_depth_synchronization: False
 * /camera/driver/depth_camera_info_url:
 * /camera/driver/depth_frame_id: camera_depth_opti...
 * /camera/driver/depth_registration: True
 * /camera/driver/device_id: #1
 * /camera/driver/devnums: 1
 * /camera/driver/rgb_camera_info_url:
 * /camera/driver/rgb_frame_id: camera_rgb_optica...
 * /rosdistro: melodic
 * /rosversion: 1.14.13

NODES
```

查看话题

```
rostopic list
```

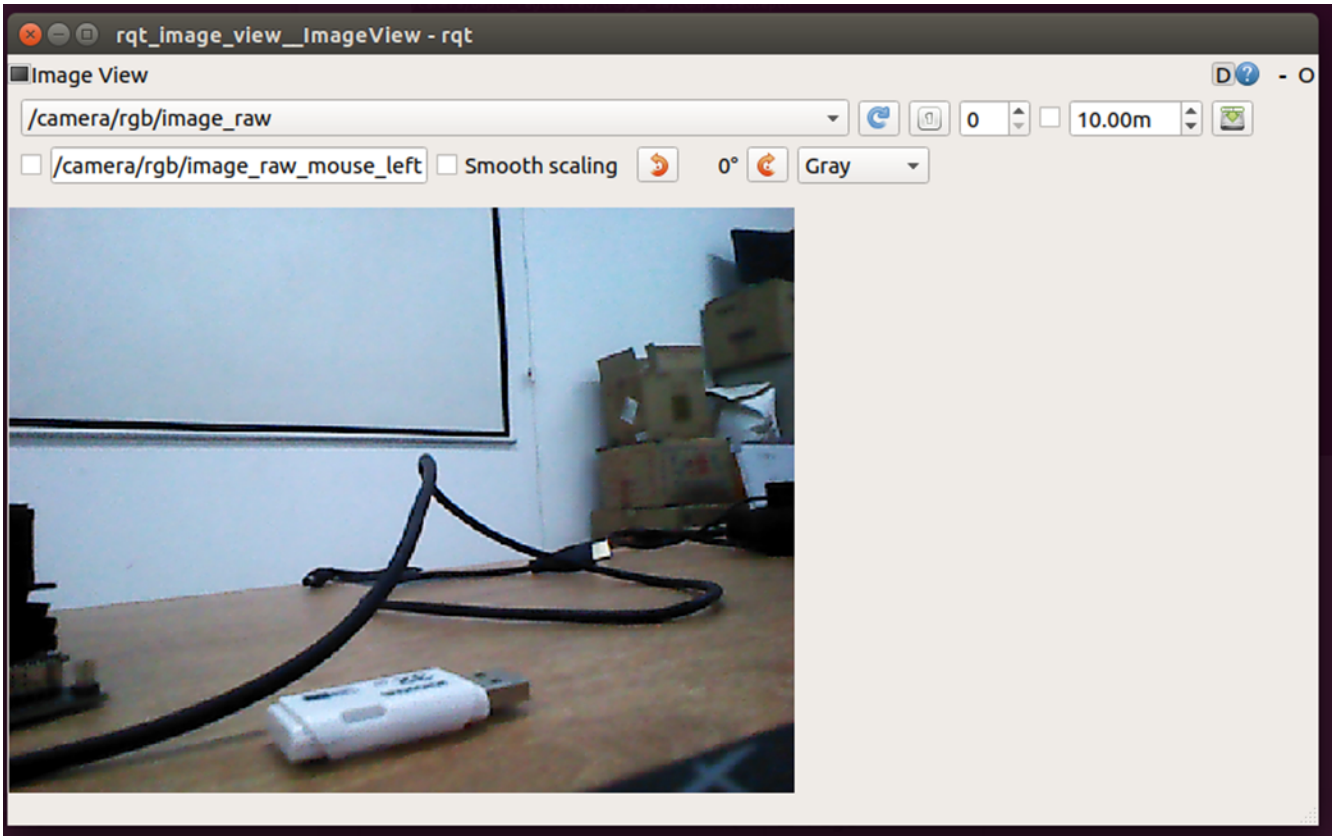


查看相机图像

`rqt_image_view`查看

```
rqt_image_view
```

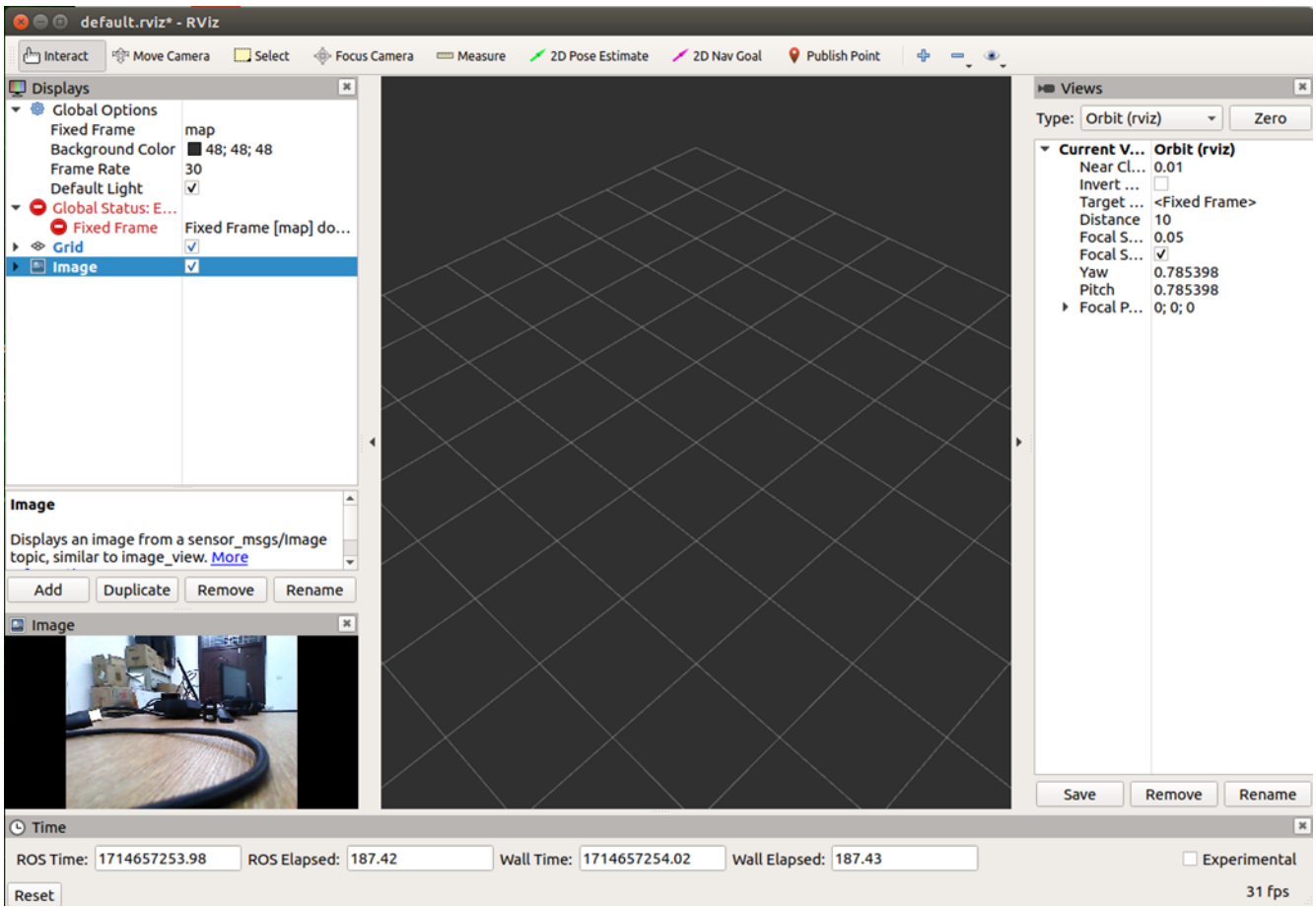
选择 `/camera/depth/image` 可以查看深度图， `/rgb/image_raw` 可以查看rgb 照片



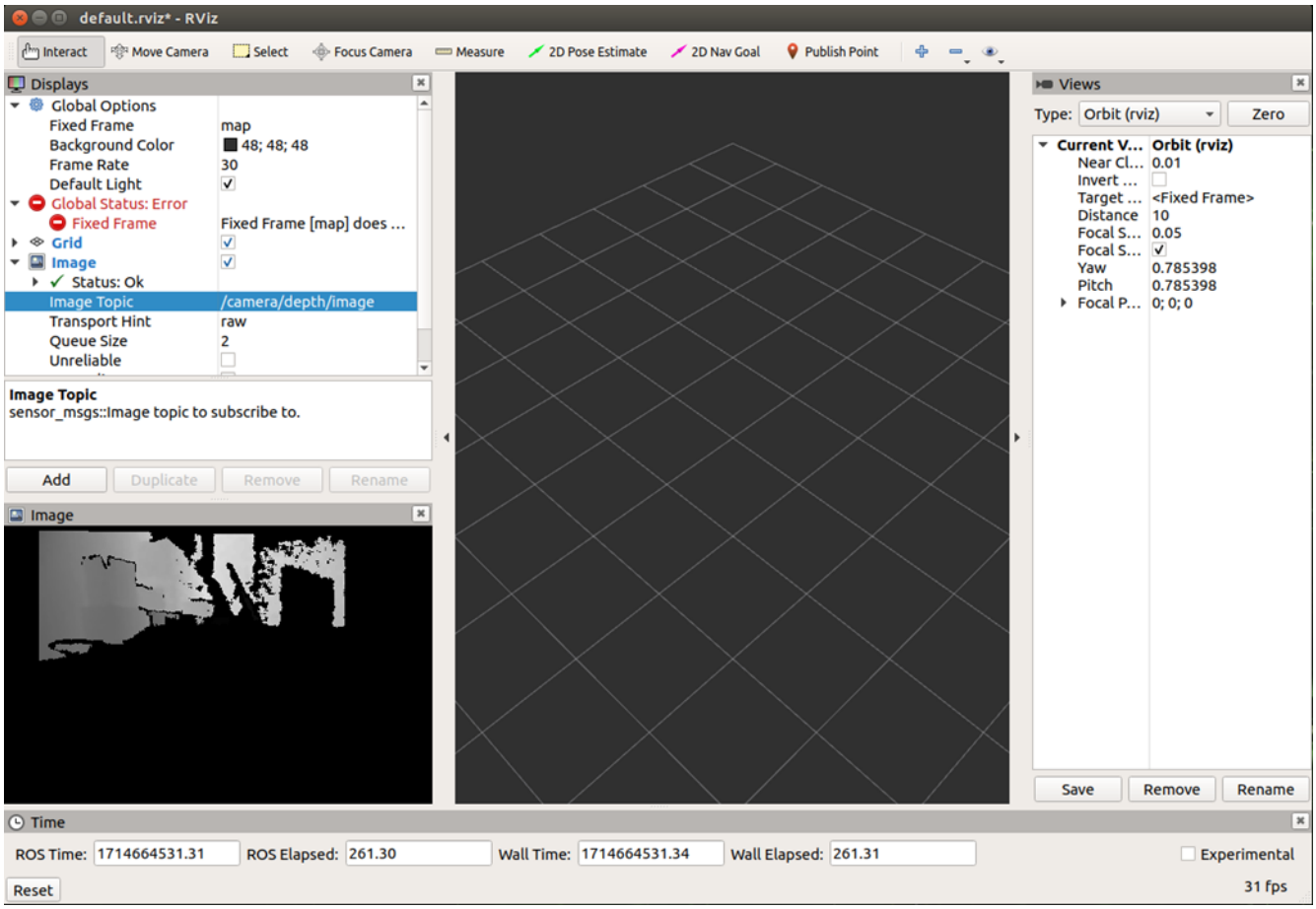
rviz 查看图像

```
rviz
```

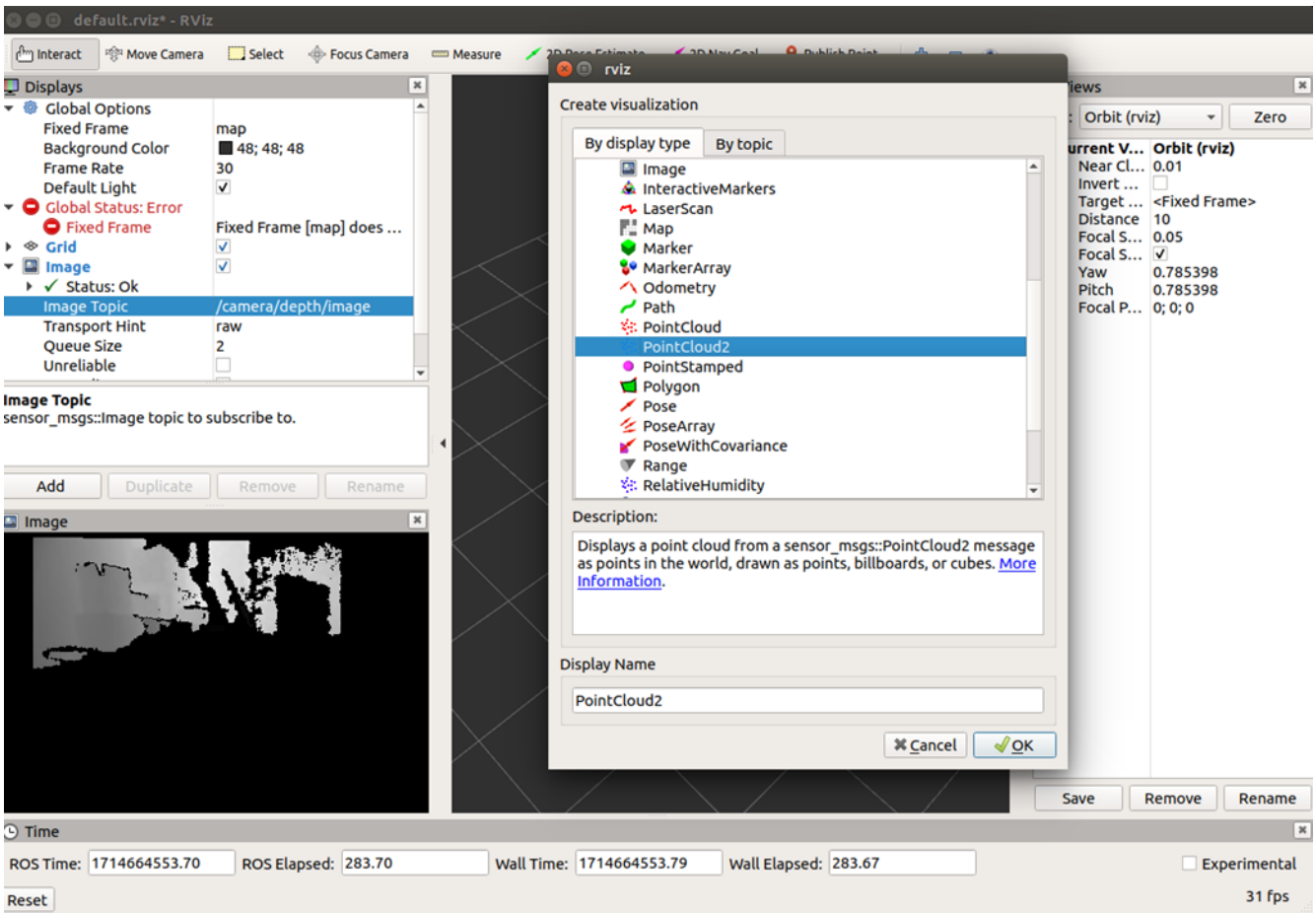
左下角add-iamge 后, 然后可以选择**topic** 选择上文提到的需要查看的话题



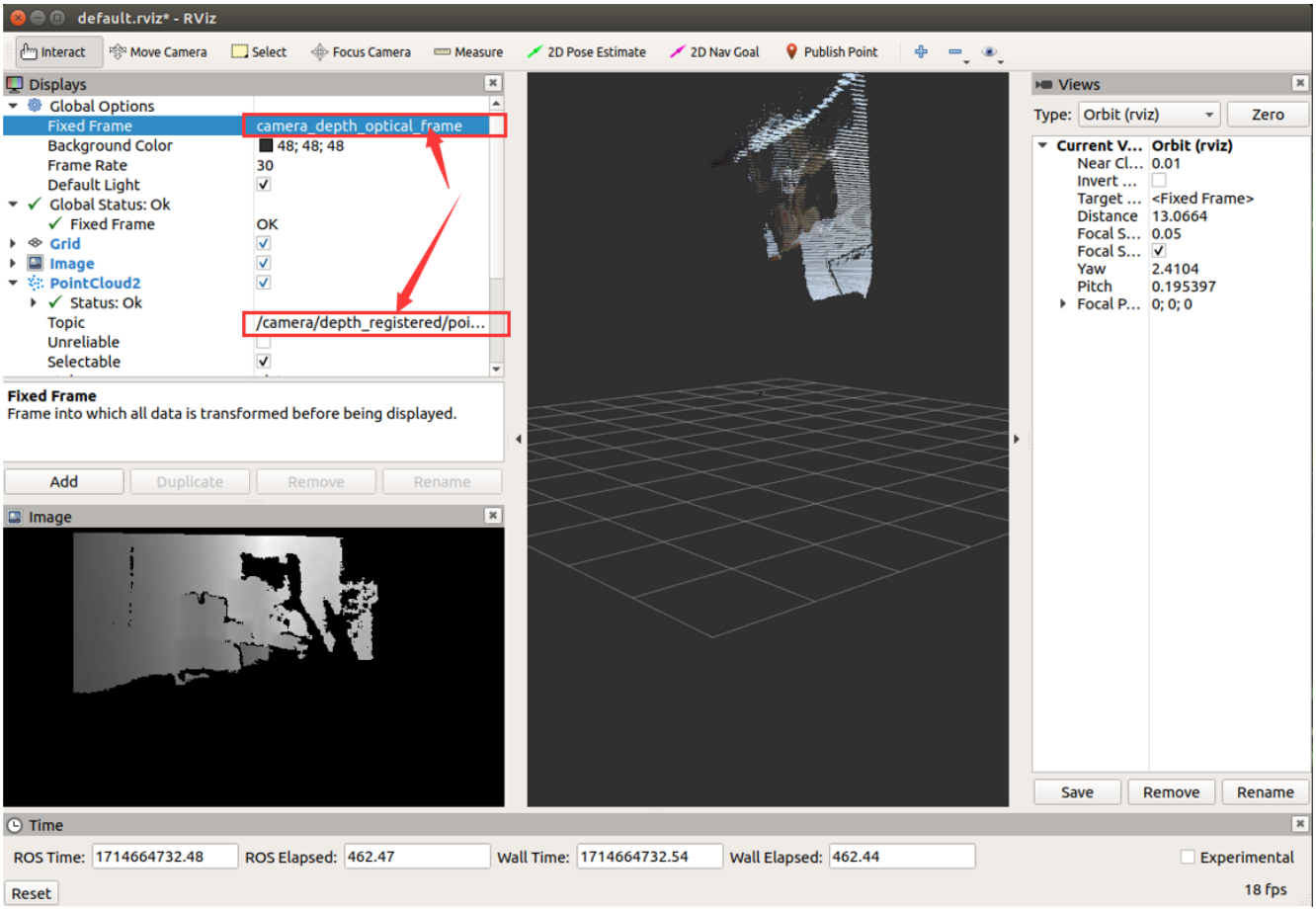
查看深度图：



add-cloudpoint2, 查看点云：



注意选好这两项，就可以查看到点云：


default.rviz* - RViz
Interact
Move Camera
Select
Focus Camera
Measure
2D Pose Estimate
2D Nav Goal
Publish Point
Displays
Global Options
Fixed Frame
camera_depth_optical_frame
Background Color
48; 48; 48
Frame Rate
30
Default Light
Global Status: Ok
Fixed Frame
OK
Grid
Image
PointCloud2
Status: Ok
Topic
/camera/depth_registered/poi...
Unreliable
Selectable
Fixed Frame
Frame into which all data is transformed before being displayed.
Add
Duplicate
Remove
Rename
Image
Views
Type:
Orbit (rviz)
Zero
Current V...
Orbit (rviz)
Near Cl...
0.01
Invert ...
Target ...
<Fixed Frame>
Distance
13.0664
Focal S...
0.05
Focal S...
Yaw
2.4104
Pitch
0.195397
Focal P...
0; 0; 0
Save
Remove
Rename
Time
ROS Time:
1714664732.48
ROS Elapsed:
462.47
Wall Time:
1714664732.54
Wall Elapsed:
462.44
Experimental
Reset
18 fps