首先安装ROS2

# 1、ROS2安装（换源后装的快点 不然太慢了 这东西还是看运气）

[ROS2安装方法 - ROS2入门教程 (guyuehome.com)](https://book.guyuehome.com/ROS2/1.%E7%B3%BB%E7%BB%9F%E6%9E%B6%E6%9E%84/1.3_ROS2%E5%AE%89%E8%A3%85%E6%96%B9%E6%B3%95/)

如果以下命令

sudo curl -sSL [https://raw.githubusercontent.com/ros/rosdistro/master/ros.key -o /usr/share/keyrings/ros-archive-keyring.gpg](https://raw.githubusercontent.com/ros/rosdistro/master/ros.key%20-o%20/usr/share/keyrings/ros-archive-keyring.gpg)  
出错的话

[彻底解决【“curl: (7) Failed to connect to raw.githubusercontent.com port 443: Connection refused”】错误\_curl: (7) failed to connect to nodejs.org port 443-CSDN博客](https://blog.csdn.net/donaldsy/article/details/107482368)

Gitclone老是失败

[解决Linux系统git clone失败或超时问题-CSDN博客](https://blog.csdn.net/weixin_42771853/article/details/133135301" \l ":~:text=%E6%96%87%E7%AB%A0%E6%B5%8F%E8%A7%88%E9%98%85%E8%AF%BB1k%E6%AC%A1%E3%80%82%20%E9%A6%96%E5%85%88%E4%BD%BF%E7%94%A8%20sudo%20vim%20%2Fetc%2Fhosts%20%E8%BF%9B%E5%85%A5hosts%EF%BC%8C%E6%AD%A4%E6%97%B6%E6%98%AF%E6%9F%A5%E7%9C%8B%E6%A8%A1%E5%BC%8F%E3%80%82,%E4%BD%BF%E7%94%A8git%20clone%E5%B8%B8%E5%B8%B8%E4%B8%8D%E6%88%90%E5%8A%9F%EF%BC%8C%E4%BB%A5%E4%B8%8B%E6%98%AF%E8%A7%A3%E5%86%B3%E5%8A%9E%E6%B3%95%EF%BC%8C%E4%BA%B2%E6%B5%8B%E6%9C%89%E6%95%88%E3%80%82%20%E6%8C%89%E4%B8%8B%20i%20%E8%BF%9B%E5%85%A5%E7%BC%96%E8%BE%91%E6%A8%A1%E5%BC%8F%EF%BC%8C%E6%AD%A4%E6%97%B6%E9%9C%80%E8%A6%81%E6%8F%92%E5%85%A5%E4%B8%A4%E4%B8%AAIP%E5%9C%B0%E5%9D%80%E3%80%82%202.%20%E9%87%8D%E5%90%AF%E7%BD%91%E7%BB%9C%E5%92%8C%E6%9C%8D%E5%8A%A1%E5%99%A8%E3%80%82)**（这个测试过后有用！）用这个就行了 非常有用！！！**

法二：看运气 一般般有用

sudo vim /etc/hosts

添加

192.30.253.113 github.com

192.30.252.131 github.com

185.31.16.185 github.global.ssl.fastly.net

74.125.237.1 dl-ssl.google.com

173.194.127.200 groups.google.com

74.125.128.95 ajax.googleapis.com

# 2、安装pangolin

https://github.com/stevenlovegrove/Pangolin

安装pangolin git clone --recursive https://github.com/stevenlovegrove/Pangolin.git

计算机生成了可选文字:
cdPangolin-e.5/
mkdirbuild&&cdbuild
sudomakeinstall

计算机生成了可选文字:
4然0就完成了，可以下面代码进行验证
1Pangolin/bui1d/examp1es/He110Pang01in
2．/He110Pangolin

**gtsam你得在orb和rtab之前装和编译好**

# 3、更换GTSAM版本

（非常关键 镜像源好像没ab92779b25b04b..版本 。最好或者说必须在linux里成功gitclone下来才能切换到ab92779b25b04b..版本（没试过host复制过来行不行）这个还可以探索）

sudo apt remove ros-humble-gtsam

sudo cp -rf /usr/include/eigen3/Eigen /usr/include

sudo cp -rf /usr/include/eigen3 /usr/local/include

sudo cp -rf /usr/include/Eigen /usr/local/include

git clone https://github.com/borglab/gtsam.git

cd gtsam

git checkout ab92779b25b04b376fbbd1846bbbd21904c50e7a

cmakelists文件显示该版本为4.1.0

mkdir build

cd build

计算机生成了可选文字:
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是直在CMa迮Lists．以0吧一行注跹了
include(cmake/HandleTBB.cmake)

cmake GTSAM\_WITH\_TBB=OFF -DGTSAM\_Bcmake -DGTSAM\_BUILD\_WITH\_MARCH\_NATIVE=OFF -DUILD\_EXAMPLES\_ ALWAYS=OFF DGTSAM\_BUILD\_UNSTABLE=OFF -DGTSAM\_USE\_SYSTEM\_EIGEN=ON ..

上面的好像语法错误，要用下面这个

cmake -DGTSAM\_WITH\_TBB=OFF -DGTSAM\_BUILD\_WITH\_MARCH\_NATIVE=OFF -DGTSAM\_BUILD\_EXAMPLES\_ALWAYS=OFF -DGTSAM\_BUILD\_UNSTABLE=OFF -DGTSAM\_USE\_SYSTEM\_EIGEN=ON ..

sudo make install -j4

# 4、安装配置ORB\_SLAM3 v0.4-beta版本

cd ~

git clone <https://github.com/UZ-SLAMLab/ORB_SLAM3.git> ORB\_SLAM3\_v0.4

镜像源（https://gitee.com/zjyfzu/ORB\_SLAM3.git）需要切换好像

git checkout v0.4-beta

cd ORB\_SLAM3\_v0.4\_RGBL/

git checkout v0.4-beta

下载补丁

wget <https://gist.githubusercontent.com/matlabbe/f5cb281304a1305b2824a6ce19792e13/raw/f9faa15c5d35084d123639578ac4ce2ca88bf006/orbslam3_v4_rtabmap_fix.patch>

补丁下载不了的话，window直接打开链接，右键页面另存为后缀为.patch的文件，再复制给linux

git apply orbslam3\_v4\_rtabmap\_fix.patch

chmod +x build.sh

将build.sh文件的make -j 全部改为 make

./build.sh

sudo gedit ~/.bashrc

export ORB\_SLAM\_ROOT\_DIR=~/ORB\_SLAM3\_v0.4

source ~/.bashrc

# 5、安装rtabmap，不能安装在ROS工作空间下

cd ~

git clone <https://github.com/introlab/rtabmap.git> rtabmap

镜像源https://gitee.com/xhb2016888/rtabmap.git

cd rtabmap

git checkout 0.21.1-humble

cd build

cmake -DWITH\_G2O=OFF -DWITH\_ORB\_SLAM=ON ..

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make -j4（不需要install）

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OptimizerG2O.cpp中77行三个头文件改成orbslam3中的绝对路径（如果报错需要改的话）

# 6、安装rtabmap\_ros

cd ~/test1/src

git clone <https://github.com/introlab/rtabmap_ros.git> rtabmap\_ros

镜像源https://gitee.com/congcongyanyi/rtabmap\_ros.git

cd rtabmap\_ros/

git checkout 0.21.1-humble

回到test1/目录下

rosdep update && rosdep install --from-paths src --ignore-src -r -y

这一步出错 连接不上的话（看运气）

[rosdep安装与使用\_rosdep install --from-paths src --ignore-src --ros-CSDN博客](https://blog.csdn.net/weixin_45378779/article/details/103617471)

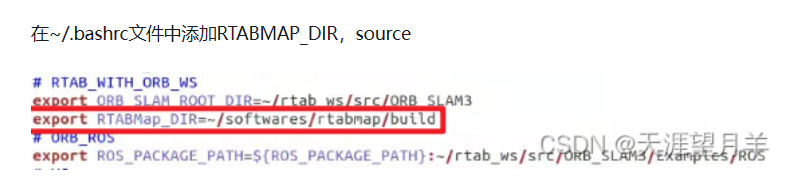
sudo apt remove ros-humble-rtabmap

export MAKEFLAGS="-j2" # Can be ignored if you have a lot of RAM (>16GB)

colcon build --symlink-install --parallel-workers 2 --cmake-args -DCMAKE\_BUILD\_TYPE=Release

**爆红色错 检查不到路径 就重新启动个终端（先加这句）**

export RTABMap\_DIR=~/rtabmap/build **在~/.bashrc添加rtabmap的路径**



可能要自己安装下colcon

sudo apt install python3-colcon-common-extensions

检查是否安装完成

Colcon –help

ros2 run rtabmap\_slam rtabmap --verison检查是否成功接入orbslam3

上面那个输出不了跟下面那个一样用下面那个指令

source 一下：

source install/setup.bash

ros2 run rtabmap\_odom rgbd\_odometry --version

计算机生成了可选文字:
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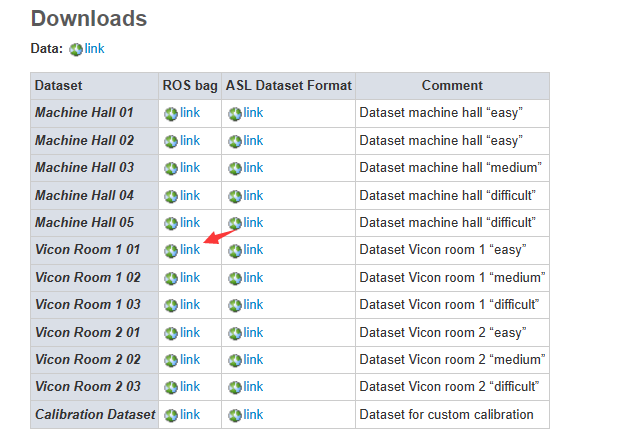
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# 7、数据集测试

**一、euroc\_datasets.launch.py 测试**

[kmavvisualinertialdatasets – ASL Datasets (ethz.ch)](https://projects.asl.ethz.ch/datasets/doku.php?id=kmavvisualinertialdatasets)

下载



**前置安装 不知道哪些是必备的 但是都装了**

sudo apt install python3-rosbag

sudo apt-get install ros-humble-image-proc

sudo apt-get install ros-humble-imu-complementary-filter

sudo apt install python3-pip

sudo apt update

sudo apt install ros-humble-rosbag2\*

单独运行（非ROS2）注意path

./Examples/Stereo/stereo\_euroc ./Vocabulary/ORBvoc.txt ./Examples/Stereo/EuRoC.yaml /home/sbim/ORB\_SLAM3\_v0.4/Datasets/MH01 ./Examples/Stereo/EuRoC\_TimeStamps/MH01.txt dataset-MH01\_sterego

**第一步**

euroc\_datasets.launch.py 在

/home/tlc/test1/install/rtabmap\_examples/share/rtabmap\_examples/launch

底下 所以用下面的命令

执行

ros2 launch rtabmap\_examples euroc\_datasets.launch.py args:="Odom/Strategy 5 OdomORBSLAM/VocPath /home/rosadmin/test1/src/ORB\_SLAM3/Vocabulary/ORBvoc.txt" MH\_seq:=true raw\_images\_for\_odom:=true

用这个

ros2 launch rtabmap\_examples euroc\_datasets.launch.py args:="Odom/Strategy 5 OdomORBSLAM/VocPath /home/rosadmin/test1/src/ORB\_SLAM3/Vocabulary/ORBvoc.txt" MH\_seq:=true raw\_images\_for\_odom:=true

**第二步**

**rosbags-convert V1\_01\_easy.bag**

sudo pip install rosbags

rosbags-convert V1\_01\_easy.bag

cd V1\_01\_easy

执行

ros2 bag play V1\_01\_easy.db3 --clock

参考资料：

# Example to run euroc datasets:

# $ sudo pip install rosbags # See https://docs.openvins.com/dev-ros1-to-ros2.html

# $ rosbags-convert V1\_01\_easy.bag

# $ rosbags-convert MH\_01\_easy.bag

#

# $ ros2 launch rtabmap\_examples euroc\_datasets.launch.py gt:=true

# $ cd V1\_01\_easy

# $ ros2 bag play V1\_01\_easy.db3 --clock

#

# $ ros2 launch rtabmap\_examples euroc\_datasets.launch.py gt:=false

# $ cd MH\_01\_easy

# $ ros2 bag play MH\_01\_easy.db3 --clock

sudo apt install python3-rosbag

sudo apt-get install ros-humble-image-proc

sudo apt-get install ros-humble-imu-complementary-filter

sudo apt install python3-pip

sudo apt update

sudo apt install ros-humble-rosbag2\*

二、rgbdslam\_datasets.launch.py 测试（没实现）

# Example to run rgbd datasets:

# [ROS1] Prepare ROS1 rosbag for conversion to ROS2

#wget http://vision.in.tum.de/rgbd/dataset/freiburg3/rgbd\_dataset\_freiburg3\_long\_office\_household.bag

# $ rosbag decompress rgbd\_dataset\_freiburg3\_long\_office\_household.bag

#wget https://raw.githubusercontent.com/srv/srv\_tools/kinetic/bag\_tools/scripts/change\_frame\_id.py

# Edit change\_frame\_id.py, remove/comment lines beginning with "PKG" and "import roslib", change line "Exception, e" to "Exception"

# $ roscore

#python3 change\_frame\_id.py -o rgbd\_dataset\_freiburg3\_long\_office\_household\_frameid\_fixed.bag -i rgbd\_dataset\_freiburg3\_long\_office\_household.bag -f openni\_rgb\_optical\_frame -t /camera/rgb/image\_color

# [ROS2]

# sudo pip install rosbags # See https://docs.openvins.com/dev-ros1-to-ros2.html

#rosbags-convert rgbd\_dataset\_freiburg3\_long\_office\_household\_frameid\_fixed.bag

# ros2 launch rtabmap\_examples rgbdslam\_datasets.launch.py

#cd rgbd\_dataset\_freiburg3\_long\_office\_household\_frameid\_fixed

#ros2 bag play rgbd\_dataset\_freiburg3\_long\_office\_household\_frameid\_fixed.db3 –clock

# 8、构建无人机

参考

[NovoG93/sjtu\_drone：ROS/ROS 2 gazebo四轴飞行器模拟器。 (github.com)](https://github.com/NovoG93/sjtu_drone)

**要求**

此软件包已使用 ROS 2 Humble 版本 （Ubuntu 22.04） 和 Gazebo 11 进行了测试。

**下载和构建**

cd ~/git && git clone git@github.com:NovoG93/sjtu\_drone.git -b ros2

**(下不下来就win下下来再复制过去)**

cd ~/test1/src && ln -s ~/git/sjtu\_drone

cd .. && rosdep install -r -y --from-paths src --ignore-src --rosdistro $ROS\_DISTRO && colcon build --packages-select-regex sjtu\*

**启动**

**ROS 2 Source Installation**

1. Start gazebo, spawn drone, open teleop in xterm window, and open rviz:  
   ros2 launch sjtu\_drone\_bringup sjtu\_drone\_bringup.launch.py
2. Takeoff:  
   ros2 topic pub /drone/takeoff std\_msgs/msg/Empty {} --once
3. Move drone: (use teleop window)
4. Land:  
   ros2 topic pub /drone/land std\_msgs/msg/Empty {} --once

使用gazebo仿真时遇到的问题

**仿真时严重卡顿问题:**

尝试下打开gazebo在Camera栏中先选择Orthographic，此时会发现拖拉栅格十分丝滑，仿真也变得丝滑了很多，再根据需要考虑是否需要再切换回Perspective。