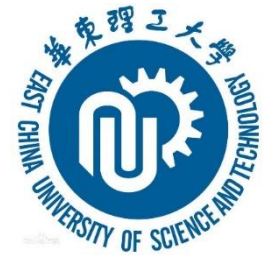


【ROS机械臂入门教程】

第9讲 视觉避障

小五

日期 2023/2/12



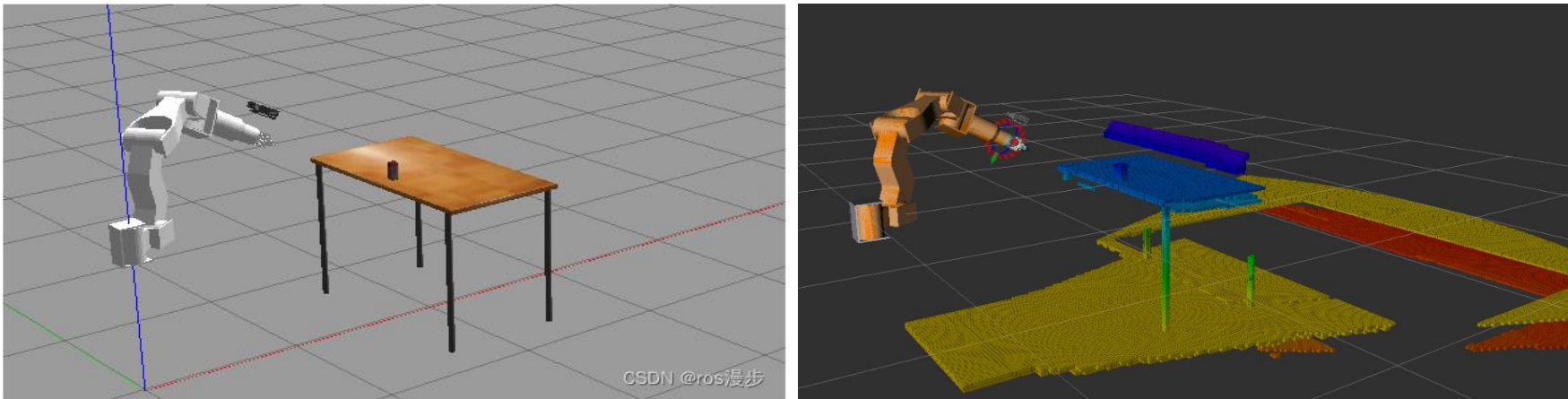
目录

「1」 引入

「2」 官方demo

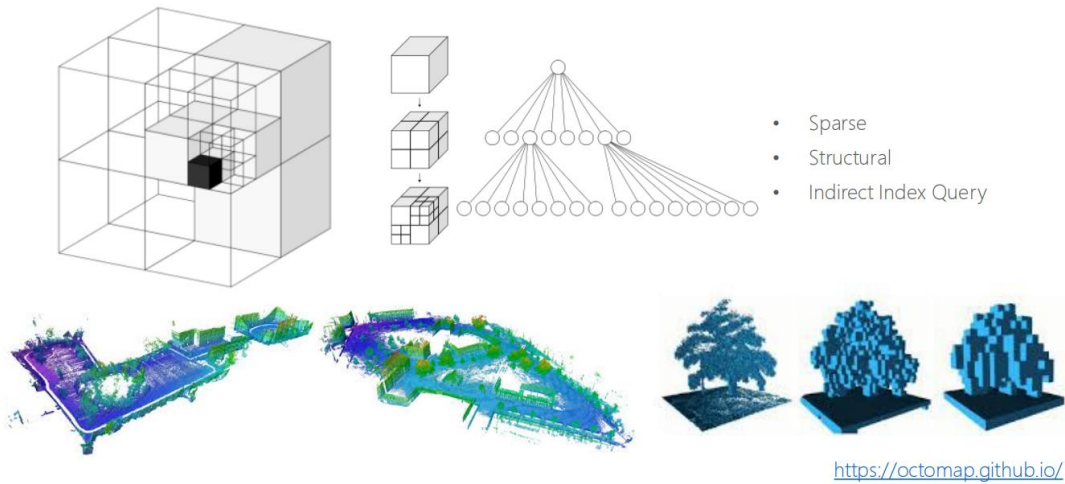
「3」 实战

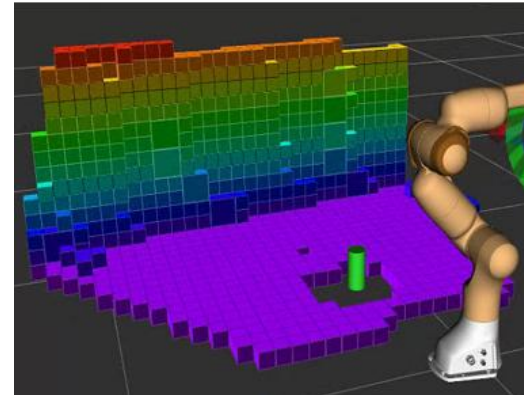
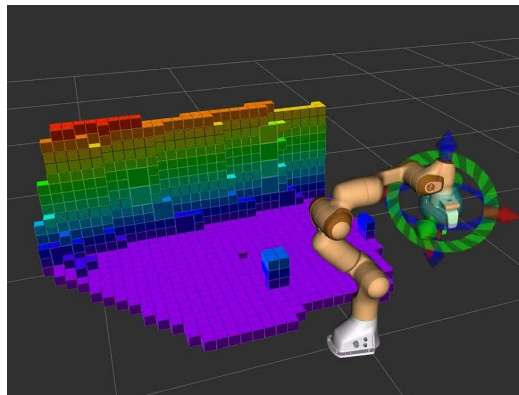
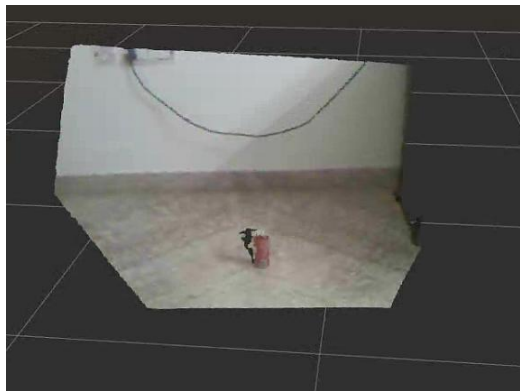
■ 动态识别障碍物



■ 八叉树地图

 Octo-map





- 只需要有一个点云/深度图输入，即可由此生成栅格图；

\$ **roslaunch moveit_tutorials obstacle_avoidance_demo.launch**

- 由栅格图又可生成圆柱体障碍物

\$ **roslaunch moveit_tutorials detect_and_add_cylinder_collision_object_demo.launch**

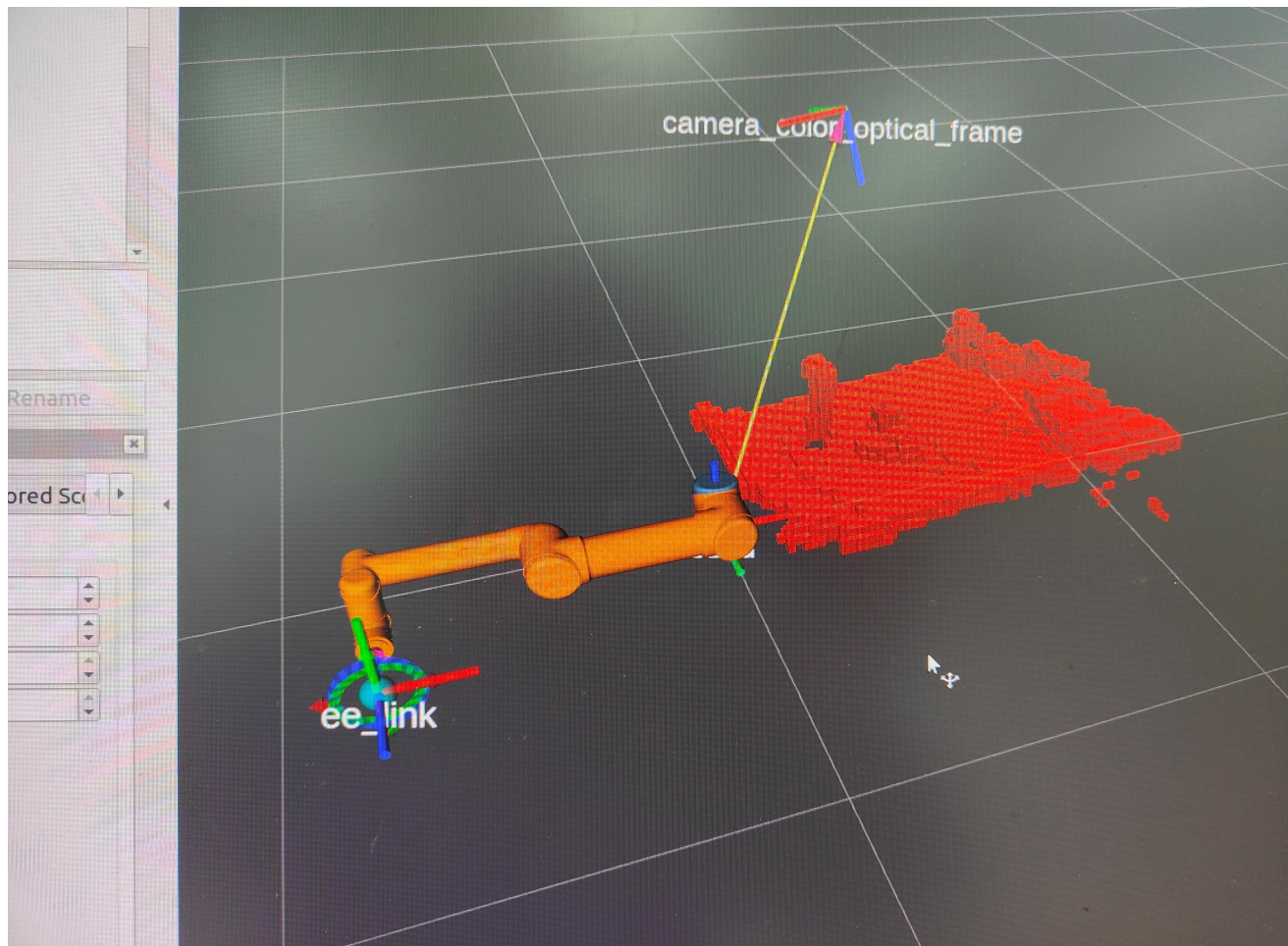
(注：运行此语句时，需要关闭**上一条**命令)

功能包：

https://github.com/ros-planning/moveit_tutorials

https://github.com/ros-planning/panda_moveit_config

■ 应用到自己平台



```
$ roslaunch ur5_moveit_config demo_with_obstacle_avoidance.launch
```


■ 主要步骤

➤ 1.启动相机ros程序

```
$ sudo apt-get install ros-melodic-realsense2-camera  
$ sudo apt-get install ros-melodic-realsense2-description  
$ roslaunch realsense2_camera demo_pointcloud.launch
```

➤ 2.修改moveit配置文件

- (1)修改xxx_moveit_config/config/sensors_kinect_pointcloud.yaml的point_cloud_topic为自己相机点云发布的话题
- (2)或者修改xxx_moveit_config/config/sensors_kinect_depthmap.yaml的image_topic为自己相机深度图发布的话题

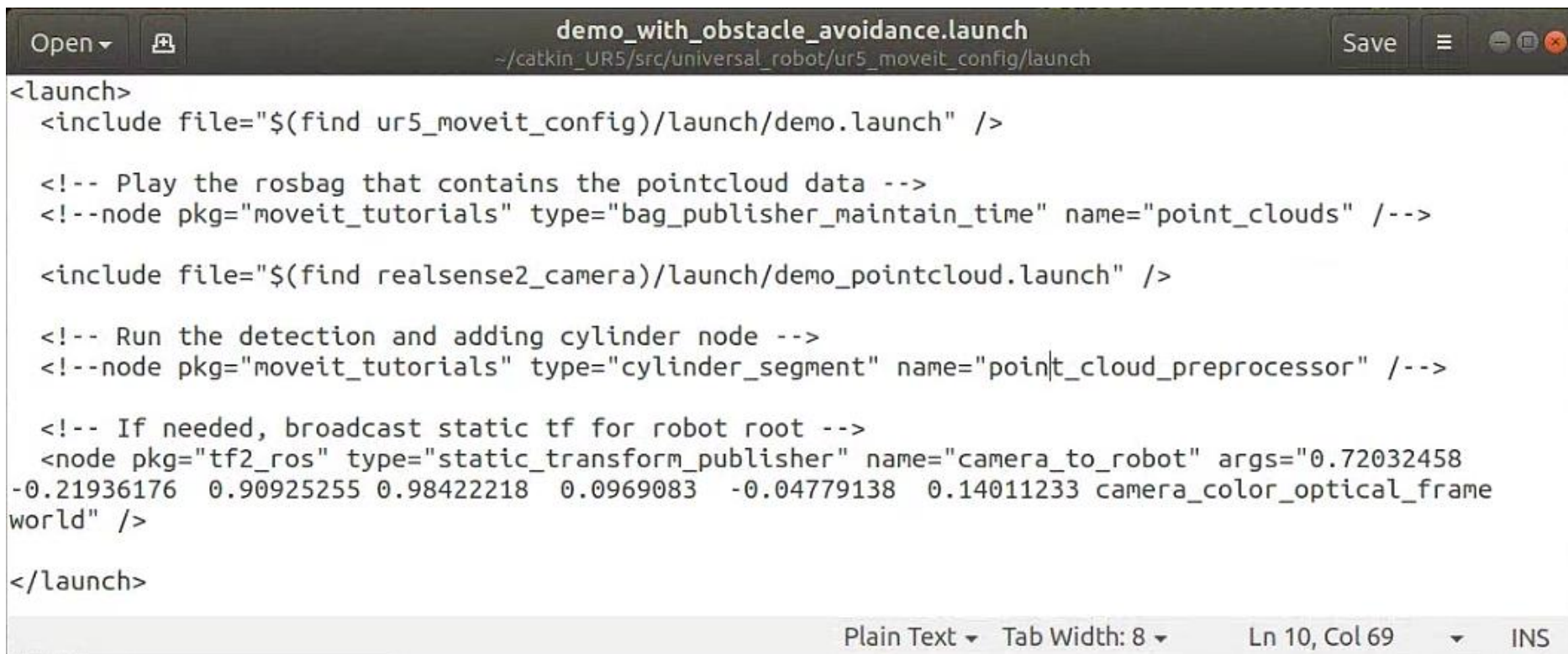
➤ 3 (可选) 修改视觉避障参数，如栅格分辨率octomap_resolution等

➤ 4 (可选) 修改相机参数，如分辨率、更新频率等

➤ 5.发布相机相对于机械臂基坐标的位姿

```
<node pkg="tf2_ros" type="static_transform_publisher"  
name="camera_to_robot" args="0.72032458 -0.21936176 0.90925255  
0.98422218 0.0969083 -0.04779138 0.14011233 camera_color_optical_frame  
world" />
```

■ 主要步骤



```
demo_with_obstacle_avoidance.launch
~/catkin_ur5/src/universal_robot/ur5_moveit_config/launch

<launch>
  <include file="$(find ur5_moveit_config)/launch/demo.launch" />

  <!-- Play the rosbag that contains the pointcloud data -->
  <!--node pkg="moveit_tutorials" type="bag_publisher_maintain_time" name="point_clouds" /-->

  <include file="$(find realsense2_camera)/launch/demo_pointcloud.launch" />

  <!-- Run the detection and adding cylinder node -->
  <!--node pkg="moveit_tutorials" type="cylinder_segment" name="point_cloud_preprocessor" /-->

  <!-- If needed, broadcast static tf for robot root -->
  <node pkg="tf2_ros" type="static_transform_publisher" name="camera_to_robot" args="0.72032458
-0.21936176 0.90925255 0.98422218 0.0969083 -0.04779138 0.14011233 camera_color_optical_frame
world" />
</launch>
```

\$ roslaunch ur5_moveit_config demo_with_obstacle_avoidance.launch

■ 主要步骤

sensors_kinect_pointcloud.yaml

~/catkin_UR5/src/universal_robot/ur5_moveit_config/config

Save

sensors:

-

sensor_plugin: occupancy_map_monitor/PointCloudOctomapUpdater

point_cloud_topic: /camera/depth/color/points

max_range: 1.3

point_subsample: 2

padding_offset: 0.1

padding_scale: 1.0

max_update_rate: 0.2

filtered_cloud_topic: filtered_cloud

ns: kinect

YAML

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INS

ur5_moveit_sensor_manager.launch.xml

~/catkin_UR5/src/universal_robot/ur5_moveit_config/launch

Save

<launch>

<!--//这个参数是octomap所在坐标系,可以自己指定-->

<param name="octomap_frame" type="string" value="odom_combined" /

>

<!--//octomap的分辨率,越小分辨率越高,越消耗系统资源.-->

<param name="octomap_resolution" type="double" value="0.02" /

>

<param name="max_range" type="double" value="5.0" />

<!--//将yaml文件里的参数传到ros参数服务器-->

<rosparam command="load" file="\$(find ur5_moveit_config)/config/

sensors_kinect_pointcloud.yaml" />

</launch>

XML

Tab Width: 8

Ln 5, Col 72

INS

*sensor_manager.launch.xml

~/catkin_UR5/src/universal_robot/ur5_moveit_config/launch

Save

<launch>

<arg name="moveit_sensor_manager" default="ur5" />

<include file="\$(find ur5_moveit_config)/launch/\$(arg

moveit_sensor_manager)_moveit_sensor_manager.launch.xml" />

</launch>

XML

Tab Width: 8

Ln 1, Col 9

INS

参考https://blog.csdn.net/ssw_1990/article/details/104053041

6

教程视频会持续更新

敬请期待！