1.frontier_exploration

使用`frontier_exploration`可以实现指定区域自动探索建图

2.安装

`sudo apt-get install ros-kinectic-frontier-exploration`完成安装

> 其他ros版本请安装对应的包，也可以使用`pibot_install_ros.sh`脚本可以一键完成安装

3.启动frontier_exploration

`roslaunch pibot_navigation frontier_exploration.launch`

```
<launch>
  <arg name="model" default="$(env PIBOT_MODEL)" doc="model type [apollo, zeus, hades, hera]"/>
  <include file="$(find pibot_bringup)/launch/robot_with_imu.launch"/>

  <param name="use_sim_time" value="false" />

  <include file="$(find pibot_navigation)/launch/include/move_base.launch.xml" />

  <include file="$(find pibot_navigation)/launch/include/gmapping.launch.xml" />
  <include file="$(find pibot_navigation)/launch/include/amcl.launch.xml" />

  <node pkg="frontier_exploration" type="explore_client" name="explore_client" output="screen"/>
  <node pkg="frontier_exploration" type="explore_server" name="explore_server" output="screen" >
    <param name="frequency" type="double" value="1.0"/>
    <param name="goal_aliasing" type="double" value="8"/>
    <rosparam file="$(find pibot_navigation)/params/costmap_common_params_$(arg model).yaml" command="load" ns="explore_costmap" />
    <rosparam file="$(find pibot_navigation)/config/frontier_exploration.yaml" command="load" ns="explore_costmap" />
  </node>
</launch>
```
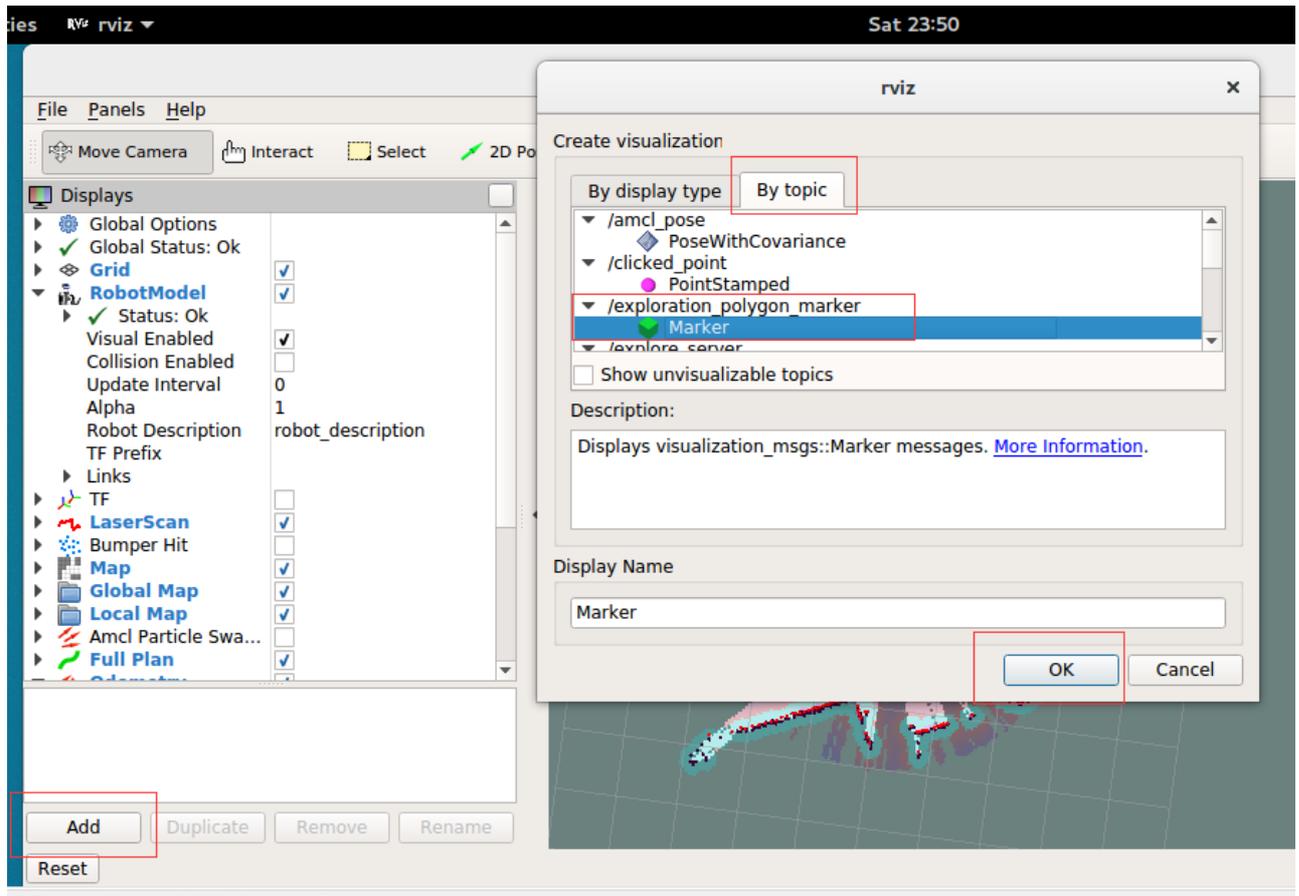
可以看到`frontier_exploration.launch`包含其他文件，其中有个`gmapping`,这里`frontier_exploration`只是一个探索算法，真正SLAM算法用的是`gmmapping`
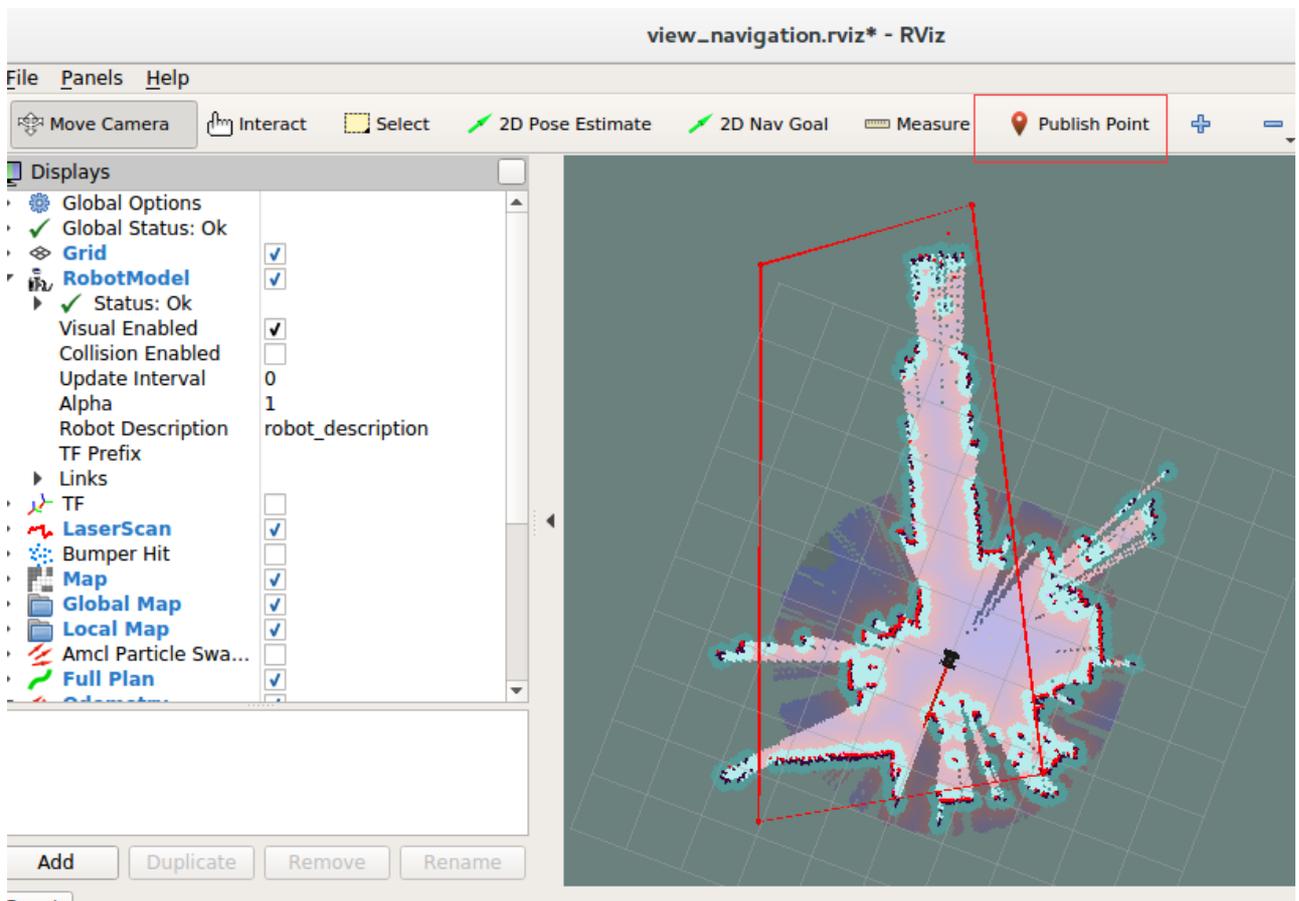
4.选择区域

`roslaunch pibot_navigation view_nav.launch`

- 添加topic的监控

- 选择区域

选择publish point,在地图选择若干点构成一个封闭的多边形

- 启动探索 选择publish point，在上面多边形内随机选择一点点击即可开始探索

- 启动探索 选择publish point，在上面多边形内随机选择一点点击即可开始探索