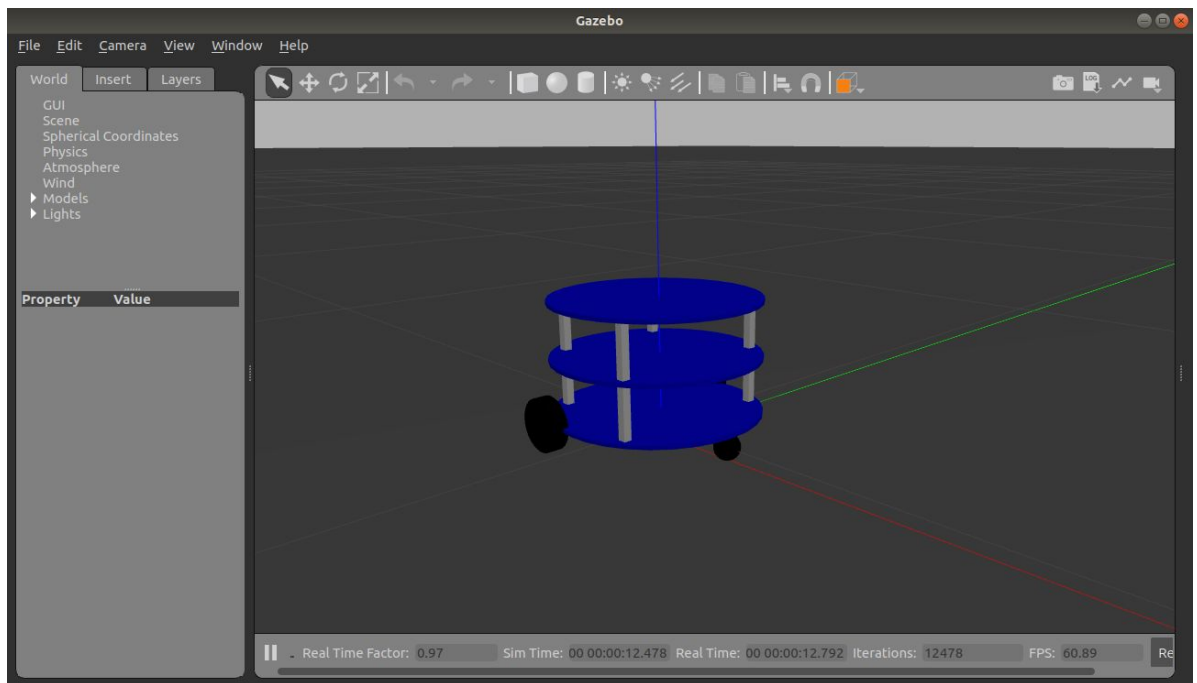


JasonLLLL-第六章作业

1. 将URDF模型文件，改写为.xacro文件，加载到gazebo中，完成速度控制

- 1.1. 进入 catkin_ws/src/ 中，创建二个新的功能包(本次作业需求)
 - 1.1.1. catkin_create_pkg mbot_gazebo gazebo_plugins gazebo_ros gazebo_roscontrol roscpp rospy
 - 1.1.2. catkin_create_pkg mbot_teleop geometry_msgs urdf xacro rospy roscpp
 - 1.1.3. **注意功能包名字**：最好按照标准起名规则，之前为了区别课件标准代码，我将所有的功能包名字后都加了_Jason(例如：mbot_description_Jason)，总是各种报错，切记切记！！！！
- 1.2. 进入mbot_gazebo 创建urdf文件夹，改写.urdf主体
 - 1.2.1. 代码文件见：mrobot_body.urdf.xacro
 - 1.2.2. pwd: /catkin_ws/src/mbot_gazebo/urdf
 - 1.2.3. 注：这里并没有完全按照第五章提交的urdf更改，而是参考了胡春旭老师的《ROS机器人开发与实践》里的代码，原因如下：
之前的模型，添加了collision和惯性矩阵后，总是前仰后俯或者前俯后仰，改来该去都不行，十分头疼
- 1.3. 在同一文件夹下，创建mrobot.urdf.xacro模型文件，用来作gazebo的文件调用
 - 1.3.1. 代码文件见：mrobot.urdf.xacro
 - 1.3.2. pwd: /catkin_ws/src/mbot_gazebo/urdf
- 1.4. 进入mbot_gazebo目录下，创建launch文件夹
- 1.5. 在launch文件夹下，创建view_mrobot_gazebo.launch文件，用来将创建好的移动机器人文件，显示在gazebo中
 - 1.5.1. 代码文件见：view_mrobot_gazebo.launch
 - 1.5.2. pwd: catkin_ws/src/mbot_gazebo/launch
- 1.6. 返回catkin_ws工作空间，编译 catkin_make
- 1.7. 运行roslaunch mbot_gazebo view_mrobot_gazebo.launch显示机器人

结果如图



1.8. rostopic list 显示话题列表，发布速度控制指令，作圆周运动

1.8.1. rostopic pub /cmd_vel geometry_msgs/Twist "linear:

x: 0.5

y: 0.0

z: 0.0

angular:

x: 0.0

y: 0.0

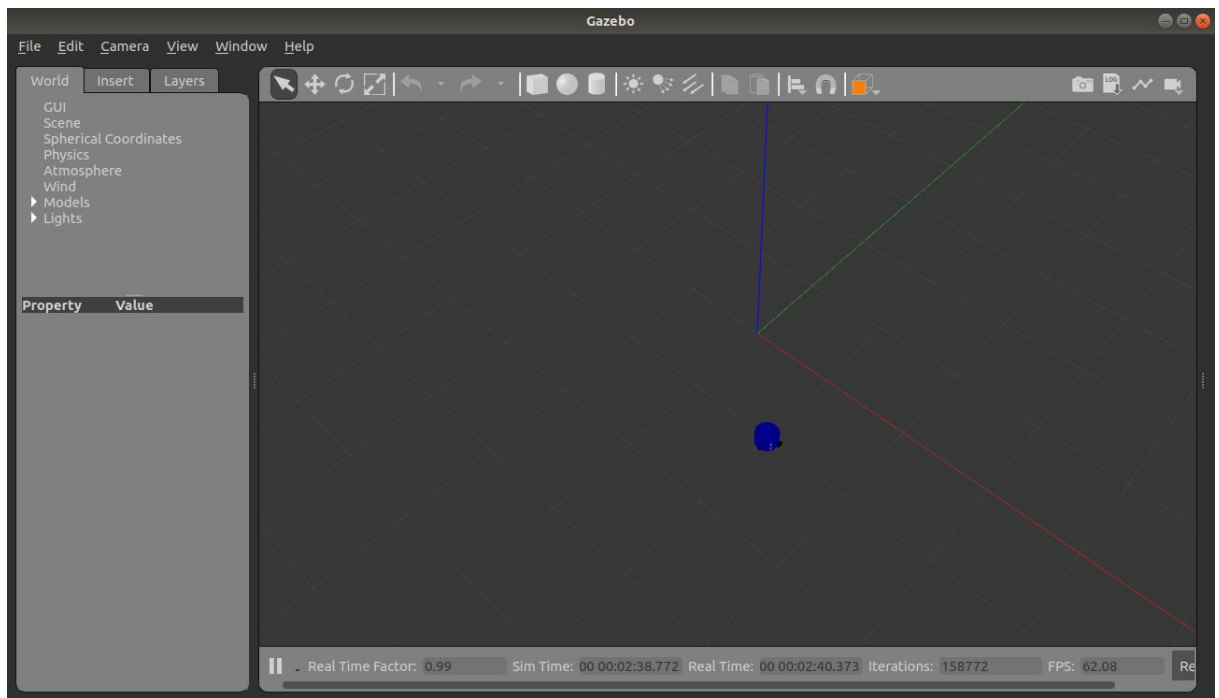
z: 0.5"

1.9. 结果如图

```
jingsheng@jslyuUB18: ~/ROS_Learning/catkin_ws
/home/jingsheng/ROS_Learning/catkin_ws/src/mbot_gazebo/launch/view_mbot_gazebo_empty_world.launch http
ive(ns = //): Try to subscribe to cmd_vel
[ INFO ] [1586168813.611965164, 0.2070000000]: DiffDr
ive(ns = //): Subscribe to cmd_vel
[ INFO ] [1586168813.612366881, 0.2070000000]: DiffDr
ive(ns = //): Advertise odom on odom
[urdf_spawner-6] process has finished cleanly
log file: /home/jingsheng/.ros/log/211d3dac-77f1-11
ea-9af1-283a4d5fae9d/urdf_spawner-6*.log

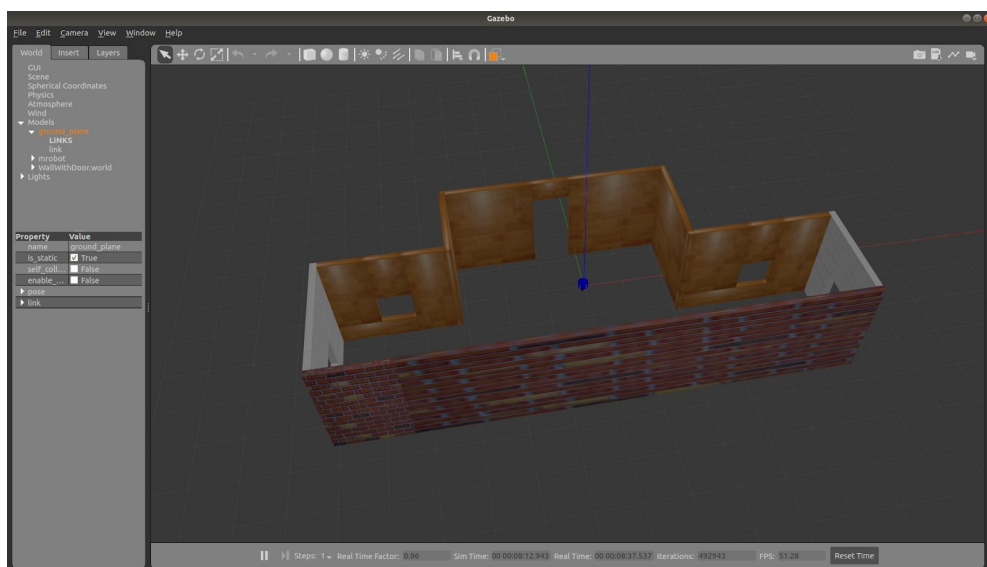
jingsheng@jslyuUB18: ~/ROS_Learning
/catkin_ws$ rostopic list
/clock
/cmd_vel
/gazebo/link_states
/gazebo/model_states
/gazebo/parameter_descriptions
/gazebo/parameter_updates
/gazebo/set_link_state
/gazebo/set_model_state
/joint_states
/odom
/roscout

jingsheng@jslyuUB18: ~/ROS_Learning
geometry_msgs/Twist "linear: gning
x: 0.5_msgs/Twist "linear: gx x
y: 0.0
z: 0.0
angular:
x: 0.0
y: 0.0
z: 0.5"
publishing and latching message. P
ress ctrl-C to terminate
```



2. 在模型上添加摄像头和激光雷达，完成传感器仿真，并在rviz中显示

- 2.1. 创建新的world文件，运行roslaunch mbot_gazebo view_mbot_gazebo_empty_world.launch来启动gazebo
- 2.2. 在Building Editor中完成虚拟墙壁的建立，并保存成room.world
 - 2.2.1. 文件为：/catkin_ws/src/mbot_gazebo/worlds/中的room.world文件
 - 2.2.2. 结果如图



- 2.2.3. 注意：应该在空的gazebo里面创作地图，否则会一直报错。(因为如果在带有机人模型的文件里面创建地图，那么机器人模型将会重复。)

```
[INFO] [1586587547.705091900]: DiffDrive(ns = ///): Advertise joint_states
[INFO] [1586587547.705562313]: DiffDrive(ns = ///): Try to subscribe to cmd_vel
[INFO] [1586587547.707286749]: DiffDrive(ns = ///): Subscribe to cmd_vel
[INFO] [1586587547.707917798]: DiffDrive(ns = ///): Advertise odom on odom
[INFO] [1586587547.731468401, 65.9690000000]: waitForService: Service [/gazebo/set_physics_properties] is now available.
[INFO] [1586587547.75739519, 65.9930000000]: Physics dynamic reconfigure ready.
[INFO] [1586587547.951483, 66.1820000]: Calling service /gazebo/spawn_urdf_model
[ERROR] [1586587547.95334498, 66.1830000000]: SpawnModel's Failure - model name mrobot already exist.
[INFO] [1586587547.956684, 66.1880000]: Spawn status: SpawnModel: Failure - entity already exists.
[ERROR] [1586587547.957741, 66.1890000]: Spawn service failed, Exiting.
[urdf_spawner-5] process has died [pid 31551, exit code 1, cmd /opt/ros/melodic/lib/gazebo_ros/spawn_model -urdf -model mrobot -param robot_description __name:=urdf_spawner __log:=/home/jingsheng/.ros/log/0a9ede8c-7bc0-11ea-9af1-283a4d5fae9d/urdf_spawner-5.log].
log file: /home/jingsheng/.ros/log/0a9ede8c-7bc0-11ea-9af1-283a4d5fae9d/urdf_spawner-5.log
```

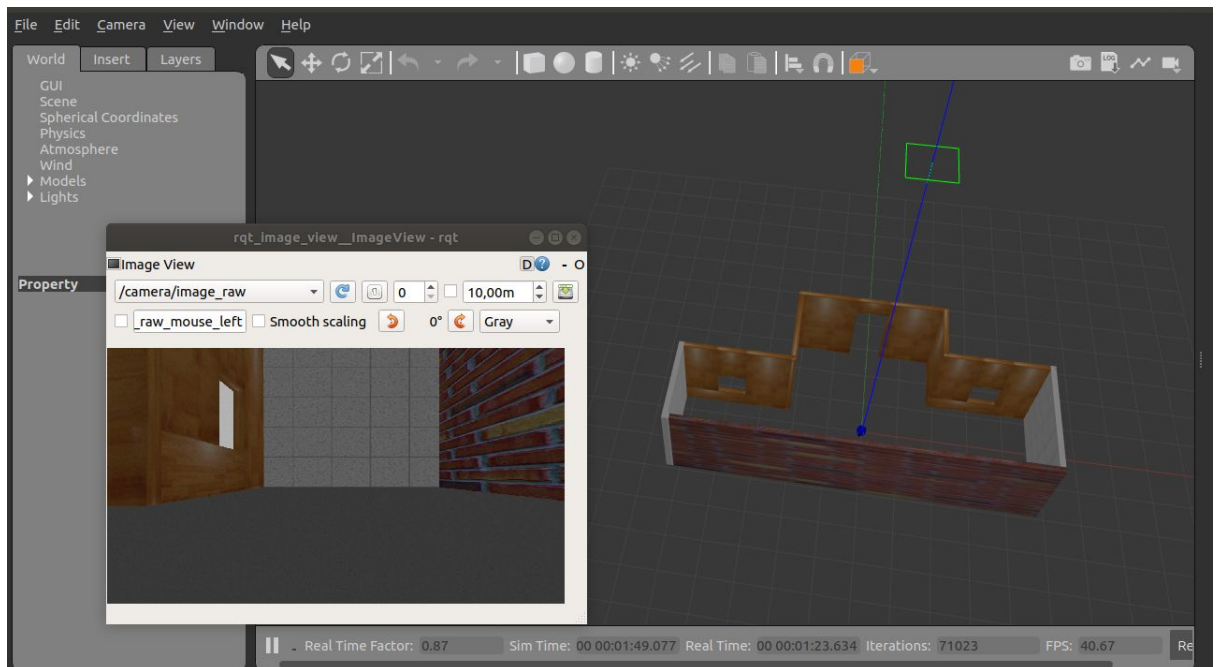
2.2.4.

2.3. 运行roslaunch

2.3.1. roslaunch mbot_gazebo view_mrobot_with_camera_gazebo.launch

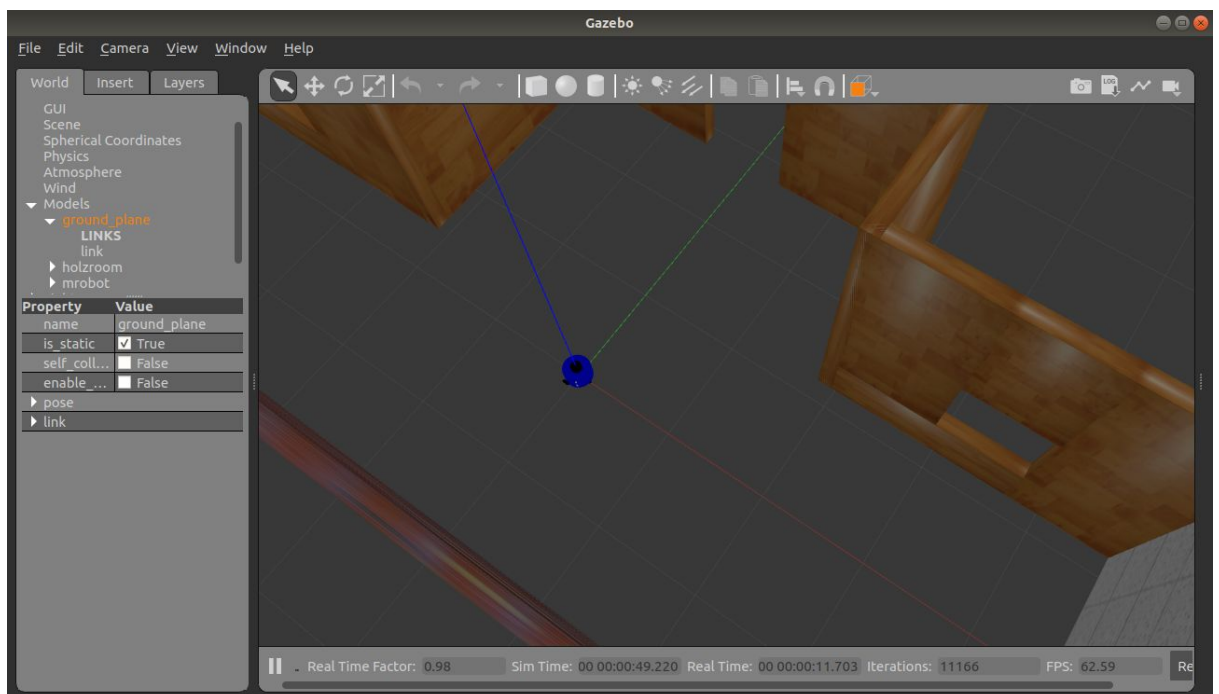
2.3.2. 运行rqt_image_view

2.3.3. 结果如图



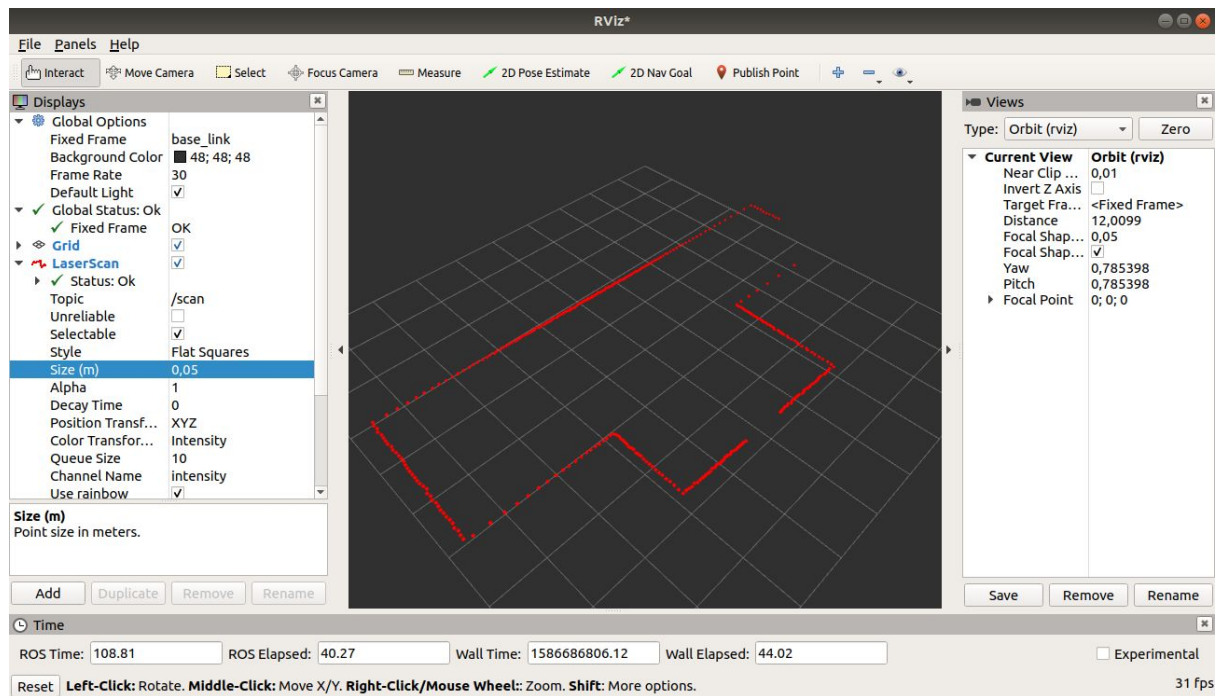
2.3.4. roslaunch mbot_gazebo view_mrobot_with_laser_gazebo.launch

2.3.5. 结果如图



2.3.6. 运行rviz, 添加laserscan

2.3.7. 结果如图



3. Reference

3.1. 胡春旭 《ROS机器人开发与实践》