EE478 HW2

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1 Problem 1

The followings are the pictures used for world generation:

Figure 1: House Plan

Figure 2: Neighborhood

The following is the picture of the world in gazebo:

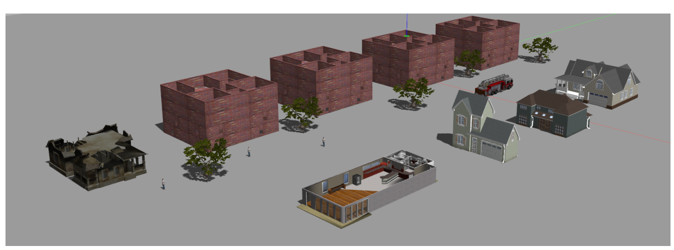

Figure 3: Gazebo_world

2 Problem 2

Figure 4: Spawning the drone

I spawned the drone using a launch file. I created a launch file named problem_3_mavros_posix_sitl.launch. Inside that file, I am calling the mavros_posix_sitl.launch with modified arg values so that instead of loading the iris model, the iris_fpv_cam model would be loaded and instead of empty.world, neighborhood.world would be loaded. The following is the visual from the drone's camera

Figure 5: drone_capture

3 Problem 3

The launch file for this problem is located at the EE478/src/drone_teleop_controller/launch/ and the name of the file is problem_3_mavros_posix_sitl.launch file. This file is spawning the drone in the neighborhood.world and launches gazebo, mavros. Then in other 2 terminals, I run the teleop_twist_keyboard package and teleop_node.py file.

4 Proiblem 4

Here, I am operating the drone without looking at the gazebo screen. I attached the video file seperately, so, here I will only present the rqt_graph:

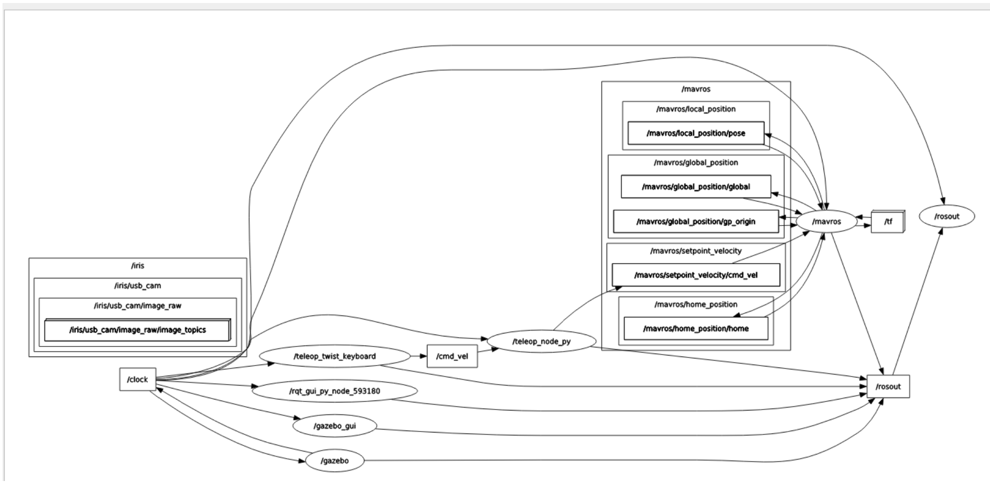

Figure 6: rqt_graph

Normally, there are extremely abundant number of topics, that is why I only took the picture of active topics.

5 Problem 5

For Problem 5, I am using iris_rplidar.sdf model. I am using problem_5_mavros_posix_sitl.launch file for 5th problem. Then I am using Rviz to visualize the lidar data. However, to be able to do this, I am using static_transform_publisher to create a frame relation between base_link and rplidar_link frame. To determine the offset in location and the degree offset between the lidar and the base link frame. I am looking at the pose of the lidar at the start of the gazebo simulation.

Figure 7: static_transform

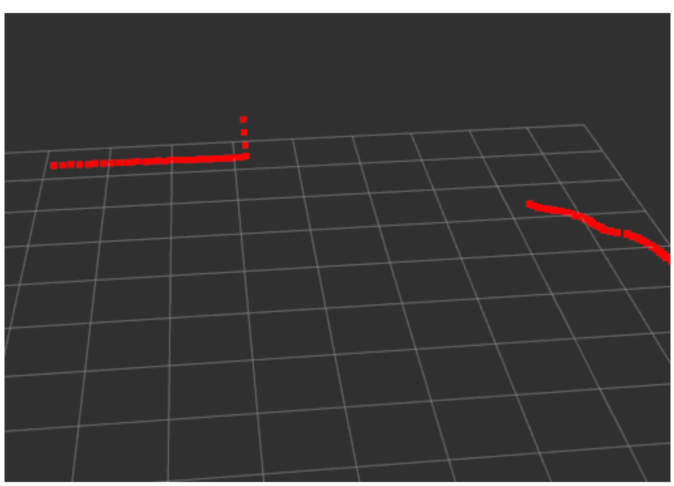

Figure 8: rviz lidar data

In the above picture, the red line in the upper left side is one of the buildings.

6 Problem 6

To visualize the flight path, I created a new node in file teleop_node_problem_6.py. This file is subscribing to the mavros/local_position/pose topic and creating a list of path poses and changing them ot the Path type of message and publishing that to the /path named topic. After this, we are able to visualize the drone's path in rviz:

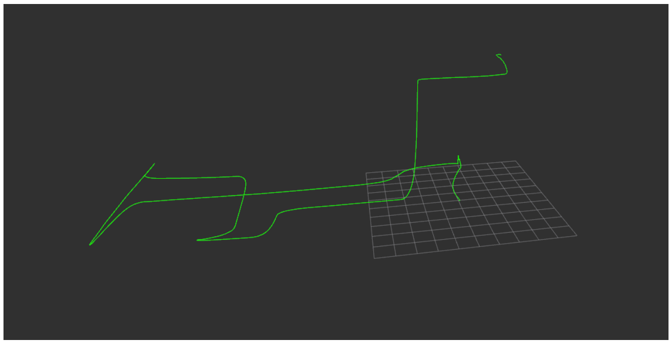

Figure 9: Path

7 Reference

[1] EE478 KAIST lecture notes