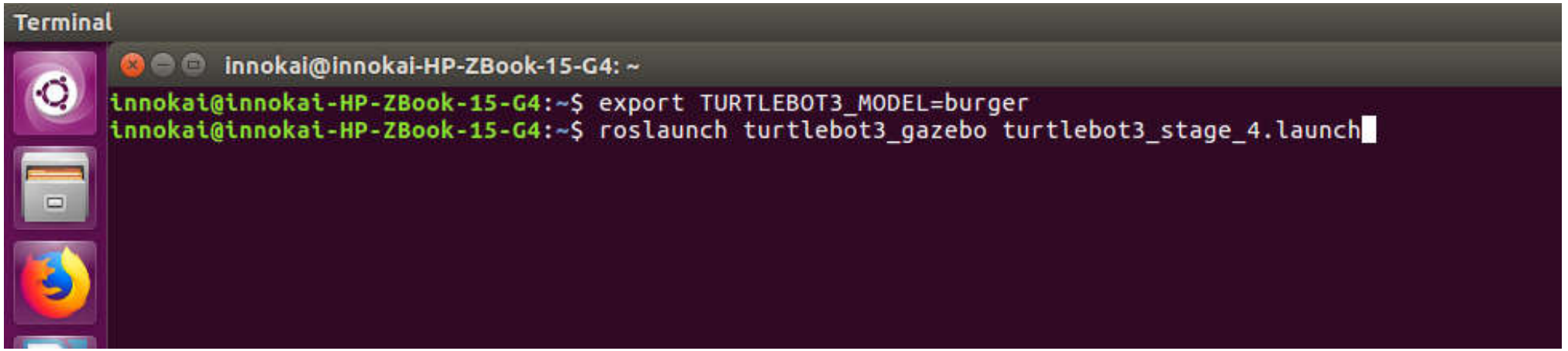
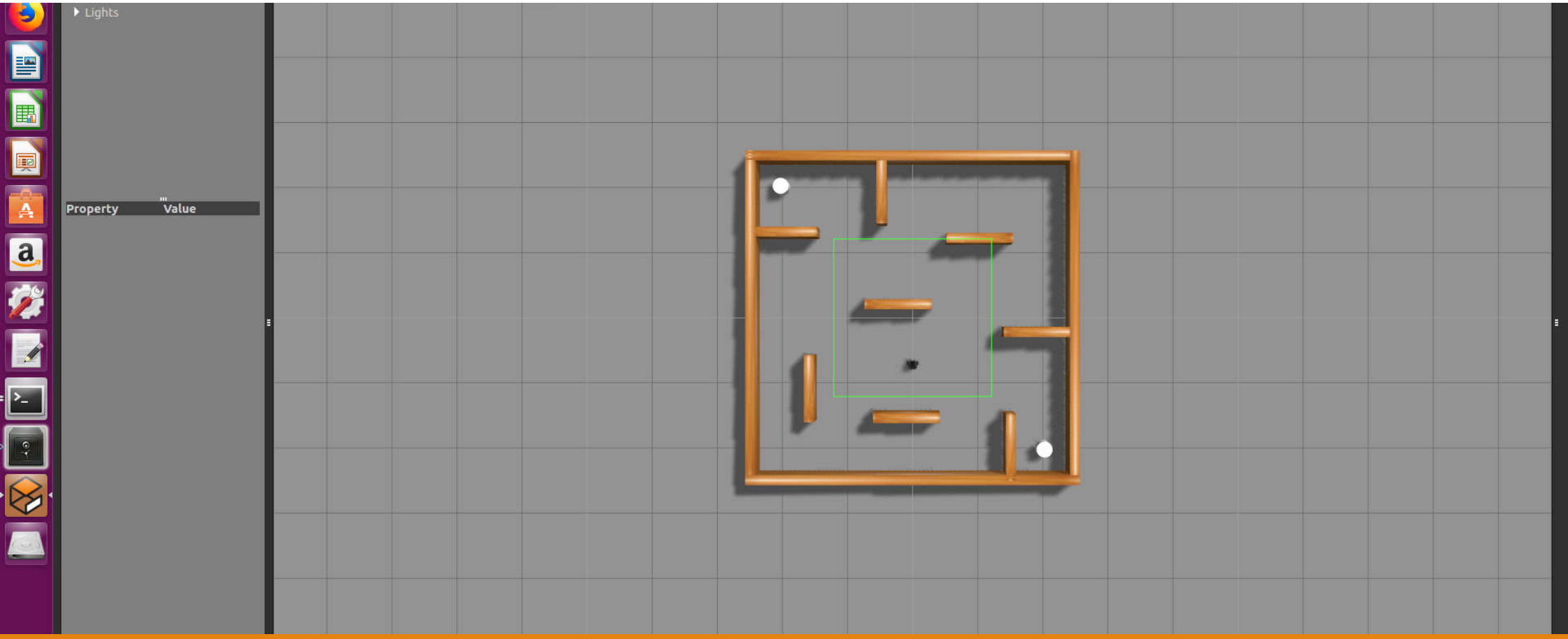
Mapping

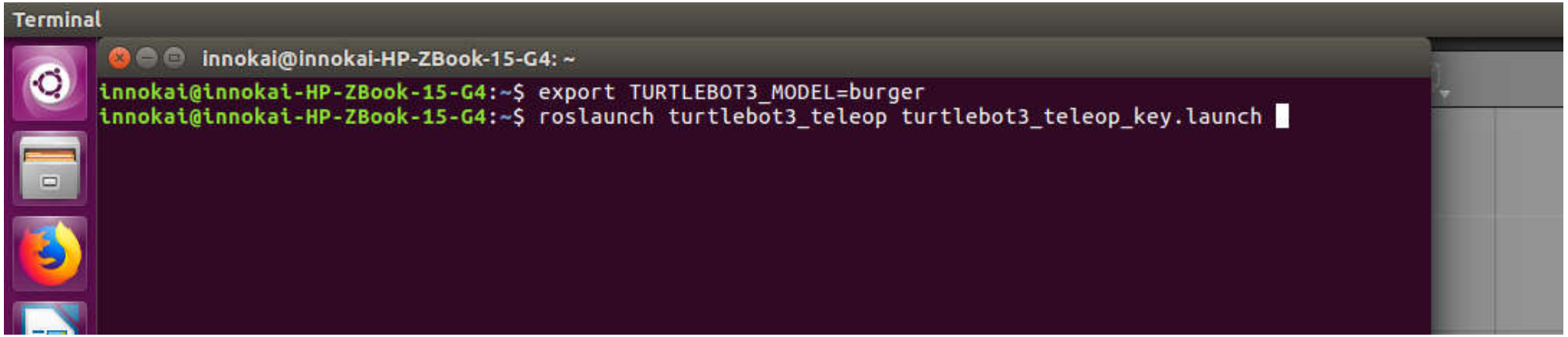
USING SLAM TO DO THE MAPPING



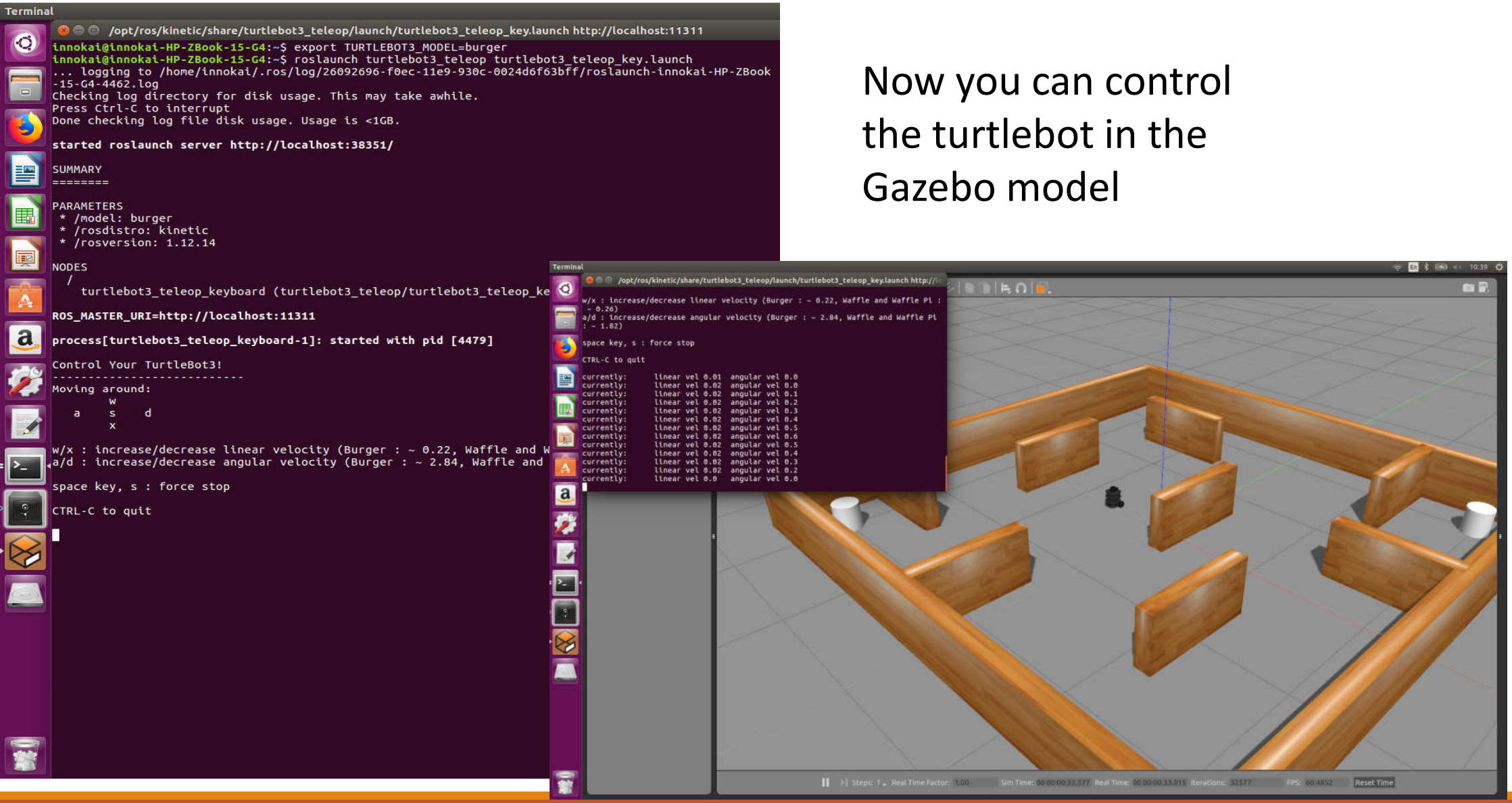
Try in simulation Gazebo



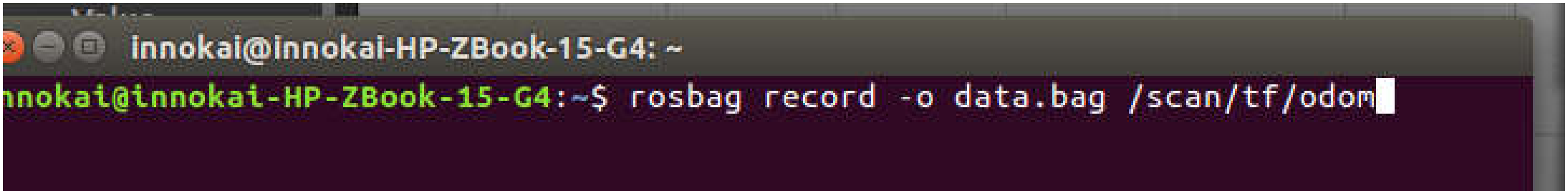
It will come out Gazebo model

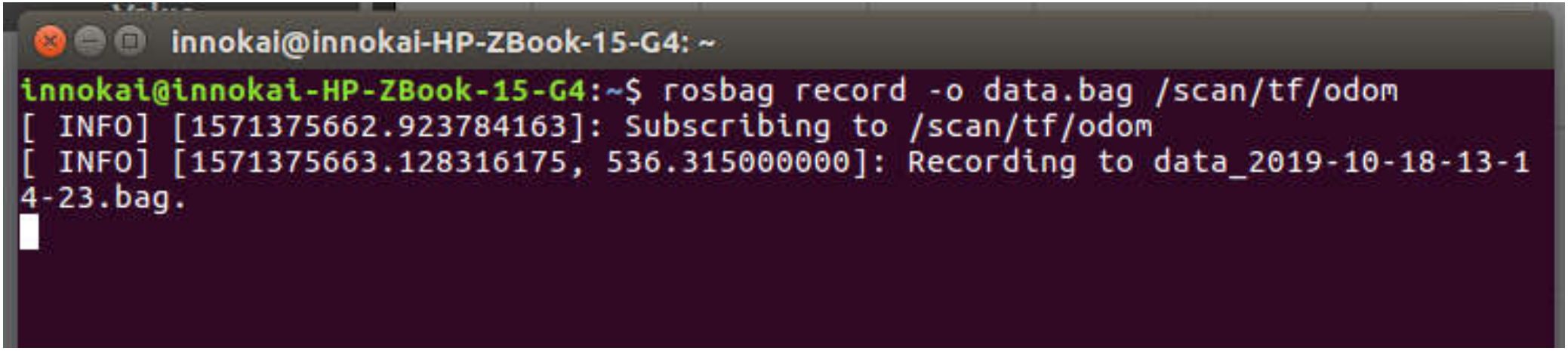


To control the turtlebot in the gazebo model, simply type:



Now you can control the turtlebot in the Gazebo model





Next, we start to scan the environment by using the radar sensor.

RUN AROUND!!!!

Check the map

-Once you are satisfied you have visited the whole space

-Click ^c to stop saving topics to the bag and close the file

-Inspect the file and see if it looks reasonable

```
innokai@innokai-HP-ZBook-15-G4:~$ rosbag info data_2019-10-18-13-14-23.bag
path:     data_2019-10-18-13-14-23.bag
version: 2.0
size:     4.0 KB
innokai@innokai-HP-ZBook-15-G4:~$
```

TUNE THE MAP

We can improve mapping quality by setting some of the gmapping parameters to different values:

$ rosparam set /slam_gmapping/angularUpdate 0.1

$ rosparam set /slam_gmapping/linearUpdate 0.1

$ rosparam set /slam_gmapping/lskip 10

$ rosparam set /slam_gmapping/xmax 10

$ rosparam set /slam_gmapping/xmin -10

$ rosparam set /slam_gmapping/ymax 10

$ rosparam set /slam_gmapping/ymin -10

RUN THE MAP

$ roscore

$ rosparam set use_sim_time true

$ roslaunch turtlebot3_slam turtlebot3_slam.launch slam_methods:=gmapping

$ rosbag play --clock data.bag

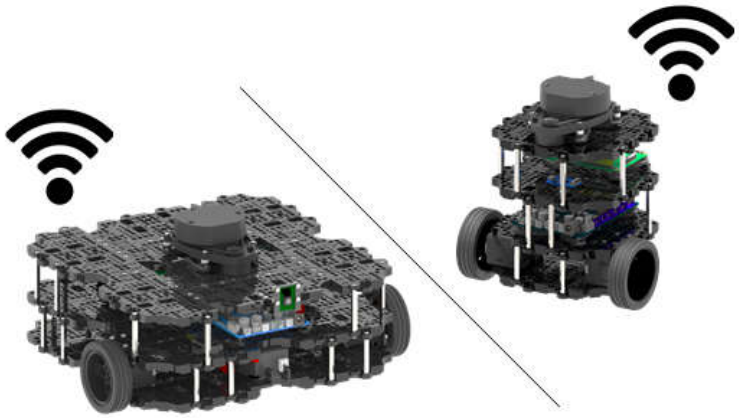
Try on the Turtlebot3

Change the Method

From the simulator to the real turtlebot3

Connect turtlebot3 via WIFI with remote PC

TurtleBot



ROS_MASTER_URI = http://IP_OF_REMOTE_PC:11311
ROS_HOSTNAME = IP_OF_TURTLEBOT

Remote PC

ROS_MASTER_URI = http://IP_OF_REMOTE_PC:11311
ROS_HOSTNAME = IP_OF_REMOTE_PC

* Example when ROS Master is running on the Remote PC

* Uniform Resource Identifier

>> ifconfig

```
zimbot@zimbot-Aspire-E5-576G:~$ ifconfig
enp4s0f1  Link encap:Ethernet  HWaddr a8:1e:84:be:4d:34
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:812 errors:0 dropped:0 overruns:0 frame:0
          TX packets:812 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:119138 (119.1 KB)  TX bytes:119138 (119.1 KB)

wlp3s0    Link encap:Ethernet  HWaddr a0:af:bd:a4:0a:01
          inet addr:10.10.229.189  Bcast:10.10.231.255  Mask:255.255.248.0
          inet6 addr: fe80::3043:daf2:c65:9465/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:13128 errors:0 dropped:0 overruns:0 frame:0
          TX packets:5229 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:14699170 (14.6 MB)  TX bytes:631867 (631.8 KB)
```

Navigation

Run Navigation Nodes

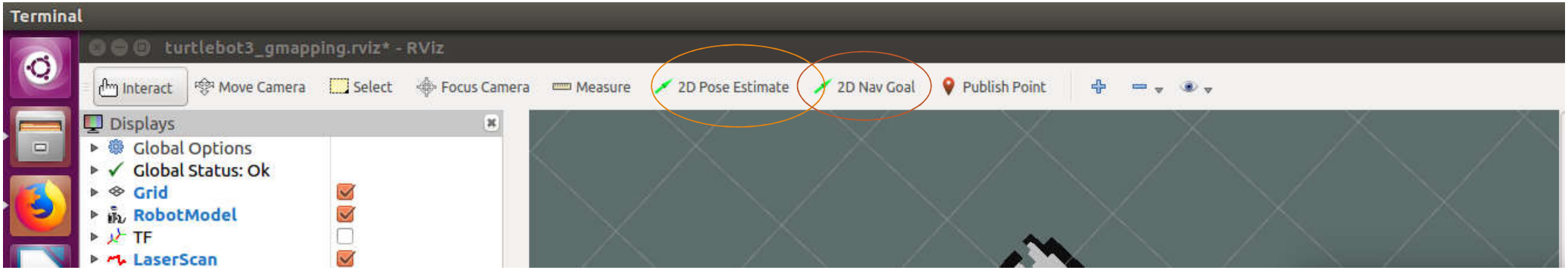
Set the model and bring up the simulation of the map
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_gazebo turtlebot3_stage_4.launch

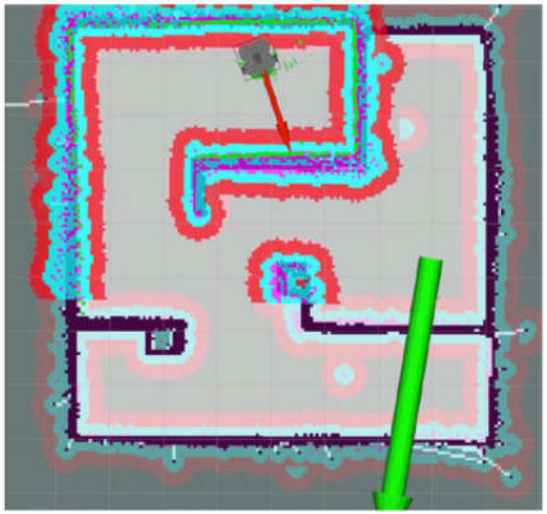
In new terminal
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_navigation turtlebot3_navigation.launch map_file:=$HOME/map.yaml

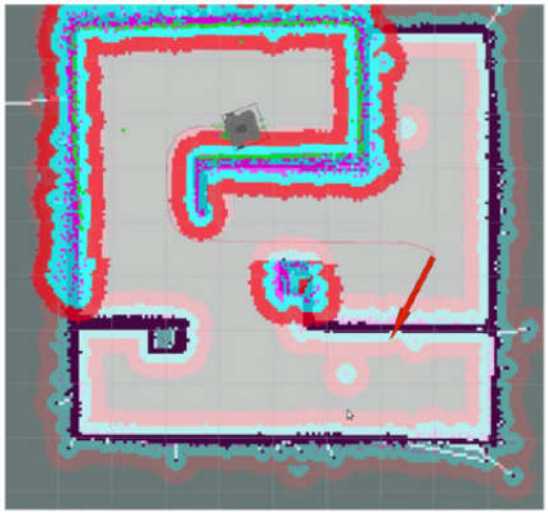
If you want to run RViz separately, use the following command.
$ rviz -d `rospack find turtlebot3_navigation`/rviz/turtlebot3_navigation.rviz

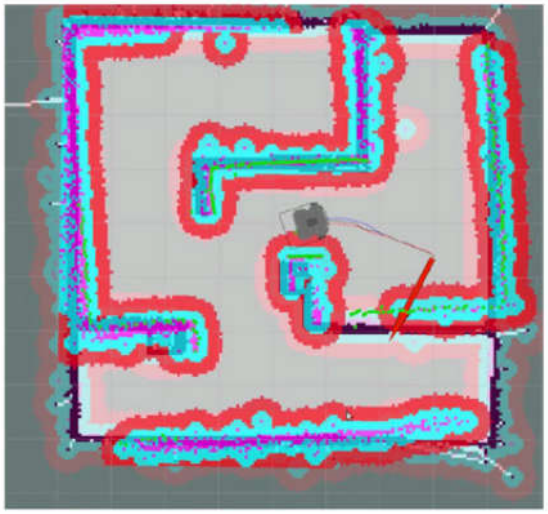
2D Pose Estimate
-Estimate Initial Pose

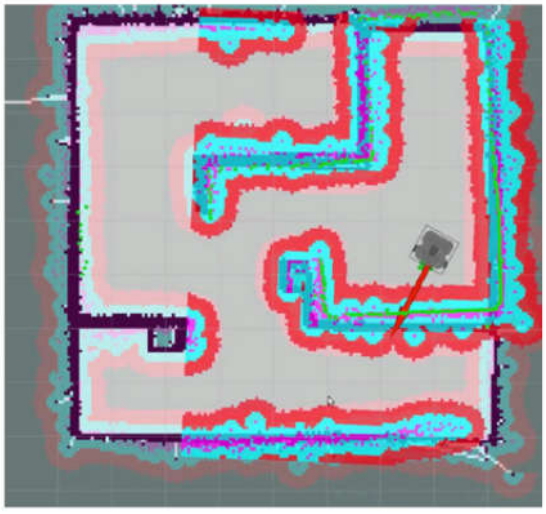
2D Nav Goal
Send Navigation Goal











Run Navigation Nodes

Run roscore.
$ roscore

Bring up basic packages to start TurtleBot3 applications.
$ roslaunch turtlebot3_bringup turtlebot3_robot.launch

export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_navigation turtlebot3_navigation.launch map_file:=$HOME/map.yaml

If you want to run RViz separately, use the following command.
$ rviz -d `rospack find turtlebot3_navigation`/rviz/turtlebot3_navigation.rviz