

## Steps of use turtlebot3 with SLAM approach to create and save a map

### Install turtlebot3 on ROS

Enter the below command to a terminal

#### 1. Enter this site

<https://emanual.robotis.com/docs/en/platform/turtlebot3/quick-start/>

#### 2. Download and install ros

#### 3. Install package ros

```
$ sudo apt-get install ros-kinetic-joy ros-kinetic-teleop-twist-joy \
ros-kinetic-teleop-twist-keyboard ros-kinetic-laser-proc \
ros-kinetic-rgbd-launch ros-kinetic-depthimage-to-laserscan \
ros-kinetic-rosserial-arduino ros-kinetic-rosserial-python \
ros-kinetic-rosserial-server ros-kinetic-rosserial-client \
ros-kinetic-rosserial-msgs ros-kinetic-amcl ros-kinetic-map-server \
ros-kinetic-move-base ros-kinetic-urdf ros-kinetic-xacro \
ros-kinetic-compressed-image-transport ros-kinetic-rqt* \
ros-kinetic-gmapping ros-kinetic-navigation ros-kinetic-
interactive-markers
```

#### 4. Install package turtlebot3

```
$ sudo apt-get install ros-kinetic-dynamixel-sdk
$ sudo apt-get install ros-kinetic-turtlebot3-msgs
$ sudo apt-get install ros-kinetic-turtlebot3
```

#### 5. Set TurtleBot3 Model Name

In case of TurtleBot3 Burger

```
$ echo "export TURTLEBOT3_MODEL=burger" >> ~/.bashrc
```

In case of TurtleBot3 Waffle Pi

```
$ echo "export TURTLEBOT3_MODEL=waffle_pi" >> ~/.bashrc
```

## Turtlebot3 Simulation

Enter this link

<https://emanual.robotis.com/docs/en/platform/turtlebot3/simulation/>

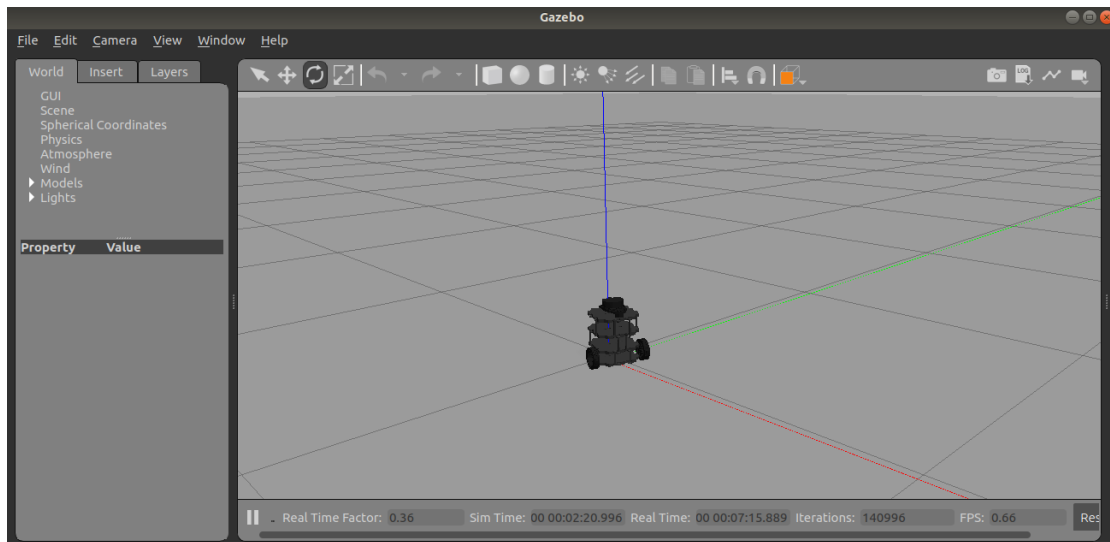
### Gazebo simulation

#### 1. Install simulation package

```
$ cd ~/catkin_ws/src/
$ git clone -b kinetic-devel https://github.com/ROBOTIS-
GIT/turtlebot3_simulations.git
$ cd ~/catkin_ws && catkin make
```

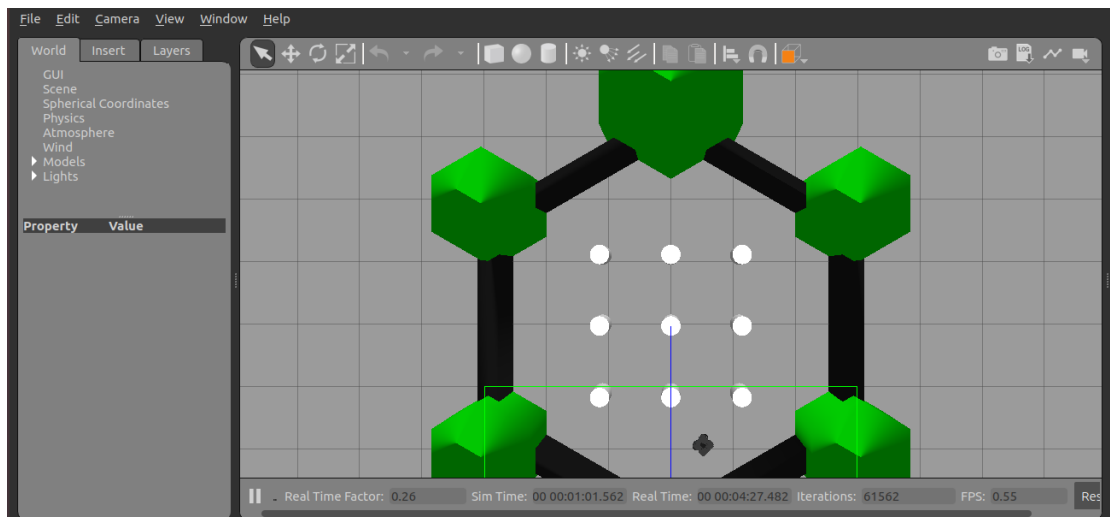
#### 2. Launch simulation world

##### a. Empty World



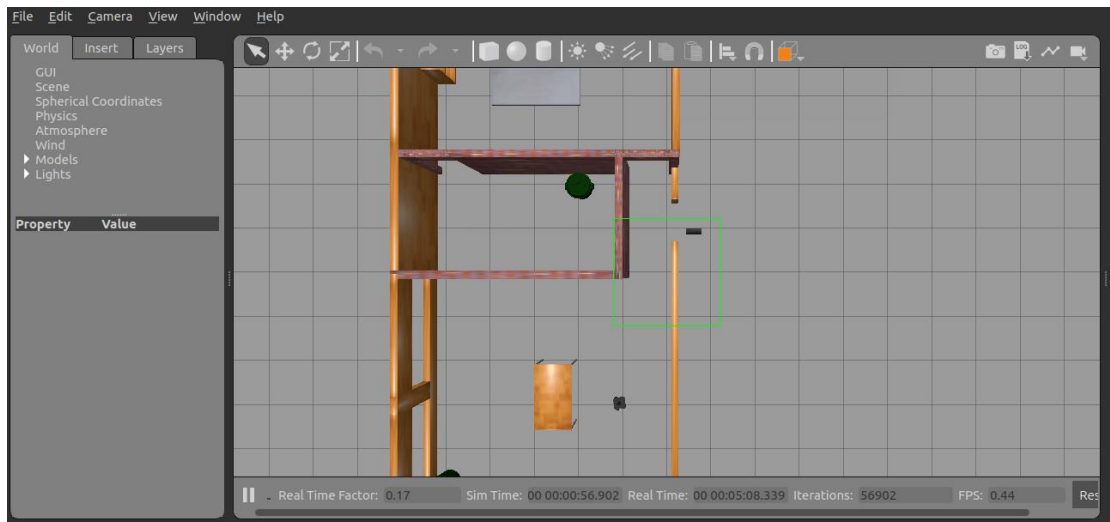
```
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_gazebo turtlebot3_empty_world.launch
```

## b. TurtleBot3 World



```
$ export TURTLEBOT3_MODEL=waffle
$ roslaunch turtlebot3_gazebo turtlebot3_world.launch
```

## c. TurtleBot3 House



```
$ export TURTLEBOT3_MODEL=waffle_pi
$ roslaunch turtlebot3_gazebo turtlebot3_house.launch
```

### 3. Operate TurtleBot3

```
$ roslaunch turtlebot3_teleop turtlebot3_teleop_key.launch
```

## SLAM Simulation

### 1. Launch Simulation World

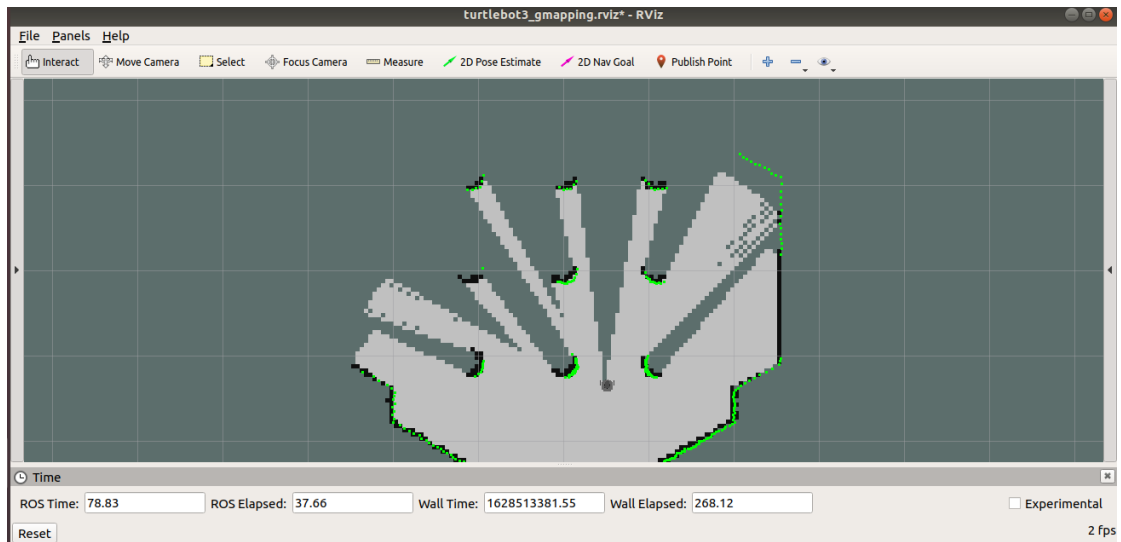
```
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_gazebo turtlebot3_world.launch
```

### 2. Run SLAM Node

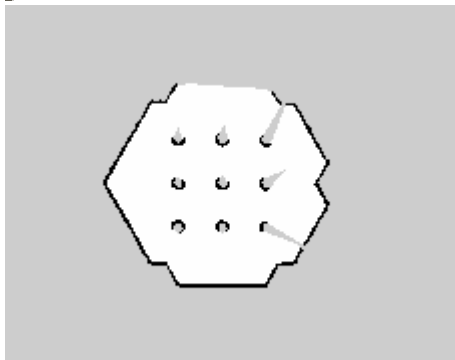
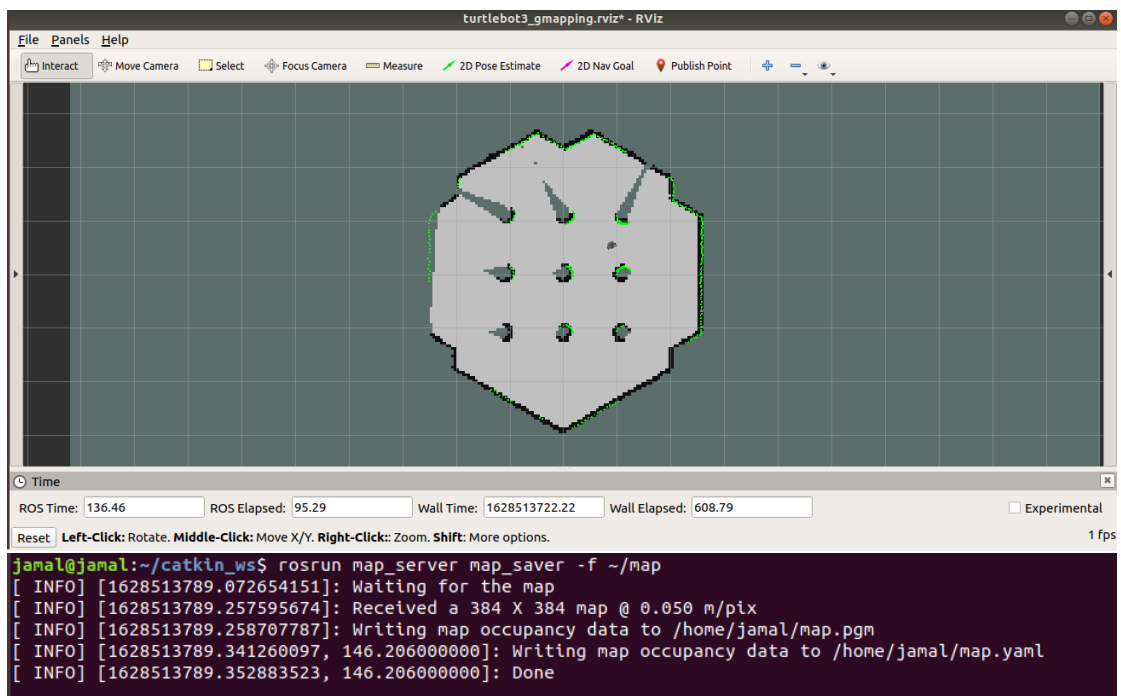
```
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_slam turtlebot3_slam.launch
slam_methods:=gmapping
```

### 3. Run Teleoperation Node

```
$ export TURTLEBOT3_MODEL=burger
$ roslaunch turtlebot3_teleop turtlebot3_teleop_key.launch
```



## 4. Save Map



```
roslaunch map_server map_saver -f ~/map
```

