TurtleBot3 Simulation

TurtleBot3 is a small, affordable, programmable, ROS-based mobile robot for use in education, research, hobby, and product prototyping. The goal of TurtleBot3 is to dramatically reduce the size of the platform and lower the price without having to sacrifice its functionality and quality, while at the same time offering expandability. The TurtleBot3 can be customized into various ways depending on how you reconstruct the mechanical parts and use optional parts such as the computer and sensor. In addition, TurtleBot3 is evolved with cost-effective and small-sized SBC that is suitable for robust embedded system, 360 degree distance sensor and 3D printing technology.

TurtleBot3 simulation

- Running TurtleBot3 simulation (launch files)
- Nodes and topics (current and needed)
- Getting laser data (python script)
- Rviz for laser data visualization
- Goal: Make TurtleBot3 to move around avoiding obstacles

1.1 Install related packages

$ cd ~
$ sudo apt remove ros-kinetic-turtlebot3 *
$ 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 ro s-kinetic-amcl ros-kinetic-map-server ros-kinetic-move-base ros-kinetic-urdf ros-kinetic-xacro ros-kinetic-compressed-image-transport ros-kinetic-rqt-image-view ros- kinetic-gmapping ros-kinetic-navigation ros-kinetic-interactive-markers

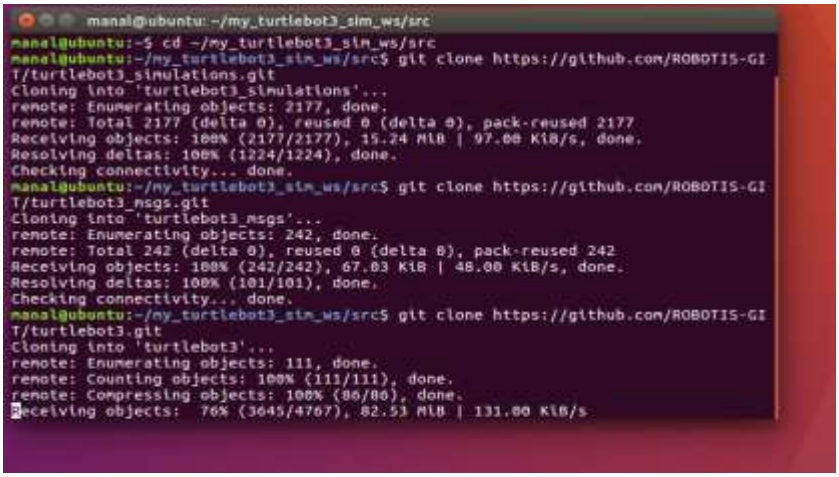
1.2 Create a space for simulation

$ cd ~
$ mkdir -p my_turtlebot3_sim_ws / src

```
manal@ubuntu:~$ cd ~
manal@ubuntu:~$ mkdir -p my_turtlebot3_sim_ws/src
manal@ubuntu:~$ cd ~/my_turtlebot3_sim_ws/src
```

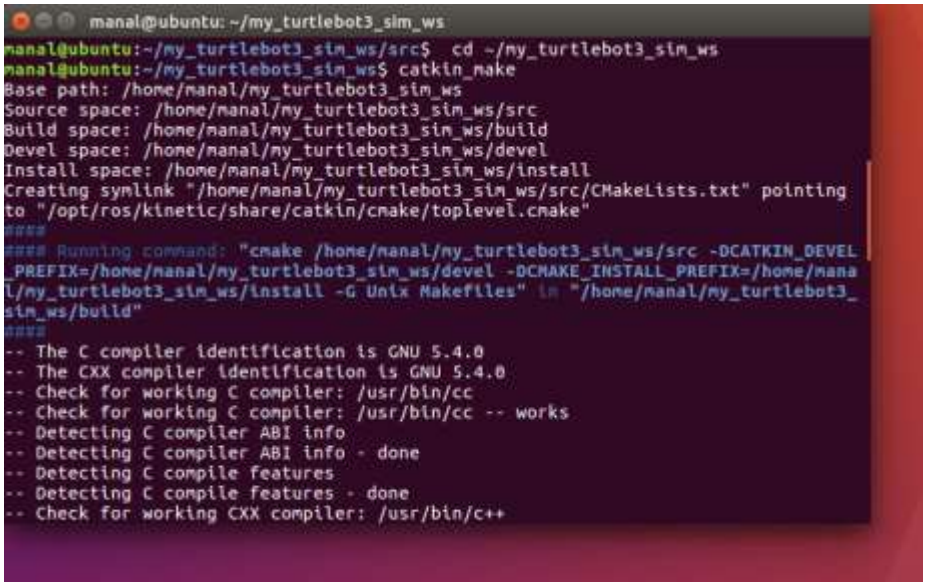
1.3 Clone the source code from the source

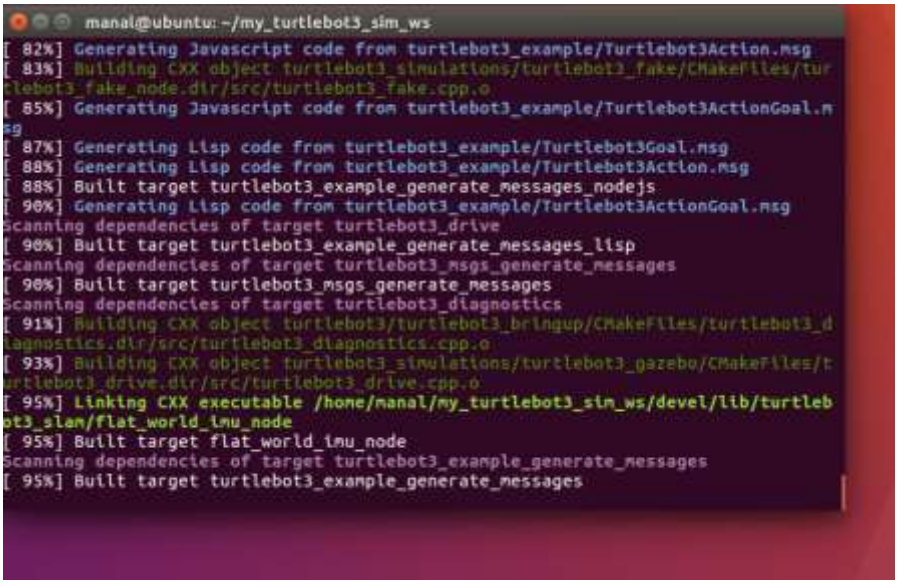
$ cd ~ / my_turtlebot3_sim_ws / src
$ git clone https://github.com/ROBOTIS-GIT/turtlebot3_simulations.git
$ git clone https://github.com/ROBOTIS-GIT/turtlebot3_msgs.git
$ git clone https: // github.com/ROBOTIS-GIT/turtlebot3.git



1.4 Compile source code

$ cd ~ / my_turtlebot3_sim_ws
$ catkin_make





1.5 Start Simulate

```
/home/manal/my_turtlebot3_sim_ws/src/turtlebot3_simulations/turtlebot3_gazebo/lau
manal@ubuntu:~/my_turtlebot3_sim_ws$ source devel/setup.bash
manal@ubuntu:~/my_turtlebot3_sim_ws$ roslaunch turtlebot3_gazebo multi_turtlebot
3.launch
... logging to /home/manal/.ros/log/b9f31e9c-be92-11ea-ac55-000c29676d09/roslaun
ch-ubuntu-8255.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ubuntu:35085/

SUMMARY
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PARAMETERS
 * /rosdistro: kinetic
 * /rosversion: 1.12.14
 * /tb3_0/robot_description: <?xml version="1....
 * /tb3_0/robot_state_publisher/publish_frequency: 50.0
 * /tb3_0/robot_state_publisher/tf_prefix: tb3_0
 * /tb3_1/robot_description: <?xml version="1....
 * /tb3_1/robot_state_publisher/publish_frequency: 50.0
 * /tb3_1/robot_state_publisher/tf_prefix: tb3_1
 * /tb3_2/robot_description: <?xml version="1....
```

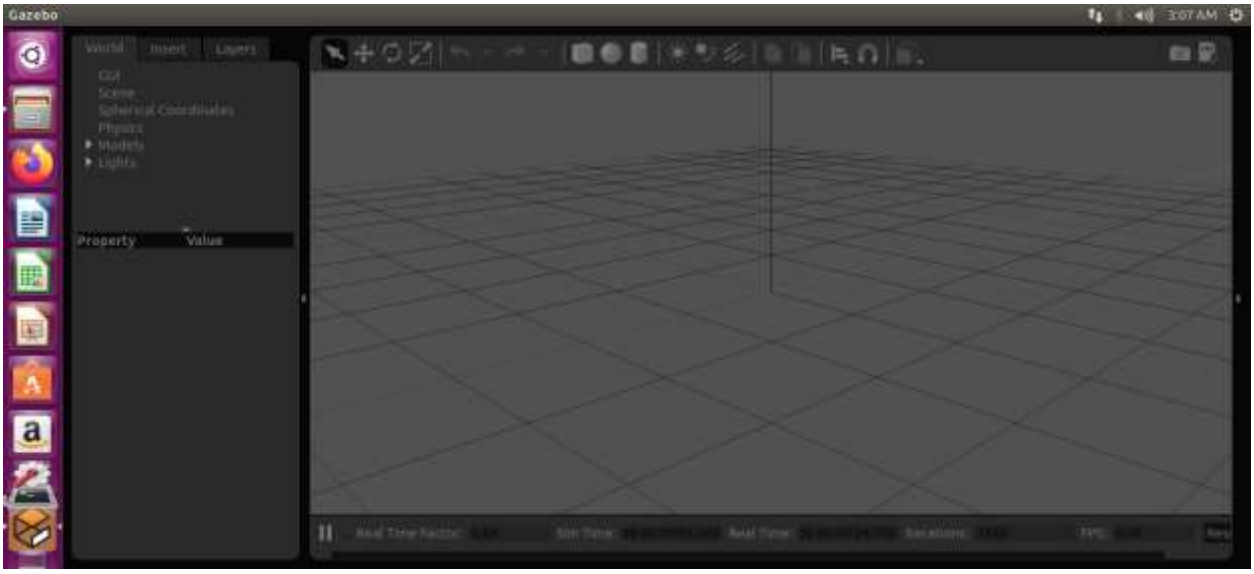

1.5 Start Simulate (RVIZ)

```
/home/manal/catkin_ws/src/turtlebot3/turtlebot3_slam/launch/turtlebot3_slam.launch
manal@ubuntu:~/catkin_ws$ source devel/setup.bash
manal@ubuntu:~/catkin_ws$ export TURTLEBOT3_MODEL=waffle_pi
manal@ubuntu:~/catkin_ws$ roslaunch turtlebot3_slam turtlebot3_slam.launch slam_
methods:=gmapping
... logging to /home/manal/.ros/log/873e645a-bead-11ea-bae7-000c29676d09/roslaun
ch-ubuntu-4716.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ubuntu:39375/

SUMMARY
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PARAMETERS
 * /robot_description: <?xml version="1....
 * /robot_state_publisher/publish_frequency: 50.0
```