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COURSE : Simulation and Modelling
COURSE CODE : CSE3102
LAB : 6

```
lab23@205A-scope--64:~/catkin_ws/src$ cd
lab23@205A-scope--64:~$ cd catkin_ws
lab23@205A-scope--64:~/catkin_ws$ catkin_make
Base path: /home/lab23/catkin_ws
Source space: /home/lab23/catkin_ws/src
Build space: /home/lab23/catkin_ws/build
Devel space: /home/lab23/catkin_ws/devel
Install space: /home/lab23/catkin_ws/install
####
#### Running command: "cmake /home/lab23/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/home/lab23/c
kefiles" in "/home/lab23/catkin_ws/build"
####
-- Using CATKIN_DEVEL_PREFIX: /home/lab23/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/noetic
-- This workspace overlays: /opt/ros/noetic
-- Found PythonInterp: /usr/bin/python3 (found suitable version "3.8.10", minimum requirec
-- Using PYTHON_EXECUTABLE: /usr/bin/python3
-- Using Debian Python package layout
-- Using empy: /usr/lib/python3/dist-packages/em.py
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/lab23/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under '/usr/src/googletest': gtests will be built
-- Found gmock sources under '/usr/src/googletest': gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
-- BUILD_SHARED_LIBS is on
-- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-- ~~  traversing 3 packages in topological order:
-- ~~  - exercise2
-- ~~  - rospy
-- ~~  - meth
-- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
```

STEPS:

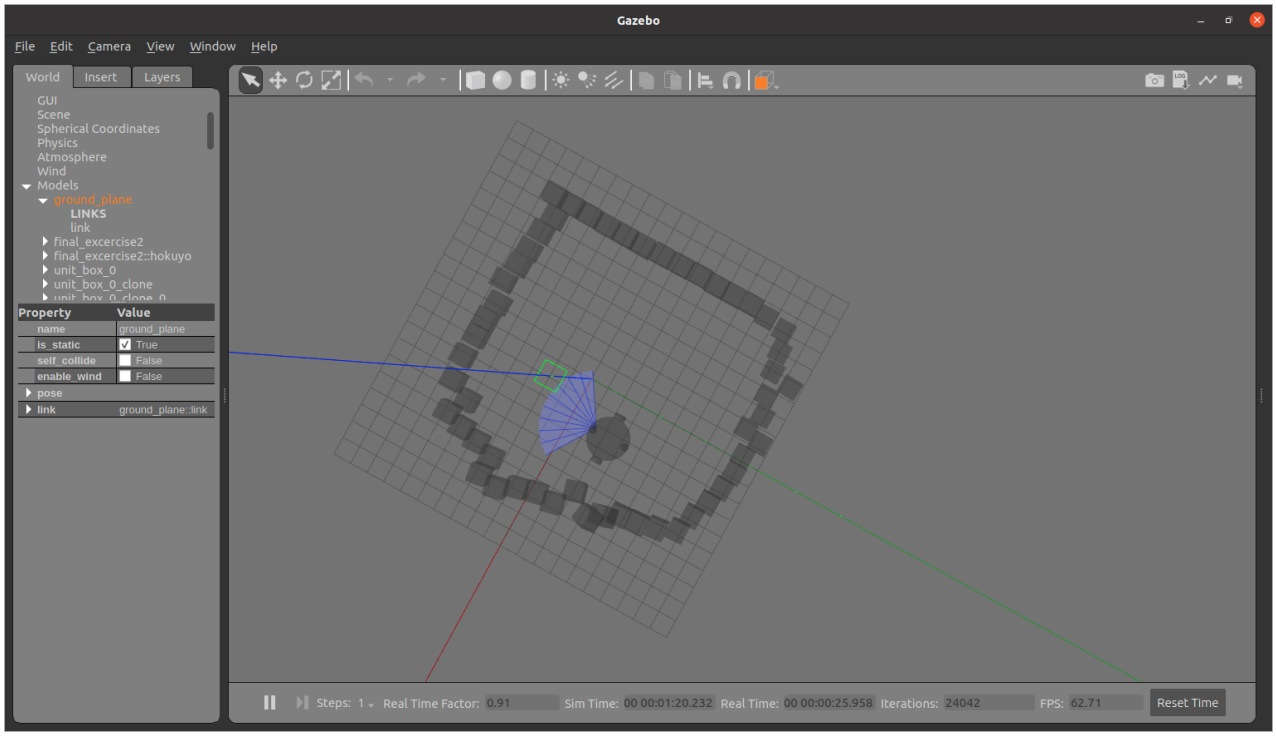
1. **Launch roscore**

```
lab23@205A-scope--64:~/catkin_ws$ roscore
... logging to /home/lab23/.ros/log/35f75370-d2a7-11ed-b8a0-df066151ec96/roslaunch-205A-scope--64-6756.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://205A-scope--64:40277/
ros_comm version 1.15.15


SUMMARY
========

PARAMETERS
 * /rosdistro: noetic
 * /rosversion: 1.15.15

NODES

auto-starting new master
process[master]: started with pid [6769]
ROS_MASTER_URI=http://205A-scope--64:11311/

setting /run_id to 35f75370-d2a7-11ed-b8a0-df066151ec96
process[rosout-1]: started with pid [6784]
started core service [/rosout]
```

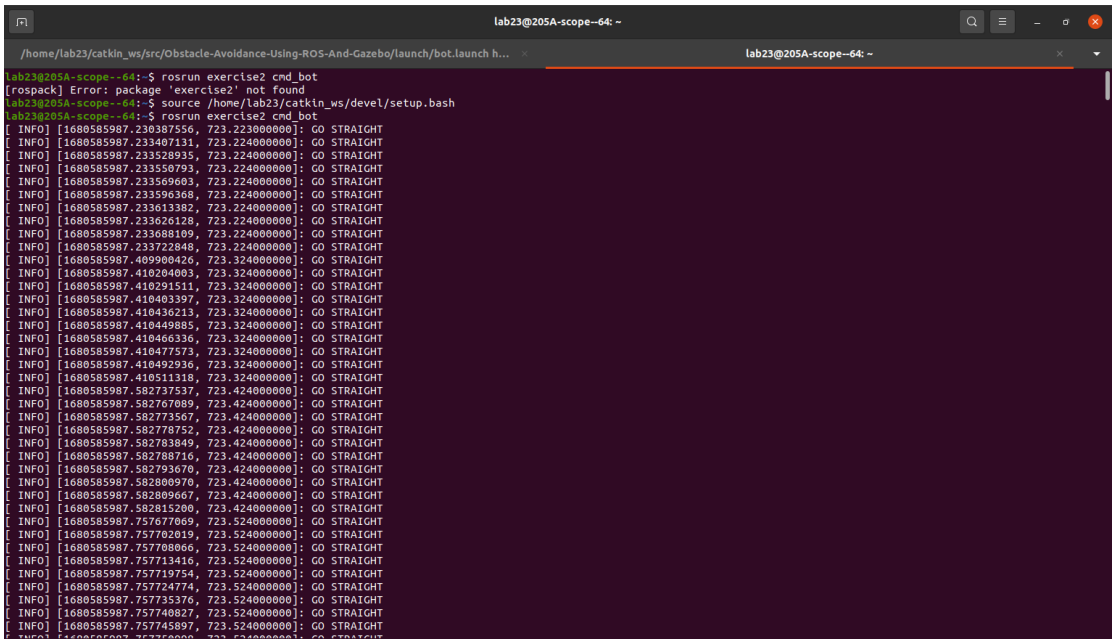
2. Run catkin_make

```
lab23@205A-scope--64:~$ source /home/lab23/catkin_ws/devel/setup.bash
lab23@205A-scope--64:~$ roslaunch exercise2 bot.launch
... logging to /home/lab23/.ros/log/0b6e159e-d2a7-11ed-88c7-757b2a72b015/roslaunch-205A-scope--64-7928.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://205A-scope--64:35501/

SUMMARY
========

PARAMETERS
 * /gazebo/enable_ros_network: True
 * /rosdistro: noetic
 * /rosversion: 1.16.0
 * /use_sim_time: True

NODES
  /
    gazebo (gazebo_ros/gzserver)
    gazebo_gui (gazebo_ros/gzclient)
    mybot_spawn (gazebo_ros/spawn_model)

auto-starting new master
process[master]: started with pid [7941]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to 0b6e159e-d2a7-11ed-88c7-757b2a72b015
process[rosout-1]: started with pid [7956]
started core service [/rosout]
process[gazebo-2]: started with pid [7959]
process[gazebo_gui-3]: started with pid [7964]
process[mybot_spawn-4]: started with pid [7973]
[INFO] [1680585041.910341, 0.000000]: Loading model XML from file /home/udit/catkin_ws/src/exercise2/urdf/model.sdf
```

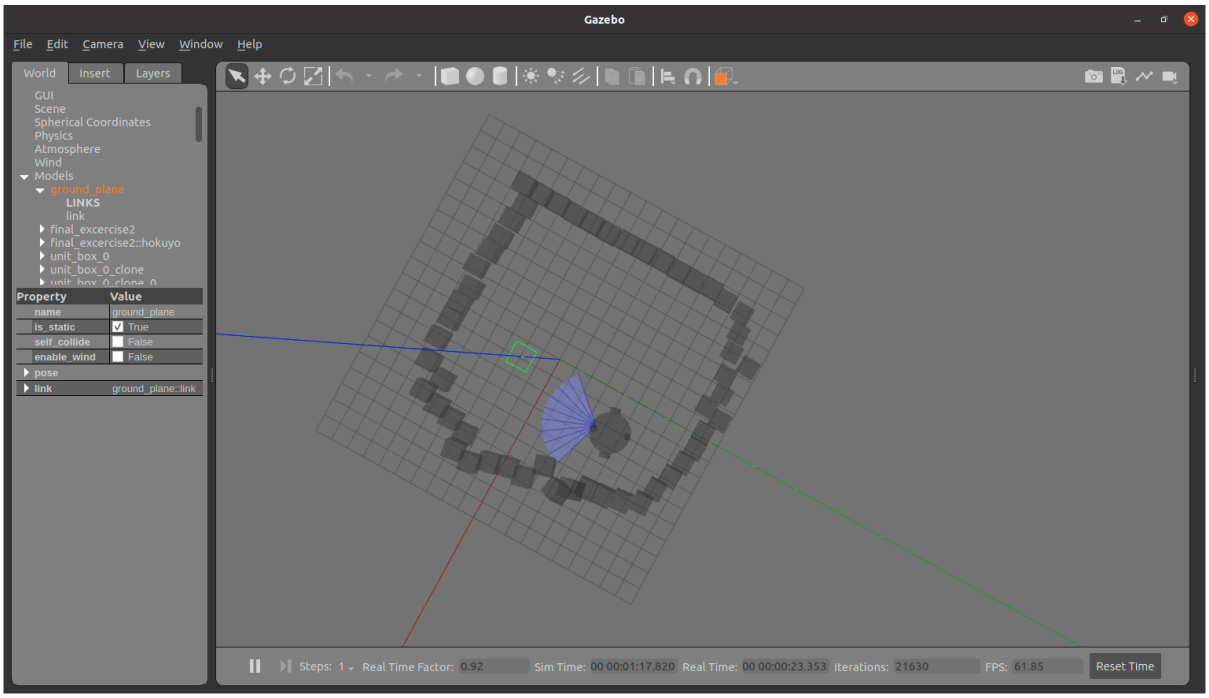
3. Lauch bot.launch

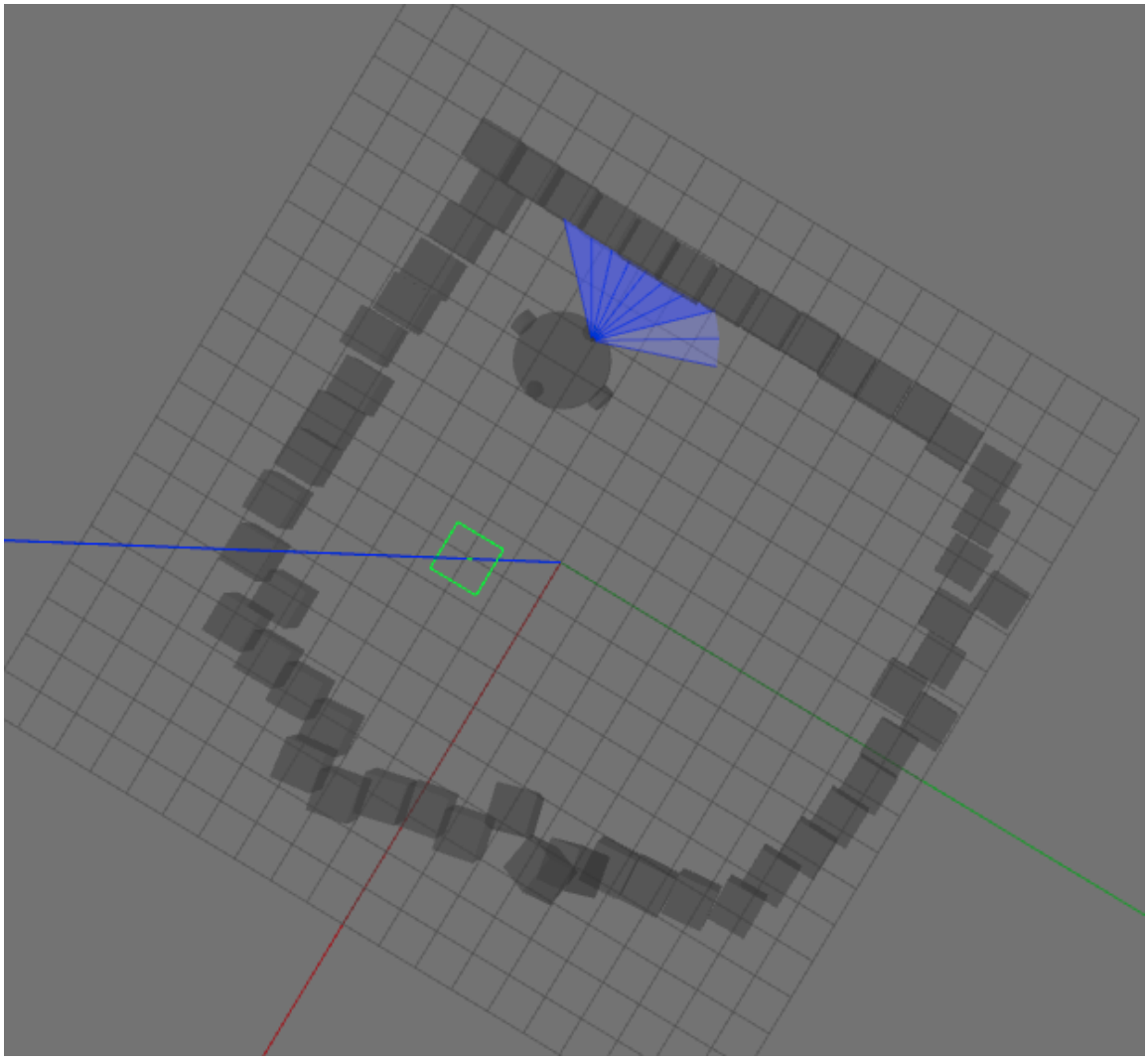


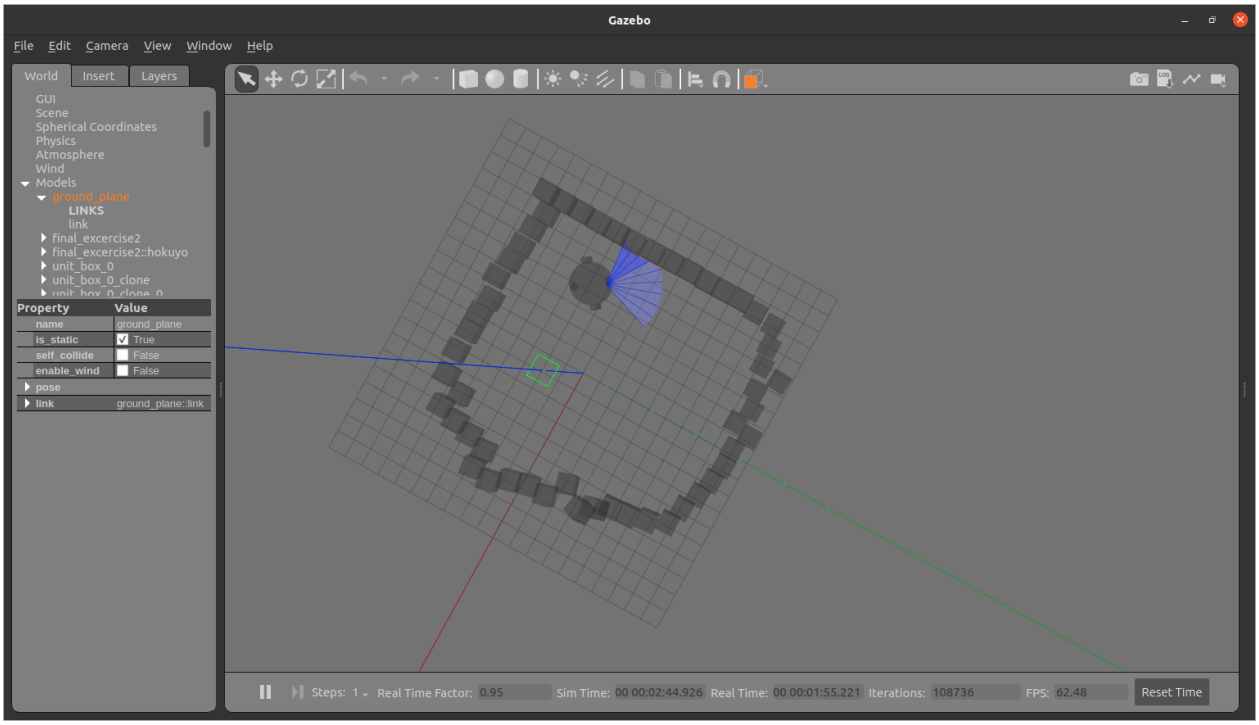
4. Run cmd_bot



5. Final Output





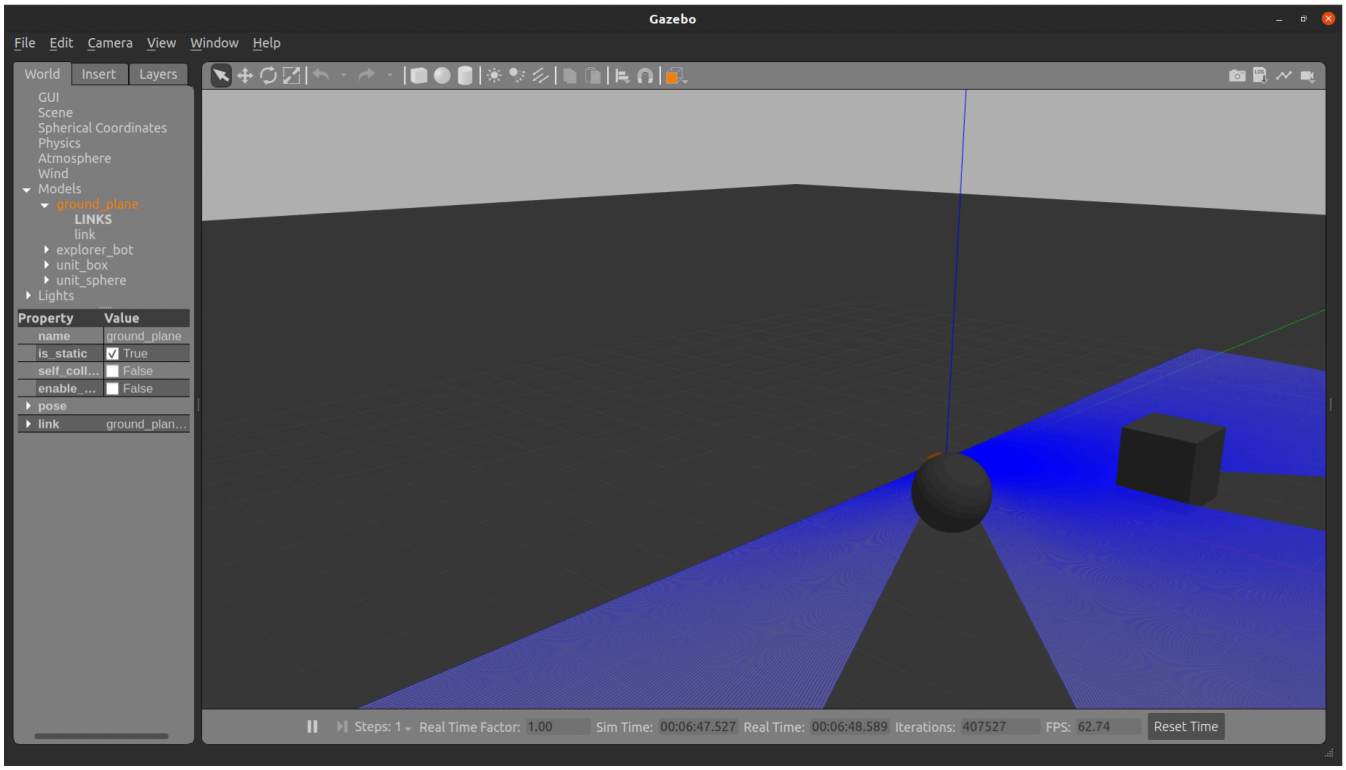

Gazebo
File Edit Camera View Window Help
World Insert Layers
GUI
Scene
Spherical Coordinates
Physics
Atmosphere
Wind
Models
ground_plane
LINKS
link
final_excercise2
final_excercise2::hokuyo
unit_box_0
unit_box_0_clone
Property Value
name ground_plane
is_static True
self_collide False
enable_wind False
pose
link ground_plane::link
Steps: 1 Real Time Factor: 0.95 Sim Time: 00 00:02:44.926 Real Time: 00 00:01:55.221 Iterations: 108736 FPS: 62.48
Reset Time

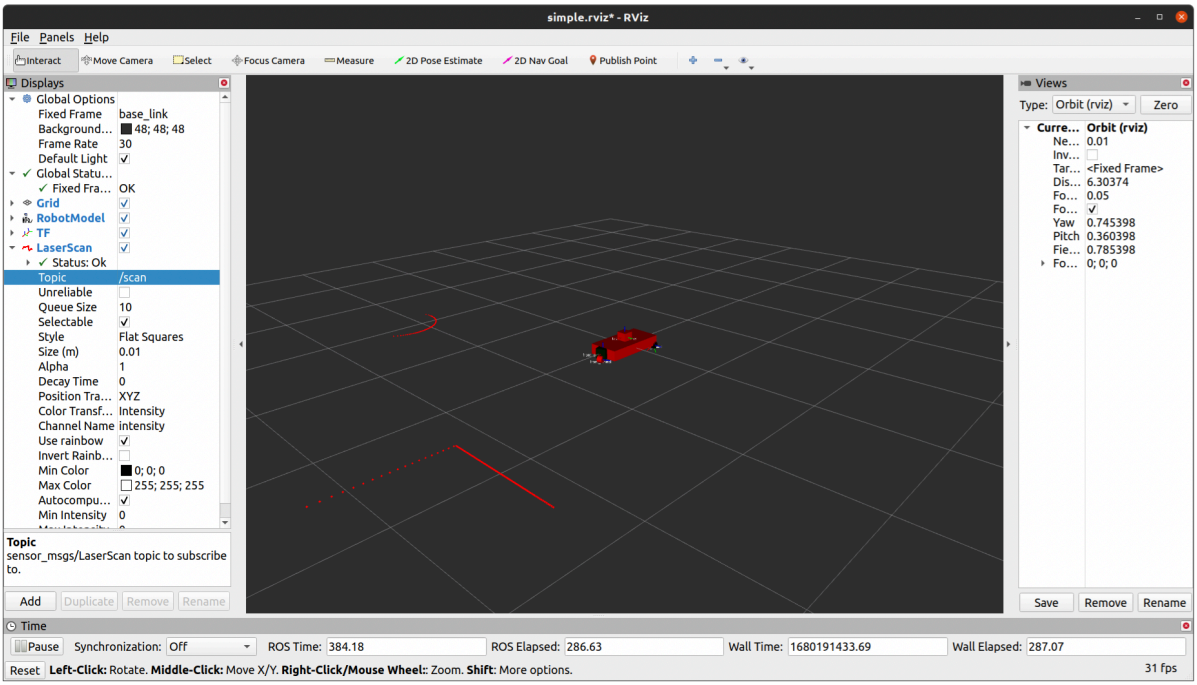
2) URDF file

Open ~/Desktop/slam_ws/src/explorer_bot/launch gazebo_explorer_bot.launch Save

gazebo_explorer_bot.launch 24thMarch2023

```
1  <?xml version="1.0"?>
2  <launch>
3      <param name="robot_description" textfile="$(find explorer_bot)/urdf/-
   explorer_bot.urdf" />
4
5      <include file="$(find gazebo_ros)/launch/empty_world.launch"/>
6
7      <node name="spawn_urdf" pkg="gazebo_ros" type="spawn_model"  args="-param
   robot_description -urdf -model explorer_bot" />
8
9      <node name="Rsp" pkg="robot_state_publisher" type="robot_state_publisher"
   output="screen"/>
10
11
12 </launch>
```




simple.rviz* - RViz
File Panels Help
Interact
Move Camera
Select
Focus Camera
Measure
2D Pose Estimate
2D Nav Goal
Publish Point
Displays
Global Options
Fixed Frame base_link
Background... 48; 48; 48
Frame Rate 30
Default Light
Global Statu...
Fixed Fra... OK
Grid
RobotModel
TF
LaserScan
Status: Ok
Topic /scan
Unreliable
Queue Size 10
Selectable
Style Flat Squares
Size (m) 0.01
Alpha 1
Decay Time 0
Position Tra... XYZ
Color Transf... Intensity
Channel Name intensity
Use rainbow
Invert Rainb...
Min Color 0; 0; 0
Max Color 255; 255; 255
Autocompu...
Min Intensity 0
Topic
sensor_msgs/LaserScan topic to subscribe to.
Add
Duplicate
Remove
Rename
Views
Type: Orbit (rviz)
Zero
Curre... Orbit (rviz)
Ne... 0.01
Inv...
Tar... <Fixed Frame>
Dis... 6.30374
Fo... 0.05
Fo...
Yaw 0.745398
Pitch 0.360398
Fie... 0.785398
Fo... 0; 0; 0
Save
Remove
Rename
Time
Pause
Synchronization: Off
ROS Time: 384.18
ROS Elapsed: 286.63
Wall Time: 1680191433.69
Wall Elapsed: 287.07
Reset
Left-Click: Rotate. Middle-Click: Move X/Y. Right-Click/Mouse Wheel:: Zoom. Shift: More options.
31 fps