C21 Vision and Lidar

Required installations – ROS fuerte , ros_fuerte_pr2_desktop packge

Installation instructions-

1.ros fuerte installation- if the machine already have ROS fuerte skip this part

open a terminal, type in the next lines in the folowing order

```
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu precise main" > /etc/apt/sources.list.d/ros-latest.list'

wget http://packages.ros.org/ros.key -O - | sudo apt-key add -
sudo apt-get update
sudo apt-get install ros-fuerte-desktop-full
echo "source /opt/ros/fuerte/setup.bash" >> ~/.bashrc
. ~/.bashrc
sudo apt-get install python-setuptools python-pip
sudo pip install -U rosinstall vcstools rosdep
sudo apt-get upgrade
sudo rosdep init
rosdep update
rosdep install gazebo_worlds
rosmake gazebo_worlds
roslaunch gazebo_worlds empty_world.launch
```

you should be able to see the simulator launched if the installation pass well, close the terminal

2. ros_fuerte_pr2_desktop packge

open the terminal and type

```
sudo apt-get install ros-fuerte-pr2-desktop
```

3. the C21 module
extract the c21_Vision_and_Lidar.tar.gz into your ros workspace/sandbox, to see if the ros workspace is defined open the terminal and type

```
roscd c21_Vision_and_Lidar
```

you should be refereed to the c21_Vision_and_Lidar folder. If not it means your workspace is not defined.

3.1 Define a workspace – if you succeeded in the last part please skip this one
we will define a workspace on the desktop, open a new terminal and type

```
cd Desktop
mkdir rosworkspace
cd rosworkspace
export ROS_PACKAGE_PATH=$PWD:$ROS_PACKAGE_PATH
```

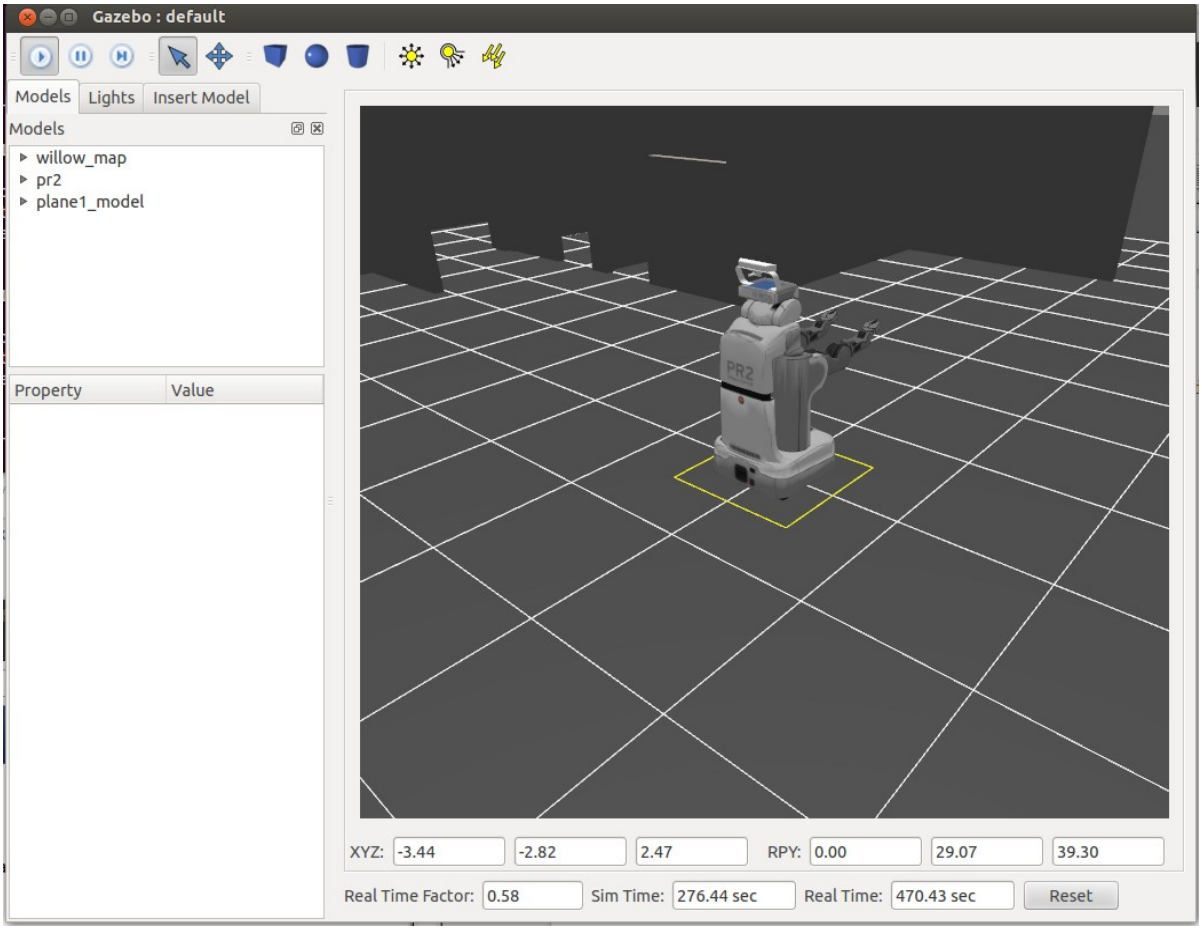
copy c21_Vision_and_Lidar into rosworkspace folder that is now located on your desktop.

3.2 build the C21_module

open a terminal and type in the lines
roscd c21_Vision_and_Lidar
rosmake

running instructions- close all the terminal windows you have open
the next instructions should be lunched one after the other

1. launch the simulator
open a terminal and type
roslaunch pr2_gazebo pr2_wg_world.launch
you should see the simulator with the Pr2 robot like this



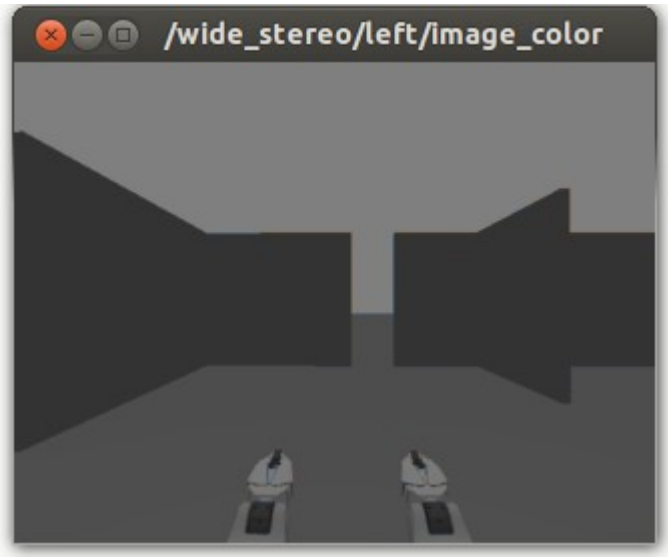
PLEASE MAKE SURE!!! - that the play button on the top left corner of the window is pressed

2. control the robot and receive data

open another terminal window and type
roslaunch pr2_teleop teleop_keyboard.launch

you should be able to move the robot in the simulation with the 'W' 'D' 'A' 'S' keys and rotate it using 'Q' and 'E' , the terminal window must be in focus for that to work

open another terminal window and type
rosrun image_view image_view image:=/wide_stereo/left/image_color



you should see a live camera feed from the pr2 left wide_stereo camera, if you move the robot around the feed will update accordingly

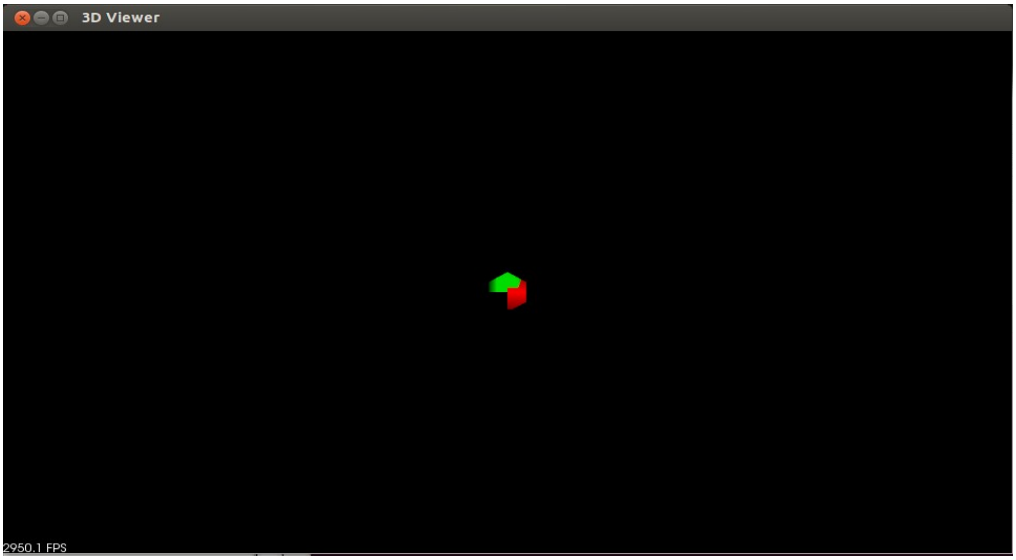
3.launch the C21module and test it

open 2 terminal windows

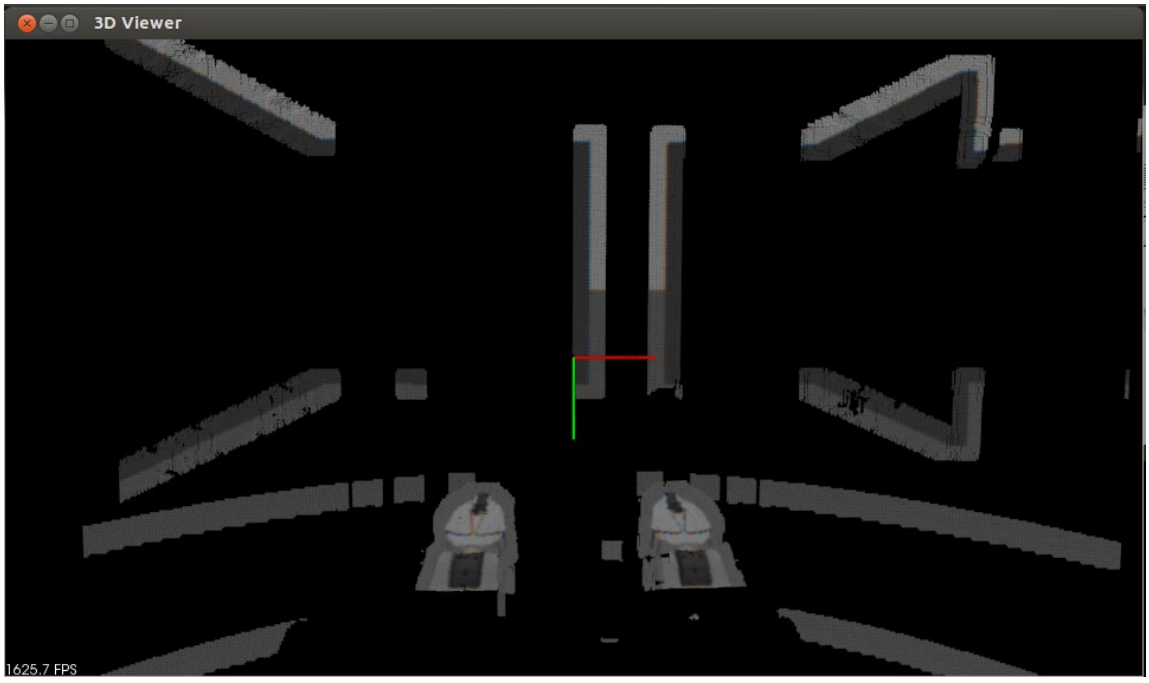
in the first one type
roscd c21_Vision_and_Lidar/bin/
./c21 wide_stereo/left/image_color wide_stereo/right/image_color

in the second one type
roscd c21_Vision_and_Lidar/bin/
./test1

a window will open up looking much like this

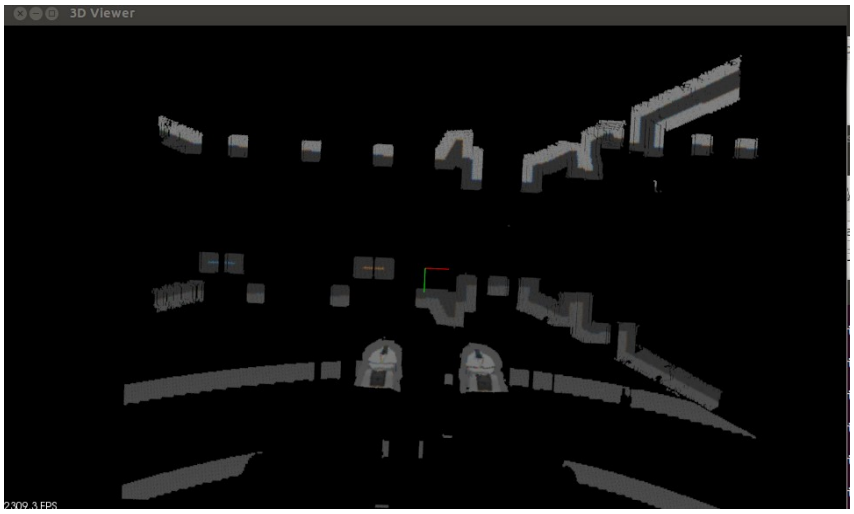


click and hold inside the window to rotate around, you will see a 3D point cloud much like this



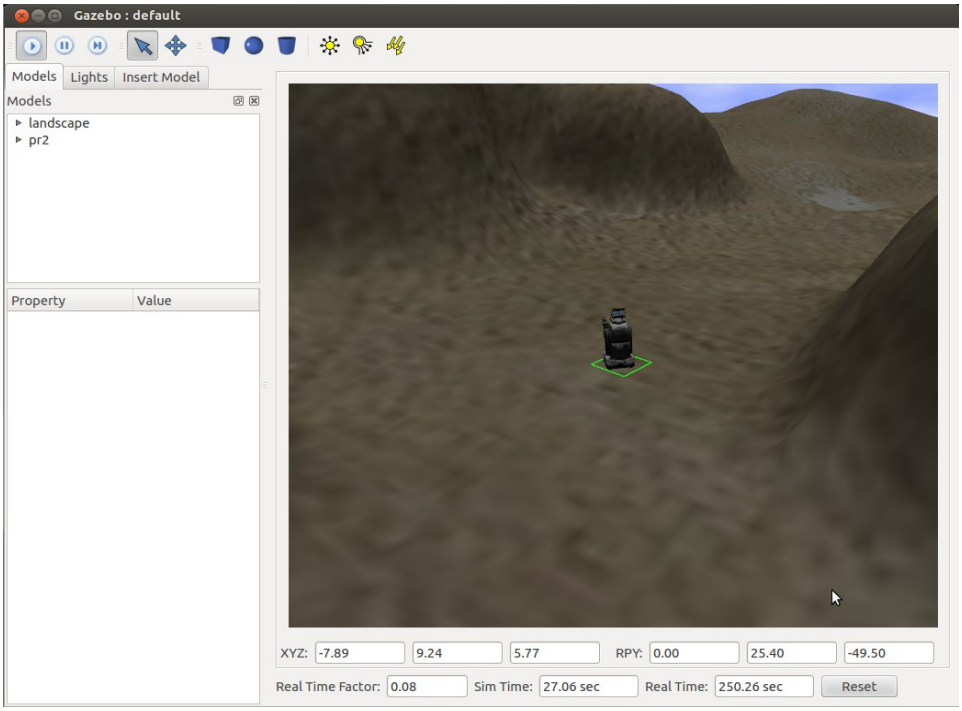
zooming out and viewing the cloud from other sides will allow you to notice the depth of the cloud

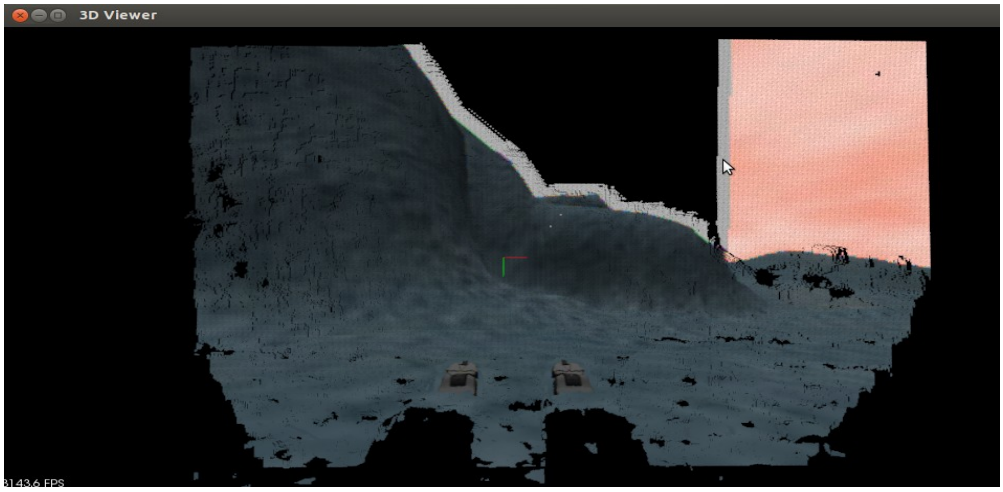
you can move the robot around close the point cloud viewer and run test1 again to receive another point cloud.



The reason we don't see enough data is because the simulation is lacking data and texture, we strongly suggest that a textured world will be used in the advanced simulations

here is the pr2 in an adapted world taken from the hector_gazebo_worlds package




3D Viewer
3143.6 FPS


3D Viewer
3153.6 FPS