How to Launch the TurtleBot3 Simulation With ROS

TurtleBot3 is designed to run using ROS and Ubuntu. It is a popular robot for research and educational purposes.

Follow the below steps to install TurtleBot3 and launch the TurtleBot3 simulation:

1- Open a terminal window and install the dependent packages. Enter the following commands, one right after the other:

```
cd ~/catkin_ws/src/
```

```
git clone https://github.com/ROBOTIS-
GIT/turtlebot3_msgs.git
```

```
git clone https://github.com/ROBOTIS-GIT/turtlebot3.git
```

```
cd ~/catkin_ws && catkin_make
```

2- TurtleBot3 has three models, Burger, Waffle, and Waffle Pi, so you have to set which model you want to use before you launch TurtleBot3. Type this command to open the bashrc file to add this setting:

```
gedit ~/.bashrc
```

3- Add this line at the bottom of the file:

```
export TURTLEBOT3_MODEL=burger
```

```
# some more ls aliases
alias ll='ls -alF'
alias la='ls -A'
alias l='ls -CF'

# Add an "alert" alias for long running commands.  Use like so:
#   sleep 10; alert
alias alert='notify-send --urgency=low -i "$([ $? = 0 ] && echo terminal

# Alias definitions.
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
    . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi
source /opt/ros/melodic/setup.bash

source ~/catkin_ws/devel/setup.bash
export TURTLEBOT3_MODEL=burger
```

4- Save the file and close it.

5- Now reload .bashrc so that you do not have to log out and log back in.

```
source ~/.bashrc
```

6- Now, we need to download the TurtleBot3 simulation files.

```
cd ~/catkin_ws/src/
```

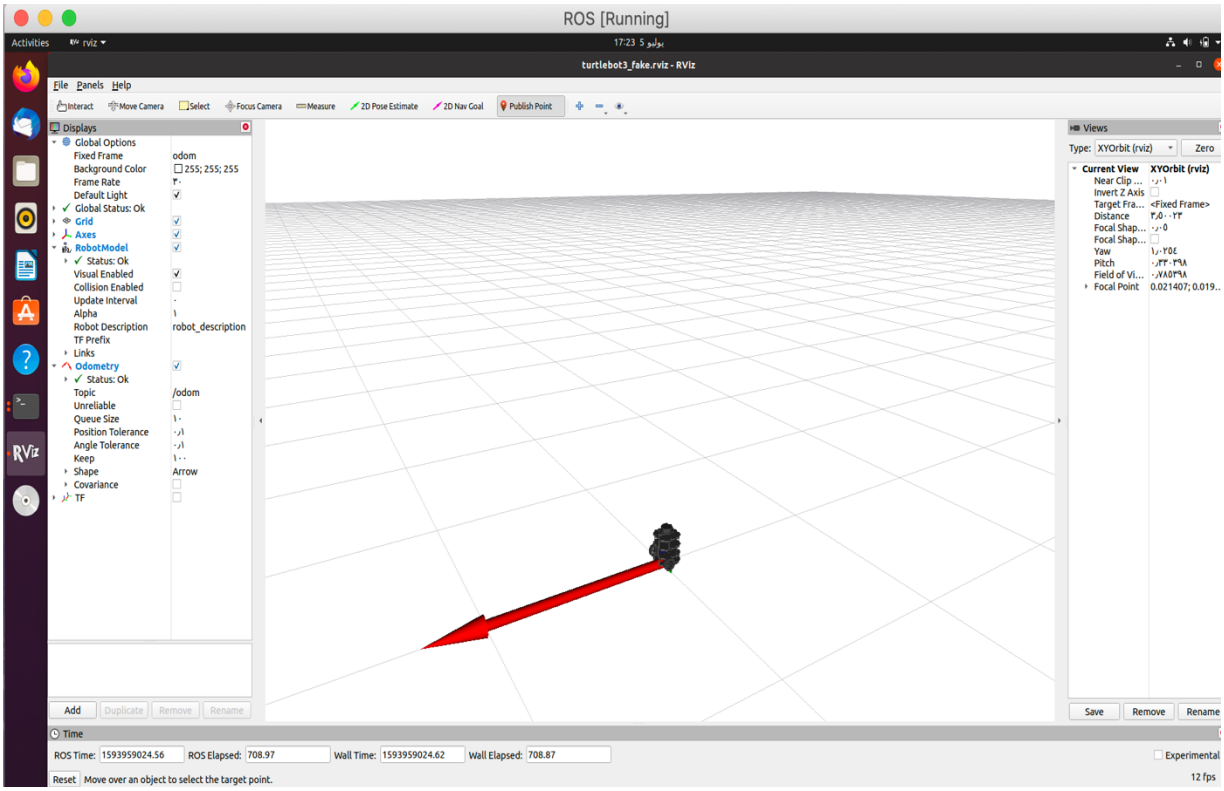
```
git clone https://github.com/ROBOTIS-
GIT/turtlebot3_simulations.git
```

```
cd ~/catkin_ws && catkin_make
```

Simulate TurtleBot3 Using RViz

Now that we have the TurtleBot3 simulator installed, let's launch the virtual robot using **RViz**. Type this command in your terminal window:

```
roslaunch turtlebot3_fake turtlebot3_fake.launch
```



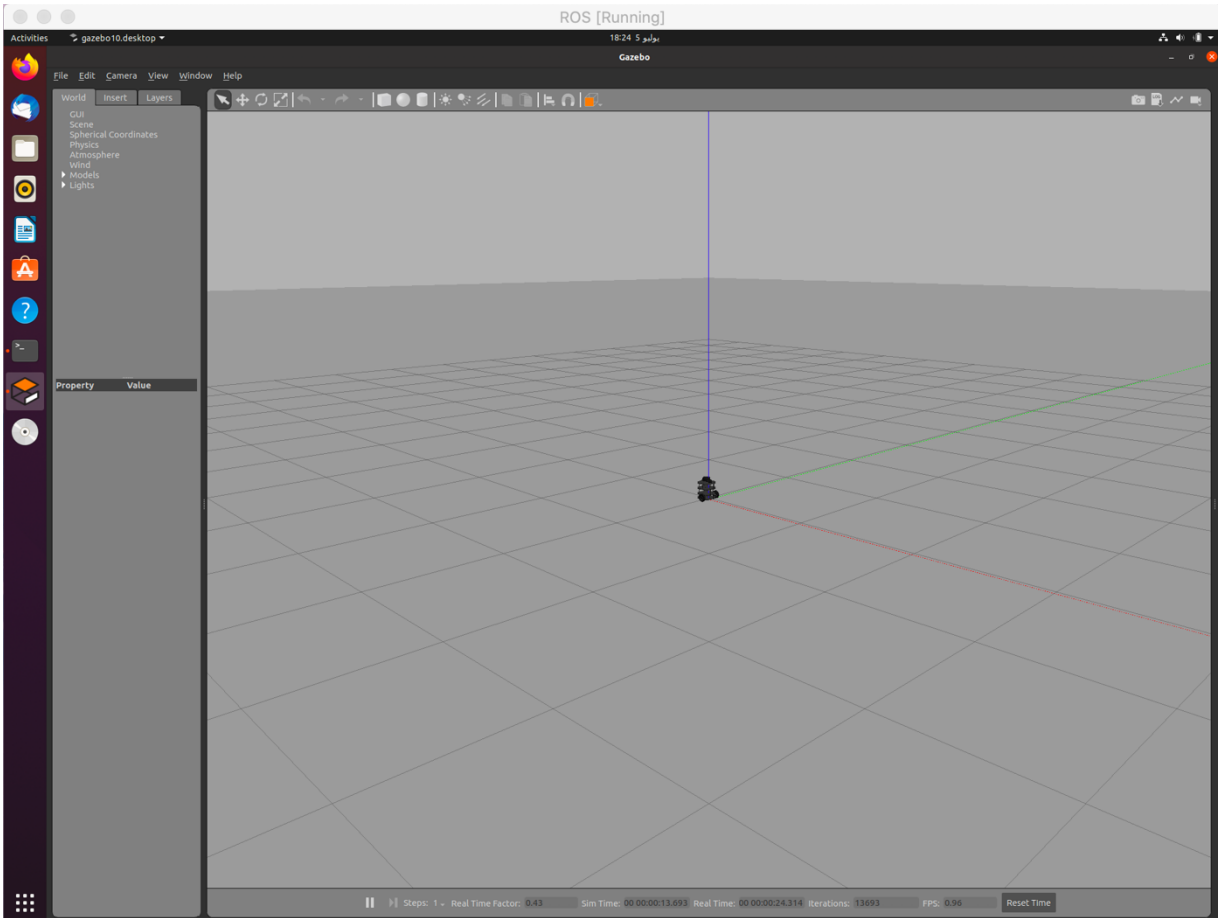
Simulate TurtleBot3 Using Gazebo

Now let's use **Gazebo** to do the TurtleBot3 simulation.

First, let's launch TurtleBot3 in an empty environment. Type this command in one line

```
roslaunch turtlebot3_gazebo
turtlebot3_empty_world.launch
```

Screen of output:



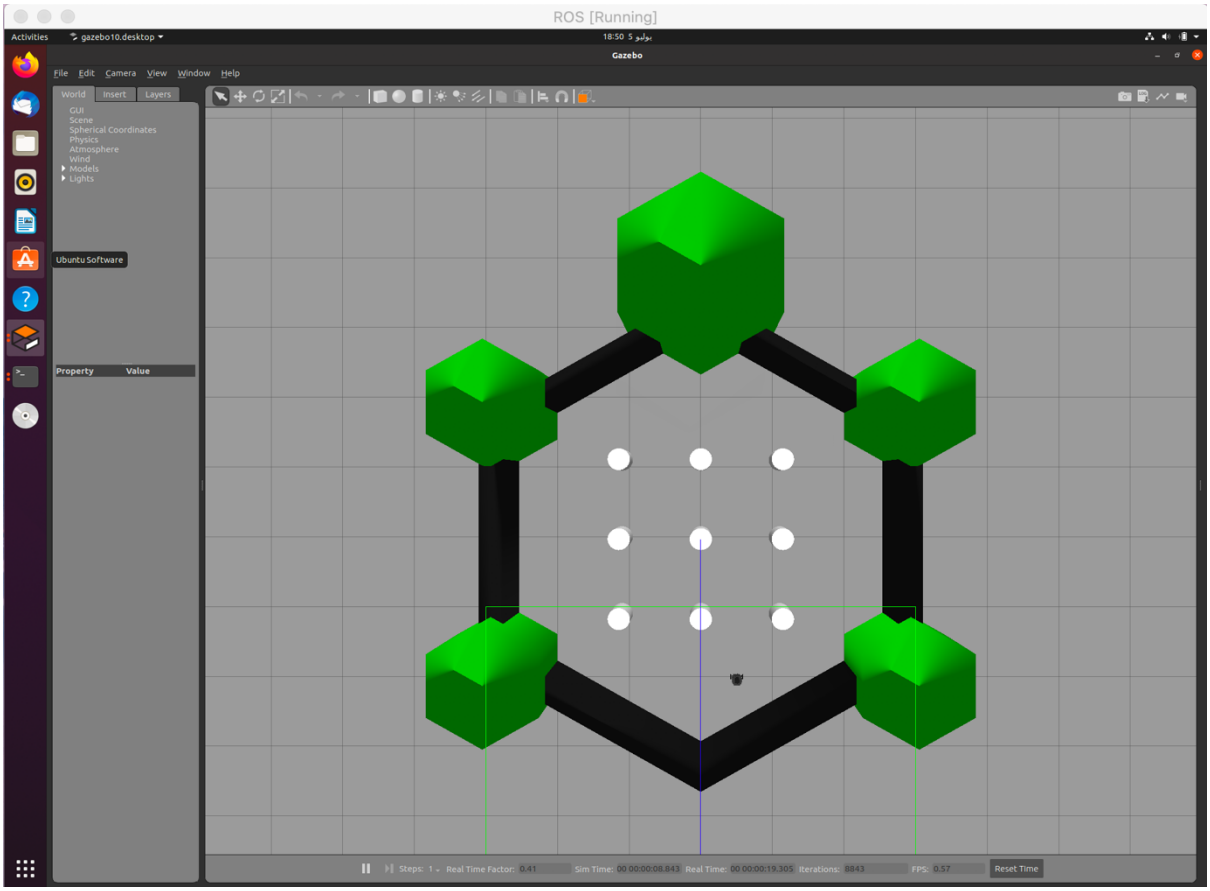
How to Change the Simulation Environment for TurtleBot3

Let’s look at our TurtleBot3 in a different environment.

In a new terminal window type:

```
roslaunch turtlebot3_gazebo turtlebot3_world.launch
```

Screen of output:



We can also simulate TurtleBot3 inside a house.

In a new terminal window type:

```
roslaunch turtlebot3_gazebo turtlebot3_house.launch
```

Screen of output: