

ROS - The Turtlebot Simulator

ME 4140 - Introduction to Robotics - Fall 2019

1. First install the 'ros stage' simulator into your ROS system. It is most likely installed already. [Link Here](#)

```
sudo apt-get install ros-kinetic-stage-ros
```

2. Now install the 'turtlebot' simulator into your ROS system.

```
sudo apt-get install ros-kinetic-turtlebot-simulator
```

3. Next install the physical 'turtlebot' drivers into your ROS system. This step is only necessary if you are using a real turtlebot. [Link Here](#)

```
(sudo apt-get install ros-kinetic-turtlebot ros-kinetic-turtlebot-apps  
ros-kinetic-turtlebot-interactions ros-kinetic-turtlebot-simulator  
ros-kinetic-kobuki-ftdi ros-kinetic-rocon-remocon  
ros-kinetic-rocon-qt-library ros-kinetic-ar-track-alvar-msgs))
```

4. This simulates a physical robot in a 2D world. Next we need to setup the world. There are 3 important files that control the world. Your installation came with a demo world.

- /opt/ros/kinetic/share/turtlebot_stage/maps/maze.png
- /opt/ros/kinetic/share/turtlebot_stage/maps/maze.yaml
- /opt/ros/kinetic/share/turtlebot_stage/maps/stage/maze.world

5. First try the simulator in the demo world called *maze*. We will export the files as *environment variables*

```
$ export TURTLEBOT_STAGE_MAP_FILE=  
"/opt/ros/kinetic/share/turtlebot_stage/maps/maze.yaml"
```

```
$ export TURTLEBOT_STAGE_WORLD_FILE=  
"/opt/ros/kinetic/share/turtlebot_stage/maps/stage/maze.world"
```

6. Now use the launch file (available upon install) to start the simulator.

```
$ roslaunch turtlebot_stage turtlebot_in_stage.launch
```

7. Now you can modify the world you have just simulated. To do this copy all three files and rename them something sensible. Open the *.png* file with any image editor, and draw on it and save. You also need to modify just a few lines in the *.yaml* file and the *.world* file. (Note: This step will be detailed in the next tutorial. Continue at your own risk or contact me for help.)
8. Did you notice an error when you turned the node on? We can fix that.

```
$ sudo gedit /opt/ros/kinetic/share/gmapping/nodelet_plugins.xml
```

Copy the code below into the new file. This a bug related to moving to ‘kinetic’.

```
<library path="lib/libslam_gmapping_nodelet">
  <class name="SlamGMappingNodelet" type="SlamGMappingNodelet"
    base_class_type="nodelet::Nodelet">
    <description>
      Nodelet ROS wrapper for OpenSlams Gmapping.
    </description>
  </class>
</library>
```

Now run your node again.