This is a cookbook showing you how to use this gazebo simulation environment running continental’s “Ridgeback Robot”.

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*Last Edit Date:* 2022/Jan./25

What you can expect after completing this introduction:

To achieve this, please complete the following steps in order.

1. Install Ubuntu (tested on version 20.04)
2. Install ROS2 (tested on ros-foxy)
3. Install Gazebo
4. Install Navigation2 Package

We will give you a brief explanation on them. Ready?

Step1: Install Ubuntu

Follow the instruction on the official website here:

<https://ubuntu.com/tutorials/install-ubuntu-desktop#2-download-an-ubuntu-image>

We’ve tried version 18.xx at late 2021, but encountered some fatal error with ROS2, so version at least 20.04 is recommended. Generally, we install Ubuntu from USB so you will need one. You shouldn’t have any severe problem at this step.

Step2: Install ROS2 (ros-foxy)

ROS stands for Robotics Operating System, and has several different distributions. Here we are using ROS2 not ROS1. At the time of 2022/Jan. version *ros-foxy* is the stable one and *ros-galactic* is the latest one. We tested our implementation on *ros-foxy*, so if you are afraid of unfamiliar errors, please use *ros-foxy*, following the instruction on official website below:

<https://docs.ros.org/en/foxy/Installation.html>

Note:

* We recommend you use the Debian packages due to its simplicity.
* Since ROS2 is still a unstable open-source project, you might encounter some fatal errors which you can’t find a way out. Our suggestion is

1. Check stackoverflow.
2. If it doesn’t help, format your disk and reinstall Ubuntu.

We had tons of unidentical errors during our installation, and have reinstall Ubuntu 3 to 4 times. Hope this doesn’t eliminate your motivation.

Step3: Install Gazebo

Gazebo is a open-source, real-world physics simulator, which offers a way to simulate gravity, collision, rolling, applied forces and other physics phenomena for your robots. It is written in xml with embed Ruby in option. The instruction for install is written on the official website below.

<http://gazebosim.org/tutorials?tut=install_ubuntu&cat=install>

You shouldn’t have any significant problem installing it.

Step4: Install Navigation2 Packages.

Navigation2 is a series of open-source packages designed for robot navigation. The instruction can be found on the official website:

<https://navigation.ros.org/getting_started/index.html#installation>

However, we found that in our case, the *get started* instruction doesn’t work. Especially with the rviz presentation.

Step5: Run

Reference: <https://navigation.ros.org/setup_guides/footprint/setup_footprint.html>

1. At terminal 1:
   1. cd rb\_ws/
   2. . ./underlay\_ws/install/local\_setup.bash
   3. . ./overlay\_ws/install/local\_setup.bash
   4. cd \_ws/
   5. . ./install/setup.bash
   6. ros2 launch conti\_robot\_bringup rb\_in\_warehouse.launch.py

Then you should see rviz and gazebo launching.

1. At terminal 2:

ros2 run tf2\_ros static\_transform\_publisher 0 0 0 0 0 0 map odom

1. At terminal 3:  
   ros2 run tf2\_ros static\_transform\_publisher 0 0 0 0 0 0 odom basic\_link
2. At terminal 4:  
   ros2 launch slam\_toolbox online\_async\_launch.py
3. Move to rviz, under left panel->Global Options/Fixed Frame, drop down to change map to odom.
4. Press startup button at the bottom.
5. Give the robot a 2D Pose Estimate, and then give it a Goal/Nav.

Then your robot should start moving.