ExFacLab Documentation

SDVUN_SIM

Welcome to sdvun_sim documentacion. In this page, you will find help and documentation about this ROS package and some tutorials that may help you.

sdvun_sim: A ROS metapackage to run SDVUN mobile robots in Gazebo

Simulation of the SDVUN mobile robots in Gazebo is posible with this ROS metapackage.

This software was maded thinking in multirobot simulation: every robot can run its own Navigation Stack, using AMCL or HECTOR_SLAM as localization components. Main objective is that this simulation runs a realistic version of SDV robots of LabFabEx, allowing the develop of new software for these robots. The Figure 82 contains a sample of this simulator running.
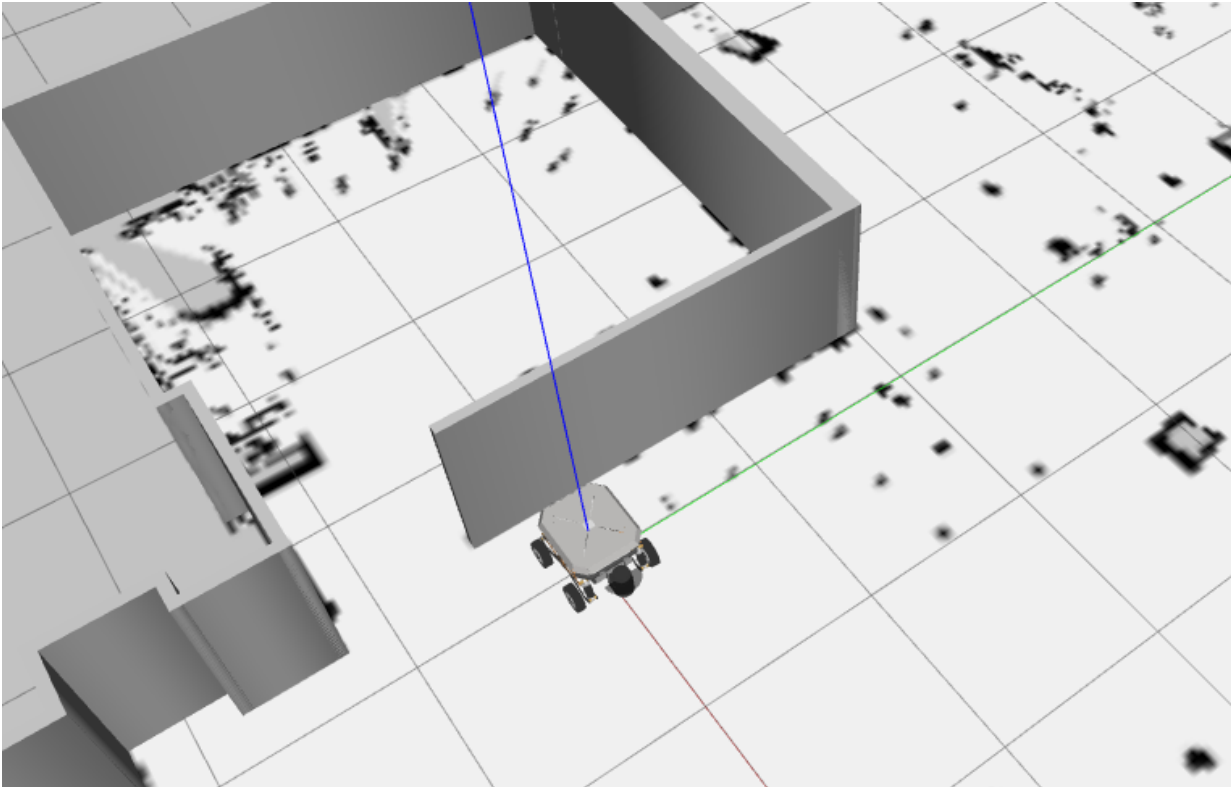

Fig. 82 sdvun_sim running with a virtual SDVUNx

Installation

Requirements

- Ubuntu 18.04
- ROS-Melodic

To install the dependencies of sdvun_sim package, available in ROS repositories, run next commands:

```
sudo apt update
sudo apt install ros-melodic-gazebo-ros ros-melodic-gazebo-plugins ros-melodic-move-base ros
```

Clone repositorie

Please, download the source code of *sdvun_sim* package through the official link. You may require authorization of LabFabEx admins:

```
git clone https://gitlab.com/LabFabEx/sdv_un4.git
```

Submodules

Also, you have to install package submodules, contained in *sdvun_sim*:

```
cd sdv_un4
git submodule init
git submodule update
```

Compiling

Run catkin_make command in the workspace to build all packages of *sdvun_sim*:

```
cd ~/catkin_ws
catkin_make
```

Simulation

Quick Simulation

Main simulation launch an instance of Gazebo with LabFabEx walls and SDVUN1 mobile robot with AMCL Stack Navigation. Also calls RViz, that allows you to send pose commands and view all planning maps and poses. To execute this simulation, run next command:

```
roslaunch sdvun_gazebo sdvun_nav.launch rviz:=true
```

Figure 83 contains a sample of RViz and Gazebo running the simulation of a SDVUNx robot.

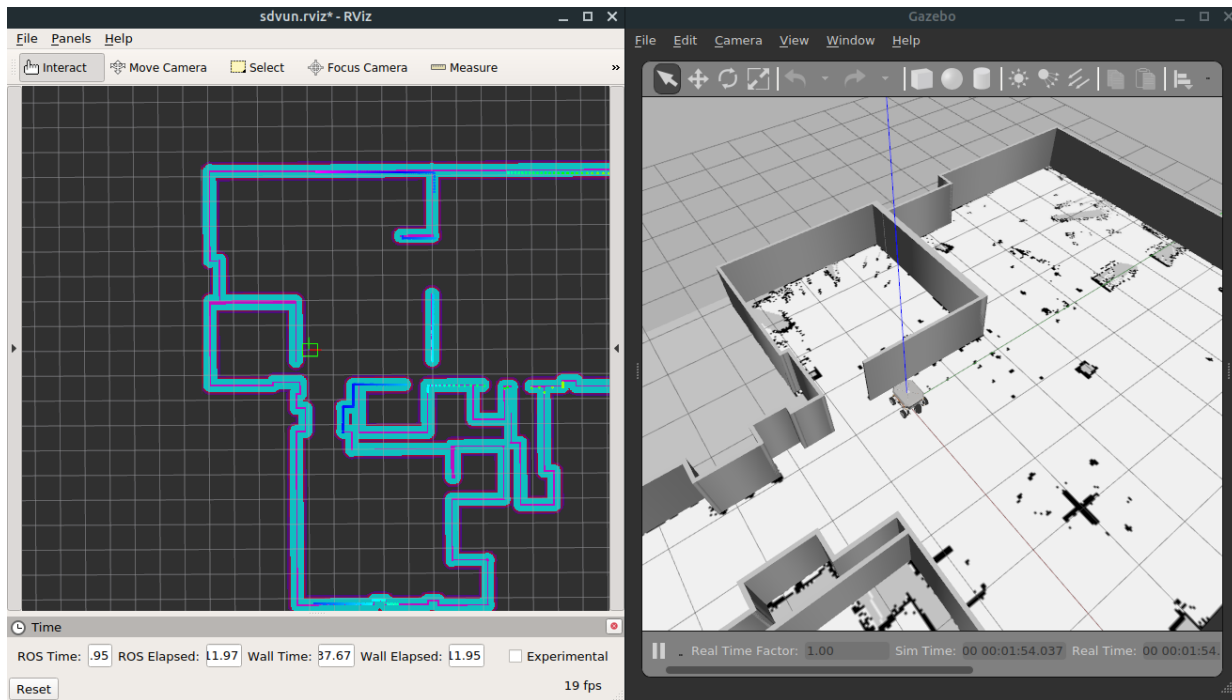*Fig. 83* RViz and Gazebo running the simulation

Custom simulation

If you want to view LabFabEx world in Gazebo, without any robot, run next command:

```
roslaunch labfabex_gazebo labfabex_bringup.launch
```
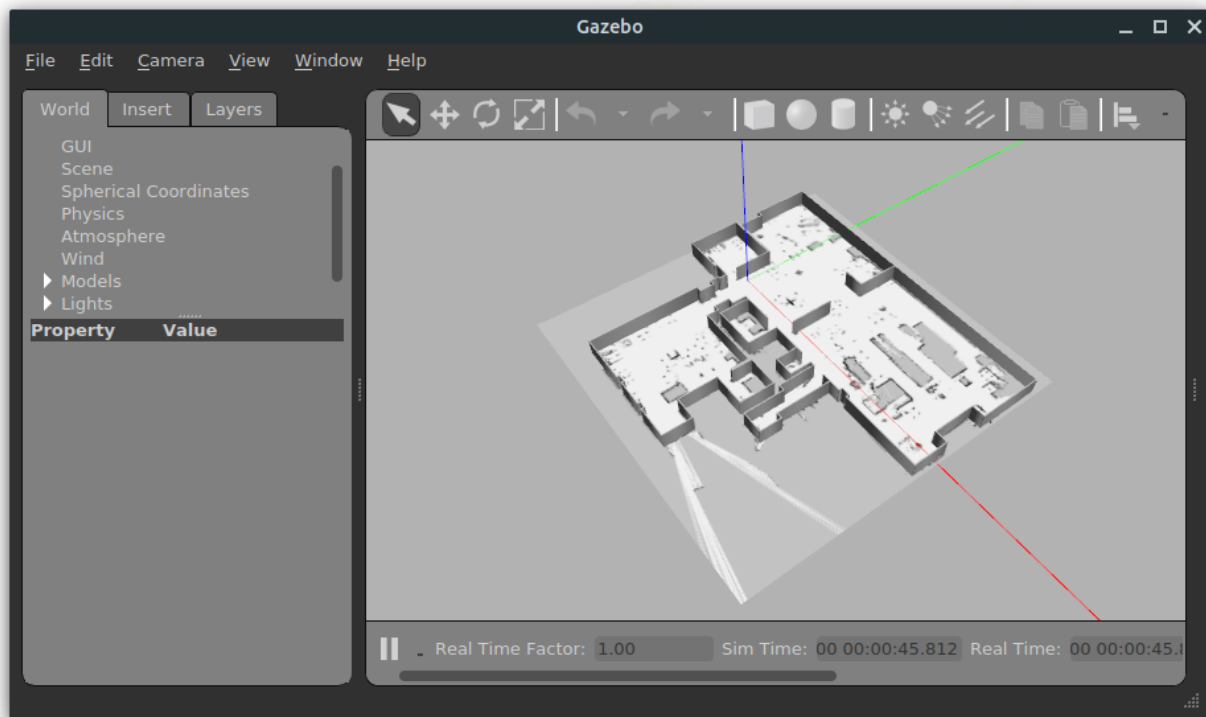
See Figure 84 as an example.

Fig. 84 ExFacLab walls

To spawn a SDVUNX robot in Gazebo, with Navigation Stack Nodes, all inside a namespace, run this command:

```
roslaunch sdvun_gazebo spawn_sdvun_nav.launch robot_model:=sdvun3 namespace:=sdvun3
```
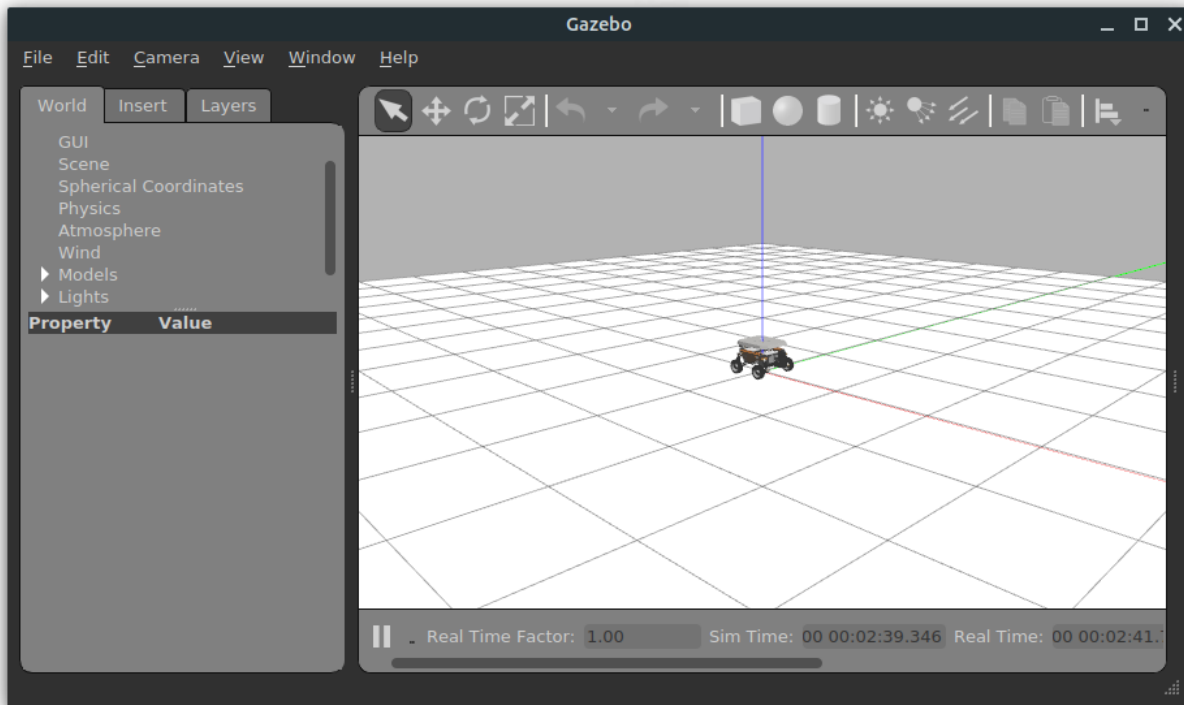
Also, you can use arguments like robot_model, localization and namespace to adjust the simulation to your requirements.

Empty world

If you want to view SDVUN3 mobile robot in an empty world, without walls, run this:

```
roslaunch sdvun_gazebo sdvun_empty_world.launch robot_model:=sdvun3
```

The Figure 85 shows a sample of empty world.

Fig. 85 Simulation with empty world

View model in RViz

To view a SDVUNX 3D model in RViz, run this command:

```
roslaunch sdvun_gazebo sdvun_empty_world.launch robot_model:=sdvun1
```

The Figure 86 contains a picture of SDVUNx model in RViz.

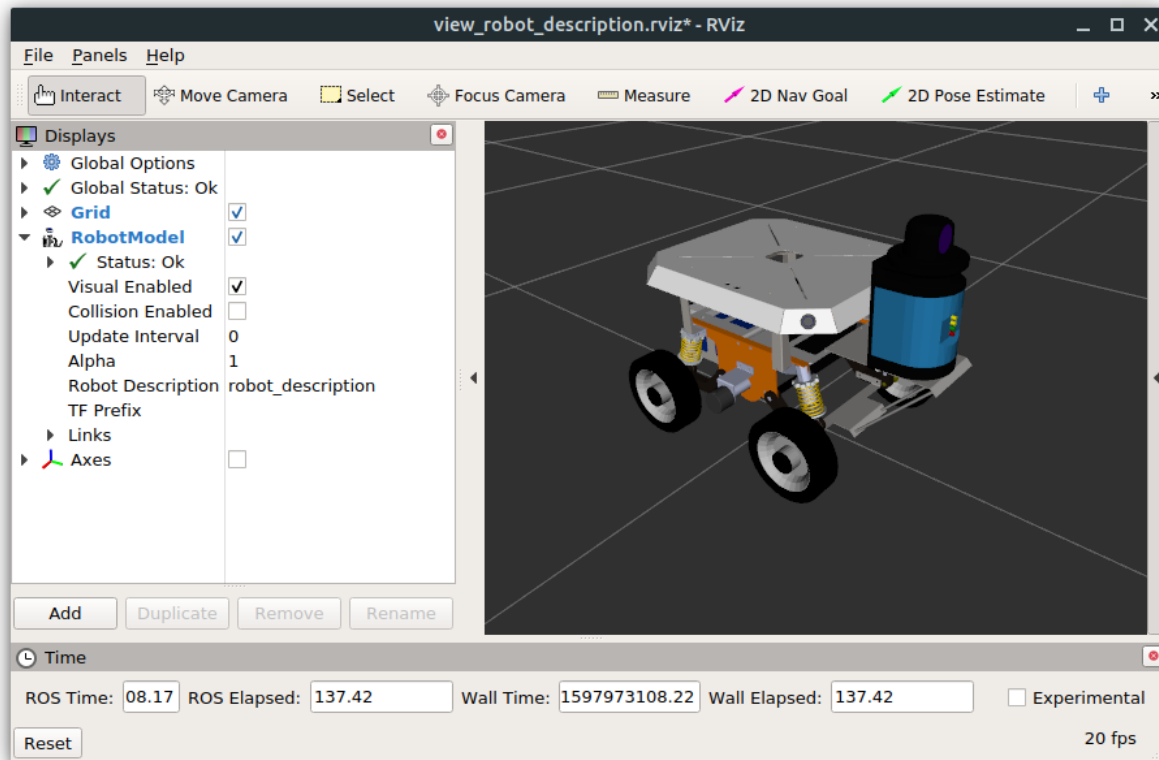*Fig. 86* Robot model in RViz

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