

ROS2 Setup Notes

Autonomous Exploration Development Environment

In an Ubuntu 22.04 system, install ROS2 Humble and the following dependencies.

```
sudo apt update  
sudo apt install libusb-dev ros-humble-desktop-full ros-humble-joy ros-humble-gazebo-msgs \  
ros-humble-gazebo-plugins ros-humble-gazebo-ros ros-humble-gazebo-ros2-control \  
ros-humble-gazebo-ros-pkgs python3-colcon-common-extensions
```

In an Ubuntu 24.04 system, install ROS2 Jazzy and the following dependencies.

```
sudo apt update  
sudo apt install ros-jazzy-desktop-full ros-jazzy-pcl-ros libpcl-dev
```

Note that in ROS2 Jazzy, RVIZ is known to have issues with wayland. Use 'echo \$XDG_SESSION_TYPE' to check if wayland is being used. If yes, install X11 using the command lines below. Then, in the '/etc/gdm3/custom.conf' file, uncomment 'WaylandEnable=false' and reboot.

```
sudo apt update  
sudo apt-get install xorg openbox
```

Follow our website to clone '*autonomous_exploration_development_environment*'. Checkout the '*humble*' or '*jazzy*' branch, and follow instructions on the website to download the simulation environments. Then, compile and source the ROS workspace. **Make sure to download the simulation environments before compiling.**

```
colcon build --symlink-install --cmake-args -DCMAKE_BUILD_TYPE=Release  
source install/setup.sh
```

Launch the system with one of the simulation environments. To launch with the '*garage*' environment, use

```
ros2 launch vehicle_simulator system_garage.launch
```

To use a Matterport3D environment model (only compatible with Ubuntu 22.04), switch to the '*humble-matterport*' branch, and follow [instructions to setup Matterport3D environment models](#). Then, compile and source the ROS workspace, and launch the system.

```
ros2 launch vehicle_simulator system_matterport.launch
```

DSV Planner

Install the following dependencies. For Ubuntu 22.04 with ROS2 Humble,

```
sudo apt update  
sudo apt install ros-humble-octomap-ros libgoogle-glog-dev libgflags-dev
```

For Ubuntu 24.04 with ROS2 Jazzy,

```
sudo apt update  
sudo apt install ros-jazzy-octomap-ros octomap-tools libgoogle-glog-dev libgflags-dev
```

Follow our website to clone '*dsv_planner*' and checkout the '*humble*' or '*jazzy*' branch. Then, compile and source the ROS workspace using the same commands with the system. After launching the system, launch the planner with one of the simulation environments.

```
ros2 launch dsvp_launch explore_garage.launch
```

If using a Matterport3D environment model, use

```
ros2 launch dsvp_launch explore_matterport.launch
```

TARE Planner

Follow our website to clone '*tare_planner*' and checkout the '*humble*' or '*jazzy*' branch. Then, compile and source the ROS workspace using the same commands with the system. After launching the system, launch the planner with one of the simulation environments.

```
ros2 launch tare_planner explore_garage.launch
```

If using a Matterport3D environment model, use

```
ros2 launch tare_planner explore_matterport.launch
```

FAR Planner

Follow our website to clone '*far_planner*' and checkout the '*humble*' or '*jazzy*' branch. Then, compile and source the ROS workspace using the same commands with the system. After launching the system, launch the planner.

```
ros2 launch far_planner far_planner.launch
```

If using a Matterport3D environment model, use

```
ros2 launch far_planner far_planner.launch config:=matterport
```