

# **Indoor Environment Mapping Tutorials**

Keyboard Mapping

# Required ROS Packages

- For using Realsense R200 camera in Gazebo
  1. realsense\_gazebo\_plugin <sup>[2]</sup> - [1]
- For registering the depth image to colour image frame
  1. depth\_image\_proc - [1]
  2. image\_common - [1]
- For incremental mapping
  1. rtabmap\_ros - sudo apt-get install ros-indigo-rtabmap-ros
- For keyboard control of the ARDrone
  1. cvg\_sim\_gazebo - [1]

# Required Files

- `demo.launch` (`realsense_gazebo_plugin/launch`) - Launch Gazebo7 and load the simulated world
- `register.launch` (`realsense_gazebo_plugin/launch`) - Launch a nodelet to register the depth image to the colour image frame
- `pub_camera_info.py` (`realsense_gazebo_plugin/scripts`) - Run a script to publish fake depth and color camera info for the simulated cameras
- `ardrone_get_odometry.py` (`cvg_sim_gazebo/scripts`) - Run a script to fetch pose of the ardrone in Gazebo and publish the tf
- `realsense.launch` (`realsense_gazebo_plugin/launch`) - Launch the RTAB-Map package
- `keyboard.py` (`cvg_sim_gazebo/scripts`) - Start the keyboard tele-op to control the drone in Gazebo

# Procedure

1. Launch `demo.launch` present in `realsense_gazebo_plugin` package to start the simulated world along which has the ARDrone with a Realsense R200 camera mounted on it
2. Launch `register.launch` present in `realsense_gazebo_plugin` package to register the depth image stream to the colour image stream
3. Run the script `pub_camera_info.py` to publish fake camera metadata for the simulated Realsense R200 camera
4. Run the script `ardrone_get_odometry.py` present in `cvg_sim_gazebo` package to fetch pose of the ardrone in Gazebo and to publish the corresponding transform (tf)
5. Launch `rtabmap.launch` present in `realsense_gazebo_plugin` package to start RTAB-Map package which will start the incremental mapping process
6. Start the ARDrone in simulation using the keyboard tele-op script (`keyboard.py`) present in `cvg_sim_gazebo` package and move the ARDrone to build a map of the world.

# Appendix

1. Github Link for packages - [https://github.com/eYSIP-2017/eYSIP-2017\\_Indoor-Environments-Mapping-using-UAV](https://github.com/eYSIP-2017/eYSIP-2017_Indoor-Environments-Mapping-using-UAV)
2. Link to install Gazebo7 - [https://github.com/eYSIP-2017/eYSIP-2017\\_Indoor-Environments-Mapping-using-UAV/blob/master/bash\\_scripts/install\\_gazebo7.sh](https://github.com/eYSIP-2017/eYSIP-2017_Indoor-Environments-Mapping-using-UAV/blob/master/bash_scripts/install_gazebo7.sh)
3. Bash Script to launch all nodes and scripts for keyboard mapping - [https://github.com/eYSIP-2017/eYSIP-2017\\_Indoor-Environments-Mapping-using-UAV/blob/master/bash\\_scripts/keyboard\\_mapping.sh](https://github.com/eYSIP-2017/eYSIP-2017_Indoor-Environments-Mapping-using-UAV/blob/master/bash_scripts/keyboard_mapping.sh)
4. Full video link - <https://youtu.be/cg0Gf3kulE8>

**THANK YOU!**