RGB-D SLAM

This guide demonstrates how to use the RGB-D SLAM ROS package on Ubuntu 14.04. A video for this guide is included in this portfolio as *'VIDEO: RGB-D SLAM tutorial'*.

- In this portfolio, go to ***/Tech report/Code/ros_catkin_ws/src/rgbdslam_v2-indigo/launch***

- Copy ***demo_rgbdslam.launch*** to your own ROS workspace, at ***~/simulation/ros_catkin_ws/src/rgbdslam_v2-indigo/launch***. In this file, a RGB-D SLAM ROS node is started, and parameters for the SLAM algorithm can be optimised to work best with your dataset. For a complete overview of all parameters, take a look at ***~/simulation/ros_catkin_ws/src/rgbdslam_v2-indigo/src/parameter_server.cpp***

- If you intend to run the algorithm live, connect a Kinect camera to your laptop and run the freenect driver:
  > ***roslaunch freenect_launch freenect.launch***

However, I advise to use a dataset. This way, you can empirically set the RGB-D SLAM parameters in the ***demo_rgbdslam.launch*** file to create an optimal map of the environment. If you have followed the dataset tutorials in this portfolio, you will have created a bagfile for RGB-D SLAM. If not, take a look at *'Record a dataset for RGB-D SLAM'*.

- Open a terminal and go to the folder where you saved the bagfile

- Play the bagfile:
  > ***rosbag play –clock <your_bag> -s <starttime> -r <speed> -u <stoptime>***

  'Starttime' and 'stoptime' are parameters in seconds, that tell the bagfile which part of the bag has to be played. 'Speed' is the speed at which the bag should be played. For RGB-D SLAM, slower is better. If you play the bagfile slower, more frames will be processed by the algorithm. Keep in mind that RGB-D SLAM demands a lot of computational resources, it could crash if there are too many frames to be processed.

- In the RGB-D SLAM GUI, you can see a point cloud being rendered. When your dataset has finished playing, you can go to **'Save'** and save a point cloud, an OctoMap, a feature map, a g2o graph and a trajectory estimate.

- If you want to visualize to OctoMap, first save it. When the OctoMap is rendered, open a terminal and go to the save folder. Type 'octovis', followed by the OctoMap file name. You will see the OctoMap in a new GUI, where you can change the resolution. To view free space, type 'f'. To view the data structure, type 's'.