

# 3D Localisation using NDT algorithm task procedure

## Day 1:

1. Installed ROS melodic and ROS2 dashing on Ubuntu 18.04
  - (a) Since ROS2 dashing is supported on Ubuntu 18.04 and ROS melodic is mainly targeted at Ubuntu 18.04 as well, I had to upgrade my Linux distribution from Ubuntu 16.04 to Ubuntu 18.04. While upgrading the system I had to solve numerous issues related to software packages compability and GUI problems
  - (b) Forked given ndt\_matching skeleton repository (which is available here - [https://github.com/woookey/ndt\\_matching](https://github.com/woookey/ndt_matching))
2. Visualised both the map available from map.pcd and lidar\_data.bag using RVIZ to get the feeling about the environment and published messages
  - (a) Found out that the map.pcd can be transformed to /PointCloud2 using PCL package, specifically using the following command, `roslaunch pcl_ros pcd_to_pointcloud map.pcd` on ROS Melodic. Be default the node would publish all data in one message on topic name /cloud\_pcd with frame id /base\_link. The visualised map is shown in Figure 1. To make it work correctly on RVIZ, I had to set the global fixed frame to /base\_link.

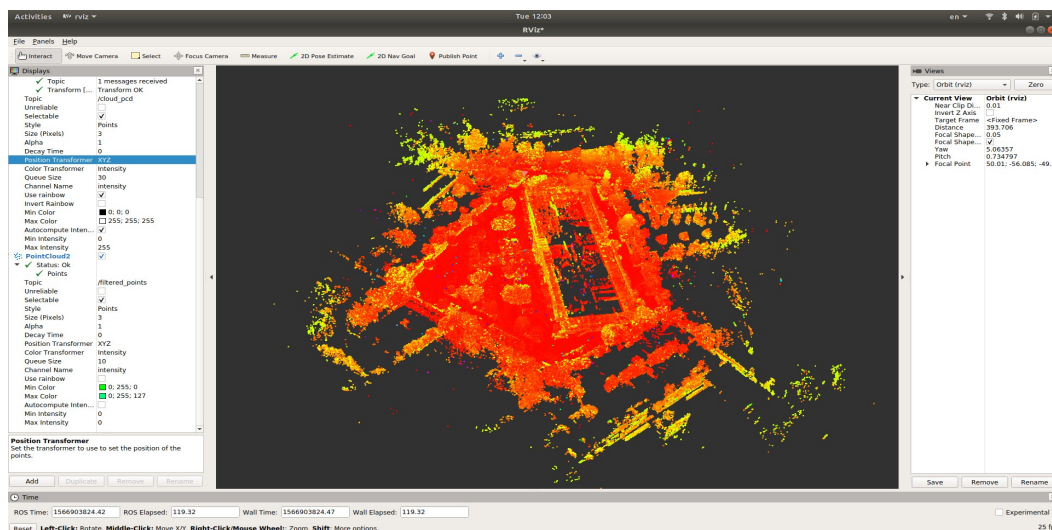


Figure 1: Map visualised in RVIZ

- (b) By subscribing RVIZ to /filtered\_points topic I could visualise the LIDAR data recorded in lidar\_data.bag using `roslaunch play lidar_data.bag` command on ROS Melodic. The visualised one step of time is shown in Figure 2. The message type was also /PointCloud2 and the bag record consisted of 1275 messages.

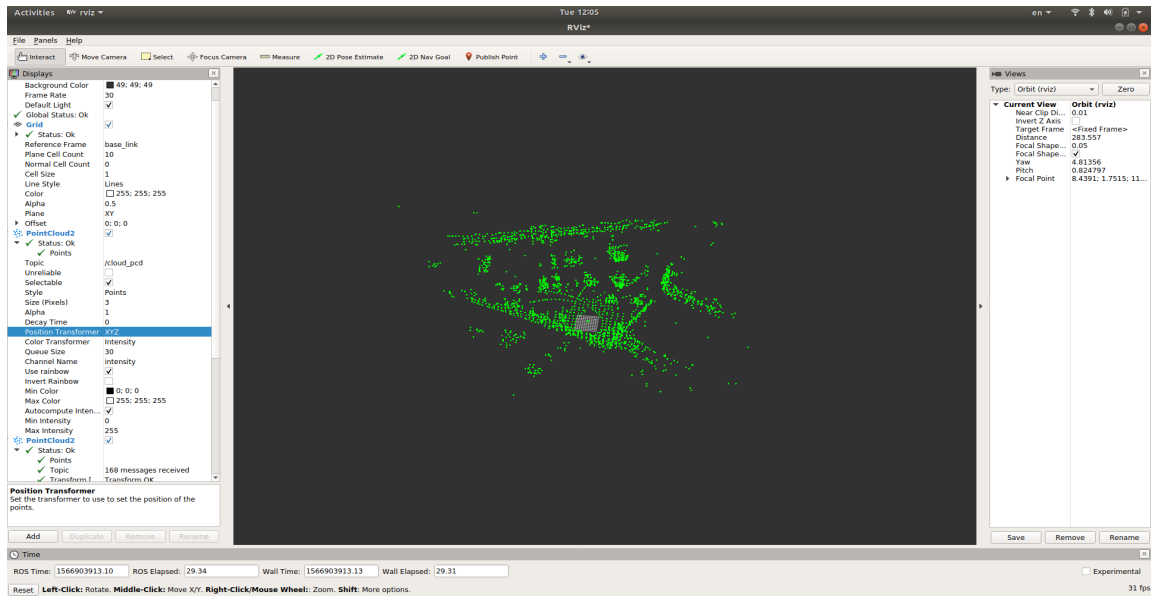


Figure 2: Visualised LIDAR measurements in RVIZ

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