

SSRR Rescue Camp Exercises

Date: Monday, October 21, 2013

Location: Linköping, Sweden

Prior knowledge: Linux terminal basic commands, compilation using CMake, basic ROS tools

Goal: get used to already existing registration tools and learn the basic steps to design a custom solution of a given problem.

Installation

Mapping ROS stack

Assuming that you are on Ubuntu 12.04 and have ROS Fuerte or Groovy installed:

```
$ sudo apt-get install ros-fuerte-ethzasl-icp-mapping
```

If you can't find the debian package you can compile the ROS package from source by following the instruction there: http://wiki.ros.org/ethzasl_icp_mapping

Paraview

Paraview is a free and multiplatform 3D viewer maintained by Kitware (the same company supporting CMake). It is mainly used to display simulation outputs from clusters and allow a high level of interaction with the data. In our case, we will use it to display debug information of ICP registration. You can install it using apt-get but we suggest to download the binaries from their web site for a more recent version.

Download: <http://www.paraview.org/paraview/resources/software.php>

Unarchive the repository, open a terminal and move to its root. You should be able to launch Paraview with:

```
$ YOUR_PARAVIEW_PATH/bin/paraview
```

Extra: If you want to launch it from any location, you can append its path to your \$PATH environment variable with the `export` command. You can add the export command to your `bashrc` script to not re-export the path in every new console you open.

Data sets

For the exercises, we will use two types of file format: *.vtk and *.bag. The VTK format will be used for the case where we want to register only two point clouds together where a single VTK file represents one point cloud. The bag format will simulate a stream of laser inputs aggregated in a PointCloud2 type of message.

Download link (87 MB):

http://robotics.ethz.ch/~asl-datasets/SSRR_summerSchool/SSRR_ICP_exercises.tar.gz

Extra: The VTK files used are part of a 3D data sets called *Challenging data sets for point cloud registration algorithms*¹, which covers multiple types of environments with ground truth information in the order of millimeters. More information about the recording setup can be found on the data set web page².

¹ F. Pomerleau, M. Liu, F. Colas, and R. Siegwart, *Challenging data sets for point cloud registration algorithms*, **International Journal of Robotic Research**, vol. 31, no. 14, pp. 1705–1711, Dec. 2012.

² <http://projects.asl.ethz.ch/datasets/doku.php?id=hardware:tiltinglaser>