Sheet 8

Topic: Least-Squares

Submission deadline: January, 14
Submit to: robotmappingtutors@informatik.uni-freiburg.de

Exercise: Odometry Calibration

Implement an odometry calibration tool based on a least-squares method as presented in the lecture. To support this task, we provide a small Octave framework (see course website). The framework contains the following folders:

- **data** contains the recorded raw odometry and the motion estimated by a scan-matcher for each time step.
- **octave** contains the Octave framework with stubs to complete.
- **plots** this folder is used to store images.

The below mentioned tasks should be implemented inside the framework in the directory **octave** by completing the stubs:

- Implement the functions in **ls_calibrate_odometry.m** for constructing and solving the least-squares system.
- Implement the function in **apply_odometry_correction.m** for applying the calibration matrix to a set of odometry measurements.
- Implement the function in **compute_trajectory.m** for chaining up the relative odometry measurements.

After implementing the missing parts, you can run the framework. To do that, change into the directory **octave** and launch Octave. To start the main loop, type **LSCalibrateOdometry**. The script will produce a plot showing the trajectory of the raw odometry measurements, the estimate obtained by scan-matching, and the odometry after applying the calibration. This plot will be saved in the **plots** directory.

The file **odometry-calibration-result.png** depicts the result that you should obtain.