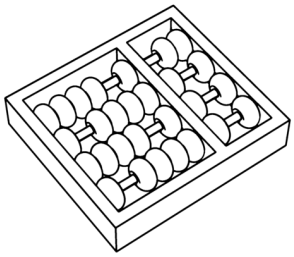

MC907/MO651 - Robótica Móvel
Instituto de Computação - Unicamp
Segundo Semestre de 2019
Profa. Esther Colombini
esther@ic.unicamp.br
http://ic.unicamp.br/~esther/teaching/2019s2/mo651

Project 1 (P1)
Deadline: 22/09/2018

1 Goals

The general objective of this work is to build, on the V-REP robotic simulator, an odometry and feature extraction system for the Pioneer P3-DX robot.

2 Description

More specifically, the system to be built must:

- Implement the kinematic model of the differential robot P3DX;
- Compute the robot odometry through its kinematic model;
- Acquire sensor data as the robot moves around and display features (point cloud, objects, etc.) extracted from them in global coordinates. The choice of sensors and features to be extracted will be part of the project evaluation;
- Compare the computed trajectory via odometry with the Ground Truth values provided by the simulator.

Additionally, the following points may be considered:

- Merge odometry with an orientation sensor to improve pose estimation;
- Merge sensors in general;

3 Evaluation

The system should be evaluated according to the quality of the solutions found and a critical evaluation is expected on the relationship between adopted parameters x solution quality. Graphs, tables and images representing the results are expected. Further comparisons with the literature are welcome, although not mandatory.

4 Groups

The project can be carried out by groups of up to 4 members.

5 Simulator, Programming Language and Libraries

The simulator adopted in the discipline is the VREP. The programming language used in the work is free and the use of libraries is allowed.

6 Submission and Report

The report must be submitted by the Moodle system (https://www.ggte.unicamp.br/ea/) in the area corresponding to the course. Delivery consists of:

- **For groups that choose Python as their programming language**: The notebook with the implementation/execution of experiments and comments in code describing the implemented approach and discussing the results;
- **For groups that choose other languages**: A report, maximum 4 pages, with the definition of the problem, the solution and the results obtained. The report template is available on the course website.