Improving SLAM Algorithms for Autonomous Robots

Project proposal

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1 Goals

Almost all autonomous robots need to use Simultaneous Location and Mapping (SLAM) algorithms [4, 3, 2, 1]. Although there are several available methods they are not tolerant to noise when creating the base map.

This noise can come from the presence of objects that do not have a permanent location in the scene, such as persons or chairs.

With this project we want to make a SLAM approach more flexible in terms of what are the objects that are included in the base map, allowing for the posterior removal or location modification of these types of objects.

A comparison of the sensibility to this problem will also be done among 3 existing SLAM methods.

The code will be done on the Robot Operating System (ROS) [5] in Python.

2 Work plan

The project has the following tasks:

T1 Introduction to SLAM (3 weeks).
T2 Learn to use ROS (2 weeks).
T3 Implement a modification to a SLAM method to make it more flexible (9 weeks).

T4 Write the project's report (3 weeks).

3 Technical and Academic Requirements

Be able to program using Python on linux, use a source code repository and produce documentation (using doxygen or other similar tool).

It is desirable that the student has grades above 13 on the following courses:

- Estruturas de Dados
- Probabilidades e Estatística
- Inteligência Artificial

4 Expected Results

- 1 implementation of the method
- 1 documentation of all code developed
- 1 project report

5 References


6 Contact

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