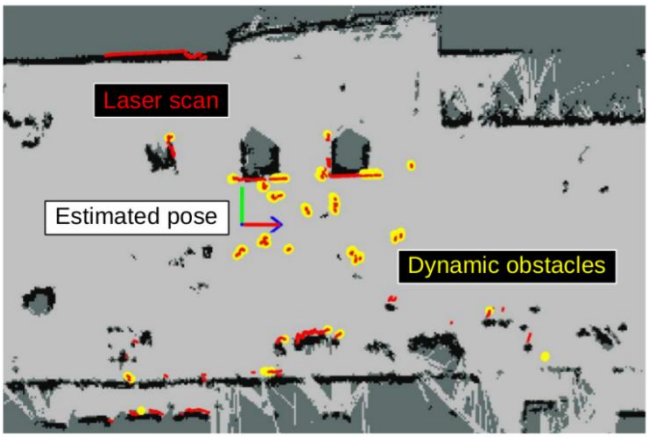
EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

Mathematisch-Naturwissenschaftliche Fakultät
Fachbereich Informatik
Kognitive Systeme (Prof. A. Zell)

Bachelorarbeit

Robust Monte Carlo Localization in Dynamic Environments



In mobile robotics, particle filters can be applied for localization in a known environment. They compare sensor measurements with a given map, using a so-called “sensor model”. Commonly used sensor models are developed to represent the sensor characteristics, but may behave unstable in dynamic environments.

Recently, a novel sensor model was proposed, which extends the likelihood field model by implicitly classifying sensor measurements into “mapped” and “unmapped” observations. This way, the pose estimation process becomes robust against unforeseen obstructions like moving people.

In this work, this sensor model is to be implemented for 2D occupancy grid maps and integrated into an existing Monte Carlo Localization framework. Further, it shall be investigated, if an existing sensor model for (Occupancy) Normal Distributions Transforms maps can be extended in a similar manner.

To evaluate the effects of the new sensor models, experiments are to be conducted in both dynamic and static environments. Therefore, the Rawseeds Dataset and Benchmarking Toolkit shall be used to compare the different sensor models.

The approach shall be implemented in C++ under Linux and using ROS. The thesis may be written either in English or in German.

Contact

Cornelia Schulz
Sand 1, Room 317
Tel. (07071) 29-77174
cornelia.schulz@uni-tuebingen.de