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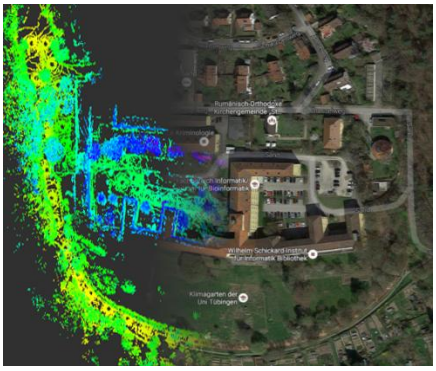
Mathematisch-Naturwissenschaftliche Fakultät
Fachbereich Informatik
Kognitive Systeme (Prof. A. Zell)

Masterarbeit

Multi-Modal SLAM for Outdoor Robots

Large-scale outdoor navigation is still an interesting problem in mobile robotics. Though there are many good SLAM systems available, most of them still suffer the problem of applicability in scenarios involving long-term deployment. Additionally, most of these systems are limited to one specific map representation, which can be disadvantageous when fusing the input of different sensors.



The goal of this thesis is to develop a multi-map SLAM system, which uses suitable map representations for different input sensor types or meta-information, e.g. occupancy grid maps, NDT maps and semantic maps. Position tracking within the system should be realized based on existing approaches, such as EKFs or particle filters.

To make the SLAM system suitable for application scenarios with long-term deployment in large-scale environments, lightweight map representations should be used. Additionally, these maps should be split up into smaller map tiles, as already introduced through an approach which is called Hybrid Metric-Topological 3D Mapping.

Requirements:

- C++
- ROS and Linux
- Linear Algebra

Kontakt

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