EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

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

Masterarbeit

Sensor fusion for self-localization of a smart rollator

Precise self-localisation is crucial for performing tasks like navigation and obstacle avoidance. Many robots are equipped with several sensors collecting data about the robot's motion. Fusing this data from different sources can greatly improve the pose prediction.

Our beActive+e smart rollator prototype is equipped with a camera for visual odometry, wheel odometry, an inertial measurement unit (IMU) and a GPS module. For fusing the outputs of these, different filters should be compared, e.g.:

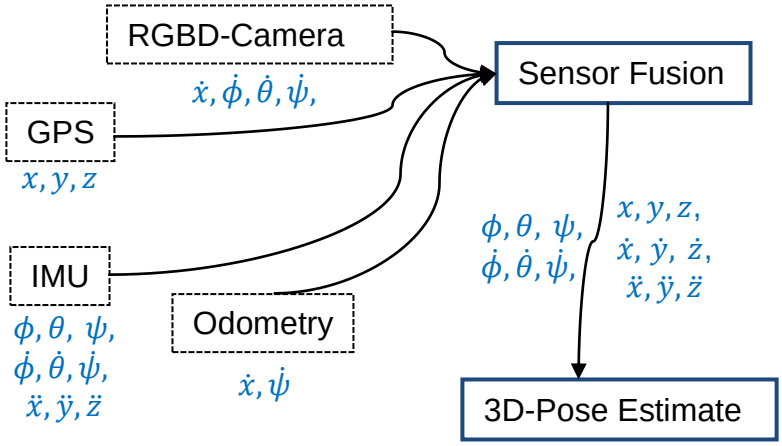
- Extended Kalman Filter
- Unscented Kalman Filter
- Smooth Variable Structure Filter

For implementation and testing, the MUSE sensor fusion framework can be used.

The goal of this thesis is to implement these methods and evaluate which combination of sensors and filter provides the most accurate and robust self-localization.

Requirements:

- Strong mathematical background
- Good programming skills (C++)
- Knowledge of *ROS (Robot Operating System)* is beneficial



Contact

Julian Jordan
Sand 1, Room 316
Tel. (07071) 29-77175
julian.jordan@uni-tuebingen.de