

Master's Thesis

Development of a Path Planning System for Mobile Agents using a Cooperative Visual SLAM system

In this work, the student shall develop a path planning system for mobile agents (in this case a 6-wheel robot platform). The agents are equipped with a visual sensor (stereo or RGB-D camera) and use a cooperative visual SLAM system for pose estimation. In addition, the visual sensors are used to build up a detailed map of the environment.

Since, in our case, the area is unknown in the beginning, the path planning can be divided into two parts:

- 1) Exploration of the environment
- 2) Keeping the map up-to-date by patrolling

Since the pose estimation and map can contain uncertainties, misalignments and dynamic objects, the path planning system has to adapt to the environment. In addition, the agents should cooperate and work as efficient as possible.

Tasks:

- Research state-of-the-art path planning algorithms
- Research visual localization and mapping methods
- Set up simulation
- Develop multi-agent path planning system
- Evaluate your approach to other systems

Prerequisites

- C++
- ROS

Advisors

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