Master's thesis / semester project

Robot Motion and Task Planning with Simulation and Experiment

Description:

Nowadays robots are capable of autonomous navigation, sensing, interacting with the workspace and so on. An interesting research direction is to develop a system that fully integrates these components, such that the robot can execute a user-defined task in a fully autonomous way. Particularly, we rely on Linear Temporal Logic (LTL) for the user to formally and intuitively specify a control task, while a hybrid control framework is designed for the robot by fusing the task planning module and the continuous motion/action module.

As part of the EU project Co4Robots (http://www.co4robots.eu/), the goals of this project are to: (1) understand the task planning software used at Automatic Control Lab; (2) develop an interface between the software and Robot Operation System (ROS); (3) build an integrated simulation environment within Gazebo of ROS; (4) design and implement relevant demonstrations with robots such as TurtleBot 2.

The experimental testbed is located at the Smart Mobility Lab, consisting of the Qualisys Motion Capture system, distributed wireless sensor networks, several quadrotors, small scale ground vehicles and robotic arms.
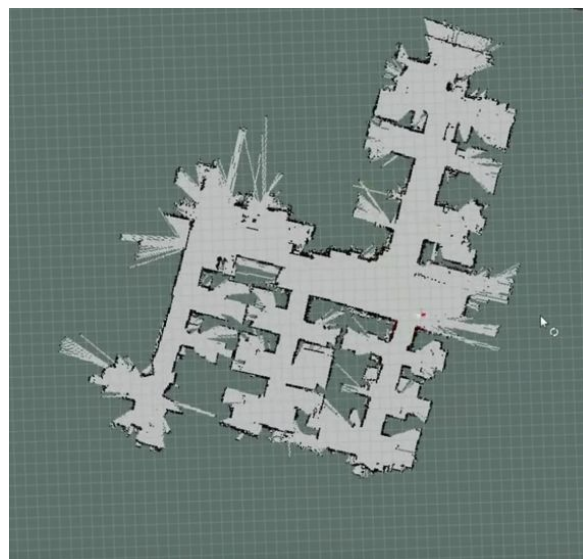
Prerequisites: Python, ROS, Courses in automatic control
Available date: 2017-March-16
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