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Bachelor Thesis/ Internship

Experimental Validation of a Multi-Robot Gas Source Localization Strategy in GNSS Denied Environment

Your mission:

In the department of Communications Systems at the Institute of Communications and Navigation, two research groups look at mobile robotic swarm systems with slightly different focus. One focus is on Swarm Navigation tackling the challenge of estimating the locations and attitudes of swarm entities and other objects, without the support of an external navigation system like GNSS.

The second focus is on Swarm Exploration strategies guiding mobile robots with the objective to collect information about the environment. For example, mobile robots are a suitable platform for monitoring toxic or dangerous airborne trace substances and gas concentrations in disaster scenarios or after technological accidents. Equipped with appropriate sensors robots can be employed to build gas distribution maps or localize emission sources.

The goal of the Thesis/ Internship is to bring the two approaches together in an experiment with our swarm ecosystem. The tasks cover adaptation of existing software components for Swarm Exploration and Swarm Navigation and their fusion. Further, it involves configuration and parameterization of a robotic path planner to account for the radio-based swarm positioning system.



Figure 1 Rover fleet dedicated to the experimental validation

Your qualifications:

- Excellent programming skills in ROS, Python or C++
- Very strong interest in implementation tasks and experiments
- Self-motivated working and a good working knowledge of English

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Deutsches Zentrum
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