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für Luft- und Raumfahrt
German Aerospace Center**

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DLR – DAAD Fellowships

Fellowship No. 625

Research Area :	Space
Research Topic:	**Design and Validation of Decentralized Swarm Navigation Algorithms for Lunar Exploration**
DLR Institute:	Institute of Communications and Navigation, Oberpfaffenhofen, Germany
Position:	Doctoral Fellow
Openings:	1

Job Specification: A robotic swarm can rapidly explore a vast area, conduct simultaneous observations from different locations and avoid single points of failure, leading to a paradigm shift for future space exploration missions. The autonomous navigation capability is an essential prerequisite for exploration, particularly in environments limited or even without satellite navigation infrastructure. Each robot in the swarm needs to localize itself and choose its own trajectory for exploration and improved self-localization. Both components, localization and control, are essentials for swarm navigation. In addition, any existing navigation infrastructure being available, e.g., around the moon, can be jointly exploited, such as signals from a lunar communication and navigation service.

Within this fellowship you will design and validate swarm navigation algorithms. These navigation algorithms shall exploit radio signals exchanged among all agents within the swarm, satellite navigation signals, as well as additional local sensors such as inertial measurement units for self-localization of robots in a swarm.

The research of this fellowship should be verified both in simulations and in experiments with our fleet of rovers. Research results will be published at top conferences and top journals.

Required Qualification: M.Sc. in Electrical Engineering / Computer Science / Mathematics / Telecommunications with excellent grades; profound knowledge in at least one of the following areas: digital signal processing, estimation theory and statistics.

Advantageous Skills: Experience with MATLAB, ROS2, Python, C++, sensor fusion, control theory and Bayesian estimation, machine learning, software defined radios.

English competence: See requirements on www.daad.de/dlr

Earliest Start Date: 01.02.2024

Application Deadline: Until position filled

Further Information: http://www.dlr.de
http://www.daad.de/dlr