inspire AG is the leading Swiss competence centre for product innovation and advanced manufacturing. As a strategic partner of ETH Zurich, our mission is to transfer knowledge and technology from research to Swiss machine, electrical and metal industries.

The research group **Control and Automation at inspire** offers in collaboration with **Tinamu Labs AG**, a Swiss deep-tech spin-off from ETH Zurich that develops an end-to-end automated drone system for indoor monitoring and inventory management. Their solution allows industrial clients, such as those in metals, minerals, and construction, to gain visibility and control over their physical assets.

Research Engineer – Robust Navigation of Quadrotors

Our research group works on increasing the efficiency of robotics systems in real-world deployment by enabling safe learning and adaptation as well as robust navigation. For this, we develop mapping, localization, and optimization techniques to be used in robust flight tasks with our industry partner.

We are seeking a highly skilled Robotics Engineer to enhance the robust, autonomous navigation capabilities of quadrotor platforms. The primary focus of this role the development of robust methods for accurate localization and loop closure for continuous data in known and unknown environments. The engineer will develop localization techniques to be used with existing and/or newly learned maps to implement collision avoidance and similar advanced techniques to ensure safe flight.

Your Tasks

- Design and implement methods to achieve instantaneous and robust relocalization after any tracking failure, ensuring uninterrupted state estimation
- Develop and integrate backend optimization techniques (e.g., Graph SLAM, pose graph optimization) to detect, verify, and correct for drift with loop closure.
- Implement advanced controllers and integrate collision avoidance features for robust navigation
- Proof-of-concept studies on selected application cases
- Collaborate with an industrial partner.

Required experience

- CH/EU/EFTA citizenship or a valid work permit for Switzerland
- Master's degree (university) in robotics, electrical or mechanical engineering, or CS.
- Solid theoretical and practical knowledge of pose optimization, loop closure, Visual/LiDAR-inertial odometry, optimization theory, and control theory (MPC and related methods for collision avoidance).
- Excellent coding skills in C++ and Python in a ROS/ROS 2 environment, including hands-on experience with hardware and firmware
- An excellent knowledge (written/oral) of English is a must. Knowledge of German is beneficial.

Required people skills

- Highly self-organized and structured way of working and solution orientation.
- High motivation and willingness to learn new skills.
- High level of teamwork, positive work attitude and creativity.
- Willingness to supervise and support student projects.

We offer a full-time position for a robotics engineer in our group as part of our collaboration with Tinamu Labs AG. Through the close cooperation with our project partner, you will quickly establish contacts to industry. In our young team you will work at the forefront of today's knowledge in robust navigation. Please send your full application (cover letter, transcripts, CV, references) with reference "Robust Navigation" to our HR department (hr@inspire.ch).

For technical questions, please contact Dr. Efe Balta, Head of Control and Automation (efe.balta@inspire.ch). Please also visit our website www.inspire.ch.