

Fusion of UWB Range Data with Visual-Inertial Localization for Aerial Robots Navigation in Underground Settings

Project goal: This project aims to enhance an existing visual-inertial localization system with range data coming from Ultra-Wide Band (UWB) nodes. The goal is to enhance the navigation capabilities of aerial robots tasked to operate in underground environments. Of particular importance is that the electronics to be integrated on the robot remain as lightweight as possible. Fusion should take place in a versatile manner, e.g., through a respective update in a Kalman Filtering fashion.



Research Tasks:

- Literature review on state estimation and visual-inertial localization
- Search for UWB products and assessment of which module should be integrated
- Integration onboard a small aerial robot
- Acquisition of range data
- Fusion of range data with the existing visual-inertial localization system
- Experimental evaluation in the lab and the field

Required Skills:

- Good understanding of state estimation
- Experience in C++ programming
- Experience with Robot Operating System (ROS)
- Embedded systems background

Contact Details:

If you are interested in this project, please send you transcripts and CV to Dr. Kostas Alexis (kalexis@unr.edu) or Dr. Christos Papachristos (cpapachristos@unr.edu).