Formation Control of a Quadcopter Swarm

Bachelor's Thesis

Control of quadcopter swarms is a research area with diverse applications ranging from agriculture and environmental monitoring to search and rescue operations and entertainment. Each quadcopter operates autonomously, exchanging information with other quadcopters via a communication network. Each quadcopter adjusts its behavior based on the information provided through this communication network to achieve a collective goal.

In formation control, each individual quadcopter establishes and maintains a specified distance from the other quadcopters while executing different tasks, e.g., following a common path. This work focuses on realizing formation control using an open-source flying development platform.
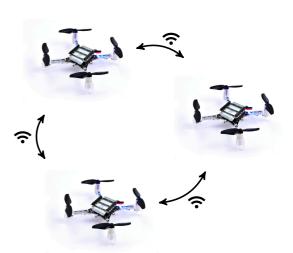
Your tasks will be:

- Literature review on formation control for multi-agent systems
- Controller and communication network design
- Experimental evaluation using Bitcraze's Crazyflies[1]

Experience with / knowledge about:	Linear control theory, graph theory
Programming skills:	Python, ROS 2
Language:	English (final report), German

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1 https://www.bitcraze.io/products/crazyflie-2-1-plus/