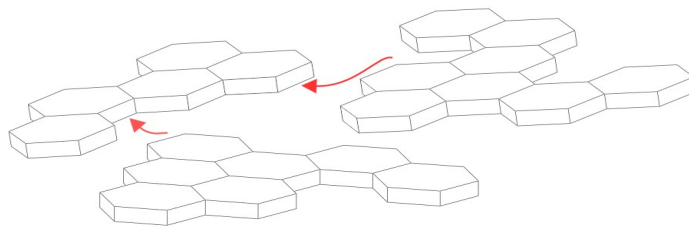


**Semester Project / Master Thesis**  
**IDSC-RD-MK-12**

# Reconfiguration of the DFA in Flight

*Design and implement an algorithm that allows the DFA to change its topology while flying*

**Description:**

The Distributed Flight Array (DFA) is a vehicle consisting of single-propeller modules that are able to drive autonomously and self-assemble with their peers on the ground. Once modules are connected, the DFA becomes a multi-propeller system capable of coordinated flight. For more information, visit: [http://www.idsc.ethz.ch/Research\\_DAndrea/DFA](http://www.idsc.ethz.ch/Research_DAndrea/DFA)

At this stage, the modules assemble in random configurations on the ground and take off to hover in the air. The modules determine the topology of the vehicle before flight, which forms the basis for a parameterized flight controller. This project aims at changing the topology of the vehicle dynamically while flying. One could imagine several modules breaking off a flying vehicle, or separate flying vehicles joining to form a larger one.

The successful applicant will familiarize him-/herself with the current implementation and status of the DFA, develop a concept for dynamic topology changes, and design adequate algorithms. The ultimate goal of this project is to show that the DFA can break apart and/or assemble during flight.

**Prerequisites:**

Strong analytical skills, programming skills in C are an advantage, creativity and enthusiasm are desirable.

**Contact:**

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