Master Thesis

Design and Development of Formation Flying Concepts for a Small Satellites Constellation

Designing and developing formation flying concepts for small satellite constellations is a cutting-edge area in space systems engineering, enabling coordinated operations such as Earth observation, scientific measurements, and communication networks. Formation flying involves multiple satellites maintaining precise relative positions while orbiting Earth, which demands sophisticated guidance, navigation, and control systems.

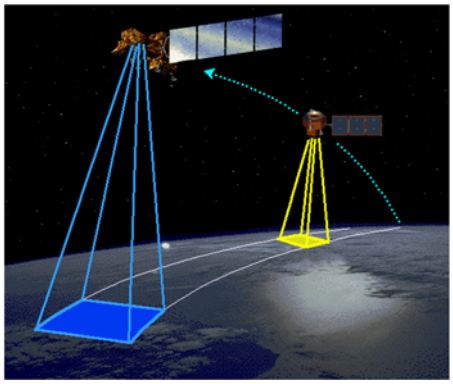
The challenges are significant: limited onboard propulsion and power, communication delays, and the need for autonomous decision-making in dynamic orbital environments. Small satellites, like CubeSats, must also contend with budget constraints and hardware limitations, making it difficult to implement complex coordination algorithms. Ensuring long-term stability and collision avoidance within the formation adds further complexity, requiring innovative solutions in both software and hardware design.

Your Tasks

- Review of missions using formation flying and their concepts
- Identification of challenges and problems faced, especially for small satellite platforms
- Development of formation flying concepts and definition of development approach

Your Profile

- Completed bachelor's degree in electrical engineering, electronics or a related field
- Interest in space activities and satellite missions
- Willingness to actively engage in research work
- Strong problem-solving skills and critical thinking
- Team-oriented and organised



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