Design of an algorithm for a CubeSat in low earth orbit (LEO) that optimizes power usage and controls subsystem priorities during launch and possible failures

We are looking for two motivated Electronic or Electronic-ICT master students.

Project description

The Aether Student CubeSat team brings together young Belgian engineers who are passionate about space technology. We are designing a CubeSat: a nano-satellite small enough to hold in your hand. In the past decade, the CubeSat standard has enabled countless new innovations in the space industry, and we are determined to uphold this tradition!

Aether is focusing on the area of re-entry: creating the technology that will allow future CubeSats to safely re-enter the atmosphere and land on Earth after carrying out their experiments in orbit. This will allow scientists to analyze samples and get even more results out of their experiments, and all this with the affordability and accessibility that come with the CubeSat platform!

Thesis description

This thesis explores the design and implementation of a control algorithm which accounts for the possible flight states of the CubeSat. The aim is to develop a reliable, secure, and efficient control algorithm that can decide on which subsystems and which processes should be prioritized considering the state of the CubeSat.

Thesis objective

The thesis will involve conducting a literature review of existing control algorithms for CubeSats and identifying their limitations in addressing the variability of flight states. The proposed control algorithm can be developed using a finite state machine (FSM) approach to ensure that all possible edge cases are considered. The performance, reliability, and efficiency of the algorithm will be tested and evaluated through simulations. The thesis will also investigate methods for ensuring the security and safety of the control algorithm during operation, as well as identifying the subsystems and processes that should be prioritized based on the state of the CubeSat.

Profile

- Familiarity with finite state machine (FSM) design and implementation.
- Interest in optimizing control algorithms for efficiency and reliability.
- Strong knowledge of C programming language.
- Interest in simulation and testing of control algorithms.

What do you gain?

- A unique engineering experience within an exciting space mission.
- Create added value for your CV and the team.
- A team of students willing to help in any way possible.
- Be part of the team that will revolutionize the CubeSat platform.
- Connection to a wide network of aerospace companies

If you are interested? Please contact us at recruitment@aetherspace.be .
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