

Attitude Control System for FSS CubeSat

Status: Filled

Group Members: Gabriel Fox, Cameron Jinks, Rachel Spinelli, Ian Woodbury

Sponsor(s):

Supervisor(s): Amr Marzouk, PhD, PEng, Lecturer, Mechatronic Systems Engineering
Kevin Oldknow, PhD, PEng, Senior Lecturer, Mechatronic Systems Engineering

Project Description

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Our proposal is to analyze, design, and build an attitude control system for directional orientation and stabilization of a 3U CubeSat (30mm x 10mm x 10mm).

This project will provide ample opportunities for demonstration of skills developed over the course of the Mechatronic Systems Engineering program at SFU, and will fall within an achievable scope. The core of the project will be the development of a controller board and associated control software for the attitude control system, with construction of hardware testing mock-ups and software simulations being secondary supporting activities.

This project will be pursued in partnership with other groups within SFU competing in the Canadian Satellite Design Challenge and Canadian Reduced Gravity Experiment Design Challenge. These partnerships will help define design goals and expand available resources.

Deliverables will include an attitude control system useful for real-world miniaturized satellite applications, as well as in-depth testing and development documentation.

Schedule Milestones:

P-8 months

- Proposal and clear outline of scope of work

P-6 months

- System model (analytical)
 - Define optimum control methods for each axis
 - Define power system requirements
- Catalog of tests
- Bill of materials and working design draft

P-4 months

- Control board prototype built

- Start of controller software development
- P-3 months
 - Testing equipment and mock-ups built
- P-2 months
 - Functional testing of working prototype, controller tuning
- P-1 month
 - Optimized prototype showing rotation control in 3 axis
 - Tuned controller
- P-0
 - Presentation with dense documentation, analysis road map, and clear demonstration