**Abstract**

Masters of Engineering Degree-Aerospace Engineering

**Project Title:** Alpha CubeSat

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This report discusses the design and integration of hardware and software components belonging to the attitude control system (ACS) of the Cornell University Space Systems Design Studio (SSDS) Alpha CubeSat. The Satellite’s overall design and mission are introduced before covering the mission specific requirements of the ACS. The application to the NASA CubeSat Launch Initiative is briefly discussed. The report then covers the Simulink model which simulates the spacecraft dynamics and ACS. The Simulink ACS algorithm was built in C++ through Simulink’s autocoding functionality, and a detailed autocoding guide, containing recommended best practices, is included. The relevant hardware elements of the ACS hardware are introduced before detailing the software written to integrate the system to the point where it can be tested at a flat sat level. The autocoded ACS functionality was tested as an embedded system. The report concludes with discussion of high-risk items and recommendations on future work in preparation for flight.

Project Approved By:

Project Advisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program Director: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_