**Senior Design Project Sample Abstract Form**

**Spring 2018**

Due: 2/9/18

**Project Name: Fiber Optic Sensor for CubeSat**

**Department: Electrical and Computer Engineering**

**Project Participants: Jiayi Ren, Aaron Volpone**

**Instructor: Dr. Grzegorz Chmaj Faculty Advisor: Dr. Ke-Xun Sun**

**Tech. Advisor: Community Advisor:**

**Special Needs/Requests for Competition Space (electricity, internet, extra space, extra table outdoor, and elevator use): Power strip**

**Project Problem Identified? (4 sentences max): Angular correction and alignment in space are extremely important for CubeSat operation in space. Many spacecraft utilize gyroscopes with complex computational hardware for precise adjustment. These types of sensors can be cumbersome – requiring high wattage and prone to failure due to the use of moving parts. With the implementation of fiber optics, these issues may be circumvented.**

**Current Market Solutions? (4 sentences max): Most angular displacement sensors for satellites are built for commercial and governmental use only. Usually it requires complex computational systems and uses bulky designs. Since most commercial options aren’t available, private companies that do offer custom parts sell them at incredibly high prices.**

**Team’s Solution, why is it better than current solutions, who will benefit? (8 sentences max): With the advent of fiber optics, avionics can take advantage of higher precision, lower power instruments. The objective of the Fiber Optic Sensor for CubeSat is to accomplish this exact premise. Special infrared fiber optic photodiodes are chosen to minimize environmental interference and maximize data reliability. The Fiber Optic Sensor for CubeSat provides accurate angular displacement sensing with complete custom design under a small budget.**

**Project Summary-Blurb (For Media Purposes): The Fiber Optic Sensor for CubeSat is a sensor module designed by students to be implemented for future use in UNLV’s CubeSat project. Compared to conventional angular sensors such as gyroscopes, this CubeSat fiber optic sensor boasts higher reliability and precision for data computations than current commercial solutions. Fiber optic sensors do not use moving parts. As a result, longevity of the sensor is ensured for flight missions. This is important to consider in the setting of space where repairs are not an option once a satellite is deployed. Ultimately, the fiber optic sensor accomplishes the challenge of angular correction and alignment in space where user controlled steering would be delayed and error-prone.**