

Thesis Project Portfolio

Hypersonic ReEntry Deployable Glider Experiment (HEDGE)

(Technical Report)

**The Frightening Future of Full-Self Driving: A Virtue Ethics Analysis of the Tesla's
Autopilot System**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

Emmanuel Jacob Kenscoff

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Department of Mechanical and Aerospace Engineering

Table of Contents

Sociotechnical Synthesis

Hypersonic ReEntry Deployable Glider Experiment (HEDGE)

The Frightening Future of Full-Self Driving: A Virtue Ethics Analysis of the Tesla's Autopilot System

Prospectus

Sociotechnical Synthesis

My technical report and STS research paper are connected through the topic of experimental and emerging technologies and their implications on the larger society. It is always interesting seeing emerging technologies interact with the environments they are placed in because even if professionals can dedicate numerous hours to coming up with a prediction, the true results will never be known until these technologies are put to test in the real world. However, there are differences in how these papers attempt to address the connecting topic. My technical report attempts to look at the Hypersonic ReEntry Deployment Glider Experiment (HEDGE) as a means of positively impacting the larger society while my STS research paper focuses on the vice versa. Yet, it is clear that they both share how these emerging technologies can impact the larger society.

My technical report focuses on HEDGE, a CubeSat system that attempts to bring satellite technology to the college classroom by creating a low-cost version of the satellites that is being used in order to study the behavior of satellites at hypersonic speeds when orbiting and entering Earth's atmosphere. The current iteration of HEDGE has been worked on over the past three years and is scheduled to be completed and launched into Low-Earth Orbit by Spring 2025. This year has been primarily focused on working on creating a demonstration model that can perform physical tests to collect crucial data to be able to make the correct redesigns. The hope of the demonstration model is to inspire next year's mechanical and aerospace engineers to consider picking up the technical project and completing it so that it can be launched by next Spring.

My STS research paper focuses on a different emerging technology, the Tesla Autopilot System. This paper primarily focused on using virtue ethics, which examines the characteristics that one should follow in order to become the most morally correct person. Using virtue ethics, I talked about how Tesla acted immorally when releasing their evolving versions of the Autopilot feature to the larger society because they did not follow two of Pritchard's virtue ethics: commitment to quality and cooperativeness. I concluded that if Tesla continues to act immorally and not show more commitment to making the Autopilot feature morally correct, I see that it can lead to the result of more fatal deaths and consumers believing that the Autopilot feature is capable of full-self driving when it is truly semi autonomous.

Having the opportunity to work on both of these projects has allowed me to greatly see the value of both works throughout the academic year. It was the research on the Autopilot System that greatly influenced my thoughts on HEDGE as well as my future work as a mechanical engineer. As we enter the era of rapidly evolving technology such as artificial intelligence, I think it's also fair to question the morality of the companies behind these products to really know their true intentions. If these companies do not see the larger society as valuable humans, then they should be removed from the larger society. Therefore, I think that applying virtues such as Pritchard's can allow the larger society to put a clearer lens on the monopolies of today's society and truly see them at their core.