Thesis Project Portfolio

Self Balancing Remote Control Toy Bike

(Technical Report)

The Impacts of Autonomous Systems and How it Affects Society

(STS Research Paper)

An Undergraduate Thesis

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

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Executive Summary

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In a world where technology innovations are rapidly evolving, understanding the impact that this creates is essential to understanding how we are able to deal with our societal problems. My technical research involves developing this technology in the form of a self balancing bike, my team and I developed this project in order to see the feasibility of a self balancing bike in real life, while it does currently serve as a prototype, it does show that it can be replicated on a larger scale. My STS research on the other hand, involves analyzing autonomous systems and how it the adoption of it affects our society as a whole, I chose this statement and topic for my STS research as it not only goes hand in hand with my technical research, but it also provides a better understanding of how we can utilize or adopt systems such as my technical research properly.

My technical research is creating a prototype for a real life version of a self balancing bike, this research aims to determine how feasible it is to replicate this on a larger scale with aims that it might serve to help people with mobility needs or disabilities. This research also hopes to aid the STS research in how the adoption of an autonomous device can benefit multiple facets of society.

From our research, we were able to successfully make the prototype of the self balancing bike work properly, which tells us that with proper tools and a proper adaptation to the larger scale alternative, a self balancing bike that can help mobility disabled people can be replicated and reproduced. However we also notice that since our bike is a prototype that it is inherently easier to balance, therefore replicating it on a larger scale may prove to be more challenging.

For my STS research, I chose to analyze the impacts of the adoption of autonomous system on society and whether or not it will prove to be beneficial, this is significant as the adoption of autonomous systems can cause multiple facets of society and understanding the

adoption process better will allow us to utilize it better when the time comes. The methodology behind this STS research is to look into how adopting autonomous will affect society politically, economically, and socially, this includes how jobs are affected, how politicians respond, and many more.

Based on the research conducted, I have found that while it is very hard to determine whether or not autonomous systems will provide more beneficial than harm due to its vague nature, it will still prove to be more beneficial to society than harm. Yes, introducing autonomous systems to society may take jobs, but it will also create more job openings in the process, while the tradeoff for jobs isn't necessarily one to one as there will be more jobs taken than given, the overall net benefit will prove to be more useful towards society as a whole.