Thesis Project Portfolio

The Development of an Autonomous Platooning Campus Vehicle System

(Technical Report)

Social impact of Autonomous Vehicles and their Future

(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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Spring, 2023

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Sociotechnical Synthesis

For my capstone project, we worked on providing timely and reliable transportation that minimized the number of drivers required, was safe, and provided original functionality as compared to current transportation methods. In order to accomplish this, we had two electric golf carts that we modified to allow semi-autonomous motion through platooning, which means the golf carts would be able to follow each other around with only one driver in the lead cart. It is very important to consider human and social dimensions, as this project directly affected both. These carts, when implemented into society, have the ability to either help people by transporting them to different destinations, or harm people by causing crashes or malfunctioning. This impact can be understood when compared to semi-autonomous vehicles on the market. Semi-autonomous cars have been the cause of crashes worldwide which directly affects the people involved and concerns everyone else. With this said, they have also saved lives with the ability to compensate for human error.

Applying STS theories to this problem, a major one applied was actor-network theory. Actor network theory defines all of the actors in society that interact with each other through a network. Applying this, the actors were the golf carts, other vehicles, people, and the institutions surrounding them. The network was then the transportation system, such as roads, highways, and sidewalks. This theory helped me understand the complex interactions that occur among the actors, and allowed me to determine how to minimize risk and increase safety surrounding my capstone. In order to conduct my research, I used the method of literature review. I planned on using a literature review as it would have been difficult to conduct my own research that would incorporate the many different implementations of autonomy in the world today. By reviewing past papers, I was able to better understand the complexity of the problem across a wide range of perspectives.

I expected to find what the main issues behind implementing autonomy in society were through my research, as well as how these safety concerns could possibly be resolved. I was also able to understand the impact that autonomous vehicles could have given the scenario that they are fully

implemented and are resolved of all their safety issues. When considering my STS research and capstone project together, the two are very closely tied. My capstone project sought to create a semi-autonomous vehicle that, when used in society, would affect those who interact with it, in either a positive or negative way. In order to truly understand the impact, field testing must be completed, and my capstone project is an example of the start to such a process.