

Thesis Portfolio

The Development of an Autonomous Campus Vehicle Through Golf Cart Modifications

(Technical Report)

Newfound Passenger and Pedestrian Safety Implications Regarding Autonomous Vehicles

(STS Research Paper)

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SocioTechnical Synthesis

Currently, motor vehicle accidents are one of the leading causes of death and injuries worldwide. It is estimated that these accidents cause damages worth nearly a trillion dollars annually in the United States alone. Much fruitful research has been conducted on vehicle safety in an effort to mitigate these damages, but car accidents remain a major public health crisis to this day. Autonomous vehicles aim to mitigate and possibly even eradicate the problem altogether. An autonomous vehicle is an automobile capable of sensing its surroundings and moving safely without human input. The objective is for these vehicles to be both safer and more energy-efficient than the conventional human-driven vehicle. One of the crucial reasons that autonomous vehicles have not had such a major impact as some anticipated is the concern over safety. There have already been multiple notable fatalities associated with self-driving cars. As such, research into newfound safety implications for both passengers and pedestrians regarding autonomous vehicles undoubtedly has a place in society. Although there is no straightforward answer to this issue, Thomas Hughes' concept of technological momentum can help in analyzing this multifaceted problem. Hughes proposes that large technological systems capable of altering society as a whole, such as autonomous vehicles, undergo a series of stages. I believe autopilot technology is analogous to Hughes' overarching example of technological momentum in the U.S. electricity grid.

The STS research was conducted with a descriptive approach. A case study was carried out through a survey and an interview. The purpose of both the survey and the interview were to gauge public perception of the technology and the perceived safety benefits and drawbacks. I hope to shed light onto possible anticipated changes to passenger and pedestrian safety associated with the switch to autonomous vehicle technology. Because this topic does not have much prior literature,

there is a degree of uncertainty regarding the results. Regardless, I believe this data will aid in future research on autonomous vehicle safety. Autonomous vehicle technology has the potential to bring about change to the transportation sector at a scale that would epitomize Hughes' concept of technological momentum. It could introduce a wave of new stakeholders, such as the elderly and disabled, to methods of personal transport. As a result, it is imperative that as driverless technology continues to be developed, an equal, if not greater, amount of effort be put forth towards vehicle safety research. With the current rapid rate of autonomous vehicle development, it is troubling to see a dearth of studies dedicated to investigating safety implications. My research is aimed towards positively contributing to the field of autonomous vehicle safety in an effort to close the gap.