Effect of Autonomous Driving Simulators on Public Trust in Self-Driving Vehicles

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Sociotechnical Synthesis

Autonomous systems are becoming increasingly prevalent in the world today. They will likely be a significant part of daily life within the next few decades. These systems enable humans to carry out tasks with a greater degree of flexibility and ease, though there do exist pressing concerns regarding their implementation into society. Essentially, an autonomous system seeks to remove human oversight and action from the function of a technology, and consequently, dilemmas arise in how these systems will behave in situations that commonly require the complicated nature of human intuition and decision-making. Autonomous systems in technologies such as automobiles require a great deal of testing before being accepted by the public as viable products. Testing these technologies in real life can incur undesirable risks to operators or third parties, and a way to avoid this would be autonomous driving simulators, which would allow manufacturers to develop their products in a safe, simulated environment. My technical project seeks to develop and autonomous driving simulator for use in the development and familiarization with self-driving vehicles. My STS research addresses the process of fostering public trust in autonomous vehicles, and how things like driving simulators can be effective in procuring that trust.

The technical portion of my thesis involved the design and development of an autonomous driving simulator for development and consumer familiarization. The overall process of development consisted of consumer input, target specification, design, acquisition of materials, construction, and testing. As this project is intended to continue to future teams, testing had not been reached since our team was still preoccupied with the development process. After gathering input from customers, we were able to establish our primary goals for achieving the most effective autonomous driving simulator. These target specifications mainly revolved

around fostering user immersion, allowing autonomous features and simulation, minimal delay between input and response, and safety standards and procedures. We then produced our design to address all these specifications. Throughout the process, it became clear which features produced the most effective simulation experience. As we took note of which features did so, we made sure to focus more on the development of those facets of the project. The main takeaway from the technical portion of my research is found in the degree of effectiveness of certain features, and how their presence affects user immersion and satisfaction with the simulator experience.

My STS research sought to assess the process of fostering public trust in autonomous vehicles. Different studies and statistics describing public familiarity with AVs were consulted to construct an idea of where the primary concerns exist. Autonomous driving simulators are one of the primary methods of increasing public trust in AVs. These are effective in that manufacturers can essentially repeat trials without incurring any additional cost or risk. While these of course won't mimic reality to the fullest extent, it is a reasonable consolation in light of the safety enhancements. Other paths to legitimizing the feasibility of autonomous vehicles involved government influence in the development process. Many people would find more trust in manufacturers who provided a greater degree of transparency to their testing data through the government. Opening up testing data to the public would also allow manufacturers to work together in forming the safety procedures of their technologies.

Overall, autonomous systems are undeniably going to be a formative feature of our society in the near future. They will provide vital improvements to our industries and world societies, although there must be a thorough process of safely developing these systems in the meantime. Autonomous driving simulators serve as an effective example of allowing for the

development of such systems. Additionally, it's important that manufacturers of these technologies exert focus on procuring public trust in their systems, and while some consolations might be taken to do so, it is vital to establishing autonomy as a viable feature of future technologies.

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