Thesis Project Portfolio

Front-End Software Internship: Restaurant Ordering Kiosk

(Technical Report)

Public Policy on Road Safety for Autonomous Vehicles in the United States

(STS Research Paper)

An undergraduate Thesis

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Introduction

The intersection of technology with social structures presents unique challenges and opportunities for our ever-evolving society. The topic explored through my capstone project was developing mobile ordering software from scratch for a restaurant kiosk company during my internship this past summer of 2023. My STS research focuses on the integration of autonomous vehicles into urban settings, and how our legislation will work in tangent with the new technology. This synthesis not only bridges my practical technological efforts with sociotechnical analysis but also highlights the importance of considering both the small impacts on individual industries and the large-scale effects on urban infrastructure and regulatory frameworks. While there is not much overlap in their subjects, both cases offer a glimpse as to what we may see in our future society.

Technical/Capstone Project

My technical capstone project was conducted as part of an internship at a software consulting firm, where I contributed to the front-end development of a mobile ordering application designed for integration into restaurant kiosks. This initiative aimed to address and streamline the customer ordering process, enhancing user experience and operational efficiency within the restaurant industry. The project utilized a suite of modern web technologies including NodeJS, React, and TypeScript, enabling the creation of a robust and user-friendly interface. The development process involved several challenges, such as ensuring the adaptability of the application across different restaurant management systems and maintaining database integrity for real-time order updates. The successful implementation of this software not only promised

improved customer satisfaction but also offered insights into the collaborative dynamics and technical challenges of developing industry-specific technological solutions.

STS Research

Parallel to my technical endeavors, my STS research paper explored the complex landscape of autonomous vehicle technology, particularly focusing on autonomous vehicle legislation. Utilizing the Social Construction of Technology (SCOT) framework, the research examined how various social groups, manufacturers, government regulators, and drivers influence the development and regulation of AVs. The paper highlighted the challenges of integrating such advanced technologies into public spaces, including issues of safety, public trust, and the readiness of current regulatory structures to manage emerging technologies. This research underscored the necessity for a robust policy framework that supports technological innovation while ensuring public safety and accommodating societal concerns about privacy and ethical implications.

Conclusion

Working on these projects provided a comprehensive learning experience that highlighted the connection between technical problem-solving and broader sociotechnical implications. The capstone project offered a practical application of technological skills, focusing on immediate user needs and system functionalities in a business context. In contrast, the STS research allowed me to engage with theoretical and policy-oriented aspects of technology integration, considering long-term impacts on society and the necessary frameworks to support sustainable technological advancement. This dual engagement has significantly enriched my understanding of how technologies are developed and implemented within specific social and regulatory contexts. It has revealed the multifaceted nature of technological innovation, where success is not only

measured by the functionality and efficiency of a system but also by its acceptance and integration into the social fabric. The simultaneous work on a practical technological solution and a sociotechnical analysis has been invaluable, providing insights into the dynamic relationship between technology and society. This experience in my final year of academic research and internships has highlighted the importance of developing technological solutions that are mindful of their broader social impacts and has prepared me for a career where I can contribute effectively to both technology development and potential in policy-making. By understanding both the granular details of technical development and the broader implications of technology in society, I am better equipped to contribute to projects that not only advance technological frontiers but also promote social well-being and public safety. Through this sociotechnical synthesis, I have learned to appreciate the complexity of technological interventions in societal contexts and the importance of a balanced approach that considers both technical excellence and sociotechnical responsibility. This synthesis not only serves as an end to my academic endeavors but also as a foundational perspective for my future career in engineering and technology policy.