Introduction

The relationship between my technical capstone project and my STS research paper is one of interdisciplinary exploration, where both projects converge on the broader theme of artificial intelligence's impact on society. While my capstone project delved into the technical aspects of developing an autonomous imaging and spotlight security system, addressing hardware design and software development, my STS research paper explored the ethical considerations surrounding artificial intelligence and data privacy laws, analyzing the social implications of AI technology. Despite their seemingly disparate subject matter, both projects share a common thread in their exploration of the complex interplay between technology and society, highlighting the need for a comprehensive understanding of the societal impacts of technological advancements.

Summary of Capstone Project

My capstone project aimed to develop an advanced automatic spotlight security system, incorporating thermal imaging technology and autonomous robotics. The system utilized a Raspberry Pi for processing real-time video feed and controlling hardware components, including motors and a flashlight. Key features included precision tracking of subjects within a designated perimeter, prioritization of multiple targets, and remote access to the thermal camera feed. Usability considerations were paramount, with a focus on inclusivity and accessibility features. With a thorough analysis of the evolving landscape of security needs, including the impact of the COVID-19 pandemic on crime rates, the project emphasizes the importance of integrating advanced technology into security systems. Radiance employs thermal imaging and AI-driven detection to automatically illuminate and track potential intruders within a designated perimeter, while also allowing for remote monitoring and manual control. The project adopts a multidisciplinary approach, incorporating elements of computer vision, autonomous robotics, and data privacy laws to ensure the system's effectiveness and compliance with regulations. Through legal analysis, qualitative research, and comparative studies, the project aims to provide

comprehensive insights into the ethical and legal implications of constant surveillance and data privacy in security systems. Ultimately, Radiance represents a significant step towards developing innovative security solutions that prioritize safety, privacy, and ethical operation in an increasingly digital and interconnected world. The project also addressed ethical considerations, such as transparency and consent, through user-generated signage and compliance with data privacy regulations.

Summary of STS Research Paper

My STS research investigates the multifaceted impact of Artificial Intelligence (AI) on ethics and data privacy, recognizing the transformative influence of AI across diverse sectors such as healthcare, education, and marketing. With AI's capacity to process extensive data and derive insights, the study identifies significant challenges concerning privacy and security, especially given AI's reliance on vast datasets. By adopting the Social Construction of Technology (SCOT) framework within the context of Science and Technology Studies (STS), my research delves into the complex interplay of societal dynamics, technological development, and ethical considerations surrounding AI. Through a nuanced analysis of current practices, emerging trends, and potential solutions, this research sheds light on the evolving landscape of data privacy in the era of AI. The findings underscore the critical need for robust regulatory frameworks and ethical guidelines to safeguard individuals' privacy rights, mitigate algorithmic biases, and ensure transparency and accountability in AI decision-making processes. This study emphasizes the importance of interdisciplinary collaboration and stakeholder engagement in navigating the ethical challenges posed by AI, advocating for the development of responsible AI systems that align with societal values and norms. Furthermore, the research highlights the necessity for ongoing exploration and innovation in AI ethics, recognizing the inherent uncertainties and limitations in AI technologies. By fostering dialogue and collaboration across disciplines, this research aims to contribute to the advancement of ethical AI development and deployment, ultimately promoting the responsible use of AI for the betterment of society.

Concluding Reflection

Working on both projects one after the other provided valuable insights into the interdisciplinary nature of technology and society, emphasizing the interconnectedness of technical innovation, ethical considerations, and societal dynamics. While my capstone project focused on the technical implementation of an advanced security system, my STS research paper broadened my understanding of the social and ethical implications of artificial intelligence. By exploring both perspectives, I gained a holistic understanding of the complexities surrounding technology's impact on society, highlighting the importance of considering both technical and ethical dimensions in the development and deployment of technological solutions. Moving forward, I am better equipped to navigate the complex challenges at the intersection of technology and society, advocating for the responsible and ethical use of technology to promote societal well-being. Ultimately, the experience of working on both projects enriched my academic journey and prepared me to address the multifaceted challenges posed by emerging technologies in our rapidly evolving world.