Thesis Project Portfolio

Improving Computer Science Curriculum through Cooperative Education

(Technical Report)

A Care Ethics Analysis of the Equifax Data Breach

(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

My technical work and my STS research are connected through a need to use online technology to secure and improve the futures of others. However, the two papers explore this theme through different lenses; the technical paper examines how to use technology through a cooperative education (co-op) program in order to further one's education and future prospects, while the research paper chooses to take a more preventative approach by exploring the implications of failing to protect people's data and technology through analysis of the Equifax data breach. While the technical and research papers differ in how they go about analyzing technological aid, the theme of engineering as the future of others is consistent across both projects.

The CS industry is constantly changing and the CS curriculum at the University of Virginia often fails to prepare students for their future careers or to meet the needs of employers. To address the technical shortcomings, my technical work explores the development of a co-op program, which would combine classroom-based education with practical technical work experience, allowing students to learn by using academic knowledge in practical settings. A successful program would acknowledge the difficulties of onboarding at a new job and provide support for students of varying experience levels through resume workshops, career exploration, interviewing skills, and professional conduct in the workplace. The goal of the proposed program and course changes would be to better prepare students for the workplace by providing them with more experience. This would allow them to be aware of the expectations and experience of beginning a new software engineer job.

My STS research explores the Equifax data breach case using social ethics, which provides a better analysis of how the social dynamics between the employers and employees of Equifax were unbalanced, leading to the failure. The employers had a relationship with the employees and this relationship had three certain obligations of care not met on both sides: project management skills, competency, and cognizance. My paper explores how this lack of ethics led to the failure of the Equifax data breach, representing how technology with unethical roots leads to catastrophe.

By writing both of these papers simultaneously, I was able to gain a good sense of how technology can be both harmful and helpful to the future of society. Cooperative education programs allow students to learn and gain experience that benefits them in future jobs, while the Equifax data breach was an example of how unethical technology fails society and what not to do when creating technology in the future. This contrast is one that should be on the minds of every engineer as it is a tough balance to keep. Through the papers I was able to explore the nuances of both ends of the spectrum, allowing me to become a better engineer in the future.