Thesis Project Portfolio

Improving Digital Footprint Management through Education: Proposal for a New University of Virginia Course

(Technical Report)

Barriers Facing Consumer Data Privacy Legislation in the United States

(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

Claire Moon Cofield

Spring, 2023

Department of Computer Science

Table of Contents

Sociotechnical Synthesis

For my capstone project, I proposed a new Computer Science (CS) course to be taught at the University of Virginia (UVA), which would teach students how to better manage their digital footprints, in order to protect themselves and their professional images. For my STS research project, I delved into the state of data privacy protection laws and regulations in the United States (US). I examined the opinions of the US people on the topic of data privacy and security, the factors hindering the passage of such protections, and the state of such regulations in the analogous governmental body of the European Union (EU). Both projects were motivated by my passion for data privacy, and my interest in both the ways that large scale data collection has been used to bring harm to consumers and the ways that various groups have tried to levy protection against such exploitative data practices. My STS research examines more structural approaches to this protection, such as what can be done from a national legislative standpoint, and my capstone research examines individual approaches, such as learning techniques for better digital hygiene.

Managing one's digital footprint and having a working understanding of the data one generates are two key skills in today's increasingly digitized world. The course I proposed as part of my capstone project, with possible course title Managing Personal Digital Security, would be offered as an elective through the CS Department at UVA. The course could be partially built on the foundations of classes already present at UVA, synthesizing specific parts of the course material from two existing classes – Introduction to Cybersecurity and Privacy in the Internet age – with new material. To determine whether the course is effective, students taking it should be evaluated on their knowledge of digital footprint management practices at the start and end of the course. I expect that the course would be successful, and the evaluations would show an improvement over the course of the semester. Such a course would be beneficial, but would also require revision every few years to stay current with advancements in technology and data science.

In my STS research paper, I explored and analyzed the current status of national consumer data privacy protection policies in the US. I examined national poll results and reactions the US public has had to previous famous news stories related to data aggregation to determine that US citizens do value privacy and security in the face of large-scale data collection. I also discussed the current status of national data privacy protection lawns, and how these fall flat of offering robust protection. To discover why the US has been unable to pass data privacy protection laws at the national level, I compared the US to the analogous EU, which does have comprehensive data privacy protection regulations that offer strong protections for its citizens. Through this comparison, I discovered that the main factor changing the ability of data protection legislation to make it through the different governing bodies is the power that corporations with financial interest in continuing exploitative data practices have in each government. I concluded that the lobbyist influence over and campaign financing focus of US politicians – compared to the parliamentary-funded EU politicians – makes them more susceptible to caving to corporate interests at the expense of their constituents, resulting in the

dearth of data privacy protection laws in the US due to the lucrative opportunities that exploitative data practices offer to companies.

Working on both projects simultaneously was beneficial. Over the course of my STS research, I was able to learn about many new aspects of digital privacy, personal data collection, and large-scale aggregation of consumer data that I had not considered before. Since I was conducting my capstone research project concurrently, I was able to incorporate a lot of the concepts I learned into the curriculum for the course I proposed in my capstone research, since it deals with similar topics. Both projects approached the issue of data privacy from different angles, allowing me to examine the issue from many different perspectives and achieve a more deep and nuanced understanding of the issues surrounding it than I would have gotten from doing these projects in isolation from each other.