Undergraduate Thesis Prospectus

# Building My Own Co-operative: Extending Higher Education into the Software Industry

(technical research project in Computer Science)

# The Struggle over Digital Privacy in the United States

(sociotechnical research problem)

by

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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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**General Research Problem**

*How does the collection of consumer data both benefit and harm individuals that are being advertised to?*

The volume of data collected online doubles about every 40 months (McAfee et al., 2012). Data collection can serve consumers' interests (Blasco-Arcas et al., 2022). Collected data can reveal and characterize public health risks, disclose personal spending patterns, and match consumers to the products they prefer, but it can also promote intrusive marketing, wasteful overconsumption, and time-intensive distractions.

**Building My Own Co-operative: Extending Higher Education into the Software Industry**

*What lessons of generalizable value to professional engineers did my experience at Tatari teach me?*

Education is one of the cornerstones of our society, it is important to always be learning, whether that be in school or in industry. I sought to expand the basis of my knowledge from the University of Virginia to the broader software engineering space. I will document my personal experience in the advertising industry, at a television agency start-up called Tatari. This is a solo project that will also fulfill the requirements for my CS 4991 capstone with technical advisor Professor Daniel Graham from the Computer Science department.

It is well documented that co-operative education benefits students, as they are able to get a taste of the industry in parallel with their higher education pursuits. Benefits include an enhancement of "the student's academic experience, becoming a more mature individual as a result of working with professionals, and improving job placement and salary prospects" (Blair & Millea, 2004). Their research shows students who participate in co-ops have an increase in

salary of around $6,000 and graduate three months earlier than their peers. It was important to me to seek out this experience, so I took off the Spring semester of 2021 in order to pursue an opportunity at Tatari.

Working at Tatari for almost a year during 2021 served as a jumping off point into the industry of software engineering. I was able to continue the development of the skills I learned at the University of Virginia and learn new ones that will aid me in my career as a software developer. I found that a lot of the things I learned at the University translated into helping me learn at Tatari, expanding my skill set, and expanding my general knowledge of computer science. During my time working there, I built an internal metrics reporting system to monitor our key statistics. This project served to nourish my understanding of technology systems and methodologies, both in practice, and while interacting with teams. Overall, I was able to reinforce much of what I learned academically in an industry setting, developing both my technical and non-technical skills as a software engineer.

This experience was invaluable to me, as I solidified my goal of working in the software industry, and became more experienced with current technology. While classes at the University of Virginia are designed to provide group assignments, none came close to working on an actual team in the industry. The experience of being on a team that depends on each other everyday is something that can not be easily replicated in the classroom. I was also able to be exposed to the advertising industry, getting a peek into how some companies manage and use consumer data. At Tatari it was important to use the data ethically, anonymizing any personal information and not targeting individuals when advertising. This aligns with the International Association of Privacy Professionals (IAPP) who stress the importance of data decentralizing (Koerner, 2022). However, it is important to question these practices, and ensure that consumers are even aware of

this data collection, no matter how ethically the data may be stored and used. Being exposed to this aspect of the software industry was eye opening, giving me a healthy suspicion of everything I encounter.

When I finished my co-op I had gained a deeper understanding of the software industry, how consumer data is collected and used, and how that relates to my education at the University of Virginia. I would encourage all of those who have the opportunity to participate in a co-op to take that opportunity as it is a great supplement to their higher education.

**The Struggle over Digital Privacy in the United States**

*In the U.S., how are privacy advocates and data collectors competing to influence digital data privacy standards?*

Digital innovation raises problems of personal privacy. According to Comas (2016), "The potential risk to privacy is one of the greatest downsides of big data." Competing interests struggle to influence the policy responses. In the U.S., data collection and use is comparatively unregulated. In California, however, a recent law requires companies to disclose to users what data they collect (California Consumer Privacy Act of 2018). Privacy advocacies include the International Association of Privacy Professionals (IAPP), the Electronic Privacy Information Center (EPIC), and the Electronic Frontier Foundation (EFF). IAPP advocates for a more individualized approach to data privacy, informing people on how their data can be protected (Koerner, 2022). EPIC and EFF advocate for legislation to protect consumers from data collection and manipulation (EPIC, 2021; Falcon & McKinney, 2021). Companies such as Google and Meta attempt to deflect the responsibility for data privacy onto the consumer

(Google, 2022; Movahedi et al., 2021). In its privacy policies, Google explains how users can restrict collection of their data. Engineering decisions as an opt-out instead of an opt-in leads to much more data being collected. Privacy advocacies also recommend to users to be aware of how their data is being used and opt out when possible. The California Consumer Privacy Act (2018) requires any "business that controls the collection of a consumer's personal information" to "inform consumers" when it collects user data.

Researchers have investigated the personal and social effects of data collection, and have proposed regulations. Soria-Comas and Domingo-Ferrer (2016) found that no governing principles guide such legislation. Few regulations apply online. EPIC remarks "there are numerous authorities the Commission presently has in its toolbox that remain significantly underused or unused entirely" (2021). California has regulated consumer data collection, but assigns extensive responsibilities to users. Busch (2019) recommends a personalized approach to data privacy, similar to what IAPP advocates for, through data disclosures, user education, and informed consent. A report funded by Meta suggests another route for data privacy, recommending stronger protocols to protect data once it is collected (Movahedi et al., 2021). This differs from other approaches because it is not concerned with how or what data should be collected, but how data should be handled once it is collected.

In the U.S., privacy policies typically assign individual users substantial responsibility for their own data, but users often feel ill equipped to bear this responsibility. According to Falcon and McKinney (2021), "More than 90% of Americans feel that they have no control over their data or their online privacy."

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