

Thesis Project Portfolio

Introducing a Database Security Course at the University of Virginia

(Technical Report)

Measuring Employee Wellbeing in Remote Workers

(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, 2022

Department of Computer Science

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Sociotechnical Synthesis

There is no doubt that software engineers joining the workforce must be sufficiently educated and trained in college. Building security and privacy principles into coding practices is not often a strong point of emphasis for software engineers, but security should always be an immediate thought for an engineer in an increasingly digitized age. While on the topic of software engineering, the COVID-19 pandemic completely reshaped the industry, as most/all companies offered a remote work option at some point during the past couple years. It is important for companies to realize that to fairly evaluate their employees, they cannot use the same standards they used in a traditional office setting, as more data points must be encapsulated to accurately evaluate an employee in a remote work setting.

Security in software engineering is becoming more important as costly code flaws / vulnerabilities have shown that bad actors can easily take advantage of websites and databases with weak security reinforcements. Although many colleges do offer some sort of security courses to their students, it is hard to find colleges that offer courses specifically on database security. Since software engineering heavily deals with data, most companies in the industry require their engineers to work with databases and it is incredibly important that software engineers do so with important security principles in mind. As part of my technical project, I propose a new course offering at UVA – CS 4755: Database Security. This class would consist of learning about different types of cyberattacks, current and historical events pertinent to database security, examples of certain types of attacks, and most importantly, how to actually prevent these attacks. Lectures would diverge this information and lab sections would be used to reinforce theoretical material by actually making students use what they have learned to get hands-on and actually secure databases.

While working from home has been very different from working in office for software engineers, most companies still have large strides to take in evaluating their employees fairly. The use of new metrics in addition to the ones currently being used are necessary for this to happen. Most companies are still stuck on using solely metrics that were used in a traditional office setting, but these fail at being able to capture factors like employee wellbeing, mental health, and overall satisfaction with their role. It is important to capture these factors because working from home has affected every software engineer in a unique way, and companies should care about their software engineers being happy and healthy so that they can put forth their best work.

For future researchers looking into these topics, I would highly recommend continuing to monitor both how university curriculums change and how companies continue to adapt to remote work. As someone joining the software engineering industry in August 2022, I am grateful for the opportunity to not only propose a change to the UVA computer science curriculum, but also to propose a change for the software engineering industry as a whole.