

A Sociotechnical Synthesis Submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science  
University of Virginia – Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

**Dev Kumar**

Fall, 2021

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.

Signed: **Dev Kumar**

Date: 11/29/2021

Approved: \_\_\_\_\_

Date:

Richard Jacques

**Introduction**

My STS research topic is on the unexpected risks of artificial intelligence (AI) while my technical project is a system I built during my internship at Salesforce. The two projects are not related. I chose the STS topic because I was taking both a Machine Learning course and Computer Vision course. I had a few choices for my project at Salesforce. I chose the one that I believed would be the most efficient for my team. The synthesis of data and computer science has some powerful applications and the STS paper discusses some of its threats including ethical decisions needed to be made and actors using its influence for nefarious purposes.

**STS/Technical Projects**

In the technical portion of my project I designed a program to discern the differences between special SQL Queries called stored procedures (sprocs). These sprocs are saved SQL Queries to be rerun multiple times. Machines have different versions of each sproc, i.e. it is non-standardized. The program ensured that the sprocs were identical to each other or confirmed the differences. The new process will be used for multiple databases across multiple teams. Society's perception of AI is largely favorable, but there are understated risks that come with its development. The research project examined current, future, and possible legislation to mitigate the likelihood of unanticipated consequences. Technology

companies such as Google and Facebook have programs much more powerful than the government's. High level executives may not be aware of the consequences of the technology. Jack Ma, co-founder of Alibaba, one of the largest public companies of the world, displayed indifference to Elon Musk's warnings of the ramifications of AI's growth. Legislation concerning AI is very miniscule but there are organizations such as the Auditing and Assurance of Algorithms with the goal to professionalize and industrialize AI, ML and associated algorithms.

### **Conclusion**

Technology has been rapidly accelerating recently and will continue to be used to efficiently streamline tasks, but following precautions will be imperative in preventing unexpected consequences. I gained a lot of insight completing my technical project last summer. I had a mentor, but I also had multiple one-on-ones with different members of the team, either for help or seeing what they were working on. I also had meetings with external members to solve problems such as getting proper authentication or learning about particular features and practices exclusive to Salesforce. Overall, the project was challenging yet doable and I now have a better picture of the work I may be doing after graduation.