KINETECH EVICTION RELIEF

HUMAN MACHINE COHABITATION

An Undergraduate Thesis Portfolio

Presented to the Faculty of the

School of Engineering and Applied Science

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science in Computer Science

By

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SOCIOTECHNICAL SYNTHESIS

Automation is a double-edged sword with tremendous potential to both improve the lives of those who are affected by it and bring about catastrophic harm. Within the software engineering industry automation has paved the way for faster developmental solutions but it is not clear what role automation will play in upcoming years. The technical research analyzes the new automatized technologies within software development and their impacts on the industry. Spurred on by the COVID-19 pandemic automation got a foothold in many other industries as well. The STS research focuses on the impacts that this automation will have on workers and society and how automation can be performed while incurring the least amount of harm. The role that automation is playing within software development serves as a case study into how automation impacts high-skill employment. It also functions as an example of how automation can successfully be implemented with less displacement and harm to workers.

My research into the potential and impact of low-code development platforms and automated testing suites gives insight into how these tools may affect the software development industry moving forward. Meanwhile, my reflections on my own experiences using these automated technologies shed light on how they are impacting workers who have to interact with them daily. In order to illuminate these issues, my technical work took the form of a report detailing the time I spent in the summer of 2021 working with the low-code development platform Mendix. Additionally, the report utilizes the latest research into how automation is impacting workers, production, and the quality of the software solutions being produced.

The research concluded that low-code development platforms and automated testing frameworks are not a fad and that their adoption is very likely to expand across the industry until they are the norm rather than the exception. Researchers successfully demonstrated that low-

code development software allows developers to produce software solutions upwards of 20% more efficiently, drastically improving productivity. Automated testing frameworks could eventually eliminate the role of software tester from software engineering teams, but research into this field while promising is still early. I urge the University of Virginia to adapt the curriculum for advanced software development courses to focus on the concepts of the software development cycle and agile development which both translate well to low-code development platforms.

The STS research asks what are the dangers of automation and how can they be mitigated? The paper argues for the existence of two specific types of dangers that occur when automating labor, visible and invisible dangers. In order to mitigate this, a SCOT analysis is performed to develop a method for creating automated technologies which help prevent many of the dangers. The research was compiled from STS journals and coupled with current articles from reputable news sources to give both theoretical and real-world examples of the harm done by automation.

The research found that automation caused direct harm to employees and society in three ways, displacement of laborers, abuse by managerial networks, and political tensions. It was also found that automation indirectly and negatively impacts the lives of workers through algorithmic bias, undervaluing invisible laborers, and human-moral crumple zones. In order to mitigate these dangers and use a social construction of technology analysis, my STS research proposes a human-centered model of automation. The human-centered model of automation makes laborers integral to the design process of automated technology in order to provide the greatest improvements in productivity while slowing the effects of displacement and the harm done by automation.

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PROSPECTUS

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