A Sociotechnical Synthesis Submitted to the Department of Engineering and Society

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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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Introduction

At first glance, there does not appear be an apparent connection to my technical capstone project and the subject of my STS research. My technical project concerned the construction of a semi-autonomous disinfection robot and my STS research explored the relationship of public transportation and its influence on social mobility. Besides the work being done at the University of Virginia and being done at least in part by me, Charles Andrew Kellas, there must be some other six-degrees-of-separation-type of way to connect the two. The one that I find the most plausible and the one explored herein will be the roll of automation. That is, how automation can be used to provide a system of increased safety, and efficiency in its robustness.

The Technical Project

As a direct result of the Covid-19 pandemic, my team and I were asked to develop a disinfection robot. This was to be used to disinfect surfaces that were exposed to the coronavirus. How this would have worked is that ultraviolet (UV) light would be shown on surfaces that may have been contaminated by coronavirus and after sufficient exposure to UV light, killed the virus. There are two benefits to using a robot in this situation. The first is that this eliminates the risk of a human worker cleaning surfaces and their potential exposure to the virus. It also eliminates human exposure to UV light. UV light has been proven to be an effective way to kill the coronavirus. However, exposure to UV light causes skin cancer in humans. This is why (at least an attempt at) automation was used. It can provide safer outcomes for the human actors that are involved.

The STS Research Project

My STS research focused on public transportation as a vehicle (pun intended) for social mobility. In my research, I found that job opportunities were more plentiful to those that had

easy access to public transportation. In addition to this, not only did public transportation just improve opportunities for those that needed it, it also returns several times on the dollar investment back into the economy. But turning away from hard research and more into speculation is where my technical project and STS research can be synthesized. Through the role of automation, a public transportation system can become safer and more robust. With driverless cars frequently making headlines, a decent prediction of the future of public transportation can include these technologies. Although the general public does not believe it, driverless cars have been shown to be a safer alternative to traditional cars with human drivers. Also, through automation it has been shown that existing systems can be extended beyond current capacities and much more efficiently. Automation can be used to extend current transportation to places where it is really needed and do so in a much more efficient and safe way.

Conclusion

Automation is a part of our future. It has been a part of our future for the past fifty years. It can be used to solve technical problems such as disinfecting contaminated surfaces. Given enough research and development it can not only to this efficiently and effectively, it may also provide a cost-effective solution. Automation can also provide a social solution to such problems as deficiency in public transportation. It can be used to provide more fluid movement of social actors through society. I will not say that automation can solve all problems, but it can solve many and we will all be better off for it.