Orthogonal Drawing Robot
(Technical Report)

A Duty Ethics Analysis of Electronic Cigarette Risk Communication
(STS Research Paper)

An Undergraduate Thesis Portfolio

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 in Computer Engineering

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May 1, 2020

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Technologies for Better

The world is constantly progressing and improving. Society and in particular engineers are continuously seeking a newer, faster, cheaper and better way of doing things. Both the technical component and the research topic of my STS project are examples of how technology can be designed to improve the given situation. Although my technical and STS projects pertain to different technologies, working on both projects at the same time has allowed me to explore the idea that technologies are designed to create progress, however society defines it.

A gap in orthographic image production technology causes archaeologists to waste time and money in order to develop three dimensional models of precious artifacts. This problem created the need for a new device to increase the speed of artifact documentation and reduce the possibility to damage the archaeological objects. The technical answer I proposed was an automated drawing machine that would be able to create orthographic projections from a physical artifact. It would work by autonomously photographing the given object and converting those pictures into orthographic images that the device would then physically draw out. The device would be able to take photographs from different angles, scale the image up or down, and detect the edges of the object in order to produce the orthographic images.

In the research phase of my STS project I was able to collect evidence to support my argument that the most ethical way to communicate the risks of electronic cigarettes should not be determined based purely on the consequences of the approach. Instead, I proposed the ethicality of different methods of risk communication should be determined based on how well the approach conforms to moral rules of society today. Since truthfulness and autonomy are widely respected principles of the population, I contended the risk communication of e-cigarettes

must be honest and respect the freedom of individual choice. In order to examine the moral aspects of risk communication for electronic nicotine devices and come to the conclusion that the current approach is unethical I evaluated the situation through a duty ethics framework which considers subjects to be acting in good will if their actions are led by a categorical imperative.

Studying both topics at once provided me with two examples of technologies that surpass the original circumstance in terms of producing outcomes our current society would consider desirable. The device I proposed in my technical work would allow archaeologists to document precious artifacts quicker, more accurately, and with a smaller possibility for damage than when they had to complete their work without the tool. Additionally, the devices I surrounded my research around, electronic cigarettes, were designed to be a safer alternative to smoking. Investigating the methods of risk communication pertaining to these devices led me to discover how important it is to understand the values of society before trying to determine the impact a technology may have on that society. If I were to have completed these phases in isolation I would have missed this grander conclusion that the principles of society help determine whether a device is truly an improvement upon the original arrangement.