Sociotechnical Synthesis

Effective healthcare is paramount to keeping the members of society alive and in the best condition possible. Exploring different avenues to deliver treatments, diagnoses, and prevention are necessary to innovate the current healthcare system. Telemedicine was created in a growing digital landscape making it ideal for synergistically blending both medicine and technology. When anything is created it is important to completely understand both its functional mechanisms and the implications of placing it in the hands of users. To get a sense of how telemedicine works at a higher level, regulation must be delved into.

The human body can create a large amount of kinetic energy throughout everyday life. In today's environment, technology is ubiquitous from computers to televisions to smart phones. Since these devices are integrated into our lives we have come reliant upon electricity and the availability of power sources. Outdoor enthusiasts such as hikers can use movement as a power source for their smart phones with the use of our product, the Kinetic Power Pack.

My STS research project focused on telemedicine and its regulation. In a digital era data security is an integral feature that entities dealing with electronic private health information need to hold to the highest degree. The Food and Drug Administration within the United States and the International Medical Device Regulators Forum for the globe were focused as the primary regulating bodies for telemedicine.

For my capstone, my group and I set out to follow the design process in order to create a shelf-ready product that utilizes a mechanical process to charge rechargeable batteries. The most important part was to create a functioning circuit that would provide a stable charge to a smart

phone. We used a third-party circuit from a shake flashlight that uses a magnet-coil induction system to charge a battery.

Through my STS research I was able to get an understanding of telemedicine's infrastructure and the players are that are propelling it forward as an upcoming technology. I researched the ways in which cybercriminals can take advantage of the digital world by hacking and stealing important private data. My research suggested that covered entities and business associates within the healthcare industry who practice telemedicine need to invest more into implementing a strong line of defense through cybersecurity systems.

This semester presented many challenges in completing my capstone project as my group was exclusively mechanical engineers and there was a great deal of electrical engineering components that were critical to the design. Though navigating the circuit-heavy portions was very time consuming, my team and I were able to work together to successfully get the device to charge. An additional unexpected challenge arose with the onset of the COVID-19 pandemic. With the transition to virtual classes, my group and I were unable to fully create the final product that we had in mind. While this was frustrating, my team and I were close to completing the project in its entirety, so I was proud of what we were able to produce.