Human-Powered, Illuminated Runner's Vest
(Technical Report)

A Virtue Ethics Analysis of the 2011 PlayStation Network Data Breach
(STS Research Paper)

An Undergraduate Thesis Portfolio

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Although my technical and STS projects are not strongly related, working on both projects simultaneously has allowed me to gain a better understanding of connected technology and its place in society. My technical project deals with a human-powered, illuminated running vest while my STS project introduces a new understanding of a massive data breach suffered by Sony in 2011. If an online network were to be created around a community of the users of our vest, similar to what can be found on the Fitbit app today, there would be a great deal of personal and health data stored online. Thus, while my two projects explore different technologies, the theme of data security can be drawn from both.

Our technical team designed a high-visibility (hi-vis) running vest capable of harvesting the physical energy expended by a runner and utilizing it to power fixated LED strips. Unlike other hi-vis vests available today, this design is self-sustaining in its capability to power its own lights by means of two linear generators located on the back of the vest. This allows the runner to be constantly illuminated, ensuring a higher level of safety when exercising in low-visibility environments. It also eliminates the need to charge the batteries beforehand along with the risk of the batteries dying while on a run. Due to the COVID-19 outbreak and the subsequent transition to online classes, we were unable to complete the physical product. By the time we had to leave Grounds, we had all parts ready to assemble and test. With this in mind, our technical paper discusses all completed work and what we hoped to continue up until project completion.

My STS project explores a hole in the understanding of one of the largest breaches of the twenty first century. In the aftermath of the 2011 Playstation Network (PSN) breach that affected 77 million users, experts analyzed Sony's security measures and communications leading up to and after the breach but failed to examine Sony's morality in the matter. To address this hole and assess the morality of Sony, I employ the ethical framework of virtue ethics. I argue the character of Sony was immoral because it lacked two virtues paramount to morally responsible engineers according to Pritchard: "expertise" and "openness to correction" (Pritchard, 2001).

Working on these two projects in tandem provided a great deal of added value. By researching data breaches stemming from seemingly technical issues, I gained a deeper understanding of how products interact with society and the risks associated with that interaction. It is easy to develop a technical product in a vacuum, but no final product can or will exist in one. On a basic level, I was forced to put a greater emphasis on designing our technical project with the user in mind and how it may be misused. On a more complex and forward-thinking level, I was made aware of the moral responsibility associated with possessing user data and how that can apply to our product and the possibility of an online network described in the first paragraph. Overall, these added perspectives greatly enhanced the quality and depth of both projects and helped my understanding of how our technical product can fit and interact with society.