

**Shake Power Bank**  
(Technical Report)

**Analysis of NYPD Officers with Virtue Ethics**  
(STS Research Paper)

An Undergraduate Thesis Portfolio

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School of Engineering and Applied Science  
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## **Socio-Technical Synthesis**

Both my technical report and STS research paper address the ability of technology to influence the freedom of an individual in their day to day operations, often times without the user knowing it. Although my technical and STS projects pertain to different technologies, working on both projects at the same time has allowed me to better understand the ability of technology to influence the agency of relevant stakeholders over their mobility and privacy. In the following reflection, I will give a summary of both my technical and STS projects. Furthermore, I will discuss how the juxtaposition of my work on both projects developed synergistic value towards my comprehension of technology as a means to liberate or control individuals.

The technical project that my project team worked on this semester is a shake-to-power portable charger. The device consists of a cylindrical case fitted with a magnet and copper coil that produces a voltage through a shaking motion using faraday's law. Using the voltage generated in the copper coil, a rechargeable lithium ion battery, and a battery charging circuit with a USB connector, our device can generate, store, and output power to small electronic devices such as smartphones. Such a device promotes the possibility of limitless charge on-the-go, and expands the "mobility" of our mobile devices. Being powered from kinetic human motion, the shake-to-power portable charger provides users the choice of sourcing their electricity from cleaner and more sustainable methods.

In my STS research paper, I discuss the moral implications of NYPD officers using the facial recognition app, Clearview AI, despite the NYPD facial recognition unit rejecting the software. In my analysis, I draw upon the ethical framework of virtue ethics, which identifies the moral character of an individual based on whether he/she practices and performs a series of virtues when called upon. I argue that the officers were morally irresponsible and unprofessional

by failing to act according to three of the NYPD's virtues: Reducing fear, having a high standard of integrity, and demonstrating respect. In using the Clearview application, the NYPD officers are disregarding the privacy of NYC civilians, and are increasing the likelihood of racial biasing and false positive identification. Overall, I show how the misuse of facial recognition technology by the NYPD officers jeopardizes the reputation of the NYPD and the safety of NYC residents.

Having worked on both projects simultaneously, I have gained valuable insight on the duality of effect that technology can have on the liberty of relevant stakeholders. Through my STS research project, I was able to better understand how a technology can be designed to bring upon social good, but ultimately have the potential to do the opposite. Facial recognition technology was designed with the ability to improve the safety of a community by aiding law enforcement in quickly and accurately arresting suspects. However, through the misuse of facial recognition by the NYPD officers, the technology contributed to an environment of fear and an infringement of individuals right to privacy. By working on my technical project at the same time, I was able to look further into the design of the shake-to-power portable charger by looking past the intended benefits, and considering the effect our device might have if it is misused. Through my understanding of the duality of technological effects from my STS research project, I was able to ensure our design promoted the freedom of mobility of the user, and offered a new level of agency over his/her contribution towards a greener society. Through my work on my technical project, I was able to see how safeguards can be developed to prevent misuse of a technology. This gave additional perspective to the unethical actions of the NYPD officers who intentionally went around the NYPD's safeguards to prevent the misuse of facial recognition.