

Thesis Project Portfolio

Ring Light: An Answer to a Usual Problem in an Unusual World

(Technical Report)

The Social Construction of Appearance Enhancement Devices

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

This project was created by addressing the needs of a technical project for a major capstone design, then abstracting the founding ideals behind the project and addressing a research topic that was (and is) relevant to a modern day environment. The link between the technical project and STS research topic is that the former is a form of an Appearance Enhancement Device (AED) while the latter defines AEDs and evaluates the history and projected future of said devices. I chose to define and research the topic of AEDs because I wanted to take a technical focused project and evaluate it in a non-technical way. The topic of AEDs garnered inspiration from a need imposed upon me and my peers by the Covid-19 pandemic: looking professionally presentable in a virtual environment. Due to this need, me and my teammates created a technical project that could potentially act as a new AED. The device itself is a ring light mounted on a motorized rail system that would use face-tracking software to autonomously detect the optimal position for providing light and move to that position in real time. Embedded software, circuit design and analysis, and PCB design and analysis were the main tools utilized within the technical project. The prospectus was the first piece of work that explicitly defined and addressed AEDs, while the thesis dived more deeply into the field itself. Social Construction of Technology (SCOT) was the chosen STS framework to evaluate the topic of AEDs and structure the type of discussion that I created within both the prospectus and thesis. I chose SCOT to shape my research project primarily due to the flexibility of SCOT as a framework. A secondary reason that led to the decision of SCOT was how the framework inherently evaluates how technology can be created in a myriad of different ways. One possible evaluation would be how the needs of society directly influences the creation and adaptation of certain technologies. Another evaluation would be how widespread adoption/mass utilization of a newly developed technology influences society's perception on said technology, alongside the

manner in which society accepts this new technology. The topic of AEDs are an example of the first type of evaluation described above. A specific example of the second type of evaluation can be seen with the creation of the iPhone and the eventual widescale adoption of smartphones.

Concerning impact of my work, I will first list the isolated cases, then the holistic case. The technical project by itself acts as a fulfillment of major design requirements and an experimental design on several fronts. The research project by itself acts as a fulfillment of STS requirements and an evaluation of a specified topic that utilizes a specified framework. When viewed together however, the research project evaluates a field of technology shaped by societies wants and needs (AEDs), lists the history of this field of technology, and postulates about the future of these devices. Meanwhile, the technical project acts as a proof of concept design that pre-existing technology (lights) and even pre-existing AEDs (industrial lighting) can be modernized and utilized for more recent societal needs. In conclusion, I view both my technical work and research as a case study for the field of AEDs.