Thesis Project Portfolio

Automatic Light Tailoring Apparatus Instructing Radiance (ALTAIR)

(Technical Report)

Anonymity's Influence: Defining Anonymity as a Continuum to Proactively Design Online Environments to Combat Toxic User Behavior

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

(Executive Summary)

Aligning Designer-User Behavior within Information Systems

In the United States, 93% of all adults and 99% of adults age 18-29 regularly use the internet. Although the internet provides a wealth of information, increased use of the internet has led to behavioral concerns for users and product designers. Both my technical project and STS research reviewed internet concerns from the perspective of both stakeholder groups. For my technical project, my team and I designed and prototyped an automatic window shade controller that wirelessly adjusted the blinds to a desired light level set by the user. My STS research focused on how system designers can purposefully address the effects associated with anonymity online.

The technical portion of my thesis produced a prototype for an automatic window shade device. Our project, named the Automatic Light Tailoring Apparatus Instructing Radiance (ALTAIR), was a two-node wireless system that maintained a constant light level in a given area. The light level is chosen by the user through an online interface. The remote node was placed at a location where user wanted to control the light level. The remote node measured light intensity and relayed that information to the window node which adjusted the window blinds. In the first stage of our project, my team designed and developed a power delivery system for the electrical and mechanical components. For the second stage of our project, my team established wireless communication between the two nodes and coded an algorithm which controlled a servomotor that connected to the window blinds. Finally, my team implemented an app which allowed users to select their desired light level. My team validated the design of the wireless window blind system by demonstrating its use within a model room. Our tests showed that

automatically adjusting the window blinds is possible by deconstructing the components into smaller, interrelated nodes that communicate wirelessly.

In my STS research, I explored the factors that affect online anonymity and how system designers could set up environments that reduce negative behavior of anonymous individuals online. Currently, system designers arbitrarily chose whether to allow anonymity on their platform. Deng (2021), Lapidot-Lefler and Barak (2012), and Santana (2014) all describe how anonymity leads to the disinhibition effect. Individuals will act negatively when their action don't affect their reputation. I expand the discourse on design by Neeley and Luegenbiehl (2008) from engineers to online designers to instill personal responsibility and purpose in designers of online systems. Based on my analysis of current environments, I determine criteria for designers to proactively address issues that arise from anonymous behavior online.

My technical project and STS research project illustrate the effects of human behavior on technical systems. My technical project addressed the designer-user relationship mainly from the perspective of the user. My team and I acknowledged the risks that wireless systems have for users' data. We managed tradeoffs necessary to complete a prototype in a way that would be desirable to a user. My STS research project addressed the designer-user relationship from the perspective of the designer. I illustrated why designers need to create their systems in accordance with an end goal. My thesis portfolio demonstrates the behaviors that designers and users engage in for a technical product. Designers that react to unintended consequences of users' behavior cede personal responsibility from their project. Instead, designers need to proactively consider ethical implications associated with their product in order to satisfy the user.

I would like to thank Professor Harry Powell and the Electrical and Computer Engineering Department for providing the resources necessary to complete the technical portion of my project.