

Thesis Portfolio

Design and Construction of a Kinetic Art Weather Display
(Technical Report)

Designing Sustainable Technology through Aesthetics
(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 and Applied Science

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Sociotechnical Synthesis

Though often overlooked, engineering design is one of the most influential and powerful techniques in the field of engineering. Design is not only important for creating functional technologies, but it can shape human behavior and human interaction amidst expanding innovation. As sustainability is becoming more mainstream in business, engineers have begun to attempt to design more sustainable technologies in the hopes to incite sustainable user behavior. One of the most considerable strategies used to accomplish this is through the deliberate use of aesthetics.

The technical portion of this research will describe the creation of a kinetic art weather display to be mounted in the basement of the Mechanical Engineering (MEC) building at UVA. The intention of this project was to create a functional yet meaningful, aesthetically pleasing display, allowing students to easily see the time and weather conditions since there are no windows on this floor of the building. One of the challenges in coming up with this project is the fact that a display with mechanical motions is not the most practical way to achieve the goal of this project: the display could be much more efficiently and accurately represented through a completely digital display, rather than going through the trouble to develop somewhat outdated mechanisms for it. However, in creating a solely digital display, it is easy for the user to overlook the intricacies behind it, and aesthetic value is lost in excluding older design techniques. Without the deliberation of aesthetic value within a technology such as this, users may be more inclined to replace it, and this would be an undesirable consequence of the technology, especially in terms of sustainability.

Creating a mechatronic weather display inspired the STS research for this paper, which focuses on trying to answer the question: are aesthetics as a design technique useful in provoking sustainable user behavior? In this research, a set of sustainability goals will be developed in order to assess technologies in how well they adhere to these objectives. Various modern examples of technology will be analyzed regarding their aesthetic design considerations in order to evaluate how effectively they meet the sustainability goals. Additionally, the conflict of sustainable product design within the United States economy will also be discussed to demonstrate the fundamental structural problem of creating sustainable technology inclusive to all sustainability goals. By the end of this research, a clearer picture will be developed of how modern technologies are able to provoke certain behaviors from users—sustainable behavior or not—using aesthetics to show how effective current approaches to sustainable technological development are.

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