Thesis Project Portfolio

Design and Construction of a Ferrofluid Kinetic Art Clock

(Technical Report)

Investigation of Specific Social Media Features that Unethically Exacerbate User Engagement

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The technical report and STS research were largely independent endeavors. The goal of my capstone class, and therefore my technical report, was to refine my CAD skills and learn to use equipment such as a laser cutter and a 3D printer. I worked on my technical report in a group, and we continued the work of a previous group; the STS research was an individual assignment so I had much more leeway in choosing a research topic. Recently, both in my own life and with events in the news, there have been situations where I've questioned the ideas of autonomy and intention. These ideas, along with the rapidly increasing prevalence of social media, led me to investigate the role social media has played in commodifying people's time and attention.

My technical report involved finishing and polishing a "ferrofluid clock"; it is a digital clock that uses magnetic liquid to display the time. The clock consists of four digits, each with seven motor-magnet assemblies arranged to resemble the number "eight." The servo motors are used to push the permanent magnets toward vials of the ferrofluid, and the liquid takes the shape of the magnets. One of the largest changes to the clock was the redesigning of the translation mechanism. The previous mechanism included a two-arm linkage and guide rails to force the servo motor to move the permanent magnet in a linear fashion. However, the magnets would often get caught on the guide rails and become stuck. My group scrapped this mechanism and designed a smoother, more reliable rack-and-pinion system to replace it. We also built a new enclosure for the clock as a whole since the construction of the last one was rushed.

My STS research improved understanding around specific features of social media platforms which are made to keep users engaged. The research specifically addressed several of those features as well as why they exist and how they affect users. I approached the research by

identifying some of the most relevant actors, analyzing the connections between them, and speculating on the motivations and reasons behind certain choices. Most of the current studies surrounding social media, the internet, and their psychological effects on people are much higher level; very few studies exist on the effects of particular features. This is an important area of research because it is relevant to anyone who uses social media, but is often overlooked. Readers of this research paper will be better able to assess their relationships with the social media platforms that they frequent and use them in a healthier manner.

Although the technical report and STS research were done separately, an interesting connection became apparent upon reflection. The ferrofluid clock is only the half of my technical report that I was directly involved with. The other half is a Rube Goldberg-esque system which coordinates with the clock by rolling pinballs along tracks to put on a show every minute, ten minutes, and hour. These spectacles are meant to serve as a reward for observers who either waited a long time, or happened to be in the right place at the right time. However, these displays can also serve as a distraction by holding people's attention for longer than they would have otherwise intended. This is very similar to the features discussed in my research; regardless of the intentions behind them, the features tend to keep people engaged longer than they meant to.