

Thesis Portfolio

Constructing a Solution Oriented Design Network Amongst the UVA Health System and Engineering Undergraduates

(Technical Report)

An Actor-Network Theory Analysis of the U.S. Opioid Epidemic and its Effect on Winchester, Virginia

(STS Research Paper)

An Undergraduate Thesis

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

University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Thesis Prospect

Sociotechnical Synthesis

This thesis portfolio has been compiled with a focus on addressing public health subject matter. The technical paper, “Constructing a Solution Oriented Design Network Amongst the UVA Health System and Engineering Undergraduates,” details the work that two classmates and I conducted over the past year. We worked to establish a sustainable network that connected UVA healthcare professionals that have medical design projects or ideas, with undergraduate engineering students who will benefit from hands-on, industry experience. The idea for this technical project was developed as a result of two factors. One being our own experience with undergraduate engineering curriculum and feeling that we were lacking real-world experience and opportunities to navigate the career selection process. The second factor was from what we were seeing with healthcare workers all across the country and those that we know and interact with personally. Especially with the ongoing COVID-19 pandemic, the pressures on healthcare professionals are relentless. Physician burnout is a common, yet overlooked issue in healthcare. The network we created serves as a way to reduce the stress on clinicians by offering help with side design projects they are working on, as well as potentially improve their ability to operate with a newly designed medical product.

One of the most pertinent healthcare issues that is placing pressure on healthcare professionals and society as a whole is the current U.S. opioid epidemic. The STS research paper included in this portfolio takes a deeper look into the opioid epidemic, more specifically it looks at how and why the opioid epidemic has so severely impacted Winchester, Virginia. Using data collected from news articles, policy reports, journal articles, statistical databases, and more, greater insight is provided about the different causes of Winchester’s unique problem. Using the Actor-Network Theory and Technological Mediation frameworks, the network of actors in Winchester is analyzed to determine who or what are the main culprits in the opioid problem.