

Thesis Project Portfolio

Surveying Efforts to Model the Propagation of Misinformation on Social Media

(Technical Report)

**Anatomizing “Fake News:” Epistemologically Reframing Misinformation to Reorient
Healthcare Interventions**

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

When I was in middle school, my father was paralyzed by an auto-immune disease called Guillain-Barré syndrome. Afflicting only 3,000 people each year, the cause of this insidious disorder remains shrouded in mystery; however, concerned friends and family were confident that they had caught the culprit: vaccines. A 1976 study noted correlations between Guillain-Barré and swine flu vaccinations, and numerous netizens clamored to anecdotally support these assertions – more than enough to convince my middle self. With “*science*” in hand and causation in place of correlation, I blazed through high school mistrustful and avoidant of vaccines. It wasn’t until a second major in biology that this haze of misinformation was successfully dispelled. Thus, it was even more bewildering to my friends and family when I committed to work for Facebook after graduation – How could I work for the very company responsible for spreading these harmful falsehoods? Through my capstone project, I sought to better understand the problem of misinformation, allowing me to navigate my concerns regarding the social harm of the misinformation that Facebook abets and developing new insights regarding misinformation as a sociotechnical system.

As an engineer, it can be easy to focus on being a cog and lose sight of the larger machine; while interning at Facebook, I was often too consumed by the minutiae of my work to see the broader implications for social wellbeing. It was not until the George Floyd protests that I truly understood the tangible repercussions of providing a platform to hateful disinformation. The technical component of my thesis was my attempt to harness computer science to confront the challenge of social media misinformation. I surveyed abstractions of misinformation spread to understand current computational interventions and identify gaps in our knowledge. My work underscored that misinformation is a menace which cannot simply be defeated with new

software solutions nor more potent algorithms, as there are crucial social and cultural dimensions to consider.

From my own experiences with Guillain-Barré, I knew that misinformation could often come from well-intentioned friends and family rather than social media. However, I needed STS to equip me with the tools to appreciate the sociotechnical underpinnings which nuance the spread of misinformation and prevent technology alone from reaching an adequate solution. Employing the lens of epistemology, I analyzed the 1992 Wakefield vaccine safety paper to understand how individuals acquire misinformed beliefs. My discovery of incompatible epistemologies between the medical community and misinformed individuals serves to reframe how we think about misinformation: rather than a simple false belief to be simply dispelled with accurate information, I postulate that misinformation constitutes a fundamental shift in the process of knowledge acquisition. These findings have conferred better insight into why our current countermeasures against misinformation are ineffective and inspired new approaches conscious of the underlying social context.

My capstone projects explore two sides of the same coin, tracking my journey to understand the roots of misinformation and come to terms with my own experiences with misinformation. I was reminded that feats of technology must be grounded by social and cultural context to yield meaningful progress. These lessons have matured my ability to gather information from the world around me and think critically and holistically to be a more proficient engineer. Admittedly, I entered the senior year dreading the arduous research process, but my research has surprisingly ignited my desire to combat this epidemic while working in the social media space. As you look to start your own projects, remember that each STS experience

is unique; by establishing a personal connection to your project, you can ensure that it will be a fruitful and memorable endeavor for years to come.