

Thesis Project Portfolio

Web Development: A Method For Remote Collaboration of Bands and Choirs

(Technical Report)

Why Do Content-Recommendating Social Media Algorithms Cause Radicalization?

(STS Research Paper)

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Sociotechnical Synthesis

Since the inception of the internet, an enormous amount of social discourse, communication, and collaboration has shifted to take place online. Worldwide, 5.03 billion people use the internet. (Statista) With such a massive shift in the way we communicate in such a short time, it's vital to take a step back and really examine where those changes have left us as a society. What are the ways that we communicate and collaborate over the internet, and how can they be changed for the better? These are important questions to answer as the internet becomes an ever larger part of the daily lives of people on Earth. To that end, this thesis will examine two ways communication can happen over the internet, and how communication over the internet might change. For my capstone project, I will examine a project I worked on that allowed music groups that couldn't meet in person to collaborate remotely, and explore how that changed what options these groups had at their disposal. For my STS research paper, I will discuss how social media algorithms have changed communication, specifically in how they've encouraged a more divided society. I'll examine why they were designed in such a way as to cause these problems, and I'll examine what avenues exist for them to be changed for the better. In general, these two points of reference will show that the processes that we use to communicate via the internet must always be analyzed and changed for the better if possible, as to do otherwise can cause real social harm.

For my capstone project, I describe a group project that I helped build as a project for the class CS 4640: Programming for Web Development. This project involved the creation of a website named COMPOSER that aimed to help musical groups around the University of Virginia collaborate remotely using the internet. This website was developed in response to issues that musical groups at the University of Virginia had when attempting to collaborate on musical

projects during the coronavirus pandemic. While in quarantine, these groups had a number of struggles adapting to remote collaboration, and found that available resources were either technically infeasible or were difficult to learn and use. In response, the website we built focused on providing these groups with an accessible and easy method of remotely collaborating on musical projects. The website was built using a combination of JavaScript, PHP, HTML/CSS, and Python over the course of a semester. It offered an easy-to-use system where users could join and contribute to projects, while owners of those projects could use some light editing tools in order to stitch audio tracks together. Ultimately, the project was fairly successful, winning the “most usable” award among CS 4640 projects, and it even sparked interest with at least one music group at UVA.

For my STS research paper, I examine content-recommending social media algorithms, and the reasons why they are designed in such a way as to cause radicalization and polarization. Through this analysis, I aim to gain a greater understanding of these algorithms and find a few recommendations for future research that seem more promising to fix the design and implementation of these algorithms. I begin with a literature review discussing past research on the harmful impacts of these algorithms on society, with a special focus on their tendency to cause radicalization and polarization. Following that, I perform a discourse analysis on what researchers are saying on the reasons why these algorithms are designed this way, as well as research on why past attempts to fix their issues have failed. Then I recommend future steps to be taken in response to these algorithms’ problems. Ultimately, I find that the reason why social media algorithms are designed to cause radicalization is that the psychological forces that drive engagement, and thus profits for social media companies, are also primed to sow seeds of radicalization and polarization. I also find that past attempts to regulate these issues have failed

due to the fact that these issues are deep-seated in the design of these algorithms and their surrounding applications, especially due to their scale and due to the nature of the radicalizing pathways that these algorithms create. Still, however, I do not conclude that there is no hope for the technology, as research suggests some avenues for improvement; these include further research into comparing these algorithms against one another, as well as the creations of greater methods for their regulation and auditing.

Together, these projects paint a varied picture of what communication over the internet can be. On the one hand, the internet can be a helpful force that helps people create art during troubled times. Websites like COMPOSER represent one way the technology of the internet provides humans a way to overcome challenges like a global pandemic and flourish, creating a better and more connected society. On the other hand, my analysis of content recommending social media algorithms shows a much darker side of this technology. Instead, it shows what the prioritization of profits with slim regulations can cause when powered by the global, interconnected scale of the internet. By working on both of these projects simultaneously, I feel that I've gained greater insight into just how helpful and how harmful the internet can be for our society, and I hope that this thesis can provide that perspective for future readers.

Works Cited

Statista Research Department. (2022, September 20). Internet and social media users in the world 2022. Statista. Retrieved October 27, 2022, from <https://www.statista.com/statistics/617136/digital-population-worldwide/>