

Thesis Project Portfolio

Recommendation AI in Social Media: Consequences and Mitigations
(Technical Report)

Analyzing the Sociotechnical System Surrounding Social Media Recommendation Algorithms

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Raj Asthana

Social Media Usage of AI Recommenders

Every day, I, along with countless others, spend way too much time scrolling whichever social media of our choosing. The COVID-19 pandemic had clearly exacerbated this, with many people staying at home looking for ways to pass time. When tasked with choosing an STS topic for my initial prospectus, I decided to conduct research on the algorithms for these social media platforms. As I learned more about the algorithms, I gradually learned about the existence of echo chambers on social media formed as an effect of the algorithms and other consequences from the algorithms. This brought me to my STS research paper, which would be an evaluation of the sociotechnical system surrounding these algorithms and how it could change. My technical project would follow the same topic, but instead be a proposal on how algorithms should be revised to better mitigate the consequences of these algorithms.

The technical portion of my thesis focused on how improvements could be made to the actual algorithms. Since the issue was polarization of content, I proposed that natural language processing AI could be used to identify aspects of the content, and index how reliable or biased the content is. This could result in content being diversified onto user's feeds. By doing this, the echo chambers would potentially not form, since instead of recommending further polar content, less biased or diversified content would be recommended. Additionally, this type of content recommendation could help people get a more unbiased understanding of events. Since social media is where many people receive news and information, improving the quality of this information could help lead to a more educated public.

In my STS research, I analyzed the system surrounding social media recommendation algorithms to try and identify patterns of sociotechnical transformation. Specifically, I focused on three levels: the regime, niches, and the landscape. The regime is the current system surrounding the actors such as users and companies. Currently, the regime seems quite stable due to the strong influence of social media in our lives, but growing concerns over algorithms and privacy are slowly changing this. Niches include new innovations that could challenge this system. These are limited mostly to researchers working on their own variations of recommendation algorithms. The landscape is the broader context surrounding the other levels, including societal values and political ideologies. As more people learn about algorithms and large events make their issues public, the landscape starts to pressure the regime. My research revealed that although the regime has many signs of stability and niches lack support, the landscape is starting to indicate signs of sociotechnical transformation.

The aspects of my STS research project and technical work highlight the interconnectedness of technology and society. Despite AI algorithms and recommendation systems being applications of machine learning and large data processing, they found their way onto applications that people spend hours on every day. The STS technical work considers how the physical algorithms could be improved to help prevent the issue. The STS research focuses on the relationships within the different levels of the system created by these innovations. The broad reach of social media and how algorithms influence information demonstrate how technology can shape society. The sociotechnical landscape responding to social media algorithms and influencing the current regime shows how society can respond and shape technology back. This relationship between technical innovation and society will always be present and should be considered when making decisions related to either of them.