

Thesis Project Portfolio

Site Reliability Engineering: Improving Performance Transparency in a Trading Platform

(Technical Report)

The Effect of Data-Based Economic Metrics on Marginalized Identity Groups

(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Metrics are now one of the most widely used and effective decision making tools. They make it easy to understand large amounts of data and convey information, however, metrics can be both beneficial and harmful depending on their sourcing and use. The technical and social aspects of this thesis portfolio center around the use and outcome of metrics based on financial data. The technical report focuses on a newer, beneficial use of metrics in software engineering: using a finance platform's performance metrics to increase speed and accuracy to increase revenue and client productivity. The results of the technical project will be beneficial to engineers interacting with the platform by adding a way to easily track performance and quantifiably justify the adoption of a new platform. The STS report analyzes a potential harmful effect of metrics, examining how while metrics generated by banks' loan approval machine learning algorithms speed up decision making processes, they also disproportionately reject minority applicants. The analysis in the STS research can point out one of the drawbacks of using metrics without vetting the process with which they were calculated and understanding the social context within which it is used. It is important to analyze how biases in society can be displayed in data, which is used to create metrics that inform decisions that impact society, creating a self-perpetuating cycle of marginalization. The combination of the technical research and STS research will explore an avenue of increasing speed and efficiency in many aspects of society while providing a framework on how to be cognizant of the effects that metrics may have on their users.