

Thesis Portfolio

E2-Chat: A Web-Based End-to-End Encrypted Messaging Service
(Technical Report)

**End-to-End Encrypted Messaging Services Are Here to Stay Even with Government
Interference**
(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Internet-based messaging services have revolutionized the way humans connect with each other across the globe. With several of the largest messaging services amassing over one billion monthly active users, users have raised concerns regarding the security of messaging data consumed by platforms and governments. In order to address concerns of users and privacy advocates, companies over the past decade have worked on increasing security and privacy measures through the adoption of end-to-end encryption technology. End-to-end encryption ensures that all messaging data is encrypted on the sender's device and can only be decrypted on intended recipient's device, assuring that platforms, governments, and any other individuals cannot decipher messages.

In order to fully examine end-to-end encryption technology, a technical project along with a research paper was completed to understand how the encryption technology works and why certain groups might support its adoption and others vehemently oppose this technology. E2-Chat, the technical project, is a fully functional web-based end-to-end encrypted messaging platform that makes this secure form of communication accessible to all populations, where traditional end-to-end encrypted platforms require the use of mobile devices. The associated research paper considers how different social groups view end-to-end encryption and proposes solutions for implementation to appease users, privacy advocates, platforms and governments using the Social Construction of Technology (SCOT) framework.

The combination of E2-Chat and the research paper provides a clear understanding of how end-to-end encryption is secure and why the technology will continue to be adopted to become the primary underlying technology across all communication services despite resistance from governments and other groups.