Thesis Project Portfolio

Algorithmic Decryption of Substitution Ciphers

(Technical Report)

Socio-Political Influences on Data Privacy and Security

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

This research investigates the effects of technological advances on data privacy and security, and the implications of weak data privacy legislation. The technical component employs a meta-study, addressing the rapid growth of technology and the embeddedness of technology in society, which has fueled the growth of both privacy concerns and privacy threats. This meta-study examines established decryption methods and algorithms for substitution ciphers, analyzes and synthesizes research regarding more efficient decryption methods and algorithms for substitution ciphers, and discusses the potential implications for data privacy and security. The research offers insight into the growing privacy threat yielded by technological advances, and the importance of considering the human and social dimensions of these advances, as they are facilitating the access of secure and private data, with the human and social dimensions ultimately facing the detrimental effects of increased privacy threats and concern. The STS component examines data privacy legislation from various nations around the globe, analyzes the role social and political contexts play in shaping the protection of data privacy, and discusses recommendations and potential courses of action to ensure effective data privacy legislation is implemented. This research employs a literature review, analyzing various sources regarding the current state of data privacy legislation in a given nation. Furthermore, it applies the Social Construction of Technology (SCOT) framework in order to examine the data privacy legislation of various nations around the globe, and outline the relationships between socio-political contexts and data privacy legislation to gain a better understanding of how each context shapes and influences legislation. The objective of the STS research is to gain insights on both the socio-political contexts surrounding weak data privacy legislation and the socio-political contexts surrounding strong data privacy legislation, and explore methodologies which social

and political contexts can employ in the development of data privacy legislation. The findings of this research are expected to raise awareness of data privacy concerns and threats, and the importance of strong data privacy legislation to ensure the protection of personal data, among engineers, and all members of society. The research when considered in concert indicates that technology and its advances pose a threat to data privacy and security, while data privacy legislation is not always effective, with many nations implementing weak frameworks that don't address public concerns regarding the privacy and security of personal data. Thus, it reveals how it is essential for governments and nations to implement strong legal frameworks, driven by aware socio-political contexts, which effectively address public concern, and protect against the increasing privacy threat yielded by technological advances.