Thesis Project Portfolio

Signature Replication Machine

(Technical Report)

An Exploration in Attempts at Developing Best Practices and Standards in the Internet of Things

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

When trusting technology with data that is crucial to identification, there are many questions that arise. As we trust the machines with more personalized information such as banking and social security numbers, security arises as a prevalent issue. Online banking has become normalized and financial transactions with applications like Venmo, and CashApp; each bank has its own mobile or web application for users to manage their balance and pay bills online. While security has been very well established in large databases, a new frontier of devices called the Internet of Things has opened a new door for both accessibility and cost. When the trust in technology shifts over from large databases for financial information to these easily accessible devices in the Internet of Things, the amount of emphasis on security needs to also transition as well.

The STS research paper has explored the rise of security on these Internet of Things devices and explored through a case study a scenario when the security was lacking. The parallel was drawn between standard cybersecurity with large databases and security specifically for Internet of Things devices. The case study was used to parallel another researcher's attempts to establish Actor-Network Theory for cybersecurity. Through the research, a similar version of Actor-Network Theory was formed for Internet of Things security and portrays the effect of largescale malware on all stakeholders regarding the Internet of Things devices.

The technical capstone project aimed to create a device that would allow signature or handwriting replication from virtual digital drawings or pictures to be drawn on paper. A server takes a handwriting sample as an input and processes it to send wirelessly to the machine that replicated the handwriting sample. The machine then simulates the strokes on the handwriting sample and replicates the image by simulating the original user's writing.

To conclude the executive summary, all the technical work has been achieved and the machine was able to successfully replicate not only signatures but also drawings as well. This technical project helped my development in a professional team setting and we were all delighted by the result.

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