Thesis Portfolio

Health Modeling Using Smart Device Data
(Technical Report)

Physiological Data Privacy in the Digital Age
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

Aldrick Johan
Spring, 2021

Department of Computer Science

Sociotechnical Synthesis

Due to the severity of the COVID-19 crisis, governments have been scrambling to find any means to slow down or prevent any spreading of the disease. They have used various methods to hold back the disease such as quarantining, limiting travel, and even using apps for contact tracing and detecting the illness. This contact tracing is accomplished by collecting physiological data from mobile phones and wearable devices. Anybody who uses their smartphone or wears a "smart" device is subject to this collection of data. This data is collected by large companies employed by governments to supposedly detect signs of the illness. However, the collection of this data can violate a person's privacy or be used malevolently. The use of smart devices to monitor the spread of COVID-19 is a pertinent example that correlates the topic of physiological data privacy with the use of smart device data for health modeling.

The STS study explored the concept of privacy in relation to physiological data collection. As wearable devices become more common, the topic of physiological data collection will become more crucial. The topic was explored through the use of surveys, interviews, and document review. The technical study connects to the STS topic by exploring how personal health data collected from smart devices can be used. One of the supposed benefits of collecting personal health data is that it can be utilized to detect mental and physical illnesses in users. The study explored this idea and utilized machine learning to glean useful information from a user's personal health data. The study also explored what data was available from the smart devices and the amount of personal data that was present in the data.

Table of Contents