

## **Thesis Project Portfolio**

### **An Automated Machine Learning Pipeline for Monitoring and Forecasting Mobile Health Data**

(Technical Report)

### **Comparative Impacts of Virtual and In-Person Socialization on Adolescents**

(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**

The technical report and the STS research paper composing this thesis portfolio both deal with the interactions between technology and adolescents. As modern technology such as cell phones, personal computing, and the internet have become increasingly prevalent and used frequently by adolescents these interaction are worth examining with greater detail. It is especially useful to focus on adolescents as a specific group rather than just technology as a whole due to the distinct nature of that age group. The two papers use different viewpoints and perspectives to view the relationship between adolescents and shed light on the existing state of that relationship and possible future interactions.

The technical project focuses on a broadly applicable mobile health pipeline that uses passive sensor data and machine learning in order to monitor and forecast health data. The case investigated in the report specifically develops the pipeline for use with the monitoring and forecasting of depression in adolescents. The developed pipeline utilizes many aspects, both positive and negative, of the relationship between adolescents and technology. It leverages the widespread and sustained use of mobile phones in order to gather data as well as present it in a way that is easily attainable by adolescents. Additionally the machine learning algorithms reveal how elements of technology use such as screen time and missed calls reveal information about the way technology may impact adolescent mental health.

While the technical project focuses on the development of a single technology and applies that for adolescent use, the STS research paper takes a broader view. The paper examines the process of socialization during adolescence and then uses the social construction of technology (SCOT) framework in order to examine how technologies such the internet and cell phones have developed in ways that reflect and provide avenues for existing socialization

methods. The SCOT framework essentially states that the development and use of technology is shaped by human action. Using this framework, the STS research paper covers a wide array of technologies and the way that adolescents use them in order to demonstrate the impact of existing adolescent socialization on the use of technologies for socialization.

The two papers making up this thesis portfolio both take advantage of different contexts and viewpoints in order to investigate specific elements of the relationships between adolescents and technology. The papers provide both a broad overview perspective as well as the investigation and development of a specific technology created for adolescent use. The STS paper provides a look at the current status of the relationship between adolescents and technology, while the technical project explores a possible future leveraging of that relationship. Taken as a whole the portfolio provides an extensive and cohesive examination of how adolescents use technology and a variety of social and technical factors at play in that relationship. This topic is extremely relevant and important to understand as technology continues to developed and used extensively by adolescents.