Thesis Project Portfolio

I AM: An Application to Harness the Power of Positive Affirmation

(Technical Report)

Electricity – A Bright Future for Mental Health Care and Medicine

(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

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Spring, 2022

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Executive Summary

Mental health is an essential aspect of human life that American society has only recently begun to emphasize. Modern culture shifts in this country have removed much of the stigma previously associated with it, and allowed ideas and technologies that can effect positive change in people's lives to flourish. Two of these methods that are still relatively unknown are self-affirmation and electrically-based treatments for depression, which are the topics of the two projects that are contained in this portfolio. Both works are centered on aspects of mental health but, in truth, these projects are loosely connected and had very different origins. The technical capstone project began as a rudimentary hackathon application that required further investigation. On the other hand, the STS research paper has a very unique inspiration. I met an individual who claimed two extraordinary things: to have built a frequency-emitting machine that cured his wife of chronic Lyme disease and to have machine in his office that could "recharge" him when he did not get enough sleep. Both claims seemed sufficiently within the realm of science fiction and it was my personal research into the validity of these devices that led me to the current topic of electric medicine for mental health.

Expanding on the capstone project, positive affirmation is a performance and mood-boosting practice that has great potential to help students but is rarely utilized. I AM. is a proposed mobile application solution to bring these benefits to students through a device that many carry wherever they go. The overall design approach is simple and is meant to help students without adding any significant burden. The anticipated outcome of this application is two-fold. Firstly, reduced mental strain on students prior to examinations as well as increased overall performance. Secondly, improved class mood by providing the data from the students to professors who can adjust classes accordingly. This project can be significantly expanded to

include a feature set that allows in-app student-teacher interaction rather than teachers only seeing student usage data.

The second project in this portfolio, the STS research paper, analyzes how electric medicine, an emerging class of treatments which utilizes electricity and magnetism, compares to mainstream treatments and explores the question of whether electric alternatives should replace those that are common prescribed today – particularly in the case of pharmaceuticals for depression treatments. To answer this question, documentary analysis and discourse analysis are used to compile evidence for the efficacy of these therapies, what medical ailments they can treat, and how effective they are in comparison to typical therapies. This evidence is viewed through the lens of technological momentum to determine whether the technology for these many treatments have reached a point where they have surpassed and should be prescribed in favor of currently used medications and procedures. The result of this investigation is that in several cases the electric alternatives are safer and as or more effective than their existing counterparts. The significance of this is a potential shift in way the we look at future medical treatments as well as expansion of engineering research in this area to, hopefully, lead to more widespread medical application

Although these two projects focus on very different aspects of mental health, working on both simultaneously has amounted to a better understanding of the current scientific and work being done this area and provided a better appreciation for how we can implement those findings in our own lives. New technologies and techniques are being created every day and, without proper investigation, many may not become aware of these beneficial resources. With the research paper in particular, there is a significant volume of lesser-known technologies that could change the way we think about healthcare and the human body – far too many to fit within scope

of the paper – and I would encourage anyone to undertake personal research into this ever-evolving field.