Thesis Project Portfolio

The Psychological Effects of Immersive Virtual Reality

(Technical Report)

Exploring Mindfulness in the Age of Information and Communication Technologies

(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, 2023

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Sociotechnical Synthesis

"Mindfulness" is a state of active, open attention to the present. Though the term is rarely used in technical contexts, the concept has gained more prominence due to the shifting relationship we have formed with digital technologies. Digital technologies or, more formally, internet and communication technologies (ICTs) have become normalized possessions that have replaced our need for stand-alone telephones, televisions, or computers. These devices provide us with access to vast pools of information, via the internet, to an extent that is unprecedented by any other technological medium. As digital technologies take on roles as avenues for social and entertainment intake, we gradually adapt to the overconsumption of media and become increasingly reliant on these technologies to replicate the sensations we feel from in-person experiences and interactions. Bearing that continued exposure and habituated practice of digital distraction can lead to consequences that lie on a psychological level (reduced attention span, poor memory, inhibited deep learning, etc.), it is necessary that we investigate what particular devices digital technologies implement, and furthermore, how these devices interact with our brain.

In order to dissect this sociotechnical dilemma, the paper will be framed to address two driving forces: user vulnerability and technological implementation. A literature review of neuroscience and psychology papers that shed light on the subject of human behavioral patterns (specifically, addiction and habit forming) will be used to provide us with initial context of what practices are easily adoptable and why. After understanding those behavioral vulnerabilities, an additional literature review of digital implementations pertaining to interface, accessibility, safety features, etc. will be used to pinpoint what behavioral vulnerability is and is not exploited by each respective digital device or technique. We will frame our discussion regarding the

distracting qualities of ICTs with the help of the Actor Network Theory (ANT) theoretical framework.

Though the shift away from digital technologies is unlikely, pivoting towards ways that rethink digital immersion have become more prominent. For the technical research project, we investigate virtual reality (VR), a relatively new development in the realm of ICTs, on a closer scale. Because VR has yet to allude to distracting practice, we will use this project to understand what design techniques it uses to produce immersive experiences that set it apart from other ICTs. In the experiment, users will be asked to play three rounds of fear inducing scenarios in which their heart rate and motion data will be monitored and then assessed. Analyzing the simulation data for its physical responses will help us better understand the psychological responses as well. Conclusions we draw regarding awareness in this technology will assist us in our effort to implement them in newer developments that promote mindfulness.