

**POWER OF DIFFERENCE ASSESSMENT SYSTEM**

**THE EFFECTS OF WEARABLE TECHNOLOGY ON HUMAN PSYCHE**

An Undergraduate Thesis Portfolio  
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School of Engineering and Applied Science  
In Partial Fulfillment of the Requirements for the Degree  
Bachelor of Science in Computer Science

By

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## **SOCIOTECHNICAL SYNTHESIS**

In the age of a rapidly evolving globalized society, humans often have a difficult time understanding the full extent of the technological systems around them. However, people can see topics in a new light and better understand the world when they listen to diverse perspectives. The technical project is the Power of Difference Assessment, an online assessment system created to reveal people's biases, and allow them to understand the role they play in combating or sustaining existing socio-economical injustices. The STS research paper highlights the ramifications of wearable devices on the human psyche and proposes solutions to mitigate these negative aspects. The technical report and STS research paper are loosely coupled to promote awareness of how unexplored assumptions about technologies and personal beliefs can hinder interpersonal and intrapersonal growth, and then provide solutions to empower humans.

The Power of Difference Assessment is offered by The Sum, a non-profit located in Charlottesville, VA, which promotes personal growth, skill development, and diversity. The goal of The Sum is to stand in solidarity with all people, no matter their background. This goal aligns with the sociotechnical objective with forming strong interpersonal and intrapersonal relationships in this globalized society. The Capstone team accepted this task of building the online assessment that asks users to respond to seventy statements that range across sociocultural locations, such as age, race, gender, sexuality, etc., on a Likert scale. The results of the assessment will then be analyzed by The Sum and the user for reflection.

Those who take the Power of Difference Assessment can meet with a consultant from The Sum to learn about their biases, understand how to better communicate across various demographic differences, and overcome their own limitations to help establish a more constructive community. At this time, the deployment of the Power of Difference Assessment

has just begun so the Capstone team has yet to receive data from real customers. During development, however, we asked our peers to take the assessment and test the application. The team was able to conclude that the system is working as intended with data being stored using Amazon's web services and viewed from the administration site. The test takers were able to receive PDF-generated results of their unconscious orientations to sociocultural backgrounds, allowing them to understand areas of strength and areas for improvement.

To highlight the ramifications of wearable devices on the human mind, the STS project's research question would be determining the degree in which wearable devices have negatively impacted everyday users. Through this problem statement, the research's thesis statement would be although existing wearable technologies have set numerous health-related achievements for many individuals, there are also underlying problems that popular wearables have that are being overshadowed by their positive feats. To shed light on the problems, documentary research sources of academic journals, engineering literature, and case studies covering wearable effectiveness and logistics were consulted. After analyzing and verifying the evidence, the sources were used to address the research question and also mentioned to support the interpretation of wearables having control over the users.

There were numerous sources from the documentary research that supports the thesis statement. A study conducted by CNN on 200 Fitbit users have shown signs of an early and steady technological takeover in decision-making, where 90% of participants deliberately took longer routes in order to meet the steps set by the fitness tracker and 22% felt less motivated to exercise without their devices. Other problems documented include information overload and poor quality of data. Recent comparisons between various wearables for tracking physical activity showed large variations in accuracy between devices with significant error margins. Not

only is the quality of data compromised, information overload occurs as well when the amount of irrelevant data used for self-diagnosis and monitoring becomes substantial and difficult to grasp. Thus, users are not necessarily gaining meaningful insights about themselves and risks users to become more self-delusional and subservient to wearables due to these issues.

The work done for the technical research and STS research has shown that testing and experimenting of technology need to be conducted continuously. Wearable devices and the Power of Difference Assessment are both in their early stages of deployment in society, but there will always be underlying problems that need to be understood, addressed, and tested in order to accomplish the goal of advancing society. Empowering humans individually and collectively requires having a solid understanding and awareness of undetected problems that stem from different technological and sociocultural aspects of this world.

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