Designing for the Changing Body: A Feminist Exploration of Self-Tracking Technologies

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Abstract

Our bodies are in a constant state of flux. Self-tracking technologies are increasingly used to understand, track and predict these fluxes and physiological processes. This paper outlines ongoing research that investigates the mediating qualities of self-tracking technologies. As physiological fluxes and processes are more commonly experienced by women, and have been historically used as a tool for subjugation, a feminist perspective and methodology is applied within this research. Methods including research-through-design and speculative and critical design are used to test the hypothesis that through speculating on the design of self-tracking technologies, valuable knowledge can be contributed to the fields of HCI and interaction design in relation to subjects such as the societal taboos and prejudices surrounding the notion of the changing body, privacy of biodata and how identity and sense of self is shaped through the act of self-tracking.

Author Keywords

Self-tracking; women's health; research-through-design; feminist HCI; menstrual cycles; menopause;

Introduction

Technological developments such as wearables, the ubiquity of smart phones and apps and a shift in attitudes towards sharing biodata have resulted in an increase in the use and application of self-tracking technologies in society. Self-tracking technologies can now use sensors to track bodies in real time and use data and algorithms to predict physiological processes and behaviour. These factors all challenge traditional formulations in how we understand and experience our bodies and their physiological processes [10,14].

As philosopher Drew Leder writes on self-tracking technologies *"what was depth is artificially made to surface"* [9:53]. Through the mediating qualities of technology, we come to understand our bodies in different ways; they enable us to gain new knowledge and skills that can be used to change lifestyle habits [12] and allow us to observe our bodies as they change. Self-tracking technologies influence our felt sense of our body, our data becomes a *"prosthetic of feeling"* [11:75] that influences our sense of self and notion of control (or lack of control) over our bodies.

Research Motivation

Traditionally the notion of the "user" in interaction design and HCI has imagined a one-state being. Those who identify as female experience more physiological processes, such as menstrual cycles, pregnancy and menopause, than those who identify as male. Physiological processes challenge the notion of the body as a constant and stable entity and historically this argument has been used to subjugate women [8,16]. This research is motivated by a desire to celebrate the changing body through designing *for* and *with* physiological processes rather than mitigating and controlling the body as it changes [15,13].

Hypothesis

The main hypothesis of this research is that there are valuable contributions to be made to the fields of HCI and interaction design in designing self-tracking technologies in speculative and embedded forms through the use of physical computing. Through designing speculative self-tracking technologies that are not in the form of wearables or smart phone apps, certain aspects and effects of self-tracking can be examined. These aspects might relate to the impact of the layering of data on the lived experience of the user, societal taboos surrounding the changing body, notions of privacy around biodata and how identity and sense of self is shaped. This hypothesis will be applied to three cases of physiological processes; menstrual cycles, menopause and a third as-yet-unknown case.

Research Objectives

- To understand the *impact of the design of existing self-tracking technologies on users* through interviews and auto-ethnographic qualitative studies.

- To understand *societal notions of the changing body* through presenting alternative self-tracking technologies through speculative and critical design.

- To study the impact of speculative technologies that *synchronize with the bodies and reflect the body's physiological changes in physical and embedded ways* through the development of prototypes and user studies.
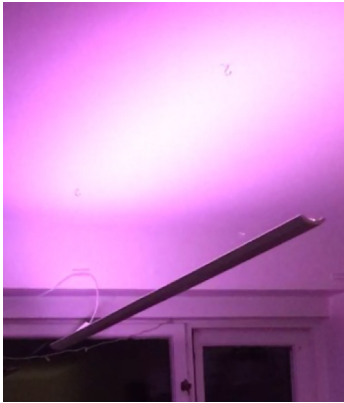
Figure 1: "Ambient Cycle" installed in the home.

Related Work

This research contributes to the burgeoning field of "women's health" in HCI and interaction design [1,3,17]. This research addresses issues related to women's health technologies such as cultural notions of taboo, power and prejudice.

Examples of affective computing [5] offer useful findings in relation to how the design of affective computing artifacts can influence our experience of our own emotions and moods, and therefore the physiological processes that produce these moods and emotions, for example [18 and 7].

Research Approach and Methods

Research-through-design [19] will be the vehicle for this ongoing research. Relating to the fact that physiological changes have been historically used to subjugate women, this research utilizes a feminist methodology that offers not only tools to critique existing technologies, but also the tools to enact feminism through the values, perspective and positions represented by and within this research project [4].

Critical and speculative design offer a framework for critical inquiry through imagining ideologically different futures [6]. These imagined futures can be used to question current ethical, moral and political factors [2]. This research employs critical and speculative design in order to produce knowledge on preferable futures [6] for the design of self-tracking technologies.

Dissertation Status and Next Steps

The first topic addressed within this ongoing research is menstrual cycle tracking technologies. In the first study, menstrual cycle tracking is taken out of the smart phone and into the home. "Ambient Cycle" (figure 1.) is a prototype comprised of an Wi-Fi connected LED light strip paired with a designed app to provide a way for users to adapt their homes to their moods experienced at different phases of their menstrual cycle through mood lighting. Colours shown at different phases of the menstrual cycle are based on emotions typically experienced during certain menstrual phases coupled with their accepted colour within the field of colour psychology. "Ambient Cycle" has been installed in the home of four participants for a month at a time with at least two more participants completing the study by the end of the year. Baseline and post-study interviews were conducted and participants were asked to keep a diary during the study. These interviews and diaries will be used to test the hypothesis that visualizing menstrual cycle data in this ambient form produces valuable knowledge on how the form of menstrual cycle tracking technologies influence participant's relationships with other people, their perception of their moods in relation to their menstrual cycles, and their sense of self.

An auto-ethnographic study into deliberately removing self-tracking technologies from our lives investigated the lasting effects of using self-tracking technologies and was used to analyze self-tracking from a philosophical, particularly phenomenological, perspective.

The next steps to take within this research is to test hypotheses and findings gathered during explorations on menstrual cycle tracking technologies, and to apply them to the case of menopause-related technologies

Contributions

Through this research, I hope to propose new understandings of the body within HCI and interaction design. I believe that the feminist perspective that I offer can combat the subjugation of women in rejecting the notion of a physiologically single-state user within HCI and interaction design. Using research-through-design, I aim to show that there is potential value for the fields of HCI and interaction design in speculating on the design of self-tracking technologies that can propose new conceptualizations of the body and self, both for the individual and for society.

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