Smart Jewelry: The Future of Mobile User Interfaces

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ABSTRACT

Recent developments in the wearable devices domain with the several high profile product launches around smart watches and glasses have captured the collective public imagination. These developments suggest the inevitable next step in the evolution of mobile devices and how we interact with the technology. The expectations for wearable devices range from an always-on information provider, a data recorder, a body signal collector, and a sense transformer, to an ultimate mind reader and a confidante. However, before trying to achieve these impossibly high expectations, wearable devices need to address the many obstacles of a highly complex personal design space, including delicate support for expressive, intimate, visual and auditory properties as well as respect for the personal-public boundary.

We believe that in order to overcome these obstacles one needs to depart from the existing paradigms of smartphones and, especially, mobile screens. We argue that the starting point resides in embracing traditions of jewelry design because of its inherent communicative qualities. Through discussion of several alternative approaches we argue for development of smart jewelry, which removes the disconnect between the wearable and the screen and focuses on the positive psychological, tactile, and performative aspects.

Categories and Subject Descriptors

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors

Keywords

Mobile; UI; wearable; jewelry

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1. INTRODUCTION

Wearable technology, in the form of smart or connected jewelry, is striving to change the ways in which we interact with and understand our mobile devices, our bodies, and each other. However, current advances are still too dependent on existing paradigms of technological platforms such as smartphones, both as inspiration and as a necessity for functionality, to result in the user experience necessary to make wearable devices fundamentally desirable and useful.

Traditional (a.k.a. not-smart) jewelry inherently possesses communicative qualities. Ideally, when designing jewelry, one wants the wearer to wear it without being overly aware of its physical presence. Such objects of adornment provide some sort of comfort to the wearer, whether the emotional significance behind its ownership or the confidence endowed through adornment. Not only is jewelry important for the wearer, more importantly it spurs a discourse, spoken or unspoken, with others who view it [1].

We believe that the future of truly mobile devices is operation without screens. The majority of commercial wearable devices available today are mostly derivatives of phone functionalities. We believe that simply putting a screen on the body to extend the smartphone's presence in our lives is fallacious.

Even many cleanly designed, ostensibly screen-less devices such as the Misfit Shine depend on screens, in this case smartphone screens, in order for the wearer to view and utilize the accumulated data, as well as to command the wearable, such as to set vibrating alarms.

Through eradicating the disconnect, mental and physical, between the wearable and the screen where the user interacts with text and other 2D depictions, smart jewelry will be able to focus on the positive psychological, tactile, and performative aspects of jewelry. In this way, it has the potential to transform mobile interaction styles, pushing forward towards ambient computing.

2. TOWARDS SMART JEWELRY

In this section we discuss several related projects that suggest alternatives to ever-present screens and the development of new mobile interaction styles.

1.1. Smart Rings

Ringly [2] is one of a number of products in the notification space, intending to “let you put your phone away and your mind at ease.” Connecting to the user's phone, Ringly uses

vibrations and light to alert the wearer to notifications, such as text messages or emails. Adjusting the color and vibration allows the wearer to discern some specifics of the notification, such as who is calling, allowing the wearer to decide whether or not to answer the phone without having to take it out and check it. Though Ringly is based on a relationship with a smartphone, its intention is to reduce the pause necessary to read notifications to those the wearer deems important.

1.2. Fitness Trackers

Fitness and health devices currently dominate the wearables scene, collecting and communicating information about the wearer’s body. Screen compatibility will remain important in this field for sharing and understanding the data, such as with doctors. However, translating the data into meaningful manifestations for the casual wearer remains a challenge, and ultimately the devices are not engaging enough. Half of fitness tracker users stop using them almost immediately [3]. Adding more of the immediate, sensory benefits of smart jewelry to these devices should encourage sustained use among a higher percentage of wearers.

1.3. Wearable Sensor Network

In order to explore the design space of the smart jewelry and wearable devices, we developed the Wearable Sensor Network (Figure 1). It uses the same sensors as many fitness trackers currently available.

The Wearable Sensor Network is a series of four bracelets—two for the wrist, one for the upper arm, and one for the ankle—that can be worn in customized configurations to read body movements and translate them into sound and light (Figure 2).

Figure 1: Wearable Sensor Network Bracelet

Figure 2: Ankle, Upper Arm and Wrist Bracelets

Figure 3: Visual Performances

Within each bracelet, the accelerometer data is used to change the colors of the LEDs, which to provide immediate feedback to the user, as well as to give the bracelets a performative quality. For example, at rest, all of the bracelets glow blue, (Figure 2). The data also streams from all the bracelets via Bluetooth LTE to a computer, where it is used to create music. The ankle bracelet can be enabled to serve as a gestural controller, allowing the wearer to toggle between electronic and piano tones as they move (Figure 3).

The main use of the Wearable Sensor Network that we continue to explore in our research is performance, adding music generation and light performance to realms such as theater and dance. However, the system, as it evolves, may also find other uses, for example as gestural controllers with visual feedback.

1.4. Aesthetics

Though screens as visual interfaces are not important for the success of smart jewelry, aesthetics play an important role in jewelry and will for the future of smart jewelry. Artists in the crafts disciplines, such as textiles, ceramics, and jewelry, have recognized since the Industrial Revolution the need for objects to serve users both functionally and formally [4]. Though such subjective “data” has faced resistance in design, wearable technology designers are be-

coming increasingly aware of the importance of the aesthetics, and ultimately the jewelry-ness, of devices meant to supplant traditional jewelry objects. This is exemplified by the Swarovski Shine by Misfit, Tory Burch for Fitbit, and Ringly.

3. CONCLUSION

Screens play and will continue to play important roles in our everyday lives. However, as the layers of media in our environments compound, awareness of the objects and information we construct to add in and how they influence us becomes increasingly essential [5].

Jewelry has played a functional role since almost the start of society, navigating the transition between personal and public space and meaning in a way still relevant today. We must continue to build a stronger understanding of the tradition of the field in order to utilize and surpass its expressive and communicative abilities via smart jewelry. By allowing users to almost forget the presence of their devices, and to interact with in their wearable-accentuated environments seamlessly, smart jewelry will amass the momentum necessary to grow as a field and transform interactions in the future.

4. REFERENCES

1. Untracht, O. (1982). The Messages of Jewelry: Why We Wear Ornaments. *Jewelry Concepts and Technology (1st ed., pp. 1-8)*. Garden City, N.Y: Doubleday.
2. Ringly. (2014). Jewelry, Meet Technology, *retrieved from* www.ringly.com.
3. Pierce, D. (2015, March 4). Fitness Trackers Won't Really Help Until They Tell Us What to Do. *Wired.com*. Retrieved March 4, 2015.
4. Albers, A. (1961). *Constructing Textiles. On designing (2d ed.)*. Middletown, Conn.: Wesleyan University Press.
5. McFedries, P. Ambient is Everywhere. in *IEEE Spectrum*, 51(12) December 2014, 29.