

Desiring Technologies: Case Studies in the Coming of Being of Wearable Technologies

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Abstract

It is our contention that wearable computing must engage in the development of systems that lie outside the purely mechanistic and functional. Adopting such a view allows for the uncovering of the unexpected, the frivolous, the human. However, for such notions to be explored it is important to situate the work within realistic and realisable frameworks and utilise any experimentation to find solutions and create devices that point to a future of integration and manufacturability. Only within the realm of the possible can the impossible occur.

Keyword

wearable computing, serendipity, social functionality, magic, open systems, frivolous technologies

Introduction

Arthur C. Clarke said that any sufficiently advanced technology is indistinguishable from magic. Maybe: in some ways, all technologies are magical - after all, what is "advanced" technology?

As technology progressively enters our personal sphere the development of a methodology becomes pressing— a critical and inspired outlook as to a way the various artifacts we have inherited, in addition to the ones we now create, can describe and in fact, articulate, a new horizon of possibility.

In order to do so we need to continue experimenting, entering into the kind of dialogue in the technological field where prototyping and development lead into concrete ways of altering our perception of "what technology is" and where it can go. A solely mechanistic view on technology is out of the current discourse- notions of playfulness, chance, appropriation and transformation are part of the most engaging aspects of research projects happening now. We are at a juncture where the technological self could end up being our best chance for a truly human self. Technology need not be alienating; it elicits, inspires, promotes modes of interaction and interoperability that will soon become part of a world in the making (and always endless).

To understand technology in such terms offers one way to expand or to transform our understanding of ourselves and the limits of our ability to communicate with each other.

Where we are, where we can go

The field of wearable computing has been growing while trying to define itself. Technical advancements in the field – from conductive fabrics to accelerated miniaturization – have not translated into any significant advancements in social or interactional instances or in an acute integration of such products in daily life and fashion.

There are many reasons this is so. On the technology side power limitations create obstacles. Washability and connectors, fully integrated conductive conduits and assembly of electronics into garments are still in the research stage. But more crucially, it is the design process that presents the greater obstacle. Such a process involves the collaboration of very different practices with very different processes and perspectives. A fashion designer and an electrical engineer operate in fundamentally different ways, in other words the mediation of such a set up has to be created.

We are at the ledge of what is possible. We are hovering over a unique possibility to create new paradigms of action and reaction, of use and assimilation. We have to entertain all possibilities and in order to do so we have to create realistic, open and alternative options for emerging technologies.

Technology as story telling

It is in our view important to approach new technologies as a medium for creating stories, envelopes that contain myriad words, for multiple stories to be written.

Wearable technologies have inherent properties that make them ideal candidates for the exploration and implementation of such notions as social functionality, serendipitous technology and experimental non-verbal communication. It is important to provide an alternative but more realistic, integrated version of wearable computing: to provide ways in which technology, and ‘the things we put on our body’, can act as means of communication- and to divert occurrences of everyday life.

Clothing and accessorising has always been a medium of communication. There are various theories why people clothe themselves. Protection, adornment, modesty are but a few, but ultimately the way people dress constructs a concise vocabulary of intentions and possible interactions.

We are currently at a threshold where we could reclaim our personal environs as an expressive, open and malleable space.

While wearable computing projects must explore social interactional patterns and institute new ones, they must also elaborate ways in which technology can seamlessly be integrated in garments. The aim is not to create “cyber” garments, but to use technology in surprising and innovative ways and place emphasis not on the technology but on its uses.

We have developed three projects that attempt to do just so:

The LoveJackets, the HugJackets and the ClickSneaks are all fully working prototypes developed by Studio 5050 and are meant as experiments that unlock the frivolous and playful in both technology and the personal (as well as the intersection of the two), while they tackle issues of construction and development. These three projects act as case studies that bring into focus some of the theoretical and practical concerns of wearable computing.

The LoveJackets

A pair of jackets emits, and polls for a particular signal. Once the pair finds each other, in at least 10 feet distance, facing each other, the two beep – emitting a sound akin to crickets mating, and a pattern of LEDs blinks. Each jacket responds only to its unique pair.

The technology used is basic: an infrared receiver and transmitter, a PIC chip that controls the LEDs and speaker output and sends out the “bits” of code that allows the pairs to find each other. The components are all surface mount, which means that the technology is as transparent as possible. Instead of wires, the components are attached to the circuit board via conductive fabric “conduits.” The mechanism (PIC and LEDs) is powered by a thin, rechargeable battery. The jackets are fastened with conductive hook & loop, which is also used to activate their mechanism. Thus what is commonly used as a fastening mechanism for garments is also used as a “switch”.

It is particularly important to use such devices and adopt existing clothing metaphors in order to assure a fluid integration of electronics into garments and accessories. Each “wearable” must first satisfy existing properties of a garment before it is transposed to the realm of electronics. In the same way that we do not expect to “turn” on our sweater in order for it to be warm, we should not be expected to “switch” on our clothes in order for them to be operational. Adopting existing practices and gestures allows wearables to be understood as part of a continuum and integrated into the realm of everyday behavioral patterns.



The LoveJackets are also a take on the origin of Love according to Aristophanes. In Plato’s Symposium, a treatise on the nature of Love, Aristophanes entertains the following: in the beginning all beings were one, forming a perfect circle, irrespective of gender, just a complete union of two bodies forming a perfect unity. In such unison, mortals had little use for gods, and they, in turn felt neglected. Smitten and uncared for, they decided to split these unions, cut them in half. Ever since all bodies seek their original half. This accounts for the completeness that arises when these two bodies mate – the wounds inflicted by the gods find their healing other.

The LoveJackets assume the above story as their heritage, or – as their playing field, one instance of a story among many. How do you transpose a myth into an artifact, into a tangible, realizable and functioning materiality?

The process is both intuitive (and in this aspect contains a grain of magic) and iterative / collaborative (thus demands the mobilization of varied practices).

In such a light technology is approached as both a metaphor and the thing-in-itself, a liberating in many ways trajectory. In the case of the LoveJackets infrared is used both to accentuate the possibility of communication through an invisible spectrum and because of its inherent limitation: infrared only works in “line-of-sight.” The two wearers have to literally “see” each other in order for the jackets to be activated. The fact that infrared technology is most commonly used in remote controls adds its own layer of irony.

The HugJackets

The HugJackets take the idea of the LoveJackets a step further. While the LoveJackets represent a random act of courtship, a chance encounter, the HugJackets demand a deliberate act of union. An embrace between the two wearers activates, like in the case of the LoveJackets, a pattern of LEDs and a “heartfelt” sound. If the LoveJackets begin a courtship, the HugJackets consummate it.

An intricate quilted pattern made of conductive fabric is sewn on the front of each jacket. When two people wearing a HugJacket embrace they actually power each other up through that pattern. The symbolic energy transfer becomes fully actualized and the embrace is instantly translated into light and sound. The HugJackets technology itself is astonishingly simple – it is the intricate patterning and placement of the conductive fabric that allows for the surprising connection and effect to take place. The two jackets, through their twined pattern, literally plug into each other’s battery source.



In the case of the HugJackets the objective was to use the metaphor of a simple interaction and in so doing also use a simple technology, in fact, a material (conductive fabric) to invoke the coming together and transfer of energy. We used conductive fabric, a most underused “sensor-system”, to register connectivity and accentuate the act of an embrace.

The HugJackets are made of UltraSuede, a robust material that was forgiving and flexible enough to make incorporating electronics and general assembly easy. This in itself was a great lesson, demonstrating once again that advanced materials and integrated technologies are fundamental in charting new territories.

The ClickSneaks

The ClickSneaks were conceived in the most pedestrian manner. Walking down a cobblestone street, wearing a comfortable pair of sneakers next to a friend wearing a stunning pair of high heels. The sound of the heels echoed through the night, each step producing a rich aural environment; what if the comfortable sneakers could partake in this world of poignant allusions?

Part fantasy, part irony, the ClickSneaks subvert both the traditional attributes of a pair of shoes, and expose the multi-layered relationship we have with our clothes and accessories.

For the ClickSneaks the sound of the inspirational high heels has been recorded, only to be activated on each step the revamped sneakers take. Surface mount technology makes it possible to fit the necessary components in the sneakers: the original “click” sound is recorded on a voice chip, while a speaker, amplifier and an accelerometer acting as a “switch”, transform these seemingly normal sneakers into a flighty performance.



The ClickSneaks demonstrate not only the subversive potential of technology but also the ways that technologies can be incorporated in various forms and form factors. The ClickSneaks are also fitted with rechargeable batteries and their driving PIC is exposed as part of the design of the shoe. The batteries, chip and speakers are fitted onto the sneaker without compromising wearability, comfort or style.

Conclusion

It is important to be able to view technology as an enabler of frivolity, of unpredictability and of instances of authentic human encounters. In expanding technology to include such notions we enlarge the space of transactional possibilities and affordances.

At the same time, we need to engage in the practice and in so doing uncover new metaphors, new devices and new ways of solving theoretical and practical problems.

It is in the doing that we can develop a stimulating discourse. In the actual practice we not only uncover the best way to attach a connector to a garment or to fit a battery into a jacket, but the invention/design process itself brings forth new paradigms of usage and action. It is there where the most promising aspect of technology (and design) lies: in the iterative and expanding ability of ideas and practice to assume each other.