Re-Visioning the Interface:
Technological Fashion as Critical Media

Susan Elizabeth Ryan

ABSTRACT

This paper elucidates two positions (the positivist and the critical) that inform the creative design of technological fashion. On the one side is the instrumentalist trend toward the minimized or disappearing interface. On the other, some theorists and artists suggest that increased invisibility presents social and ethical concerns (such as invasiveness and control) when networking and communication devices are involved.

The positivist side has roots in modernist design. Positivist designers create responsive and controllable fabrics using shape-changing polymers, e-textiles, and nano-scale electronics to resolve clumsy and prohibitive problems of hardware vs. body. The critical side draws upon archetypal ideas about technology and the body that are familiar from literature and science fiction, and includes writers and media artists who emphasize the intractable or mechanic nature of technological clothing to enhance, rather than erase, the body. The paper concludes that both positions must be considered as the field of technological fashion moves forward.

Designers of material computing promote the minimized or disappearing interface in technological fashion applications. At the same time, some media critics and theorists suggest that increased invisibility presents social and ethical concerns, especially when networking and communication devices are involved. This paper will elucidate these positions, which I call the positivist and the critical, and suggest some of the issues at stake in this debate. Furthermore, it will compare the interpretation of wearable technology garments as, on the one hand, a process of invisibility based on an ideal of pure functionality, and, on the other, a process of technologically elaborating an age-old creative dialogue between society and the body.

The positivist position on wearable computing is historically anti-fashion and anti-dress, and essentially modernist in its cultural viewpoint, in accordance with traditional science. The idea that clothing must be minimized, standardized, and muted amounts to a classic tendency known among fashion historians as anti-fashion. Anti-fashion maintains there is a neutral or “natural” way to dress, or that it is
most “natural” to dispense with dress altogether. Not fabric but skin is the mantra. When conjoined with technology, positivist wearable systems ignore clothes’ cultural connotations and seek a pure functionality that harks back to early 20th-century modernist prototypes in cinema and art, such as utopianist avant garde like Russian constructivism (Vladimir Tatlin’s Worker’s Clothing, Figure 1).

A perfect recent expression of this purism is Susumu Tachi’s Invisibility Cloak. Designed for medical and military applications, it is more like a “cloaking device,” which echoes not only episodes of Star Trek, but ultimately a similar idea in Gibson’s 1984 Neuromancer (Figure 2): the garment that appears to erase the body altogether [1]. Gibson’s mimetic polycarbon suit achieves an even older mythological essence, that of the invisible man, popularized in H.G. Wells’ 1897 novella of that name, in which the protagonist, a scientist named Griffin, theorizes and carries out a procedure that changes his body’s refractive index to that of the ambient air so that his body cannot reflect light. Anti-fashion, along these lines, I would argue, is another masculinist myth about the visual body.

We note that the other Invisible Man, the 1952 American novel by Ralph Ellison, provides us with the critique of Wells’ story: invisibility as a function not of optics but of social dynamics and cultural conditioning. Ellison’s book is rich with allusion and metaphor, revealing the dynamics of the visible, and his novel, more than Wells’, is suggestive of the critical position of wearable technology art, to which I will return.

In the fast-paced field of mobile technologies, responsive and computationally controllable fabrics— including shape-changing polymers, e-textiles, and nano-scale electronics— resolve awkward, clumsy, and prohibitive problems of hardware vs. body. New-media wearables researchers like Christa Sommerer, Maggie Orth, and Joey Berzowska, among others, and corporations like Philips Electronics, are rapidly advancing the reach of smart-fabrics concepts. They are developing conformable and stretchable sensing and networking surfaces.

For example, Philips’ SKIN project was first reported on in December 2007. According to Philips, these dresses “show emotive technology and how the body and the near environment...
can use pattern and colour change to interact and predict the emotional state.” Each emotion, such as stress, fear, or arousal, will affect the body’s temperature and consequently the sweat levels that generate light, which changes the pattern and color of a gown [2]. In this view, a modernist and techno-futurist one, the realm of human emotions is equally measurable and manipulable, even predictable, and can be configured for an expanding array of communication products. As of October 2008, smart fabrics and interactive textiles, or SFIT, is a multi-million dollar industry growing at an annual rate of around 25 per cent [3].

Much research is being prompted by strides in nanotechnology. Last year at Cornell University, design student Olivia Ong collaborated with fiber scientist Juan Hinestroza on a “Glitterati” line of fashion made of cotton bonded to silver and palladium nanoparticle solutions. The results were antibacterial couture cocoons (Figure 3) that keep wearers free of allergens and pollutants in the air [4]. But like antibacterial soaps, caution is required, as these garments might retard our own immune systems’ capabilities.

Scentsory Design’s 2003-2005 collection of responsive clothing uses nanotechnology and microfluidics to sense the wearers’ body heat and interpret emotional states, especially stressful ones (Figure 4). The garments provide aromas that boost the limbic system in the brain, our emotional center. The designers and researchers offer an “anti-depressive” form of embodiment and propose design that breaks down “the taboo on mental health and [improves] quality of life” [5]. These responsive garments interpret self-expression as an involuntary emotional condition that is instantly addressed by the system.

This trend toward automatic responsiveness is not interactive and participatory, but follows the drift of emphasis from clothing to the body that has taken place alongside the commercialization of mobile media and especially ICT (information and communications technologies) concepts. According to Gilles Lipovetsky, since the beginning of the information age we have witnessed increased commercial activity linked to a growing “anxiety-producing cult of the body characterized by the desire to avoid looking old, to avoid cellulite and wrinkles, a desire manifested in the endless task of vigilance, prevention, and self-improvement” [6]. So, with SFIT, the body is enhanced, augmented, given super powers, as it were; it is no longer “clothed,” so the sensual (visible, audible, tactile, and even olfactory) aspects of clothing and dress as social behavior are left behind. The positivist lineage of this trend is hard to shake: it is the figure of the disembodied cyborg or posthuman, and the reciprocity of humans and intelligent machines.
As Barbara Wegenstein has pointed out, such ideas have been echoed by techno-futurist writers from Warren McCulloch to Ray Kurzweil and Nicholas Negroponte [7].

On the other hand, many artists working in new media have taken an opposing viewpoint, sometimes exploring the intractable or mechanic nature of devices in mobile contexts like garments and fashion to enhance, rather than erase, the potential for statement making. Rather than hiding the interface, they use the social presence of clothing to emphasize or exaggerate both digital and garment operations. Examples from the exhibition Social Fabrics, which took place in Dallas in 2008, include Joanna Berzowska/XS Labs’ Skorpions (2007), a series of dresses with Nitinol, a shape-memory alloy, and customized circuitry that move on their own, even opening on their own to expose the body. They are poeticized garment malfunctions. Similarly, Heidi Kumao’s Posture Generator (2005) is a bondage-style leather corset that screams at the wearer when she begins to slouch, demanding a return to correct and adopt perfect (vampish) posture, and providing viewers and hearers with uncomfortable reminders of the dysfunction of fetishized display. A number of artists have addressed the concept of personal space in an overcrowded world by creating pneumatic attire. Teresa Almeida’s Space Dress (2005) expands at will to achieve a little more breathing room on a crowded subway, and shields its wearer from probing hands (Figure 5).

Among the endless examples that could be cited, some visualize operations of the body that are not normally aestheticized or even much noticed. Suzi Webster’s Electric Skin is a bio-responsive garment that turns the intimate breath of the wearer into pulses of aqua blue light (Figure 6). A breath-controlled electro-luminescent panel embedded in the hood flares off of the garment. It does not diagnose its wearer or suggest a treatment. It merely focuses the experience of breathing in both a metaphysically and digitally enhanced way, and, at the same time, it buzzes, encouraging an awareness of connectivity to electrical circuitry. In another vein, Stephanie Sandstrom’s
EPA Dress (2008) responds not to breath but to bad air. Rather than being functional and staying wrinkle-free, the dress crumples up in response to pollutants.

An important subset of wearable-technology art deals with social relations online and off, and how these are enhanced (or not) by mobile technologies. Laura Beloff, Erich Berger, and Martin Pichlmair’s Seven Mile Boots (2003) enable their wearer to surf audio chats on the internet by walking on actual ground. The conversations are broadcast in the boots’ vicinity, unbeknownst to the chat room participants (Figure 7). Big and covered with hardware, the boots are showy and evoke fabulous boots of cultural myths and fairy tales.

In another work that represents network connectivity in the real world, Katherine Moriwaki’s umbrella.net (Dublin) is a network of umbrellas that emit an electronic signal when opened and light up when nearing others of their kind. Umbrellas always make an appealing display for pedestrians walking in any rainy urban landscape. Umbrella.net references this picturesque phenomenon and discloses offline awareness of the online world as well. In all these examples, the exploration of visibility as well as physical fact or even physical flaw invokes more the recalcitrant figure of Ellison’s Invisible Man than the erased one of Wells’.

Most wearables artists are acutely aware of the history of clothing as intellectual context for their work. But even in the realm of fashion design, we find the utilization of digital technologies to visualize complexity. Hussein Chalayan’s 2007 animatronic collection presented dresses that expand and contract. Beneath each model’s skirt was a computer-driven system designed by the creative engineering firm 2D3D. The point of these clothes was to digitally perform the history of fashion within a single dress. The collection emphasizes the act of change in a larger fabric of behavior and time.

But why garments and wearables as an artistic strategy, and why now? While wearable art had a conflicted development within the institutional contexts of museum and art historical discourse in the 20th century, the increasingly mobile and participatory public of today favors performative and interventionist practices over traditional art objects, and the old barriers between aesthetics and functionality seem to be breaking down. Moreover, increasing numbers of researchers are studying garment history and theory, and some argue, as Lipovetsky does, that, far from being materialistic incentives for the growth of market economies, ideas about what we put on our bodies are implied in the very infrastructure of democratic societies. He writes:

We have reached the era of consummate fashion, the extension of the fashion process to broader and broader spheres of collective life. Fashion is not so much a particular peripheral sector, now, as a general form at work in society as a whole. Everyone is more or less immersed in fashion, more or less everywhere. [8]
For Lipovetsky this is not a bad thing: fashion (or, more broadly, dress) is not merely a commercial, but rather a quintessential element in the life of individuals functioning in societies. In fact, despite the “cult of the body,” interest in dress is everywhere, in both commercial and DIY manifestations, and throughout popular culture, from the “Project Runway Effect” (Americans buying more sewing machines) to the centrality of costume in virtual online worlds.

To reference an idea of Gilles Deleuze, the increased interest in dress embodies (as it were) what he terms “control society,” the formation that has replaced Michel Foucault’s “disciplinary society,” based upon institutional spaces like hospitals and prisons. Control society’s lack of enclosure, its nomadic present, is the vehicle for dress. Dress is everywhere. It is our primary interface to our environment and transmits and receives emotions, experiences, and meanings. But dress, like other technologies, is ruled by codes and susceptible to protocological control.

Critical media artists working in wearables incorporate technologies in ways that not only reference the history of garments as (indeed) the oldest mobile IT, but also—and this is in line with what dress has always done throughout its history—to examine given forms and technologies, and discover inherent weaknesses or flaws in the systems that embed them. These flaws reveal attitudes and intentionalities that some might call problematic. Joanna Berzowska writes:

As designers of wearable technologies we need to step back and ask why we want our fabrics to be electronic… The clothing and electronic industries are looking for the killer application, the next big thing that will introduce wearable computing to a mass market. However, many research directions are misguided. The focus on health monitoring and surveillance technologies clearly reflects the military funding structures and fails to deliver appealing product ideas that respond to personal, social, and cultural needs. [9]

Media theorist Geert Lovink claims that the vanishing interface makes us vulnerable. He states: “The integration of technology into clothing has the danger to become invisible and merely expand corporate functionality, which is not beneficial for the user” [10]. Lovink is especially wary of the developing ubiquitous use of RFID tags, RF fibers, and micro-sensing devices. The idea that our clothing (or our personal environments, for that matter) can regulate our health or physical performance or cater to our desires has a dark side that calls to mind Deleuze’s notions of control societies [11].

Critical wearables artists are hacking the protocological networks of the body in a manner Alexander Galloway describes as “life-resistance” [12]. They position themselves as interventionists by drawing attention to social phenomena rather than actually attacking corporate technology. But the systems these artists bring together for scrutiny are more diverse and subtly related than those of any programmer, and include technological protocols, bio-power, EMF environmental “pollution,” gendered representational patterns in both dress and technology contexts, and the mimetic or mime-like nature of both dress and technology. More than
anything else, critical wearables artists explore something that technological design rarely does: the complexity of online and offline combinations, i.e. the metaphysical messiness of digitized life. As Andraž Petrovčič found in his recent study of personal networks in Slovenia, users tend to combine multiple media modes to sustain their personal networks. Furthermore, “results regarding the distance of ties in the personal networks of ICTs users and offline socialization indicate that the new forms of sociality, although promoting spatially extended personal communities, are firmly embedded in physical settings” [13].

Given the tactical and critical roles that new media artists have played in the past, plus the social commentary inherent in radical fashion design, we might ask: Does fully integrated material computing represent greater creative freedom, or an area that can be occupied by political interests or any means of social control? Can we compare wearable technologies to the pencil or the printing press, a kind of medium with powerful reach and impact that we must learn to use with subtle understanding? The growing use of wearable technology as a critical art practice dramatizes such questions and allows us to fine-tune our reactions to them.

The positive and the critical views frame how we use technology and how we imagine it will be used in society. Clearly, neither position is exclusively correct, and wearable technology art and design will encompass both on an ongoing basis. But with the advancement of material computing technologies, more and more “smart” wearables will enter the social and commercial fields. Since the body itself and our corporeal existence are at stake here, these respective positions should be carefully considered as we incorporate the new technologies seamlessly into our practice of dress.

References