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21W.784 Becoming Digital

Professor Aden Evens

E3D

*(wearable computers)*

The desktop computer is one of the first and most familiar manifestations of computing for personal use. Its physical relationship with the user is dictated by its hardware design; it is a bulky tool installed in a fixed location for the user to come to when he wishes to perform computing tasks. Then, a new demand was made of the personal computer: the desire to break the constraint of location. Hence, the demand for portability brought about the inventions of the laptop, PDA, and Blackberry. With these devices (and the parallel invention of wireless internet), a user can work on his own computer at home, on the bus, or at a café at his convenience, creating the second stage of computer-user physical relationship. However, now that laptops, PDA's, and Blackberries have themselves become familiar manifestations of the personal computer, is there a third stage of computer-user physical relationship coming into being? We can already bring our computers anywhere we wish; how much more "intimate" can we possibly hope to get?

Unknown by the general public, the third dimension of human-computer intimacy is currently being sketched out in research labs at universities and technological companies, as well as in limited commercial use. The manifestations of this third stage of computer-user physical relationship are at the cutting edge of hardware and technology today: wearable computers. The web page of one wearable computers research group at the MIT ~~Media Lab~~ declares, “To date, personal computers have not lived up to their name. Most machines sit on the desk and interact with their owners for only a small fraction of the day. Smaller and faster notebook computers have made mobility less of an issue, but the same staid user paradigm persists.” The impetus for the second stage was portability; what is the need behind this new dimension of human-computer interaction, manifested by video goggle displays, electronic eyes clamped over the real eye, and entire computer systems strapped to the body as a backpack or vest?

(<http://www.media.mit.edu/wearables/>)

At the 1998 International Conference on Wearable Computing in Fairfax, Virginia, Steve Mann presented a keynote address titled “Wearable Computing as Means for Personal Empowerment.” Among his listed attributes for a wearable computer, he states that, unlike a desktop or a laptop, it should be in constant operation, not inhibit the user’s normal activities in any way, be as unobtrusive as possible, and be a constant, attentive mediator between the user and his environment. In fact, he goes so far as to say that “Human and computer are inextricably intertwined ... You can adapt to it so that it acts as a true extension of mind and body; after time you forget that you are wearing it.”

(<http://wearcam.org/icwckeynote.html>)

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Indeed, the desire expressed here is for the computer to be become a part of the human mind and body, for it to be as “in constant operation” as the human brain, as “unobtrusive” in operation as the eyes and arms, and as “constant” and “attentive” a “mediator” between a human and his environment as the nerve endings in his skin. We want not only to bring computers about with us – we want them to be part of us.

This previous statement – “We want not only to bring computers about with us – we want them to be part of us” – contains a very significant categorization in humans’ interaction with technology. Technology can, roughly, be divided into two forms: technology humans use to perform outward tasks such as coal mining, car manufacture, and data analysis in a computer spreadsheet, and technology used to directly affect the self, such as medicine, textile development for clothing – and wearable computers that augment and add to human capabilities and senses. [This is an interesting distinction, but I wonder whether it would hold up to close scrutiny. That is, I suspect that much of our use of tools is as an extension of human capabilities and senses, while much of our use of nascent wearable computing is as a means to an external end.] Hence, the difference in impetus between the portable and wearable stages of computer-user physical relationship is a startling leap, from using the computer as an external tool, to incorporating it as part of the self.

That the computer is chosen for this leap is unsurprising; the binary system of bits and bytes and the microscopic circuitry of a chip is one of the most fearsome technological combinations of power and flexibility, physical and functional, we have ever seen. [Though dramatic, this last sentence doesn’t really have much content. How does this combination become so powerful, and what sort of power is it?] Perhaps this

tool, with its great capabilities, can create and inhabit yet another dimension of the use of technology beyond the “outward” and the “self,” one that we have yet to dream of.

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### Self-Critique

This draft is, I admit, very sketchy and needs a lot of examples, elaborations, and further analysis. The claim in my last paragraph, that computer technology may be so powerful as to bring about a new dimension of technology, I’m eager to pursue.

However, from looking at statements from wearable computing sources, I’m afraid my original “claim” about wearable computers augmenting the self is not original enough to deserve that great of a portion in my essay – how should I treat it?

Hui Ying,

Your draft introduces the nascent technology of wearable computing, representing it as an attempt both to bring computers as close as possible to the self and to exploit this intimacy toward an enhancement of normal human function. Though your self-critique is certainly correct in pointing out that this is very sketchy—really more of a suggestion of a topic than an essay in itself—it is well written, well organized, and already contains valuable and informative research.

It's hard for me to offer substantive recommendations about where to go with this draft because you haven't given me much to work with. If you are excited to pursue the idea of wearable computing as a way of augmenting the self, then I don't think you should let a "lack of originality" stand in your way. Even though other theorists have surely covered this theme, your investigation could offer original insights and ask particular questions that haven't already been addressed. Moreover, your perspective will inevitably be unique, provided that you push yourself to think freely and to keep your curiosity turned up to eleven.

In fact, I think that your claim to discover a radical difference between the aim of wearable computing and the aims of earlier forms of technology is already a pretty contentious idea. If you can articulate further the "startling leap" that you discover, that would be a worthy accomplishment in itself. And if it is somewhat obvious that wearable computing is about a desire to augment the abilities of the self, the specifics of this desire are very much up for grabs. Why do we have this desire? Is it competitive? Does it grow out of technological determinism? Is it fetishistic? Is it healthy? Are we insufficiently suspicious of technology? Are we blinded by the very pace of technological advance? What forms does this desire for augmentation take? Is it all about the senses? Is it about strength and speed? Do the prostheses being developed operate on their own, or do they require a world full of transmitters that they read their data from? What sorts of changes is the world undergoing to accommodate these new technologies? Aren't cellphones already almost prosthesis, with Bluetooth headsets and radical miniaturization? What about necklaces with USB hard drives on them?

I recommend that you turn to some specific examples and let them guide your investigation a bit. Are these technologies growing out the medical industries, where they may have been developed to help disabled people? What does this say about the abled who choose to use them anyway.

I also recommend that you check out Paul Virilio's book, *The Aesthetics of Disappearance*, which describes the rapidly increasing pace of our lives, with an implicit attention to the technologies that are driving this acceleration. Good luck. I look forward to seeing it become an essay. It's a great topic.