

Performing Identity through Wearable Sensing

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Abstract

The current technology fervour over wearable technology that collects user's intimate body data, under the pretense of medical or fitness monitoring, highlights that it is time that critical questions were raised. The ethics of corporate ownership of body data for consumerist agendas is rarely discussed beyond the fine print on these devices [5]. More awareness and education on these issues, would potentially allow more access, ownership, and creativity in the use of one's own body data, and ways to express personal identity through this data.

This paper highlights these issues, through discussion of a new collaborative project by the authors, which brings performers together to help address the ethical issues around identity and data ownership when using wearable technology in performance. The project develops methods to use and hack commercial wearable devices, as well as making handmade e-textiles sensing devices for performance. As such, we aim to engage performers to access their own physiological data for personal use, but also to create unique and interactive performances.

Wearable Devices in Context

The zeitgeist around corporate medical or fitness monitoring highlights that it is time that critical questions were raised on the ethics of corporate ownership of this data for profit and government surveillance. Wearable apps and device development is a growing commercial field. With smart watches, fitness trackers and sport tech, such as Nike Fuel Band, Fitbit, and Jawbone, there are many devices that are designed to collect user data through sensors, such as accelerometers, gyroscopes and pedometers, breath sensing, heart-rate monitors, and calorie trackers. These technologies and other concurrent developments in electronic textiles, medical/biotech, have all evolved to the point that there is a community called the Quantified Self Movement based upon bodily self-monitoring. BBC recently reported that "97,000 apps are on sale in the mobile health sector" (Forrester, June 2014) that track this data. Many tech companies and start-ups are working to make the next wearable device or application for body data tracking.

General users and the public must be made more aware of the ethical issues of body data collection.

Everyone should have the right to access, own, explore, and use their own body data, as well as to interpret or reinterpret this data however we choose, to express our own personal identities, which is presently easy since the companies hold it as proprietary and only sell it to insurance or medical companies (Forrester, June 2014).

Currently the wearable tech companies, who can then sell it on to whomever they wish, own our physiological data, collected by wearable technology companies via mobile apps and devices. In one news story, (Rose, 12 November, 2014) fitness data from these devices is being used to monitor one company's employees' fitness, which could easily be used against them.

During a time of public cynicism around spying and data collection practices by governments and corporations, brought to the fore by the Edward Snowden revelations, artists, designers and performers should be involved in the wearables discourse as critical agents to educate the public about the corporate colonisation of the body through wearable technologies.

Exploring Through Performance

Researchers in recent years have been exploring these issues from the mobile health dimension, but, as Susan Elizabeth Ryan has noted in her recent book *Garments of Paradise* (2014:8), few are exploring the full potential of wearable technology in performance, let alone the other related issues of identity and body data ownership in performance. She writes:

Wearables in the context of performance present opportunities for exploring our relationships with our bodies and how we move them... [or how] communications interfaces, and other soft and sensory technologies allow us to experience or transcend our bodies, and how the concept of theatrical performance can be expanded in virtual space (2014:8)

As researchers and artists we question how this unique individual data demonstrates who we are as people, and how movement and our physiology can demonstrate

that. Does this relate to the performance of identity [1]? We would like to question how body data might be able to demonstrate who we are, through movement, through our physiology. How does access to personal data enable the performer to show their identity, rather than what is subscribed by the corporation making the sensing device? How can we explore these issues while enabling people access to their own data, especially in performance contexts, in order to interact with it? How can we explore these issues while enabling people access to their own data to interact with, especially in performance contexts? The Performing Identity Through Wearable Sensing project hopes to highlight:

- the need for new directions and to transform engagement in performance using wearable technology,
- identity and body data ownership issues in the current zeitgeist around wearable technology development,
- the need for critical discourse on wearable tech in general, but within the performance community in particular, the transformative potential of making experiments in ‘performing one’s own identity’ via body data and self-made wearable sensing devices and garments.

This collaboration addresses the issues, challenges and problems of developing methods of making and using handmade wearable sensing to access physiological data to create unique interactive performances. As such, we aim to share Maker/DIY practices with the local performance communities and educate these communities in making their own electronic textiles-based devices. We see this as a way to draw these communities into the development, evolution of, and conversation around wearable technology, data collection ethics, and in particular how wearable technologies might enhance performance creation, while being playful, challenging work.

In the context of this project, we wish not only to help performers to use and make their own physiological sensing devices using electronic textiles and accessible technologies for DIY smart fashions costumes, but also to enable them to use them to express and perform their own identities as they choose.

One current exploration of this notion by the authors is through programmable garments that are used within live dance performance. In this piece, vibration motors, such as the ones found in mobile devices, are embedded into costumes. The buzzing patterns indicate a choreographic score for the performers. This score is a

representation of data previously collected with a fitness tracker by one of the authors. The piece questions if the identity of the choreographer can be revisited through a performance and through a smart textile device. It also raises issues over who is the owner of this data – the choreographer or the performer who is now taking this data and reinterpreting it to their own ends. It may be considered a metaphor for the corporate appropriation of personal data collected through fitness trackers.

Practical Investigations

In April 2015, the authors had a ten-day residency to immerse more deeply and practically in the project’s concerns. Two approaches were explored within the work with performers during this time, including using commercial biosensing devices as well as DIY wearable tech devices.

Within our first explorations we focused on what we know about the commercial biosensing products that we chose (Polar belt and OMSignal shirt), and how we could start to play with layers of interpretation, based on what we know about data types they collect from our bodies. We revealed this knowledge orally in layers, which was a very complicated task for the dancers in terms of interpreting information through embodiment and movement.

As we revealed more information to the dancers – about the devices/garments, the data they were collecting the nature of our research, the ethics and corporate activities of companies who made the devices – their movement changed from a free flowing dance to more gestural, smaller, intense movements. Their movement transitioned from dueting with the other performer to solo performance. They moved from an embodied, responsive, expressive body to confused, individuated, over-analytical, paranoid, less-connected and engaged body. However, it was not the device itself that triggered this movement response. Based on their observed movement, it seemed that it was the idea that the data from their bodies was being collected and used - by both us (the artists) and the businesses that sell these devices. The devices themselves and the functions they sensed had less of an impact on the movement and the movement qualities. The dancers had trouble seeing these devices beyond things that would collect numbers. They were changing their expression based on the concepts we were having them explore, rather than experience of wearing the devices/ garments themselves, which they soon forgot they had on.



Figure 1, *Hacking the Body 2.0*, 2015. Using commercial biosensing wearable technology in performative contexts with dancers.

The second part of the project focused on the use of DIY sensors and actuators in handmade garments. The dancers reported much more affinity towards these garments and more interest in how the actuators in them triggered them to move. These garments were more sensual, delicate and elicited more tactile, intimate responses by design. They were playful in this way as well. Each of the handmade sensors was unique and personal in design, style and required close up interaction, touch and engagement.

The overall long term direction of this project is to refine methods of working with performers to enable them to control how they use the physiological data from their body or the data from another performer. This will be developed through further iterations of sensing and actuation via devices/wearable technologies they wear. This may then allow them to interact or respond to biosensing to create new movement 'dialogue' or interaction with other performers and therefore explore identities. In this way, the performers reclaim the data sensing and collection by using the technology as another tool to help them devise movement and co-create or choreograph performance works. This circumvents, and puts into new light, the ethical issues of corporate ownership by putting the ownership back into the hands of the user. This in turn may be considered a critical act of making and confrontation of the issues of surveillance and data control.



Figure 2, *Hacking the Body 2.0*, 2015. Dancers performing with DIY wearable sensing devices created by the authors.

Summary

Throughout this research, questions about ethics, data collection, how we use wearable tech, and how these devices reflect our identities are raised. By using performative practices and new devices, new ideas about what we are sharing and what this may mean begin to emerge. Future practical explorations include: organising more performance experiments and continuing to develop different approaches to using wearable tech in performance contexts, as well as making more robust custom wearable tech garments, embedded with both specialist sensors and actuators, that enable the performers to intervene with each other's expression using their body data. The ultimate goal is that performers engage with their own and other's body code to create new forms of 'live data performance', where the performer is initiating the interaction, using the wearable devices to aid their interaction. There are no concrete conclusions as yet, as the project is still ongoing and a new recent phase has involved performance for audiences with new custom made garments (due to the nature of the funding), rather than more strict research. Thus, more research work needs to be done with the new garments and newly developed technologies. Stay tuned.

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