

Body and Mind Connected Through Garments: How Wearable Technology
Highlights the Importance of Mental Health

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As the barriers between technology and humans become thinner and thinner, innovation becomes embedded in our everyday life not through an external computer but on our wrist or even embedded in our clothes. Wearable technology is described by Dr. Lamontagne as “electro-mechanically enhanced garments with the ability to process and receive information, sense the body or environment, and thus create effects” (p.8). Wearable technology is the key to understanding mental illness through visual demonstration of the unity between mind and body. We will examine it through different lenses: the performative aspect of wearable technology, its ability to collect data and, its concrete applications.

The Performative Aspect of Wearable Fashion

From Alexander McQueen’s *Highland Rape* exploring England’s shameful past (Autumn/winter 1995-1996), to Rei Kawakubo’s *Body Meets Clothes Clothes Meet Body* sending a message on body positivity (Spring 1997) or Vivianne Westwood’s *Red Label* show sending models down the catwalk wearing “YES” badges referencing the Scottish independence (Spring/Summer 2015). Fashion has always been an outlet to express oneself and often to rebel. The advancement of technology has provided us a rise of new possibilities and we are seeing more and more the end of the dichotomy between art and technology. Fashion has the ability to bridge the gap between the mundane and extraordinary. From streetwear to sportswear to gowns and theater costumes, clothing is a part of every activity. It is a visceral part of performance acts, whether it is to set in time a Shakespearian tragedy, or when used as a power move by wearing to the Met Gala a unique piece from a designer that retired 20 years ago (De Klerk, 2018). With the added complexity of e-textiles, wearable technology has an even deeper link with the performative act. If wearable technology has gained massive interest in the past decade, updating clothes and

using them as a tool of performance were already seen in the 1960s and the rest of the 20th centuries from fine artists and performers, not yet entering the world of couture (Hrga, 2019, pp.125).

A few well-known artists were Atsuko Tanaka, a Japanese pioneer artist famous for her 1956 piece “Electric Dress” (see Figure 1). She composed a garment entirely of light bulbs and tubes in response to Japan’s radical technological advancements during that time (“Atsuko Tanaka”, 2019). Marcel·lí Antúnez Roca is another example with his 1994 interactive exposition *Epizoo*. The artist was wearing a robotic exoskeleton and the audience was able to control his movement from a computer (Roca, n.d).

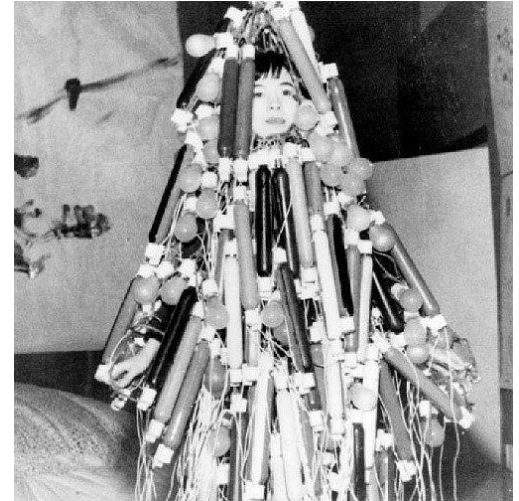


Figure 1: Atsuko Tanaka and her Electric Dress (1956) Taken from phillips.com

Even now, current fashion designers celebrated from their use of technology like Anouk Wipprecht or Ying Gao often exhibit in art galleries or expose at academic conference. Anouk Wipprecht, a technologically savvy Dutch fashion designer, designed a dress in



Figure 2: Anouk Wipprecht 2012 smoke dress. Retrieved from streamingmuseum.org



Figure 3: YinGao 2019's Flowing Water Retrieved from dezeen.com

2012 (see Figure 2) that releases smoke when someone approaches, allowing a perfect disappearing act. (“Anouk Wipprecht: Fashion Technology, n.d”). Ying Gao, a Montreal-based fashion designer and

teacher at Université du Québec à Montréal (UQAM), creates dresses that respond to their environment (see Figure 3). Her

Flowing Water dress uses colour and light sensors, as well as tiny cameras to gather information about their environment; the fabrics ripple and move based on the data provided (Griffiths, 2019).

As mental illness is often ridiculed as something imaginary that doesn't deserve the same recognition and care physical illnesses do. Wearable technology's performative aspect comes in handy to put the topic under light. Lauren Bowker, a chemist from England, creates science-

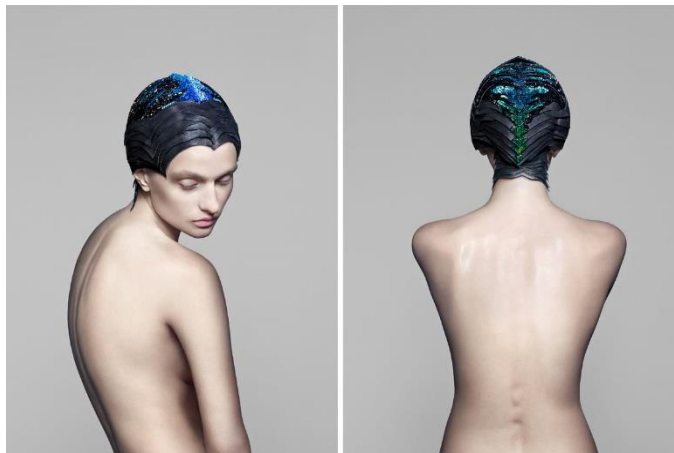


Figure 4: Lauren Bowker's 2014 Swarovski headpiece visually show emotion. Retrieved from designboom.com

fiction like product: hair dye that changes color according to heat, coats that become darker according to the pollution level in their environment. Her 2014 partnership with Swarovski (see Figure 4), resulted in jewelled headpiece that can visualise its

wearer's brain activity and a garment that changes color to reflect emotions such as fear and excitement. The experimental headpiece brings together a collection of over 4000 black lab grown spinel stones paired with color-changing ink, chosen specifically for shared characteristics with human bones (Caula, 2014). By showcasing emotions like stress, sadness, mania it becomes possible to exemplify their reality and thus mental illnesses.

Hussein Chalayan, a Cypriot-British Designer, known for his innovative designs like a coffee table that turns into a dress or outfits changing shape by using microchips and animatronics partnered with Intel in 2017 for his spring/summer collection to start a discussion on the amount of stress we face daily. As models walked the runway, visual projections showcased their stress levels on the wall beside them via



Figure 5: Hussein Chalayan's 2017 dress showcased stress in a visual way. Retrieved from forbes.com

biofeedback sent from the connected accessories they were wearing (see Figure 5). By decreasing their level of stress through conscious breathing, they were able to change the imagery behind them (Arthur, 2016).

Data Collection

Mental hospitals are often overloaded with lists of patients waiting months to be followed by free healthcare not to mention seeing your doctor is far from the end of the journey as subsequent tests and specialized doctors can take even longer. According to the Fraser's Institute report the average wait for a magnetic resonance imaging (MRI) scan is 10.6 weeks (Barrus, Jacques & Collyer, 2018). The Government of Canada declared in 2016 that "over 4,000 Canadians die by suicide every year—an average of 11 per day". There is a mental crisis in Canada and a lack of resource put in place. Doctors are often limited by the information patients want to share or even notices which is hard since a lot of signs in mental illnesses are easy to underestimate or ignore. Artificial intelligence's application to speech could be very beneficial to mental health: speaking in a monotone tone is linked to depression while fast speech can point to mania, disjointed word choice can be connected to schizophrenia (Ducharme, 2019).

For the moment, wearable technology designed for mental health is still heavily comprised of watches but as research continues, we should see more attention paid on e-textile, a fast-moving field. As Peter Brown explains, e-textiles are created in part with "sewing machine[s] that embroiders thread into fabric in a pattern via a computer program. Instead of thread, however, metallic fibers [...] are used that feel the same as traditional thread to the touch (n.d). As research progresses and e-textiles cost diminish, it will be easier to access for everyone. The added advantage of e-textile is a more precise application as you are not only taking data from a wrist

but from your whole body. There is already a lot of successful products developed on physical health ranging from shirts that relieve chronic back pain to soft all-day belly bands that monitor uterine contractions and fetal heart rate in pregnant (Brown, n.d.)

Wearable technology has brought creative solution to those problems. YBRAIN, a Korean start-up founded in 2013 developed the MINDD STIM, a headband that helps to activate communication between neurons in the cerebral cortex using electrical stimulation. The headband targets patients that suffer depression, anxiety, and insomnia and designed to be used at home according to doctors' directions. This allows clinicians to monitor treatment records and adjust patients' treatment more efficiently. ("7 Wearables for Treating Mental Health Conditions", 2019).



Figure 6: YBRAIN's MINDD STIM headband. Retrieved from www.nanalyze.com

Typically used to track physical activity, Flinders Associate Niranjana Bidargaddi and researcher Dr. Alissa Knight's study tested whether smart watches can also provide updates about someone's mental health, while also allowing users to track their own wellbeing if they choose to do so." Digital track of physical activity could show someone's mental health as a decrease could be a symptom of depression. Dr Knight explains that " while the study proves wearable technology could be used to monitor changes in mental health, the next step is further research into which kind of devices and apps would be most effective." An example of future research they are looking in would be to improve location data to measure how often sufferers leave their house in a certain number of days or whether they are spending more time at the gym. (Flinders University, 2018).

Applications

Another way, wearable technology has brought innovative solution is through meditating which is known for its many mental health benefits: reducing stress and regulating negative emotions. Although there are many mobile and smartwatch apps that help with meditation, haptic technology, the use of touch in a user interface design brings to a whole other dimension and hold much promise for future research because it can be easily miniaturized in e-textile and does not require moving mechanical parts. (Brown, n.d).

Released by Wearable X in 2018, an Australian company based in New York City, the Nadi X smart yoga pants are biometric leggings (see Figure 7). They use vibrations to correct your yoga poses (Leighton, 2018). One-on-one personal and intuitive feedback makes it much easier to improve your technique on the daily, however a downside is that you won't be getting feedback on your upper body.

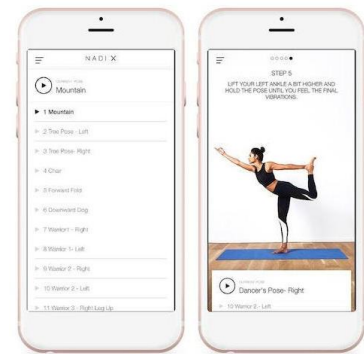


Figure 7: The Nadi X smart yoga lets you follow exercises on your phone and guides you through vibrations. Retrieved from www.businessinsider.com

Spire, a leader in actionable health monitoring introduced in 2018 “Health Tag” a washable wearable that you attach on the inside of your sports bra or underneath a t-shirt to monitor your workout (see Figure 8). It continuously monitors breathing and reminds you to relax via alerts from a connected app. They have been recommended by thousands of healthcare professionals worldwide. Spire’s IOS applications



Figure 8: Spire’s 2018 Health Tag monitors breathing and reminds you to relax www.spirehealth.com

suggests actionable steps you can take to improve your health, such as increasing activity or getting more sleep. (Spire Health Tag, n.d.)

Bellabeat's 2016 Leaf Urban Model is a leaf-shape pendant that you can wear as either a clip-on or as a piece of jewelry (see Figure 9). When you buy a Leaf Urban, it comes with a necklace and bracelet strap.

In addition to sleep tracking and being the first tracker to include settings for women to monitor their menstrual cycles and pregnancies, Leaf turns breathing data into real-time advice for your meditation practice: it will run you through guided breathing and you can see weekly meditation goals in the app. (Duffy, 2016) There is still a lot of innovation needed in the field since too often the aesthetic aspect of



Figure 9: Bellabeat's Leaf Urban turns breathing data into real-time advice for your meditation practice. Retrieved from www.medicalxpress.com

the wearable weights the utility. The breathing tracking is functional, but not really advanced and it only works when attached to your wristband, more so for their meditation feature you can't close the screen of your application. (Duffy, 2015)

Conclusion

Wearable technology is a recent medium with countless new possibilities. Its ability to shed light towards mental health, its performative aspect, data collection, and concrete applications is starting a new conversation on the subject which is necessary to change legislations and spark change.

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