Technology Meets Fashion: Exploring Wearables, Fashion Tech and Haute Tech Couture

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ABSTRACT

The introduction of technology into the worlds of fashion and haute couture, has made it possible for fashion designers and technologists to create and experiment with garments and wearables in a variety of novel and expressive forms. Several of these haute couture garments infused with technology are shown on international runways and can ultimately influence the design of consumer fashion and wearable products. Within this context, I describe my dissertation which aims to explore and understand the role of technology throughout the process of design and fabrication in the haute tech couture domain and uncover broader implications for the design of wearables.

CCS CONCEPTS

• **Human-centered computing** → Human Computer Interaction → Interface design prototyping

KEYWORDS

Fashion; Fashion Technology; Haute Couture; Haute Tech Couture; Wearables; Interaction Design.
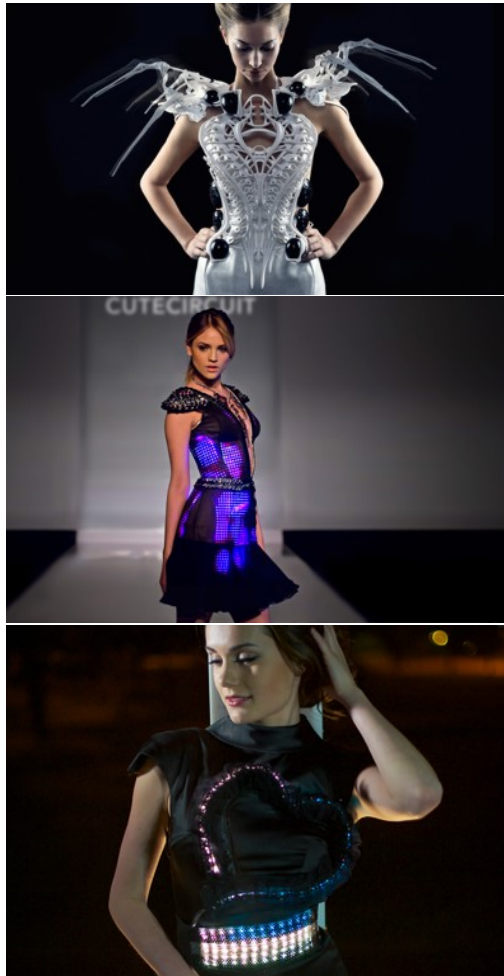
Figure 1: (a) A fashion tech garment created by Anouk Wipprecht, exploring biomimicry and proximity; (b) An early garment created by the team CuteCircuit (c) A fashion tech piece by Maria E. Hoover of MakeFashion, exploring the expression of anxiety using a proximity sensor.

1 CONTEXT AND MOTIVATIONS

Fashion influences culture drives social and economic change and is a key component of everyday life and expression. One particular hallmark of fashion is its rapid and ever-changing style and pace, with an ability to set global trends [1]. Similarly, the pace of innovation within the technology sector is also rapid, both influencing and blurring the lines between fashion and technology, as well as their related industries, companies, and respective products. This has given rise to the growing area of Fashion Tech.

Fashion tech and its communication medium (how it is expressed) can be split into the street (or consumer market) and the catwalk (or runway) [1]. In this particular context, there is a disparity in the rate in which technology is adopted. Only very recently have technology companies like Google begun collaborating with fashion brands (e.g. Levis and Jacquard [2]) to create products or vice versa, with fashion brands (e.g. Chanel [3]) creating their own fashion tech products. Another example is prevalent with smartwatches today, the most popular wearable in the consumer market. Fashion companies (e.g. Fossil) have begun influencing and creating smartwatches themselves, using technology to enhance their designs and brands. Alternatively, runway shows have featured technology for a number of years, with fashion tech designers creating haute couture (high-end and custom fashion) garments, infused with technology (haute tech couture). As shown in Figure 1, this fusion of fashion and technology leads to interesting experiments and explorations by both fashion tech designers and technologists. Given that runway shows, and their haute tech couture garments are more exploratory in their nature, it has allowed for far more novelty when compared with consumer fashion tech and wearables.

2 WORK TO DATE

I am a PhD student at the University of Calgary and have just finished my 5th year in my PhD program under the supervision of Dr. Anthony (Tony) Tang and Dr. Frank Maurer. My work is strongly interdisciplinary connecting Fashion Technology, Interaction Design, Art, and Human-Computer Interaction.
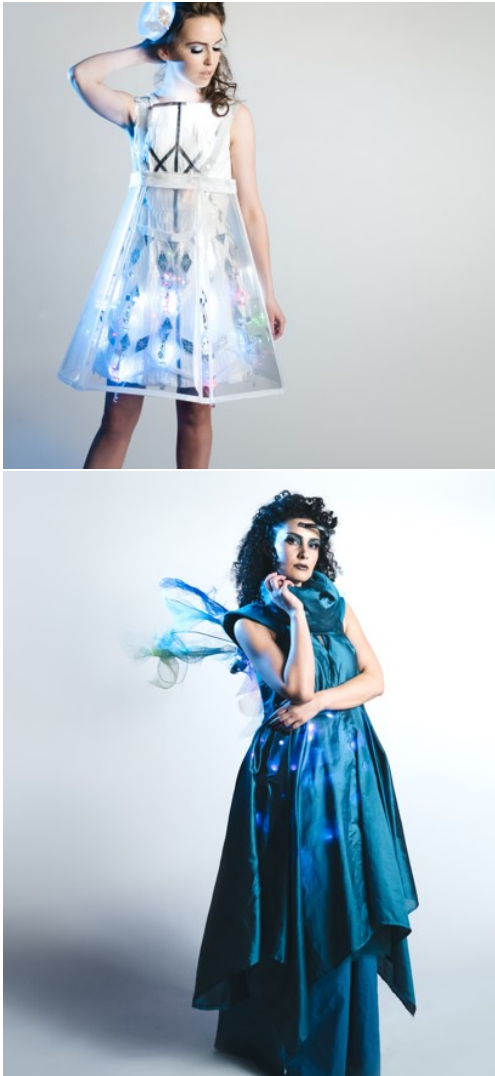
Figure 2: Two fashion tech garments created for the MakeFashion 2017 Gala Show (a) Exploring light and mirrors (b) Exploring a sleep recording headset and visualizing it.

Over the past 3-years I have been embedded in the Fashion Technology industry, designing, creating and assisting with haute tech couture garments, and I am in the final stages of preparing how to translate my learnings for academia. Generally, my path in the dissertation has been unconventional and broad, where I first began researching wearable (and multi-screen) devices, before focusing on the fashion technology domain.

Project 1: Designing Wearables and Devices

Smartwatches are one of the most common forms of wearable devices, where it is convenient to access information, but interactions can be made difficult due to the small form factor and screen area. A number of solutions have been created to address this issue, such as placing touch displays around the entire watch band [4]. Additionally, since most watches use direct touch on the display, the small display combined with fat fingers is problematic. My approach was to extend the notion of manipulating a watch as input by adding a second face to a smartwatch (called Doppio [5], published in CHI 2016) that can be attached, oriented, and manipulated around a base watch face. This approach created a tangible input language with manipulations like stacking, peeking, hinging, adjacency, distance, and indirect input. While exploring building a commercial version of Doppio, I realized that fashion was going to play a critical role in the success of a smartwatch (or other wearables), which is where I then began to research the fashion technology world, specifically haute tech couture.

Project 2: Initial Explorations into Fashion

The fusion of technology into fashion is fundamentally transforming its creation and fabrication processes. Ultimately this translates into fashion becoming a critical component and influencer of the consumer wearables industry, and vice versa. With this in mind, I grounded my initial research in the space of fashion tech and haute tech couture, through an exploratory study in collaboration with MakeFashion[1] . In April of 2017, MakeFashion hosted a fashion tech runway show featuring 40 different garments (e.g. Figure 2). My study consisted of two phases: (1) After the show, I surveyed each of the garments created, examining the technologies used in the garment, as well as common design elements (e.g. fabrics); (2) I then conducted semi-structured interviews with seven fashion designers and technologists who were involved in the creation of garments for the show. My initial results revealed that areas such as tools, troubleshooting and even communication remain as issues for the field. For my research especially, designing a better communication medium between fashion technologists and designers or creating more accessible tools that are independent of experience level in the domains of technology and design was important. This work is being submitted to DIS 2019.

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[1] MakeFashion – www.makefashion.ca

Project 3: Designing Tools for Haute Tech Couture

A result of my initial explorations, I then focused on further understanding the processes that exist within haute tech couture, the key challenges tools for haute tech couture should address, and finally building a tool that enabled facilitated communication between designers and technologists. Similar to Doppio [5], I created and deployed (over an 8-week period) a modular fashion technology tool with 8 design teams (consisting of technologists and designers) who created garments for the MakeFashion 2018 show, to gain early insights into how to design such tools. My results of the deployment study and follow-up interviews indicated that while it assisted with facilitating in creativity and communication in haute tech couture, challenges such as tools (e.g. Arduino) need to be reconsidered for the fashion designer audience, or that tools need to facilitate more open-source sharing concepts, similar to the maker community, given the lack of materials for designers and technologists to draw upon when creating haute tech couture garments.

3 ONGOING AND FUTURE WORK

While completing the first three projects, I learned that it might serve the fashion technology (especially the haute tech couture audience) better to even more strongly consider using the design language and tools that already exist and augment them (e.g. fabrics or mannequins) and make areas such as programming simpler. My ongoing and proposed work addresses these areas specifically by focusing on better understanding the design language of traditional fashion tools and using those as the vehicle for facilitating technologies (e.g. Augmented Reality, Electronics, etc.) into the garment construction process.

Project 4: Programmable Fabrics

Through my ongoing work with MakeFashion, where I have been embedded for 3 years, I aim to explore how to create simpler programming tools that are paired with smart fabrics and embedded sensors. One of the key findings from Project 3 was the need to use the existing design language and mental models of fashion designers and augment their tools and redesign electronics such as boards and sensors. I will be creating, deploying, and evaluating a system for this through a series of fashion technology shows in 2019.

4 CONTRIBUTIONS

Over the past several years, wearables have grown in popularity significantly, offering researchers new opportunities to create and study wearable experiences and interactions. While this area is interesting, I strongly believe more consideration needs to be given to the fashion side and am curious to discover whether merging these two fields of research yields interesting results. I hope that my research will contribute to the wider HCI research community and CHI; by offering a combination of novel lessons from haute tech couture, and wearable designs that will enhance the field of wearables research.

REFERENCES

[1]   Manuel Martínez Torán, Alicia Bonillo, and Emilio Espí. 2018. Future Trends about Fashion and Technology: A Forward Planning. 2, 2: 2.

[2]   Ivan Poupyrev, Nan-Wei Gong, Shiho Fukuhara, Mustafa Emre Karagozler, Carsten Schwesig, and Karen E. Robinson. 2016. Project Jacquard: Interactive Digital Textiles at Scale. Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, ACM, 4216–4227.

[3]   2017. Chanel Spring Summer 2017 Classic And Boy Bag Collection Act 2. Bragmybag. Retrieved January 15, 2018 from https://www.bragmybag.com/chanel-spring-summer-2017-classic-and-boy-bag-collection-act-2/.

[4]   Kent Lyons, David Nguyen, Daniel Ashbrook, and Sean White. 2012. Facet: a multi-segment wrist worn system. In Proceedings of the 25th annual ACM symposium on User interface software and technology (UIST '12). ACM, New York, NY, USA, 123-130.

[5]   Teddy Seyed, Xing-Dong Yang, and Daniel Vogel. 2016. Doppio: A Reconfigurable Dual-Face Smartwatch for Tangible Interaction. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16). ACM, New York, NY, USA, 4675-4686.