Exploring wearable music players with focus on subculture and style

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Abstract

We present our current explorations on mobile interaction design grounded in subcultural expressions in dressing and in music listening practices. Based on a three weeks workshop with university students, we elaborate on our findings in the domain of wearable designs embedded with soft electronics, and future research directions.

Author Keywords

Subculture; wearable technology; music practice; interaction design

ACM Classification Keywords

D.2.2 Design Tools and Techniques, D.2.10 Design, H.5.2 User Interfaces

Introduction

Our aim is to explore how soft electronics, the practice of music listening, and dressing styles adopted by subcultures, could be combined in new forms of interaction design. We have started to investigate this topic theoretically as well as through a series of design explorations. In this paper we present one such design exploration, conducted in the form of a three weeks workshop, with master students in interaction design.

Six groups of two students in each group got to select a garment or accessory that they thought reflected a subculture and a context of music listening, where a mobile music device is normally used. Focus in the exploration was thereafter on the very concrete challenges of merging studies of dressing practices and style, with the design of functioning wearable technology. A main conclusion from the workshop was that we do not propose the replacement of the already existing mobile devices that are used for listening to music, by similar wearable electronic devices, but to investigate the potential of enhancing the interactivity with the mobile devices, which are currently widely being used, by combining/connecting them with functional wearable electronics that fits well into cultural practice.

Wearable Technology and Subculture

In this paper we are focusing on the emerging design space of *soft electronics*, or what is popularly referred to as *soft hardware*, or *smart textiles*. Designs in this area have over the recent decades been showcased with much interest from the general public, and there is currently a growing industrial interest in how digital sensors and microprocessors can be embedded in soft materials, e.g. for medical purposes, for sports, and for entertainment. This development is very closely connected to the open source and DIY ideals of manufacturing, supported by growing online communities (e.g. KOBAKANT[1], How to Get What you Want[2]), of predominantly amateur makers and practitioners in the creative industries, as well as by academic initiatives (e.g. Perner-Wilson *et al.* [4]).

Our main research interest is in the domain of *wearable technology* or *fashionable wearables*, which Seymour [5] has defined as " 'designed' garments, accessories, or jewelery that combine aesthetics and style with functional technology".

In this domain, the Mp3 jacket is perhaps the most well explored design concept. This concept has been realised in different forms by various manufacturers, like Philips and Levi Strauss (2000), Burton Snowboards (2003), more recent models by Spyder, Rosner GmbH & Co, Location Clothing, and O'Neill, but we have not yet seen any strong examples of commercial success either by the Mp3 jacket, or by other wearable technological concepts. These and other experiments with interactive garments point to new opportunities both for the making of robust and working solutions, and for generating attractive and useful designs. This broad area also merges disparate knowledge domains such as software development, electronics, textile crafting, and product design.

So far the design examples in the field that combines wearables with soft electronics have mostly focused on the material level, or design concepts for how to integrate this technology into garments/accessories. To our knowledge, very little work has so far concerned examples that more seriously address wearable technological garments in relation to actual dressing styles and subculture.

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[1] KOBAKANT (http://www.kobakant.at/)

[2] How to Get What You Want (http://www.kobakant.at/DIY/)

Figure 3. Making soft button controllers for a vintage apron music player.

Figure 3. Using a natural body movement while running, to change to control the functions of a hacked Mp3 player (street style T-shirt).
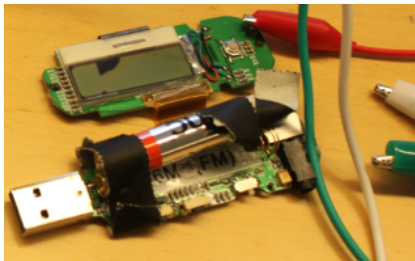
Figure 3. An example of a hacked Mp3 player.

The practice of dressing and following a commonly defined dressing norm is highly connected to the instictive human need of belonging to society. As Kawamura [3] mentions, clothing *"is percieved as a personal prosthetis, a second protective skin on which we inscribe our identifying signs"*.

But apart from belonging to a broader society, there is a tendency, especially among youth, to express their identity through the clothing they wear [1] and subsequently to be part of a smaller community or **"**subculture". According to Hebdige [2],

> *"subcultures manifest culture as systems of communication, forms of expression and representation and the succession of youth styles, or subculture, can be represented as a series of transformations of an initial set of items (clothes, dance, music, argot), unfolding through an internal set of pluralities (e.g. punk v. hippie, mod v. rocker)"*.

Among several subcultures, huge differences can be defined in terms of dressing style, music listening and general lifestyle, while people who belong to the same subculture follow very similar dressing and music listening practices and a similar lifestyle, ranging from places where they meet, how they spend their leisure time, and even the use of a specific body language.

Music and dress are regarded as being the two basic "contents" or "substances", which define a specific subculture and act as a medium of communicating what it represents. There are also very strongly connected to one another, as the name, which characterizes a subculture is usually the one used to define its music style (e.g rock music/rock style, punk music/punk style). But this pattern doesn't cover all the different subcultures, especially nowadays when dressing styles and music are characterized by plurality and mixing. One example that belongs to this category is the contemporary "hipster" subculture, which is not strongly characterized by a distinct music style, but more with a general music practice that covers a spectrum of a typical body language while dancing, places where they go to consume music, etc.

People nowadays, when being outdoors, usually carry mobile devices such as smart phones and other devices (e.g. iPads), either in pockets, on their clothes or adjusted to/combined with accessories that they wear (e.g. inside a bag). Among other uses, such as surfing on the Internet or communicating with friends through social platforms (e.g. Facebook), listening to music is a very common activity that takes place in several contexts or environments, especially when people are alone. For example while commuting with the public transport, while doing sports, or while shopping. The lifestyle of some subcultures is more connected to the use of mobile electronic devices (e.g. hipsters) along with a general philosophy of being up-to-date with the last technological advances, while others praise more traditional and non-technological ways of consuming music (e.g. steampunk, hippies). But as the practice of listening to music is so common among people, Mp3 players, pocket radios, and mobile phones are basic mobile devices that almost everyone are familiar with.
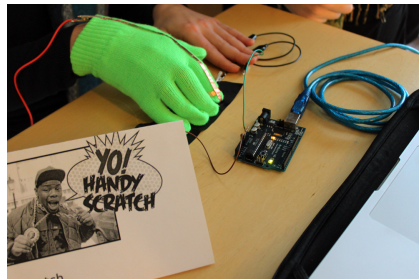
Design workshop setup

Based on the motivations outlined above, we ran a three-week part-time workshop with Master's students in interaction design. Of the 12 students participating in

Figure 4. Testing the controls of a soft music player hipster hat.
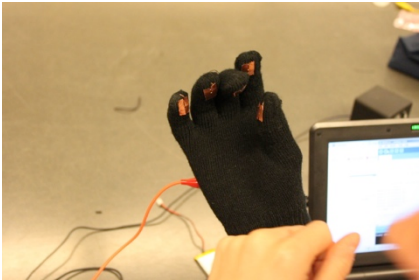
Figure 5. Testing the controls of a personal techno music glove.

Figure 6. Testing the hip-hop/turntablists scratching glove.

the workshop, none had a background in fashion or textile design, but two of them had taken a short course in physical computing. The main part of the workshop was to experiment with ways of hacking Mp3 players (Figure 3) or program small microprocessors and connect them to interaction controls, in contexts of listening to music.

The questions that students got to explore were:
1. How and when people listen to music, using a mobile device (e.g. mobile phone, Mp3 player),
2. How people's gestures or bodily movements, connected to clothes/accessories that they wear and music listening, could be used to enhance the existing interaction with a mobile device, and
3. How functioning soft electronics embedded into clothes/accessories could become a part of the dressing practice and the general lifestyle of a subculture, in realistic use contexts.

The idea was to try to relate the dressing and behavioural practices of subculture with existing music listening practices. First there was a brainstorming and discussion session on fashion subcultures, for defining what clothes/accessories they wear, what activities they engage in, and their music listening practices. The concepts that emerged and developed from this session were: 1. Scratching glove (hip hop/turntablists, Figure 6), 2. Jogging T-shirt music player (street style, Figure 2), 3. Dance twitter (hipsters), 4. Knitted music hat (hipsters, Figure 4), 5. Glove synthesizer (techno, Figure 5), 6. Cooking apron music player (vintage, Figure 1). The groups were working on hands-on explorations of soft electronic materials (conductive yarn, soft sensors, etc), to transform garments into enhanced and dynamic interfaces for mobile music

practices. The technology used is hacking of Mp3 players, Arduino[3] and LilyPad Arduino[4], MaKey MaKey[5], and physical materials for making soft switches and circuits.

The main focus of this workshop became to lie on the interactions with soft interfaces and the different physical forms these may take, with grounding in realistic use contexts. In the "jogging T-shirt", for example, it was examined how to use natural ways of interacting with the T-shirt (e.g. specific gestures adopted by street style subculture and the context of running), for controlling the functions of a music player through soft switches integrated in the T-shirt for changing a music track. Another aspect examined was how to add features, combining mobile music devices and clothing that music listeners of a subculture may find interesting, which is a direction that was followed by the "scratching glove" group, or the dance detecting twittering device.

Preliminary findings and future work
In our workshop, similar to the repeated findings of other workshops connected to soft electronics, we noticed that it is fairly easy to quickly get started with a hands-on practice in this field, without specialized previous knowledge. Still, the most complex part is the concrete realization of a project, specifically sewing a circuit and connecting all the parts of a circuit together, to make the electronics work when worn as a garment on the body. Reflecting on the process, we can say that

[3] http://www.arduino.cc/

[4] http://web.media.mit.edu/~leah/LilyPad/

[5] http://www.makeymakey.com/

the focus on subculture helped the students to develop concepts towards the direction of re-thinking interaction beyond the ad-hoc solutions of "making something just because it works" or embedding technological components into garments/accessories without a specific reason. Surprisingly, one of the most challenging parts was still to keep a focus on subculture and style in a meaningful way, which means to integrate behaviour, bodily movements and gestures, rather than just a visual fashionable style.

The central idea of combining the garment/accessory and the music interaction to subculture and style seems as a field that has a potential for further exploration, especially regarding existing practices of bodily engagement with clothes and music. Trying to combine soft electronics embedded into clothes/accessories together with smart phone interactions (e.g. "dance twitter" project,) is a fruitful area, as it combines the rich abilities of existing mobile music devices with wearable technology. With this we hope for a focus on subcultures and style within the area of wearable electronics, but that combines the functionality of the existing mobile music devices, instead of totally replacing them. Our conclusion is that wearable technology should be examined towards the direction of enhancing the existing interaction with mobile devices and serve as a broader interface, as we naturally tend to interact with the clothes and accessories that we wear and we still carry mobile devices in our bodies (e.g. inside bags, pockets or holding them in our hands). In our future analysis we hope this exploration could provide new knowledge and inspiration both conceptually, and in terms of materials and technologies.

References
[1]   Cassidy, T. D., & Schijndel, H. V. (2011). Youth identity ownership from a fashion marketing perspective. *Journal of Fashion Marketing and Management*. 15(2):163

[2]   Hebdige, D. (1979). *Subculture: The Meaning of Style, Volume 4*. Routledge.

[3]   Kawamura, Y. (2005). *Fashion-ology*. Berg

[4]   Pan, Y., Roedl, D., Thomas, J.C., and Blevis, E. (2012). Re-conceptualizing fashion in sustainable HCI. *Proc. DIS '12*, ACM Press, 621.

[5]   Perner-Wilson, H., Buechley, L., and Satomi, M. (2010). Handcrafting textile interfaces from a kit-of-no-parts. *TEI '11*, ACM from? Capturing and interacting with design history. In *Proc. CHI 2002*, ACM Press (2002), 1-8.

[6]   Seymour, S., ed. (2008). *Fashionable Technology*. Springer, Vienna, Austria.