

Digi Merkki: An Interactive Clothing Patch Creation Kit for Socio-cultural Dress

Introduction

The central promise of toolkits for designers is to reuse components and engage amateur stakeholders [11]. Since the LilyPad toolkit [2] made crafting garments more accessible, various toolkits [e.g. 8,9] and techniques, like iron-on textile circuits [e.g. 10] and digital embroidery [e.g. 5], have been suggested to facilitate the co-design of wearable technology. Despite these efforts, commercial wearables are still mostly limited to health-related use cases[6]. However, wearables are inherently social, as any clothing is part of one's social identity. For a lasting impact, wearable designs need to address an individual's culture and personal style [3,7]. Congruently, scholars suggest that toolkits have to "better accommodate the everyday" [1] and fit within existing clothing [7,9]. As any design process has to introduce constraints due to the infinite number of possible use scenarios [11], we suggest tailored creation kits as an addition to open-ended toolkits.



Figure 1 Left: A patch worn by a participant, Right: Digi Merkki input functionality.

Methods

In a field study on wearing technology for social interaction [4], we engaged with Nordic university students and their cultural practice of wearing dashing adorned boilersuits (see Figure 3 bottom left/right). We co-designed Digi Merkki, an interactive clothing patch for social interactions. The patches, as seen in figure 1 have a small colour screen and LEDs, can be controlled through conductive yarn, and are wirelessly connected to trade digital pictures and play LED animations based on social ties and proximity. However, Digi Merkki comes as a creation kit, so that every user can assemble a personalised patch.



Figure 2 Left to right: Three steps from the instruction manual of preparing fabrics, adding lamination foil and sewing layers together.

Each kit contains the electronics patch prototype, various textiles and a battery (see Figure 3 left). While participants received detailed instructions for the process (see Figure 2), they could choose the cover fabric and design (e.g. open vs covered LEDs), three digital pictures to start with and a unique colour for the LEDs. Furthermore, the students chose the patch's location on the body. Therefore, our creation kit used the advantages of handcrafting toolkits, i.e. personalisation and leveraging pre-existing skills [12].



Figure 3

Left: The contents of a Digi Merkki creation kit.

Bottom left: Two participants posing with their Digi Merkki patches on their legs.

Bottom right: Participants during an organised event using Digi Merkki together.



This approach contributed to integrating the patch into the students' everyday practices (see figure 3). Personalisation helped students stand out through their creations, and diverse modifications based on different skillsets inspired others. Consequently, students adapted new practices with this digital form of expression and interaction. They playfully explored the boundaries of their community practices with stealing and spamming pictures and integrated their digital practice of memeing into their clothing practices.

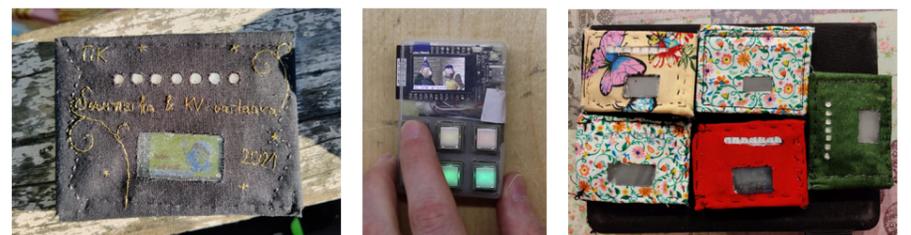


Figure 4: Left: A patch with hand embroidery, Centre: A Digi Merkki with physical buttons encased in plastic, Right: Five patches created by a group of participants.

“was fun, when the people make modifications ... one girl who had some really nice embroidery ... or then the guys who made it encased in plastic to make it more resistant”

Conclusion

We suggest an increased research effort into creation kits based on our example of combining crafting practice and personalisation to embed wearable technology into cultural practices [4].

Designing technology for actual everyday wear needs more knowledge about supporting processes that aim beyond openness and novelty but enable embedding into the everyday practice of wearing clothes.

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