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Published: 01/01/2022

Document Version

Publisher's PDF, also known as Version of record

Please cite the original version:

Epp, F. A. (2022). *Digi Merkki: An Interactive Clothing Patch Creation Kit for Socio-cultural Dress*. Abstract from ACM SIGCHI Annual Conference on Human Factors in Computing Systems, New Orleans, Louisiana, United States. http://techfashion.design/wp-content/uploads/2022/04/CamReady_25.pdf

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

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Fig. 1. Contents of the co-creation kit that each participant received.

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. In a field study on wearing technology for social interaction [4], we engaged with Nordic university students and their cultural practice of wearing dashingly adorned boilersuits (see figure 2a). We co-designed Digi Merkki, an interactive clothing patch for social interactions. The patches, as seen in figure 2c 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. Each kit contains the electronics patch prototype, various textiles and a battery (see figure 1). While participants received detailed instructions for the process (see figure 3), 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]. This approach contributed to integrating the patch into the students' everyday practices (see figure 2b). 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. 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.

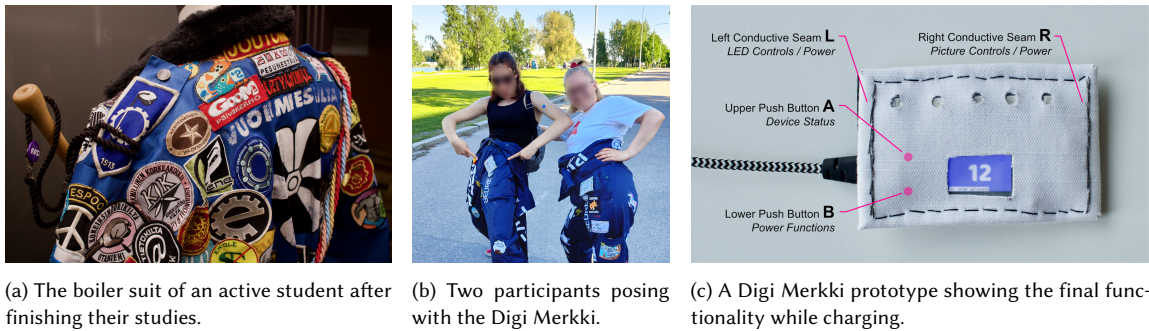


Fig. 2. Nordic student adorn their boiler suits (a) and during our study also with Digi Merrki (b). The interactive clothing patch had a limited amount of functions but focused on cultural wearability (c).

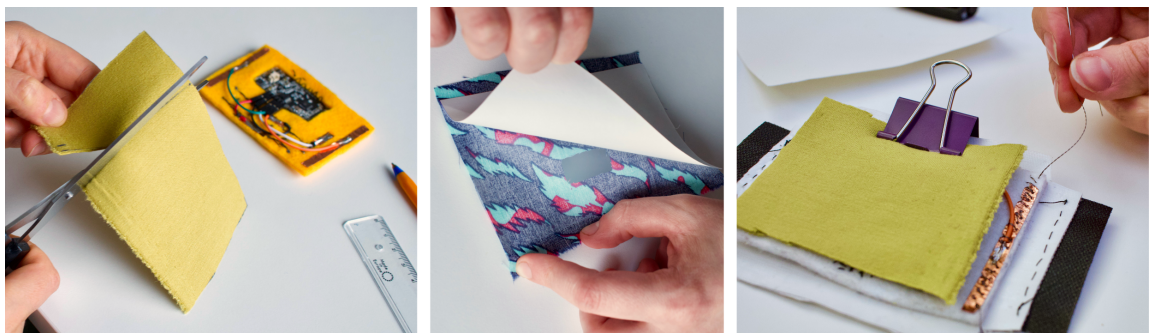


Fig. 3. These pictures are examples from the instructions given to the participants.

CCS Concepts: • **Human-centered computing** → **Empirical studies in HCI**; **Empirical studies in collaborative and social computing**; **Empirical studies in ubiquitous and mobile computing**; *Collaborative and social computing theory, concepts and paradigms*; Ubiquitous computing; Interaction paradigms.

ACKNOWLEDGMENTS

This work was supported by the Academy of Finland project grants Digital Aura (311090) and Future Methods (330124).

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Fig. 4. Some of the personalised Digi Merkki that participants created.

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