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Touch, E-textiles and Participation: Using E-textiles to Facilitate Hands-On Making Workshops with Blind and Visually-Impaired People

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Introduction

My research explores the potential of touch and e-textiles – particularly for exploration and expression – when working with blind and visually impaired people. The research takes a participatory design approach, facilitating the design and creation of e-textiles in hands-on making workshops. A key goal of this approach is to allow participants to be playful or creative, with a focus on emotions and experiences, taking inspiration from Bødker's concept of third-wave HCI [2].

Related Work

E-textiles and touch: Much research around e-textiles is focused on the visual aspects of garments, as opposed to how they feel. However there is increasing research on touch in this area, especially for health and wellbeing. Schelle et al. [6] created a pillow for interpersonal touch-based contact between dementia patients and their family or carers.

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Objects of reference: One form of communication used by and with visually impaired people is *objects of reference*, described by Bloom as being: "*three dimensional iconic symbols that can be used to represent real objects or events*" [1]. Can this concept be extended to personal objects of reference created by visually impaired people themselves to express stories or memories that have meaning for them?

Participatory design: More research is taking a participatory approach. Kettley et al. [3] have worked with users with mental health issues, to create their own e-textile pieces, whilst also inviting them to reflect on their sense of wellbeing through psychotherapy techniques. Rogers et al. [5] explored the process of older people co-designing using MaKey MaKeys, inviting the participants to work creatively and speculatively in their design process to imagine technologies which they might want to exist. Metatla et al. [4] worked with blind and visually impaired participants to create non-visual displays for music interfaces through low-fidelity prototyping. These examples indicate the promise of participatory design for engaging participants in communication and creation. My research aims to link participatory design with tactile interaction using e-textiles, working with blind and visually impaired people to create opportunities for self-expression.

My PhD Approach

My research question is '*How can blind and visually-impaired people design with e-textiles for tactile interaction, to both foster and evoke self-expression?*' The research will include repeated series of six hands-on making workshops with different groups of participants. The workshops include hands-on making with e-textiles and electronics, group discussions, and time to interact with pre-fabricated e-textile examples. In these sessions the participants are designing and creating their own, personal, interactive e-textile objects that are triggered by touch. The end result is a sensory object that has visual, tactile and auditory elements that link to the creators' own associations or stories. Data collection will include contextual inquiry (rich data collection during the sessions, participant diaries, and reflective interviews between sessions and after the workshop). Audience responses will also be collected during exhibits of the participants' creative artefacts. Outcomes are expected to include insights into how to structure tools, materials and activity to best empower this user group, an assessment of the potential of e-textiles as an

expressive medium, to gain a better understanding of how this user group associates touch and sound with memory and how technology can help them tell their own stories.

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