

Rethinking Assistive Technology with Children with Autism

This research proposes a paradigm shift in the way we design assistive technology (AT) for children with disabilities. Current approaches aim to match limitations of users with features of technology, an approach which ignores the rich and complex life-worlds of children with disabilities as an opportunity space for design. The shift we propose is a shift of focus, from designing for limitations to designing for positive experiences, wellbeing and quality of life. The technologies we envision not only support children, but empower them and respond to needs and desires that go beyond mitigating the functional limitations of their disability.

Thus, rather than making existing applications accessible, with this work we aim to explore new meanings of technologies. The key to unlocking new application spaces is to let design be guided by children with disabilities as experts in their own life-worlds. The great challenge this research tackles is to find ways to facilitate such guidance from children, with the promise that we discover radically new ways in which technology can contribute to the wellbeing of children with disabilities. We approach this challenge within the context of ubiquitous computing (UbiComp), a defining paradigm in the future technological landscape which opens up technical possibilities using mobile, tangible and sensor-based technologies. As disability context we focus on children with Autism Spectrum Conditions (ASC) and over 3 years we will invite 12 children with ASC to work with us and realise their own UbiComp ideas. The applications we build will fulfil two requirements: they afford and scaffold positive experiences in the daily life of children with ASC, and enable them to share those experiences with their social peers—something notoriously difficult for children with ASC.

The contributions of this research are of three kinds: firstly, we develop a *theoretical framework* that underpins our approach, meshing theories from interaction design and disability studies. Secondly, we provide a *conceptual space* offering designers with methodological guidance by providing evaluated design methods. And thirdly, we realise a series of *case studies* which ground the theoretical and methodological outcomes in concrete implementations of design processes and prototypes. In 12 case studies we re-interpret 6 participatory design approaches to co-designing UbiComp applications ranging from co-operative inquiry to drama workshops and personal fabrication. Mapping out these diverse approaches, evaluating processes and resulting prototypes, will demonstrate a fundamentally different approach to designing technology for children with disabilities and thus allows us to argue for a fundamental paradigm shift in AT. However, the potential impact of this work goes beyond AT, into the fields of UbiComp, Human-Computer Interaction, Disability Studies as well as education, policy making and ethics.