Materialising Cyborg Bodies – Technology Approaches in Dialogue with Disability Cultures

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The material aspects of technologies on disabled bodies are somewhat under-researched. I'm currently in the process of trying to figure out what the aesthetic, sensory and overall material qualities of assistive technologies constitute for the bodies on and within they operate and vice versa. For an initial exploration, I have conducted a visually guided analysis contrasting technological approaches and disability cultures, identifying how technology encroaches closer onto the body when cultural and personal preferences – at least in the cases I reviewed so far – have a more interactional and dialogue oriented quality to them. Such work is intended to pave the way for a framework or theory supporting more disability culture sensitive and oriented technological approaches in HCI.

CCS Concepts: • **Social and professional topics → People with disabilities**; • **Human-centered computing → Interaction paradigms**; **HCI theory, concepts and models**; **Interaction design theory, concepts and paradigms**.

Additional Key Words and Phrases: disability, materiality, visual analysis, embodiment

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1 MOTIVATION

Framed as support devices, assistive technologies are often intended to 'help' disabled people[1] to find workarounds to pass or simply engage with a fundamentally ableist environment. Through their form factors and material choices, they construct a specific type of lived experiences previously linked to the notion of a technology-dependant cyborg [11]. However, little research has been conducted on the aesthetic and material qualities of technologies created largely *for* instead of *with* disabled people. I started probing this space with some initial inquiries that I hope to share with other workshop attendees and discuss across different perspectives and experiences.

2 METHOD

In previous works, I have used the notion of 'thinking through drawing' [4] or 'theory through design' [7]. Essentially, I use drawing on imagery as an analytical through which I reflect on the specific qualities of interaction, design and other dispositives to arrive at theoretically driven insights. In this case, I went with a select set of disabilities, sketched an example of a technology typically used in this space and then chose imagery associated with the related disability cultures. I intended to identify a potential discrepancy, though through visualising the settings through example cases, I further gleaned insights into the aesthetic and material qualities of these technologies and what specifically separates

[1] I use identity-first language when referring to a group of disabled people to avoid artificially constructing language around disability [1]. However, personal preferences differ between individuals and should be respected as such.

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them from disability cultures. Specifying these qualities might allow us to more deeply engage with disability cultures in technology design and development.

3 MATERIALISING CYBORG BODIES

I now briefly delineate some initial thoughts on the individual visual analyses before coming to preliminary conclusions regarding the specific material qualities that make up technological approaches and disability cultures.

Figure 1 illustrates, within the technological concept a wearable made from strong textiles and vibrating motors (cf. [6]). It binds the body of a child with Attention Deficit Hyperactivity Disorder (ADHD) and warns them before they might impulsively act in their environment (a.k.a. 'blurting'). This tendency to restrict ADHD bodies can be found in many technologies in this space [9]. In opposition, we see a child presumably inattentively playing with a pencil by balancing it on their face and fidgeting with their hands. Such strategies of self-regulation help regulating attention with

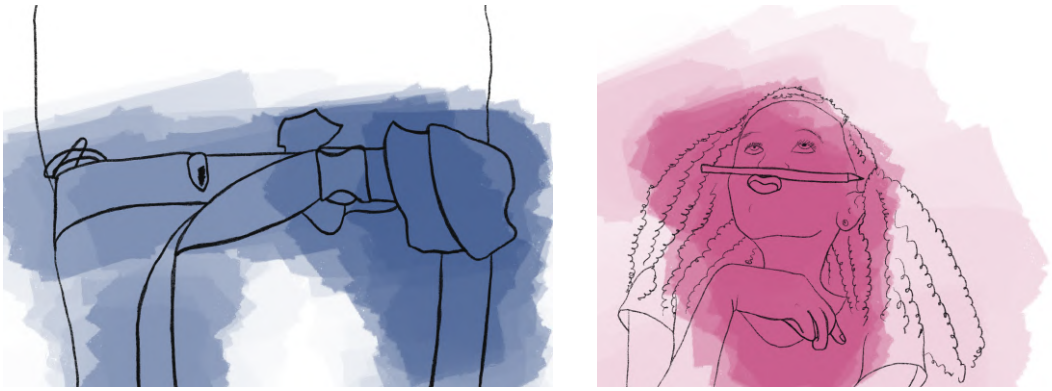

Fig. 1. To the left, the Blurtline [6] belt reminding children with ADHD to not react impulsively to their environment. To the right, a person using their environment for self regulatory stimming that can facilitate the self-guided regulation of attention even within school classrooms.

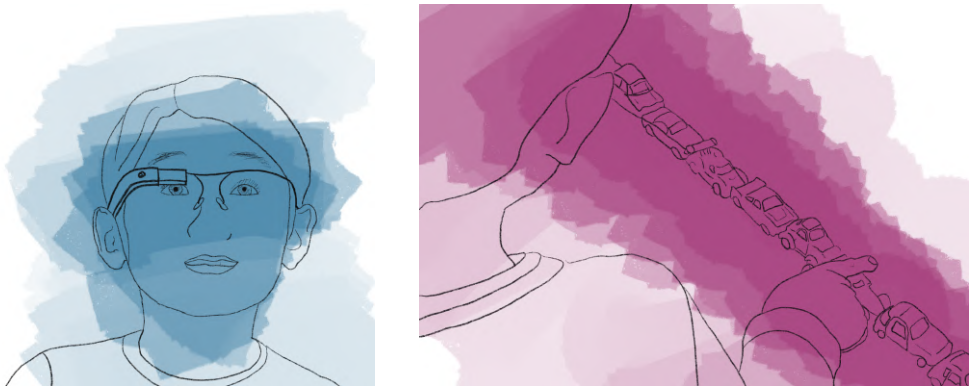

Fig. 2. To the left, a google glass project intended to provide normative social cues to autistic people (cf. [10]). To the right, an autistic kid sharing their play setup of lining up toys, effectively communicating about their interests with their environment.

Fig. 3. To the left, a cochlear implant, a technology aiming to supplement hearing capabilities for some deaf individuals, which has been associated with stigma [3]. To the right, a communicative alternative, namely a sign language, in this case American Sign Language (ASL) used vibrantly to interact in community.

Fig. 4. To the left, an exoskeleton supporting someone in walking on their feet albeit slow and often prohibitively costly. To the right, someone using their wheelchair, sometimes even to speed along faster than the walkies, as described previously [2].

more self-determination and in a more relaxed fashion, removing pressure from the external environment (caused by remembering 'not to blurt') and allowing attention to flow more freely. Instead of having a dedicated piece of technology on their body, the child uses aspects of their body as is and the environment to regulate their attention on their terms.

In a similar space of neurodivergence, Figure 2 details the difference between teaching normative social cues to autistic children in contrast with self-guided initiation of communication and presentation of affect (cf. [8]). Here as well, technology in the form of wearables operate on the body of the child, ultimately ignoring their sociality with the aim to override it instead of creating spaces where they could figure out their individual style and preferences to engage with their environment (also discussed by [12]). Communication is initiated as a mutual interaction then instead of something dominated by the styles of the majorities of interaction.

The starkest contrast (to me) comes out in Figure 3, where the hearing (tech) world inscribes itself quite literally (through scars) on the bodies of deaf people providing them with substandard hearing equivalence. While this comes

with ethical concerns regarding the status quo of deaf culture [5], deaf culture already comes with a whole set of sign languages and approaches to communicate across them that are linked to vibrant communities. Here, the technologically facilitated engagement with the environment is created through magnetic metals and electric signals coated in hard plastic expected to 'function' like a hearing person while dismissing the fragility of any kind of technological setup.

Finally, Figure 4 discusses the discrepancy between the cyborgs envisioned by an ableist environment (propped up by a highly technical, refined and complicated setup) where wheelchair users are more interested in environmental structures attending to their specific modes of movement, which are sometimes even perceived as preferable [2]. The exoskeleton, by trying to shape people's bodies into movements that are akin to what is perceived to be the norm, with its belts, metal pieces and hard plastic contraptions working towards that goal, operates around the body. The wheelchair, in contrast, becomes a more symbiotic aspect, enabling new forms of mobility, which yet have to be accommodated more broadly.

So, what I find is hard materials, even if occasionally flexible, in technological approaches: hard plastics, restricting textiles, metal contraptions and through those, materials that embody ableist norms. In disability cultures, though, we find an acceptance of non-normative embodiments, socialities and communicative preferences. We find fluid engagements with environments, self-determined choice making and, fundamentally, not individualised but dialectic approaches to interaction even in the use of technology. Next to the analysis of additional use cases, exploring these qualities and their potentials for materialising different kinds of technologies comprises the next step on my endeavour.

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