Disableism and Constrained Computing

Checking privilege and power in a future of limits

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ABSTRACT

This paper reflects upon disableism and constrained computing by drawing on a recent multi-stage mixed methods research project that focused on a “public washrooms” open dataset released by the City of Vancouver. During that project, I encountered some of the ways that open data can be used to expose, reproduce, and transpose infrastructural inequalities related to disability. The project reminded me that many digital technologies and "sustainable practices" are disableist: they privilege certain ways of being that discriminate against the ‘less able’. Examples can be readily found in online digital technologies that have only been designed for interaction through sight or sound, in the "sustainability"-driven outcry against pre-cut vegetables and fruit, or in calls for direct action that do not accommodate the diverse physical and cognitive abilities of relevant communities. Although surely of interest to many members of the LIMITS community, issues of ableism and disableism have yet to be explicitly addressed in our papers. My paper addresses this gap, and ends with a call for the LIMITS community to check our privilege(s), grapple explicitly with disableism, and imagine a more just, inclusive future.

CCS CONCEPTS

• **Human-centered computing → Accessibility**; **Accessibility theory, concepts and paradigms**; **Empirical studies in accessibility**; **Accessibility design and evaluation methods**;

KEYWORDS

Inclusivity, accessibility, sustainability, ableism, disability, open data, public washrooms

ACM Reference format:
Vanessa Thomas. 2018. Disableism and Constrained Computing. In *Proceedings of LIMITS, Toronto, ON Canada, May 2018 (LIMITS’18)*, 9 pages.
https://doi.org/xxxx

1 INTRODUCTION

In the spring of 2017, I was challenged to create a cool "open data science" project. I had grown pretty bored of uninspiring or uninsightful research based on biased and unrepresentative Twitter or Wikipedia data [19], so I set out to find something I considered to be more useful and interesting. Since I’m Canadian, I decided to start by visiting Canadian open data repositories. I knew the City of Vancouver’s open data team had a really positive reputation within the country’s open data community, so I checked their repository first. As I was scrolling through their listings, one dataset immediately caught my attention: the public washrooms dataset[48]. Within the dataset, every public washroom was assigned a wheelchair accessibility status, and *that* piqued my interests.

My submission to LIMITS’18 straddles the line between a personal essay, a discussion paper, and a systems-focused research paper. It introduces and draws upon the multi-stage mixed methods research project that I undertook in response to Vancouver’s public washrooms dataset, whilst also drawing upon my recent personal experiences with and long-standing connections to ableism and disableism. My project and experiences drew my attention to dimensions of ableism and disableism that I both had and had not been aware of previously; they forced me to reflect upon my own privileges and powers as a mostly able-bodied researcher and technologist interested in sustainability, the design and deployment of digital technologies, social and environmental justice, and futurisms. This paper includes some of those reflections.

I have returned to the LIMITS community to openly share my project and subsequent reflections because I believe they are relevant to many of our projects. First and foremost, as disability scholars have reminded us for decades, nearly all of us will become disabled at some point in our lives [53, 55], so thinking about how our work includes or excludes disabilities can have directly personal implications

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LIMITS’18, May 2018, Toronto, ON Canada

ACM ISBN xxxx.
https://doi.org/xxxx

for many of us. Secondly, many members of the LIMITS community have conducted research on and written about inequality [1, 30], social justice [36], digital communication [28], and sustainability [5, 9]. Disability and ability studies scholars have written about these topics at length (e.g. [12, 15, 29, 33, 56–59]), raising important points about how each of the aforementioned topics can intentionally and unintentionally exclude people based on ability or disability. Yet, with the exception of [27, 30], which mention disabled people and assistive technology in passing, the LIMITS community has not thoroughly engaged or explicitly grappled with the ableist and disableist implications of our work. My paper seeks to address this latter gap in our discussions by linking my critical open data project and reflections with the concerns and critiques raised by ability and disability studies scholars. I hope that my paper sparks a dialogue amongst the LIMITS community about how we can collectively check our privilege(s), grapple explicitly with disableism, and imagine a more just, inclusive future.

2 BACKGROUND

Before linking my open data project and subsequent reflections with the concerns and projects of the LIMITS community, I will briefly introduce some of the terms and concepts used by ability and disability studies scholars. I will also briefly describe some of their perspectives on disability and digital technologies, as well as disability and "sustainable practices".

Dis/ability studies and dis/ableism

Disability studies emerged as a field of research in the late 1970s and early 1980s, with many scholars taking inspiration from or participating in grassroots disability activist movements [16, 29, 56]. These global movements demanded better treatment for people with physical, cognitive, and/or sensory disabilities, and were responsible for inspiring the UN 'Decade for Disabled Persons' (1983-92), "the first and second 'Asian and Pacific Decade of Disabled Persons' (1993-2002 and 2003-2012), the 'African Decade of Disabled Persons' (2000-2009) and the 'Arab Decade of Disabled Persons' (2003-2012)" [2]. Better treatment was needed, and remains needed, because "disabled people, their families and many others who are in precarious relationships with labour and/or the welfare state acutely feel the inequities of capitalism" [16, p.52].

In addition to partnering with disability rights organisations and raising public awareness about diverse issues related to access and inclusion, disability studies scholars influenced the growth and development of numerous other disciplines [29], including design, architecture, engineering, medicine, and even computing (e.g. through accessibility standards [26]). They achieved their multidisciplinary influence by producing research rooted in the "perspective that disability is a sociological, economic and cultural thing rather than a psychological, embodied or medicalised problem" [16, p. 3]. This research took on many forms, epistemologies, and ontologies [2, 16, 29], and ultimately spawned the field of *ability studies* [55].

Ability studies emerged in the early 2000s as the disability community recognised its need for a language about and framework for critically examining able-bodiedness [16, 58]. According to one of its most prominent academic authors, Gregor Wolbring, "ability studies investigates (a) which abilities are seen as essential in a given context, (b) the dynamic of how an ability expectation consensus is reached if it is reached and (c) the impact of ability expectations" [58]. These ability expectations—which directly relate to perceptions of disability—have been prevalent and powerful throughout history; ability expectations were "used by various social groups to justify their elevated level of rights and status in relation to other groups (i.e. women were viewed as biologically fragile and emotional, and thus incapable of bearing the responsibility of voting, owning property and retaining custody of their own children)" [55].

Whereas disability studies centres the socio-cultural, political, and medical constructions of disability, ability studies centres and critically examines the psychological, social, economic, and cultural construction of able-bodiedness. These complementary and interconnected fields of research are often referred to jointly as "dis/ability studies" (e.g [16]). Dis/ability studies scholars regularly use two terms that I will also use throughout this paper: *ableism* and *disableism*. As Wolbring explains,

> "ableism is a set of beliefs, processes and practices that produce—based on abilities one exhibits or values—a particular understanding of oneself, one's body and one's relationship with others of humanity, other species and the environment, and includes how one is judged by others. [...] Ableism is an umbrella *ism* for other isms such as racism, sexism, casteism, ageism, speciesism, anti-environmentalism, gross domestic product (GDP)-ism and consumerism" [55].

Disableism is a set of beliefs and "a form of social oppression involving the social imposition of restrictions of activity on people with impairments and the socially engendered undermining of their psycho-emotional well being" [50, p. 73]. Much like the complementary differences between disability and ability studies, the complementary differences between disableism and ableism lie in what gets centred: "ableism values certain abilities, which leads to disableism—the discrimination against the 'less able"' [55]. There are ongoing discussions in the dis/ability community about which term to use, when to use each term, and if the terms are geographically bound [11, 45, 55].

Dis/ability and digital technologies

Digital technologies are "often characterised as liberating—making up for social, educational and physical barriers to full participation in society" [13]. Evidence and examples of this characterisation are rampant, with "disability technology"[1] companies and proponents promising to eliminate or significantly reduce the impact of disabilities through a variety digital innovations [3, 13, 35]. For example, NeoSensory created *'the Buzz'*—a digital wristband that promises to help the deaf and hard-of-hearing community "hear with their skin" [32]. INTACT healthcare's *'dbGlove'* uses "several existing touch-based alphabets, such as Malossi and Braille, to enable blind and deaf-blind people to use all the features of a mobile device, to communicate with others, and to interact with the world" [20]. Even the language within media coverage of these devices emphasises their socially and economically liberating effects. The BBC recently explained that "technologies that could help disabled people contribute more in the workplace—and improve their quality of life—are surely welcome. And it also makes good business sense. If a million more disabled people could work, the UK economy alone would grow 1.7%, or £45bn ($64bn)" [3]. But digital technologies are *not* always welcome within the disabled communities that the technologies are allegedly attempting to serve [43].

The "liberating" characterisation of digital technologies can mask the ways they intentionally and unintentionally exclude and isolate disabled people. Much like urban infrastructure, digital technologies privilege "particular ways of being, which are grounded in normative, social, cultural and economic practices, further reified in [their] design, manufacture, marketing and implementation" [13]. These design and implementation issues can be especially isolating if the technologies are paired with ableist language, such as in early childhood educational settings "where technology is matched prescriptively to student 'impairments' "[13] or in the domain of cochlear implants, where language about the surgically implanted devices can imply an erasure of Deaf culture [43]. These latter examples of isolation and exclusion highlight why the phrase *"nothing about us without us!"* is so important within the disability rights movement, as well as why it *should* extend to the design, manufacture, marketing and implementation of digital technologies [54].

Dis/ability and sustainable practices

The phrase "sustainable practices" is multifaceted; it means many things to many communities, in part due to the highly contested nature of what 'counts' as a practice, as well as what 'counts' as 'sustainable'. These issues have been debated by entire research communities, and acknowledged in the work produced by some members of the LIMITS community (e.g. [7, 46, 47]). I cannot—and do not wish to—attempt to tackle those issues in a workshop paper of this length of scope. Rather, in this section, I focus solely on how dis/ability and ecologically sustainable practices are interconnected. I do this for two reasons: 1) the LIMITS' community is interested in considering "contexts for computing within fundamental economic and ecological limits", and; 2) there is a body of research that explicitly examines the unique dimensions of dis/ability and ecologically sustainable practices [33, 57].

Ecological sustainability is concerned with whether or not the "remaining natural capital stocks (including other species populations and ecosystems) are adequate to provide the resources consumed and assimilate the wastes produced by the anticipated human population into the next century, while simultaneously maintaining the general life support functions of the ecosphere" [40]. Ecologically sustainable practices consider how they influence other species and ecosystems through their resource consumption and waste production processes. Research about and analysis of ecologically sustainable practices come from a variety of disciplines, including computing (e.g. [8, 25, 38, 39, 52]).

Some ecologically sustainable practices have been called dis/ableist. As Gregory Mengel explains, "certain forms of consumption, such as buying local, driving a hybrid, or even voluntary simplicity, are often conferred moral weight, despite the fact that the ability to make such choices relies on systemic unearned privileges" (as cited in [57]), including ability privileges. After all, driving a hybrid vehicle is not an option for people who rely on wheelchairs for mobility. Similarly, tiny houses are not wheelchair accessible [44]. Moreover, buying locally grown and fresh produce is not always an option for people with mobility issues—some dimensions of this issue were publicly and hotly debated in 2016 when a Tweet about pre-peeled, plastic-packaged oranges went viral and drew attention to the limited availability of accessible, fresh produce [10, 44].

In short, many ecologically sustainable practices erase considerations related to disability. After the pre-peeled orange debacle of 2016, Disability Studies scholar Kim Sauder took to her blog to declare that "environmentalists need to start considering disability and accessibility whether it be in

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[1] "Disability technology" and "assistive technology" are terms that appear to be used interchangeably in the media (e.g. [3]); "adaptive technology" and "enabling technology" are two additional popular terms for describing digital technologies designed to address disabilities or support disabled people [13, 18]. I have no doubt in my mind that there are social politics and cultural constructions underpinning each of these terms, but I could not find any literature that helped me unpack their nuances.

finding more sustainable ways to create the products we rely on [or in creating more] accessible sustainable housing" [44]. Developing these solutions will require collaboration with and amongst able-bodied and disabled experts—once again highlighting the importance of the phrase *"nothing about us without us!"*.

3 DISABLEISM AND CONSTRAINED COMPUTING: AN OPEN DATA CASE STUDY

To help link issues of dis/ability with the LIMITS community's goals and research, I offer the following open data case study based on the project I pursued in Vancouver. I recognise that an open data-centric project might not appear to have the most direct connection to the LIMITS community or to issues of dis/abileism; however, I believe it is a relevant project and have therefore chosen to write about it for two reasons: 1) I believe we need to discuss the role(s) that data might play in a future of limits/scarcity, and; 2) I believe that open data specifically—including my case—can expose, transpose, and reproduce unique dimensions of in/equality and dis/ability in that future.

The LIMITS community hopes "to impact society through the design and development of computing systems in the abundant present for use in a future of limits and/or scarcity" [31]. For me, this implies we need to engage in conversations about data (e.g. open vs. closed, qualitative vs. quantitative, oral vs. written, ephemeral vs. enduring) and what role(s) we expect that data to play in a future of limits/scarcity. After all, conversations about data have tended to dominate discussions about how economies, infrastructures, and communities should operate and prioritise their decisions, including decisions related to the design, development, and deployment of computing systems; I see few reasons for "data-driven" rhetoric to change dramatically in the future. As we know, data "is, like all technologies, a construct, an operationalization of an actor's concept and reality, interpreting between the physical world and the intellectual structures by which actors understand that world, and embedded in a set of social practices by which it is created, interpreted, and used" [23]. In short, data, like all technologies, is not neutral. As such, if we hope—or wish to intentionally plan—for a future of limits/scarcity that is more inclusive and equitable than the present, then I believe we should think about and discuss the role(s) that data might play in our imagined future(s)—including the dis/ableist dimensions of that data.

Open data has specifically been touted—*for more than a decade!*—as a type of data that could create a more just and inclusive world [14, 17, 22, 23, 37]. For example, the influential Open Government Partnership suggests that open data is crucial for helping "governments become sustainably more transparent, more accountable, and more responsive to their own citizens, with the ultimate goal of improving the quality of governance, as well as the quality of services that citizens receive" [37]. However, a growing number of scholars have described the challenges, opportunities, and myths of open data [4, 14, 17, 22, 23], including how open data has exacerbated the long-standing and widening digital skills gap [4, 14], as well as perpetuated existing inequalites [23]. It are these latter critiques that I believe are most relevant to the LIMITS community as we research, plan for, and envision our various presents and futures. In particular, as we begin to explicitly discuss the role(s) that data might play in a future of limits/scarcity, I believe that we might want to be skeptical about the promises of open data. My case study specifically highlights how social, infrastructural, and institutional dis/ableism can become embedded in a dataset, even though the dataset superficially appears to combat disableism by offering wheelchair accessibility information. I reflect on these issues and their relevance to the LIMITS community, as well as on my positionality[2] while undertaking this research, throughout the short case study and in the subsequent reflections.

Case Study: Vancouver's Wheelchair Accessible Public Washrooms Dataset

As mentioned at the outset of this paper, when I encountered Vancouver's public washrooms dataset, I knew I wanted to craft a project about it. One of the reasons why I found the dataset to be so interesting was that it *was* quite novel; very few major cities publish open data related to their public washroom infrastructure, and even fewer include wheelchair accessibility information within those datasets (e.g. as of early 2018, no other Canadian city provides information about wheelchair accessibility in their "public washrooms" data sets[3]). As an early career researcher who held a long-standing commitment to social justice, and felt the pressure of academia's culture of "publish or perish", I was excited by the possibility of conducting research on such a unique dataset. I was even more excited by the dataset when I looked carefully at the the name, location, hours, and wheelchair accessibility information about the 105 public washrooms contained within the dataset.

According to the version that I encountered in early 2017, merely fifteen of Vancouver's 105 public washrooms were

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[2] By "my positionality", I mean that, at the time, I was a visiting, white, female, middle-class, able-bodied, settler Canadian computing researcher who knew enough about Vancouver's accessibility reputation to be surprised by its public washrooms dataset, and who also had enough spare time to cycle to all of the city's public washrooms.

[3] This nationwide lack of government-published wheelchair accessibility data is, in and of itself, a sign of dis/ableism. The fundamental problem is that not all publicly funded toilets are accessible to all people; however, that problem is magnified when wheelchair accessibility information about public toilets is inaccessible.

wheelchair accessible—just over fourteen percent. This percentage was surprising to me. Vancouver is renowned for its wheelchair accessibility [34, 49], so the low percentage of accessible toilets struck me as being incredibly unlikely. It struck me as being so unlikely that I decided to visit all 105 washrooms during a short trip to Vancouver in July 2017. I mapped out five cycling routes to follow over the course of five days so that I could visit and verify the accessibility of every single toilet in the dataset[4]. I also spoke with two occupational therapists about the infrastructural requirements for wheelchair accessible toilets (e.g. ramp to the entrance, stall door width, nearby arm supports, accessible sinks), just in case I wanted to take any measurements or document specific details about the facilities I encountered[5].

By the time I completed my verification process, I had identified over two dozen validity issues with the dataset. I encountered fifteen additional wheelchair accessible toilets that had been mislabeled as inaccessible, two inaccessible toilets that had been labeled as accessible, eleven appeared as if they might have met the criteria for accessible toilets, and numerous community centres (with public washrooms) that had been excluded from the dataset. Beyond these validity issues, I also encountered numerous on-the-ground ephemeral issues. For example, one accessible toilet was temporarily closed for cleaning, whereas another was closed due to filming. At least one wheelchair accessible toilet was temporarily inaccessible due to a water main break, and another—quite remote toilet—was chained and padlocked shut with no posted reason as to why or for how long[6].

I found the inaccuracies in the dataset to be troubling; if a local resident or visitor tried to use the dataset to inform where they went to the washroom, they would have been led astray on numerous occasions. What struck me as more troubling, though, was the fact that both my verified dataset and the original inaccurate dataset highlighted just how inaccessible the City of Vancouver's public infrastructure was: merely 28 of Vancouver's 105 public toilets were definitely wheelchair accessible—that's less than thirty percent. I planned to use my updated dataset to run some shortest path calculations and analyse how much more difficult it would be for a wheelchair user to get from public transit to a public washroom, but I decided to contact the City of Vancouver about the dataset first.

Figure 1: Three of the toilets I visited, including one wheelchair-accessible toilet that was temporarily closed for cleaning.

In August, I exchanged a couple of emails with their open data team, hoping that we could update the dataset quickly. Unfortunately, the update process was slow. According to an email I received from an open data team member, City of Vancouver employees *needed* to go out and re-verify all of the information I submitted—despite the fact that I submitted an updated and annotated excel spreadsheet, as well as an interactive Google Maps instantiation with photos of the mislabelled toilets. This process, I was advised, would likely be slow, because the time and effort it would take to repeat my verification process was not an institutional priority. Similarly, part of the reason why the data was inaccurate in the first place was due to its low institutional priority. I had not anticipated these internal, institutional requirements and, although they should not have affected my project, they managed to deflate my enthusiasm for the power of crowd-sourced information[7].

4 REFLECTIONS

The wheelchair accessible toilet case study, and the footnotes I included throughout it, highlights some of the ways that my research has intentionally and unintentionally addressed issues related to data, digital technologies, and institutional

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[4] The way that I constructed my research plan is one of the first clear signs of my own able-bodied privilege; I was only able to craft this research project *because* I was able-bodied enough to personally cycle to each of the toilets.

[5] The fact that I had previously never needed to speak with an occupational therapist or think about the layout of a public toilet was yet another sign of my able-bodied privilege.

[6] These types of ephemeral issues highlight the able-bodied privilege embedded in the City of Vancouver's toilet maintenance processes.

[7] I had planned a second-phase of research for this project, wherein I intended to run shortest path calculations and demonstrate how much more difficult it would be for physically disabled people to reach accessible toilets than it is for able-bodied people. My personalised instantiation of Google Maps makes this difference visually clear, but I had planned to collect and publish some quantitative proof of this, too. I had hoped this would influence Vancouver's policies around wheelchair accessible public washrooms, among other types of public infrastructure, but my deflated enthusiasm for crowd-sourced information—as well as my already hectic schedule, which involved relocating to a new country, learning a new language, and learning a new academic role—has slowed my progress on this second phase of work.

or infrastructural dis/ableism. As part of my ongoing commitment to reflexivity and open reflection in research [6], this section builds upon some of the footnotes I included and further explores the dis/ableism of my own research. After addressing my research, I turn to the LIMITS community and discuss how these issues relate to their existing and future research. This structure was intentional; I start with reflections about my own research so that my subsequent discussion of dis/ability and constrained computing comes from a position of mutual vulnerability. I want you, the reader, to know that I am guilty of ignoring ableism and disableism in my own work; I think many people likely are. But I also think the LIMITS community can do better and be better—or at least that's what I hope to demonstrate we can and should work towards achieving.

Ableism and disableism in my own research

At the outset of my wheelchair accessible toilet project, I was really excited about what I thought I might be able to accomplish with the open dataset. I was proud that I could use my spare time and able-bodied privilege to critically examine a dataset that seemed to discriminate against disabled people by providing them with inaccurate information about public facilities. I *thought* that my project might usefully highlight how open data could expose, reproduce, and transpose inequalities related to disability and public infrastructure. By "expose, reproduce, and transpose inequalities", I mean that I thought the Google Map instantiation that I created after cycling to every public toilet in Vancouver *exposed* the neighbourhoods where there were no wheelchair accessible toilets. I thought I was able to *expose* Vancouver's lack of infrastructural support for an already marginalised community. However, I also thought I could have used the original dataset to *reproduce* inequality, if I had trusted its inaccuracies and produced an analysis based on those inaccuracies. Through this, I could have also *transposed* Vancouver's infrastructural deficits and inequality into an even greater informational deficit, which might have then also influenced how, where, and when people engaged with Vancouver's urban infrastructure. I thought I had highlighted a fundamental issue with the production and maintenance of civic open data in relation to disabilities, as well as a significant issue in the rhetoric around the emancipatory power of crowd-sourced information, both of which might be ignored by municipal governments that had higher priorities. But as I continued to reflect on my project, I realised some fundamental issues with how I had conducted my research.

Despite my longstanding commitment to and involvement with social justice causes, including causes that have adopted the *"nothing about us without us!"* mantra, I pursued this research project without even attempting to reach out and connect with disability rights organisations and communities in Vancouver. I did not check if this dataset meant anything to local disability rights organisations and community, and I did not ask about their relationship with the municipal government. I made all kinds of excuses for not reaching out to those groups. I told myself I didn't have to connect with local organisations because I was conducting a "data science" research project, and my university did not require any sort of ethical approval for such data-centric projects. I told myself that this lack of approval was convenient! I didn't have time to connect with the right organisations and communities in Vancouver in advance of arriving—besides, I was "just" there as a tourist-researcher! I told myself that I could wait until after I visited all of the toilets to see if there really was an issue with the dataset to discuss. And even after I confirmed that the dataset was highly inaccurate, I told myself that just seeing it updated on the City of Vancouver's open data portal would be enough. Many of these excuses feel inadequate, and highlight how my privilege as an able-bodied academic allowed me to justify conducting a vanity research project based on my own assumptions, interests, and ambitions. I have not yet fully and thoroughly deconstructed the excuses I made for myself in the wheelchair accessible toilet project, but the project *has* encouraged me to become more acutely aware of and sensitive to how I connect with relevant communities in my current research.

This project has also led me to reflect upon and notice dis/ableist dimensions in some of my other work. For example, both of the papers that I co-authored last year at LIMITS had unintentionally dis/ableist undertones [41, 51]. Our paper discussing evaluation does not acknowledge the complexities or importance of designing sustainable technologies that are inclusive. Is it ableist for us to imply that the same technology to should be evaluated similarly when it is being used by able-bodied vs. disabled people? Similarly, although we endeavoured to escape anthropocentrism in our paper about human-centred design's ISO, we failed to acknowledge and integrate the complexities and politics of dis/ability. For example, in our proposed amendments to section 4.6—*"The design addresses the whole user experience*—we acknowledged "the users' personal goals, skills, meaning, knowledge and attachment", but did not include dis/ability. Similar oversights are evident in all of our proposed amendments. We could have asked ourselves questions akin to those raised by Wolbring and Rybchinski [58] with respect to maintenance; in our reimagined ISO, which ability-related experiences will be sustained and which will be up for negotiation? And who will be involved with the process of deciding that?

Dis/ableism and the LIMITS community

The LIMITS community is producing diverse and interesting multidisciplinary research examining the impact of present and future ecological, material, energetic, and societal limits on computing [31]. In its call for participation, the LIMITS website lists various types of constraints, including constrained computing, as relevant topics [31]. As numerous dis/ability scholars have argued, the present and *'the future'* are often "normatively deployed in the service of able-bodiedness and able-mindedness" [42] and issues related to 'sustainability' and 'constraint' are often wrapped up in those normative notions [33, 58].

In addition to the normative notions about able-bodiedness and able-mindedness that I highlighted in my two co-authored papers from LIMITS'17, I believe that there are likely other examples in our work. For example, if we are to consider crisis response and international development scenarios as already existing examples of computing within limits, as Chen encourages us to do [9], then we may be unintentionally adopting ableist dimensions of those scenarios [21]. Research has shown that "that 'natural hazards' are realised disproportionately as 'human disasters' for disabled people, and most notably for disabled people in poor communities" [21]; the exclusion of disabled people from social, economic, and institutional processes prior to a crisis exacerbates the scale and severity of that 'human disaster'[21].

A more specific example of dis/ableism in our community can be found in Blevis, Preist, Schien, and Ho's LIMITS'17 paper, which describes three design scenarios that are riddled with dis/ableism. The tangible and visual nature of the "Steeped in Flow" design, which is intended "for the use of one person" [5], would be inaccessible to many people with limited mobility, dexterity, and eyesight. Their discussion of YouTube streaming experiences and "resisting technologies that push more consumption" fails to even briefly mention the need for unique accessibility considerations. Will concerts hosted in inaccessible venues be excluded from the authors' imagined streaming restrictions? Will visually impaired people who prefer to watch, or need to use, higher resolution videos on larger screen face the same restrictions as those who are not visually impaired? I raise these questions not as an attack on or critique of the authors; rather, I am asking them because I believe that the fact they are not even mentioned in passing—nor, if I recall correctly as one of the attendees, discussed during LIMITS'17—is an indication of some of our community's able-bodied and normative assumptions.

Blevis et al. also highlight the importance of discussing data and its dis/ableist dimensions. The authors explain that "what we can know is things that can be monitored, for example, how much time is spent scrolling on particularly addictive sites, such as social media and video streaming sites, and possibly measure how much time spent online is too much time away to maintain a healthy, sustainable society" [5]. If what we know is what we can monitor and measure, then the well-documented politics [23] of collecting, analysing, and—as my case study highlighted—maintaining data must be at the forefront of our discussions about how we know "what we know", and who gets to decide what "a healthy, sustainable society" [5] looks like.

5 CONCLUSION

In the words of Alison Kafer, "how one understands disability in the present determines how one imagines disability in the future; one's assumptions about the experience of disability create one's conception of a better future" [24, p.2]. We, as a community, have thus far largely ignored the issue of disability (again, with the exception of [27, 30]) or (unintentionally!?) adopted dis/ableist rhetoric, which implies that we are not imagining an especially inclusive future. I do not believe our collective dis/ableism oversight has been a malicious or intentionally exclusive act on our parts. As I attempted to demonstrate by openly sharing my own research failings, ability-based exclusivity can happen for a variety of reasons—including, sometimes due to pressures related to our careers. But as a relatively new research community, we have an opportunity to actively reach out to dis/ability studies scholars and organisations to ask for their participation in and visions for the LIMITS community. Let's do better when we're imagining our constrained computing futures. Let's do better so that those same communities are not marginalised by our work. Let's do better by openly acknowledging and reflecting on our privileges, so we can use the power we have in our academic positions to actively address and dismantle our privilege(s). I plan to work on doing so by the time LIMITS'19 arrives.

6 ACKNOWLEDGMENTS

I would like to thank Anil Bhambhani, Weihua Yan, Dr. Dawn Burt, and Lars Schuster for their care during my recent experience with mobility loss. I would also like to thank my parents and brother for feeding me, driving me to various medical appointments, and for being supportive in every possible way a person could need. As always, thank you to C02K31YADRVG, C02QK6EDG8WN, and CB5A24N59J for being my digital co-conspirators and connectors-to-the-world when I couldn't walk. Lastly, thank you to the reviewers of this paper, who provided me with helpful commentary on improving the narrative flow. I look forward to discussing these issues, and my own complicity in perpetuating dis/ableism, at LIMITS'18.

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