A Cyborg Design Manifesto: Why Bodies Matter Anyway

on transhumanism, disability, and labor

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[Excerpts: Introduction]

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What

We stand at the threshold of the future, paved before our feet by myriad design choices made across the technology and biotech industries. How we see, and by extension, value the bodies for which industry designs products has a profound effect on the nature of those products. If design is nothing more than the manifestation of our values, our most closely held values center around our own bodies and the bodies of others. In this work, I hope to explore this intersection in the search for the so-called "ideal body" from the perspective of transhumanism and disability. I seek to learn how this notion manifests both in the workplace and in the design priorities of the biotech world. I believe these understandings will allow us to construct a new relationship between the "working body" and design practices, so that we may fight for more intentional and equitable futures for all bodies.

This project is ambitious in scope, unwieldy, interdisciplinary, and, most importantly, unfinished. As far as I am able, I am committed to paying due diligence to this complexity. As such, I will present a content analysis on various facets of assistive and bio-tech, layered in with interviews from three populations: the **transhumanist movement**, the **disability community**, and **designers & engineers of Silicon Valley**. To conclude, I suggest a manifesto for new design practices to support a more equitable vision of the good life. It is my hope to make all these connections as clear as possible. In places where I struggle to do this as an academic, I lean against the incisive critiques and insights from my interviewees, who live in the read world — a world which crosses capitalism and disability and design because, in the real world, all the edges touch.

Finally, before moving forward, I want to note my own positionality: I do not personally identify as having a disability, though I belong to other marginalized communities. In addition, though I make efforts to present body ethics through an intersectional lens, I will specifically be talking about disability throughout this work, based on my interview domain. I believe it is important to distinguish the ways that disability moves in the world, especially as it differs from race, but also from gender, sexuality, and other embodied oppressions. As such, I will not be conflating these, but will instead attempt to set them up against the "unmarked" body as perpetuated by current design practices.

Why & Where

In a world where humans can finally subject themselves to technological modification, I began this project with a conviction in the body as a foundation for ethics. We have long marinated in the science fiction of the cyborg's sharp logic, mentally replaced our own fragile meat machine with the invincibility of its hard planes. Once a construct of fantasy, with the turn of the 21st century, human biotechnologies have entered not only the realm of possibility, but, for a small

minority, the realm of daily life. Now as never before, technological advances provide humanity with an immense amount of control over the form and function of the body.

Nowhere is the fight for a particular vision of ideal body as influenced by technology more starkly formulated than in the San Francisco Bay Area. Situated between the humanist counterculture revolutions of the East Bay and the tech-boom capital of Silicon Valley, the Bay Area has historically bred new ways of living, beginning with the hippie movement of the 1960's and 70's. Originally, this movement championed the creation of self-reliant tools outside of a capitalist system. Though the focus on freedom of expression took many forms, DIY technology has always played a large role in the design of the future, to be first taken on by thinkers coming out of Berkeley and Stanford, until finally manifesting as the hotbed of innovation we know Silicon Valley to be today. As a space welcoming of disruptive thinking, intellectual risk, and experimentation with different ways of life, the Bay is the ideal place from which visions of the cyborg body could arise. Even as this disruption was taking place within the sphere of tech, Berkeley simultaneously became home to a dynamic activism scene for race, disability, gender, and sexuality. In particular, a powerful disability rights movement fought back against what the body could and should be. As it stands now, the relationship between the technologist and disability communities is vexxed, historically fraught with the battle for basic human rights on one hand, and ethos of constant enhancement on the other. Depending on how one looks at it, these communities are either stuck on opposite sides of a misunderstanding — or else speaking entirely past one another, worlds apart.

Growing up as a San Francisco native, I have always felt the familiar and competing pressures of this strong humanist tradition, a culture of technological innovation, and, underneath it all, insidiously divisive socioeconomic stratification. Throughout this project, I have thus sought out the multiple viewpoints of diversely-embodied makers and activists from the disability and technology worlds for their fascinating overlaps in perspective, as well as their stark distinctions. In doing this research, I am fascinated by the richness inherent to their philosophical struggle, and seek to connect these voices toward manifesting new ways of seeing and making.

Who

To tease through the various threads of the Bay Area narrative, I have centered my research on three very different (though by no means entirely distinct) communities: the **transhumanist movement**, the **disability community**, and **designers & engineers of Silicon Valley**. Each set of new voices has shaped the path along which my research has unfolded, often making strange and cyclical shapes I could not have anticipated at the outset. Because my fundamental interest throughout this project has been to track visions around the ideal body, I initially focused on the transhumanist movement for its boundless speculative imagination. If technology could allow us to become *anything*, the transhumanist movement asks, what would we become? As an international

intellectual community, transhumanists unify around the idea that humanity's progress is limited only by our technical constraints.

Yet, it quickly became clear that progress is a contested term. Even as transhumanist rhetoric champions human evolution, its eugenic logic simultaneously pathologizes bodies "marked" by gender, race, or disability as unfit to live. As such, it became vital to uncover and amplify the responses of the disability community to this rhetoric. Disabled bodies have long been exploited by technology-marketing as the so-called "original cyborgs," all while being denied the resources of transhumanist transcendance.

I learned that the Bay Area, and specifically Berkeley, has been the historic home to a vibrant disability counterculture movement. In reaction to status quo ableism, this incredible counterculture included people writing poetry and survival guides from bed, disabled artist collective putting on works of theater, folks gathering, organizing, sharing information. This activism continues into the present, with a powerful disability community currently working at the frontline of eugenic / ableist rhetoric and rampant socio-economic inequality. The bulk of my personal interview data has been collected from these individuals.

Lastly, I examine how subtle forms of transhumanist thought diffuse into the technologies produced by Silicon Valley, which starkly perpetuate these inequalities for the disability community and other intersectionally "marked" bodies. Though usually thought of as a fringe movement enamoured of genetically-modified superhumans, transhumanist logic can be located in wearables and assistive technologies alike — areas which are easily normalized into the mainstream. While many would contest that "transhumanism" is a label too extreme for these technologies, advancements like this already belong to the transhumanist vision insofar as they build criterias of value around good and bad bodies. For this reason, I explore how Bay Area-based tech designers and engineers interpret the ideal body and the "transhumanist trickle-down effect."

Sometimes these three communities enrich each other's perspectives; sometimes they try to kill each other. In either case, I have come to see that this is an enormously complicated space. For, while it may initially seem that the goals of people with disabilities are antithetical to those held by transhumanists, this is not the whole truth. Between internal divisions and curious overlaps, it is safe to say that there is no such thing as a singular technologist perspective, much less a singular disability perspective — not to mention a singular disabled technologist perspective. Because of this rich complexity and the size of my interview space, I treat these views as individual opinions throughout the thesis; rather than proving generalizable knowledge for the community as a whole, I will simply let these voices speak for themselves.

Upon starting my interviews, I hypothesized fairly hard-lined distinctions between the groups. Sure enough, the differences in opinion I originally expected to encounter certainly exist. Self-identified biohackers and transhumanist visionaries, for instance, truly see the body as a limited

meat machine, whose flaws may be transcended with technological progress. Josiah Zayner, a prominent DIY biohacker, describes the cyborg future during an interview with The Guardian like this: "I imagine people going to some place like a tattoo parlour, and instead of getting a tattoo they pick out some DNA that makes them muscly, or changes the colour of their hair or eyes" (I Want to Help Humans). Meanwhile, many in the disability community are still wishing that getting replacement parts for their wheelchairs was as easy as walking into a tattoo shop. Disability thus condemns transhumanist logic as utterly blind to the realities of ableism and inequity. Folks on this end of the spectrum loathe to even entertain the hype around transhumanist "advancements" in the face of an inaccessible healthcare infrastructure and their daily struggles in navigating the built environment. My body, they assert, is not the problem here. As disability activist Corbett O'Toole said to me, "Exoskeletons might be cool, but even that is made within a height and weight range… which many disabled people fall outside of. So even when people are designing exoskeletons, they're designing them for a normative body. So I don't give a shit about exoskeletons, if I can't get a robust health plan."

Unsurprisingly, this is not disability's only response to the transhumanist vision. Even as assistive technology seeks to assimilate disabled bodies into a normative mold, many disabled individuals instead see potential in a transhumanist logic to destroy the mold rather than "recovering" to a normative baseline. Many disability thinkers who fall into this camp agree with transhumanists that by hacking the body, we can recreate what counts as normal and expand outdated notions of human value. While the underlying values behind disability and transhumanist perspectives might differ in crucial ways, we can still come to see disabled and transhumanist hackers alighting on similar hopes for technological body modification. Therefore, though some members of the disability community may argue that bodily transcendance is the only path to freedom from embodied oppressions, others contest that such technology is wasteful, dehumanizing, and the furthest direction from equitable human flourishing. There are many grey spaces between individuals, often based on their proximity to technology, or the ways in which they find themselves embodied. Finally, we can see that contradictions and convergences between these spaces make it almost impossible, and in fact, reductive, to draw neat divisions between disability and non-disability views.

Embodied Worldviews

To see the body as a foundation for ethics is to explain why my interview populations have such different beliefs about technology and the body. As much as thinkers and makers can use social understandings of bodies to form value systems, I posit that individuals also uses their *own* bodies as lenses through which to see the world. In a nutshell, the body one inhabits determines their values.

I want to tenuously suggest that the divergences of opinions I have observed in my interview populations have much to do with whether they were born with a disability. If someone was born able-bodied, for instance, and additionally has had greater interface with technology as a result of their economic and social privileges, that individual may hold a more optimistic viewpoint around technology regardless of their current disability status. It is with enormous gratitude and a fair share of amusement that I can cite myself as the perfect example in this hypothesis: I hold positionality as non-disabled technologist, who set off on my first interviews with the disability community by asking individuals to describe their ideal exoskeletons. I was met by incredulity. Corbett O'Toole told me, "That's like talking to poor people about what kind of marble flooring to put in their mansion." Such responses were humbling, and allowed me to learn from the perspective of an embodied worldview. This is to say that the body one inhabits will inherently create blind spots which can only be overcome through careful research, conversation, and the recognition of one's own subjectivity.

The "Marked" Body

With this perspective of the embodied worldview, I'd like to return to why I believe it is so important to study disability. Many might not initially think disability studies to be relevant toward the subject of technology, and that it is a niche space for disabled folk alone. In response, I argue for a reframing of what we count as disability. Undoubtedly, ableism affects all of us, whether from a sprained ankle, depression, or old age. All of these are categories for the so-called "marked" body, which carry oppressions related to race, gender, sexuality, age — and of course ability. This stands in contrast to the neutral or "unmarked" body, which in design practice is almost always taken as the default user.

The majority of our philosophical traditions have implicitly taken their ethical premises from society's articulation of the human body. Appeals to biology or "nature" have historically been used to make normative claims about human behavior, from Aristotle to Thomas Paine to James Damore. In every corner of creation, from architectural design to the design of political systems, these understandings have elevated the experiences of (and access points for) neutral able-bodied white men above other groups. According to disability and design historian Aimi Hamraie, "A universal body has served as a template for the architectural user for centuries" (Hamraie 20). This "mythic average norm" is always represented as a "particular white, European, nondisabled, youthful, and often masculine figure whose features remain unmarked" (Hamraie 20). In the world of architecture, buildings have also assumed the existence of certain bodies—presumably white, masculine, nondisabled citizens—as the most likely inhabitant of public space (Hamraie 21). Given these developments, it makes perfect sense why the built environment quite literally erases marked bodies. We know that if an environment assumes people with disabilities don't venture beyond their

own doorsteps, those environments make it nearly impossible for people to actually appear in public space.

This same cyclical logic neatly applies to recent technological developments. Too often, we use ableist rhetoric as a locus of judgement around good or bad bodies in visions of the future. As Alison Kafer writes in *Feminist, Queer, Crip,* "The very *absence* of disability signals a better future. The *presence* of disability, then, signals something else: a future that bares too many traces of the ills of the present to be desirable" (Kafer 2). For every mention of transhumanist gene-editing, disabled people are being written out of the future. On a subtler level, "simple" technologies we may take for granted similarly proclaim marked bodies as lesser. At best, I show such tech is designed at the exclusion of marked bodies; at its worst, it is designed specifically toward the elimination of such bodies. Examples of such technologies will also show the creeping progression of exclusionary values into Silicon Valley spaces, which manifest unwittingly ableist design trajectories.

In this thesis, disability thus represents one spectrum of the marked body, which technology so desperately attempts to either "fix" or erase. If we fail to turn toward this community, and take unmarked bodies as the default or normative user, we only constrict our imagination for what humanity may become. In essence, we narrow our worldview. I believe that only by looking at diverse embodied experiences can we make a world that enhances our mutual humanity instead of just our mutual efficiency.

Design as Intention

As a design researcher, I'm interested in the design spaces that result from the kinds of conflicts outlined above. In particular, I want to trace through how the meld of these Bay Area cultures affects what and how we build. My broader philosophical goal for this project is to suggest that design is a clear indication of our values, and that there is a strong feedback loop between how we see the body and how we design for it. Certainly, our societal articulations of normative bodies serve to construct value premises, which in turn lead to design decisions. Yet, understanding that the values we hold around the body are reflected in design practices is only the first step. I believe these design practices also circle back to further cement our value systems. If we, for instance, believe that people with disabilities don't leave their homes, there is no need for curb cuts. By this same token, a lack of curb cuts means that people with disabilities — and older people, and mothers with strollers, and folks with broken bones — will never be able to comfortably navigate the streets. Though it is easy to see the stark negative implications of this example, it is much harder to predict the sneaking effects biotechnological advancements will manifest under ableist value systems. It follows that how we see bodies is at the crux of how we do human-centered design, and how new technologies affect our daily lives.

I believe design is the ultimate form of human intention. Standing at the threshold of this biotechnological future, we are breaking with centuries of traditional philosophy which has imagined human nature as static. Truly, this is radical divide in our discourse, attenuating previous ethical assertions of the natural and even the human. We have only recently come to understand that, in a biological sense, nature has no goal or final destination for humankind, and fundamentally lacks coherent intention. It follows that "natural" can no longer mean inherently "good." From this, we may read that it is *intention,* or the appearance of intention, which has for so long served as an ethical tie to conceptions of the good. Yet what happens when we can no longer rely on biology alone as a guide post? When the body begins to change, our legal definitions and ethical principles, which previously took the boundaried body and the autonomous self for granted, are no longer fixed landmarks on which we can rest. If we thus establish that evolution is not teleological, it is up to us to imagine the course of our evolution — and this is the definition of design. As a form of intentionality, design now replaces the notion of evolutionary teleology. In trading "nature's intent" for human intent, design further takes over as the strongest manifestation of our ethical principles.

At present, however, our value systems are not entirely in our own control. Capitalism teaches us that all bodies are inefficient, all bodies are disabled impediments to production. The rise of automation is based on the limitations of the human body as such. Likewise, for a select group of scientists and technology designers, decisions around biotechnologies are a tangible fact to grapple with. Meanwhile, for the rest of humanity, the idea of control — the very possibility of change — is an abstract question too often left in the hands of this select group. Indeed, most lack access to the necessary tools of efficacy: updated information, socioeconomic standing, and a critical imagination with which to interrogate humanity's biotechnological future. Most pressing, however, is that so very many lack an avenue for their voices to be heard. All of these represent a barrier to intentional design. For this reason, I envision this project as both the platform for developing such an imagination, and as a vehicle to amplify the visions and voices which arise from it. To instead leave these imaginings in the hands of powerful forces is to submit to a future we have not chosen with intention, in an age where choice is uniquely and remarkably possible. I thus wish to focus on the self-conceptions of these three communities to mold human evolution toward ends of our choosing.

Framing

To do this, I will be using a specific metaphorical framing to connect technology, labor, and disability: that of the cyborg body. Though I am far from the first to constitute a relationship between the cyborg body and disability, I hope to use this metaphor to ask new questions. Specifically, I will be considering the cyborg body as a representation of possibility as it relates to the perspectives of my three interview spaces. Because the ideal of the cyborg first emerged in science fiction from technological advancements, this fantasy continues to keep pace with and inform

real-world developments. Conversely, it remains a rich and underexplored locus for disability studies, precisely through the ways in which cyborgism shores up human flaws. It is thus an excellent metaphor to explore our deeply seated beliefs around humans and their "flaws," in relation to standards of value.

As Alison Kafer suggests in *Queer, Feminist, Crip,* the cyborg may offer an effective model for disability theory and politics as a "boundary-blurring hybrid," somewhere between such squishy biological flaws and gleaming hard-edged tech fixes (Kafer 105). In the brief history of disability studies literature to take up this metaphor, Kafer says this claim has been extended by both technologists and academics to suggest that *all* people are cyborgs in some form. Upon first glance, the relationship appears fruitful. I will consider, for instance, how cyborg tech can erase bodily oppressions through a long list of sensory enhancements, increased mobility, etc. With all this attention given to the cyborg, however, there have been few disability studies pieces that focus exclusively on the figure itself; most analysis instead centers on specific examples of technology, such as the cochlear implant. Though many of the questions to follow have been similarly posed by disability scholars, seldom have the answers taken root in an analysis of the ideal body and not in an analysis of ideal technologies. While this project will certainly touch upon a range of case studies, I am not studying the effects of particular devices, but have employed participatory ethnographic methods to explore philosophical approaches to the body.

In addition, I will also use this metaphor to explicitly connect disability not only with the technology of science-fiction, but with the automation and labor practices we see everyday. It is not a coincidence that transhumanist technologies market toward a global elite, whereby the ideals of efficiency, productivity, and the removal of the body are reproduced in the technology of daily life. As a result, so much of the tech we use every day inadvertently exacerbates ableism by pairing a valuable body with an economically productive one. Fueled by a cyborg imagination, there is furthermore a tight connection between a "perfectly" productive body and the ideals of industrial automation. The supposed aims of the cyborg keep close step with the values industry has made so familiar: discipline, productivity, efficiency, and, of course, only the most minimal physical needs. From the amphetamines hailed as study drugs, to protein shakes which sidestep the dreaded inevitability of grocery-shopping, the advancements we come to call progress already belong to the transhumanist vision — and, not coincidentally, to the 70-hour week of the Silicon Valley employee.

Methods

Dreams are powerful. They are repositories of our desire. They animate the entertainment industry and drive consumption. They can blind people to reality and provide cover for political horror. But they can also inspire us to imagine that things could be radically different than they are today, and then believe we can progress toward that imaginary world.

— Speculative Everything: Design, Fiction, and Social Dreaming by Anthony Dunne & Fiona Raby

Under this metaphorical framing of the cyborg, I wanted to engage in a rather unconventional research practice for a research thesis — that of speculative design. Because I am interested in design processes, it was important for me to employ this lens over conventional ethnographic practices, to understand the perspective of a constituency that, while is so often the object of design, is almost always left out of the process of making. Through my interviews, this project represents the first step toward the creation of a more ethical design methodology.

I use my three interview spaces to explore how, **based on technologies individuals already employ or wish they could employ**, they envision **the ideal human body at work** and **the ideal body at rest.** In this process, I was interested in asking about underlying values big-picture visions, as opposed to specific products, to truly understand *why* technology carves out particular paths. For this reason, I engage in design ethnography for my interviews. Design ethnography is a process for diving into the everyday life and experiences of the people a design is for. Originally rooted in anthropological ethnographic methods, the aim of design ethnography is to enable a designer to build up an empathic understanding of the practices and routines of their interviewees, to later inform new design work. In a nutshell, I want to learn what my "users" care about and why. This allows myself as a designer to work from the perspective of these "users" on idea generation, concept development, and implementation for relevant slices of daily life (Design Ethnography). Apart from a few technology case studies, I'll my using my ethnographic interview data to talk about the values and experiences of my populations more broadly.

From here, I plan to involve interviewees using design fictions. Situated under a broader umbrella of speculative and critical design practices, design fictions are working prototypes or objects to be imagined in alternate universes. I choose to employ design fiction for its ability to address both the challenges and opportunities of the future in a democratic way. As such, I use ethnographic methods to co-create experimental design fictions that may make sense of bio- and assistive-technologies in defining the most and least desirable futures. Fundamentally, the goal of this kind of design is to invite public participation of experts and non-experts alike, to envision a future in which their own values of the body take primacy over the values of an opaque set of institutionalized power-structures. Without such work, we are left with underimaged or absent alternatives for the role of the body in technology — in short, no "choice" but to accept a future

that serves only a few. While this stage of the research is just in its nascent phase, my hope for this is that each design fiction will follow a narrative structure that interrogates transhumanist logic, re-imagines disability philosophy, and provides a new model for imagination. Coming out of the design ethnography work I have completed, the next stage of this project will be to bring the seeds of the design fictions back to my interviewees for feedback. For now, I will only be able to share the beginnings of these fictions toward the end of the thesis.

Result

Even as the design fictions I'm creating are currently works in progress, I hope to offer a design manifesto of my learnings for future designers and engineers entering the space. Our current design practices are deeply troubling as they construct the body.

Based on my interviews, I suggest that the ways in which disability and non-disability come to understand the body in context are nearly opposite: while non-disability rhetoric sees the individual body as a self-contained and ideally invincible unit, disability insteads imagines the body as inherently fragile, situated within a network of mutual care. From this divide, I articulate a new relationship between the "working body" and design. This means to rethink the ways in which we link labor with bodily worth — and so, to rethink the ways we utilize bodily worth in product design.

Finally, I set out a list of practices and questions for future design work. Among these are to ask who we count as a maker, what we count as a normative body, and to whom particular products are accessible. By considering these, I believe we can reframe the value judgement of the "ideal body" for all of us who move differently through the world.

Hypothesis

I emerged from my interview process with this hypothesis: there is a tight relationship between the ideals of biotechnological intervention and workforce automation. When we consider a more perfect body, our understandings are shaped by economic values: efficiency, productivity, and a confluence of work and leisure. Ultimately, for this reason, the current vision of the crip cyborg as an equalizing force are misguided.

I will attempt to unpack this hypothesis by going through findings from my disability design ethnographies and interleaving these with a few examples of specific technologies. I then show how these are underlied by labor practices and systemic issues of socioeconomic inequality.

[Excerpt, page 41] **Body Values: A Synthesis**

Up to this point, I have traced through the worldviews and positions of transhumanism, disability, and Silicon Valley technology. We have considered examples from technologies that have attempted to eliminate the body, to mechanize it, to recenter it's impairments. Based on this research, I have come to believe that there are fundamental differences in how people with disabilities contextualize the body, versus those without.

As channelled through transhumanism and the culture of Silicon Valley, the world of non-disability sees the individual body as self-contained, ideally invincible, and only to be augmented from within. Buttressed by the capitalist ethos of independence and self-determination, the disabled body becomes an unwitting consumer of ableist technologies. These technologies reify notions of a working body as a body *at work*. Of the assistive technologies that attempt to intervene, most only exacerbate socioeconomic divisions and place the burden of change on individuals. For this reason, the vision of the crip cyborg may do more harm than good; this vision is ultimately one of the singular body.

In contrast, disability justice fights against a world of "singular crips." Indeed, this is one value I received resounding consensus on from every person with disabilities that I interviewed. From those interviews, I learned that disability sees the body as inherently fragile, situated within a network of care-relationships, and wholly dependant on a well-designed environment to thrive.

As Liz Henry asks of transhumanism, "When you think you're going to shoot a bunch of people into Mars, how are you building a care network? Our physical bodies need care and attention." Henry says she is often around people who need attendant care or assistance. Ignoring that work assumes a society where that labor and those bodies are discounted. "Interdependence is not terrible," says Henry. "It's a form of connection. I would be suspicious of something that promises to enhance us by making us completely independent and self sufficient from all other people."

Alice Wong agrees, "Self improvement alone is not the key to liberation. It is not a weakness to care for one another." Wong cheekily calls this the same "bullshit white masculinist logic" she sees leading to productivity as the highest goal under a Silicon Valley labor culture. "Optimization is everything, speed is *everything*. But, does productivity really make you happy? If you're someone who takes an hour break to eat, you're not an ideal human." Wong shakes her head, and tells me that's not the way she wants to live her life. For Wong, like for Henry, fragility and mortality allow us to care for one another. Technology that aims to make the body invincible actually deny humanity networks of care and support. As Patty Berne puts it, disability justice is unique in "the recognition

of our fragility and simultaneous power." Only in this recognition are we able to locate a vision of human worth which prizes care above profit.