Introduction: #TravelingWhileTrans, Design Justice, and Escape from the Matrix of Domination

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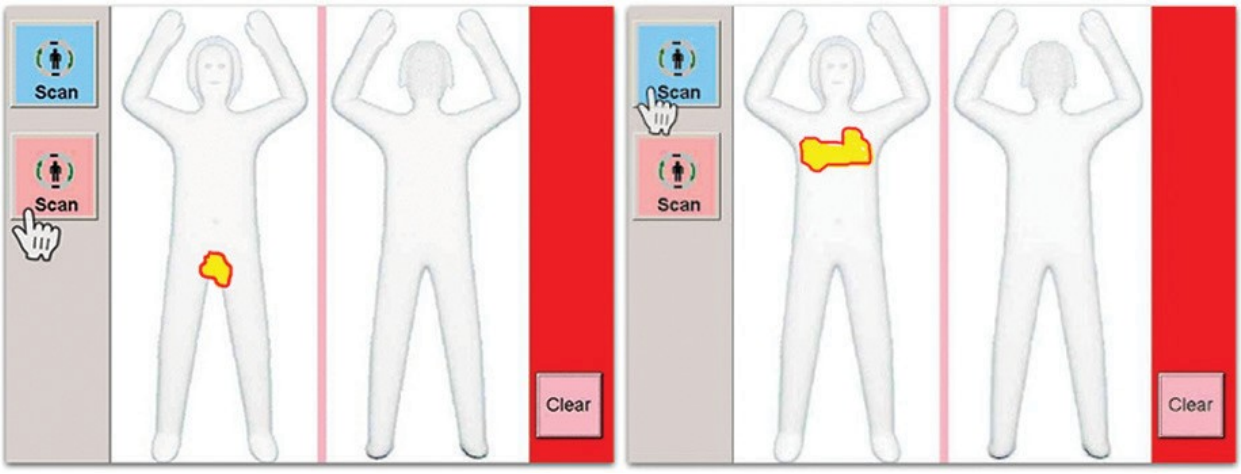

Figure 0.1 "Anomalies" highlighted in millimeter wave scanner interface. *Source:* Costello 2016.

It's June 2017, and I'm standing in the security line at the Detroit Metro Airport. I'm on my way back to Boston from the Allied Media Conference (AMC), a "collaborative laboratory of media-based organizing" that's been held every year in Detroit for the past two decades.[1] At the AMC, over two thousand people—media makers, designers, activists and organizers, software developers, artists, filmmakers, researchers, and all kinds of cultural workers—gather each June to share ideas and strategies for how to create a more just, creative, and collaborative world. As a nonbinary, trans*,[2] femme-presenting person, my time at the AMC was deeply liberating. It's a conference that strives harder than any that I know of to be inclusive of all kinds of people, including queer, trans*, intersex, and gender-non-conforming (QTI/GNC) folks. Although it's far from perfect, and every year inevitably brings new challenges and difficult conversations about what it means to construct a truly inclusive space, it's a powerful experience. Emerging from nearly a week immersed in this parallel world, I'm tired, but on a deep level, refreshed; my reservoir of belief in the possibility of creating better futures has been replenished.

Yet as I stand in the security line and draw closer to the millimeter wave scanning machine, my stress levels begin to rise. On one hand, I know that my white skin, US citizenship, and institutional affiliation with the Massachusetts Institute of Technology (MIT) place me in a position of relative privilege. I will certainly be spared the most disruptive and harmful possible outcomes of security screening. For example, I don't have to worry that this process will lead to my being placed in a detention center or in deportation proceedings; I won't be hooded and whisked away to Guantanamo Bay or to one of the many other secret prisons that form part of the global infrastructure of the so-called war on terror;[3] most likely, I won't even miss my flight while detained for what security expert Bruce Schneier describes as "security theater."[4] Only once in all of my travels have I been taken aside,

placed into a waiting room, and subjected to additional questioning by the Department of Homeland Security (DHS).[5]

On the other hand, my heartbeat speeds up slightly as I near the end of the line, because I know that I'm almost certainly about to experience an embarrassing, uncomfortable, and perhaps humiliating search by a Transportation Security Administration (TSA) officer, after my body is flagged as anomalous by the millimeter wave scanner. I know that this is almost certainly about to happen because of the particular sociotechnical configuration of gender normativity (*cis-normativity*, or the assumption that all people have a gender identity that is consistent with the sex they were assigned at birth) that has been built into the scanner, through the combination of user interface (UI) design, scanning technology, binary-gendered body-shape data constructs, and risk detection algorithms, as well as the socialization, training, and experience of the TSA agents.[6]

A female-presenting TSA agent motions me to step into the millimeter wave scanner. I raise my arms and place my hands in a triangle shape, palms facing forward, above my head. The scanner spins around my body, and then the agent signals for me to step forward out of the machine and wait with my feet on the pad just past the scanner exit. I glance to the left, where a screen displays an abstracted outline of a human body. As I expected, bright fluorescent yellow pixels on the flat-panel display highlight my groin area (see figure 0.1). You see, when I entered the scanner, the TSA operator on the other side was prompted by the UI to select Male or Female; the button for Male is blue, the button for Female is pink. Since my gender presentation is nonbinary femme, usually the operator selects Female. However, the three-dimensional contours of my body, at millimeter resolution, differ from the statistical norm of female bodies as understood by the data set and risk algorithm designed by the manufacturer of the millimeter wave scanner (and its subcontractors), and as trained by a small army of clickworkers tasked with labeling and classification (as scholars Lilly Irani, Nick Dyer-Witheford, Mary Gray, and Siddharth Suri, among others, remind us).[7] If the agent selects Male, my breasts are large enough, statistically speaking, in comparison to the normative male body-shape construct in the database, to trigger an anomaly warning and a highlight around my chest area. If they select Female, my groin area deviates enough from the statistical female norm to trigger the risk alert. In other words, I can't win. This sociotechnical system is sure to mark me as "risky," and that will trigger an escalation to the next level in the TSA security protocol.

This is, in fact, what happens: I've been flagged. The screen shows a fluorescent yellow highlight around my groin. Next, the agent asks me to step aside, and (as usual) asks for my consent to a physical body search. Typically, once I'm close enough, the agent becomes confused about my gender. This presents a problem, because the next fork in the security protocol is for either a male or female TSA agent to conduct a body search by running their hands across my arms and armpits, chest, hips and legs, and inner thighs. According to TSA policy, "if a pat-down is performed, it will be conducted

by an officer of the same gender as you present yourself."[8] As a nonbinary trans* femme, I present a problem not easily resolved by the algorithm of the security protocol. Sometimes, the agent will assume I prefer to be searched by a female agent; sometimes, a male. Occasionally, they ask for my preference. Unfortunately, "neither" is an honest but unacceptable response. Today, I'm particularly unlucky: a nearby male-presenting agent, observing the interaction, loudly states "I'll do it!" and strides over to me. I say, "Aren't you going to ask me what I prefer?" He pauses, then begins to move toward me again, but the female-presenting agent who is operating the scanner stops him. She asks me what I prefer. Now I'm standing in public, flanked by two TSA agents, with a line of curious travelers watching the whole interaction. Ultimately, the male-presenting agent backs off and the female-presenting agent searches me, making a face as if she's as uncomfortable as I am, and I'm cleared to continue on to my gate.

The point of this story is to provide a small but concrete example from my own daily lived experience of how larger systems—including norms, values, and assumptions—are encoded in and reproduced through the design of sociotechnical systems, or in political theorist Langdon Winner's famous words, how "artifacts have politics."[9] In this case, cis-normativity is enforced at multiple levels of a traveler's interaction with airport security systems. The database, models, and algorithms that assess deviance and risk are all binary and cis-normative. The male/female gender selector UI is binary and cis-normative.[10] The assignment of a male or female TSA agent to perform the additional, more invasive search is cis-normative and binary-gender normative as well. At each stage of this interaction, airport security technology, databases, algorithms, risk assessment, and practices are all designed based on the assumption that there are only two genders, and that gender presentation will conform with so-called biological sex. Anyone whose body doesn't fall within an acceptable range of "deviance" from a normative binary body type is flagged as risky and subjected to a heightened and disproportionate burden of the harms (both small and, potentially, large) of airport security systems and the violence of empire they instantiate. QTI/GNC people are thus disproportionately burdened by the design of millimeter wave scanning technology and the way that technology is used. The system is biased against us. Most cisgender people are unaware of the fact that the millimeter wave scanners operate according to a binary and cis-normative gender construct; most trans* people know, because it directly affects our lives.[11]

These systems are biased against QTI/GNC people, as I've described; against Black women, who frequently experience invasive searches of their hair, as documented by the team of investigative journalists at ProPublica;[12] and against Sikh men, Muslim women, and others who wear headwraps, as described by sociologist Simone Browne in her brilliant book *Dark Matters*.[13] As Browne discusses, and as Joy Buolamwini, founder of the Algorithmic Justice League, technically demonstrates, gender itself is racialized: humans have trained our machines to categorize faces and bodies as male and

female through lenses tinted by the optics of white supremacy.[14] Airport security is also systematically biased against Disabled people, who are more likely to be flagged as risky if they have non-normative body shapes and/or use prostheses, as well as anyone who uses a wearable or implanted medical device. Those who are simultaneously QTI/GNC, Black, Indigenous, people of color (PoC), Muslim, Sikh, immigrant, and/or Disabled[15] are doubly, triply, or multiply burdened by, and face the highest risk of harms from, this system.

I first publicly shared this experience in an essay for the *Journal of Design and Science* that I wrote in response to the "Resisting Reduction" manifesto, a timely call for thoughtful conversation about the limits and possibilities of artificial intelligence (AI).[16] That call resonated very deeply with me because as a nonbinary trans* feminine person, I walk through a world that has in many ways been designed to deny the possibility of my existence. The same cisnormative, racist, and ableist approach that is used to train the models of the millimeter wave scanners is now being used to develop AI in nearly every domain. From my standpoint, I worry that the current path of AI development will reproduce systems that erase those of us on the margins, whether intentionally or not, through the mundane and relentless repetition of reductive norms structured by the *matrix of domination* (a concept we'll return to later), in a thousand daily interactions with AI systems that, increasingly, weave the very fabric of our lives. My concerns about how the design of AI reproduces structural inequality extend more broadly to all areas of design, and these concerns are shared by a growing community.

The Design Justice Network

Design justice is not a term I created; rather, it emerged from a community of practice whose work I hope this book will lift up, extend, and support. This community is made up of design practitioners who participate in and work with social movements and community-based organizations (CBOs) across the United States and around the world. It includes designers, developers, technologists, journalists, community organizers, activists, researchers, and others, many of them loosely affiliated with the Design Justice Network (http://designjusticenetwork.org). The Design Justice Network was born at the AMC in the summer of 2015, when a group of thirty designers, artists, technologists, and community organizers took part in the workshop "Generating Shared Principles for Design Justice."[17] This workshop was planned by Una Lee, Jenny Lee, and Melissa Moore, and presented by Una Lee and Wesley Taylor. It was inspired by the Allied Media Projects (AMP) network principles, the Detroit Digital Justice Coalition (DDJC) digital justice principles, and the pedagogy of Detroit Future Youth. The goal of the workshop was to move beyond the frames of *social impact design* or *design for good*, to challenge designers to think about how good intentions are not necessarily enough to ensure that design processes and practices become tools for liberation, and to develop principles that might help design practitioners avoid the (often unwitting) reproduction of existing inequalities.[18] The draft

principles developed at that workshop were refined by the Design Justice Network coordinators over the next year, revised at the AMC in 2017, and then, in 2018, released in the following form:

Design Justice Network Principles

This is a living document.

Design mediates so much of our realities and has tremendous impact on our lives, yet very few of us participate in design processes. In particular, the people who are most adversely affected by design decisions—about visual culture, new technologies, the planning of our communities, or the structure of our political and economic systems—tend to have the least influence on those decisions and how they are made.

Design justice rethinks design processes, centers people who are normally marginalized by design, and uses collaborative, creative practices to address the deepest challenges our communities face.

1. We use design to **sustain, heal, and empower** our communities, as well as to seek liberation from exploitative and oppressive systems.
2. We **center the voices of those who are directly impacted** by the outcomes of the design process.
3. We **prioritize design's impact on the community** over the intentions of the designer.
4. We view **change as emergent from an accountable, accessible, and collaborative process**, rather than as a point at the end of a process.
5. We see the role of the **designer as a facilitator rather than an expert.**
6. We believe that **everyone is an expert based on their own lived experience**, and that we all have unique and brilliant contributions to bring to a design process.
7. We **share design knowledge and tools** with our communities.
8. We work towards **sustainable, community-led and controlled** outcomes.
9. We work towards **non-exploitative solutions** that reconnect us to the earth and to each other.
10. Before seeking new design solutions, **we look for what is already working** at the community level. We honor and uplift traditional, indigenous, and local knowledge and practices.[19]

These principles have now been adopted by over three hundred people and organizations. The Design Justice Network has grown, nurtured by many; besides dozens of track coordinators (many named in this book's acknowledgments) and workshop facilitators, ongoing steering committee members include designers Una Lee, Victoria Barnett, Wesley Taylor, and myself.[20] The network produces a series of zines that provide an evolving record of our ideas and activities (http://designjusticenetwork.org/zine); coordinates a track at the AMC; and organizes workshops on a regular basis. Information about the dozens of organizations and hundreds of individuals that have been part of the design justice track at AMC is available in the archived conference programs.[21]

In particular, the design studio And Also Too has been a key actor in the development of design justice ideas and practices. Founded by designer Una Lee, And Also Too is "a collaborative design studio for social justice visionaries," and is home to designers and artists Lupe Pérez, Sylver Sterling, Lara Stefanovich-Thomson, and Zahra Agjee. As they describe on their site: "And Also Too uses co-design to create tools for liberation and visionary images of the world we want to live in. … Our work is guided by two core beliefs: first, that those who are directly affected by the issues a project aims to address must be at the center of the design process, and second, that absolutely anyone can participate meaningfully in design."[22] And Also Too facilitated the development of the Design Justice Network Principles, and is guided by those principles in its own day-to-day work.[23] Others that practice design justice include the worker-owned cooperative Research Action Design (RAD),[24] the Detroit-based artist collective Complex Movements, and a growing list of more than three hundred Design Justice Network Principles signatories (the full list is available at http://designjusticenetwork.org/ network-principles).

More recently, other groups that are not (yet!) formally connected to the Design Justice Network have also begun to use the hashtag #designjustice on various social media platforms. These include the architects and city planners who organized a series of DesignAsProtest events in 2017, the EquityXDesign campaign to end gender and racial disparity in architecture as a profession, and the architects affiliated with the American Institute of Architects (AIA) who convened a 2018 Design Justice Summit in New Orleans, among others. The Equity Design Collaborative, led by Caroline Hill, Michelle Molitor, and Christine Ortiz, has been working to retrofit design thinking methods with a racial justice analysis.[25]

There are also many, many organizations that don't use the term *design justice* but are engaged in closely allied practices. For example, the Inclusive Design Research Centre (IDRC) is "a research and development centre where an international community of open source developers, designers, researchers, advocates, and volunteers work together to ensure that emerging information technology and practices are designed inclusively."[26] Professor of Civic Design Ceasar McDowell has developed an extensive body of theory and practice of *design for the margins*.[27] Other allied projects, groups, and networks include the Association for Progressive Communications, the Catalan GynePunk collective (who develop and circulate queer feminist design practices of DIY gynecology[28]), the Center for Media Justice, Coding Rights (Brazil), the Critical Making Lab, Data Active, Decolonising Design, the Design Studio for Social Intervention, Design Trust for Public Space, the Digital Justice Lab (Toronto), FemTechNet, Intelligent Mischief (Brooklyn), MIT CoLab, SEED Network, Social Justice Design Studio, and the Tech Equity Collective, just to name a few.[29]

In particular, there is a rapidly growing community of researchers, computer scientists, and advocates who are focused on challenging the ways that inequality is reproduced through the design of AI and

algorithmic decision support systems. This area has seen a wave of recent publications, such as Virginia Eubanks's *Automating Inequality* (2018), Safiya Noble's *Algorithms of Oppression* (2018), Meredith Broussard's *Artificial Unintelligence* (2019), and Ruha Benjamin's *Race After Technology* (2019), among others. In this area, there is also an explosion of new organizations and networks. Data for Black Lives has emerged as a key community of data scientists, scholars, artists, and community organizers who work to rethink data science, machine learning, AI, and other sociotechnical systems through a racial justice lens. Others (among many!) include the AI Now Institute, the Algorithmic Justice League, the Center for Critical Race and Digital Studies, Data & Society, the Data Justice Lab (Cardiff), the Digital Equity Lab (NYC), the JUST DATA Lab, the Our Data Bodies Project, the People's Guide to AI, and the Stop LAPD Spying Coalition.

Throughout this book, I will return to, draw from, and reference the work of these and other scholars, designers, and organizations that are already working to put design justice principles into practice, although there are so many that it won't be possible to mention them all.

Methods

My Own Standpoint

Feminist standpoint theory recognizes that all knowledge is situated in the particular embodied experiences of the knower.[30] Accordingly, I begin here by locating my own position and trajectory for the reader. I'm a nonbinary trans* femme queer person, of Italian-Russian-Polish-Jewish descent, raced white within the current logic of racial capitalism in the United States. I was born into a rural, hippie, cooperative home near Ithaca, in upstate New York, to parents who took part in feminist, antiwar, anti-imperialist, Latin American solidarity, and environmentalist movements of the time. I grew up on land stolen from the Onöñda'gaga' (Onandaga), Susquehannock, Gayogohó:no' (Cayuga), and peoples of the Haudenosaunee (Iroquois) confederacy. My political education came first via my parents and community, then my teachers at the Alternative Community School, a public alternative school. I attended high school in Puebla, México, then moved to Boston and attended Harvard College on a scholarship, gaining access to a new level of educational privilege. While in Boston, I joined the popular theater and cultural organizing collective AgitArte,[31] and in that work became more deeply politicized through the efforts of Puerto Rican artist-organizers like Jose Jorge Díaz and Mayda Grano de Oro. After college, I lived and worked in San Juan, Puerto Rico, with the public arts project EducArte, before moving to Philadelphia for graduate education, hoping to connect my activist work to media theory.

At that time, in the early 2000s, I was part of the global Indymedia network of DIY social movement journalism.[32] I traveled throughout Latin America to bring donated video cameras and computers to local Indymedia collectives, participated in organizing Independent Media Centers to provide

grassroots coverage of large protest events, and produced and distributed documentary films and videos about the global justice movement.[33] Through Indymedia, I also learned about free software and gained software development skills.

In 2003, I became involved with the Allied Media Conference, a space that continues to transform and shape my life.[34] I moved to Los Angeles for a PhD program at the University of Southern California, and while there, I worked with the Institute of Popular Education of Southern California (IDEPSCA), the Garment Worker Center (GWC), and other community-based organizations to support worker-led media projects like VozMob (*Voces Móviles*/Mobile Voices), developed through participatory design.[35] In 2011, I moved to Boston to take a position at MIT, and in 2014, I cofounded the worker-owned cooperative Research Action Design with Chris Schweidler and Bex Hurwitz.

As I write these words, in 2018, I have a faculty position at a high-profile university. I materially benefit from, and in some ways am harmed by, my location within systems including whiteness, educational inequality, capitalism, ableism, and settler colonialism. Simultaneously, I experience oppression based on patriarchy (although in the past I experienced both benefits and harms from this system), transphobia, transmisogyny, and cis-normativity. My standpoint and lived experience shape my understanding of design as a tool for both oppression and liberation, and throughout this text I will occasionally return to my lived experience to ground and illustrate key points.

Participatory Action Research

Most of my work falls within the tradition of participatory action research (PAR) and codesign. PAR is a framework with roots in the work of scholars and educators such as Kurt Lewin, John Dewey, and (later) Paulo Freire, Orlando Fals-Borda, and Linda Tuhiwai Smith, and it emphasizes the development of communities of shared inquiry and action.[36] *Codesign*, a closely allied approach, can be traced to Scandinavian efforts in the 1960s and 1970s to include both workers and managers in sociotechnical systems design. Both PAR and codesign consider communities to be co-researchers and codesigners, rather than solely research subjects or test users. Chapter 2 provides a more in-depth discussion of the roots of codesign methods.

Together with the community-based organizations that are my research partners, I typically employ a combination of participant observation, semi-structured interviews, popular education, and codesign workshops. The empirical grounding for this book includes (1) my experience as a cofounder of Research Action Design (RAD.cat), a worker-owned cooperative that attempts to put the principles of design justice into action; (2) my work as part of the Tech for Social Justice Project, a PAR team that produced the report *#MoreThanCode: Practitioners Reimagine the Landscape of Tech for Justice and Equity*,[37] based on more than one hundred semi structured interviews (most of them conducted by Maya Wagoner and Berhan Taye) and a series of eleven focus groups with technologists, designers,

developers, product managers, and others across the United States (explore morethancode.cc); and (3) my own experience developing, teaching, and evaluating the Civic Media: Collaborative Design Studio course at MIT, from 2012 through the present (https://codesign.mit.edu).

Thus, although this book itself is not a PAR project, the experiences and insights that it contains were developed over many years in community and in collaboration with other researchers, community organizers, and design practitioners.

A Note on "We" and "I"

As an engaged scholar and design practitioner who is guided by anti-racist, feminist principles and epistemology, I want to make clear that although this is a single-authored book, many of the ideas it explores have bubbled up through the Design Justice Network as an emergent community of practice. All credit for the key ideas of design justice is due to this community, whereas all responsibility for the many errors in this text is mine. To paraphrase one of the anonymous reviewers of this manuscript, there is a tension between my attempt to provide a normative design justice framework as a single author and my claim to be amplifying knowledge that has been produced by a movement. I will do my best to remind the reader of this tension throughout.

In this book, I also move back and forth between third-person description and use of the first-person pronouns *we* and *I*. In particular, I use the first-person singular when I'm describing or drawing from my own personal experience to illustrate a point. When I use *we*, sometimes it refers to the community of existing design justice practitioners, and I will attempt to make that clear. At other moments, *we* refers to the aspirational broader community of those who care about remaking design, as part of broader efforts to make more liberatory and just worlds. I hope that you (the reader) will feel included in this broader *we*. Let us begin with a few key terms.

Design Justice: Defining Key Terms

Design

> Design (noun): A plan or scheme conceived in the mind and intended for subsequent execution; the preliminary conception of an idea that is to be carried into effect by action; a project.
>
> —*Oxford English Dictionary*[38]

There are many definitions of *design*. I won't attempt their synthesis here, nor will I advocate for the adoption of a particular definition. Nevertheless, before diving into the theory and practice of design justice, I'll briefly discuss a few of the many ways that the term *design* is used and offer some thoughts about the meanings that are most useful in the context of this book.

As a verb, *design* originates from the Latin *de signum* ("to mark out") or *designō* ("I mark out, point out, describe.") In early use, it described the act of making a meaningful physical mark on an object. *Signum* evolved, mostly through French, into words such as "signify, assign, designate, [and] signal,"[39] and this sense is maintained today in the idea that designers sketch, draw, and mark out representations that will later become objects, buildings, or systems. In common usage, *design* carries multiple meanings. We use it to refer to a plan for an artifact, building, or system; a pattern (such as a floral print on a textile); the composition of a work of art; or the shape, appearance, or features of an object.[40] It also refers to the practice, field, or subfields of design work (e.g., "Icelandic design dominates global furniture markets.").

In his classic text *Design for the Real World*, Victor Papanek positions design as a universal practice in human communities: "All [people][41] are designers. … Design is the conscious effort to impose a meaningful order."[42] Design professor, practitioner, and philosopher Tony Fry also argues that we are all designers and that design is not solely the province of architects, graphic designers, industrial designers, or other design professionals; instead, he sees it as a component of all intentional acts.[43] Anne-Marie Willis, professor of design theory and editor of *Design Philosophy Papers*, puts it this way:

> Design is something far more pervasive and profound than is generally recognised by designers, cultural theorists, philosophers or lay persons; designing is fundamental to being human—we design, that is to say, we deliberate, plan and scheme in ways which prefigure our actions and makings … we design our world, while our world acts back on us and designs us.[44]

At the same time, *design* frequently refers to expert knowledge and practices contained within a particular set of professionalized fields, including graphic design, fashion design, interaction design, industrial design, architecture, planning, and various other industries. Alongside the discussion of design as a specialist activity or as a certain type of work accomplished by experts, there is also a steadily growing literature on marginalized people's design practices. In line with feminist critiques of frequently unpaid and invisibilized forms of feminized labor,[45] it's crucial to acknowledge the importance of everyday, vernacular, and often unrecognized design practices (as in chapter 3). Alternative histories of technology and design help to recuperate and center people, practices, and forms of expertise that have long been erased by mainstream design theory and history, both in scholarly and popular writing. A few of these counter histories of invisibilized technology design work have been widely popularized; for example, the 2016 film *Hidden Figures* chronicles the work of Katherine Johnson and other Black women who worked for NASA as "human computers," coding space flight trajectories.[46] In addition, recent innovation literature decenters the myth of the individual designer and emphasizes the key roles played by "lead users" who constantly modify, hack, repurpose, and reuse technologies to better fit their needs[47] (a point taken up in chapter 2).

However, inclusive visions of design as a universal human activity in many ways conflict with the realities of the political economy of design. True, everyone designs, but only certain kinds of design work are acknowledged, valorized, remunerated, and credited. In other words, design is professionalized: certain people get paid, sometimes quite well, to be design experts. Designers have professional associations (such as the American Institute of Graphic Arts, or AIGA, with over twenty-five thousand members),[48] conferences, and in some subfields, extensive processes for accreditation and licensing (architects, industrial designers), standardization (negotiated through standards bodies such as the United States Access Board, tasked with developing the Americans with Disabilities Act Accessibility Guidelines), norms, and principles (such as universal design principles).[49]

According to design scholars Robert Hoffman, Axel Roesler, and Brian Moon, the *designer* as a specific kind of person, or as a profession, emerged with the Industrial Revolution. Until then, knowledge about how to create, use, and maintain specialized tools was transmitted via craft guilds. However, the craft guild model could not support larger-scale designs that required the distribution of skills among many specialists. Accordingly, "this new task—designing for a class of people with whom the designer did not interact—helped mark the origin of industrial design."[50] At this time, they also note, designers took on a new role: "to reshape formerly hand-crafted processes into ones that machines could do. Mass and assembly-line-based production stimulated, or necessitated, the creation of many designs for artifacts aimed at a broad mass of consumers and for machines designed to help in manufacturing other machines."[51]

The Industrial Revolution–era association of design with industry, machines, and mass production shifted over time. Design, designers, and design work are now inextricably linked with computers, software, and the virtual representation of objects and systems. Across all professional design fields, including industrial design, architecture, graphic design, and software design, design work has become primarily digital work, performed with computers and software tools. As in so many fields, certain design tasks are also increasingly automated or semiautomated. In chapter 2, I will further discuss the implications of design justice on the question of who gets paid to do design work.

Design is also a way of thinking, learning, and engaging with the world. Reasoning through design is a mode of knowledge production that is neither primarily deductive nor inductive, but rather abductive and speculative. Where *deduction* reasons from the general to the specific and *induction* reasons from the specific to the general, *abduction* suggests the best prediction given incomplete observations.[52] Professor of urban planning, philosopher, and scholar of organizational learning Donald Schön put it this way: "Designers put things together and bring new things into being, dealing in the process with many variables and constraints, some initially known and some discovered through designing. Almost always, designers' moves have consequences other than those intended for them. Designers juggle variables, reconcile conflicting values, and maneuver around constraints—a process where, although

some design products may be superior to others, there are no unique right answers."[53] Design is thus also *speculative*: it is about envisioning, as well as manipulating, the future.[54] Designers imagine images, objects, buildings, and systems that do not yet exist. We propose, predict, and advocate for (or, in certain kinds of design, warn against) visions of the future.

In his recent book *Designs for the Pluriverse* (2018), anthropologist Arturo Escobar sees design as an "ethical praxis of world-making."[55] He urges us to consider the ways that design practices today too often reproduce the totalizing epistemology of modernity and in the process erase indigenous worldviews, forms of knowledge, and ways of being. Escobar calls for an approach to design that is focused on the creation of a world "where many worlds fit." This is a reference to the Zapatista slogan that so powerfully articulates a need to move past the current globalized system that is spiraling rapidly toward ecological collapse. Escobar reminds us that the erasure of indigenous lifeworlds takes place through the long-running and still-unfolding imposition of colonial ontologies, epistemologies, and ways of knowing the world. The call for community-led practices to build the *worlds* we need (this book's subtitle) is directly inspired by Escobar's discussion of the pluriverse. In a similar vein, Ramesh Srinivasan, in his recent book *Whose Global Village?*, reminds us that indigenous peoples have their own ways of imposing meaningful order on the world, which have not only been under attack through centuries of colonialism but also are often erased in interactions with present-day sociotechnical systems, even within supposedly human-centered or participatory design processes.[56]

What of design itself as a totalizing project? Undoubtedly, *design thinking* has become increasingly popular. Propelled by the Stanford d.school and by the design firm IDEO, this approach is widely influential throughout business, the academy, and, most recently, the public sector.[57] Feminist science and technology studies (STS), human-computer interaction (HCI), and South Asia studies scholar Lilly Irani critiques the way that design thinking is deployed to reproduce a colonial political economy, with design imagined at the top of the value chain as a key process to be managed only by firms from the Global North (and as a mechanism for the reproduction of whiteness).[58] Product designer Natasha Jen, in a widely seen 99U talk, states that "design thinking is bullshit."[59] Sociologist Ruha Benjamin, in her recent book *Race After Technology: Abolitionist Tools for the New Jim Code* (2019), examines the relationship between design and systemic racism; she calls both for a more intentionally antiracist approach to innovation and for a healthy skepticism of universalist and solutionist notions of design as a way out of structural inequality.[60] I will return to a discussion of design thinking later in the book.

Design thus may be thought of as both a verb and a noun, a universal kind of human activity and a highly professionalized field of practice (or several such fields), a way of manipulating future objects and systems using specialized software and an everyday use of traditional knowledge embedded in indigenous lifeways, a type of work with one's hands and a way of thinking, an art and a science, and more. My goal is not to capture or reduce this multivalence to a single true essence. Instead, design

justice raises a set of questions and provocations that (I believe) apply to *any and all* meanings of design. Before I offer a working definition of *design justice*, however, I will briefly discuss two key concepts from Black feminist thought that reside at the core of many of this book's arguments: *intersectionality* and the *matrix of domination*.

Intersectionality

Black feminist thought fundamentally reconceptualizes race, class, and gender as interlocking systems: they do not only operate on their own, but are often experienced together by individuals who exist at their intersections. The analytical framework built on this fundamental insight is called *intersectionality*. Although the idea has a longer legacy (think of African American abolitionist and women's rights activist Sojourner Truth's "Ain't I a Woman?," Communist Party Secretary Claudia Jones's writings about being "triply oppressed," or the Combahee River Collective's critiques of white feminism),[61] the specific term *intersectionality* was first published by Black feminist legal scholar Kimberlé Crenshaw in her 1989 article "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics."[62] In the article, Crenshaw describes how existing antidiscrimination law (Title VII of the Civil Rights Act) repeatedly failed to protect Black women workers.

First, she discusses an instance in which Black women workers at General Motors (GM) were told they had no legal grounds for a discrimination case against their employer because antidiscrimination law only protected single-identity categories. The court found that, since GM hired white women, the company did not systematically discriminate against women. It further found that there was insufficient evidence of discrimination against Black people, because GM hired significant numbers of Black men to work on the line. Thus, Black women, who in reality did experience systematic employment discrimination *as Black women*, were not protected by existing law and had no actionable legal claim. In a second case described by Crenshaw, the court rejected the discrimination claims of a Black woman who sued Hugh Helicopters, Inc., because "her attempt to specify her race was seen as being at odds with the standard allegation that the employer simply discriminated 'against females.'"[63] In other words, the court could not accept that Black women might be able to represent *all* women, including white women, as a class. In a third case, the court *did* award discrimination damages to Black women workers at a pharmaceutical company, but it refused to award the damages to *all* Black workers, under the rationale that Black women could not possibly represent the claims of Black people as a whole.[64]

Crenshaw notes the role of statistical analysis in each of these cases: sometimes, the courts required Black women plaintiffs to include broader statistics for all women that countered their discrimination claims; in other cases, the courts limited the admissible data to that which dealt solely with Black

women, as opposed to all Black workers. In those cases, the low total number of Black women employees typically made statistically valid discrimination claims impossible, whereas strong claims could have been made if the plaintiffs were allowed to include data for all women, for all Black people, or both. Later, in her 1991 *Stanford Law Review* article "Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color,"[65] Crenshaw powerfully articulates the ways that women of color often experience male violence as a product of intersecting racism and sexism, but are then marginalized from both feminist and antiracist discourse and practice and denied access to specific legal remedies.[66]

The concept of intersectionality provided the grounds for a long, slow paradigm shift that is still unfolding in the social sciences, in legal scholarship, and in other domains of research and practice. This paradigm shift is also beginning to transform the various domains of design. One of the central claims of this book is that the predominance of what Crenshaw calls *single-axis analysis*, in which race, class, or gender is considered as an independent construct, continually undermines the intentions of well-meaning designers who hope to challenge bias through the objects, systems, or environments they design. In law, as Crenshaw points out, "the single-axis framework erases Black women in the conceptualization, identification and remediation of race and sex discrimination by limiting inquiry to the experiences of otherwise-privileged members of the group. In other words, in race discrimination cases, discrimination tends to be viewed in terms of sex- or class-privileged Blacks; in sex discrimination cases, the focus is on race- and class-privileged women. This focus on the most privileged group members marginalizes those who are multiply-burdened and obscures claims that cannot be understood as resulting from discrete sources of discrimination."[67]

In this book, I will demonstrate how universalist design principles and practices erase certain groups of people, specifically those who are intersectionally disadvantaged or multiply burdened under white supremacist heteropatriarchy, capitalism, and settler colonialism. What is more, when designers do consider inequality in design (and most professional design processes do not consider inequality at all), they nearly always employ a single-axis framework. Most design processes today therefore are structured in ways that make it impossible to see, engage with, account for, or attempt to remedy the unequal distribution of benefits and burdens that they reproduce. As Crenshaw notes, feminist theory and antiracist policy that is not grounded in an intersectional understanding of gender, race, and class can never adequately address the experiences of Black women, or any other multiply burdened groups of people, when it comes to the formulation of policy demands. Design justice holds that the same is true when it comes to "design demands."

For example, intersectionality is an absolutely crucial concept for the development of AI. Most pragmatically, single-axis (in other words, nonintersectional) algorithmic bias audits are insufficient to ensure algorithmic fairness (let alone justice). While there is rapidly growing interest in algorithmic

bias audits, especially in the fairness, accountability, and transparency in machine learning (FAT*) community, most are single-axis: they look for a biased distribution of error rates only according to a single variable, such as race or gender. This is an important advance, but it is essential that we develop a new norm of intersectional bias audits for machine learning systems. Toward that end, Joy Buolamwini of the Algorithmic Justice League has produced a growing body of work that demonstrates the ways that machine learning is intersectionally biased. In the project *Gender Shades*, Buolamwini and researcher Timnit Gebru show how facial analysis tools trained on "pale male" data sets perform best on images of white men and worst on images of Black women.[68] In order to demonstrate this, they first had to create a new benchmark data set of images of faces, both male and female, with a range of skin tones.

Of course, there are many cases where a design justice analysis asks us not to make systems more inclusive, but to refuse to design them at all; we will return to that point repeatedly as well as at the end of the book in a discussion of the #TechWontBuildIt movement. However, industry appropriation aside, Buolamwini and Gebru's work not only demonstrates that facial analysis systems are technically biased (although that is true); it also provides a concrete example of the lesson that, wherever we contemplate developing machine learning systems, we need to develop intersectional training data sets, intersectional benchmarks, and intersectional audits. The urgency of doing so is directly proportional to the impacts (or potential impacts) of algorithmic decision support systems on people's life chances.

More broadly, without intersectional analysis, we cannot design any objects or systems that adequately address the experiences of people who are multiply burdened within the matrix of domination.

The Matrix of Domination

Closely linked to intersectionality, but less widely used today, the *matrix of domination* is a term developed by Black feminist scholar, sociologist, and past president of the American Sociological Association Patricia Hill Collins to refer to race, class, and gender as interlocking systems of oppression. It is a conceptual model that helps us think about how power, oppression, resistance, privilege, penalties, benefits, and harms are systematically distributed. When she introduces the term in her 1990 book *Black Feminist Thought*, Collins emphasizes race, class, and gender as the three systems that historically have been most important in structuring most Black women's lives. She notes that additional systems of oppression structure the matrix of domination for other kinds of people. The term, for her, describes a mode of analysis that includes any and all systems of oppression that mutually constitute each other and shape people's lives.[69]

Collins also emphasizes that every individual simultaneously receives both benefits and harms based on their location within the matrix of domination. As Collins notes, "Each individual derives varying amounts of penalty and privilege from the multiple systems of oppression which frame everyone's lives."[70] An intersectional Black feminist analysis thus helps us each understand that we are simultaneously members of multiple dominant groups and multiple subordinate groups. Design justice urges us to (1) consider how design (affordances and disaffordances, objects and environments, services, systems, and processes) distributes both penalty and privileges to individuals based on their location within the matrix of domination and (2) attend to the ways that this operates at various scales.

In *Black Feminist Thought*, Collins also notes that "people experience and resist oppression on three levels: the level of personal biography; the group or community level of the cultural context created by race, class, and gender; and the systemic level of social institutions. Black feminist thought emphasizes all three levels as sites of domination and as potential sites of resistance."[71] Design justice urges us to explore the ways that design relates to domination and resistance at each of these three levels (personal, community, and institutional). For example, at the personal level, we might explore how interface design affirms or denies a person's identity through features such as a binary gender dropdown menu during profile creation. Such seemingly small design decisions have disparate impacts on different individuals.

At the community level, platform design (for example) fosters certain kinds of communities while suppressing others, through setting and enforcing community guidelines, rules, and speech norms, instantiated through different kinds of content-moderation algorithms, click-workers, and decision support systems. For example, when ProPublica revealed that Facebook's internal content moderation guidelines explicitly mention that Black children are not a protected category, while white men are,[72] this inspired very little confidence in Mark Zuckerberg's congressional testimony that Facebook feels it can deal with hate speech and trolls through the use of AI content moderation systems. Nor was Facebook's position improved by the leak of content moderation guidelines that note that "white supremacist" posts should be banned, but that "white nationalist" posts are within free speech bounds.[73]

At the institutional level, we might consider how design decisions that reproduce and/or challenge the matrix of domination are influenced by institutional funding priorities, policies, and practices. Design institutions include companies (Google, Apple, Microsoft), nation-states that decide what kinds of design to prioritize through funding agencies such as the National Science Foundation (NSF) and Department of Defense (DoD), venture capital firms, standards-setting bodies (like ISO, W3C, and NIST), laws (such as the Americans with Disabilities Act), universities that educate designers, and so on. Not only do institutions influence design by other actors, they also design objects, systems, and processes that they then use to distribute benefits and harms across society. For example, the ability to

immigrate to the United States is unequally distributed among different groups of people through a combination of laws passed by the US Congress, software decision support systems, executive orders that influence enforcement priorities, and so on. In 2018, the Department of Homeland Security had an open bid to develop "extreme vetting" software that would automate "good immigrant/bad immigrant" prediction by drawing from people's public social media profiles. After extensive pushback from civil liberties and immigrant rights advocates, DHS backpedaled and stated that the system was beyond "present-day capabilities." Instead, they announced a shift in the contract from software to labor: more than $100 million dollars will be awarded to cover the employment of 180 people, tasked with manually monitoring immigrant social media profiles from a list of about one hundred thousand people.[74] More broadly, visa allocation has always been an algorithm, one designed according to the political priorities of power holders. It's an algorithm that has long privileged whiteness, hetero- and cis-normativity, wealth, and higher socioeconomic status.[75]

Finally, Black feminist thought emphasizes the value of situated knowledge over universalist knowledge. In other words, particular insights about the nature of power, oppression, and resistance come from those who occupy subjugated standpoints. This approach also explicitly recognizes that knowledge developed from any particular standpoint is partial knowledge: "The overarching matrix of domination houses multiple groups, each with varying experiences with penalty and privilege that produce corresponding partial perspectives, situated knowledges, and, for clearly identifiable subordinate groups, subjugated knowledges. No one group has a clear angle of vision. No one group possesses the theory or methodology that allows it to discover the absolute 'truth' or, worse yet, proclaim its theories and methodologies as the universal norm evaluating other groups' experiences."[76]

The challenges presented by deeply rooted and interlocking systems of oppression can seem overwhelming. What paths might lead us out of the matrix of domination?

Design Justice

So far, we have briefly explored the meanings of *design*, *intersectionality*, and the *matrix of domination*. To conclude this section, I offer the following tentative description of design justice:

Design justice is a framework for analysis of how design distributes benefits and burdens between various groups of people. Design justice focuses explicitly on the ways that design reproduces and/or challenges the matrix of domination (white supremacy, heteropatriarchy, capitalism, ableism, settler colonialism, and other forms of structural inequality). Design justice is also a growing community of practice that aims to ensure a more equitable distribution of design's benefits and burdens; meaningful participation in design decisions; and recognition of community-based, Indigenous, and diasporic design traditions, knowledge, and practices.

This isn't meant to be a canonical definition of design justice. Nor should it supplant the Design Justice Network Principles presented earlier, which were developed by a growing community of practitioners through an extensive, multiyear process. Instead, it is a provisional, succinct description that I found useful as I worked to organize my thoughts about design theory and practice for this book.

This description of design justice also resonates strongly with the current widespread rise of intersectional feminist thought and action, visible in recent years in the United States in the emergence of networked social movements such as #BlackLivesMatter, the immigrant rights movement, the fight for LGBTQI+ and Two-Spirit rights, gender justice, and trans* liberation, indigenous struggles such as #IdleNoMore and #StandWithStandingRock, disability justice work, the #MeToo movement, the environmental justice movement, and new formations in the labor movement such as platform cooperativism and #TechWontBuildIt. These movements fight to resist the resurgent extreme right, and also to advance concrete proposals for a more just and sustainable world. They are growing, and in 2018 provided the momentum for a historic midterm election that won record numbers of seats for leftists, queer people, and B/I/PoC in the US Congress.

Intersectional feminist networked movements are also increasingly engaged in debates about the relationships between technology, design, and social justice. It is my hope that design justice as a framework can provide tools to support existing and emergent critique of design (from images to institutions, from products to platforms, from particular practitioners to professional associations), as well as encourage the documentation of innovative forms of community-led design, grounded in the specificity of particular social movements. In this book, I draw from the activities of the Design Justice Network, my own experience working on design projects and teaching design theory and practice, practitioner interviews, and texts by other scholars, designers, and community organizers. I hope that this book can help shift our conversation beyond the need for diversity in tech-sector employment, and that it will help make visible the growing community of design justice practitioners who are already working closely with liberatory social movements to build better futures for us all.

Chapter Overview

In the Design Justice Network, for the last several years we have been asking questions about how design currently works, and about how we want it to work. I have structured the chapters in this book as an extensive reflection on a few of these questions—in particular:

- *Values*. What values do we encode and reproduce in the objects and systems that we design?
- *Practices*. Who gets to do design? How do we move toward community control of design processes and practices?
- *Narratives*. What stories do we tell about how things are designed? How do we scope design challenges and frame design problems?

- *Sites*. Where do we do design? How do we make design sites accessible to those who will be most impacted by design processes? What design sites are privileged and what sites are ignored or marginalized?
- *Pedagogies*. How do we teach and learn about design justice?

The book is organized as follows:

Chapter 1 addresses the question, "What values do we encode and reproduce in the objects and systems that we design?" It argues that, currently, the values of white supremacist heteropatriarchy, capitalism, ableism, and settler colonialism are too often reproduced in the affordances and disaffordances of the objects, processes, and systems that we design. The chapter begins with a story about using Facebook to organize a trans*, queer, and immigrant solidarity protest and uses that experience to open a critical conversation with the literature on affordances, disaffordances, discriminatory design, and cognitive load.[77] Although design affordances are often assumed to be universal, the chapter argues that they are actually unequally distributed based on the matrix of domination. The next section briefly discusses approaches such as value-sensitive design,[78] universal design, and inclusive design. Over time, these have produced much-needed shifts in design theory and practice, and design justice builds upon them but also differs in important ways. The chapter also draws on feminist and antiracist strands within science and technology studies to unpack the ways that the matrix of domination is constantly hard-coded into designed objects and systems.[79] This typically takes place not because designers are intentionally "malicious" but through unintentional mechanisms, including assumptions about "unmarked" end users, the use of systematically biased data sets to train algorithms using machine-learning techniques, and limited feedback loops. Addressing these issues requires that we retool for design justice, and the chapter analyzes various design concepts and tools, such as differential cognitive load, intersectional instrumentation, benchmarking, and A/B testing, through a design justice lens. It ends with a question about what it might mean to hard-code liberation.

Chapter 2 focuses on the questions, "Who gets to do design? How do we move toward community control of design processes and practices?" It argues that the most valuable ingredient in design justice is the full inclusion of, accountability to, and control by people with direct lived experience of the conditions designers claim they are trying to change. The chapter builds on the work of the disability justice movement, whose activists popularized the phrase "nothing about us without us."[80] It begins with a discussion of the raced, classed, and gendered nature of employment in the technology sector, but quickly proposes a shift from arguments for equity (such as "we need more diverse designers and software developers") to arguments for accountability and community control ("those most affected by the outcomes should lead and own design processes and products"). This is not a new idea; the chapter reviews the participatory turn in technology design and includes discussion of user-led innovation,

participatory design, and feminist HCI, among other strands of theory and practice.[81] Key lessons include the following: leadership and control by members of the community that is most directly affected by the issue is crucial, both because it's ethical and also because the tacit and experiential knowledge of those marginalized within the matrix of domination is sure to produce ideas, approaches, and innovations that a nonmember of the community would be very unlikely to come up with. The chapter ends by exploring findings from the #MoreThanCode field scan of technology for social justice practitioners across the United States; in particular, it summarizes practitioners' suggestions about how to create community accountability in technology design processes.

Stories have great power, and chapter 3 asks, "What stories do we tell about the design of digital technologies?" It opens by contrasting the "official" Twitter origin story (one of the founders had a brilliant blue-sky flash of genius) with counternarratives from developers who were part of the process (anarchist activists created the demo design for Twitter as a tool to help affinity groups stay one move ahead of police during the NYC Republican National Convention protests of 2004).[82] The key point is that attribution and attention are important benefits of design processes, and they should be more equitably distributed. Innovation in media technologies, like all sociotechnical innovation, is an interplay between users and tool developers, not a top-down process. Social movements in particular have always been a hotbed of innovation in media tools and practices, in part because of the relationship between the media industries and social movement (mis)representation. Social movements, especially those led by marginalized communities, are systematically ignored, misrepresented, and attacked in the mass media, so movements often form strong community media practices, create active counterpublics, and develop media innovations out of necessity.[83] Social movement media innovations are later adopted by the broader cultural industries. Examples include TXTMob and Twitter, DIY livestreams from DeepDish TV to Occupy, and message encryption from Signal to WhatsApp. These stories have to be more widely told so that movements' contributions to the history of technology aren't erased. The last section of the chapter explores the importance of design scoping and framing, and critically analyzes how design challenges act as antipolitics machines. How do institutions frame and scope "problems" for designers to "solve" in ways that systematically render structural inequality, history, and community resistance invisible? Ultimately, the chapter maintains, we need a shift from deficit to asset-based approaches to design scoping; we also need community leadership in design processes during scoping and "challenge" definition phases of a design cycle, not only during the "gathering ideas" or "testing our solutions" phases.

Chapter 4 considers the question, "Where do we do design work?" Of course, design takes place everywhere, including in subaltern design sites and in marginalized communities. However, particular sites are valorized as ideal-type locations for design practices. The first part of this chapter explores the growing literature about design sites like hacklabs, makerspaces, fablabs, and hackathons—places where people gather to share skills, learn, design, prototype, make, and build using new technologies.

Some scholars argue that originally hacklabs were explicitly politicized spaces at the intersection of social movement networks and geek communities.[84] Over time, startup culture and neoliberal discourses of individual mastery and entrepreneurial citizenship largely coopted hacklabs,[85] even as city administrators leveraged technofetishism to create municipal "innovation labs." This section also provides a critical analysis of the fablab network.

Next, the chapter interrogates the ideals, discourse, and practices of hackathons: What do people think hackathons do, and what really happens at hackathons? In what ways do they challenge and/or reproduce the matrix of domination? How might we imagine them as more intentionally liberatory and inclusive sites structured by design justice principles and practices? There has been a recent move toward intentional diversification of hacklabs, makerspaces, and hackathons, specifically along lines of gender, race, and sexual orientation. Examples include DiscoTechs (pioneered by the Detroit Digital Justice Coalition), CryptoParties, Trans*H4CK, #A11yCAN Hackathons, and the Make the Breast Pump Not Suck Hackathon and Policy Summit, among many others. In addition to the diversification of hacklab participants, the chapter concludes that design justice requires a broader cultural shift, back toward intentional linkage of these sites to social movement networks.

Chapter 5 is an extended reflection on critical pedagogies of design justice. It asks, "How do we teach and learn design justice?" It begins with a summary of the ideas behind critical pedagogy and popular education, based on work by Paulo Freire, bell hooks, and others. The chapter places these ideas in dialogue with constructionist design education theorists such as Seymour Papert and Mitchel Resnick, as well as the community technology pedagogy of Diana Nucera and the Detroit Community Technology Project, Maya Wagoner's Critical Community Technology Pedagogy, and Catherine D'Ignazio and Laura Klein's feminist pedagogy of data science, among others. In the second half of the chapter, I draw from my own experience teaching the Civic Media: Codesign Studio course at the Massachusetts Institute of Technology over the last six years. I synthesize lessons from the Codesign Studio case studies and consider them within the framework of the ten Design Justice Network Principles. The chapter ends with a reflection on the famous debates between W. E. B. DuBois and Booker T. Washington about the nature of education, and asks us to consider: What would it mean for institutional structures to support a community-based pedagogy of technology design? What are the challenges in an age of the neoliberalization of the educational system?[86] Is the aim of computing education to make all people good coders, or to make all coders good people?

The book ends with more questions than conclusions. "Directions for Future Work" describes the growing #TechWontBuildIt movement and asks, "What are some important directions for future design justice work?" It considers tensions between design justice processes and their outcomes, the role of Black feminist thought in design theory writ large, the paradox of pragmatic design, and the need for more specific design justice work in design domains like architecture, urban planning,

industrial design, fashion design, and more. Next, it examines possible future areas for expanding the design justice framework, such as in project evaluation and impact assessment; guidelines, standards, codes, and laws; and the dynamics of unintended consequences. The chapter concludes with reflections on design justice and platform cooperativism, the need for more systematic resourcing for design justice sites, and possible institutional mechanisms to support design justice pedagogies. Finally, it points readers toward additional areas for research, and offers an invitation to join the growing community of design justice practitioners.

Limitations

Before we dive in, a brief note on the limitations of my approach: first, I believe that design justice is a framework that is applicable to all forms of design. However, my own practice and knowledge are limited to certain subfields, and I have drawn examples primarily from these. I encourage other scholars and practitioners to extend the design justice framework to other areas. In particular, I hope that others will explore the implications of design justice for industrial design, fashion design, and architecture, among other areas. I do not know these fields in depth and am not able to do them justice.

Another caveat: this is not a how-to manual. The Allied Media Projects Network Principles include the following: "Wherever there is a problem, there are already people acting on the problem in some fashion. Understanding those actions is the starting point for developing effective strategies to resolve the problem, so we focus on the solutions, not the problems. We emphasize our own power and legitimacy. We presume our power, not our powerlessness. We spend more time building than attacking."[87] Throughout this book, I have accordingly attempted to find a balance between critique of the ways design processes reproduce the matrix of domination and discussion of already existing design justice work. However, this is not a manual for practitioners. The Design Justice Network is producing excellent practical guides—for example, in its zine series, in the annual design justice track at the Allied Media Conference, via the network's website, and in other ways. I hope that at some point soon the network will produce a design justice methods kit; for now, I urge readers who are more interested in immediately putting design justice into practice in their own work to explore http://designjusticenetwork.org.

Overall, design justice, both as a conceptual framework and as a community of practice, provides a normative and pragmatic proposal for a liberatory approach to design. *Normative* because design justice practitioners feel that we have an ethical imperative to systematically advance democratic participation in, and community control of, all stages of design. We therefore work to center historically marginalized communities in design processes. *Pragmatic* because, at the same time, we believe that design that follows these principles can produce images, objects, products, and systems that work better for all of us.

There is already a growing design justice community: people and organizations who work to realize design justice principles in our daily practices. In the spirit of accountability to community-led processes, the Design Justice Network Principles appeared near the beginning of this introduction. The Design Justice Network describes these principles as a "living document" and plans to continue to develop them with practitioners. I urge you, gentle reader, to reflect on them, incorporate them into your own work, and continue to develop them. Let's build the theory, practice, and pedagogy of design justice together!

Footnotes

1. See alliedmedia.org. ↩
2. For a recent discussion of the increasingly widespread use of the term trans* with an asterisk, see Halberstam 2018. ↩
3. Sadat 2005. ↩
4. Schneier 2006. ↩
5. Despite my participation in social movement networks, including the global jus- tice movement, Indymedia, the immigrant rights movement, countersurveillance work, and more, my white skin, institutional affiliations, educational background, and US citizenship have largely protected me from the most egregious types of abuse by state power. ↩
6. Costello 2016. ↩
7. Irani 2016; Dyer-Witheford 2016; and Gray and Suri 2019. ↩
8. See https://www.tsa.gov/transgender-passengers. ↩
9. Winner 1980. ↩
10. As Anna Lauren Hoffmann notes about the simplified gender binary inter- face, "The thing that really gets me is that this screen was developed as a privacy- preserving compromise after folks realized the level of detail these machines were *actually* capable of rendering!" Twitter, September 3, 2018, https://twitter.com/ annaeveryday/status/1036635912761819136.

↩

11. In 2009, Toby Beauchamp wrote about state surveillance and trans* conceal- ment/visibility (Beauchamp 2009). In September of 2016, Shadi Petosky brought national attention to the challenges of #TravelingWhileTrans when she live-tweeted her experience with an invasive search by TSA agents at the Orlando airport, after she was flagged in a millimeter wave scan for presenting as female while having a penis. See Lee 2016. ↩

12. See https://www.propublica.org/article/tsa-not-discriminating-against-black-women -but-their-body-scanners-might-be. ↩

13. Browne 2015. ↩

14. Buolamwini 2017. ↩

15. Throughout this book I use the identity-first term "Disabled people" rather than the people-first term "people with disabilities" because design justice is more closely aligned with a social/relational disability justice analysis than with the individual/ medical model of disability. For more, explore Piepzna-Samarasinha 2018. ↩

16. Ito 2017. ↩

17. The seeds for this gathering were planted in 2015 at the Future Design Lab at AMC, itself inspired by the Discovering Technology events, or DiscoTechs, orga- nized by the Detroit Digital Justice Coalition. See https://www.alliedmedia.org/ddjc/ discotech. ↩

18. The authors of the first version of the Design Justice Network Principles are Una Lee, Jenny Lee, Melissa Moore, Wesley Taylor, Shauen Pearce, Ginger Brooks Takahashi, Ebony Dumas, Heather Posten, Kristyn Sonnenberg, Sam Holleran, Ryan Hayes, Dan Herrle, Dawn Walker, Tina Hanaé Miller, Nikki Roach, Aylwin Lo, Noelle Barber, Kiwi Illafonte, Devon De Lená, Ash Arder, Brooke Toczylowski, Kristina Miller, Nancy Meza, Becca Budde, Marina Csomor, Paige Reitz, Leslie Stem, Walter Wilson, Gina Reichert, and Danny Spitzberg. The designjusticenetwork.org website includes blog posts that further describe the origins of the network; for example, to learn more about the first workshop at AMC, see http://designjustice network.org/blog/2016/generating-shared-principles. ↩

19. The Design Justice Network Principles and list of signatories are available at http://designjusticenetwork.org/network-principles. ↩

20. The Design Justice Network has been built through the hard work of many, many people over the past several years. It would be difficult to list every individual, group, and community here.

Many additional track coordinators are named in the acknowledgments at the beginning of this book, and can be found in the Allied Media Conference program books and on the Design Justice Network website. ↩

21. See https://www.alliedmedia.org/amc/previous-years.

↩

22. See https://www.andalsotoo.net. ↩

23. And Also Too is known for projects such as graphic design with the Feathers of Hope First Nations Youth Action Plan; an infant feeding resource with HIV positive mothers with CATIE, the Teresa Group, and Women's College Hospital; and Contrat- ados.org, a resource for migrant workers, with Research Action Design, Studio REV-, and the Centro de los Derechos del Migrante; among many other projects. ↩

24. I was a co-founder of RAD. ↩

25. See EquityXDesign 2016. ↩

26. See https://idrc.ocadu.ca/about-the-idrc. ↩

27. For more information explore https://www.civicdesigner.com, see also McDow- ell and Chinchilla 2016. ↩

28. Chardronnet 2015. ↩

29. For a list of people and organizations who have signed the Design Justice Prin- ciples, see http://designjusticenetwork.org. For expanded lists of organizations, networks, and projects working in this space, see https://morethancode.cc and also https://www.ruhabenjamin.com/resources. ↩

30. See Harding 2004 for an edited volume that brings together key scholars of standpoint theory including Dorothy Smith, Donna Haraway, Patricia Hill Collins, Nancy Hartsock and Hilary Rose. ↩

31. Jobin-Leeds and AgitArte 2016; see also https://agitarte.org. ↩

32. Downing 2003; Halleck 2003; and Kidd 2013. ↩

33. See https://archive.org/search.php?query=indymedia. ↩

34. See https://www.alliedmedia.org. ↩
35. VozMob Project 2011. ↩
36. Lewin 1946; Dewey 1933; Freire 1972; Fals-Borda 1987; and Smith 2013. ↩
37. Costanza-Chock et al. 2018; see also https://morethancode.cc. ↩
38. For the *Oxford English Dictionary* definition, see https://www.lexico.com/en/ definition/design. See also the *Merriam-Webster Dictionary*: "Design (transitive verb): to create, fashion, execute, or construct according to plan," https://www.merriam-webster.com/dictionary/design. ↩
39. Hoffman, Roesler, and Moon 2004. ↩
40.

Furniture designer Charles Eames said that design is "a plan for arranging ele- ments in such a way as to best accomplish a particular purpose." Quoted in Neuhart et al. 1989.

↩

41. In the original, Papanek says, "All men are designers." ↩
42. Papanek 1974, 17. ↩
43. In his 2010 book, *Design as Politics,* Fry also specifies at least three separate meanings of *design* that are often conflated: first, the design object; second, the design process; and third, the design agent, which may be an individual designer, a design firm, or an array of people and sociotechnical processes (what Latour might call an *actor-network*) that engages in design activities. See Fry 2010. ↩
44. Willis 2006, 80. ↩
45. Dalla Costa and James 1972. ↩
46. Shetterly 2017. ↩
47. Von Hippel 2005. ↩
48. See https://www.aiga.org. ↩
49. See https://www.access-board.gov. ↩
50. Hoffman, Roesler, and Moon 2004, 89. ↩

51. Hoffman, Roesler, and Moon 2004, 89. ↩
52. Aliseda 2006. ↩
53. Schön 1987. ↩
54. DiSalvo and Lukens 2009. ↩
55. Escobar 2018, 21. ↩
56. Srinivasan 2017. ↩
57. Hernández-Ramírez 2018. ↩
58. Irani 2018. ↩
59. See Natasha Jen's talk at https://99u.adobe.com/videos/55967/natasha-jen-design-thinking-is-bullshit. ↩
60. Benjamin 2019a. ↩
61. Truth 1995 (originally published in 1851); Jones, cited in Davies 2007; Combahee River Collective 1983 (originally published in 1977). ↩
62. Crenshaw 1989. ↩
63. Crenshaw 1989, 144. ↩
64. Crenshaw 1989, 149. ↩
65. Crenshaw 1991. ↩
66. In that article, Crenshaw also goes on to describe structural, political, and repre- sentational intersectionality. ↩
67. Crenshaw 1989, 140. ↩
68. Buolamwini and Gebru 2018. ↩
69. Collins 2002. ↩
70. Collins 2002, 229. ↩

71. Collins 2002, 223. ↩
72. Angwin and Grassegger, 2017. ↩
73. Gillespie 2018. ↩
74. Harwell and Miroff 2018. ↩
75. Segarra and Johnson 2017. ↩
76. Collins 2002, 234. ↩
77. Gibson 1979. ↩
78. Friedman 1997. ↩
79. Wajcman 2010. ↩
80. Charlton 1998. ↩
81. Von Hippel 2005; Schuler and Namioka 1993; and Bardzell 2010. ↩
82. Siles 2013. ↩
83. Downing 2000. ↩
84. Maxigas 2012. ↩
85. Irani 2015. ↩
86. See https://codesign.mit.edu. ↩
87. Allied Media Projects n.d. ↩