Design Justice

Community-Led Practices to Build the Worlds We Need

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4 Design Sites: Hackerspaces, Fablabs, Hackathons, and DiscoTechs

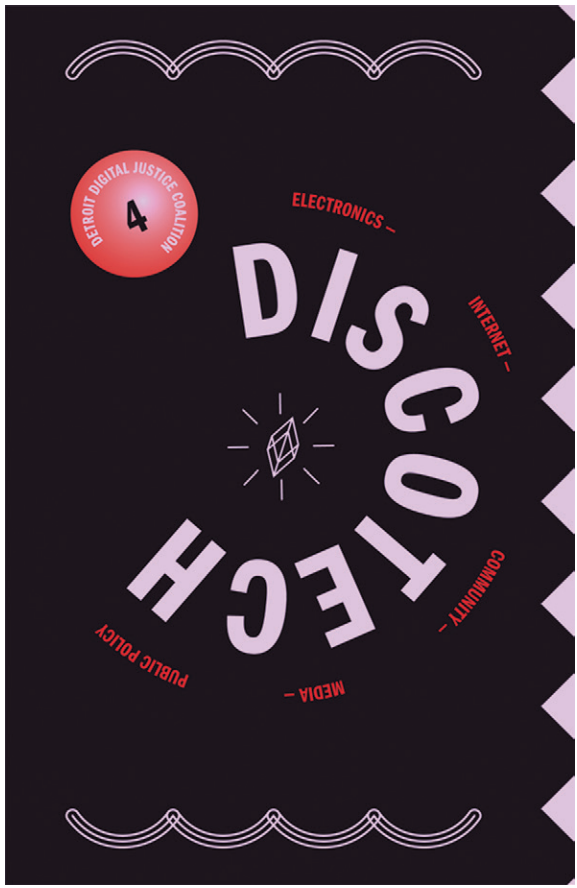

Figure 4.1
Cover of *DiscoTech* zine, by the Detroit Digital Justice Coalition.

> Be excellent to each other, dudes.
>
> —Noisebridge's One Rule[1]

> In many ways 'hackerspace' is an elitist name for middle-class white guys screwing around with computers and making a big deal out of it. Come on. Every other block in this town has an auto body shop where more hacking takes place than y'all can imagine, and people have their own networks of friends and family and colleagues who learn stuff and create things. Nobody's writing about that in Wired. That has to set off your bullshit detector a little.
>
> —Liz Henry, "The Rise of Feminist Hackerspaces and How to Make Your Own"

The acrid smell of hot solder emanates from a table in the corner, where an intergenerational group of people is learning how to build a pirate FM radio station. Across the room, at the beat-making collaboration station, three teenagers with headphones on nod in time to the *boom boom bap* of hip hop beats they are creating. In another corner, several children goof around in front of a giant green screen, where they shoot still images that they will later stitch together into an animation. These activities, and many more, are part of a DiscoTech, or Discovering Technology community fair, within the Media a Go Go Lab at the 2012 Allied Media Conference (AMC).[2] The description of that space in the AMC program reads: "Lab participants will learn DIY media making skills, collaborative design, innovative communications tactics, and build technology (transmitters, device controllers, etc.) throughout the weekend. We will create opportunities to analyze, remix, and transform our current and future media and technologies! This dynamic space is where we put the Walk to the Talk at the AMC."[3] Over the course of three days, hundreds of people will participate. Some come for focused workshops led by talented facilitators, others to "hang out, mess around, and geek out."[4]

DiscoTechs were first created a decade ago by community technologist Diana Nucera and the Detroit Digital Justice Coalition (DDJC). According to the DDJC, a *DiscoTech* is "a replicable model for a multimedia, mobile neighborhood workshop fair."[5] The first DiscoTech took place on Saturday, December 12, 2009, at the 5E Gallery in Detroit; it featured hands-on workshops about the Internet, electronics, public policy, and the growing community of organizations that had then recently linked to form the DDJC. There were consultation stations,

electronics workshops, and film screenings. Attendees included seniors, youth, environmental justice activists, hip hop artists and producers, people on welfare, community organizers, artists, technologists, and others. Hands-on activities ranged from how to set up an internet account to how to build a computer using recycled parts. DiscoTech attendees also participated in interviews and surveys that were used to develop ideas for DDJC programs, many of which were later implemented using the federal Broadband Technology Opportunity Program (BTOP) funds that the DDJC successfully bid for in partnership with the University of Michigan.

The DiscoTech model spread widely after it was shared at the DiscoTechs Unite session at the 2012 AMC. There, the DDJC joined Broadband Bridge (a Washington, DC-based initiative that had also begun organizing DiscoTechs during the previous two years) and members of the AMP network to create the first AMC DiscoTech.[6] On Sunday, July 1, they invited conferencegoers to "come and jump around from station to station, discovering technology with your peers. It will be fun!"[7] This DiscoTech featured dedicated *collaboration stations* where participants could learn and practice design and technology skills focused on electricity, audio recording and beat making, soldering, mesh networking, and cryptography. The *DiscoTech* zine (figure 4.1) was also published in 2012 and distributed widely at the AMC and beyond.[8]

By 2013, Diana Nucera and Janel Yamashiro from AMP, Nina Bianchi from the Work Department (theworkdept.com), Andy Gunn from the Open Technology Institute, and I worked to expand the AMC DiscoTech into an ongoing three-day-long dedicated space. That year, the Discovering Technology Lab focused on DIY and do-it-together (DIT) technologies, collaborative design, making, hacking, hardware, software, and sustainable technologies. All attendees received a *DiscoTech* zine and were invited to "get down with Phunky Phone Phreaks, Fierce Fashionistas, Data Viz Wiz Kids, Documentation Doctors, Tech Help Desk Divas and our Wonderful Webmaking Friends!"[9]

Inspired by the AMC DiscoTechs, I connected with others to help organize similar events in the Boston area and elsewhere. In 2014, students and staff at the MIT Codesign Studio partnered with local organizations around the world to coordinate a series of "countersurveillance DiscoTechs" in Cambridge (Massachusetts), San Francisco, Ramallah,

Mexico City, Bangalore, and New York City.[10] I wasn't the only one excited by the model: also in 2014, the Bento Miso Collaborative Workshop hosted a design-focused DiscoTech in Toronto, featuring poster design, screen printing, bookbinding, comics, and stop-motion animation;[11] this event was a fundraiser for the Future Design Lab at the 2014 AMC. The 2014 Internet Governance Forum in Istanbul featured a DiscoTech organized by the Association for Progressive Communications, Tactical Tech, and the World Wide Web Foundation.[12] In 2016, the MIT Codesign Studio team, Research Action Design, Intelligent Mischief, and the DCTP supported local organizers in multiple cities to run Cooperative Economy Discovering Technology fairs (co-op DiscoTechs). These focused on the use of technology to strengthen worker-owned cooperatives, consumer cooperatives, housing cooperatives, and other aspects of the cooperative economy. The response was tremendous, with events in Boston, Salem, New York City, Boulder, Philadelphia, Oakland, and London.[13]

DiscoTechs continue to spread. They provide one excellent model for how to organize inclusive, community-centric events focused on participatory design, digital media, and technology. There are many other kinds of design events, gatherings, and spaces, such as hacklabs, makerspaces, fablabs, and hackathons. This chapter explores the question, "How do we apply design justice principles to create inclusive design sites?"

Design takes place everywhere, but particular sites are valorized as ideal-type locations for design practices. There is a growing literature about hacklabs, hackerspaces, makerspaces, and fablabs (various types of spaces where people gather to learn how to hack, make, and build), as well as about temporary design- and technology-focused events, such as hackathons. Unfortunately for design justice practitioners, this literature reveals a long-term shift away from hacklabs and hackerspaces as explicitly politicized spaces at the intersection of social movement networks and geek communities.[14] Instead, start-up culture and a neoliberal discourse of individual technical mastery and entrepreneurial citizenship have largely come to dominate hackerspaces,[15] even as city administrators have leveraged the popularity of technological solutionism to create municipal "innovation labs."

At the same time, we should not allow neoliberal discourse about these sites to erase their past, present, and future radical possibilities. There is a deep history, or alternative genealogy, of hacklabs and media/tech convergence centers as spaces tied to social movements. There has also been a recent move toward the intentional diversification of hacker and makerspaces, specifically along lines of gender and, to a lesser degree, race. Examples of this trend include Liberating Ourselves Locally, Double Union, and a wave of new, explicitly intersectional feminist spaces dedicated to hacking, making, crafting, and design. In this chapter, I argue that in addition to the diversification of hacklab participants, design justice requires a broader cultural shift in how such sites are organized. In particular, design justice implies an intentional relinkage of design sites to social movement networks.

Just as dedicated design sites need to be transformed, we must also interrogate the ideals, discourse, and practices of design events like hackathons. There is growing interest in reimagining design events to be more intentionally liberatory and inclusive, as in DiscoTechs, Occupy Data hackathons, MigraHack, Trans*H4CK, and the Make the Breast Pump Not Suck Hackathon and Policy Summit. This chapter critically engages the literature about, and real-world practices within, hackerspaces; traces the cooptation of hacker culture by neoliberalism; attempts to imagine more intentionally liberatory and inclusive sites where design justice principles and practices can be implemented; and describes the ongoing spread of intersectional feminist design sites. It concludes with specific recommendations for how to develop design sites that are informed by design justice principles.

Hack, Make, Hustle: Subaltern Design Sites, Marginalized Design Practices

Privileged design sites like hackerspaces, makerspaces, and hackathons are not the only game in town; indeed, most design takes place elsewhere. Oppressed and marginalized peoples already have their own design sites, practices, and communities, although these are often ignored, pushed to the side, made invisible, or made to seem "less important." What I call *subaltern design sites* have always existed.

As the authors assembled by science and technology scholars Alondra Nelson, Thuy Linh Nguyen Tu, and Alicia Headlam Hines, in their edited volume *Technicolor: Race, Technology, and Everyday Life* (2001) reminds us, subaltern design sites may be focused on normatively "high-tech" tools and practices such as computers and software development, but also may focus on "everday" technologies—for example, in auto workshops, cell phone repair shops, or in audio stores and sound system culture.[16] Car culture requires highly technical skills and design capacities; think about the work that goes into designing and maintaining lowriders.[17] Or consider the extensive scholarship on the history of Jamaican sound systems, the influence of the Caribbean diaspora on sociotechnical knowledge and practices that gave birth to hip hop in New York City (for example, the influence of Jamaican-born DJ and audio innovator Kool Herc),[18] and the appropriation of vinyl records and turntable technology to create a new, world-changing musical genre and cultural movement.[19] King Tubby, Lee "Scratch" Perry, and other Jamaican studio innovators created music recording techniques that now permeate all of global popular music, such as the *drop* (an approach to musical composition and the creation and resolution of rhythmic tension through the subtraction and addition of prerecorded tracks). They were also brilliant hardware hackers; for example, they created tape-delay effects by physically stretching a loop of magnetic tape around the studio, cut to the length that would produce triplets timed against the track's main rhythm, among many other techniques.[20]

At the same time, design justice also recognizes the importance of sites where people focus on design practices that have been raced, gendered feminine, and/or otherwise coded as less valuable or not recognizable as "technology." In some cases, women, femmes, and other oppressed people's design practices operate within microsites such as the home. Under conditions where only certain kinds of technologies, sociotechnical knowledge, design practices, and skills are recognized and promoted by larger institutional, cultural, political, and economic regimes, many design practices never receive resources or recognition. Another way to look at it is that design justice recognizes that many important sociotechnical practices are designed, developed, and shared through constant, small-scale interactions within the space of the home, the family, kinship networks, and within communities.

For example, consider the development and exchange of agricultural knowledge and technologies that takes place in sites such as village farms or community gardens.[21] Or to take another example, communication scholar Aisha Durham created the term *hip hop feminism* to describe both the social history of and the specific forms of sociotechnical innovation by Black women that produced a sea change in feminist organizing practices, such as the outreach and media strategies they used to organize the successful Million Woman March in Philadelphia on October 25, 1997.[22] There is a large and rapidly growing body of scholarly work that centers and recovers stories of sociotechnical innovation from the margins. Still, design practices, spaces, networks, and histories that are about women and femmes, QTPOC, and/or Disabled people remain marginalized, invisibilized, and under-resourced.

Invisibilized design practices also take place on the margins within larger institutions. Marginalized people working within institutions that they do not control often create in-group support networks that include sharing a wide range of knowledge and practices, including design skills. For example, Jose Gomez-Marquez, the codirector of MIT's Little Devices Lab, found that between 1900 and 1947, nurses (who were mostly women) not only constantly designed and modified medical technologies to improve patient care, but also shared and published their medical device innovations in a magazine called *American Journal of Nursing* (*AJN*).[23] Gomez-Marquez, inspired by this history of subaltern design practice, has been working with nurses and hospitals to open *MakerNurse* sites meant to support, facilitate, and valorize present day nurses' medical technology design knowledge, practices, and objects.[24]

Design, maker, and hacker cultures that originate in working-class communities, center women and femmes, and/or are based in communities of color don't receive the resources, visibility, validation, and respect that those centered on white, cisgender, heterosexual men do. These communities have deep but less-recognized histories of hacking, making, design, and innovation. This includes what mainstream economists refer to as *business process innovation*, as well as what the design community refers to as both *product* and *service design*. Service design innovations in working-class communities aren't necessarily referred to as *service design innovations*. Instead, people might use their own terms—for example, a side gig or a hustle, as described by media scholar

S. Craig Watkins in his new book about how these types of activities form an increasingly important part of the innovation economy.[25]

At the same time, invisibility may be strategic: subaltern communities sometimes shield their practices and innovations from mainstream visibility to avoid incorporation and appropriation. In addition, innovations in many fields often operate in legal grey zones, and systematically unequal policing may expose subaltern innovators to harm from the various arms of the prison industrial complex. This is most starkly visible in the United States today in the legalization of marijuana. After decades of a so-called drug war that saw hundreds of thousands of people, disproportionately Black and Latinx, incarcerated for marijuana use, possession, and sales, suddenly (primarily) white-owned companies are swooping in to capture the lion's share of the newly legalized marijuana market. Most of these companies participate in the discourse of technological innovation as they jostle to offer the "market-leading" app for on-demand marijuana delivery and to secure millions of dollars in venture capital funding.[26]

In addition, design justice practitioners recognize that neither subaltern design sites nor privileged design sites are utopias. Many, or most, of the power dynamics that we would like to critique and transform in the latter also often operate within the former. For example, an auto workshop may be a site for the development, expression, and sharing of sociotechnological knowledge and skills between working-class men while simultaneously reproducing heteropatriarchal norms of gendered technical knowledge and skills that exclude women and femmes. Or it may be a site where those norms are challenged or transformed. Similarly, a fashion design studio may be a site where highly technical knowledge about apparel design and production is developed and shared and may (or may not) be an inclusive space along lines of race, gender identity, and/or sexual orientation. The same site may also be a key node in capitalist relations of production and consumption, as clothing designers labor to create innovative patterns that are then produced in sweatshops by migrant workers who typically face long hours, low wages, abusive bosses, health hazards, and humiliating work conditions.[27] Nor does design justice ignore the ways that community, local, diasporic, and/or Indigenous design sites may sometimes be locations for sustained resistance to cultural erasure through the ongoing

production of sociotechnical knowledge and designed objects, even as they may simultaneously reproduce heteropatriarchal values and norms that were often imposed through settler colonialism.

Design justice emphasizes the value of local, community, diasporic, and Indigenous knowledge, practices, design processes, and technologies. These have often been appropriated, undermined, attacked, and marginalized for centuries under colonialism and capitalism, but they have not been erased. Indeed, the history of capitalism is in large part a history of the extraction of design practices that once took place in family and community microsites and their subsequent systematization, rationalization, and modification to fit the requirements of mass production. For example, consider the transformation of agriculture from Indigenous knowledge of small-scale planting, harvesting, and land-management techniques to modern agribusiness with monocultures, pesticides, fertilizers, and roboticized megafarms;[28] the transformation of healing from women's work to modern medical science (accomplished only with great violence to women healers, as autonomist Marxist feminist scholar Silvia Federici documents in her brilliant and disturbing text *Caliban and the Witch*);[29] or the archetypal birth of the capitalist mode of production in the transformation of clothing from a home-based practice of design, production, and constant repair to a globalized megaindustry of sweatshop labor, fast fashion, and disposability.[30]

What, then, does a design justice approach have to tell us about privileged design sites?

Design Spaces: Hacklabs, Makerspaces, and Fablabs

Design justice is a community of practice that locates itself within longer social movement histories. For example, the book G*rassroots Innovation Movements*[31] (mentioned in chapter 3) describes six case studies: the UK movement for socially useful production, the South American appropriate technology movement, the Indian People's Science Movement (PSM), hackerspaces, fablabs, and makerspaces around the world, the Brazilian Social Technology Network, and the Indian Honey Bee Network. The authors contextualize hackerspaces, fablabs, and makerspaces within "a tradition of thought in modern environmentalism and development

concerning accessible tools for local, sustainable developments … that includes the social ecology of Murray Bookchin, Stewart Brand and the Whole Earth project, E. F. Schumacher's *appropriate technology*, Ivan Illich's *convivial tools*, alternative technologists such as Peter Harper and Godfrey Boyle, and ideas by Mike Cooley and others concerning socially useful production."[32] However, much of this history is erased by popular narratives of design and sociotechnical innovation.

Many are working to challenge that erasure. Media scholar Maxigas has carefully traced the evolution of hacklabs from key nodes in a global autonomist network in the 1990s to their more common present-day configuration as hacker playpens integrated into the neoliberal city.[33] This transformation was also described by designers Johannes Grenzfurthner and Frank Apunkt Schneider in their *Hacking the Spaces* zine for the Critical Making publication series.[34] They describe the origin of hacklabs as spaces for the micropolitical practice of alternate life pathways that emerged in parallel to the ascendant regime of capitalist globalization in the wake of the collapse of the vague utopics of late 1960s counterculture. In place of drugged-out, sloganized imaginaries of global revolution, they argue, some participants in the counterculture shifted their energies to the creation of concrete alternative communities. This involved various projects focused on building the new world in the shell of the old, rather than attempting to institute systems transformation from above by seizing state power. Grenzfurthner and Schneider's reading of this history leaves race and gender unmarked, despite the fact that many autonomist practices were directly inspired by ongoing dialogue with Black Marxists like C. L. R. James, by the Black Panther Party's free breakfast and education programs, and by Black women in the wages for housework movement.[35] As they put it: "The autonomia movement of the late 1970s that came to life in Italy and later influenced people in German-speaking countries and the Netherlands was about appropriation of spaces, be it for autonomous youth centres or appropriation of the airwaves for pirate radio. Thus, the first hackerspaces fit best into a countercultural topography consisting of squat houses, alternative cafes, farming cooperatives, collectively run businesses, communes, non-authoritarian childcare centres, and so on."[36] The authors argue that participants in this first wave of hackerspaces were explicitly antiauthoritarian and opposed both capitalism

and authoritarian communism. They also rejected bourgeois norms, culture, values, and lifestyles. Often physically located within squats, these hackerspaces served as models for an alternative spatial organization of life because they were mixed environments for work, play, and sleep. However, as they note, "alternative spaces and forms of living provided interesting ideas that could be milked and marketed. So certain structural features of these 'indie' movement outputs were suddenly highly acclaimed, applied and copy-pasted into capitalist developing laboratories."[37]

Communication scholar Fred Turner describes a closely related dynamic in the United States, where he traces the cultural origins of Silicon Valley–style libertarian techno-utopianism to failed California communes. Turner also discusses the influence of the Burning Man festival on the rise of Silicon Valley and the information economy. For Turner, capitalism is endlessly adaptable and uses the energy and fresh ideas of the counterculture to revitalize itself.[38] Grenzfurthner and Schneider argue that something similar took place with hackerspaces in the European context, which they describe as originally being "third spaces" outside of the logic of both the communist state and the capitalist market. Initially, people were drawn to these spaces as highly politicized countercultural communities where life, work, and play could be seamlessly blended. However, the authors argue that, ultimately, many ecological countercultural ideas and projects turned into trendy "green" or "sustainable" businesses, which provide a reservoir of positive affect for continued participation in the capitalist system.

A less totalizing narrative of this process might be that radical ideas and practices that were pioneered by people working within antiauthoritarian social movement networks were, in some cases, adopted by corporate actors and thereby scaled up and normalized. In other words, another reading is that anarchist ideas and, in some cases, individuals were able to infiltrate capitalist institutions, and through technical systems design, they spread certain kinds of decentralized power throughout society (e.g., in internet architecture).

In any case, the transformation of hackerspaces from radical nodes in autonomist movement networks to geeky havens geared toward sprouting new start-ups took place in the long context of the end of the Cold War, the collapse of Communist states, and the heady, mythological

moment of the global triumph of liberal democracy and neoliberal markets.[39] As city governments reconfigured themselves for the age of free market triumphalism, and as they "sanitized" urban cores to attract high-skill information industry jobs, reverse the process of white flight, build tourist economies, and gentrify, they also cracked down on and closed most of the squats. A few were converted into loft spaces for (mostly) white urban bohemians, "creative workers," and hipsters.

As recently narrated in compelling detail in the book *Kaos: Ten Years of Hacking and Media Activism* (2017), a page-turning, collectively authored history of the radical Italian tech collectives Autistici/Inventati, squats and social centers linked to the antiauthoritarian left were key sites for the European hacker activist scene in the 1990s and into the 2000s. Many, but not all, of these spaces were later evicted by police. They were dismantled or pushed out in the drive toward redevelopment of the city centers for tourism, revitalization, and the creation of sanitized innovation hubs or entrepreneurial zones.[40] Hacklabs were thus transformed from semi-permanent social anarchist enclaves into sites for the production of neoliberal entrepreneurial subjectivity.

Hacklabs in the Global South

Even as Maxigas, Grenzfurthner and Schneider, Toupin, and others provide thoughtful and critical histories of hackerspaces and hacklabs, and critique such spaces for their recent depoliticization and the ways they often unwittingly reproduce patriarchy and racism, they also largely ignore the rich history of hackerspaces outside of the European and US contexts. The Latin American hacker scene, for example, is largely invisible in their accounts. Digital media scholar Andres Lombana Bermúdez has written in depth about Latin American hacker- and makerspaces.[41] For example, there are Territorial Innovation Centers (*Laboratorios de Innovación Territorial*) in Colombia, as well as "make, tinker, and learn" creative camps in several locations in Central America. TecnoX is a growing network of open hardware hackers from across Latin America who are increasingly visible and engaged in conversations about how to connect open hardware hacking to social movements.[42] Brazil-based transfeminist hacker organization Coding Rights, led by lawyer and technologist Joana Varon, uses research, prototyping, design, and meme culture to challenge data colonialism, gender-based

violence, and structural information inequality across the Americas (codingrights.org).

In Cuba, media and culture scholar Paloma Duong describes DIY neighborhood networks organized by gamers, as well as the *paquetes*, or sneakernet content-delivery networks organized by entrepreneurs who physically distribute copies of films, music, and games via USB drives.[43] Anthropologist Sujatha Fernandes explores the ways that urban social movements in Venezuela pushed the state to support community control of ICTs through a change in telecommunications law to allow community radio and TV stations, as well as through the establishment of ministries of popular telecommunications and popular information with multimillion dollar budgets. She also notes the tensions between the state apparatus and the movement organizations along the way.[44]

The Instituto de Midia Etnica in Salvador, Brazil, founded by Paulo Rogerio, has an Afrocentric media, tech, and design center called *Ujamaa*. The site boasts a hacklab, a guest room for visitors, a kitchen, and a space for talks and events. Ujamaa regularly hosts design workshops, such as the *Ocupação Afro Futurista* ("Afrofuturist Occupation"), and works to raise awareness of the long history of Afro-Brazilian sociotechnical innovation.[45] Also in Brazil, under the Workers' Party government of Lula Inacio da Silva, Minister of Culture Gilberto Gil promoted and supported a network of *Puntos de Cultura*, or cultural hotspots. These community media centers, powered by free software, provided infrastructure for cultural production and circulation in low-income neighborhoods throughout the country. This experience was also replicated in Argentina.[46] Puntos de Cultura became sites where neighborhood youth developed digital skills such as music recording and editing, video production, graphic design, and web development.

Communication professor Anita Say Chan, in her book *Networking Peripheries*, provides a powerful overview of the ways that technological innovation often happens on the margins of society, far from the innovation hubs imagined and created by city planners, state officials, and private sector investors. She describes how digital cultures that emerge organically from the peripheries, including in the Global South, are different from those produced via the universalizing imaginary of technosolutionists who operate from positions of great power.[47]

It's beyond the scope of this chapter to trace the scale of too-often invisibilized regional and local design sites across the entire Global South. Other scholars and practitioners, such as those cited here (and many more, such as those in the Decolonising Design group at decolonisingdesign.com), are already doing this work. I hope that over time more inclusive histories of design sites will emerge. This will help us envision the possible liberatory futures of design justice sites in ways that are global in vision and aspiration, while also deeply rooted in local and regional specificities.

Hacklabs in the Neoliberal City and the Rise of Innovation Hubs

Over the last three decades, the private sector, the academy, and the state (in that order) all recognized the power of hacklabs and moved to incorporate them into their respective innovation strategies. Innovation labs are increasingly popular at private universities; for example, the Annenberg Innovation Lab at USC, the Harvard Innovation Lab, and so on. Cities everywhere, like universities, are also setting up innovation labs. Boston is home to the Mayor's Office of New Urban Mechanics; in Los Angeles, there is the Civic Innovation Lab (CIL). The CIL frames itself as follows: "Part design lab, part community caucus, part accelerator of urban solutions, Civic Innovation Lab at Hub LA is dedicated to the development of real solutions designed with and for communities throughout Los Angeles."[48] The CIL launched with a design event in September of 2014, for which people were encouraged to come up with possible design challenges. The next move was a call for solutions, followed by a selection of projects to be "incubated" on the path to becoming start-ups. We can read this is a move in the right direction: city government is becoming more transparent, more administrative data is being made available to the public, and administrators are actively seeking ideas from engaged publics about how to improve government services and city residents' quality of life. Through such initiatives, city administrators signal that the public is invited to participate in decisionmaking on an ongoing basis, not only at the ballot box every few years. Innovation labs, through this lens, move us toward the everyday practices of participatory democracy and have the potential to include many more people in the design of city systems. It is also encouraging that residents were included in the call to define the

design challenges because, as noted in chapter 3, power over framing and scoping design challenges is so important.

More cautiously, we might say that these developments are positive, but imperfect. First, the "stakeholders" involved in these processes are typically not representative of city residents. In most public participation design processes, unfortunately, research shows that elite participation (by class, race, gender, education, language, and so on) is the norm.[49] Accordingly, design challenges and solutions are typically limited in scope to elite concerns. In addition, implementation is key: city innovation labs may develop excellent ideas and prototypes, but without top-down buy-in from city officials, department heads, technocrats, and administrators, as well as bottom-up buy-in from community-based organizations, adoption often fails.

It's also possible to read municipal innovation labs more critically within the larger context of city officials, planners, and the real estate industry collaborating to rebrand cities and attract tech companies by establishing innovation centers, hubs, and/or zones. For example, Boston created an innovation zone;[50] Cambridge, Massachusetts, and MIT are developing a software, aerospace, and biotech development zone around Kendall Square;[51] New York City partnered with Cornell University to transform Roosevelt Island into an innovation zone;[52] Los Angeles provided incentives for tech firms to establish offices along the Los Angeles River in Downtown Los Angeles; and so on.

In a 2015 article, civic technology professor Eric Gordon and graduate student Stephen Walter trace a brief history of the rise of innovation offices in American cities.[53] They argue that the growth of urban data systems begins with New York City's CompStat crime database, designed for internal use by the NYPD, then spreads to other city offices (such as ParkStat and HealthStat) and is later adopted by other cities: Baltimore, Boston, Los Angeles, and more. They also discuss the creation and spread of the 311 system, designed to capture citizen feedback via voice calls. As they describe it, the Obama administration's open data directive pushed federal agencies to make data available, and also served as a catalyst for many cities to open data sets, as well as to create and maintain application programming interfaces (APIs) to allow both individuals and private companies to build new services on top of public data. Along the way, the authors note the steady growth of

high-level city administrative positions such as chief digital officer and chief innovation officer. These positions are often filled by individuals who come from the private sector. People with backgrounds in technology start-ups and internet companies bring the language, design approaches, and values of the for-profit sector into city government and promise to use their experience to make city government more user-friendly and efficient.

On the one hand, this process does produce an improvement in the usability of many city service interfaces. At the same time, citizens become conflated with users—and while users simply take actions within a framework, citizens participate in constructing that framework.[54] Neoliberal, technocentric ideas about the city as a machine or as a software system waiting to be optimized have become increasingly prominent. I agree with these authors, and with digital media theorist Wendy Chun, that citizens should not be reduced to users through the lens of neoliberal governmentality.[55] At the same time, I believe "users" can also be reconceived as active participants in the design and (re)production of technologies (as discussed in chapter 3).

In addition, when design sites emerge organically, they are not islands: they are hubs within thick networks of practitioners or gathering places for vibrant cultural scenes. This is why top-down innovation spaces that are planned and built by powerful institutional actors like city governments or private companies often feel forced. They don't emerge from an existing, dedicated community of practitioners; they usually don't reflect local specificity, culture, and assets. Rather, they draw on globalized, universalized, abstracted ideals about what constitutes innovation. Typically, by default they encode and reinscribe raced, classed, gendered, ableist assumptions about innovation, design, and creative industries. They reproduce what Arturo Escobar describes as the *one world ontology* instead of serving as sites for the production of pluriversal possibilities.[56]

This happens at multiple levels: spatial, aesthetic, discursive, and linguistic, as well as in terms of membership, staffing, governance, resource allocation, and so on. For example, consider the location of an innovation space in a particular kind of neighborhood in the city; the type of building it's located in; the aesthetics of the space itself. Consider the ways that the space is talked about, who it is meant to

serve, and the visual and written style of the propaganda about the space. Think about the way that such spaces are typically monolingual in the dominant language of the nation state, culturally geared toward the dominant racial/ethnic group, and discursively and pragmatically gendered. For example, how many innovation spaces include translation services? How many include childcare? Rooms for pumping breast milk?

Given both broader social structural inequality and the reproduction of those structures in the ways just described here (spatial, aesthetic, discursive, cultural, political economic, etc.), membership in these spaces also tends to skew heavily white, middle-class, cisgender, and male. Governance (decision-making about how the space operates, how to allocate the resources that it attracts, what the priorities are, etc.) is typically dominated by the same group of people.

Innovation offices also tend to reproduce neoliberal values of efficiency, predictability, and individualism. The individual user replaces both the citizen and the community, not to mention the community-based organization or the urban social movement. The limits of citizen action, as imagined by tech-sector transplants to city government, are constrained by "good" citizen behavior and largely center on the "happy customer" who has a pleasant interaction with new, streamlined city services (making appointments at the DMV, paying parking tickets, etc.). The good citizen in the neoliberal city is also imagined as a contributor to public reporting systems set up and maintained by city administrators, most likely via a contract with a private-sector, for-profit firm (such as Textizen). In this way, "city government is masking its authority under this promise of collaboration as it redoubles its hold on power by dispersing it to the governed."[57] Innovation offices create, maintain, and promote platforms that facilitate the offloading of tasks traditionally performed by government onto city residents.

Just as users provide free labor for the dominant platforms in the cultural economy, neoliberal citizens provide free labor for city managers on the dominant urban incident reporting platforms. Citizens are encouraged to report potholes, petty crime, and graffiti and are rewarded with promises of more rapid service delivery. Journalism professor Michael Schudson describes these practices as *monitorial citizenship*.[58] Monitorial citizenship can be read as a key part of the privatization of public

services, the conflation of the citizen with the user, and the spread of neoliberal governmentality into administrative discourse. This process also produces neoliberal subjectivity: the citizen reimagines their own role as an urban denizen who is doing their part to increase efficiency.

Gordon and Walter critique the ideology, discourse, limited forms of action, and other aspects of the growth of smart (and participatory) cities. They also note that these systems constrain and limit citizen participation even as they maximize the efficiency of existing city systems. However, they don't fully explore the differential impacts of these systems on different kinds of city residents. What happens when we bring race, class, gender, sexual orientation, disability, and/or immigration status into the analysis of these developments? So-called smart city systems have differential impacts on the lived experience and life chances of city residents based on their location within the matrix of domination.

Next, what are the larger structural effects of the spread of design thinking labs and processes across cities? The language of civic innovation is often neoliberal code for the continued shrinkage of the social welfare state. Public programs are converted into design challenges as the first move in the privatization process. Participatory design processes are too often used to generate community-created materials that provide cover for the underlying assumption that the private sector can do everything better, cheaper, and more efficiently. Sustainability is converted from a systems-level analysis that examines the long-term maintenance of a particular process, taking labor, ecology, and social goods and harms into account, into an organizational-level analysis that focuses primarily on the efficiency of a state organization or the potential profitability of a particular firm. The design process itself becomes an exercise in the state feeling good about itself. In the worst cases, participatory design processes are simply used to provide legitimacy for preexisting plans. More typically, a small group of mostly middle-class participants have a chance to suggest minor modifications to processes and plans the guiding principles of which, if not their most significant aspects and detailed clauses, have already been determined according to the interests of incumbent power holders and professional lobbyists.

Overall, deindustrialization and the emergence of empty or abandoned factory zones close to urban cores, coupled with the rise of new social movements, squats, and autonomous social centers, was an important condition for the first wave of hacklabs in the European context. It also seems to be a factor in the Latin American context—for example, in the case of Las Barracas Hacklab in Buenos Aires.[59] A tentative hypothesis might connect hacklabs as explicitly movement-linked, politicized spaces to the moment of local deindustrialization. In other words, hacklabs emerge as factory production shifts locations and abandons middle- or higher-income countries for cheaper labor and more lax environmental regulations in lower-income countries. Later, the urban cores and nearby postindustrial zones are reorganized by an influx of new kinds of capital for globally networked, information-intensive industries, such as software development and biotechnology. Poor and working-class people are pushed out of the urban core as rents soar.[60] Abandoned factories are reclaimed, demolished, and/or refurbished as hip corporate offices or ready-made "live/work" lofts. This largely displaces squatters, artists, political organizers and activists, and social centers. The political hacklabs are either physically displaced or shift gears to accommodate the discourse of neoliberal entrepreneurialism. New spaces are created that are native to this discourse. This narrative isn't generalizable everywhere and is admittedly painted in quite broad strokes. However, understanding these larger patterns might help produce intentional strategies to maintain more hacklabs as movement-linked, rather than corporate-linked, design sites.

Fablabs: Designing Whose Reality?

A fabrication laboratory, or *fablab*, is "a small-scale workshop offering (personal) digital fabrication."[61] Fablabs include tools for design, modeling, prototyping, fabrication, testing, monitoring, and documentation. The idea of fablabs emerged through a collaboration between the Grassroots Invention Group and the Center for Bits and Atoms at the MIT Media Lab.[62] The first fablab was set up in 2002 at Vigyan Ashram in Pune, India; since then, the fablab network has grown to about 1,300 sites (according to the network's website).[63]

Figure 4.2, showing a "typical fablab," is the main, full-page visual of the fablab network's landing page at fablabs.io. It shows eleven people;

Figure 4.2
"A typical fablab." Main image from fablabs.io.

all appear to be male or masculine-presenting, with nine young boys, one young adult, and one older man. All except for one or two appear to be white. Although gender presentation is not the same as gender identity, and a quick reading of this image cannot confirm the race, gender, or other identities of the participants, the image generally conveys the impression of a fablab as a space for white boys to learn about technology together, with intergenerational mentorship and guidance from older men.

MIT professor Neil Gershenfeld, co-creator of the fablab concept, recently coauthored a new book that he positions as a kind of guiding bible for the fablab network: *Designing Reality: How to Survive and Thrive in the Third Digital Revolution*.[64] Copies of the book are freely available to all fablabs—although somewhat ironically, given the basic proposals in the book for the restructuring of global production and consumption systems through local and digital fabrication, the book is not freely available as a downloadable file. The authors include a section about the threat of a "third digital divide" that could potentially extend, and even amplify, inequality based on the differential rollout of digital fabrication technology around the world. However, they conceive of inequality in the broadest terms, as a relationship between what they call *wealthier countries* (what others might describe as nation states that became wealthy through the historical processes of settler colonialism, native genocide, slavery, and/or extractive colonialism and the theft

of natural resources) and *poorer countries* (those that were dominated for hundreds of years through military force and occupation under European colonialism). They do mention gender but do not discuss the specific ways that digital inequality is structured by gender, race, class, disability, or migration. They do not consider the intersectional distribution of resources and opportunities, nor does their conception of the digital divide incorporate the concept of the matrix of domination. An intersectional analysis of the distribution of benefits of digital fabrication, as structured by the matrix of domination, would be far more precise than their abstracted, country-level digital divide framework.

In addition, a design justice approach to the question of "designing reality" would involve multiple levels of analysis: "Who will have access to digital fabrication tools?" is an important question, and it is the question that fablabs seek to address. Another might be "What values will guide the use of these tools?" On the one hand, there is clearly a huge opportunity to use digital fabrication to hard-code liberation across a broad range of material objects through the approaches that we discussed in chapter 1. Broader availability of digital design and fabrication increases the opportunity for community-controlled design processes, as we saw in chapter 2, and that include more diverse users and user stories, with more equitable and inclusive distribution of affordances (and disaffordances). However, this opportunity by no means implies that this path is natural, inevitable, or even likely.

Instead, absent an intentional and systematic effort to implement a pedagogy and practice of design justice, fablabs (like hacklabs, makerspaces, and other privileged design sites) too easily become sites for the reproduction of the matrix of domination, despite their promise to radically democratize the means of production of everyday objects. More specifically, fablabs may reproduce patriarchy, white supremacy, and settler colonialism, even as they challenge (if we want to be quite generous) or reconfigure (to be more realistic) capitalism. In many cases, these sites do partially challenge ableism through a common emphasis on assistive technology, such as 3-D printed prosthetics, but typically do so through the individual/medical model of disability, rather than the social/relational model, let alone a disability justice analysis.[65]

The Fab Charter[66] says that the spaces are "open," but it doesn't mention or specify even a desire for diversity and inclusion, doesn't propose

a code of conduct of the kind that intersectional feminist spaces frequently employ, and so on. The assumption that making sites "open" makes them inclusive, without specifically addressing race, class, gender, and/or disability dynamics, is common to many privileged design sites. For example, the hacklab design kit, published in 2007 by Hackers on a Plane and credited widely with kicking off the current wave of hacklabs, doesn't discuss race, class, gender, or disability.[67] By contrast, more recently several templates, guides, how-to manuals, and zines promote diverse, inclusive, and explicitly antiracist feminist sites such as events, conferences, and ongoing spaces. For example, consider the approach taken in the *DiscoTech* zine (described in the beginning of this chapter),[68] the Code of Conduct promoted by the ADA initiative to make more gender-inclusive conferences,[69] the AORTA collective facilitation guide for inclusive and antiracist events,[70] and similar documents.

The relationship of fablabs to design justice principles is thus complicated. Fablabs do promote the idea of technological democratization, and they do challenge the idea of technological expertise as an exclusive realm. However, they also participate in the discourse of neoliberal entrepreneurialism. Like hacklabs and makerspaces, fablabs are usually framed as sites where individual subjects can learn STEM skills, better position themselves for technology-related jobs, and create and invent new products and start-ups that can be smoothly (or "disruptively") integrated into global capitalism. For example, one of the most visible outcomes of the digital fabrication movement is MakerBot, a 3-D printing company that appropriated the designs, volunteer community, and momentum around the RepRap open-source printer, patented certain aspects of 3-D printers and 3-D printing software interfaces, then was purchased by multinational company Stratasys for $604 million.[71] The MakerBot 3-D printer can now be purchased at Walmart. As Smith et al. note, "The figure of the design-savvy and networked (social) entrepreneur looms large here."[72]

In some cases, open and collaborative design methods that are the cultural norm in such sites have made their way into business practices: "Rather than seeing openness as a threat, firms are becoming familiar with ways of engaging and appropriating the fruits of collective, alternative, or deviant prototyping and learning how to enclose designs,

control marketing and benefit from the diffusion of the resultant products and services."[73] In other words, similar to Tiziana Terranova's critique of free labor for social media platforms,[74] the democratization of production can be seen as a new mode of exploitation where "ideas, design, and research efforts are effectively outsourced to 'free labour' in workshops, but with capital retaining the power to appropriate, enclose and commercialize the most promising fruits of that common endeavor."[75]

Simultaneously, though, "workshops are seen as boosting resilient, cooperative local economic activity based in grassroots initiative, collaboration, control and development. The figure of the community activist has a presence here."[76] Many of the sites discussed in this chapter are also committed to free and open-source software and hardware. As Smith et al. put it, most hacklabs, makerspaces, and fablabs have policies and cultural norms via which "all code, designs, and instructions in the making and repairing of something are made freely available for people to access, adopt and modify, so long as the source is acknowledged and any modifications also become freely available."[77] Many who are active in these sites feel themselves to be participants in what legal scholar and political economist Yochai Benkler defines as *commons-based peer production*, or "decentralized, collaborative, and non-proprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands."[78] Others identify as tech innovators ushering in an age of personalized manufacturing, mass customization, and a new industrial revolution.[79] Still others feel that hackerspaces, fablabs and makerspaces are crucibles for the formation of technological citizenship.[80] Smith et al. consider them to be key infrastructure for grassroots innovation movements, "not as a new model for transforming production and consumption but, rather, as a real-life laboratory experimenting with grassroots fabrication possibilities in terms of objects, practices, and ideas."[81]

Barcelona's city government is working to support makerspaces, called *Ateneus de Fabricació Digital* (digital fabrication workshops), with a plan to open them in every neighborhood across the city by 2040. These are meant to be key nodes in a production system that will help

the city locally manufacture at least half of its needed goods. Similar initiatives have been announced by the municipality of São Paolo and by the Icelandic government. However, critics say the Ateneus plan is "the latest in a series of city makeovers, prioritizing international capital markets and speculative investments in the city over the real needs and aspirations of its residents."[82] Conflict over these city-led makerspaces reached a peak when the city displaced a food bank in one of its poorest districts to set up an Ateneu, leading to an occupation of the site by community activists who demanded the reopening of the food bank and a refocusing of the Ateneu to emphasize job training.

Overall, most hacklabs, makerspaces, and fablabs fail to disrupt the matrix of domination. Some of the key organizers of these sites feel that providing people with digital tools is enough. A few actively resist the idea that these spaces should be part of specific social movements or that they should have an explicitly political program. Instead, they emphasize individual autonomy and the "empowerment" that comes from individuals developing their own ability to hack and make things. Some imagine their spaces as incubators of a future where personal programming and digital fabrication will become ubiquitous at the household level and shared spaces will no longer be necessary—much as shared computers supposedly disappear in advanced economies once "everyone" has a personal computer (this is not really the case, as is evident in any library or school computer lab).

As Smith et al. put it, broader institutional forces are increasingly invested in transforming these sites according to their own agendas, through funding, partnerships, discourse, and more. "If workshops are to genuinely realize [their] transformative potential," they note, they must develop a broader analysis of the role they hope to play in the larger political economy, and become strategic about it, or risk being "pulled into the institutional logics … that could force design and fabrication activities back onto dominant development pathways."[83] Indeed, corporations, governments, and even military agencies are all extremely interested in these sites. For example, Chevron donated $10 million to the Fab Foundation to establish more fablabs, while the Defense Advanced Research Projects Agency (DARPA) partnered with *Make* magazine.[84] Others, like TechShop (the chain of ten makerspaces

that suddenly declared bankruptcy in 2017) have attempted to create a business model out of setting up spaces modeled on these sites, then charging membership fees.[85]

Democratizing access to design tools and skills is truly important. We should laud and support efforts to create spaces where more people can learn how to design, prototype, code, hack, make, and build. At the same time, without intentional intervention, these spaces find it very difficult to fulfill even their own liberal democratic rhetoric, because they end up dominated by white cis men and by middle-class people with free time and disposable income. What's more, if we imagine all such spaces magically transformed into gender-diverse, multiculturally inclusive sites overnight, this would be a huge improvement. However, it would not be enough to realize their truly transformative potential. That requires the communities around such sites to develop their own shared analysis of unjust power (the matrix of domination), how to dismantle it, and the specific role of design, hacking, making, and fabrication in that much larger process. It means development of shared identities beyond the neoliberal entrepreneur. Most of all, it requires the intentional nurturing of deep links between these sites and already existing social movement networks.

Hacking the Hurricane? Hackathons, DiscoTechs, Convergence Spaces, and Other Design Events

So far, this chapter has focused on ongoing design sites like hacklabs, makerspaces, and fablabs. Another key type of design site can be found in temporary events like hackathons and design jams. A hackathon is "an event in which computer programmers and others involved in software development collaborate intensively over a short period of time on software projects."[86] The mythology of hackathons is perhaps best expressed in the 2010 film *The Social Network*. In one scene, a young Mark Zuckerberg presides over what is essentially a frat party, but with computers. Drunken (white, cisgender, male) college student developers gather in a dark basement, bingeing on beer and pizza, competing to solve a coding challenge and thereby win employment at the then-nascent social network site TheFaceBook.com. Many of the dynamics at play in semi-permanent sites like hacklabs also operate, sometimes

with condensed intensity, in more temporary or pop-up design sites like hackathons.[87]

Hackathons have become increasingly popular both in the private sector and under the auspices of the neoliberal state. They are understood by corporate managers as potentially effective ways to identify new talent, and therefore as a possible mechanism in the tech sector hiring pipeline. In "Hackathons as Co-optation Ritual: Socializing Workers and Institutionalizing Innovation in the 'New' Economy," sociologists Sharon Zukin and Max Papadantonakis draw from their ethnography of seven New York City hackathons to provide a withering critique: "Hackathons, time-bounded events where participants write computer code and build apps, have become a popular means of socializing tech students and workers to produce 'innovation' despite little promise of material reward … [Hackathons] reshape unpaid and precarious work as an extraordinary opportunity, a ritual of ecstatic labor, and a collective imaginary for fictional expectations of innovation that benefits all, a powerful strategy for manufacturing workers' consent in the 'new' economy."[88] In short, from a managerial perspective, hackathons provide excellent opportunities for the extraction of free labor. This helps explain the increasing popularity of hackathons within the regular practices of technology firms.[89] As evident in figure 4.3, hackathons have become increasingly popular over the last decade. The state has also adopted hackathons at multiple levels, from city halls to the White House. Symbolically, a government agency running a hackathon signals an embrace of technology, as well as of the solutionist framework of civic technology. Some government actors may cynically organize these events as (primarily) a media spectacle. Others are truly excited by the possibilities of civic tech and its instantiation in the event form of a hackathon.

Many of these same dynamics are at work in the nonprofit sector and in "civic hackathons." On the one hand, nonprofit and civic hackathons are less focused on the creation of profitable new firms; instead, they typically seek to produce social, environmental, or civic innovations. On the other, if anything, this sector is more solutionist than the private sector. The assumption that a "hackathon for good" will be successful if it produces a new app that can help "solve" a social problem runs deep.

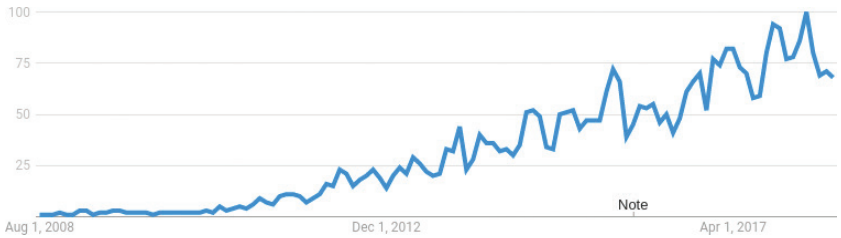

Figure 4.3
Web search interest in *hackathon* over time, from July 17, 2008, to July 17, 2018, from trends.google.com search for "hackathon."

Whether in the corporate, state, or nonprofit sectors, the model of hackathons as prize competitions has also gained prominence in recent years. In this model, teams compete to solve design challenges, typically by producing a prototype web and/or mobile application within a limited time-intensive sprint. Panels of judges review prototypes and pronounce one or more winners. Winners receive prizes, usually consisting of some amount of money, a chance to present the prototype to venture capitalists (VCs), publicity, and perhaps free (as in beer) access to packages of (nonfree, proprietary) software, web services, and tools. Recognizing the potential value (symbolic, material, speculative) of hackathons, a small sector populated by for-profit firms that bill themselves as expert hackathon organizers has emerged. These firms, such as Hackathon.com and BeMyApp, are contracted by other companies to organize and run corporate hackathons.

Hackathons: The Bad

Prompted by his experience with the way media outlets covered a Hurricane Hackers event at the MIT Media Lab, software developer and cooperative economy advocate Charlie DeTar wrote a blog post that powerfully summarizes some of the frequent problems, narrative distortions, and potential benefits of hackathons.[90] DeTar and others have pointed out some of the most frequent problems with hackathons: they're often dominated by white, cisgender men with software-development skills; they tend to be exclusive, normative, and solutionist; they often don't respect the experiential knowledge and tacit expertise of people who deal with the issue area of the hackathon on

a regular basis; they nearly always focus on problems and rarely build on existing community assets; and people think hackathons can do things that they usually can't, such as solve big or even little problems, create new products overnight, or 'level the playing field' of innovation through meritocracy. Data journalist and professor Meredith Broussard, in her brilliant book *Artificial Unintelligence*, levies a similar critique of hackathons and the culture around them.[91]

To take another example, writer, artist, and activist Gloria Lin's (2016) ethnography of college hackathons describes how "hackathon spaces cultivate a culture that marginalizes hackers with specific needs, including but not limited to women, people with disabilities, people with non-traditional backgrounds, and even individuals with specific dietary restrictions. By consistently ignoring the health, diet, and care needs of diverse attendees, along with needs based on skill, class, and gender identities, hackathons create an exclusive and hostile environment."[92] Lin describes in detail what this looks like at a UCLA hackathon organized by a company called Major League Hacking. She notes that ideal attendees, organizers, mentors, and judges were all white or Asian cis men. Lin also points out that hackathons often reward misogyny: "At LA Hacks 2014, Wingman, an initial finalist, made headlines as a winning app that analyzed photos of females to determine their promiscuity and whether they'd altered an image to look more attractive. The openness to this type of content at hackathons sends the message that women aren't welcome."[93] In addition, hackathon teams tend to recreate the wheel. The cult of the new and shiny drowns out the quiet call of the well-established,[94] and no one wants to solve the bugs in the old thing that already does what the new thing is supposed to do.

Why does this happen so frequently? For one, under patriarchy, making something "new" is valued more and is better rewarded than caretaking, maintaining, or supporting something "old." Also, starting a new thing is fun; for many, it feels more creative than working on the nuts and bolts of an existing project. There are also context-specific challenges and reward structures at play. If you have limited time to work on a particular problem, it may not make sense to contribute to an existing software project unless it's possible to reach that project's maintainers in real time. Existing systems that address a design

challenge are likely to be more complex and feature-robust than a proposed new solution because they have had time to be exposed to real-world use (and real-world challenges to design assumptions). Creating a new big-picture solution in prototype form is generally simpler and carries more immediate rewards than contributing a small improvement to an existing real-world tool. Contributing to an existing project requires contacting and negotiating with the existing developers, maintainers, and community. Creating something new produces attribution, credit, and visibility for its developers, whereas attribution, credit, and visibility for participating in an existing project must, at the very least, be shared.

These problems are widespread across corporate, state, and nonprofit or civic tech hackathons. The solutionist approach to civic hacking is sometimes mitigated by the inclusion of individual(s) from the most affected community on the hack team, but in general the short time span, problem-based (as opposed to asset-based) framing, and product-oriented process of most hackathons makes them a poor fit for deep engagement with the principles of design justice.

In chapter 2, I described the Technology for Social Justice project and the *#MoreThanCode* report (https://morethancode.cc), based on interviews and focus groups with 188 technology practitioners. Many of these practitioners had strong opinions about hackathons. #MoreThanCode participants mentioned many problems with the dominant hackathon model: several noted that most hackathons don't produce working products, that hackathons can bring out weird power dynamics with people competing for leadership, and that women often experience sexism at hackathons.[95] They felt that hackathons often reinforce elite networks and don't usually include the most impacted community members. For example, one noted that most hackathons meant to help low-income people don't usually have the intended end user at the table.[96] As one practitioner who came to tech from legal services put it, "A one day hack for homelessness takes away from the complexity of social justice issues. … You can't just come up with an app and solve the world's problems."[97] In general, study participants said that hackathons often attempt to solve big, underlying problems with technology, when what is needed is democratic consensus, strong social movements, and policy.

Another practitioner, who works at a civic tech unit within Microsoft, noted that there are many new actors, including traditional start-up accelerators, that are increasingly interested in the "tech for good" space. Unfortunately, they said, these new actors mostly seem to be ignorant of the work that has already been done. They provided an example of a civic tech hackathon where they gave a talk: "You can totally create a new call Congress tool, just please know that these other seven ones are there and tell me how yours is different"; however, they said, the civic hackers "ignored my talk … one of the winners built a call Congress tool."[98]

In short, hackathons are too often sites where the dynamics of structural inequality and unquestioned privilege are reproduced. Like many tech spaces, they tend to be dominated by white, straight, able-bodied cisgender males, masculinist assumptions about technical competence, universalizing discourse, and solutionism. They are too frequently exclusive, alienating to those who don't already feel comfortable in normative tech culture, and dismissive of the difference, experiential knowledge, and domain expertise of marginalized people.

Hackathons: The Good

All that said, hackathons, like other design events, are potentially very valuable sites for the practice of design justice. They are often crucibles of intense and focused learning, making, problem-solving, community building, and play. One #MoreThanCode participant notes that hackathons can be good for connecting domain experts, community members, designers, developers, and researchers.[99] Researchers Robinson and Johnson agree: they argue that city-run hackathons can create valuable spaces for administrative staff to interface with interested publics, provide clear feedback for city administrators about what open data sets are important, "help put open data into public use," and inform future open data releases.[100]

Another #MoreThanCode participant says that hacker camps, such as Chaos Communication Camp and ToorCamp, create comradery; a second points out that hackathons form networks of people who can be mobilized to participate in larger collaborative projects; a third notes that, if well-organized, hackathons can provide an introduction to the use of tech for social justice, as well as pathways to employment.[101] For

example, in response to the question "How did you enter this work?," one software developer interviewed for the *#MoreThanCode* report describes a city hackathon, in partnership with Google, as their entry point; another mentions organizing woman-centered hackathons as an important aspect of their own career path.[102]

Many feel that focused pop-ups, hackathons, and hack nights can be valuable if they respond to the real needs of organizations with a lot of domain expertise, instead of focusing on ideas that come from coders.[103] For example, one participant notes that hackathons have been useful in the legal services community to generate ideas for apps to support clients and legal aid workers as they navigate the legal system. A software developer at a worker owned co-op shares that some tech communities, like Drupal for Good, use hackathons to organize pro bono website creation for community-based organizations.[104] According to these participants, there has been a slow, long-term shift toward including community members in design and development processes, including hackathons: "In the old days people used to form teams and rush in and try to fix things, without really even knowing what was broken … it is no longer just a bunch of programmers in a room. There are now hackathons where actual community members are learning to code and interacting. … Community members are also teaching programmers about the things they need to sustain and build for the future. That's a really good thing happening."[105]

Rethinking Design Sites through a Design Justice Lens

What are some of the practical implications of design justice for how we organize design sites? Recall that, at its core, design justice is about the fair distribution of design's benefits and burdens; fair and meaningful participation in design decisions; and recognition of community-based design traditions, knowledge, and practices. Some design spaces, increasingly, are oriented toward some or all of these goals.

In their account of hackerspaces (summarized at the beginning of this chapter), Grenzfurthner and Schneider urge the repoliticization of design sites. In part, they imagine this can be accomplished through a rediscovery of theory and history: people in hackerspaces need to learn about where hackerspaces came from, discuss the social developments

that they oppose (identify the "anti"), and develop their own theories of resistance and social change. They also call for a shift in the leadership of most hackerspaces, which they note are largely dominated by "benevolent" and informal white, male, nerd elites. They needle US hackerspaces to consider whether they include Black and/or Latinx members, European hackerspaces to be reflexive about whether they have North African or Turkish migrant members, and hackerspaces everywhere to be real about gender balance in membership and leadership: "What is needed is the non-repressive inclusion of all the groups marginalized by a bourgeois society just as it had been the intention of the first hackerspaces in countercultural history. If we accept the Marxian idea that the very nature of politics is always in the interest of those acting, hackerspace politics are for now in the interest of white middle-class males. This needs to change."[106] Beyond representational politics, design justice compels us to develop a range of strategies to explicitly relink design sites to social movement organizations that are rooted in marginalized communities.

Happily, many people are already working to create new, radically inclusive design sites, to transform existing sites, and to explicitly relink hacklabs, hackerspaces, and hackathons to social movements. Some spaces embrace the hacker ethic while striving to be radically inclusive; examples include Design Studio for Social Intervention in the Boston area; Intelligent Mischief in Brooklyn; LOLspace and Double Union in the Bay Area; the Afro-Brazilian hackerspace Ujamaa in Salvador de Bahia, Brazil; and so many more.

Activist and researcher Sophie Toupin provides a brilliant and definitive account of the rise of intersectional feminist hackerspaces in the United States. She begins by summarizing intersectional feminism, then reviews what hackerspaces are and provides a brief history of their spread from Europe to the United States. Next, Toupin traces the origin of feminist hackerspaces in the United States to the Geek Feminism Wiki, the Ada Initiative, and a presentation by Seattle Attic on "how to build a feminist hackerspace" at the third Ada Camp in San Francisco in 2013. She shuttles back and forth between concise description of theoretical developments in intersectional feminist thought, a history of hacker, geek, and maker feminists, and discussion of the recent establishment of intersectional feminist hackerspaces like Mz* Baltazar's

Laboratory in Vienna, Liberating Ourselves Locally in Oakland, Mothership Hackermoms in Berkley, Seattle Attic, Flux in Portland, Double Union in San Francisco, and Hacker Gals in Michigan.[107] Liz Henry, in a widely circulated 2014 article for *Model View Culture*, described the creation of the Oakland-based feminist hackerspace Double Union and located it alongside the history of feminist organizing within technology.[108] Another makerspace that positions itself as antiracist, feminist, and activist-oriented is the Sugar Shack in Los Angeles, open since 2001.[109]

Some makerspace and fablab organizers have explicitly incorporated a liberatory political vision. For example, De War's fablab in Amsterdam appropriated the MIT model, opened a grassroots fablab without permission, and now focuses on hacking production, consumption, and the broader economy through the lens of sustainability and resilience.[110] This has been described as a *grassroots insurgency* and appropriation of the fablab model.[111] There are also many individuals within the fablab network who seek to transform fablabs into more inclusive spaces.

There are also many important parallel processes that aren't necessarily called *hacklabs* or *hackerspaces*. For example, in the United States, under the Broadband Technology Opportunity Program (BTOP) section of the American Recovery and Reinvestment Act (ARRA, more commonly known as the Obama Stimulus Bill), organizers with the Media Mobilizing Project in Philadelphia were able to leverage federal funds to resource community computer labs that combined broadband access with political education and media production workshops.[112] Community-based workshops where people learn design skills, share access to tools, explore hacking and repair culture, and generally challenge the disposable logic of consumer culture are increasingly widespread. As Smith et al. put it: "To hack open a device designed for obsolescence, and to repair it and upgrade it and then to share freely that knowledge about the device and its workings is a deviant act within the logics of cognitive capitalism. … The question is whether these initiatives … can connect to movements that are seeking pathways organized to alternative logics of sustainability and social justice."[113]

Although they are beyond the scope of this chapter, libraries also have long been important to the democratization of access to knowledge, and there's a growing trend to develop libraries as sites where

people can learn about and explore digital design.[114] Another interesting site is Computer Clubhouses, where educators like Jaleesa Trapp work with low-income youth, girls, and/or gender-non-conforming kids of color to build their design skills and their support networks.[115] Schools are, of course, also crucial sites for the development of a praxis of design justice. I further discuss pedagogies in chapter 5.

Hacking Hackathons: Models for More Inclusive Design Events

Just as some more permanent design spaces can potentially support the goals of design justice, so can short-term design events. Active social movements have already developed multiple models for hackathons and other design events that are more closely aligned with design justice principles. For example, during the height of the global justice movement in the late 1990s and early 2000s, before there were hackathons and DiscoTechs, mass mobilizations and convergences often featured media/tech labs. As anthropologist Jeffrey Juris describes, these temporary labs were embedded within larger global justice convergence spaces where all kinds of movement activity were coordinated, so they served as tech and media organs within a larger social body. They were sites of sociotechnical innovation, knowledge exchange, and community building, but they didn't exist in a vacuum. They responded most directly to the particular project at hand, which was to effectively organize communications, connectivity, and ICT infrastructure to support large-scale mobilizations and independent media coverage of those mobilizations.[116] I personally participated in and helped organize these kinds of spaces at protests against the World Trade Organization (WTO) ministerial meeting in Cancun (Hurakan Cancun), at the Free Trade Area of the Americas (FTAA) IMC that was organized during protests in Miami in 2003; the We Seize! Hub at the World Summit on the Information Society (WSIS) in Geneva in 2003;[117] the Polimidia Lab at the OurMedia conference in 2004;[118] and the Twin Cities Indymedia Center that was organized during protests against the Republican National Convention in 2008. In 2012, similar media and tech spaces were organized at many of the occupy encampments. There were media tents at Occupy Boston, Occupy Wall Street, Occupy London, and many more. At Occupy DC, there was a tech space and a working group that, among other projects, organized a mesh wireless network for the camp and

prototyped portable battery mounts for small computers to enable consistent, high-quality livestreams from the camp even during marches and in the event of dislocation by the police.[119]

Today, there is a growing community of people and organizations that works to create and share models for inclusive hackathons or for hackathon-like events that capture the spirit, energy, and positive possibilities of hackathons while transforming their too-often exclusionary tendencies. This includes groups like Geeks Without Bounds, Aspiration Tech, the Detroit Digital Justice Coalition, and EquityXDesign, among many others. We have already discussed DiscoTechs and the context of the Allied Media Conference from which they emerged. Other conferences and events that emphasize diversity and inclusion include MozFest, the Internet Freedom Festival, CryptoHarlem meetups in New York City, CryptoParties in Brazil, Encuentros Hackfeministas throughout Latin America, and the Tech Lady Hackathons in DC. The Lesbians Who Tech Summit[120] provides a physical meetup and networking space for lesbians working at all levels of technology industries. Trans*H4CK is a series of hackathons by and for trans* and gender-non-conforming people, with local events in San Francisco, Boston, and other cities.[121] In Latin America, there are International Development Design Summits (*Cumbres Internacionales de Diseno para el Desarollo* [IDDS]). WhoseKnowledge.org is "a global campaign to center the knowledge of marginalized communities (the majority of the world) on the internet … we work particularly with women, people of color, LGBTQI communities, indigenous peoples and others from the global South to build and represent more of all of our own knowledge online."[122] The campaign organizes resources, how-to guides, summits, and hackathon-like *knowledge sprints* where participants edit Wikipedia together to recenter marginalized people, histories, and knowledge.

The accessibility technical community organizes inclusive design events under the moniker #A11yCAN Hackathons. These focus on "the design of products, devices, services, or environments that can be used by people with disabilities."[123] The Make the Breast Pump Not Suck Hackathon and Policy Summit focused on improving both the design of breast pumps and the policies and norms that push breastfeeding people, especially low-income PoC, away from breastfeeding. The series organizers worked hard to create a space that was inclusive, centered

the experience and expertise of low-income women of color and reproductive justice organizations, and supported participation by mothers with infants and young children.[124]

Gloria Lin has also noted the emergence of more inclusive hackathons, such as "Technica, an all-women hackathon at the University of Maryland, College Park … [which] incorporates yoga breaks in its schedule, which allows hackers to practice self-care. Hack Davis at the University of California, Davis brands itself as a 24-hour social hackathon."[125] As Lin describes, "Such hackathons push hackers to reflect on why they are doing the work they do, push for the ideas and welfare of marginalized communities in the tech sphere, and do so on the terms of their wellbeing and safety."[126]

In a 2015 conference paper for SIGCSE, education technology scholar Gabriela T. Richard and her coauthors describe StitchFest, a hardware hackathon focused on using LilyPad Arduinos to design wearables under a theme of "wear and care."[127] They argue that they were able to increase women's participation rate through targeted recruitment, a thematic focus, and offering participants particular kinds of materials. They also summarize the recommendations from the National Center for Women and Information Technology (NCWIT) about how to recruit more women and minorities to coding competitions: "(1) including promotional materials that feature females and a range of students, (2) actively recruit females, (3) provide ongoing encouragement, (4) allow participants to create projects that appeal to them, (5) encourage mixed teams with experienced and inexperienced members, (6) host a tutorial or how-to event, (7) focus on learning and different ways to win, (8) include female mentors, educators and judges, (9) make sure the space is accessible to all, and (10) educate others involved."[128]

Along similar lines, #MoreThanCode participants had many specific suggestions for how to effectively organize design sites to be more diverse, inclusive, and useful. One pointed out that the way you organize a hackathon greatly influences who will show up, and that aspects such as the day of the week, time of day, location, and highlighted speakers are all important.[129] Another described working with the NYC Parks Department to hack on thirty years of open tree data; this hackathon included volunteer tree stewards, neighborhood association staff, city-wide nonprofits, and parks department staff, as well as people from

the tech, data, and design communities.[130] One practitioner described the process of creating intersectional, feminist, PoC-led makerspace in Oakland; another shared their experience of setting up a city innovation lab in New York City.[131] Several shared that social justice tech organizations, especially May First/People Link, have long organized tech convergences that gather activists to identify the ways that technology might be used to most effectively build social movement power. In the end, the *#MoreThanCode* report provides the following key recommendations for creating more diverse and inclusive technology design sites: gather and publicly share diversity data; set public, time-bound diversity targets; and "transform conferences, convenings, meetups, and other gatherings to be far more diverse, inclusive, accessible, and affordable. Adopt best practices for inclusive events, such as the DiscoTech model. Do the same at key sites such as libraries, universities, community colleges, hacklabs, and makerspaces."[132]

In general, it should be possible to organize more hackathons according to these recommendations, as well as in accordance with other principles of design justice: most crucially, to include those affected by the domain area of the hackathon on the organizing committee. It is also crucial to encourage or require teams to include people with lived experience of the event domain, and to provide support and scaffolding to make this possible. Other common best practices include the following: develop clear codes of conduct; provide financial support to enable more inclusive participation; and create community advisory boards. As noted in chapter 3, it is also important to develop framing language together with community-based organizations that work on the issue; scope design challenges in consultation with CBOs; and consider asset-based framing rather than default to problem framing. In addition, directly affected people can be mentors for design teams; as well as judges to provide critique and feedback to project teams (whether or not there will be a "winner"). Publicity about design events can highlight the work of existing CBOs, alongside event organizers.

Many #MoreThanCode interviewees noted that at design events, organizers should pay attention to participants as whole human beings. For example, this means that it is important to consider food, bio breaks, accessible bathrooms that are friendly to all body types and genders, comfortable spaces to nap or relax, and decent lighting; provide

childcare so that parents can participate; provide a clean, comfortable space to nurse or to pump breast milk; and consider holding events in venues that are familiar to community members. If there are good reasons to hold the event in another kind of venue, organize transportation and other logistics support so that community members can more easily attend; choose locations that are friendly to more than just the "usual suspects," and consider transportation, food, child care, translation, and accessibility.

Most recently, in 2019, students in my Codesign Studio course at MIT focused on working with community-based organizations to "hack hackathons," in other words, to support radically inclusive and accessible design events. As her final project, doctoral student, designer, and software developer Victoria Palacios conducted a literature review of existing suggestions for how to organize better design events, reviewed the lessons that emerged over the course of the semester, and synthesized them all into a set of extremely useful guidelines, freely available at bit.ly/designeventguidelines.

Ultimately, if the master's tools can never be used to dismantle the master's house, as Black lesbian feminist writer, poet, and activist Audre Lorde stated so powerfully,[133] can hackerspaces, makerspaces, fablabs, and hackathons be sites where we develop new kinds of tools? Perhaps, or perhaps not, but either way new tools won't matter if we use them to follow the master's architectural plans. By following design justice principles, design sites might be transformed into feminist, antiracist spaces that are not only truly inclusive, but also organized to explicitly challenge, rather than tacitly reproduce, oppressive systems. Furthermore, they can link with social movements led by those who are multiply burdened under the matrix of domination, in order to help develop plans for new kinds of dwellings.

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