1

Introduction

THE PROMISE OF MAKING

> Promises . . . point us somewhere, which is the where from which we expect
> so much. . . . The promise is also an expression of desire; for something to be
> promising is an indication of something favorable to come.
> —SARA AHMED, *THE PROMISE OF HAPPINESS*, PP. 29-30

What is a prototype? The term prototype is typically used in the context of
industrial production, design, and engineering; a prototype is built to model
or test demand (from investors or users) for an idea or a product. But can we
speak of prototyping a city, a region, a nation, or new ways of being? What
would these complex prototypes look like, and what would they do? This
book tells the story of how prototyping at vast scales came to be viewed as a
promising way to intervene in entrenched structures of inequality, exploita-
tion, and injustice—and how this promise became a demand for individual
self-upgrade and economic development. As an ethnographer, I spent ten
years (2008–2018) following the people who came together around the idea
that cities, regions, economies, and even nations and life itself can be proto-
typed. They argued that if the production of technology was made available to
everyone, concrete alternatives to corporatized, exploitative, and politicized
technology could be tested. They envisioned that if people became makers
of technology, they would own the things they made and could decide for
themselves what their technologies—and by extension their social, economic,
and political lives—would be like. The prototypes of intervention they made
came to be widely known as the "maker movement."

This promise of making—that *every* individual can prototype and thus intervene at scale—was fundamentally exhilarating. It felt empowering to many, like a moral form of hacking; an ethical, democratized technological resistance that was experimenting with how technology can be otherwise. This book unpacks in ethnographic and historical detail how this happened; how "making" became saturated with an *affect of intervention*—a feeling of agency and control, a sense that alternatives to dominant structures at various spatial and temporal scales were possible. This affect of intervention created seemingly shared visions for the future—even when those visions were incompatible and contradictory. Making was taken up simultaneously to articulate a return to "made in America"—as former US president Barack Obama had envisioned it in 2013—and to overcome "made in China" and its associations of China with backwardness, low quality, and fakery. It was taken up by people, institutions, and corporations that we would typically think of as holding sharply opposing views; feminist technology researchers and designers, venture capitalists, educators, major tech corporations from Intel to Tencent, designers, technology activists, major governments with opposing political views, critical scholars of science and technology. The uptake of making was driven simultaneously by desires to relive modernist ideals of technological progress *and* by projects aimed at relocating future making and decolonizing technology and design. It was articulated both in terms of a nostalgic longing for older, "better" times *and* as a toolkit to imagine alternative futures. It became a site to rearticulate the importance of craftsmanship and its associations with individual self-transformation and autonomy. At the same time, it became a resource to envision an alternative designer, engineer, and computing subjectivity that challenged ideals of the autonomous self. The interesting question is not which version is true, but how it was possible for making to be understood through such contradictory terms.

I use the prototype as both an analytical concept and an emic term, i.e., as practiced in technology production and design. As anthropologist Lucy Suchman and colleagues note, the prototype has "particular performative characteristics within the work of new technology design."[1] It is a material and concrete proposal of alternative ways of thinking about technology and its role in the world, not "simply as a matter of talk, but as a means for trying the proposal out." In other words, the affective qualities of the prototype lie in its simultaneous functioning as object (a model) and process (testing). The term refers to both the normative modeling—the making concrete, or realizing—of specific ideas *and* the making of an alternative, which carries the potential for contestation and intervention. One of the key promises of the maker movement was that prototyping—the testing and modeling of a technological alternative—was no longer reserved for elites, for scientists, designers, or engineers. Rather, the techniques of "making" from reverse engineering closed systems to building

your own devices and machines with open source hardware platforms and tools would make prototyping (and thus the testing and modeling of alternatives) available to everyone. A flurry of maker and open source hardware prototypes made this promise of making concrete; the "DIY cellphone" showed that *you*—rather than a big corporate player like Apple—can control the design and inner workings of your communication devices;[2] the hacking of proprietary health devices demonstrated how *you* can regain ownership of your body's data;[3] open source 3D printers made palpable how *you* can mass-produce in your own home.[4] All of these projects functioned as *prototypes of intervention*. They "demoed" how to see oneself as capable of intervening in technological ownership, industrial production, economies of scale, broken healthcare systems, and of undoing established notions of the good life. They modeled how to see oneself as in control of what technologies—and by extension one's social, economic, and political life—could look like. They created a feeling of being able to intervene at scale, from the individual body to the nation.

I use the prototype as an analytical concept to attend to a broadening disillusionment with digital technology and the IT industry. This book shows that ideals and practices of making spread in the very moment as the political and economic regime of techno-solutionism, i.e., the construal of complex social and economic inequities as problems that can be solved by technological solutions, began to be more widely critiqued. Making became more prominent during a time when people began reckoning with the tech industry's complicity in enabling structures and processes of exploitation, racism, sexism, and exclusion. It was a moment of realization that the structures and processes of capitalism had never been "external" to or "above" the workings of technology and design. The historical condition that gave rise to making was marked by a coming to terms with how technology had enabled the entrenchment of what is commonly thought of as key characteristics of neoliberal capitalism: the economization of the environment, of natural resources, and of life itself in the name of progress and development; the demand placed on individuals to self-actualize as economic agents made responsible for their own survival; the displacement of people and animals in the name of national sovereignty, global competitiveness, and security.

Making's particular local and translocal formations unfolded through a growing distrust of some of the basic assumptions of modernity itself. It emerged through and alongside a (belated) realization by members of tech and design industries and research that the promise of modern, technological progress and techno-solutionism had occluded and thus legitimized the violence and loss caused by capital accumulation and economic development. Advocates of making were less interested in finding a technological fix than in redefining what technology or a technological solution meant in the first place. They were invested in experimenting with alternative ways of conceiving

of and producing technology, which ultimately recuperated the promise of happiness[5] and the good life attached to technological progress, precisely as people realized that these feelings had, in fact, long been unattainable for most.[6] Making, in other words, was simultaneously an expression and refutation of technological promise.

To make sense of this seeming contradiction, this book offers a genealogical approach that attends to the displacements of technological promise. It examines how technological promise can coexist with the proliferating distrust of its attainability. I show that the endurance of technological promise works through its displacement to sites formerly conceived of as the tech periphery, once portrayed as incapable of innovating and "in need" of technological intervention and economic development. Specifically, my focus is on China and how its image began shifting in the broader tech imagination at the very moment that the promise of making took shape and modernist ideals of technological progress were more broadly challenged.[7] I show how China, and more specifically the city of Shenzhen in China's Southeastern province of Guangdong, alongside other regions—including regions in the postcolonies, regions in rural America, former manufacturing cities in Europe and the United States—were rearticulated by a range of actors in the global tech industry, investment, policy, and politics as places where the future was now made, as newly innovative exactly because they were considered to be backward and thus not tainted by capitalism or modernity the same way.[8] These displacements of technological promise co-produced China as a *prototype nation.*

By *prototype nation*, I mean the stipulation that a nation can function as a prototype—a nation that can serve as the raw material for a new model (for instance, an alternative to established models of modern progress) or can generate demand for a particular kind of future (for instance, a nation's future freed from past and ongoing colonialism). The idea that a region, even at the scale of the nation, can function as a prototype, as a means of modeling a new way of life for others, and as an archetype that makes certain futures felt, concrete, and "masters the unknowable," is of course not new; it is historically constituted through projects of modernization, economic development, and colonization.[9] The European invention of the "nation-state," the historian Arif Dirlik reminds us, "was the ultimate vehicle of modernity."[10] The European nation was positioned as the prototype of modern progress and economic development, positing Europe as the archetype and "first" that had let go of feudal pasts and traditions. Other regions were construed as stuck in the past and as "in need" to learn from the Western "model" nations. Postcolonial studies have shown in great depth how the making of the Western nation as *the prototype* of modernization and development was contingent on the invention of "the Third World" as "other"—the discursive construct of a less civilized "other" that legitimized the extraction of resources the West needed for its own project of progress and economic development.[11]

The colonial project of prototyping a certain way of life (and demanding that others model themselves after that particular image) endures through the ideals and practices of technology innovation. It lives on in the construal of Silicon Valley's methods, instruments, and ideas of technology design and engineering as universally applicable.[12] And it is sustained through projects aimed at replicating Silicon Valley's "regional advantage"[13] elsewhere—from efforts to build the Silicon Valley of Russia in Skolkovo, a suburb of Moscow, to claims of the emergence of a global creative class.[14] It is most recently reactivated through the displacement of technological promise and the stipulation that "regional advantage" is now located elsewhere (in China, in rural America, in sub-Saharan Africa, etc.), at new frontiers, producing new horizons of possibility and investment opportunities—it is these displacements of technological promise that centrally concern this book.

I offer *displacements of technological promise* to bring into focus the violence and loss that are produced and yet often occluded by the endurance of technological dreams of future making. Weaving together sensibilities from feminist anthropology, critical race studies, and science and technology studies, this ethnography shows that the displacement of technological promise onto what was once imagined as the periphery of technological future making is a discursive move with material consequences, providing legitimacy for the reordering and restructuring of space and people, the flow of investments into certain spaces and technology practices rather than others, the casting of certain people as deserving while continuously keeping others on hold, framed as not (quite) ready, not capable of their own self-investment. Displacements of technological promise are *not* a linear movement of technological ideals and objects from "here" (the so-called developed world) to "there" (the so-called other part of the world). As I will show in this book, they unfold, instead, through circular, recursive moves, the recuperation of certain pasts and the silencing of others. They require labor and active maintenance. They thrive on the inclusion and exclusion of select sites and bodies. Displacement, anthropologist Juno Salazar Parreñas theorizes, is the "slow violence" that "works over multiple scales and beyond the clean boundaries of specific events, places, and bodies affected."[15] The displacements of technological promise I document in this book are not the same and yet are not unlike the slow violence Parreñas observes as materially experienced through eviction, mega-dam construction, and natural resource extraction. My particular focus is on how displacements of technological promise imbued neoliberal projects of regional laboratories, special economic zones, and smart city planning with a renewed promise of happiness, despite their histories of extraction, displacement, and violence.[16] When technological promise is at last granted to places and people that long yearned to be seen as just as innovative and creative as places like Silicon Valley, acts of violence and control in the name of innovation become less noticeable, occluded by the promise of modern technological progress and its

associations with the good life[17]—the promise to be at last freed from colonial and racial "othering."

The idea that China constitutes a place to prototype alternatives to existing models of modern technological progress would have sounded absurd to most people ten years ago, when I started the research that informs this book. This is less so more recently. Western China commentators and news media have variously proliferated a sense that we are witnessing the rise of an emboldened China—one that more forcefully and assertively demands that the world, and the West in particular, ought to take it seriously as an equal (or threatening) player in the global political economy and in technology innovation in particular. Indeed, some speculate that the twenty-first century will be China's century. This book complicates these narratives of what historian Gabrielle Hecht calls "rupture-talk."[18] The notion of rupture cannot explain China's current moment, nor the ideals of the maker movement; indeed, "rupture talk" renders invisible the contingencies between past and present dreams of China as an alternative "model" or *prototype nation*, the rise and spread of the promise of making, and displacements of technological promise.

This ethnography is attuned to the genealogies of technological promise; it attends to the occluded contingencies of colonial pasts that remoralize "neoliberal exceptions"[19] and the endurance of technological promise in the present. Its analysis folds through recuperations and reappropriations, rather than "tracing" global flows and historical continuity. One of the most pressing tasks today, anthropologist Ann Laura Stoler urges, is to examine how imperial formations are refashioned, "often opaque and oblique," seemingly indiscernible, and escaping scrutiny.[20] This book attends to such "colonial reverberations" in the tech industry and digital technology projects whose promises of participation, peer production, and entrepreneurial agency occlude their historical contingencies.

In the following sections I provide a cursory sketch of the spatial and temporal contingencies of technological promise that this book attends to at length. I turn to 2015, when a high-profile Chinese politician and a well-known figure of the American maker movement each articulated a vision of making that was—without any explicit reference to the other—aligned in seemingly paradoxical ways that would escape our view if we restricted our analysis to the boundary of the nation or to an ahistorical approach.

The Socialist Pitch

The Chinese hackerspace Chaihuo (柴火) is not the kind of place in which one would expect to find the prime minister of China. It is a 15-by-10 square meter room on the second floor of a refurbished factory building located in OCT Loft, a creative industry park in the city of Shenzhen.[21] Chaihuo is a

community space that provides its members with access to low-cost machines, electronic tools, open source hardware platforms, and educational kits for a small monthly fee (RMB 50[22]—at the time, less than USD 10). On the weekends, it frequently hosts educational workshops that are open to the broader public; at these workshops, attendees can learn how to reverse engineer the printed circuit board of an electronics toy or how to use the open source microcontroller platform Arduino to build their own DIY robots. Chaihuo is in many ways a typical hackerspace. On a regular day, one finds its tables covered in electronics tools and components, breadboards, alligator clips, and wires spilling out from work-in-progress prototypes, giving off a vibe of unhinged creativity and messy experimentation. Hackerspaces (or makerspaces as they are also often called) had rapidly proliferated across the world since the 2007/2008 financial crisis, and by 2015, Chaihuo was one of several thousand hackerspaces worldwide. These hackerspaces were not the spaces frequented by the type of "hackers" portrayed in movies—basement apartments littered with Mountain Dew cans where young men illegally accessed information or broke through security barriers. The hacking that took place in Chaihuo and other hackerspaces like it was a project of self-transformation from a passive consumer into a "maker"—an active participant in social, economic, and political processes, made accessible via technological tinkering.

As unlikely as it seems, though, China's prime minister, Li Keqiang, did indeed visit Chaihuo on an official state visit in January 2015, alongside two other Shenzhen-based businesses: the tech giant Huawei and a renowned investment bank. "Makers," the prime minister declared during his visit, "show the vitality of entrepreneurship and innovation among the people, and such creativity will serve as a lasting engine of China's economic growth in the future."[23] Shortly after the visit, the Chinese state newspaper, *Xinhua News*, publicized the prime minister's praise of making, and of Chaihuo in particular; it ran an article with the headline 李克强鼓励"创客"小伙伴: 众人拾柴火焰高 (Li Keqiang guli "chuangke" xiao huoban: zhongren she chaihuo yangao),[24] which loosely translates as "Li Keqiang encourages young 'makers': everyone should ascend to excel like Chaihuo."[25] The Chinese government website posted a photo essay of the prime minister surrounded by young Chinese men showing off their latest technological creations; later, the government website asserted that this visit showed that the prime minister himself was a maker at heart, for as a politician, he (like a maker) was approachable and invested in empowering citizens to "make things happen": 创客李克强: 创造一个让人时时感到方便的政府 (Chuangke Li Keqiang: chuangzao yi ge rang ren shishi gandao fangbian de zhengfu).[26]

Only a couple of months after the prime minister had returned to Beijing, he announced a new national policy that escalated making into a nationwide project. The policy was written around three key terms; "mass makerspace

FIGURE 1.1. Photos posted on the official Chinese government website (English.gov.cn/permier /photos) depicting Prime Minister Li Keqiang's visit at Chaihuo makerspace in January 2015.

众创空间 (zhongchuang kongjian)," "mass entrepreneurship 大众创业 (dazhong chuangye)," and "mass innovation 万众创新 (wanzhong chuangxin)."[27] These terms framed the policy's key directive, which called upon provincial, munici-pal, and district level governments to allocate existing resources toward setting up "mass makerspaces" modeled on Chaihuo. The policy was aimed at devel-oping these makerspaces for "the people" in order to help cultivate a "maker spirit" among the masses, a spirit that would in turn help foster an attitude of "self-making" and "self-entrepreneurship."[28] In other words, the policy held up Chaihuo as a model for the nation. About a year later, China allegedly housed the largest number of makerspaces globally—several thousand such spaces were reported to have sprung up across the nation.

At first, the official endorsement of making by the CCP (Chinese Com-munist Party) might strike you as counterintuitive; why would the CCP, often associated with top-down decision making, authoritarian rule, and harsh limi-tation of personal freedom, endorse the workings of a small makerspace, asso-ciated with prototyping alternatives to entrenched structures of technological control and injustice? You might read the CCP's appropriation of making as yet another example of how the very tactics of grassroots intervention leveled against "the system" turned out to feed and sustain it;[29] or as demonstrative of how authoritarian rule allowed for the fast and efficient implementation of new policies, deemed impossible for Western liberal democracies. Perhaps you see it as a success story of a grassroots movement that managed to shape policy making and educational agendas on the national level.

While each of these interpretations gets something right, they each also occlude something; they assume making as a universal project—as standing broadly for what was, however, a very specific, American-centric articulation and manifestation of making that China's maker and open technology advo-cates felt pressure to take up as a reference and a model for their own work and ideals. When China's prime minister urged citizens to model themselves after Chaihuo makers, he endorsed a particular version of making—the kind that

was marshaled by some of America's most well-known maker and open source hardware advocates and that the Chinese founders and members of Chaihuo had worked hard to be associated with in order to be "seen" and taken seriously as equal and creative partners by their Western counterparts in the maker movement (a theme I unpack at length in chapters 2 and 3). Indeed, it was this dominant articulation of making that centrally shaped its broad uptake across seemingly opposing and contradictory viewpoints (including the endorsements of making by the Chinese government)—a thread that I turn to next.

In 2015, the same year that China's prime minister had visited Chaihuo, the magazine *Pacific Standard* published an article by Dale Dougherty titled "The Future of Work: Join the Maker Movement." In this article, Dougherty, who had founded the San Francisco–based publication house Maker Media (which helped proliferate the ideals of a global maker movement), argued that by becoming "makers of machines," individuals could regain control over their lives and over work amidst the spread of automation and precarious economic conditions:

> Losing faith in the utility and even beauty of machines is losing faith in the kind of future we can build. We need more machines and even smarter robots that can do more for us. Even if such machines do eliminate jobs, they also create new opportunities—or at least new problems to solve. . . . If we see ourselves as the makers of machines, we are invested in creating the future, rather than having it imposed on us. The big challenge is how to get more people, not just a few, to take advantage of opportunities to do work that matters to them and makes the world a better place.[30]

Dougherty's article centered on the story of Lisa Fetterman, a passionate hobbyist cook who, fed up with the steep prices of sous vide cooking machines, took matters into her own hands and produced her own machine: she designed, prototyped, and manufactured it on a mass scale. Along the way, she transformed herself from a maker of food (often feminized labor) into an entrepreneur (often rendered masculine). By doing so, Dougherty argued, she also transformed work itself into something that was no longer drudgery, but desirable and even fun:

> Without any prior knowledge in hardware, she [Lisa] and her husband began building a sous vide prototype of their own . . . she moved to China for three months to learn how to do that. That's how her company, Nomiku, was born. Work, she told me, "was once boring but now I really don't feel like I am doing work."[31]

Dougherty's narrative condenses a key promise of the maker movement: self-transformation into an entrepreneurial agent was now democratized, available to everyone. Makers need not be professional engineers, designers, or

computer scientists to build machines and devices, start tech companies, sell products, and shape industries along with the future of work. Makers, instead, could decide for themselves what their technologies looked like. They would no longer have to listen to the state, the corporation, or the university to tell them what the good jobs were, what the good life meant, and the kinds of futures they wanted. Instead, they could prototype their own. Making offered both a sense of control over work—a way to escape what Dougherty saw as the drudgery and feminization of labor—and, more important, a way to intervene in the structures of neoliberal capitalism typically seen as inevitable.[32] Dougherty's article was published as debates about the ethics and moral dilemmas of the tech industry were escalating across American news and social media. In 2015, AI, big data, and the Internet of Things were becoming fodder for rhetoric of both promise and fear. Standards like 5G and machine learning approaches in AI were portrayed as both inevitable and necessary, as delivering on several decades of promises about the smart self, the smart city, autonomous transportation, and interconnected living. Yet it was feared that these developments would have drastic, poorly understood impacts on work, from deskilling to outsourcing. They seemed to put at risk jobs that thus far had been protected from labor changes—white-collar jobs such as tech work and creative work.[33]

Following the global financial crisis in 2007–2008, such forms of crisis thinking have become pervasive in the United States in particular;[34] indeed, our contemporary moment is often articulated as one of permanent crisis characterized by ever-increasing economic uncertainty, political instability, and severe environmental havoc. But projects of "economic development" and modernization (and the resource extraction, displacements of humans and animals, and extinction they have legitimized and demanded) of course had already much earlier outgrown their laboratory Third World.[35] The financial crisis made visible the processes of exploitation, the feminization of work,[36] and the neoliberal colonization and economization[37] of ever-larger swathes of our lives,[38] for they began to affect people who had been temporarily (even if precariously so) insulated from them. Workers in tech industries, design consultancies, architecture firms, and computing research labs began to question the promise of modern progress that had sustained their own work.[39] The years following the crisis were marked by a reckoning with the complicity of technology, engineering, and design in labor exploitation, resource extraction, economization, and the creation of what critical race scholar Neferti Tadiar calls "surplused populations"—"populations figured as forms of bare life, at-risk populations, warehoused, disposable people, urban excess,"[40] who serve capital as it moves from one site to another. American news media coverage began warning about the costs of ruthless neoliberal capitalism and the precarious work conditions it created, with pieces such as "Entrepreneurs Are

the New Labor" in *Forbes* in 2012,[41] "The Future of Work and Workers" series run by *Pacific Standard*,[42] *Fortune*'s 2016 "Even the IMF Admits Neoliberalism Has Failed"[43] by Ben Geier, and the 2017 *New Yorker* article "The Gig Economy Celebrates Working Yourself to Death" by Jia Tolentino.[44] Increasingly, people criticized Silicon Valley as a central culprit in this destabilization. *Wired* magazine, known for its central role in propagating and legitimizing the belief in techno-optimism in the 1990s,[45] began running articles on the pervasive sexism of the Silicon Valley industry as well as essays calling out the tech industry's complicity in neoliberal capitalism. These writings signaled the dilemma of a tech industry that found itself confronted with a growing public suspicion that its countercultural ideal of "tearing down hierarchies, undermining the sorts of corporations and governments that had spawned them, and, in the hierarchies' place, create a peer-to-peer, collaborative society, interlinked by invisible currents of energy and information,"[46] had benefited only a small minority.

The idea of a "maker movement"—while couched in a rhetoric of global and universal applicability—came out of this specific moment of techno-crisis thinking that was particularly pronounced in the United States. The idea that if individuals turned themselves into makers of machines, devices, and tools, they could also prototype concrete alternatives to contemporary capitalism and the spread of loss of control, vulnerability, and insecurity, was specific to the American context following the global financial crisis, accompanied by a rising distrust—expressed by Americans themselves—in their own IT industries. While ideals of open source hardware and electronics hacking had been circulating since the mid- to late 1990s, they picked up steam in the years of the financial crisis, 2007–2008. In 2008, the flagship Maker Faire in the Bay Area, an annual gathering of maker and open source hardware enthusiasts, began counting participant numbers over 200,000; during the same year, the number of hackerspaces in existence worldwide rose from less than a hundred to more than a thousand. Many of the key ideals of hacking—the notion that societal structures are technological and as such modifiable via technological tinkering, the idea that tinkering with code could be a form of moral and political intervention[47]—were rearticulated in terms of "making" and thus rendered as available not only to geeks or computer scientists but to everyone. The global spread of hackerspaces and the growth of Maker Faires proliferated the sense of being part of something greater.

It was the writings, educational initiatives, and methodological toolkits promoted by a group of powerful, mostly male actors[48] associated with networks of tech production and innovation in the United States that attached this affect of intervention to making. They "pitched" making as a democratized approach to technology production and design. This democratization of tech production, they argued, would enable "everyone" (rather than just the elite) to turn themselves into self-defining and entrepreneurial agents of change

who intervened in societal and economic structures not by political action and mobilization, but by technological experimentation. In this vision, makers "take action" by experimenting and tinkering with technological alternatives; they *prototype* alternatives to the status quo rather than demanding change by political activism, critique, social uprising, or protest. In this pitch, they appealed at times explicitly and at other times tacitly to socialist values and ideals. As a telling example, we can turn, for instance, to a quote from the book *Makers: The Next Industrial Revolution* (2012) by Chris Anderson, former editor-in-chief of *Wired* magazine:

> the ability—to manufacture "local or global" at will—is a huge advantage. That simple menu option [of a digitized machine like the 3D printer] compresses three centuries of industrial revolution into a single mouse click. If Karl Marx were here today, his jaw would be on the floor. Talk about "controlling the tools of production": you (you!) can now set factories into motion with a mouse click.[49]

Anderson's invocation of Karl Marx here exemplifies portrayals of making through images and ideals of political action and mobilization. Not without irony, socialist ideals are reduced to serve the function of a pitch, i.e., the formulation of an idea or project as attractive to potential investors and media by producing an affect of anticipation and by promising intervention at scale. Anderson's book, like other prominent writings on making from the periodical *Make: magazine* to Neil Gershenfeld's *Fab* and Mark Hatch's *The Maker Movement Manifesto*, all "branded" their arguments by invoking socialist imagery, tactics, and language. They claimed that making enabled societal and economic change for "everyone." They called making a movement, they wrote maker manifestos and maker bills of rights. They articulated making as returning control to "the people" and as democratizing peer production, open sharing, and co-ownership of resources and knowledge. They talked about acquiring "ownership" over the means of production, intervening in corporate control over economic processes, from commodification to finance speculation. Unlike Marx, though, who understood alternatives to capitalism as emerging from class struggle, solidarity movements, and the collectivization of workers, these writings portrayed *individual* self-actualization as desirable. Notably, Anderson describes making's transformative power as stemming not from a collective "we" but from many individual "you's."

These writings and projects construed one of the core techniques of neoliberal governance—the framing of life itself in economic terms—as desirable and as key to enabling social change. They produced what seems to be an inherent contradiction: a *socialist pitch.* "Pitching" is typically associated with a start-up's ability to formulate itself as attractive to venture capital, often using a standardized script, for the start-up has to produce a feeling of anticipation

and a promise of scale.[50] The "socialist pitch" derives its power from this technique of producing an affect of exuberant excitement and buy-in, by drawing specifically on the language and image of change and justice. Pitching works through promise rather than actual change; investors fund ideas and prototypes of intervention rather than finished products. Promises are "expressions of desire," feminist and critical race scholar Sara Ahmed reminds us. They "point us somewhere, which is the where from which we expect so much . . . for something to be promising is an indication of something favorable to come." The socialist pitch is aimed not at social justice per se, but at creating a desire for change and a feeling that justice via technological intervention is the only path forward. By the socialist pitch, I do not mean to suggest that the American advocates of the maker movement made a case for building a socialist or communist society. On the contrary, socialist imagery, tactics, and ideals were utilized to make a rhetorical move, to recuperate technological promise and modernist ideals of progress, precisely as people realized that the good life and the modernist dream of technological progress and solutionism had, in fact, long been unattainable for most. Socialist ideals were used to attach an affect of intervention—via making—to self-economization, i.e., the neoliberal demand that one convert the self into human capital, investing in various aspects of one's own life in order to make the self attractive to the machineries of finance speculation and investment.[51]

Processes of economization, i.e., the framing of humans, animals, the environment, and life itself as economic,[52] are at times simply taken as the consequences of neoliberalism. One of the great myths of the neoliberal ideology is that market capitalism is laissez-faire, that economization of life simply happens with no intervention. I use the concept of the *socialist pitch* to show that the economization of life and the creation of human capital had to be actively cultivated.[53] I focus on the artifacts, instruments, machines, people, and sites that imbued processes of economization with affect.[54] In chapter 4, I show the role that incubators and adjacent entrepreneurial training programs (from startup weekends to hackathons and accelerators) play in training people to see themselves as human capital and to channel their commitments to justice and technological alternatives as attractive to finance capital.

The socialist pitch remoralizes economization (of the self, life, the environment, and things) by rendering it as key to an optimistic, interventionist, and future-oriented way of living. The economization of life is portrayed as desirable and as providing individuals with interventionist capacities; *economic life* appears to be *entrepreneurial life*. The socialist pitch thus functions as a *market device of finance capital.* Market devices are typically defined as the technological, discursive, and/or human actors that generate knowledge and practices that create markets and thereby define their means of commercial exchange.[55] Pricing techniques, accounting methods, monitoring instruments,

trading protocols, benchmarking procedures, and economists all have been shown to function as such devices to create markets.[56] These market devices operate by translating complex societal and political processes via quantitative measures and simplification into manageable and seemingly controllable entities.[57] By contrast, market devices of finance capitalism operate through affect and by channeling yearnings and aspirations. They imbue processes of economization with feelings of actionability, intervention, and the promise of happiness.

The broad endorsement of making further legitimized the technique of the socialist pitch that remains pervasive in the tech and creative industries despite a growing suspicion of these industries' promises of better futures and the good life; when users participate in digital platforms such as Amazon, Facebook, or Uber, they are celebrated as entrepreneurial agents of content creation, remix, and even social movements, masking their transformation into co-creators of economic value behind a story of empowerment;[58] when citizens are celebrated as entrepreneurial change agents, the demand placed on them to construct markets and innovate national economic development appears hopeful;[59] when educational reform is framed as an entrepreneurial endeavor, the broken promises of the techno-fix are re-invested with renewed optimism and feelings of social change;[60] and when tech companies propagate the mantra of disruption, acceleration, and breakage, the "people and places broken in the process" are enrolled in an enticing story of market development and progress.[61] All of these are processes of economization that reproduce and often intensify inequities and violence because they work behind the "socialist pitch" of participation, inclusion, and empowerment; they are also a process of depoliticization,[62] for the subjects interpellated through such participation are positioned in ways that discourage collective agency and resistance.[63] People's hopes, dreams, and yearnings for alternatives to regimes of exploitation and disempowerment paradoxically end up further enabling them.

The socialist pitch deployed by prominent maker advocates recuperated certain aspects of earlier revolutionary rhetoric common to innovation discourse.[64] It can be understood as a rhetoric of techno-optimism haunted by a shift in attitude toward digital technology—increasingly cautious, reflexive, and ambivalent. It was this socialist pitch that engulfed making in a feeling of possibility, an imaginary of action-ability that circulated through various and often even opposing sites and places. And it was this "socialist pitch," the promise of democratized interventionist capacity, that masked the universalizing tendencies of the American maker discourse and practice. Articulated as an extension of earlier Western traditions from the American Internet counterculture to European ideals and practices of craftsmanship to the democratic ideals of post–World War II design—from the experiments at the Bauhaus to Black Mountain College,[65] making was posited as having arrived

"here" (in the West) first, while then proliferating outward and made specific in local contexts. While making was positioned as intervention into persistent structures of technological elitism and control, the writings on making and open source hardware that proliferated in and beyond the United States largely retained a very old ideal; the West as the emanating center of future making,[66] following in the footsteps of a long Western lineage of scientific and technological experimentation, hacking, design, and craftsmanship.[67] What endured, in other words, was an old, and all-too-familiar colonizing narrative, a "universalizing view that promotes a notion of technological and scientific progress" that in its claims to universality masked how it was deeply entwined with specific national, state, and commercial interests.[68]

Let me pause here and return to the region that has come to hold a paradoxical place in this old, new project of future making—Shenzhen. Remember Lisa Fetterman, the hobby cook who made her own sous vide machine? There was an element of Fetterman's story that one could very easily overlook, and that was, indeed, mentioned only in passing by Dougherty himself. Lisa Fetterman "moved to China" to accomplish her self-transformation from passionate hobby cook to savvy tech entrepreneur and maker of machines. But why would an American entrepreneur have to travel to China to free herself from the drudgery of work? Why did the promise to prototype the future of work in America hinge on China and, more specifically, on Shenzhen, where Fetterman traveled?

Shenzhen has long figured in the Western imagination through the sensational news stories of Foxconn worker suicides and copycat electronics production. It has also long been considered Silicon Valley's unimaginative counterpart, as the site of mere execution of ideas "created" elsewhere, a place that was backward and lagging behind the "forward-looking" centers of tech innovation. While this image of Shenzhen persists, another narrative of the region emerged around 2010 reformulating the region's "backwardness" as an opportunity (rather than what held the region back). This happened for two reasons: first, China's early open source and maker advocates had begun to form as a loose collective between several Chinese cities in 2007, and they had turned toward making as a way to reposition China in the global imagination, shifting it from being seen as a low-quality producer to being an equal partner in hardware innovation (I explore this in detail in chapters 2 and 3). Second, foreign designers, engineers, artists, educators, and entrepreneurs began travel to China (mostly Shenzhen), with numbers peaking in the years of 2013–2016. Among the crowds who came to China were well-known figures of the American maker and open source hardware scene as well as investors, entrepreneurs, designers, scholars, artists, and educators from elite institutions in Silicon Valley, the East Coast of the United States, and various corners of

Europe. Their stories of working with Chinese factories, China's makerspaces, and open source hardware advocates were documented on personal blogs and eventually by an expanding number of Western news media outlets (from *Wired* magazine to *Forbes* and the *Economist*).

Together, these accounts produced an image of Shenzhen as a rising innovation hub, a "Silicon Valley of Hardware," and "Hollywood for Makers." It was in this moment that Shenzhen was enrolled in the socialist pitch advanced by America's maker advocates, investors, and corporate players by attaching an affect of intervention to the city and its wider region. The "travel reports" from (at first largely Western) designers, educators, engineers, artists, maker advocates, and even scholars portrayed Shenzhen as a new frontier and the next "regional advantage"[69] not unlike what the West Coast had once represented for the early Internet counterculture, a "place where things still get made," as Dougherty himself put it when I interviewed him in 2014 during his first visit to the region. Not uncommon across such accounts were colonial tropes of adventure, frontierism, and of "going back in time." Within the time span of only a couple of years the story of a "new China" was constructed—China as a prototype nation that was promising for the entrepreneurial designer and engineer, exactly because it was construed as "other" than the West, i.e., because it was seen as a site of fakes, copies, violations of IP regulations and copyright law, and lax rules of law and regulations writ large (see chapter 3 for details). Shenzhen was portrayed as an opportunity to go back in time and as the "underbelly" of the glittery world of Silicon Valley tech innovation, i.e., a place where the "cultural hegemony"[70] of the global Intellectual Property Regime (IPR) and the black-boxing of technology were not (yet) fully accomplished and complete. It was celebrated as a place where one could "see" the inner workings of industrial production: large-scale machineries and the "hands-on" labor on the assembly line were celebrated as providing opportunities for the designer and engineer to move beneath the slick surface of the software interface and re-learn the craft of production. It was framed as Silicon Valley's "other," a new frontier, and a "scaled-up" version of the hackerspace, i.e., a "city-size" laboratory to deliver on the key promises of the maker movement as I described it earlier: to prototype alternatives. Embedding oneself into Shenzhen, so the vision, would provide technology producers, researchers, designers, and activists with the tools necessary to intervene across scales by moving outside the "clean" and "elitist" office spaces of "venture labor"[71] and creative work. Shenzhen was understood as a place where one could travel and "see" scale in action; global supply chains, mass production, the city as special economic zone, international borders, and global ports of trade. One could "see" and thus understand acceleration and economies of scale—one would learn and thus be empowered to intervene in the workings of capitalism.

FIGURE 1.2. Still image—*Wired* UK documentary, 2016: "Shenzhen: The Silicon Valley of Hardware." From *Wired UK*.

Frontiers, anthropologist Anna Tsing reminds us, "are not just discovered at the edge; they are projects in making geographic and temporal experience."[72] Frontiers are places where one goes to see and build the future, and to erase certain pasts.[73] China was "(re)made" in the broader tech imagination as a place to dream, to see the future "again," precisely as that future was being called into question. It was rearticulated as it dawned on many people active in the worlds of (largely Western-centric) technology innovation, research, and design that the dream of modernity to "bring about an end of scarcity, an abundance of goods, permanent employment, prosperity and the fulfillment of personal happiness"[74]—in other words, the dream of "living the good life"[75]—was exclusionary from its inception; it had not been, and would not ever be, attainable for most. It was in this moment that the south of China, and the city of Shenzhen, in particular, came to be seen by many as a paradoxical "laboratory" of exuberant scale, where the master could dwell in the illusion of taming the land just a little bit longer. In Shenzhen, one could relive—even if only temporarily—the modernist promise of progress and control that had once made Europe and America great.

It is this displacement of modern, technological promise onto Shenzhen (via the socialist pitch of entrepreneurial living) that co-produced China as a prototype nation and that explains the Chinese government's absorption of the ideals of a tiny makerspace in Shenzhen into a nationwide policy and educational initiative—the part of the story with which I began and return to in greater detail in what follows.

Prototype Nation: Histories of the Future

> Images of the past help facilitate a vision of a future that harkens back to aspirations from the past.
>
> —JUNO SALAZAR PARREÑAS, *DECOLONIZING EXTINCTION*, P. 58

The displacement of technological promise I have described so far is not a linear move from "here" to "there" (from the West to China) but works through temporal and spatial contingencies. Specifically, the making of Shenzhen as a new "frontier" was co-produced on the one hand by anxieties about the shortcomings of modernist ideals of technological progress (anxieties that registered in the promise of making and a growing suspicion of the tech industry particularly pronounced in the United States and Europe), and on the other hand by long held desires of Chinese people to overcome racialized othering, shaped by the CCP's own ambitions to integrate citizens into "the dream of regaining China's stature as an empire" and to "attain material and moral parity with the West,"[76] a project that has occupied Chinese leaders since China's partial colonization by Europe in the nineteenth century. In other words, colonial formations of the past govern both of these political projects; the mobilization of insecurity, fear of loss, and crisis in the West, and the channeling of desires for parity and national sovereignty in China. Colonial pasts reverberate both in the contemporary displacement of technological promise (e.g., Shenzhen portrayed as Silicon Valley's "other" as I described it earlier) *and* in political ambitions to reposition China as a forward-looking, happy, and optimistic nation that reasserts itself globally—a project that has gained force since Xi Jinping became president in 2013.

This book shows that making was appropriated by the CCP to mobilize feelings of optimism and happiness on a mass scale in the very moment that the party feared social and political instability due to China's first significant economic slowdown since the economic opening reforms in the 1980s. The party feared that the slowing economy—what it has referred to as "China's New Normal"—would lead to social instability. The CCP had retained its legitimacy in part due to its assertions that it had lifted millions of people out of poverty and it feared that people's dissatisfaction with the economy could harm the legitimacy of the party state.[77] The particular version of making that the prime minister endorsed when he visited Chaihuo makerspace in Shenzhen in 2015 was ideal for the CCP in this particular moment; the socialist pitch (as advanced by America's maker advocates and as I outlined it earlier) had translated economic life into entrepreneurial life, i.e., it had framed processes of self-economization as hopeful and as democratizing technological agency. For the party, this pitch constituted an ideal *technopolitical instrument of affect*, i.e., a tool to frame its own political agendas via a language of technological

promise.[78] Specifically, it helped position the political demand placed on individuals to self-economize on behalf of the nation (to address "China's New Normal") as advancing long-held yearnings of Chinese citizens to be seen as modern innovators. Making, in other words, was ideal for the CCP to portray what was fundamentally a neoliberal strategy—the demand of citizens to self-upgrade into optimistic, economic agents who drove innovation and who built their own jobs rather than relying on the state—as in line with the principles of the communist party and as serving the hopes and dreams of the people.

Just a couple of months after the official endorsement of making by China's prime minister in 2015, I attended the Pujiang Innovation Forum in Shanghai, where I listened to a keynote by Wan Gang, the then-minister of science and technology, in which he encapsulated the CCP's utilization of making: "In China's New Normal, makers, open source and open hardware—as a form of entrepreneurship amongst the people—can help realize China's innovation strategy. It is the opportunity of the majority, rather than just the privilege of the few, to realize a lifelong dream." Not unlike the socialist pitch of America's maker advocates, the Chinese minister of science and technology here deploys socialist language (the majority, the people) to mobilize people to take individual action. Further, the language of entrepreneurial agency and innovation is strategically paired with one of the key (national and global) branding strategies the CCP has deployed under Xi Jinping: the Chinese Dream.[79]

Since he ascended to power, Xi has positioned China as a nation of dreamers, a place of promise and happiness. This includes not only Xi's notion of the "Chinese Dream," but also a series of "happiness campaigns,"[80] and his appropriation of the citizen-driven phrase "positive energy" (zhengnengliang 正能量).[81] These constructs indicate a discursive "shift from locating the future outside China (by figuring China as backward and the West as advanced) to see[ing] China itself as the future."[82] They are aimed at creating an affective relationship of mutual interest and "positive feeling" between the Chinese party state and citizens. This affective bond is aimed at advancing the nation and at solidifying the party state as *the* political power to support the Chinese nation and its people. The happiness campaigns, anthropologist Jie Yang shows, "encourage people to focus on the self, adjusting oneself to realize one's self" on behalf of the nation. The pursuit of happiness, in other words, becomes a moral imperative for the "quality" citizen who advances the self to advance the economic future of the nation; as Jie Yang puts it, "how better to legitimate crippling economic restructuring and intensified social stratification than to deploy programs that suggest that these processes are actually an opening that could lead to happiness?"[83]

Making proved ideal for the CCP to portray this neoliberal ideology of self-care, self-realization, and self-enterprise (in the name of happiness) as advancing people's own yearnings to be seen as innovative, creative, and modern—a

subjectivity that had long been denied to most of China's citizens, both by their own government and by the West. As I explain in greater detail in chapter 2, the CCP has strategically utilized China's partial colonization by the UK and France during the Opium Wars in the nineteenth century—what the party refers to until today as China's "period of national humiliation"—to invoke in people desires to upgrade into modern, "civilized," and "quality" citizens (and to legitimize a range of governance techniques, including the adoption of "neoliberal exceptions"[84]). The discourse of China's citizen's supposed lack of civility emerged from China's partial colonization and has been variously deployed by China's leaders ever since to argue that "China's humiliating and unequal participation in the globalized historical time of the modern instate system"[85] (its failure to modernize) was due to the failure of its people to modernize, owing to people's lack of "civility." The cultivation of a "civilized" citizen (a citizen recognized both as uniquely Chinese and as modern by the West) has been at the heart of China's modern nation-building projects ever since, from the late 1920s until today. China's projects of modernization have always struggled with the fact that the very notion of modernity was itself a colonial imposition.[86] When the CCP came into power, it argued that socialism constituted an ideal approach to establish an alternative modernity to the capitalist West.[87] "The socialist revolution itself," Dirlik and Meisner explain, "was the product of the deepest urges of a society to gain entry into the stream of history as its subject against forces that denied to it such entry."[88] The cultural revolution did not reject development; it sought to restructure the idea of development by politicizing it.[89] Modernity, in other words, was to be achieved not through economic expansion but by cultivating revolutionary subjects via social struggle and mass mobilization.[90]

Following Mao Zedong's death, the CCP positioned China's economic opening reforms in the 1980s as necessary to address China's failure to modernize during the previous decades. Political leaders at that time (Deng Xiaoping being the most prominent) argued that this was to be accomplished by transforming revolutionary subjects into citizens of "quality" (素质 suzhi), invested in their own economic development for the purposes of furthering the nation. The notion of quality (suzhi) was deployed to attribute China's failure to modernize under Mao Zedong—once again—to the "low quality" of its people. The economic reform period was characterized by a turn away from politicization to economization. Modernity was no longer portrayed as arising from ideology but a pragmatic, fact-based approach—an attempt "to seek truth from facts" and a "socialism with Chinese characteristics" as Deng Xiaoping put it in the 1980s. The reform era was a "pragmatic adjustment of revolution," i.e., socialist progress and social change had to "follow the demands of economic development."[91] The party portrayed self-transformation of citizens into "economic subjects" as key to this adjustment. In other words, the political aspiration to return China

to its "rightful place" and guarantee sovereignty from Western hegemony that had guided postcolonial governance was now to be accomplished via what during the cultural revolution had been punishable by death: self-investment, entrepreneurial activity, privatization of state-owned land and resources.

How did the CCP get people to perform this drastic self-transformation from revolutionary subjects into economic agents? How did it convince people to give up socialist support structures such as the "iron rice bowl" (the guarantee of life-long employment) and the danwei system (the "work unit," i.e., work-based communes that provided living space, meals, medical care, socialization, and ideological indoctrination, all in one small geographic area)? To "reform" its people, the CCP established so-called Special Economic Zones (SEZ), i.e., spatially bounded zones in which economization, privatization, and foreign direct investment were encouraged, while they remained at first still prohibited (or at least not enabled) in the rest of the country. In 1979, Deng Xiaoping declared Shenzhen a SEZ (alongside Zhuhai, Shantou, and Xiamen)—a laboratory to "feel out" how far away from socialist structures and values China could move without changing its essential character.[92] Crucially, this "laboratory" model induced desires in citizens for economic and social upgrading. Political scientist Mary Gallagher, for instance, shows that the 1980s' "dual track" system of the special economic zones that allowed for socialist models and organizations to coexist alongside the new experiments with capitalist markets created competition over FDI (foreign direct investment) between regions and cities.[93] It led to a race to implement more flexible labor policies, to create a mobile workforce, and to grant autonomy to enterprises. By "allowing some to get rich faster," as Deng Xiaoping had famously put it, the government induced desires to self-transform and embrace values such as autonomy, self-reliance, and economic initiative.[94] Economic reform was pushed ahead, while resistance was reduced—a "contagious capitalism."[95]

During the 1990s and 2000s, the CCP stimulated economic growth by expanding the technique of the SEZ rapidly throughout the rest of China (a well-known example is the SEZ of the Pudong New Area and the Lujiazui Finance and Trade Zone established in Shanghai in 1993). When China joined the WTO (World Trade Organization) in 2001, municipal- and provincial-level governments competed over receiving designations such as "creative city" or "city of design," which in turn would funnel resources from the central government in Beijing into their districts and provinces. Shanghai and Shenzhen, for instance, were among the first to turn old city neighborhoods into creative industry clusters and build high-tech innovation parks. These parks, zones, and refashioned neighborhoods (and the high-tech businesses and educational initiatives they attracted) were aimed, broadly construed, at cultivating citizens as "creative talent" (rencai).[96] The build-up of China's creative industry was motivated by the political ambition to mass produce "prototypic liberal subjects,"[97] people

trained to model the social transformation desired by the CCP and "rebrand" the nation in both the national and global imagination as a creative producer.[98]

The official uptake of making by the CCP in 2015 has to be understood as prefigured by these various political projects that strategically invoke China's "humiliating" history of colonization, aimed at inducing desires in Chinese citizens to self-transform and self-upgrade on behalf of the nation. China as a prototype nation, as a nation that is newly emboldened and asserts itself as an alternative model of future making, is co-produced by these long-held aspirations to achieve parity with the West and the party's claims that to achieve a sovereign, modern Chinese nation necessitates a particular kind of citizen. When the prime minister of China visited the makerspace Chaihuo in 2015, the young Chinese men he met (and whom he framed as model makers for the nation) had already received international recognition and were regarded as legitimately creative in the Western tech scene. In the official state media's news coverage that followed his visit, the prime minister was depicted side-by-side Eric Pan and Kevin Lau, both active members of China's maker scene since the beginning. Pan had co-founded Seeed Studio, an open source hardware company that had been key to reformulating Shenzhen's image from a site of low-quality and copycat production into a legitimate partner in open source hardware and tech innovation. In 2010, Pan and Lau had founded Chaihuo—the organization that was key to hosting China's early featured Maker Faires (2014–2015), which drew hundreds of thousands of people, many from abroad. Both Seeed Studio and Chaihuo had become well-known entities in the international maker and open source hardware scene, celebrated by many prominent American maker advocates as advancing their ideals of playful experimentation and grassroots innovation in China, despite early Western accusations that China's version of open source hardware was copying them (see details in chapters 2 and 3). These Chinese men already had, in other words, transformed themselves into the kind of globally recognized, techno-optimistic, happy citizen subjects that the CCP is aiming to cultivate.

When China's prime minister endorsed Chaihuo, the aim was to induce desires in other Chinese to self-transform in the image of the model makers the prime minister celebrated—or, as state media had put it: "Li Keqiang encourages young 'makers': everyone should ascend to excel like Chaihuo." Modeling yourself after Chaihuo, in other words, promised Chinese people they would redeem themselves as creative producers on an international stage; if young Chinese managed to "excel" like Chaihuo, they would receive Western recognition and would be granted (by both the West and the Chinese government) the status of modern and happy world-class Chinese citizens. By transforming themselves into model makers, they would prototype at scale: lift up the nation and its image on both a national and global stage. This call for self-upgrade on a mass scale was aimed specifically at the marginalized and displaced in China's

FIGURE 1.3. Venue of the "2016 National Innovation and Entrepreneurship Week" (2016 年全国大众创业万众创新活动周), also often promoted simply as "Maker Week" (创客周) in Shenzhen. Banners at the venue and throughout the city promoted (in both English and Chinese) Shenzhen as "City of Makers" (与深圳同创造) and called upon citizens to "promote the development of New Economy & Cultivate New Growth Dynamics" (发展新经济，培育新动能), to "Make Innovation and Entrepreneurship Sweep across China" (创新创业，创响中国), and conjure an "Era of Innovation. For Dreams of Entrepreneurship" (创新时代，创业梦想). Large screens showed videos of Prime Minister Li Keqiang among crowds of passionate makers at the event. Photograph by the author.

younger generation, for employment rates among China's college students were low and upgrades in the manufacturing industry (like those carried out as a result of the "Made in China 2025" initiative) had begun to drastically shift the conditions of employment for a generation of young migrant workers,[99] whom the government called upon to return to the countryside and become entrepreneurs, starting businesses—ideally high-tech businesses—of their own. This cultivation of Chinese citizens as human capital was crucial at the moment as the party's leadership was focused on creating a positive image of China abroad to create buy-in for one of its major, transnational infrastructure projects, the Belt and Road initiative (BRI).

Shortly after president Xi Jinping ascended to power, he initiated two major infrastructure projects, in part aimed at addressing China's New Normal through industrial upgrade: the BRI and the "Made in China 2025" initiative. The "Made in China 2025" initiative funded (to the tune of 2 Bio Chinese Renminbi) the upgrade of China's old industries into intelligent/smart manufacturing zones, and the BRI aimed at moving China's capacities in industrial

production, real estate, and infrastructure development (train, roads, cities) into other regions in Asia, Europe, and Africa through a global trade and infrastructure route. Important for both of these projects was the cultivation of "human capital"—people who saw themselves as an instrument in advancing both China's image and its material infrastructures nationally and abroad. Making was ideal for the government purposes to induce in people desires to self-upgrade and build what the CCP referred to as China's "indigenous innovation economy" that would cement China's leadership in global supply chain markets, geopolitics, and the tech industry.

The CCP's invocations of China's colonial past *and* the colonial tropes of othering that wove through the displacement of technological promise onto Shenzhen co-produced "slow violence."[100] They occluded the violence of proliferating precarious conditions of life by harnessing individual dreams of modern belonging and yearnings for alternative ways of being. The promise to be granted the label of creative, modern producer led many of the people I met during my research in China to tolerate orientalist discourse and racism deployed (predominantly) by various Western actors *and* the precarious life their government demanded of them. My point is this: Technology research and design—especially in light of the recent and growing interest in ethics and politics of computing and design amid rising concerns over big data and AI[101]—must reckon with the violence that displacements of technological promise occlude and thus legitimize; violence in the form of racism, sexism, classism, and exploitation masked behind the promise of democratized tech innovation.[102] Just as colonial tropes of the frontier and of "othering" endure in a range of well-known technology practices and sites from Silicon Valley's exceptionalism and universalizing discourse and methods[103] to technology research programs such as ICT4D (Information and Communication Technology for Development) and Ubicomp (Ubiquitous Computing),[104] so are the recent displacements of technological promise onto what was formerly dubbed the "tech periphery" (from "smart zones" and "opportunity zones" in rural America to endorsements of certain regions and cities in the Global South as authentic maker cities and emerging hubs of innovation) marked by what Ann Laura Stoler calls "duress," i.e., the "enduring fissures" and the durable marks of colonial pasts.[105] Communication scholar Fan Yang urges us to understand such processes of colonization not strictly in terms of occupation of territories and the displacement of sovereignty. China, she argues, is not exempt from the conditions of American "coloniality" simply because it was never colonized by the United States. "Coloniality," she shows, is "a cultural logic that continues to exert influence through "imperialism without colonies."[106] Imperial formations and coloniality endure in technology production and design methods, including those celebrated as enabling inclusive and diverse futures such as making and its associated values of open technology and peer production.

The appropriation of making by the CCP was aimed at instilling in people desires to advance the party's ambitions to reassert China as a prototype nation, one that modeled for the world an alternative to the West, a China-specific approach to modernization and economic development—an "indigenous innovation" economy. While some of the people I met in my research expressed suspicion of the government's infatuation with making and open technology, many argued that the party was indeed supporting one of the key goals of China's maker advocates: to reposition China and its people as an equal partner in global tech innovation networks. There was a growing sense that China might in fact be the frontier, the place where the future was being made. And the party's espousal of these values only increased the people's affective connection to these goals. Because making was associated with play, experimentation, and tinkering—qualities that many Chinese I interviewed over the years insisted were Western, and more specifically American—they did not see the CCP's appropriations of making as part of the state's tactics of hegemony, for it functioned not by coercion but by promising happiness via self-transformation.

Differential Yearnings: The Labor of Promise and Future Making

> Yearning is the word that best describes a common psychological state shared by many of us, cutting across boundaries of race, class, gender, and sexual practice. Specifically, in relation to the postmodernist deconstruction of "master" narratives, the yearning that wells in the hearts and minds of those whom such narratives have silenced is the longing for critical voice.
>
> —BELL HOOKS, *YEARNING*, P. 27

What sustained these displacements of technological promise—of frontiers, of happiness, of future making—that came with no guarantees, one that might be deferred or withdrawn without notice? Who were the people who enabled others to live renewed technological promise, and what were the histories and stories of the places where they lived? This book tells their stories alongside those of the people who formulated and implemented the promise of making; it focuses on the sites and bodies that labored to sustain others' lives of technological promise. It was their labor, precarious and often hidden through gendered and racialized exclusions, that provided the necessary conditions to sustain the promise of technological progress, techno-optimism, and future making.

During fieldwork in 2013, I lived for several months in a modern high-rise building in Shahe, one of the city districts in Shenzhen. My apartment was right above the subway stop for "Window of the World," a forty-eight-hectare

theme park with a 1/3 scale reproduction of the Eiffel Tower, which can be seen from across the district. The theme park was built in 1994 as a "world culture primer for China's political elite," who were eager to position Shenzhen as a "civilizational front line in the nation's efforts to 'join tracks' with the rest of the world." The name of the theme park referred to the SEZ itself, which China's political leaders at the time had called a "Window of the World." This move framed the SEZ (in the words of Jonathan Bach) as a "spatial threshold," which "mediates between China's economic space and that of other countries" and "through which one can look both in and out."[107] The theme park was built two years after Deng's famous return to the city in 1992, when he dubbed Shenzhen as a success and held it up as a model for the nation. The rhetoric of the "Shenzhen miracle," propagated by state media at that time, "concealed the precariousness and liminality that characterized and continues to define migrant workers' conditions," the historian Eric Florence reminds us. The people who were made responsible for remodeling themselves to follow Shenzhen's success "were the workers who came from rural hinterlands."[108] They bore the responsibility and precarity that came with the new lifestyle of the SEZ—what then-president Jiang Zemin in the 1990s referred to as the "Shenzhen spirit." This phrase describing the early SEZ was deployed to encourage the cultivation of a new kind of ideal subject, "a person able to transform her/himself and the socialist world," who would (like the SEZ) model the transition from socialism to capitalist expansion and economic development—a person who would live by the neoliberal doctrine, "decide for oneself, strengthen oneself, be autonomous, compete, take risks, and face danger." The construction of this model worker was key to the party-state's ability to "adapt its system of signs and symbols of socialism to the conditions of global capitalism," and to position Shenzhen as the passageway, the window into the world of global capitalism. The language framing Shenzhen as a laboratory and a window, which "emphasized the state's agency in 'opening' (a window) and 'conducting experiments,'"[109] is cemented into the day-to-day urban structures of China's contemporary middle class in the Window of the World theme park, which is now a tourist attraction, a site of leisure and consumption. The theme park materializes a vision of the SEZ not as an incubator for a range of ideas but as an example of successful party policy that set China on the path to the future.[110]

While I lived by the Window of the World theme park, the park was less of an attraction than the glittery shopping mall adjacent to it. With its myriad of restaurants, its large grocery store selling European brands and expensive, carefully wrapped fruits and vegetables, its international fashion labels, its Starbucks and Apple store, the mall extends into contemporary China the SEZ's technique of instilling desires for personal upgrade, autonomy, and self-actualization. The mall is the place where China's upper middle class consumes and plays, where those with sufficient suzhi (quality) feel like modern citizens enjoying the pleasures of their high-tech, modernist city. The thirty-six-story

apartment building in which I lived was only steps away from the mall. My building, which was also home to the Chinese middle class who shopped at the mall, was taller than the replica Eiffel Tower across the street. Looking out from my apartment on the twenty-third floor, I saw high-rise buildings like mine stretching as far as I could see, an ocean sea of glittering lights amidst grey concrete.

This Bladerunner-like image fuels the postmodern sci-fi fantasies of Shenzhen that are invoked in the foreign travel reports depicting Shenzhen as a new technological frontier. But if one reoriented the gaze, away from the seductive draw of the glittering high-rise scape, another life world came into view; my building was located on the edge of Baishizhou, one of Shenzhen's few remaining urban villages. While the theme park, the mall, and my apartment building all contributed to the imaginary of Shenzhen as an "ideal modernist city" with no history, "a clean state, a tabula rasa,"[111] the "architectural form" of the urban village materially encodes the city's "rural history," its stubborn past. As anthropologist Mary Ann O'Donnell has painstakingly documented for more than a decade, Shenzhen's urban villages like Baishizhou played a central role in the making of the high-tech modern city, "provid[ing] the physical infrastructure that has sustained the city's extensive grey economy, including piecework manufacturing, spas and massage parlors and cheap consumer goods."[112] These villages—and their informal economies, based on what O'Donnell, Wong, and Bach (2017) call "illicit experimentation"—were the bedrock of the city's boom, providing affordable housing for the low-income migrants that helped build Shenzhen's economy. In 2007, Shenzhen's urban villages were slated to undergo renewal. Powerful, partially state-owned real estate firms benefited from erasing old neighborhoods and rebuilding them as more lucrative, upscale structures, from condominiums to office spaces and malls—like my apartment building and the mall beside it. These "renewal" projects treat urban villages as cankers—the city's past, its rural history, bursting through the image of the clean, modern, upscale city. As O'Donnell argues, the developers deny the villages' urban status, thereby legitimizing their erasure—and that of a particular past. While the glittering mall and the high-rise apartment complex represent the modernist fantasy of "a rationally ordered society where nature and society fit into precise categories and interact productively according to an unerring logic,"[113] Baishizhou represents its opposite: the narrowly built houses, the tangled electric wires that span its alleys, the small manufacturing shops around the corner of a wet market, make up a rich urban sociality, but officials see it as mud on the hem of the controllable, clean, logically ordered modern city.

I spent much of my time in Shenzhen in 2013 in Baishizhou. The urban village offered a different pace, moments of pause that sustained the projects of acceleration that I had come to study. As an ethnographer, I had joined a start-up team that had been admitted to a Shenzhen-based hardware incubator,

FIGURE 1.4. Street in Baishizhou—urban village, Shenzhen, 2013. Photograph by the author.

funded by a venture capital firm with deep roots in Silicon Valley whose Irish offices were strategically located for tax purposes. This three-month intensive training program invested in open source hardware and maker ideas that promised to scale, working with teams to bring their ideas to the prototype and pitching stage in an "accelerated" fashion (this notion of "acceleration" is an ethnographic thread that I explore in greater detail in chapters 4 and 5). This particular program invested in promising hardware products: data-driven smart systems, Internet of Things, smart objects, wearable technologies, and so on. In the evenings and on weekends, the start-up teams would often gather in urban village neighborhoods, for in the villages, people found a refuge from the demands to scale up and speed up. We ventured into these neighborhoods for fun and leisure, to eat at open-air bbq restaurants where locals played games and drank beer, sometimes staying late into the night. The villages not only offered space for play, they also provided access to affordable services, from mail delivery to electronics repair, laundry services, barber shops, wet markets, and clothing. Many of the team members of start-ups admitted to the incubator program lived on shoestring budgets, and the urban villages provided a crucial infrastructure to sustain the daily needs of team members under the precarious conditions of "venture labor"[114] at the incubator. In other words, the urban village's informal social, economic, and technological infrastructures (built, in part, by waves of migrants) enabled others to live out the promise of prototyping at scale.

In the offices of the incubator itself, a support network in many ways adjacent to that of the urban village made the work of the start-up teams and incubator staff possible—it kept afloat those entrepreneurial workers who were performing the desired work of technological promise, those who, under precarious conditions, worked to transform themselves and their economic and social positions into human capital on behalf of the investor. The incubator had hired two Chinese staff, women in their early twenties, whose key task was to help guide the start-up teams through the emotional ups-and-downs of their entrepreneurial labor in Shenzhen. As the European director of the incubator put it on the first day of the program, when "shit" was broken, it was their job to "fix" it and "to make our lives better." They were to stay in the background, to take care of the program's day-to-day functioning, and to ensure the start-ups' emotional well-being. As I elaborate in much greater detail in chapter 5, these two women were hired to perform what I call *happiness labor*—the work that goes into producing a feeling of optimism and cheerful delight, the affect that underpins entrepreneurial living. It is not unlike what Arlie Hochschild has described as "emotional labor," but it is more specific: it is the particular kind of labor relied on by a range of new organizational models in tech production, including but not limited to incubators, coworking spaces, makerspaces, and open innovation labs. This happiness labor is crucial to making bearable

(and thereby sustaining) the precarious conditions of "venture labor";[115] this labor allows the entrepreneur to feel positive about technology despite his realization that for many, the self-investment on which he is gambling will not pay off.[116]

These differing sites and temporal scales—from contemporary happiness labor in pristine tech programs to the histories of urban villages and migrant labor that prefigure it—produce differential yearnings for alternatives, yearnings that feed the machineries of finance speculation and the displacement of technological promise. Each of these sites variously creates the foundations and possibilities for dreaming and prototyping at scale. The incubator, like many similar programs I encountered over my years of research, functioned like an educational boot camp. Its key aim was to train people to "pitch" or "dramatize" their dreams "in order to attract the capital they need to operate and expand." Anna Tsing puts it this way: "In speculative enterprises, profit must be imagined before it can be extracted, the possibility of economic performance must be conjured like a spirit to draw an audience of potential investors. The more spectacular the conjuring, the more possible an investment frenzy."[117] The start-up teams, the happiness workers, and the migrant workers who built Shenzhen, despite their drastically different positions in society, are all reduced through the logics of finance capital to their roles in the production of dreams. Some people dream; some people support those who dream. They have differential yearnings rooted in their respective positionalities and lives, but to investors they all look the same; they are relevant only if their dreams can scale; only the dreams that are dramatized or spectacularized are eligible for investment.

Some of these dreamers are held up as "models" to induce desires in others, and others are made invisible. The question of who is seen as offering technological promise and happiness and who gets to experience the affect of entrepreneurial living is highly gendered and racialized. During my time in the aforementioned incubator program, only one female entrepreneur was admitted, and only a few Asian men. As the start-up culture taught us, white boys pitch better. The (primarily white) start-up teams were future makers, people who lived the socialist pitch, people who were ascribed the capacity to make a difference, to intervene. They were charismatic figures, and many happiness workers and small entrepreneurs in the hinterlands dreamed of being in their shoes. Some yearnings are enrolled to enable other yearnings, some people's precarity sustains yet other precarious conditions of work.

It might be tempting to imagine the emergence of a unified, unmarked precariat that forms across these different subject positions. This book takes a difference approach. It brings together differential yearnings for alternatives, not to flatten them, but on the contrary to highlight how some people's dreams of social justice and change can actively weaken other people.[118] I show how

the promise of individual empowerment and the consolidation of socialist ideals into the self leads to many individualized "you"s, who in competition with one another rarely find themselves in situations of collective solidarity. The mall by the Window of the World theme park, the middle-class apartment next to it, and the incubator together form an urban high-tech machinery of promise that's oiled for forward movement and for the making of the prototype nation; malls instill desires for middle-class life in the migrant worker, start-up incubators train people to see self-economization as providing them with hopeful agency, and makers model such self-investment for others rendered less innovative.

The concept of *happiness labor* contributes to scholarship of tech and digital labor by attending to labor exploitation in the sites celebrated as open and diverse, lauded for their commitments to peer production, participatory design, and open sharing. While recent scholarship has focused on how creative work has become highly precarious, there is much less attention to the multiple forms of precarity within the creative office, design studio, maker-space, or incubator. Labor exploitation is often assumed to occur elsewhere, on the factory floor, in the warehouse, in an Uber car; much less noticed are the workers who labor to maintain creative and innovative work itself, from cleaning staff to office assistants.[119] I spent much of my research with these workers, whose labor was never celebrated on stage or imbued with the kind of technological promise an entrepreneurial maker could claim, even though it enabled the work of creative production (see chapters 5 and 6).

I argue that attending to the labor that is necessary to nurture and support the neoliberal project of self-economization (of converting the self into human capital) challenges the notion that neoliberal processes and capitalist expansion are inevitable. This book shows that the subsumption of hope and of yearnings for alternatives by capital did not simply occur because of some inert law of the market, but had to be sustained, maintained, and nurtured. We must notice the labor that is necessary to sustain self-economization to refute the neoliberal ideology that economic growth and progress are inevitable and that resistance is unneccessary. If we refuse to participate in displacements of technological promise and attach ourselves instead to those bodies and sites that sustain them, we notice that technology can be otherwise; we recognize that the neoliberal doctrine of inevitability is already being challenged, on a daily basis, by those excluded from living its seemingly utopian promise.

A Few Words on Methods, Sites, and Position

The temporal and spatial contingencies I have sketched in this introduction weave throughout the book. With this approach, I align with the kind of critical historical analysis that moves beyond simply pointing to repetition (historical

continuity) or rupture,[120] but highlights "partial inscriptions, modified displacements, and amplified recuperations."[121] And I align with the (largely feminist) anthropology of the global to attend to the contingencies of multiple sites and regions in uneven, contested, and negotiated alignments and frictions.[122] This is not a study of "tracing" the global proliferation of Silicon Valley's tech promises "outward" into the corners of its imagined periphery. On the contrary, this feminist ethnography of a global phenomenon unpacks how such modernist and colonial tropes of forward and outward movement, of promised connectivity, and transnational "flows" obscure the violence, exploitation, and vulnerabilities of the places and people who are made to endure the perpetual postponement of a more just and equitable world, despite and because of displacements of promise. The kind of multi-sited, genealogical,[123] and interscalar[124] investigation that I have outlined is vitally necessary, I argue: we cannot understand the broad appeal the ideals of the maker movement once had without also understanding the colonial pasts and presents that enabled it to rise, and we cannot understand China's shifting place in the world without accounting for how it was affected by the West's displacements of frontier thinking and technological promise.

By offering a translocal and multi-sited ethnography,[125] this book follows people, stories, and artifacts across regions; my research took me from China to the United States as well as to Taiwan, Singapore, Europe, and Africa. As an ethnographer, I followed the people who opened China's first makerspaces, co-working spaces, incubator spaces, and open source hardware businesses. I also worked with those who were hired to manage and sustain these spaces, but who were seldom interviewed by the media or given space on stage to "pitch" their work. Not all of the people I met were Chinese, and some of those from China had studied or worked abroad. Many who identified with making, hacking, or open source hardware considered themselves to be part of a global movement, traveling across regions and countries to attend events, make connections, present their visions, show off their creations, and learn from one another. In addition to long-term observations and interviews with a range of actors at maker/hackerspaces, coworking spaces, incubators, maker-related events, factories, and electronic markets, a central part of this work included the study of discourse, writings, and policy texts—not only those coming out of China, but also those circulating throughout what many of the people I met over the years described as a "global maker movement."

The research that informs this book spans a decade (2008 to 2018), from when I was a doctoral student, through my time as a postdoctoral fellow at Fudan University in Shanghai and the Intel Center for Social Computing in Irvine, and eventually to my transition to working as an assistant professor at the University of Michigan in 2014. Five years of this time, I lived and worked full-time in China. While my early work took place predominantly in Shanghai

and Beijing, since late 2012, my research has frequently taken me to Shenzhen, when a growing number of open source hardware enthusiasts, makers, designers, researchers, investors, and start-ups just began traveling there. Shenzhen has transformed rapidly in the short time span, both in terms of its image and in terms of its material, economic, and political infrastructures. My research in Shenzhen in 2012 started out in a foreign-funded incubator and some of the Chinese makerspaces and open source hardware businesses that had just opened up. Part of this research included the participation in the day-to-day, decidedly unglamorous process of repeatedly pitching to investors and repeatedly revising the pitch until the central product idea was muffled in a cloak of tech buzzwords—the monotonous, vacuous language of techno-utopianism—that was required to get a VC's brief attention. I joined start-up teams as they visited local factories to source components, get prototypes made, or plan assembly production, and as they interacted with vendors on the Chinese ecommerce website Taobao to negotiate prices, shipping, and quantities.

Over the following years, I focused specifically on the transformations I saw unfolding at the intersection of urban and technological remodeling in Shenzhen. I followed the material and discursive productions that transformed the region in the broader tech imagination. This research included observations of and interviews with not only the growing number of Chinese start-ups, makerspaces, and incubator programs, but also with urban planners, policy makers, and government officials, and with the workers, engineers, managers, and designers in Shenzhen's manufacturing industry. As a white, female researcher, affiliated with an American university, conducting research on Shenzhen's manufacturing industry, I was often approached with a sort of bewildered curiosity that opened some doors and closed others. Not surprisingly, people at first associated me with the figure of the Western reporter focused on producing sensational sound bites, retelling the familiar story of China as a copycat nation or, more recently, telling stories about Shenzhen and China as rising innovation powerhouses. Many assumed at first that I would write negatively about Shenzhen's history of electronics production, and most people distanced themselves from the region's associations with copycat at first. But over the years, such interpretations of my work faded. Some began seeing me as an ally who could help correct China's image in the West—a project that, I came to discover, many were nevertheless highly ambivalent about.

For this period of research with Chinese workers, designers, and engineers in the manufacturing industry, I worked closely with Ingrid Fischer-Schreiber. She was an invaluable interlocutor for my thinking throughout my research and a key partner for these later parts of my fieldwork. Ingrid came to China for her training in Mandarin Chinese in the early 1980s and has since worked as a professional cultural interpretor, translator, and writer. Her long-term engagement with China and Chinese cultural and creative practices in

particular greatly enriched my ethnographic research. Her outstanding language skills were of tremendous support during interviews and conversations with people from diverse ethnic and language backgrounds when my skills in Mandarin Chinese, obtained through training at universities and language programs in the United States and in China since 2006, would reach a limit. In all of these research engagements, my work has been centrally informed by the fields of science and technology studies (STS), cultural anthropology, human-computer interaction (HCI), and China Studies. I have read and cite widely across adjacent fields pertaining to my topic, such as political science, labor studies, postcolonial studies, critical political economy, communication and media studies, and southeast Asian studies. I am deeply committed to the critical sensibilities that inform these fields (and, ironically, suffuse much of the maker movement itself)—specifically, a modality of detangling, of unmasking concealed processes and ideologies, of challenging both linear time and the assumption that technology flows from a dominant Western "here" to another "out there."[126] I am both sympathetic to and wary of the well-known maker and hacker practices of reverse engineering and opening up the black box of technology. My commitments lie adjacent. I draw specifically from the techniques of feminist scholarship that have been working to untangle seemingly solid knots and show how technology can be otherwise.

My aim is to speak and write through the contingencies and complicities that held up the promise of making through a myriad of sites—financial investments, scholarly fascination, corporate interests, activist ideals, educational programs, techniques of governance. Specifically, I step away from two existing (dominant) interpretations of making—one of a successful grassroots movement that returns power to the users and consumers of technology, the other of how a once-authentic resistance movement has been co-opted by neoliberal corporations, states, and institutions. Both narratives depend on romanticized ideas about resistance and intervention, embodied in specifically racialized (white) and gendered (male) figures such as Edward Snowden or Steve Jobs. Stories of either success or failure prevent us from noticing what was most interesting about making; its capacity to accommodate diverse, often contradictory hopes and anxieties. This book does not speak of either pure dissent or total appropriation, but traces stories of ambivalent alliances and always already partially compromised ideals. We need to make sense of how the enduring seductive draw of technological promise can coexist with the proliferating distrust of its attainability. Future thinking and the promise of technological progress still exist in making, but only partially, and often contested. This book looks at efforts to work within and through neoliberal restructuring and technological promise, while moving outside their logics and attending to the contingencies and ruptures of techno-economic universals. Rather than

seeking to pronounce making as ultimately "good" or "bad," as radical or thoroughly subsumed, I focus in this book on its tangle of contradictions.

In 2011, when I was a graduate student at UC Irvine, feminist technoscience scholar Donna Haraway came to speak as part of the university's famous Wellek Lectures series. In her talk, she invoked a figure that stuck with me, one that I have often returned to over the years: the cat's cradle, one of my favorite childhood games. In this game of "relentless contingency," the longer one plays, the more complex the patterns that are woven and pulled apart become, the deeper one becomes entangled. In order to function, the game demands continuous and often ambivalent attachment that is sustained through literal manual labor—the labor of one's hands.

This book traces such knotted attachments and complicit tangles, in which the scholar is also enmeshed. Over the years of research that have informed this book, my own job as a scholar and educator at the university has become increasingly intertwined with the sites, ideals, and practices I studied— including the less idealistic, more instrumental uses to which making has been put. During this period, universities sprouted incubators, makerspaces, and design thinking labs that promised to train both students and faculty in entrepreneurial skill sets and innovation thinking. When I started out as an assistant professor at the University of Michigan, my school set up an entrepreneurship program that employed the tools and techniques of making, acceleration, and design thinking in order to graduate "valuable employees," trained "to identify problems" on their own (UMSI entrepreneurship program). Similar efforts are nearly ubiquitous in universities, libraries, and educational programs across regions. And, as is becoming painfully evident, universities are not spared from the creep of neoliberalism.[127] In the United States and China alike, scholars are called upon to become entrepreneurial, to accelerate their output, to increase the numbers of citations they receive, to teach students to upgrade themselves into attractive human capital that serves the needs of the market economy. This feminist ethnography will thus frequently take us to scholarly and educational sites deeply complicit in producing the displacements of technological promises I examine here.

In-depth research on China's design, technology, and entrepreneurship cultures and histories remains sparse, with a few notable exceptions.[128] This book aims to further intervene in this field by teasing out the various threads that make up contemporary sites of technology production in China. These sites are rarely considered with the same careful focus or given the same countercultural cachet as similar sites and practices in the West; and rarely is scholarship that theorizes from the non-West taken up for its analytical and theoretical contributions alone. Similar to many of the people I met in my research in China, I have struggled with the relentless interrogation of what was the

"uniquely Chinese" approach to making. Research in China is often interpreted as being about what is going on *in* China, but seldom read as having much to say about Western imperialism or processes of globalization. Research on technology practice in China is seldom taken up to inform theories of computing more broadly and beyond insights specific to China. Technology practice and research in China are largely construed as standing for a local and a national particular, despite the push back of a lineage of feminist anthropology that has introduced us to global assemblages, frictions, and political projects of decolonization.[129] This book shows that it is exactly such portrayals of China as incapable of defining anything of the scale as theory and modernity that enable colonial reverberations and their violence, legitimizing experiments with various forms of neoliberal restructuring and various forms of exploitation, within and beyond China's national borders. It is this tangled cat's cradle, woven of China's long-held aspirations of modern and global belonging, the proliferation of fears about increasing labor precarity and loss of agency in the West, and experiments in technological tinkering, that this book aims to loosen up.

Chapter Overview

The chapters that follow do not map a linear, temporal trajectory. Instead, they move between various temporal and spatial scales, pause at expressions of ambivalence, fall into gaps that interrupt smooth global connection, and move along the cycles of enduring promise.

Chapter 2, "Prototype Citizen: Colonial Durabilities in Technology Innovation" covers the years 2007 through 2011, when a collective of Chinese artists, designers, engineers, entrepreneurs, and Internet bloggers began to experiment with the ideals of the American free culture movement, participatory design, and eventually, open source hardware and making. Their work of transplanting Western ideals of participatory, open, and democratized technology production into contemporary China created an affective connection between China's history of manufacturing and its future as a global economic power. Their early experiments with participatory design, coworking spaces, makerspaces, and open source, open innovation, and open design, were aimed at prototyping a "new" Chinese citizen, i.e., the utilization of technology to cultivate an optimistic, forward-looking, entrepreneurial Chinese citizen, at last freed from connotations of lack and low quality. These attachments to technological promise are deeply intertwined with China's ambivalent relationship to the West, marked both by histories of colonialism and by revolutionary imaginings of alternative modernities.

Chapter 3, "Inventing Shenzhen: How the Copy Became the Prototype, or: How China Out-Wested the West and Saved Modernity," shows how a growing

distrust of modernist ideals of progress in the broader tech and design imagination following the financial crisis of 2007–2008 found expression in shifting engagements with China. Specifically, I focus on how a series of influential actors, entangled with Western networks of investment, open source hardware, the arts, and design, turned to Shenzhen to make sense of technology's broken promises and partially redeem them. They portrayed China through colonial tropes of othering, framing its alleged backwardness, its associations with fake and copycat, as an opportunity space, to be celebrated for its difference. As technology was increasingly disassociated from its promise of modern progress, a new concern arose—that of the ethics and morality of the designer and engineer. As this chapter shows, Shenzhen was framed as a laboratory of exuberant scale that enabled the prototyping of a moral designer and engineer self who could claim to recuperate technological promise.

Chapter 4, "Incubating Human Capital: Market Devices of Finance Capitalism," documents how the venture capital system captures yearnings for technological alternatives. I follow the workings of a foreign-funded hardware incubator program in Shenzhen that trained people to translate their commitments to social justice into a pitch for finance capital. The incubator program taught people how to see themselves as human capital.[130] The chapter shows that the turning of the self into human capital is all but an inevitable outcome of neoliberal capitalism but has to be actively taught and learned.

Chapter 5, "Seeing Like a Peer: Happiness Labor and the Microworld of Innovation," builds directly on the previous chapter. It shows that entrepreneurial life required nurturing and maintenance. Specifically, I examine the exploitation of "happiness labor," the work of emotionally supporting precarious entrepreneurial life. Although happiness workers are often highly educated, happiness labor itself is low paid. These overqualified people are drawn in by the implicit promise that one day the happiness worker will be one of the entrepreneurs. Happiness labor is performed primarily by women and racial minorities. This chapter examines how the misogyny that is seemingly baked into tech bro culture in Silicon Valley was re-legitimized in China via the promise of peer production and openness.

Chapter 6, "China's Entrepreneurial Factory: The Violence of Happiness," documents the appropriation of making by the CCP, which manifested in infrastructural and urban upgrades aimed at inducing desires for self-transformation in Chinese citizens. I draw, here, from ethnographic research I conducted with the workers, designers, and managers in Shenzhen's manufacturing industry, documenting their ambivalent relationship to the "invention" of Shenzhen as a maker city. The chapter shows that by positing certain urban spaces as sites of making and as the ideal training ground for happiness and self-investment, the government aimed to induce in the workers, designers, and engineers of

China's manufacturing industry desires to upgrade themselves. It documents the slow violence at the heart of contemporary displacements of technological promise.

The conclusion returns to the labor and sites that have long challenged the inevitability of technological progress and its violence. It argues that if we attend to the labor that's necessary to nurture and sustain entrepreneurial life, we can mobilize other feelings to subvert the political economy of affect that runs on the promise of happiness. We can subvert the seemingly endlessly spiraling displacement of technological promise if we reframe what counts as intervention by moving away from our ideal types of countercultural heroism.