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## Introduction

### [0] *Todos con el mismo chip*

In the year 2014, three different collectives of promising young people in Mexico boarded buses. All three shared a general disillusionment with Mexican political and economic reforms, and all three had visions about how to leverage new technologies to disrupt business as usual in Mexico and effect meaningful change. They had different destinations, yet they traveled similar roads—but the three buses and the talented young people aboard never intersected or met. Their journeys also met dramatically different ends. One group received prizes and national acclaim. Another made it to Silicon Valley, where they brushed shoulders with renowned investors and entrepreneurs. Most of the young people aboard the third bus wound up dead or disappeared by state authorities.

The first collective boarded *la combi de la ciencia* (the science VW bus/van), a 1992 baby blue Volkswagen Transporter, with a plan to make science accessible to marginalized rural communities. The project was spearheaded by Cristóbal Miguel García Jaimes, who had become known in Mexico as *El Chico Partículas* (The Particle Boy). At the age of 17, he had worked on building the world's cheapest scale model of a particle accelerator. His vision was to bring this miniature on tour using the combi de la ciencia, showcasing it to his paisanos across rural regions in his native state of Guerrero, driving along a route he called “la ruta de la ciencia” (the science route). One of the key projects they carried out with the combi de la ciencia was called *pepenando computadoras* (trash-picking computers), in which they repaired unused computers from Mexico City and donated them to young kids along the science route who didn't own personal computers. “Qué tal si el próximo genio de la computación está en la sierra!” (Perhaps the next computer genius is somewhere in the mountains of Mexico!), he emphatically told reporters. In the many videos across social media and news sites that documented El Chico Partículas and *la combi de la ciencia*, Cristóbal wore his “Work Hard Dream Big” t-shirt and frequently pointed out that one could easily find

“talent” in marginalized rural towns and that with enough will and education anybody from these communities could “salir adelante” (get ahead in life). Media reports loved to highlight his humble origins and sense of overcoming, and frequently included his exuberant quotes, such as “Si Pedrito no puede bajar de la montaña, los aceleradores de partículas y la combi de la ciencia subirán hasta Pedrito.” (If Pedrito can’t come down from the mountain, the particle accelerators and the combi de la ciencia will come up to find Pedrito.)

Around the same time as El Chico Partículas and friends were *pepenando* computers between Mexico City and rural Guerrero aboard their mobile science lab, a different group of technology tinkerers boarded a bus headed out of Mexico City, toward the US. Traveling on this mobile hackathon, this “startup bus,” they were tasked with representing Mexico in a festival to be held in Austin, Texas. Chosen from and tried among Mexico’s best technology hackers after being active participants in Mexico’s hackathon scene, the young people aboard, like those traveling in la combi de la ciencia, also felt that they had to take matters into their own hands in order to implement needed change in Mexico. One of the young men on this startup bus was Javo, who straddled the line between hacker and entrepreneur, having previously worked on technological projects to prevent voting fraud, as well as other more commercial apps that he had pitched to Mexican investors. Disillusioned with the lack of support he had received from state and private entities for any of his proposed projects, the startup bus allowed him to pitch his ideas to a broader audience. But it also gave him the space to conceive a new idea altogether. Experiencing intermittent internet connection on the bus and having just lived through several earthquakes in Mexico City that left residents disconnected and unable to communicate with one another, Javo and his co-founders came up with an app, Pingafy, that would allow people to communicate with each another without needing an internet connection. They not only won that hackathon competition, but after years of perfecting their technology and pivoting their ideas, they received millions of US dollars from Silicon Valley investors who saw their project as a promising “disruptive” technology, and their platform was eventually used during protests and natural disasters across the world.

The third collective that boarded a bus also set out to disrupt business as usual. On September 26, 2014, a group of students from the teacher-training college of Ayotzinapa in the state of Guerrero mobilized to attend the annual commemoration of the 1968 massacre, in which the Mexican army killed hundreds of student demonstrators. To arrive at the event in Mexico City,

they commandeered several buses, a practice that was quite common for students from the country's rural boarding schools. These schools—called *normales*—were created in the 1920s for children of campesinos (working-class farmers), and the students had developed a reputation for political militancy.<sup>1</sup> The students wore their penchant for disruption proudly, and taking over private buses as transportation to attend a demonstration was a way to display the tactics they had to resort to since the government had abandoned them in lieu of supporting urban, more “modern” citizens. The *normalistas* had evolved over the century, though they still carefully cultivated a culture that privileged collective action, education for the poor, and student voices in all political matters.<sup>2</sup> As the students set out from the city of Iguala that night, they were met with an armed operation that left most of them dead and 43 students disappeared. Although the case is still officially “unresolved,” the disappeared students are still “missing” and many accounts link federal forces to the incident, charging that the Mexican Army was responsible for kidnapping and murdering the students, with many of them last seen being dragged off by federal and state authorities.<sup>3</sup>

While these three collectives experienced drastically different fates, their stories nonetheless share key elements and their political aims overlapped. Like El Chico Partículas, the future teachers at the escuela normal in Ayoztinapa imagined a brighter future for young people in Guerrero. One of the requirements to enter this rural school was to come from a family of *campesinos* or from a poor family, and they worked directly with a younger generation to implement self-sustaining projects, often using new agricultural technologies, aimed at achieving a more egalitarian future. The founders of Pingafy even aligned themselves with the mission of educating the poor and working with rural communities. Javo asserted that his team would have been as happy connecting a few students with no internet access in rural Mexico as helping to connect thousands of protesters in Hong Kong. The interventions of the three groups were inflected by class privileges that granted social and physical mobility, but they also enacted a socially conscious “disruptive” spirit; fed up with promises that never materialized, they

1. Padilla (2013) shows that “escuelas normales” are a direct product of Mexico’s 1910–1920 revolution and gained prominence in the 1930s as part of a push for land rights and worker’s education and political consciousness. Known for their political radicalism, they garnered frequent intelligence reports from Mexico’s *Secretaría de Gobernación* (Ministry of the Interior).

2. Padilla, 2022: 2.

3. The mass murders caused national scandal, protests, and political commentary. For a collection of texts from Mexican and other Latin American scholars addressing the incident, and criminalization of particular youth across Latin America more broadly, see Valenzuela, 2015.

took matters into their own hands. However, instead of receiving the awards and acclaim that El Chico Partículas and friends received, or the millions that Javo and his app’s co-founders received, the Ayotzinapa students were met with gunshots.

This juxtaposition of initiatives might be less jarring when contextualized in relation to the sociotechnical imaginaries that have historically animated tensions between the old and the new, the traditional and the modern, the indigenous and the mestizo, the urban and the rural, the technical and the non-technical. In contemporary Mexico the celebration of “modern” engineers, scientists, and entrepreneurs—El Chico Partículas and especially Javo, in this case—became part of the nation-making project to stage the potential of technology to fulfill the promise of progress. The promise of *entrepreneurial* engineers and scientists helped to promote a political agenda where young people were asked to appropriate neoliberal discourses about taking initiative, being self-satisfied, not waiting for government, and being “socially conscious.”<sup>4</sup> These entrepreneurial engineers were constructed in opposition to the more rural, less “modern,” not-technical-enough normalistas, whose projects and initiatives were considered more threatening and a nuisance to the state’s path to progress—their “disruptions” were not considered of the respectable variety that El Chico Partículas’, and especially Javo’s Silicon Valley-focused efforts, came to represent.

Anxieties about Mexico’s future were manifested in state economic reforms as well as in myriad initiatives undertaken by young people themselves. El Chico Partículas became a poster boy for the government’s Mexico Conectado project, which promised to end the digital divide across the country by “connecting the disconnected.” The project established *odos* (nodes), or *puntos* (points), across the country where young people could gain access to the promised technological infrastructure that would help them get ahead in life. Many of my research participants took part in the first cohort of the original nodo in the state of Veracruz, and I followed their trajectories as they were commissioned to implement nodes in other parts of Mexico. Within these spaces, the government dedicated resources to hackathons that became part of *retos* (challenges) named *Todos con el mismo chip* (Everybody with the same chip). These challenges occurred

4. I use “neoliberal” as a logic of governing for optimal outcomes (Ong, 2006), an approach that moves away from all-encompassing Neoliberalism “whole” (Collier, 2009). As scholars have shown, elements usually associated with “neoliberalism” (e.g., efficiency, transparency, forms of enterprising subjectivity) can take unexpected forms on the ground (DeHart, 2010; Hoffman, 2010).

within the nodos, and they aimed to recruit young people who wanted to propose technological solutions to “transform communities and positively impact Mexican lives,” according to their promotional materials. They also made clear that computers as well as a particular coding logic and code model of cognition were central to alleviating Mexico’s social and economic ills. “Inglés y computación para todos” (English and computation for all) was a slogan consistently featured on promotional materials for the nodes, presented as a viable solution for helping the nation “catch up.”

My opening stories of young people boarding buses, mobilizing across different locations and spaces, mean to highlight this feeling of catching up, this neoliberal hustle, that motivated different groups of young people. Disenchanted with the state-sponsored initiatives meant to boost a failing economy, young idealists were nonetheless willing participants in these endeavors. They attempted to sustain a critical stance on these projects even as they were also figuring out how to succeed in the global information economy workforce, and most importantly, how to stay alive within repressive government structures.

*Code Work* highlights the ways young people position themselves in relation to narratives that promote the promise of technology and modern infrastructures.<sup>5</sup> As government-sponsored nodes were constructed here but not there, as particular forms of disruption and technological entrepreneurship were valued for some people but not for others, young people learned to function inside of a neoliberal economy by using resources at hand and by appropriating the discourses of flexibility and self-management across highly uneven terrain. I focus in particular on young people who are drawn to the world of computer programming, who find value in honing their code work within hackerspaces. Throughout the book, I show how participants cultivate careful hacker ethics to develop a strong sense of self and to use the practice and language of “coding” to negotiate their sociopolitical reality.

From villages in rural Mexico, through urban labs and hackathons, to the iconic reference point of Silicon Valley, these hackers work on exposing the tensions between the socially transformative potential of hacking and its imbrication in the transnational political economy of tech work divided and structured by the US/México border. Mexican and Latinx hackers immerse themselves in the code worlds, develop hacker ethics, and re-interpret coding logics to think with the underlying political, social, or economic system in an attempt to reorganize their relationships with entities who produce

5. Anand et al., 2018; Shankar, 2008.



value from their hacking. Across the book's chapters I take the labor of coding as central to my interlocutor's constructions of self. Connecting such self-making idioms of coding to the logics and metaphors programmers deploy across the "stack"—those interdependent layers of hardware components and software protocols that make high-level computation possible—I develop the concept of the *ethno-stack*. The ethno-stack refers to those interleaved personal, interpersonal, sociopolitical, and sociotechnical elements that come together when actors seek to make computation work for a people, an ethnos, here, often a people identified as Mexican or Latinx. *Code work* is the labor my research participants engage in as they create and think with instances of the ethno-stack. As I will explicate, this work unfolds across a US–México network, or the *techno-borderlands*. In this zone, which I myself traveled as an ethnographer, US/Mexican hackers deploy the language of coding to navigate boundaries of nation, race, ethnicity, class, and gender—boundaries, often hierarchical, that coding promises to reconfigure, but that also remain essential to the transnational economy of tech and, thus, also, often resurgent at every step.

### [1] Hackathons, Hacker-Entrepreneurs, and Hacker Ethics

Although the collectives aboard the three buses never intersected, one space that *could* have offered an opportunity for them to meet and collaborate was the hackathon. Hackathons take on very different modes of participation depending on the group of organizers and sponsors, but the basic idea of the form is that an interdisciplinary group of (mostly) young people meet and network with other hackers or entrepreneurs over the course of a weekend.<sup>6</sup> They work collaboratively to prototype project ideas that might resolve an issue related to an organizing theme for the event. Themes such as health-care, economic or social inequality, climate change, and immigration make frequent appearances. Participant teams then present "pitches" to a panel of experts who judge the viability of the proposed projects, which usually offer technological solutions to the identified problem. While thousands of prototypes might be started at these events, many hackathons end similarly,

6. To get a sense of how popular hackathons were when I conducted research, an organization dedicated to enumerating the events and their artifacts reported that in 2016 there were at least 3,450 hackathons organized, 200,000 people participating in them, and 13,000 prototypes built in over 100 countries (Quenardel, 2017).

with participants just shaking hands and saying goodbye, and much of what “gets built” never getting built at all.<sup>7</sup>

An existing and vital literature on the social science and culture of hackathons centers around three themes. First, there is a conversation about connections with state-based hacking.<sup>8</sup> Second, many scholars have tracked the re-emergence of the maker movement and a do-it-yourself ethic that defines hacking as broad clever practice.<sup>9</sup> Third, there is a discussion of how hackathons may operate as a training ground for the frequently unpaid grunt work of the knowledge economy.<sup>10</sup>

In the state-based hacking domain, hackathons are advanced by governments with interests in creating both temporary and permanent spaces as models for a new society, where openness, acceptance, discussion, and participation flourish, and where digital technologies can become tools for empowerment. From the state’s perspective, the construction of modern hacker and maker spaces represents a newly forming “innovative culture”; the spaces function as efficient and scalable means to “develop,” “modernize,” and appear economically competitive.<sup>11</sup> Within these spaces young people are encouraged to take matters into their own hands and assume their role as technical, “entrepreneurial citizens.”<sup>12</sup> This connection between entrepreneurial subject-making and neoliberal nation-making is not unique to Mexico. Describing projects across Asia and Africa that present entrepreneurs as drivers of forward-thinking, large-scale social change, Lilly Irani observes, “These projects cast entrepreneurs as collaborative rather than agnostic, technical rather than political, and constructive rather than complaining.”<sup>13</sup>

The second thread of research emphasizes the crossover between hacking based on manipulating software and hacking based on manipulating materials. With the rise of hackerspaces, we also see a rise in “fab labs” and

7. Irani, 2015: 804. McIntosh and Hardin (2021) conducted an empirical study of nearly 12,000 project code repositories related to the popular Major League Hacking events between 2018 and 2010 to conclude that very few show patterns of consistent development, with only 7% of projects showing any activity after 6 months.

8. Beltrán, 2020a; Irani, 2019; Lindtner, 2020.

9. Jordan, 2017. Maxigas (2012) explores how these movements and corresponding ethics have been characterized by a turn toward the physical, especially spurred by the emergence of new technologies like 3-D printing.

10. Gregg, 2015; Zukin and Papadantonakis, 2017.

11. Beltrán, 2020a.

12. Irani, 2015, 2019.

13. Irani, 2015: 803.

other makerspaces that center “making” as an activity.<sup>14</sup> Here, making is framed as a solution to social and economic struggles by enabling a return to an authentic, deep, and hands-on engagement with the world—one imperiled by the outsourcing and automation of manufacturing and advances in information technology.<sup>15</sup> Hacking and making are thus framed in opposition to passive consumer culture; “prosumers” are now technology producers and engaged citizens who address societal concerns in a hands-on manner and gain the skills to intervene in the market economy, or at least become employable in it.<sup>16</sup>

The third line of research overlaps with the second by emphasizing how Silicon Valley always looms large in the background of the hackathon. Quite literally, many times the representative images and inspirational quotes from famous Silicon Valley entrepreneurs are painted on the walls of hackerspaces.<sup>17</sup> Here, the hackathon event is analyzed as a microcosm of Silicon Valley dynamics, where participants perform mercurial allegiances and work in focused, high-innovation cycles meant to mimic free-market business processes.<sup>18</sup> While Silicon Valley is a diverse region by no means governed by a single ethos,<sup>19</sup> the techno-entrepreneurialism and high-tech capitalism it has come to represent leads to pre-packaged toolkits and guides which have created a type of branding that attempts to emulate professional identities and economic success in innovation hubs around the world.<sup>20</sup>

Across the many hackathons in both Mexico and the US that constituted my research sites, the cultural practices of the tech companies and collectives that make up Silicon Valley were inextricable from the sociotechnical infrastructures my research participants navigated. Many of my research participants aspired to gain employment with prestigious tech companies, and even if they didn't, they ended up doing work for them on a contractual

14. Gauntlet, 2011.

15. Lindtner, 2020; Uribe, 2021.

16. Lombana-Bermudez et al., 2020.

17. Beltrán, 2020b.

18. Jones et al., 2015.

19. Scholars have shown that “Silicon Valley” is home to a range of distinct values and ideologies, from conventional engineering commitments (English-Lueck, 2002), to “laid back” California attitudes (Saxenian, 1996), to narratives of rapid class mobility for specific ethnic groups (Shankar, 2008), to new age philosophies (Zandbergen, 2010), to neoliberal orientations (Marwick, 2013), to countercultural practices (Turner, 2006).

20. Avle et al., 2017. One Silicon Valley-inspired tech startup approach frequently heard in the hackathon circuit, for example, is looking for the “ideal” team of a hacker (a person with programming skills), a hustler (a person with business skills), and a hipster (a person with marketing/design skills).

basis or used their technologies. Silicon Valley is frequently championed as a model for technological innovation, a place where high revenue generation and disruptive technologies are attributed to a culture of competitive collaboration, lean methodologies, and colorblind meritocracy; these cultural practices are said to “level the playing field.” At the same time—and especially after major tech companies released demographic data about their workforce—it is critiqued for underlying structures that promote patriarchy, racialization, and exploitation.<sup>21</sup>

The popularity and proliferation of the hackathon in the early 21<sup>st</sup> century thus provides an entryway for examining the way some hacking formats attempt to encompass both liberatory and market logics. The highly ephemeral but also highly public nature of the hackathon further allows a precise view of how different communities crystallize and evaporate as they align with hacker and entrepreneurial identities. Companies capitalize on hacking energy “from below” to promote their products and have developers work on their technological platforms and infrastructures.<sup>22</sup> At the same time, anthropologists and other researchers have benefited from the space and time compression of the event, which allows them to treat it as an ideal ethnographic site to focus on the imaginative and communicative labor, in addition to the technical work, that enthusiastic participants come to perform within these spaces.<sup>23</sup> What is being “made” at these events is really a set of dispositions and attitudes about how to develop relationships to new technologies, as well as to one another, as “maker,” “hacker,” or “entrepreneurial” subjects, many times in the face of precarity and marginalization.<sup>24</sup>

What the compressed time of the hackathon offers for many participants is the promise of self-guided discovery and learning that can provide a heightened sense of agency. This is especially true for members of marginalized groups who participate in the cultures of computing and entrepreneurialism often promoted at hackathons. If hacking is to be not merely a site of activism that gets co-opted and absorbed back into corporate cultures of innovation, where hackathon participants are implanted with “el mismo chip,” where they’re asked to “add value” by translating injustice into corporate products and services, then the compacted space might serve to forge new solidarities, oppositional politics, or even calls to dismantle the

21. See Beltrán, 2017c.

22. Söderberg and Delfanti, 2015.

23. Irani, 2020.

24. Ames et al., 2018; D’Ignazio et al., 2016.

structures central to the oppression and dispossession of others.<sup>25</sup> As events continue to be organized by communities with a critical eye toward the potential for sociotechnical infrastructures to be deployed in the name of re-shuffling hierarchies of power and expertise, it's important to understand how hackers from other(ed) positionalities not only extend the genealogies of hacking, but also re-establish and re-orient them by imploding popular terms such as “hacking” and “entrepreneurship”—they learn to think against the ideology of “todos con el mismo chip.”

One of the ways I point to the shifting tenor of hacking communities in Mexico is by using the term *hacker-entrepreneur* to identify my research participants. Though in subsequent chapters I analyze the ways a minority of them more tightly control the hacker identity, this hybrid term points to the way many often shift between these labels, or in some cases see no difference between the labels at all. A popular conception of the hacker might refer to someone who loves to program computers in the spirit of playfulness and exploration, and a popular conception of an entrepreneur might reference someone immersed in capitalistic or technocratic motives. A smaller subset of hacker projects, such as radical hacker collectives or *hacktivists*, were directly antagonistic to capital and sought to enact social justice politics, but hacker-entrepreneurs didn't conform to these strict demarcations. The term points to this fluidity between identities but also to the ways techno-entrepreneurial Silicon Valley-esque cultures have come to dominate hacking cultures in Mexico and Latin America more broadly. Some collectives might have originated as free software development and advocacy projects in the late 20<sup>th</sup> century,<sup>26</sup> but (whether they like it or not) they are now tightly coupled with the technologies and infrastructures that have emanated from techno-entrepreneurial cultures. Still, my research participants proudly wore the hacker badge across diverse spaces and collectives, usually to reference the fact that they were able to put in the code work, that they had the ability to immerse themselves in the code worlds and program computers.

One way research participants took it on themselves to hone in on what exactly a hacker identity symbolized was by developing hacker ethics. As programming extended in time and space from the confines of the

25. Irani, 2019. Maxigas (2012) makes a distinction between a later generation of “hackerspaces” and the early “hacklabs.” The latter were situated in anti-capitalist movements and barriers of access to communication infrastructures, which made them more overtly political in their call to spread access to the dispossessed and championing of folk creativity.

26. Kelty, 2008.

hackathon to the first hacker school in Mexico (and Latin America), for example, hacker-entrepreneurs gathered to improve their programming skills, work collaboratively on projects, and cultivate the hacker ethos by making explicit the ten principles of their “hacker ethics”<sup>27</sup>:

- <1> Give before you get
- <2> No pedir permiso (Don’t ask for permission)
- <3> Hacer > Hablar (Doing > Talking)
- <4> No existen excusas (No Excuses)
- <5> Resolver problemas (Solve problems)
- <6> Sigue tu curiosidad (Follow your curiosity)
- <6.2> Fracasar == Crecer (Failing == Growing)
- <7> Conoce tus herramientas y comunidades (Know your tools/  
communities)
- <8> Siempre aprender (Always be learning)
- <9> Involucrarse (Get involved)
- <10> Divertirse en el proceso (Have fun)

The emphasis on self-sufficiency, curiosity, and fun espoused in this ethic is fundamental to defining hacker culture and identity, as well as to guiding hackers as they move through other domains of their personal and professional lives. The listing out of these tenets takes inspiration from the lore of hackerdom, especially other rules and manifestos that frame hacking as encompassing alternative practices and means of exchanging knowledge; modes of cultural and technical production that defy convention; counter-cultural politics; and most saliently, computing expertise.<sup>28</sup>

Hacking, especially when considered from outside the Global North, can become a site where young people work to either break *out of* or *into* global techno-cultures.<sup>29</sup> In contemporary Mexico and across the US/México techno-borderlands, young people learn to do both as cultures and imaginaries of “innovation” and “disruption” collide with practices of

27. Morato (2015a, 2015b) created both the English and Spanish versions of this list.

28. Levy ([1984] 2010), for example, provides a journalistic account of the founders of the Tech Model Railroad Club at MIT, who took their technical curiosity to all domains of life, who saw themselves as hackers because of their shared interest in the computer as a revolutionary tool, and proposes six key tenets that guided their underlying set of morals, beliefs, and worldviews. See also Wark’s (2004) hacker manifesto and Himanen’s (2001) hacker ethic.

29. Nguyen (2016) works with Vietnamese hackers to show that people from marginalized locations might very well be looking to break into global techno-cultures from which they have been excluded. Nguyen argues that this is quite different than the breaking out of sociotechnical limitations that hacking in the Global North posits.

protest. With Silicon Valley and its corresponding techno-entrepreneurial culture always looming in the backdrop of many of these hacking spaces, emergent politicized forms of hacking can both accommodate and even succumb to market logics of competitiveness, agility, autonomy, and risk, while also providing openings for more critical, anticapitalist, and decolonial approaches. Considering practices of coding across the US/México techno-borderlands as an instance of “hacking in/from the South” further reveals the complex relationships between technology-driven capitalism, entrepreneurship, and hacking outside the Global North context.<sup>30</sup> The state builds more nodes and hackerspaces as it reinvents itself in relation to an ever-shifting modernity, but hackers create a collectivist response—within these spaces, they learn to hone their code work and use analogic thinking to “think with the code” and to slow things down, to inspect the iterative processes of exploitation and co-optation characteristic of global market forces as well as Mexican statecraft.

## **[2] Code Work AND the Ethno-Stack**

To think with the code within hackerspaces means to think with but also beyond the “todos con el mismo chip” mentality espoused as part of the Mexico Conectado reforms. This government slogan, as well as the hacker-entrepreneurs’ own moves with collectives such as the hacker school, made clear that coding as a symbol and as a metaphor to be applied to Mexican society was deeply contested between the hackers and the state. While government officials envision generic users plugged into computing devices—quite literally, as photographs of young people on computers is a favorite media trope—hackers not only develop their own specific ethics that guide their code work but, immersed in these worlds of computing, they learn how particular coding logics come to govern the ways people go about doing things in other domains—how the rhythms and movements that drive the code worlds deeply influence the government reforms many of them are against, or perhaps how they come to govern even their very own ideological commitments and everyday practices.

To trace how these logics and approaches from the code worlds influence life “outside” of them, we first must understand that what’s “in the code” is

30. Amrute and Murillo (2020) propose “in/from the South as method” in hacking studies as a way of conceptualizing connections, divergences, and contradictions in how the Global North and the Global South hack and use computational technologies.



always influenced by more than the code. Matthew Fuller develops a vision and lexicon for a software studies which “aims to map a rich seam of conjunctions in which the speed and rationality, or slowness and irrationality, of computation meets with its ostensible outside (users, culture, aesthetics) but is not epistemically subordinated by it.”<sup>31</sup> Indeed, a grounded and engaged approach to studying software should be attuned to the fact that what ends up in the code proper, as well as the very style and approach one brings to coding, is influenced by the dispositions carefully cultivated by conditions around us, and vice versa. In her longitudinal and multi-sited ethnography with FLOSS (Free/Libre and Open Source Software) hackers, Gabriella Coleman notes that because the technical craft of coding requires a constant awareness and rearrangement of form, hackers develop competence in transferring mental dispositions into other arenas of life.<sup>32</sup>

I use “code worlds” to point to the space and time coders inhabit when they become immersed in computer programming. I build on work by media anthropologists who have defined “media worlds” as “the network of production, circulation, and reception of expressive and audiovisual forms.”<sup>33</sup> In the early 2000s, media anthropologists set out to understand “not only how media are embedded in people’s quotidian lives but also how consumers and producers are themselves imbricated in discursive universes, political situations, economic circumstances, national settings, historical moments, and transnational flows, to name only a few relevant contexts.”<sup>34</sup> By situating media as social practice within shifting political and cultural frames, ethnographic approaches promised to illuminate how media challenge (or enable) power structures, the imaginative alternatives to these underlying media infrastructures, as well as the role of media technologies in constructions of selves and collectives. While much of the early work on media worlds investigated how indigenous people used media technologies manufactured elsewhere as tools for self-representation, thinking with the code instead of with the media necessarily means thinking with the makers of the root infrastructures underlying technologies.

To explore the code worlds anthropologically thus means to consider how coding is inherently a social practice embedded in specific cultural and

31. Fuller, 2008: 5.

32. Coleman, 2013: 100.

33. Johnson and Jones, 2021: 7. For additional background on the disciplinary genealogy of the concepts “worlds” and “worlding” and how they have been applied to research with specific communities, see Ginsburg and Rapp, 2020.

34. Ginsburg et al., 2002: 2.



political contexts, influenced by power structures that mold the computing infrastructures themselves. To consider what it means to think or hack “in/from the South” means to treat the South not as a geographical south *per se*, but as a perspective that fights for the recognition of knowledges and forms of being seen as “other.”<sup>35</sup> Guided by this approach and inspired by linguistic anthropology’s contributions to media anthropology, which insists on not essentializing “digital communication” as separate from other channels of communication,<sup>36</sup> I explore how the social practices around the code worlds—what I call “code work”—take into account the production, circulation, and reception of narratives, artifacts, and subjectivities that arise when individuals and collectives navigate the code worlds. By staying committed to an anthropological focus on how difference and inequality are produced across domains of socio-cultural practices, and to further illuminate the back and forth movements between the code and social life, between the code worlds and what seem to be “other” worlds, I offer the *ethno-stack* as a framework to help us think with these traversals as well as to examine how difference is actively produced by and through code work.

The stack, in computing terms, refers to the interrelated and interdependent layers of hardware components and software protocols that make high-level computation and programs possible. To move from the bottom of the stack (e.g., machine code) to the top of the stack (e.g., programming languages and systems) means to traverse the corresponding circuits, microchips, and computer code that can be part of each layer of abstraction that makes up the system.

The fundamental idea is that one can navigate the stack by building up layers of abstraction from lower-level components. At the lowest level we might have MOSFETs (metal-oxide-semiconductor field-effect transistors), the most common transistors that ultimately produce the 0 and 1 bits; these 0s and 1s are fed into logic gates used as Boolean operators (e.g., AND, OR, NOT); these logic gates are then assembled with other gates, which become components used by other programs; and ultimately these programs are used by larger-scale systems, which are used by other systems, and so on. Across different layers of the stack, each configuration of elements becomes a component to be used by other components. The corresponding internal implementation of each element is abstracted away and largely irrelevant to the other components that use it.

35. Santos, 2014.

36. Johnson and Jones, 2021: 6.

Social scientists who research new computing technologies and their aspirational promises have proposed that in order for marginalized populations to infuse their own worldviews and future aspirations into a system, they must fully participate in and be adept at navigating all layers of the stack. The structure of the stack inherently hides conditions, keeping its range of possibilities from view. Becoming a full-stack code worker might help to uncover the stack and its liberatory possibilities.<sup>37</sup> Jason Edward Lewis argues that only by fully and comprehensively infiltrating and navigating all layers of the stack can Indigenous people, or other communities systematically excluded from the power of computing, increase their ability to “make the technology speak in the way that they [we] desire.”<sup>38</sup>

Learning to navigate the stack across all its layers is one way to think with and beyond computing-as-usual, to think of alternative stacks or of alternatives to the stack. Even scholars who push the stack and its metaphors to the planetary scale to think about *everything*, from human and nonhuman users to state governance to climates,<sup>39</sup> leave conceptual space for other stacks to emerge. “We need not one but many Stack design theories,” Benjamin Bratton tells us.<sup>40</sup> His invitation starts with what he calls “The Black Stack,” the “generic term for The-Stack-to-Come that we cannot observe, map, name, or recognize.”<sup>41</sup> The idea is that this more elusive and future-looking stack is coming and we can have a hand in modeling it. If we cannot escape the stack, at least it’s designed to be re-designed and re-made.

Transdisciplinary scholars have taken this call to heart as they devise models for alternative stacks and stack thinking. A “diversity stack” might be made up of different layers (identity, chronotope, multimedia, and multilingual layers) meant to foster a virtuous circle in which research on diversity could help shape technological innovation, and technological designs could help understand and act on diversity.<sup>42</sup> A stack focused on creating a “new nomos for the post-capitalist common” engages with three levels of sociotechnical innovation, virtual money, social networks, and bio-hypermedia to invent

37. In the world of professional software development, a full-stack developer is a programmer who shows interest and mastery in all facets and layers of software development. A common way to describe a full-stack developer, for example, is as someone who can write code for both the back-end of a project (e.g., databases, architecture, servers) and the front-end of a project (e.g., graphical user interfaces, web applications, mobile clients).

38. Lewis, 2016: 242.

39. Bratton, 2016.

40. Bratton, 2016: 300.

41. Bratton, 2016: 368.

42. Liu, 2020.

new “social algorithms of the common.”<sup>43</sup> Even Earth systems monitoring, understood computationally, may be brought into stack thinking.<sup>44</sup> The design of alternative stacks might be better able to accommodate racialized epistemologies, ontologies, and fields of action.<sup>45</sup> My thinking of a kind of stack “in/from the South” is informed by this work. As Amrute and Murillo formulate in their proposal for computing in/from the South, *in* the South centers digital infrastructures ethnographically to understand how they construct politics and ways of producing knowledge; *from* the South “opens up the material, immaterial, social, and political aspects of computing to alternative forms of life and future realities.”<sup>46</sup>

Correspondingly, the *ethno* in ethno-stack points first to the definition of “ethno-” as a particular culture or people, this notion of difference signaling the *different* stacks that can emerge from stack theorizing.<sup>47</sup> In order to build the Black Stack or the Stack-to-come, coders might have to “first imagine it in ruins and work backward from this as both a conclusion and a starting point.”<sup>48</sup> They might have to destroy the stack in order to re-build it. But once they are actively re-building this stack, once they infiltrate the deepest layers of this corrupted, monocultural stack, they might encounter the “ghosts” that first built it, along with their corresponding epistemologies and ideologies.<sup>49</sup> These ghosts in the machine might represent “phantasms,” or a combination of images and ideas that become codified and reified in computing systems and encompass a “sense of self, metaphor, social categorization, narrative, and poetic thinking.”<sup>50</sup> To take this stack by the horns they need to infiltrate its deepest layers to displace those ghosts or phantasms that have instantiated themselves at its core level, the root stack layers, which might hold the stories, worldviews, and epistemologies that govern all the other layers.

To begin to ground the stack thus means to “bend” its deep technical structure in order to make it work for corresponding communities.<sup>51</sup> This is

43. Terranova, 2014.

44. Helmreich, 2023.

45. Lewis, 2016: 241

46. Amrute and Murillo, 2020: 9.

47. I’m not promoting the essentializing of any particular ethnos (ethnic group) and understand any ethno-racial category not as an indicator of preexisting difference but as colonially conditioned and shifting, based on institutional and interactive structures (see Rosa, 2019).

48. Bratton, 2016: 357.

49. Lewis, 2016: 246–7.

50. Harrell, 2013: ix.

51. Lewis, 2016.

particularly challenging for marginalized groups who have been proportionately excluded from educational access to the stack and from stack theorizing. Bratton views the “user” subject within the Stack as “a position that can be occupied by anything (or pluralities, multitudes and composites),”<sup>52</sup> and this user might be something beyond the human, “Users (e.g. human, animal, machine) view The Stack and that initiate chains of interaction (columns) up and down its layers.”<sup>53</sup> This might work for unmarked subjects accustomed to seeing themselves as generic users within a system, but for subjects marked along some dimensions of difference, their preoccupation might be with just making it to the “human” category, or with not being noticed as an exceptional user. The average “user” (white, male, heteronormative) is historically applauded for bending, hacking, or otherwise skillful technical maneuvering. For the racialized, gendered, or sexualized user, or for the hacker in/from the South, these moves are frequently criminalized and always surveilled.<sup>54</sup> To understand the role of computing in Othering and vice versa, we must think of computing not only as a field of expertise and as a set of converging technologies, but also as a means of organizing and differentially valuing knowledge as well as a method for surveilling and categorizing groups of people and their knowledge practices.<sup>55</sup>

The *ethno* in the ethno-stack thus also refers to the *ethnographic* approach that can lead us to think in this more expansive way about computing and its code worlds. Like the systems engineer, the avid ethnographer also deploys a type of “systems thinking” as they set out to their fieldsites or when they return from their sites to do the theorizing.<sup>56</sup> They observe or reflect about (or from within) a particular system to find its internal logic. Whether it’s an economic system, a legal system, an educational system, or a particular community, ethnographers are determined to find out how these systems “work.” Depending on their disciplinary training and what their specific purposes are, they develop theories about how these different (perhaps autonomous systems) interact to make up “society.”

52. Bratton, 2016: 376.

53. Bratton, 2016: 375.

54. Beltrán, 2022.

55. Amrute and Murillo, 2020.

56. Ilana Gershon (2005) traces the work of Niklas Luhmann to show how “systems thinking” overlaps specifically with anthropological concerns about difference, the global/local, agency, and reflexivity. Thinking with systems theory allows ethnographers to develop concept work related to how participants experience and analyze their relationships to social orders, many times constituted as systems, but also about how people navigate systems with different and sometimes contradictory dynamics or internal logics.

The ethno- and ethnographic in the *ethno-stack* thus work together to ground the stack, to ask how it might be inhabited, contested, accommodated, resisted, multiplied, situated, or *bent*. Throughout the book's chapters, I offer four basic layers that can help us think with the ethno-stack: the personal, the interpersonal, the sociopolitical, and the sociotechnical. At the personal layer, the ethno-stack invites ethnographers, as well as coders themselves, to ask questions such as: how do practices of coding contribute to constructions of self? At the interpersonal level: what type of opportunities for solidarity-making across markers of difference (race, class, gender, sex, disability) are available at hackerspaces or sites that promote practices of computer programming? At the sociopolitical level: how do state representatives push nation-making narratives and ideologies of modernity when they sponsor such events, and how do participants respond to these political initiatives? And finally, at the sociotechnical level: how might researchers, together with research participants, source concepts and metaphors to make analogic traversals across these layers of analysis? Especially with this last layer, I argue that the code work might become "good to think with"—for code workers and for ethnographers—not only about how one moves from the back-end of a software project to the front-end, but also about how sociotechnical systems construct and are constructed along markers of racial, gendered, and embodied difference.

As computer programmers we can become adept at navigating the code worlds, but the ethno-stack prompts us to consider how the code work might provide us with the tools to re-envision, re-imagine, and re-arrange complex social relationships in and out of the code worlds. In the context of contemporary Mexico and hacking cultures that shuttle across the US/México border, the ethno-stack becomes key to uncovering the tenuously constructed yet fiercely imposed borders that make up the political economy of tech and code work, or the *techno-borderlands*.

### [3] Techno-Borderlands

In her genre-breaking writing, Gloria Anzaldúa develops the concept of the "B/borderlands." For Anzaldúa, the lower case "b" borderlands refers to the geographic region separated by the geopolitical Texas/Mexico border on which she grew up, and the upper case "B" Borderlands encompasses the psychic, sexual, and spiritual Borderlands of her own embodied subjectivities resulting from oppressions experienced due to her culture, color, health, gender, sexuality, economic status, and especially her complex relationship

to language.<sup>57</sup> The B/borderlands, then, “in both its geographical and metaphoric meanings—represent intensely painful yet also potentially transformational spaces where opposites converge, conflict, and transmute.”<sup>58</sup>

My notion of the techno-Borderlands pays homage to, and also plays with, Anzaldúa’s concept to examine the political economy of tech and code work as it relates to US–México politics and the corresponding subjectivities of difference found apart from yet deeply influenced by the US/México border. The influence of the borderlands on US/México hacking cultures can manifest itself quite explicitly, as, for example, when collectives on both sides of the border collaborate to organize the “Migrahack,” a mobile hackathon aimed at resolving issues related to border securitization, US/México migration, and surveillance of undocumented communities explored in Chapter 5. The more subtle Borderlands, with its soft mechanisms for constructing differences across intersecting dimensions of other differences, manifests more implicitly across various sites I explore in the book: gender and sexuality (all-women hackathon vs. performances of masculinity in mostly all-male hackathon), class (those who can travel to US vs. those who can only mobilize their efforts within Mexico), nation, race, and ethnicity (mobilization of Latinidad and Mexicanness in both US and Mexico). To explore US/México hacking cultures means to follow the varied experiences of the hacker-entrepreneurs who work in Mexico, those who travel to the US, and the “Latinxs” and “Mexicans” from the US who travel to Mexico—as well as their physical encounters across these borderlands. But more importantly, it also means to trace the subtle difference-making that is enacted, mobilized, resisted, and reconfigured across the techno-Borderlands.

Two key ideas from Borderlands theorizing that offer openings to study the politics of code work in US/México hacking cultures are the concepts of multiple allegiances and of in-betweenness. Thinking with the Borderlands means to move “within, between, and among these diverse, sometimes conflicting, worlds.”<sup>59</sup> Anzaldúa herself frequently moved between conflicting personal, political, and professional worlds, but what connected these worlds wasn’t just overlapping or intersecting identities, as Anzaldúa’s work is usually interpreted as suggesting.<sup>60</sup> A steadfast resistance to clear-cut labeling, coupled with this interest in developing novel alliances, “makes Anzaldúa’s work vital for twenty-first century social actors, artists, thinkers

57. Keating, 2009: 1.

58. Keating, 2009: 10.

59. Keating, 2005: 2.

60. Keating, 2005: 2.

and scholars. Her words challenge conventional views that lead to stereotyping, over-generalizations, and arbitrary divisions among different groups; her writings open up new spaces where innovative, sometimes shocking connections can occur.”<sup>61</sup> Thus, community-making across borders of difference is not based on sameness but instead on commonalities. In the case of hacker-entrepreneurs across the techno-Borderlands who are already adept at navigating the layers of computing stack abstractions, the stage is set to hone this code work in order to find parallels between the code worlds and other worlds they might not have imagined, be it the world of the humanities or social sciences, the world of activism, or new worlds altogether.

The call of the Borderlands is also about finding power in the in-betweenness, in the borders themselves. Becoming a threshold person, a border-worker, means to locate oneself simultaneously inside and outside of group formations, and to live “in between overlapping and layered spaces of different cultures and social and geographic locations, of events and realities—psychological, sociological, political, spiritual, historical, creative, imagined.”<sup>62</sup> Bringing the power of belonging to multiple worlds as well as the transformative potential of existing *in-between*, scholars have proposed research frameworks where both ethnographer and research participant shuttle between differing, incomplete, and multifaceted viewpoints that offer more complex understandings of ever-changing social realities by navigating spaces characterized by tension, struggle, conflict, and ambiguity.<sup>63</sup> The “thickening of the borderlands” prompts us to look for the border in the oppositional subjectivities it engenders as people bring “new energies, new frequencies, new orientations” to confront these borders away from the border.<sup>64</sup> The multi-border analytic thus means that in order to understand constructions of communities and selves we need to think of borderlands as “hemispheric, plural, and multi-sited.”<sup>65</sup> Mobilizing these theoretical paradigms, women of color immersed in both cyborg politics<sup>66</sup> and intersectional perspectives<sup>67</sup> have proposed weaving “between and among” oppositional ideologies to arrive at a way of moving they refer to as “oppositional

61. Keating, 2005: 3.

62. Anzaldúa, 2000: 176.

63. Rosaldo, 1989.

64. Rosas, 2016: 355.

65. Guidotti-Hernández, 2017: 24.

66. Haraway, 1991.

67. Moraga and Anzaldúa (1981), Combahee River Collective (1979), Crenshaw (1989), and Oyèwùmí (1997) were among the first scholars to consider how race, gender, class, and other markers of difference overlap and intersect.



consciousness,” a “differential mode of consciousness functions like the clutch of an automobile, the mechanism that permits the driver to select, engage, and disengage gears in a system for the transmission of power.”<sup>68</sup> These emerging perspectives invite us to think from the borders themselves as we engage with the machines and the systems in order to decipher ever-shifting structures of power and inequality.

*Code Work* further prompts us to “think with the code” and across the ethno-stack to develop new terms and structures that, instead of cutting across difference, never lose sight of the political-economic and thus compel us to think about how inequity is structured and re-structured across domains, how recursive borders are produced and reproduced on a number of scales. The seduction of the stack is precisely that it allows us to highlight the visible from the invisible, to illuminate the known from the unknown; its separation of software from hardware, interface from infrastructure, allows us to decide what to show and what to hide as we play with the interfaces that lead us from one layer of abstraction to another.<sup>69</sup> The computer and its stack of abstractions provide a condensation of power that is “radically alien to most human experiences of the world. It is this alienness that allows software, particularly at moments when one is attempting to understand its working or to program it, that engenders the delicious moments of feedback between the styles of perception and ordering, logic and calculation, between the user and computer to be so seductive and compelling.”<sup>70</sup>

How to bring it all together? How best to leverage the seduction and power of computing, and yet mobilize Borderlands perspectives to challenge the stack, the foundation of the computing infrastructure that guides the imaginaries and the political economy of the programming work? The argument I unfold throughout this book begins by paying attention to the code work already going on across the US/México techno-Borderlands, to take my ethnographic cue from the metaphors, logics, and ethics that these othered hackers deploy across domains. They use coding concepts and metaphors such as “batches,” “exceptions,” and “loose coupling” to describe their fraught relationships with employers and government institutions, as I analyze in Chapter 1. They recognize the complex intersections between their hacker ethic and transnational migrant ethics of “hard work,” as I unpack in Chapter 2. They mobilize underlying coding principles of iteration and

68. Sandoval, 2000: 57.

69. Chun, 2013.

70. Fuller, 2008: 151–2.



efficiency to attempt to make them work in other domains of their lives, as I trace in Chapter 3. They rethink participation infrastructures and build solidarity by inviting programming newcomers to align themselves with specific layers of the stack, as I learn by participating in the all-women hackathon, in Chapter 4. They transform the practice of prototyping and iterative code design used across the stack to interrogate and propose versions of a transnational Latinidad, as I explore in Chapter 5. And they repurpose the tech startup logic of the “pivot” to represent their selves and projects across the unevenness of Silicon Valley politics, as I demonstrate in Chapter 6. Across these diverse spaces and experiences, I show that US/México hacker-entrepreneurs use their code work to develop heuristics for analyzing the organization of entities and relationships among them, whether they are elements in a coding environment, actors in a political-economic environment, or acquaintances in their intimate social environments. While I argue that this code work happens at the sociotechnical layer of the ethno-stack, I propose that connecting this work across its other layers—the personal, interpersonal, sociopolitical layers of the ethno-stack—will guide us toward thinking more holistically about the computing stack.

To cultivate *border-code-workers*, those who can connect the border work with the code work, is to provide code workers with the tools to think within and across layers of the ethno-stack, as well as within and across the communities that make up the techno-Borderlands. Returning to the call of the Borderlands, border thinking provides us a framework to “make connections among seemingly disparate events, persons, experiences, and realities” as well as to build on Anzaldúa’s “holistic activist-inflected epistemology designed to effect change on multiple levels.”<sup>71</sup> I’ve included the Ayotzinapa incident in this introduction because it points to interconnectedness of seemingly disparate communities as well as to the challenging era of political violence under which my research participants were honing their code work. Unfortunately, the incident was hardly remarkable.

Since the late 2000s, thousands of citizens in Mexico had been murdered or disappeared, and the Ayotzinapa incident simply mobilized the multitudes of citizens to protest the corruption, impunity, violence, and long relationships to drug trafficking that had come to characterize state practices in Mexico. In the state’s eyes, the normalistas were treated as collateral damage—as coming from a space of social backwardness that was

71. Keating, 2005: 8. This foundation builds specifically from Anzaldúa’s epistemological process of *conocimiento*.

preventing the rest of the country from moving forward on a developmental scale.<sup>72</sup> But coworking spaces, hackathons, entrepreneurial initiatives, and neoliberal “reforms” were seldom differentiated by politicians across their campaigns, as they simply shifted and constructed new categories of people that were keeping Mexico from advancing their modernist nation-building efforts. Becoming a border-code-worker, an approach spelled out more fully in the coda, means learning to mobilize coding logics and analogic reasoning while also thinking alongside the institutions and systems responsible for reinstating the unequal opportunities that many times result in violence and death, iteration after iteration.

Recalling the missed connections between the three collectives aboard buses that opened this introduction, I want to underscore that the potential for connection across efforts, perhaps the potential to hone this border hacking, was there all along. If the ephemeral nature of the hackathon forecloses any slower, longer-term solidarity-making and coalition-building that might lead to meaningful politics, El Chico Partículas might have been able to show Javo and his startup bus buddies how to build community with one’s paisanos. If any diversity advocacy stemming from hacking cultures is ultimately too narrow when it centers technology as an orienting concept, both the publics on the startup bus and the *combi de la ciencia* could have learned from the *normalistas*, who have fostered class consciousness and fought for agrarian justice while surviving a century of iterations of repression masked as “national development,” how to hone more radical politics. On the flip side, Javo might have helped *la combi de la ciencia* or the *normalistas* gain resources and support for their projects while not losing sight of their ultimate goals. The possibilities are impressive, but the fact is that the *normalistas* ended up murdered or “disappeared,” while Javo and El Chico Partículas received prizes and acclaim. *Code Work* ethnographically investigates those moments across hackerspaces and hacker lives where such potentials could have crystallized, unpacks why they didn’t, and proposes how they might in the future.

#### [4] Ethnographic Border Work

Three connected origin stories led me to investigate emerging forms of hacking and tech entrepreneurship between key sites in Mexico and the US. The first occurred as part of the “Latinxs in/and Tech Initiative,” which I founded along with the help of undergraduate students at the UC Berkeley

72. Mora, 2017.

Center for Latino Policy Research. As part of the initiative, we set out to decenter mainstream “diversity in tech” discourse by critiquing dominant “bootstraps” narratives (for putting the onus of responsibility on underrepresented groups and individuals) and instead foregrounding the practices and structures that sustained the tech industry’s underrepresentation of historically racialized groups.

As we met with and worked to connect different actors from academia, industry, and community-based activist circles, we were repeatedly appalled by obvious mis-connections between US-focused and Latin American-focused efforts. For example, at one conference in San Francisco dedicated to Latinx entrepreneurship, it was striking to note differences in discourse across two back-to-back panels: one featuring US Latinx speakers unpacked many of the complex diversity issues that we also had been pointing to, whereas the other, discussing opportunities for people from Latin America, disregarded these arguments and uncritically forwarded the meritocratic model of tech entrepreneurship. At another conference, Latin Americans were directly pitted against US Latinxs, with a panelist praising Latin Americans for “taking advantage” of the opportunities in Silicon Valley that US Latinxs were failing to capitalize on, blaming them for a lack of interest or even their weak entrepreneurial abilities. My frustration inspired me to dig deeper into these missed connections, and hackathon events proved to be ideal research sites to begin an ethnographic research project.

*Code Work* draws on participant-observation and interview-based research carried out between 2013 and 2020 both in Mexico and in the US, just before a newly formed leftist political party regained power from Mexico’s “revolutionary” party, which had governed for nearly a century. In this decade, the tech startup scene surfaced in parallel with hype from economic analysts who projected that Mexico’s economy was set to emerge as the “Aztec Tiger,”<sup>73</sup> and programmers from different socioeconomic backgrounds and across nationalized and classed boundaries gravitated toward code work. In my ethnographic research, I attended over twenty hackathons (usually multi-day) and spent extended time in hackerspaces, co-working spaces, and at tech industry events.<sup>74</sup> Drawing on my own undergraduate

73. Popular media outlets consistently announced that Mexico was undergoing rapid economic growth that would lead to an increase in standard of living.

74. Organizers and participants in Mexico variously translated hackathon to *hackatón* or *hackathón*, or didn’t translate it, using the English spelling. I stick to *hackathon* across the book for consistency and easier referencing.

training in computer science, I was able to participate actively at these events and in these spaces, sometimes even serving as a “technology mentor,” as I brainstormed and prototyped alongside hacker-entrepreneurs, coding their projects or providing feedback on their tech startup ideas.

I conducted over fifty open-ended, formal and informal interviews with research participants primarily in two cities in Mexico: Mexico City (one of the centers of tech startup activity) and Xalapa (a small city in Veracruz about 300 kilometers east of Mexico City, where the startup and hacker community was unexpectedly vibrant). These two cities provided access to hackers from different geographic and demographic backgrounds. Mexico City is a mega-city where individuals more freely perform bicultural identities and interact with foreigners; Xalapa is a smaller university city of about 500,000 people surrounded by small municipalities where much of the economy revolves around commerce and services and the major employers are government and universities. Although the sites I investigate in *Code Work* are mostly situated in Mexico, my ethnography is transnational in that I traveled frequently between Mexico and various US sites, mostly in the San Francisco Bay Area, sometimes accompanied by my research participants, and sometimes running into them at various tech related events and spaces.<sup>75</sup>

Across these research sites I was able to develop relationships with a surprisingly heterogeneous cast of characters with unique backgrounds, motivations, and experiences. Featured characters are critical of, some even disenchanted with, the state-sponsored or neoliberal technology initiatives meant to boost a flailing Mexican economy, but many are also willing participants in these endeavors. Kike wants to live the excitement of the hackathon every day and decides to help found the first hacker school in Latin America. Leo, a veteran coder who religiously immerses himself in the vast libraries and functions of various coding languages, is concerned that this school is effectively “selling out” by commodifying the hacker identity, and distances himself from other dilettantes such as El Pato, who divides his time more equally between learning the ways of the code worlds and learning the philosophies and the language of the tech-startup entrepreneurial worlds. Mariana can code with the best of them in these mostly male-dominated hackerspaces, but is also an eager organizer and participant in the first all-women’s hackathon in Mexico.

75. In order to highlight “transnational” phenomena, scholars have proposed traveling back and forth between their research sites (e.g., Joo, 2012) or trying to produce “ethnographic simultaneity” (Zilberg, 2011) between their sites located in spaces contained by national borders.

Some code workers have the privilege to travel to or reside in the US, or move across the US/México border frequently for professional or personal reasons. Armios follows the transnational Migrahack event across the border to work on hacking immigration issues that he's always felt close to, and his proclivity to think with the code persistently and across different domains (or systems) leads him to connect his "coder's paranoia" to a "migrant paranoia." Jesse, a Latino startup CEO, mobilizes an iterative way of thinking based on software development methodologies to consider the prototyping of future companies, coders, users, and especially of himself. Hiro thinks he can capitalize on his knack for hacking everything by attempting to hack the dating scene in San Francisco, with very questionable results. And the boundaries between the code worlds and other worlds are once again held up for inspection when Estefy tells her boyfriend, Rodo, that she doesn't want "MIT in bed with them," pointing to an unwelcome algorithmic-efficiency approach to their sex life.

This eclectic cast of code workers thus think with coding logics and rely on technical idioms to make sense of all sorts of non-technical aspects of their lives: their predicaments as migrants, their career choices, their love lives, and more. Because some of these characters make appearances in different chapters, they are listed in "Appendix 1: Cast of Code Workers" for easy reference. These concise profiles include their corresponding fieldsites, age and educational or professional backgrounds, relevant geographic or national origins, pertinent biographic details, and in some cases miscellaneous lifestyle preferences. All names are pseudonyms except for public or government figures, and unless otherwise noted.

My second origin story conveys how I was able to "enter the field" in these two Mexican cities. I had conducted preliminary fieldwork during the summers of 2013 and 2014, in Mexico City and in Xalapa, respectively, by serving as a technical instructor in a 6-week incubator program run by MIT meant to train recent university graduates with the technical and entrepreneurial skills to launch viable tech startup companies. As part of the "Aztec Tiger" initiatives, this type of project was easy to materialize in Mexico, receiving overwhelming support from government and universities, as well as interest from eager students. Participants in the bootcamp had backgrounds in software development, business/marketing, visual user interface design, and closely related disciplines. Through these contacts, I started to become active in the hackathon circles in both cities and developed relationships with participants and founders of the hacker school in Mexico City. Eventually I was invited to spend time with hacker-entrepreneurs outside of the

hackerspaces and got to know them on a more personal level. These research experiences allowed me to begin to understand how hacker-entrepreneurs maneuvered their way through hacking and entrepreneurship worlds and mobilized their code work across other domains of their lives.

The final origin story is nested inside the second, for it explains how I became the technical instructor in the MIT bootcamp in the first place. As an undergraduate Course 6 (computer science and electrical engineering) student at MIT, I was seduced by the code worlds yet often felt an outsider to them. An ambivalent coder, I took a job post-graduation as a traveling business technology consultant working in both the US and Mexico, helping diverse organizations to design and implement custom software solutions. A defining experience came when a Mexican client, a large multinational corporation looking to update their complex legacy systems, tasked me with serving as a bicultural and bilingual broker between the US consultants and the Mexican code workers. It became clear to me that what was at stake was less their technical infrastructure's inadequacy and more a clash of sociotechnical "cultures." Fascinated by these differences and motivated to study "culture" more systematically, I went from ambivalent coder to ambivalent anthropologist, but always remained an unwavering code worker.

## [5] Chapter Overview

My chapters think with the language of hacker-entrepreneurs to demonstrate how their practices of coding connect with their constructions of self and negotiations of diverse sociopolitical realities. Throughout, I return to the ethno-stack to show how specific hacking practices, logics, metaphors, ethics, and imaginaries are mobilized across personal, interpersonal, sociopolitical, and sociotechnical layers.

Chapter 1, "Thinking with the System in México," introduces the concept of *code work*, with an in-depth look at how hackathon participants immerse themselves in the code that underlies the technologies that promise developmentalist change. Hacker-entrepreneurs re-mediate pessimism and guarded optimism alongside each "new" version of modernity staged by corresponding political parties. The code work extends in time and space from the confines of the hackathon to the hacker school, where they carefully cultivate a specific hacker ethic in relation to state and market demands on their time, especially as the tech startup scene surfaces in parallel to hype from economic analysts who projected that Mexico was set to emerge as the "Aztec Tiger" economy.

Chapter 2, “Becoming Chingón at the Hackathon,” mobilizes an intersectional analysis of how transnational labor, class, and masculinity come together at hackerspaces to consider how (mostly male) research participants enact hacker imaginaries and ethics as they strive to become “chingones” at the hackathon. I argue that the hacker ethics thus intersect with, align with, and sometimes challenge ethics formulated from the life experiences of young men who have to cope with the contradictions of their coding skills being valued in some spaces and undervalued in others.

Chapter 3, “Code Work across Domains,” considers how the subjectivities underlying the code work is welcomed, or not, in domains of life outside of hackerspaces. Hackers tell me stories about how being immersed in the code worlds influences the way they solve problems across various domains of their everyday lives. Some give examples of how elements they associate with coding (speed, efficiency) and the entrepreneurial worlds (contracts, ephemerality) infiltrate their dating and sex lives. While some of these stories seem lighthearted, I end with the story of an encounter with healthcare inequities in the US to demonstrate how these cross-domain subjectivities are always connected to transnational constructions of race and class.

Chapter 4, “Abuelitas as Infrastructure,” focuses on an event advertised in Mexico as the “first women’s hackathon in Latin America.” Participants in the women’s hackathon work to align themselves with cultures of expertise as they negotiate normative roles of gender and femininity. Caught up in nationalist pushes for productivity, hackers weigh competing pressures in deciding what counts as “wasting time” at different moments during the event. A surprise visit by abuelitas (grandmothers) at the end of the hackathon makes a strong statement about unrecognized and invisibilized labor. I argue that the women’s hackathon in Mexico serves as reminder to not devalue traditionally domesticized or feminized labor, as well as an expression of female solidarity, and that thinking carefully with the “bottom” layers of the ethno-stack can lead to inadvertently thinking with its higher-order, closely coupled layers.

Chapter 5, “Making Latinx Makers,” looks at constructions of global Latinidad within the Migrahack, a series of hackathons that took place in both the US and Mexico. I connect scholarship on prototypes and participatory models with work that addresses the constructions and mobilizations of Latinidad to show that *making* prototypes becomes a way of *making* hypothetical versions of a transnational Latinidad, helping Migrahack participants to think through—as members of this community—issues related to US/México relations, border security, and migration.



Chapter 6, “Pivoting across the Techno-Borderlands,” examines how research participants think with and against “the pivot,” a tech startup term that calls for changes to a product that might better align it with the market. I show how Mexican and Latinx hacker-entrepreneurs pivot their identities, their language practices, their presence and presentation of self as they reconfigure the market logics of agility, competitiveness, and risk to creatively combine them with logics of hacking characterized by reinvention, playfulness, and resistance. I follow the trajectory of Javo closely across the techno-Borderlands to show how his app ends up returning to politics in surprising ways, arguing that this happens because he not only mobilizes migration as a type of hack, but also focuses his code work at the root layers of the ethno-stack.

*Code Work* ends with a coda, “Working Code AND Working Futures,” where I expand on my notion of border-code-workers of the future, building on proposals from different media artists who have been inspired by border hacking; between “migration as a hack” and “hacking the border,” I offer ways that the code work might be connected to the border work, and put forward questions that can guide our thinking with the generic ethno-stack, thereby grounding the stack logic of a variety of sociotechnical systems, present and future.



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