

Ensuring Minimal Computing Serves Maximal Connection

Grant Wythoff <gwythoff_at_princeton_dot_edu>, Princeton University  <https://orcid.org/0000-0002-6605-9596>

Abstract

Originally devised as an insult by Richard Wollheim, the term “minimalism” described a 1960s movement that foregrounded the relationship between an art object and its museum viewer. Today, minimalism is the guiding ethos for a surprising variety of pop cultural phenomena, from belongings that spark joy to contemplative practice that increases mindfulness. This article first takes a broader view of minimalism to register several problematic echoes of minimal computing among digital detoxers and disaster survivalists in intensities ranging from Luddism to asceticism. Attention needs to be given to these echoes, especially when valorizing DIY infrastructures built out of necessity by Indigenous, poor, or coastal communities and out of privilege by doomsday preppers. Second, this article asks what becomes of minimal computing now that we have seen the vital importance of maximal connection during the COVID-19 pandemic. Do arguments for minimalism still hold in a socially-distant, unevenly-connected world? I argue that it will be important to reframe the digital minimalist conversations of the 2010s for the demands of digital equity in the 2020s. Going forward, we should ask: which of these competing claims to minimalism — as a form of attention, mindfulness, and agency — are compatible with maximal connection, with maximal choice, with maximal investment in communities and infrastructures? And when we hold up minimalism as a virtue, is that virtue a property of particular tools or specific techniques for using them? Finally, this article profiles the ways that academic conversations on minimal computing have independently taken root outside universities through grassroots organizing and activism under the banner of community technology. I close by suggesting ways that minimal computing can be led by community input, while also playing a role in public scholarship and community partnerships that extend existing academic research.

The question that has been at the heart of minimal computing — “What do we need?” — may never quite land the same way again.^[1] The summer of 2020 found librarians asking researchers about books they needed to access, department chairs surveying faculty for their remote teaching needs, undergraduate students sharing leads on summer work after paid internships were cancelled, and graduate students turning CVs into resumes as the remains of the academic job market all but evaporated. As I write this, academics continue to hash out detailed scenario plans at universities whose fates seem to change by the day. But these approaches to what we need in academia, these finer-grained tactics and forms of exchange, have only now become possible to imagine. Not long ago, we found ourselves asking even more fundamental versions of the question: What do we need in order to communicate, to eat, to stay healthy, to keep communities intact?

1

The same pandemic has affected everyone in remarkably different ways. But no one will soon forget the feeling of preparing in March 2020 for a crisis whose shape seemed to evolve in real time. I remember standing with my partner in a grocery aisle, wondering whether microwavable or stovetop rice would be a safer bet if infrastructure maintainers could no longer report to work. Which utilities would last longer: electricity (delivered here in Philadelphia by a private company) or gas (a municipal utility)? The next day, I tried to reassure myself that it was just paranoia that led me to download PDFs of grocery checklists and CDC preparedness guides in case our Internet connection also went down. “Who knew what was true,” says the protagonist of *Severance* (2018), Ling Ma’s uncannily timed novel of pandemic survival in New York City:

2

The sheer density of information and misinformation at the End, encapsulated in news articles and message-board theories and clickbait traps that had propagated hysterically through retweets and shares, had effectively rendered us more ignorant, more helpless, more innocent in our stupidity. [Ma 2018]

3

The actuality of what communities experienced in the following months — checking on neighbors, refreshing news feeds, delivering groceries, shuffling endless Zoom calls — was nothing like the dystopian imaginaries that led us to go with the stovetop rice over the microwaveable. (Didn't Snake Plissken cook over an open fire in *Escape from New York*?) Nor did it make the growing number of doomsday “prepper” billionaires — whose minds apparently always work this way — look any less silly [O'Connell 2020] [Osnos 2017]. As Laurie Penny writes on these techno-libertarians, who for years have been buying underground bunkers, bullets, and meals ready to eat:

4

Shit-hits-the-fan escapism — a big part of the alt-right imaginary — never predicted this. I have lurked in countless stagnant ideological Internet back alleys where young men excitedly talk about the coming end of civilization, where men can be real men again, and women will need protectors. How inconvenient, then, that when this world-inverting crisis finally showed up, we weren't given an enemy we could fight with our hands (wash your hands). [Penny 2020]

5

Instead, the past two years have crystallized the meaning of asking “What do we need?” both as individuals and as communities, demonstrating how the question surfaces issues of connection, solidarity, and belonging (Who are “we”?) as well as different orders of value (Which needs get prioritized?). Countless forms of communal response to this crisis have quickly overshadowed the individualistic, doomsday prepper imaginary.^[2]

6

Proponents of minimal computing have placed “What do we need?” at the center of digital humanities practice, beginning with the formation of the Global Outlook::DH Minimal Computing Working Group in 2014. In a field often tempted by the discourse of innovation, minimal computing instead has pushed digital humanities conversations toward issues of technology access, participation, sustainability, stewardship, and equity. In *New Digital Worlds*, Roopika Risam describes minimal computing as “a range of cultural practices that privilege making do with available materials to engage in creative problem-solving and innovation. These go by names like *jugaad* in India, *gambiarra* in Brazil, *rebusque* in Colombia, *jus kali* in Kenya, and *zizhu chuangxin* in China” [Risam 2018, 43]. Risam shows that by foregrounding cultural practices rather than tools or platforms, minimal computing prioritizes a humanist approach to technology, including questions like:

7

How to repurpose existing technologies to reduce e-waste and engage with obsolescence in generative ways; how to conceptualize the difference between choosing to engage with minimal computing principles and doing so out of necessity; and how to examine the social impacts of computing through postcolonial lenses. [Risam 2018, 43]

8

Judging from the range of contributions to this issue of *Digital Humanities Quarterly*, humanists have experimented with many permutations of digital methods and media theory to explore these questions over the past eight years.

9

But the idea that I can't shake — and the place I began when first proposing this essay — is that minimal computing often bumps up against problematic echoes of constraint, disaster, and isolation that circulate in far more public contexts than digital humanities discourse is capable of reaching. Some of these echoes can be found among groups animated by imaginaries of collapse, like the aforementioned disaster preppers and a recent subgenre of speculative fiction known as “solarpunk,” committed to far more generative stories of “ingenuity, generatively, independence, and community” in the face of climate change [Flynn 2014] [Konstantinou 2019]. Meanwhile, self-described digital minimalists promote screen detoxes, mindfulness retreats, and tech fixes to reclaim control of our attention, ultimately advancing an asocial imaginary of disconnection and withdrawal. To cite the title of a recent documentary film, “offline is the new luxury” [Van der Haak 2016].

10

Still, other echoes can be found in movements that I see running in parallel to minimal computing, grassroots movements that bear important lessons for our academic conversations. This includes community technology

11

organizations working to ensure digital equity in U.S. cities that still, in 2022, see less than fifty percent of residents in some areas connected to broadband. And it includes proponents of a decentralized web in response to the advance of data surveillance and tech industry overreach.

But the imagination of constraint that generated solarpunk stories of climate resilience is not at all the same one that produced an injunction to limit screen time and reclaim attention. Nor are the arguments for living out a doomsday scenario in an off-the-grid, independent bunker commensurate with arguments for a decentralized, interdependent network topology. And yet all of these discourses are animated by competing visions of minimalism as a virtue. Across the political spectrum, the idea is in the air.

12

How ironic then, that maximal digital connection is all that has kept and will keep so many going during this epoch of social distancing, as every happy hour and routine healthcare appointment, every first date and kindergarten class moved online. It's far too early to describe this shift accurately, but even in the thick of things it's clear that the pandemic has shuffled all previously settled distinctions between on- and offline, distance and proximity, connection and touch. What becomes of minimal computing now that we have seen the vital importance of maximal connection? Do arguments for minimalism still hold in a socially-distant, unevenly-connected U.S., let alone around the world? In order to take some steps toward an answer, I want to understand the problematic echoes that have informed the practice and reception of minimal computing. At the same time, I'd like to outline some of the emergent ways that I see minimal computing growing in this new world.

13

Community Technology and Mesh Networks

In the context of COVID-19, asking “What do we need” depends largely on the “we” in question. For Black, Indigenous, and people of color (BIPOC) in the U.S., the pandemic has exacerbated inequities that have plagued their communities for centuries. As Stacey Patton put it, “The pathology of American racism is making the pathology of the coronavirus worse.” Higher rates of incarceration, homelessness, chronic medical conditions, and a lack of access to quality health care all leave Black Americans “more vulnerable to increased viral transmission, infection and death during a pandemic” [Patton 2020].^[3] The disproportionate impacts of COVID-19 are seen not only in health outcomes, but also in employment — the unemployment rate for Black people rose in May 2020 while the employment rate for white people rebounded — as well as in digital inclusion. When schools closed at the beginning of the pandemic, roughly half of Philadelphia’s K-12 students lacked an Internet connection at home, rendering the Chromebook laptop lending program offered by the school district useless [Hetrick and Purcell 2020].^[4] And according to a March 2020 study by the Federal Reserve Bank of Philadelphia, 80% of White residents had broadband subscriptions, compared to only 53% of Black and 44% of Latinx residents in the Philadelphia-Camden-Wilmington metropolitan area [Sanchez 2020]. Internet accessibility in Philadelphia corresponds so closely with race that a map of broadband connection rates by neighborhood is essentially identical to a map of the city’s whitest neighborhoods.^[5]

14

Unfortunately, Philadelphia is not unique among U.S. cities in this regard. When every classroom and doctor’s office moved online, when bearing witness to violence and injustice on the Internet became a matter of life and death, the twinned crises of global pandemic and state-sponsored, racist violence, symbolized by the murder of George Floyd, foregrounded the urgency of finally addressing digital inclusion in the U.S., almost a decade after the United Nations declared Internet access a fundamental human right [Wired 2011]. But in the absence of a competent policy response at either the federal or local levels in the U.S., communities have devised various forms of “making do” to fill the gaps. During the summer of 2020, across the country, groups organized to build networked computing infrastructures from scratch, using various combinations of hardware, software, policy stopgaps, community ownership, and cooperative decision-making [Rosen 2021].^[6]

15

These projects center on the development of mesh networks. Greta Byrum, Co-Director of the Digital Equity Laboratory at The New School, explains:

16

Instead of requiring a centralized hub to direct network traffic, a mesh operating system automatically searches for the best path for data to travel. Devices (even computers or phones) can become “nodes” or

connecting points that enable data to hop from place to place until it reaches its destination. If a node fails or breaks, the network automatically routes around it through other nodes. [Byrum 2019]

In the context of the COVID-19 crisis, many groups have been using community-owned and operated mesh networks to share a single Internet connection among a broader group of users with comparatively little cost required.^[7] In New York, Community Tech NY developed DIY instructions for making their Portable Network Kit at home, as the in-person workshops they led for years became impossible.^[8] In Baltimore, the Digital Harbor Foundation and Project WAVES worked with the public schools to “daisy-chain” the schools’ Internet backbone to neighboring homes with mesh radios [Digital Harbor Foundation 2021] [Project Waves 2021]. And in several cities along the East Coast, bookmobiles, ice cream trucks, and satellite vans were repurposed as mobile WiFi hotspots resembling the 1970s Stanford Research Institute Packet Radio Vans: the first example of mobile networking. The Kingston Equitable Internet Initiative also expanded their network with one of these vehicles.^[9]

17

Like the “cultural practices . . . with available materials” detailed in Risam’s description of minimal computing, community technology involves the construction, maintenance, and care of technical and community infrastructures alike [Risam 2018, 43]. Many of these mesh groups have learned from the foundational training curricula developed by the Detroit Community Technology Project, founded by Diana Nucera, who defines community technology as, “A principled approach to technology that is grounded in the struggle for a more just digital ecosystem, placing value on equity, participation, common ownership and sustainability” [Nucera 2016, 15]. From the perspective of community technology, building mesh networks means not only maintaining the codebase and buildout, but also “fostering relationships of trust and cooperation among neighbors, who must work together to make decisions about network design, services, access protocols, security, and long-term sustainability” [Byrum 2019]. Rather than parachuting in shiny new hardware, mesh network groups and community technologists host participatory design workshops and technical trainings that empower communities to maintain and grow their network connections in relationships of care. As Hi’ilei Julia Kawehipuaakahaopulani Hobart and Tamara Kneese write in their introduction to an important new issue of *Social Text* devoted to “Radical Care,” such forms of care have historically come to the fore^[10]

18

when institutions and infrastructures break down, fail, or neglect. Reciprocity and attentiveness to the inequitable dynamics that characterize our current social landscape represent the kind of care that can radically remake worlds that exceed those offered by the neoliberal or postneoliberal state, which has proved inadequate in its dispensation of care. [Hobart and Kneese 2020, 3]

Here in Philadelphia, these conversations flourished among a working group composed of community organizers, technologists, academics, public school teachers, and City Hall staffers who came together during the early months of the COVID-19 lockdown. This Philly Community Wireless (PCW) project has been learning from the efforts of mesh groups in other cities, as well as from the history of past community technology efforts in Philadelphia. These include Wireless Philadelphia, one of the country’s first municipal WiFi providers that unfortunately dissolved soon after it was formed in 2004; Prometheus, a collective that built and advocated for independent, low-power radio and other wireless technologies throughout the 2000s; and Philly Mesh, an experimenter group that worked toward interoperability with mesh networks in other cities in the mid-2010s [Breitbart, Lakshmipathy, and Meinrath 2007] [Dunbar-Hester 2014] [Philly Mesh 2021].

19

One thing we have learned at PCW by centering our conversations on community technology is that not all approaches to “minimalism” are compatible. For example, two very distinct versions of minimalism have emerged in our survey of mesh projects around the country, as well as within our own conversations. In the first version, decentralized networks, non-proprietary hardware, and open source software are prized for their ability to build truly independent networks. A decentralized web (DWeb) could minimize reliance on exploitative Internet service providers looking to sell user data, as well as minimize the surveillance harms that disproportionately impact BIPOC communities. The second version of minimalism instead emphasizes inclusion and access, regardless of the tools used to achieve them. In this version, access to the Internet is viewed as a fundamental human right. The Alliance for Affordable Internet — a global coalition of organizations working to reduce cost barriers to Internet access — further specifies that baseline connectivity is not

20

enough and instead emphasizes “meaningful connectivity” as the standard. “Meaningful connectivity,” according to their definition, involves the following four “minimal thresholds”:

- Regular Internet use | minimum threshold: daily use
- An appropriate device | minimum threshold: access to a smartphone
- Enough data | minimum threshold: an unlimited broadband connection at home or a place of work or study
- A fast connection | minimum threshold: 4G mobile connectivity [Alliance for Affordable Internet 2020].

These debates will continue to evolve alongside the mesh networking technologies that animate them. As Rory Solomon details, technologists have only recently developed the routing protocols that make mesh networks scalable, in which every radio sends and receives packets of information simultaneously, minimizing “hops” between nodes while avoiding interference between all of that delicately interwoven traffic [Solomon 2020, 2–3].^[11] And so the kinds of political ideas emerging from mesh praxis — ideas about justice, equity, and privacy — will only become clearer as more communities in cities around the country begin to map their lines of sight and thread themselves together, node-by-node. It will be interesting to see whether the “minimal thresholds” of meaningful connectivity can be achieved through complex, experimental hardware, and whether that highly specialized hardware can be made responsive to community input and ownership.

21

For now, the problem is that the non-proprietary hardware prized by one crowd presents yet another barrier to access in the eyes of the other, who prefers tools that easily connect people right out-of-the-box. And so the pursuit of decentralization on the one hand and meaningful connectivity on the other is a tension that seems present in many mesh communities. But the debate plays out differently depending on its context. In some cases, one form of tech activism gradually transforms into another when arguments for network independence and racial justice are found to be complimentary. In others, a mesh group splinters and factions end up pursuing different goals. This outcome is more likely to be the case when the group’s membership consists largely of tech and telecom employees volunteering their time to build experimental infrastructures without much input from the community.^[12]

22

What do we need? Clearly, it depends.

23

Minimalism as Austerity Chic

Community technologists and advocates of the decentralized web each stake competing claims to “minimalism”: one draws attention to the minimal requirements necessary for human flourishing, while the other seeks to minimize the influence of corporations that extract profitable data from everyday life.^[13] Working with members of both groups over the past year, I’ve found myself wondering what the concept and practice of minimal computing might offer these evolving debates. Does minimal computing offer its own competing school of thought? Or is it more of an umbrella descriptor for these interrelated approaches to tech justice?^[14]

24

At the moment, it’s difficult to say. “Minimalism” is an incredibly diffuse idea circulating in so many different contexts that it’s often tricky to parse the weight that “minimal” holds when someone says “minimal computing.” Today, minimalism is the guiding ethos for a surprising variety of pop cultural phenomena, spanning everything from belongings that spark joy to contemplative practice that increases mindfulness [Kondō 2014] [Crawford 2016]. A minimalism of paring back and throwing things away can be found on Instagram and Pinterest: in mid-century modern furniture and lone potted plants against clean white subway tile backdrops, in sans serif fonts on bright, monochrome backgrounds with slogans reading “Own less stuff. Find more purpose” and “The more you throw away, the more you’ll find.”^[15] But this aestheticized minimalism — a choice to pare back made by people who have everything they need — is a stark departure from the minimalism of necessity highlighted by practitioners of minimal computing. Taking a broader view of minimalism registers several problematic echoes of minimal computing among digital detoxers and disaster survivalists in intensities ranging from Luddism to asceticism. Attention needs to be given to these echoes, especially when valorizing DIY infrastructures built out of necessity by Indigenous, poor, or coastal communities and out of privilege by doomsday preppers.

25

Minimalism was originally the name for an avant garde movement in 1960s art that foregrounded the relationship between an art object and its museum viewer. With techniques like prioritizing shape and scale over representation, artists associated with minimalism sought to project little more than objecthood from their sculptures and paintings. “What is at stake . . . is whether the paintings or objects in question are experienced as paintings or as objects,” wrote Michael Fried, who preferred the term “literalist” to describe these conceptual works, in 1967. “Like the shape of the object, the materials do not represent, signify, or allude to anything: they are what they are and nothing more” [Fried 1998, 151]. In the case of a minimalist sculpture, brushed aluminum is just brushed aluminum. Think of Donald Judd’s repeating cubes of identical size, Anne Truitt’s pillars broken by contrasting bands of color, Dan Flavin’s sculptural arrangements of fluorescent light fixtures, and Richard Serra’s massive, curved steel structures. At first, critics and artists alike applied a variety of terms to these works: literalist, cool, ABC, receptive, primary. But eventually, “minimalist” stuck.

26

Critics writing about this cadre of 1960s artists emphasized the theatrical qualities of the museum goer’s experience in the presence of their works. The sculptor Robert Morris described “one’s awareness of oneself existing in the same space as the work . . . as he [*sic*] apprehends the object from various positions and under varying conditions of light and spatial context” [Fried 1998, 153–154]. Minimalist sculptures tend to be either massive or scaled to the size of the human body. When massive, viewers have to back up and circle around the sculptures, participating in space and time as they take in the objects from multiple angles. When they are anthropomorphically scaled, like Tony Smith’s six-by-six-by-six foot cube *Die*, the sculptures possess an eerie presence: coming across one in an empty room feels like being surprised by someone you didn’t expect to be there.

27

If minimalist art amounted to “a new genre of theater,” as Fried wrote, it was a profoundly atomizing form of theater in which the viewer is confronted, distanced, and isolated:

28

That the beholder is confronted by literalist work within a situation that he [*sic*] experiences as his means that there is an important sense in which the work in question exists for him alone, even if he is not actually alone with the work at the time. . . . Someone has merely to enter the room in which a literalist work has been placed to become that beholder, that audience of one — almost as though the work in question has been waiting for him. [Fried 1998, 163]

29

This asocial theatricality couldn’t be farther from the communal experience of theater that Bertolt Brecht or Antonin Artaud advocated for, a theater that transformed its heterogeneous audience into a collective whole. For Michael Fried, if minimalism is a form of theater, it only admits an audience of one.

30

The ubiquity of minimalist sensibilities today makes a lot more sense when seen in light of its roots in this 1960s conceptual art movement, with its sculptures that provoked atomization and isolation. For Kyle Chayka, minimalism today is “an inevitable societal and cultural shift responding to the experience of living through the 2000s,” from the impossibility of owning a home and paying down debt to the vanishing likelihood of ever being paid a fair wage in a job that is secure. During a time when crises fade only as the next one begins, “flexibility and mobility now feel safer than being static, another reason that owning less looks more and more attractive. . . . It makes sense that millennials embrace minimalism. My generation has never had a healthy relationship with material stability” [Chayka 2020, 14].^[16]

31

The architect Pier Vittorio Aureli is less charitable in his description of minimalism as a form of “austerity chic.” In *Less is Enough*, Aureli argues that the endless romanticization of minimalism in the 21st century is the result of the inhumane demands that capitalism has made of people since the industrial age:

32

Within the history of capitalism, “less is more” defines the advantages of reducing the costs of production. Capitalists have always tried to obtain *more* with *less*. Capitalism is not just a process of accumulation but also, and especially, the incessant optimisation of the productive process towards a situation in which *less* capital investment equals more capital accumulation. Technological innovation has always been driven by the imperative to reduce the costs of production, the need for wage earners. The very notion of *industry* is based on this idea: to be *industrious* means being able to obtain the best results with fewer means. [Aureli 2014, 3]

33

Because capitalism constantly demands that we do more with less, minimalism could serve as an invitation to ask why: why we should be content with austerity, where this injunction comes from, and what might be possible with more. Unfortunately, minimalism is instead broadly seen as a self-apparent virtue, a celebration of isolated individuals paring back the boundaries of their otherwise shared experiences.

34

From Digital Minimalism to Digital Equity

Digital minimalism has recently emerged as an offshoot of the broader minimalist imaginary in order to cope with ever-intensifying forms of precarity that affect our ability to maintain not just livable wages, but also uninterrupted trains of thought. Digital minimalists seek to reinforce the permeable membrane of their attention through mindfulness exercises, software settings, productivity apps, and other forms of tech fixes. Approaches in this area fall into a few different categories. First are the books that seek to identify and change the habits that lead users to constantly seek refuge in their phones. Proponents in this camp offer prompts like “spend time alone” and “hold conversation hours.”^[17] A related group consists of tech industry employees and insiders who have seen the light and devoted themselves to fixing the social harms their algorithms have created. Former Google engineer Tristan Harris, for example, founded the nonprofit Center for Humane Technology to draw attention to the ways recommendation algorithms manipulate our cognitive biases in order to keep us scrolling. The group has begun a laudable campaign that pressures tech companies to pivot from business models built on cognitive exploitation by “creat[ing] market conditions for humane tech,” albeit without a real road map for doing so [Center for Humane Technology 2021].

35

A second category tries to solve surveillance capitalism with tech fixes. For their part, tech companies now allow users to seemingly calibrate their attention through options recently added to the system preferences of all major mobile platforms. These features are known as “Digital Wellbeing” in Android, “Screen Time” in iOS, and “Zen Mode” on OxygenOS. A digital minimalist might be further outfitted with gadgets like IRL Glasses with polarized lenses that block the images on screens and slabs of solid plastic called NoPhones that act as pacifiers for smartphone addicts. Digital minimalists can also choose from the Google Paper Phone, a paper printout folded like a zine containing all of the information you’ll need for the day and the Light Phone, an app-less device with an e-ink display that only calls and texts. If minimalism has become synonymous with the capitalist injunction to do more with less, it also promises that buying more will allow us to do less.

36

A third group of digital minimalists draws from the medicalized discourse of screen detoxes and tech fixes used by both groups above. But they go one step further by attributing the 21st-century crisis of attention not only to overreach by the tech industry and its powerful algorithms but also to a certain moral failure on the part of users. Public philosophers James Williams and Matthew Crawford both describe attention as a battleground for human agency. And both seem almost nostalgic for an earlier era when humanity could rely on an “off-the-shelf package of religious and cultural constraints” to regulate our attention, agency, and values [Williams 2018, 21]. Williams writes, “In the twentieth century the rise of secularism and modernism in the West occasioned the collapse — if not the jettisoning — of many of these off-the-shelf packages of constraints in the cause of the liberation of the individual.” Users of digital devices are now faced with “the self-regulatory cost of bringing your own boundaries” to attention [Williams 2018, 21–22].^[18] For Crawford, “The left’s project of liberation led us to dismantle inherited cultural jigs that once imposed a certain coherence (for better and worse) on individual lives” [Crawford 2016, 41].^[19] Both writers retreat into the Western philosophical canon for guidance amid our present “vacuum of cultural authority” [Crawford 2016, 41].

37

Digital minimalism has emerged at a moment when the tech industry continues to invent new methods for transforming our habits and desires into profitable data. But most researchers understand this transformation not in terms of the absence of religion, but the presence of capitalism. These are the terms that Shoshana Zuboff has persuasively developed in her work on “surveillance capitalism” [Zuboff 2019]. Others describe the tech industry’s co-opting of our everyday behavior into new forms of value as a colonial process. Nick Couldry and Ulises A. Mejias see this digital extraction as an expansion of the ways colonialism has appropriated human life for centuries: “Colonialism’s sites of exploitation today include the very same West that historically imposed colonialism on the rest of the world. . . . What if the armory of colonialism is expanding? What if new ways of appropriating human life, and the freedoms on which it

38

depends, are emerging?” [Couldry and Mejias 2019, x]. Unfortunately, the self-help nature of digital minimalism is disconnected from a broader accounting of the tech industry’s collective, social impacts. Instead, much like the isolated, atomized viewer of a minimalist sculpture, digital minimalists emphasize the sanctity of an idealized, individual human experience without ever thinking to address the stratification of those experiences.^[20]

While some manuals are better conceptualized than others — especially Jenny Odell’s wonderful *How to Do Nothing*, in many ways a parody of the genre [Odell 2019] — digital minimalism is largely an argument against technology that forecloses collective action. Digital minimalists often fashion themselves as 21st-century Luddites. But as Megan Ward has argued, Luddism was originally an economic argument, not a self-help motto or personal virtue: “Refusing to be ceaselessly on-call may increasingly become the province of the wealthy and powerful, a return to an era when recreational time was a luxury of the elites rather than a social right for the masses” [Ward 2017].^[21] Unplugging or digitally detoxing doesn’t absolve us of any ethical entanglements at a time when gig workers don’t have the privilege to put their devices away, or when Black and Brown communities don’t have a say in whether they will be surveilled by facial recognition systems and disproportionately imprisoned by pretrial sentencing algorithms [Ticona 2015].^[22] Ruha Benjamin, who details these and other forms of digital inequity in *Race After Technology: Abolitionist Tools for the New Jim Code*, writes of

39

Silicon Valley parents requiring nannies to sign “no-phone contracts” and opting to send their children to schools in which devices are banned or introduced slowly, in favor of “pencils, paper, blackboards, and craft materials.” All the while I attend education conferences around the country in which vendors fill massive expo halls to sell educators the latest products couched in a concern that all students deserve access — yet the most privileged *refuse* it? . . . Social theorist Karl Marx might call tech personalization our era’s opium of the masses and encourage us to “just say no,” though he might also point out that not everyone is in an equal position to refuse, owing to existing forms of stratification. [Benjamin 2019, 15–16, 17]

Read in this light, “offline is the new luxury” seems to be less a celebration of leisure and mindfulness than an accurate diagnosis of digital inequity [Van der Haak 2016].

40

Of course, all these terms have been scrambled amid a pandemic, when broadband connectivity could mean the difference between going out of business and creating an online storefront, or going without healthcare and scheduling a virtual appointment. The writings of the digital minimalists seem almost quaint now that so much of social existence has become filtered through screens. For some time, maximal digital connection will be all we have. It’s difficult to say how much of this new maximalist sensibility will survive the pandemic. But it will be important to reframe the digital minimalist conversations of the 2010s for the demands of digital equity in the 2020s. Going forward, we should ask: which of these competing claims to minimalism — as a form of attention, mindfulness, and agency — are compatible with maximal connection, with maximal choice, with maximal investment in communities and infrastructures?

41

Minimal Computing, Maximal Connection

It’s almost impossible to talk about minimal computing without reference to these free-floating cultural imaginaries of minimalism as a “solution” to the problems of technology today, from doing more with less to surviving off the grid. Before we deploy minimal computing in digital humanities pedagogy and practice, these problematic echoes of minimal computing need to be examined. At a moment when minimalism in pop culture commodifies asceticism and romanticizes disconnection, practitioners of minimal computing should use the term carefully. When digital humanists use the phrase, what does “minimal” mean? And when we hold up minimalism as a virtue, is that virtue a property of particular tools or specific techniques for using them?

42

In 2014, Dennis Tenen and I published a tutorial that showed how academic writers could step outside “proprietary word processing software and fragile file formats” like Microsoft Word and Google Docs. The values guiding that piece included an emphasis on the fundamentals of computation, legibility of the many layers of mediation involved in word processing, and above all, sustainability of the media on which we record our ideas [Tenen and Wythoff 2014] [Gil

43

2015]. The tools we used to achieve those goals are now closely associated with “minimal computing”: markdown and the document conversion software Pandoc, as well as static site generators. But I now wonder whether we were prioritizing the values embedded in the tools (as do the proponents of a decentralized web who advance non-proprietary hardware) or the values that informed our selection and use of those tools (like the community technologists who advocate for meaningful connectivity for all). When it comes to Pandoc and static sites, do these artifacts have politics, as Langdon Winner famously asked? Can particular technologies have either inherently democratic or inherently authoritarian tendencies, “embody[ing] specific forms of power and authority?” [Winner 1980, 121].

The answer is of course a resounding yes. Pandoc prevents information from being endangered or locked into proprietary ecosystems, while static sites enable the democratization and rapid deployment of humanist praxis, which Alex Gil and Élika Ortega usefully describe as “the renewal, dissemination, and preservation of the scholarly record” [Gil and Ortega 2016, 29]. However, I would caution against an easy equivocation between tools and their attendant politics. Too often, digital humanists attribute democratic tendencies to some tools while overlooking the authoritarian tendencies of others. I’m thinking in particular about the number of digital humanities studies that use facial recognition technologies in studies of film and television without once mentioning the racist ways those tools are deployed in the world^[23] — or work in cultural analytics that sidestep questions about machine learning’s amplification of existing inequities with the briefest of preambles before moving on to the value-neutral application of those tools.^[24] If we simply borrow a data science tool in the humanities and apply it to a corpus of photographs or novels without questioning the assumptions baked into that tool or the harmful ways that tool is deployed in the world today, that is a missed opportunity for dialogue and advocacy.

44

A better approach might be to invert Langdon Winner’s question, as Christina Dunbar-Hester does in her book *Low Power to the People*: “Do politics have artifacts?” This is a much more difficult question, asking how we can identify which tools best exemplify a particular political argument. Dunbar-Hester’s book is an ethnography of community technologists working with radio and WiFi in the early 2000s who negotiated “the construction and implementation of specific beliefs about what technology can do, what technology should do, or what artifact is most appropriate to enact a set of politics” [Dunbar-Hester 2014]. Winner explores the existence of “artifactual politics,” rightly concluding that all artifacts entail some form of political argument or effect. His approach to artifactual politics would describe minimal computing as an assemblage of particular tools and platforms — Jekyll, Hugo, Pandoc, Markdown — that afford a particular form of politics, an argument about the role of technology in daily life. Dunbar-Hester asks instead how to identify and describe “political artifacts,” or the artifacts that embody particular arguments. If the politics of minimal computing are access, participation, sustainability, and equity, then what tools are best suited to achieve those goals? The benefit of Dunbar-Hester’s approach is that there is never just one right answer, and it ensures that we lead with a fluid conversation about values rather than locking those values into the affordances of a particular tool.

45

For example, while the tools currently associated with minimal computing are more sustainable, they can be less equitable in terms of participation (considering the steep learning curve of starting from scratch) or bandwidth (given their pared back, lower-definition, lesser-than resources). Jentery Sayers warned of this early on, in 2016: “It’s easy to become preoccupied with technical details and specialization, which often ostracize people or inhibit participation” [Sayers 2016]. Since then, minimal computing has become near synonymous with static sites in particular, but static sites are often at odds with some of minimal computing’s core values of access and participation. The Executive Council of the Association for Computers and the Humanities, for example, recently decided against migrating their website from WordPress to a static site generator due in part to learning-curve concerns. The Council worried that the command line, markdown, and Git may have presented too great a barrier to entry for new contributors to the site.^[25] While static site generators are remarkable tools — I’m a known fan — they have become too easily conflated with minimal computing. An artifactual politics approach has welded a value (rapid deployment) to a tool (static site generators) at the expense of sustainable community partnerships and equitable participation.

46

Values guiding the theory and practice of minimal computing include access, participation, sustainability, stewardship, and equity. When placed alongside each other — as we’ve seen — these values often produce rich contradictions that can be difficult to appreciate if particular tools elevate some values at the expense of others. I find that this has been

47

especially difficult to remember during the pandemic, amid a rush to throw tools and platforms at every activity under the sun in a desperate attempt to recreate the way things felt before social distancing. But the contribution of minimal computing has always been the way it foregrounds — instead of particular tools — what Roopika Risam calls “cultural practices,” what German media theorists call *Kulturtechniken*, and what we can simply refer to here as technique, or the way we do things [Risam 2018, 43] [Siegert 2015]. If minimal computing is to continue asking “What do we need?” in order to define the “we” in question and elevate the values held in common by that “we,” then it will have to find new ways to center its principles on the way we do things rather than the tools we use to do them. I offer three suggestions in closing for how to surface such techniques in the unsettled months and years to come.

First, minimal computing should be led by community input. For the community technologist, maximal connection doesn’t necessarily mean more tools. Instead, it means increased accountability, tangibility, and locality to the ways we connect with one another. In building social and technical infrastructures alongside one another, community technologists advocate not only for access, but also for the legibility of unseen, surveillant infrastructures. As Rory Solomon writes:

Mesh networks are more like students passing notes in class. . . . Even though social media and meme culture are often referred to as peer-to-peer, they remain intermediated by vast agglomerations of actors — corporations, institutions, platforms, infrastructures, workers — that we don’t know and maybe can’t fully know or see. [Solomon 2020, 3]

For Greta Byrum, mesh is “a tool of resilience and mutual aid . . . a way to resist autocratic control of communications systems” [Byrum 2019]. As we’ve seen, minimalism is relative. But the version of minimal computing offered by community technologists is a minimalism of paring back to make visible, of participation and equity. At the same time, it is a minimalism that remains tool-agnostic and responsive to the values of a community. Community technology connects the individual user to her shared social bonds — and the impacts of technology on both — by advancing a form of minimalism that is rich with social connection.

Second, minimal computing should be responsive to the underlying contradictions and concerns that have inspired flawed responses to the tech industry like digital minimalism and disaster survivalism. Both of these ideas advocate for inward retreat and isolation. But their imaginaries of constraint also offer lessons for the future of minimal computing as it is practiced in digital humanities scholarship, pedagogy, and praxis. Clearly, the romance with the tech industry is over and the public is hungry for new ways to think about the role of invasive technologies in daily life. And so minimal computing should incorporate the bare minimum literacies needed today in order to understand what data is captured about our habits and desires, as well as the impacts that collection will have. It should also incorporate tactics for data literacy and the obfuscation of surveillance (also known as “sousveillance”), instead of retreats into mindfulness.^[26] Minimal computing can offer self-determination rather than self-help, an ethics of connection rather than an injunction to detox, and forms of solidarity rather than appropriation.

And finally, given this broad hunger for more responsible technology, minimal computing can play a role in public scholarship and community partnerships that extend existing academic research.^[27] Minimal computing has largely grown in digital humanities contexts by emphasizing the preservation of the scholarly and cultural record. But the use of minimal computing tools and techniques in digital humanities research can also provide a model for the understanding, critique, and application of those tools in the broader world. What academics call minimal computing has independently taken root outside universities through grassroots organizing, activism, and advocacy on technology. Two groups of people are having the same conversation in two different contexts: for every Maryland Institute for Technology in the Humanities there’s a Detroit Equitable Internet Initiative, for every Harvard MetaLab, a Pittsburgh MetaMesh. It’s especially important to recognize these existing parallels as many expect the makeup of academia to change dramatically from the coronavirus’s irreparable damage to already-misguided university budgets. Asking “What do we need?” in minimal computing now means defining the “we” that will constitute researchers, scholars, and archivists as graduate programs contract and the professoriate is hollowed out. If we can’t count on institutional support, what comes next?

While the pandemic has widened fault lines that long predate the current crisis, academics can now triangulate a new “we” as the common ground shifts beneath our feet. If universities fail, digital humanities praxis will continue elsewhere. The pandemic provides the occasion for community technologists and digital humanists to join efforts, and for academics to contribute their energies to support the voices and vision of community-based organizations.

Acknowledgments

This essay was written with a sense of urgency in May and June 2020, during collective reckonings with a global pandemic and state-sponsored, racist violence: twinned crises that have lasted longer than any crisis, by definition, should. I’m grateful to Rebecca Sutton Koeser, Zoe LeBlanc, Jessa Lingel, Rory Solomon, Sara J. Grossman, Alex Wermer-Colan, and two anonymous reviewers for their input, to Roopika Risam and Alex Gil for the uncommon lengths they went in order to make this special issue stand as a well-designed, consistent whole, to Lydia Guterman for engaging these ideas so thoroughly during copyedits, and for my friends at Philly Community Wireless.

Notes

[1] As Alex Gil and Élika Ortega frame minimal computing, “We prefer to (un-)define minimal computing around the question ‘What do we need?’” [Gil and Ortega 2016].

[2] Hopefully, one legacy of this pandemic will be an understanding of the uselessness of preparing alone — preparing based solely on individual needs and isolated experiences of crisis — rather than preparing as a community.

[3] Ruha Benjamin’s Pandemic Portal “tracks, synthesizes, and situates the data on the racial dimensions of the pandemic within historically and sociologically grounded interpretative frameworks” [Benjamin 2021].

[4] According to Christian Hetrick and Dylan Purcell, “A 2019 survey by the School District of Philadelphia found that only 45% of students in grades three through five accessed the Internet from a computer at home, compared with 56% in grades six through eight, and 58% for high school students” [Hetrick and Purcell 2020].

[5] See, for example, the following two Philadelphia maps based on 2018 data from the US Census Bureau’s “American Community Survey”: A map of disconnection rates [Purcell 2021] and a map of race and ethnicity [Statistical Atlas 2018].

[6] These community technologies respond to the prevailing mode of Internet access in the United States; even though there is broad agreement that the Internet is a *public* good, neoliberal policies have only privileged *private* models of Internet service, financializing the commons and withholding access and ownership from exploited communities.

[7] See the *Community Technology Field Guide* for an overview of mesh networks. It was co-authored by New America’s Open Technology Institute, The Work Department, Allied Media Projects, and the Detroit Community Technology Project [Community Technology Field Guide 2021].

[8] See <http://communitytechny.org/stepping-through-the-portal-ctny-the-pandemic/>.

[9] See <https://keii.network/>. For the SRI packet van, see [Computer History Museum 2021].

[10] In the wake of 2020, I highly recommend this special issue as a roadmap for the ways history can inform collective practice now.

[11] As Rory Solomon notes:

This process of relaying messages through intermediaries is called routing, and a crucial part of building mesh networks is the development and deployment of routing algorithms that optimize network efficiency in terms of several possible variables, including: minimizing number of intermediate steps or ‘hops’ [between network nodes], minimizing time or cost of message delivery, maximizing the quantity of overall throughput in the network, performing well in the presence of high levels of message traffic or noise, and perhaps most importantly, maximizing network resiliency, meaning the capacity of messages to be successfully routed from sender to receiver even in the event of lost intermediate links. [Solomon 2020, 2–3]

[12] As many of us learned when building Philly Community Wireless beginning in the summer of 2020, not all scholarship happens in the space of publication and peer review. I am grateful to many people for conversations, instruction, and advice on community technology praxis that informed this section, including Adam Longwill, Addie Barron, Andrew Coy, David Johnson, Devren Washington, Erica Kermani, Franca Muller Paz, Greta Byrum, Hannah Sassaman, Heather Lewis-Weber, Helyx Horwitz, Houman Saberi, Jennifer Oxenford, Jonathan Latko, Juliet

Fink-Yates, Kate Goodman, Mark Steckel, Michael Major, Monique Tate, Raul Enriquez, Rory Solomon, Sascha Meinrath, Stasia Monteiro, Tejas Gupta, and Tithi Chattopadhyay.

[13] For examples of these two different schools of thought, see the Community Technology Collective (<https://www.ctcollective.org/>) and Tim Berners-Lee's new open source software project Solid (<https://inrupt.com/solid>), in which "pods store user data in an interoperable format and provide users with permissioning controls."

[14] My understanding of "tech justice" is informed by the work of the Philly Tech Justice coalition, which pushes back "against intrusive data collection and unnecessary camera surveillance, and digital illiteracy and lack of technology access" [Philly Tech Justice 2021].

[15] For examples of this brand of minimalism, see the Netflix film *Minimalism: A Documentary About the Important Things* (2016) and Instagram accounts like @minimalismlife. For critiques of the self-help industry tied to this minimalist ethos, see [Brinkmann 2017] and [Cederström and Spicer 2015].

[16] As Chayka notes, "I began thinking of this universal feeling as the longing for less. It's an abstract, almost nostalgic desire, a pull toward a different, simpler world. Not past nor future, neither utopian nor dystopian, this more authentic world is always just beyond our current existence in a place we can never quite reach. Maybe the longing for less is the constant shadow of humanity's self-doubt: What if we were better off without everything we've gained in modern society?" [Chayka 2020, 14].

[17] See also [Brabazon 2013], [Clear 2018], [Levy 2017], [Newport 2019], [Otto and Westhagen 2016], [Perlow 2012], and Stanford's Ritual Design Lab [Ozenc and Hagan 2021].

[18] Williams continues: "In many cases, this rejection occurred on the basis of philosophical or cosmological disagreements with the old packages. This has, of course, had many great benefits. Yet by rejecting entire packages of constraint, we've also rejected those constraints that were actually useful for our purposes. When you dismantle existing boundaries in your environment, it frees you from their limitations, but it requires you to bring your own boundaries where you didn't have to before. Sometimes, taking on this additional self-regulatory burden is totally worth it. Other times, though, the cost is too high" [Williams 2018, 21–22].

[19] Crawford continues: "This created a vacuum of cultural authority that has been filled, opportunistically, with attentional landscapes that get installed by whatever 'choice architect' brings the most energy to the task — usually because it sees the profit potential" [Crawford 2016, 41].

[20] Laura Portwood-Stacer argues that "individuals who consciously choose to abstain from participation on the ubiquitous Facebook platform" end up "framing refusal as a performance of elitism, which may work against observers interpreting conscientious refusal as a persuasive and emulable practice of critique." She refers to this stance as "conspicuous non-consumption" [Portwood-Stacer 2013, 1041]. See also [Karppi 2018].

[21] On the post-WWII afterlives of nineteenth-century Luddism, see [Tierney 2019].

[22] Ticona conducts a comparative study of how workers in different sectors manage the "entrance of mobile phones into the workplace . . . within a marketplace where jobs are increasingly uncertain and insecure." She finds that "service workers deployed strategies of everyday resistance in concert with their ICTs to gain a feeling of autonomy within the power structures of their workplaces. The knowledge workers deployed strategies of inaccessibility to resist the work-extending affordances of their devices and decouple from work which threatened to colonize too much of their lives. Both service and knowledge workers deploy strategies that may obscure the institutional sources of their problems by overindividualizing risk and responsibility" [Ticona 2015, 509]. On pretrial sentencing, see especially the Mapping Pretrial Injustice Project, a collaboration between the Movement Alliance Project and MediaJustice, at <https://pretrialrisk.com/>.

[23] There is growing public awareness of the discriminatory effects of these technologies. For example, IBM, Microsoft, and Amazon have all banned the sale of their facial-recognition systems to police departments [Greene 2020]. See also the Safe Face Pledge, "an opportunity for organizations to make public commitments towards mitigating the abuse of facial analysis technology" [Algorithmic Justice League 2021].

[24] These automated systems introduce "subtler forms of discrimination that give the illusion of progress and neutrality, even as coded inequity makes it easier and faster to produce racist outcomes" [Benjamin 2019, 22].

[25] The details on this decision were relayed to me by Executive Council member Rebecca Sutton Koeser.

[26] A regular workshop series on Obfuscation showcases and debates "creative ways to evade surveillance, protect privacy, and improve security by adding and modifying data instead of concealing it, making it more ambiguous and difficult to exploit" [Workshop on Obfuscation 2021]. The workshop grew out of the book by Finn Brunton and Helen Nissenbaum, *Obfuscation: A User's Guide for Privacy and Protest*

[Brunton and Nissenbaum 2016]. For a grassroots parallel to this academic initiative, see *Our Data Bodies: Digital Defense Playbook*, authored by the Detroit Community Technology Project [Lewis et al. 2018].

[27] Here, we might think of earlier calls among digital humanists to ground their theories in community practice, or more specifically, by rethinking what constitutes scholarly community. Rita Raley, providing the examples of DHCommons and the HASTAC Scholars program, writes: “Tactical activities are increasingly framed in terms of community and infrastructural investment, and the result has been a proliferation of community labs and gardens and alternative systems of exchange. To take a tactical, media-informed approach to the digital humanities is thus to renew one’s commitments to the sharing of knowledge — not simply references and links but, more important, ideas” [Raley 2014]. More recently, Matthew Applegate has written on “politicized modes of DH praxis” that have “proven to be a conduit for centering marginalized voices, creating space for many who are excluded from academic advancement, and rethinking how humanistic inquiry is practiced” [Applegate 2019].

Works Cited

- Algorithmic Justice League 2021** Algorithmic Justice League. “Overview - Inactive.” *Safe Face Pledge*. Accessed October 19, 2021. <https://www.safefacepledge.org/>.
- Alliance for Affordable Internet 2020** Alliance for Affordable Internet (A4AI). “Meaningful Connectivity: A New Target to Raise the Bar for Internet Access.” *Alliance for Affordable Internet*. Accessed October 13, 2021. <https://a4ai.org/meaningful-connectivity/>.
- Applegate 2019** Applegate, Matthew. *Guerrilla Theory: Political Concepts, Critical Digital Humanities*. Evanston, IL: Northwestern University Press, 2019.
- Aureli 2014** Aureli, Pier Vittorio. *Less Is Enough: On Architecture and Asceticism*. Moscow: Strelka Press, 2014.
- Benjamin 2019** Benjamin, Ruha. *Race After Technology: Abolitionist Tools for the New Jim Code*. Medford, MA: Polity, 2019.
- Benjamin 2021** Benjamin, Ruha. “About Pandemic Portal.” *The Just Data Lab*. Accessed October 19, 2021. <https://www.thejustdatalab.com/>.
- Brabazon 2013** Brabazon, Tara. *Digital Dieting: From Information Obesity to Intellectual Fitness*. London, UK: Routledge, 2013.
- Breitbart, Lakshmipathy, and Meinrath 2007** Breitbart, Joshua, Naveen Lakshmipathy, and Sascha D. Meinrath. *The Philadelphia Story: Learning from a Municipal Wireless Pioneer*. Washington D.C.: New America Foundation, 2007.
- Brinkmann 2017** Brinkmann, Svend. *Stand Firm: Resisting the Self-Improvement Craze*. Malden, MA: Polity, 2017.
- Brunton and Nissenbaum 2016** Brunton, Finn and Helen Nissenbaum. *Obfuscation: A User’s Guide for Privacy and Protest*. Cambridge, MA: MIT Press, 2016.
- Byrum 2019** Byrum, Greta. “Building the People’s Internet.” *Urban Omnibus*, October 2, 2019. <https://urbanomnibus.net/2019/10/building-the-peoples-internet/>.
- Cederström and Spicer 2015** Cederström, Carl and André Spicer. *The Wellness Syndrome*. Malden, MA: Polity, 2015.
- Center for Humane Technology 2021** “For Technologists: Review Our Principles.” *Center for Humane Technology*. Accessed October 19, 2021. <https://www.humanetech.com/technologists#principles>.
- Chayka 2020** Chayka, Kyle. *The Longing for Less: Living with Minimalism*. NY: Bloomsbury Publishing, 2020.
- Clear 2018** Clear, James. *Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones*. NY: Avery, 2018.
- Community Technology Field Guide 2021** Open Technology Institute, New America, The Work Department, Allied Media Projects, and Detroit Community Technology Project. “Neighborhood Network Construction Kit: Introduction to Mesh.” *Community Technology Field Guide*. Accessed October 19, 2021. <https://communitytechnology.github.io/docs/cck/networking/intro-to-mesh/>.
- Computer History Museum 2021** “SRI Mobile Van.” *Computer History Museum*. Accessed October 19, 2021. <https://www.computerhistory.org/collections/catalog/X1590.99>.
- Couldry and Mejias 2019** Couldry, Nick and Ulises A. Mejias. *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism*. Stanford, CA: Stanford University Press, 2019.

- Crawford 2016** Crawford, Matthew B. *The World Beyond Your Head: On Becoming an Individual in an Age of Distraction*. NY: Farrar, Straus and Giroux, 2016.
- Digital Harbor Foundation 2021** "About." *Digital Harbor Foundation*. Accessed October 19, 2021. <https://www.digitalharbor.org/about/>.
- Dunbar-Hester 2014** Dunbar-Hester, Christina. *Low Power to the People: Pirates, Protest, and Politics in FM Radio Activism*. Cambridge, MA: MIT Press, 2014.
- Flynn 2014** Flynn, Adam. "Solarpunk: Notes toward a manifesto." *Hieroglyph*, September 4, 2014. <https://hieroglyph.asu.edu/2014/09/solarpunk-notes-toward-a-manifesto/>.
- Fried 1998** Fried, Michael. *Art and Objecthood: Essays and Reviews*. Chicago: University of Chicago Press, 1998.
- Gil 2015** Gil, Alex. "The User, the Learner and the Machines We Make." *Minimal Computing*, May 21, 2015. <https://go-dh.github.io/mincomp/thoughts/2015/05/21/user-vs-learner/>.
- Gil and Ortega 2016** Gil, Alex and Élika Ortega. "Global Outlooks in Digital Humanities: Multilingual Practices and Minimal Computing." In *Doing Digital Humanities: Practice, Training, Research*, edited by Constance Crompton, Richard J. Lane, and Ray Siemens, 22–34. Abingdon, UK: Routledge, 2016. 10.4324/9781315707860-12.
- Greene 2020** Greene, Jay. "Microsoft Won't Sell Police Its Facial-Recognition Technology, Following Similar Moves by Amazon and IBM." *The Washington Post*, June 11, 2020. <https://www.washingtonpost.com/technology/2020/06/11/microsoft-facial-recognition/>.
- Hetrick and Purcell 2020** Hetrick, Christian and Dylan Purcell. "Thousands of Philly Students Are Stuck at Home with No Computer or Internet After Coronavirus Closed Schools." *The Philadelphia Inquirer*, April 3, 2020. <https://www.inquirer.com/education/coronavirus-students-digital-divide-philadelphia-comcast-20200403.html>.
- Hobart and Kneese 2020** Hobart, Hi'ilei Julia Kawehipuaakahaopulani Hobart and Tamara Kneese. "Radical Care: Survival Strategies for Uncertain Times." *Social Text* vol. 38.1 (March 2020): 1–16, doi:10.1215/01642472-7971067.
- Karppi 2018** Karppi, Tero. *Disconnect: Facebook's Affective Bonds*. Minneapolis: University of Minnesota Press, 2018.
- Kondō 2014** Kondō, Marie. *The Life-Changing Magic of Tidying up: The Japanese Art of Decluttering and Organizing*. Berkeley, CA: Ten Speed Press, 2014.
- Konstantinou 2019** Konstantinou, Lee. "Our Sci-Fi Is Broken, and Hopepunk — Whatever That Is — Can't Fix It." *Slate Magazine*, January 15, 2019. <https://slate.com/technology/2019/01/hopepunk-cyberpunk-solarpunk-science-fiction-broken.html>.
- Levy 2017** Levy, David M. *Mindful Tech: How to Bring Balance to Our Digital Lives*. New Haven, CT: Yale University Press, 2017.
- Lewis et al. 2018** Lewis, Tamika, Seeta Peña Gangadharan, Mariella Saba, and Tawana Petty. "Digital Defense Playbook: Community Power Tools for Reclaiming Data." *Our Data Bodies*. Accessed March 15, 2022. https://www.odbproject.org/wp-content/uploads/2019/03/ODB_DDP_HighRes_Spreads.pdf.
- Ma 2018** Ma, Ling. *Severance*. New York: Farrar, Straus and Giroux, 2018.
- Movement Alliance Project and MediaJustice** Movement Alliance Project and MediaJustice. "About." Mapping Pretrial Injustice Project. Accessed October 19, 2021. <https://pretrialrisk.com/our-research/about/>.
- Newport 2019** Newport, Cal. *Digital Minimalism: Choosing a Focused Life in a Noisy World*. NY: Portfolio, 2019.
- Nucera 2016** Nucera, Diana J. "Teaching Community Technology Handbook." *Detroit Community Technology Project*. Accessed March 15, 2022. <https://detroitcommunitytech.org/sites/default/files/librarypdfs/TeachingCommunityTech.pdf>
- Odell 2019** Odell, Jenny. *How to Do Nothing: Resisting the Attention Economy*. Brooklyn: Melville House, 2019.
- Osnos 2017** Osnos, Evan. "Doomsday Prep for the Super-Rich." *The New Yorker*, January 30, 2017. <https://www.newyorker.com/magazine/2017/01/30/doomsday-prep-for-the-super-rich>.
- Otto and Westhagen 2016** Otto, Daniela and Florian Westhagen. *Digital Detox: Wie Sie entspannt mit Handy & Co. leben*. Berlin: Springer, 2018.
- Ozenc and Hagan 2021** Ozenc, F. Kursat, and Margaret Hagan. "About." *Ritual Design Lab*. Accessed October 19, 2021. <https://www.ritualdesignlab.org/about/>.

- O'Connell 2020** O'Connell, Mark. *Notes from an Apocalypse: A Personal Journey to the End of the World and Back*. London: Granta Publications, 2020.
- Patton 2020** Patton, Stacey. "Black America Is Suffering from the Coronavirus." *The Washington Post*, April 11, 2020. <https://www.washingtonpost.com/outlook/2020/04/11/coronavirus-black-america-racism/>.
- Penny 2020** Penny, Laurie. "This Is Not the Apocalypse You Were Looking For." *Wired*, March 30, 2020. <https://www.wired.com/story/coronavirus-apocalypse-myths/>.
- Perlow 2012** Perlow, Leslie A. *Sleeping With Your Smartphone: How to Break the 24/7 Habit and Change the Way You Work*. Boston: Harvard Business Review Press, 2012.
- Philly Mesh 2021** "Home." *Philly Mesh*. Accessed October 13, 2021. <https://phillymesh.net/>.
- Philly Tech Justice 2021** "About." *Philly Tech Justice*. Accessed October 19, 2021. <https://phillytechjustice.org/about/>.
- Portwood-Stacer 2013** Portwood-Stacer, Laura. "Media Refusal and Conspicuous Non-Consumption: The Performative and Political Dimensions of Facebook Abstention." *New Media & Society* vol. 15.7, (November 2013): 1041–1057. doi:10.1177/1461444812465139.
- Project Waves 2021** "About." Project Waves. Accessed October 19, 2021. <https://www.projectwaves.net/about>.
- Purcell 2021** Purcell, Dylan. "Broadband Internet Access Lags in Many Philadelphia Neighborhoods." *Datawrapper*. Accessed October 19, 2021. <https://datawrapper.dwcdn.net/Ce3Cz/3/>.
- Raley 2014** Raley, Rita. "Digital Humanities for the Next Five Minutes." *Differences* vol. 25.1 (January 2014): 26–45.
- Risam 2018** Risam, Roopika. *New Digital Worlds: Postcolonial Digital Humanities in Theory, Praxis, and Pedagogy*. Evanston, IL: Northwestern University Press, 2018.
- Rosen 2021** Rosen, David. "Cities Struggle to End the Urban Digital Divide." *The Progressive Magazine*. Accessed October 24, 2021. <https://progressive.org/latest/urban-digital-divide-rosen-210916/>.
- Sanchez 2020** Sanchez, Alvaro. *Toward Digital Inclusion: Broadband Access in the Third Federal Reserve District*. Federal Reserve Bank of Philadelphia, March 2020. <https://www.philadelphiafed.org/-/media/frbp/assets/community-development/reports/toward-digital-inclusion-broadband-access-in-the-third-federal-reserve-district.pdf>.
- Sayers 2016** Sayers, Jentery. "Minimal Definitions-Minimal Computing." *Minimal Computing: A Working Group of GO::DH*, October 2, 2016. <http://go-dh.github.io/mincomp/thoughts/2016/10/02/minimal-definitions/>.
- Siegert 2015** Siegert, Bernhard. *Cultural Techniques: Grids, Doors, Filters, and Other Articulations of the Real*. Oxford: Oxford University Press, 2015.
- Solomon 2020** Solomon, Rory. "Meshiness: Mesh Networks and the Politics of Connectivity." PhD dissertation, 2020. New York University.
- Statistical Atlas 2018** "Race and Ethnicity in Philadelphia, Pennsylvania." *Statistical Atlas*, September 10, 2018. <https://statisticalatlas.com/place/Pennsylvania/Philadelphia/Race-and-Ethnicity#data-map/neighborhood/white>.
- Tenen and Wythoff 2014** Tenen, Dennis and Grant Wythoff. "Sustainable Authorship in Plain Text using Pandoc and Markdown." *The Programming Historian* 3, 2014. <https://doi.org/10.46430/phen0041>.
- Ticona 2015** Ticona, Julia. "Strategies of Control: Workers' Use of ICTs to Shape Knowledge and Service Work." *Information, Communication & Society* vol. 18.5 (May 2015): 509–523. doi:10.1080/1369118X.2015.1012531.
- Tierney 2019** Tierney, Matt. *Dismantlings: Words Against Machines in the American Long Seventies*. Ithaca: Cornell University Press, 2019.
- Van der Haak 2016** van der Haak, Bregtje, dir. *Offline Is the New Luxury*. Hilversum, Netherlands: VPRO Backlight, 2016.
- Ward 2017** Ward, Megan. "Your Digital Detox Isn't as Radical as You Think." *The Washington Post*, July 30, 2017. <https://www.washingtonpost.com/news/made-by-history/wp/2017/07/30/your-digital-detox-isnt-as-radical-as-you-think/>.
- Williams 2018** Williams, James. *Stand Out of Our Light: Freedom and Resistance in the Attention Economy*. Cambridge, UK: Cambridge University Press, 2018.
- Winner 1980** Winner, Langdon. "Do Artifacts Have Politics?" *Daedalus* vol. 109.1 (1980): 121–136.

Wired 2011 “U.N. Report Declares Internet Access a Human Right.” *Wired Magazine*, June 6, 2011.
<https://www.wired.com/2011/06/internet-a-human-right/>.

Workshop on Obfuscation 2021 “About.” Workshop on Obfuscation. Accessed October 19, 2021.
<https://www.obfuscationworkshop.org/>.

Zuboff 2019 Zuboff, Shoshana. *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. NY: PublicAffairs, 2019.



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.