Deconstructing Urbit: The Politics of Software as Infrastructure

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Foreword

The following essay was originally written as a contribution intended for the Routledge Handbook of Architecture, Urban Space and Politics. I proposed and drafted it in early 2020, and then submitted it for peer review. I returned to work on the final edit in July 2021, having not thought about the work for some six months, and noticed that a new paper with a very similar thesis (and deeper research regarding the neoreactionary intellectual genealogies) had been published in April 2021 about Urbit. Not feeling equipped to update the paper to adequately reflect and build upon that work, having moved onto other research topics, I withdrew my chapter from the publication.

I make it available here as a 'preprint' in the spirit of sharing unfinished academic work I am particularly grateful to Nikolina Bobic and Farzaneh Haghighi for their close reading of the work in its draft stages, and their understanding regarding the non-publication at the time. Thank you also to Chiara Ficarelli, Francis Tseng, all those in Brown University's STS reading group for their varied contributions in form and kind. Thank you also to the reviewer two of the first draft of this piece as it was originally submitted to the *Routledge Handbook of Architecture, Urban Space and Politics*, who put much needed pressure on the more extensive use of Lefebvre's ideas that existed in early drafts. All editorial and formatting mistakes are mine, as the piece is slightly restructured in comparison to what was originally submitted for the handbook.

Introduction

Urbit is the name of an operating system developed by Tlon, a San-Francisco software company whose stated mission is to develop a "clean-slate OS and network for the 21st century" [1]. What Urbit actually offers as a software company is curiously difficult to discern, even for the code-literate, as the technical language Urbit employs is arcane and its mission statement broad [2]. Most plainly, Urbit's product is an operating system (OS), comparable to Microsoft Windows, Apple MacOS, or Linux. This OS runs on the same kind of hardware you can find in a commercial laptop, and provides the user with functions that are now common and expected of a personal computer, such as messaging and sharing digital content with others, creating personal notes, and publishing shareable blogs [1]. What Urbit offers that many other popular operating systems do not (at least not by default) is a guarantee that the user owns their own data, and that when is it shared with others, it is via encrypted networking. In other words, Urbit is software for personal

computers that allows for the social functions we have come to expect of operating systems, but without the requirement of corporate intermediaries who profit from users' transactions (i.e. the profit model of Facebook, Google, and many other Internet companies.)

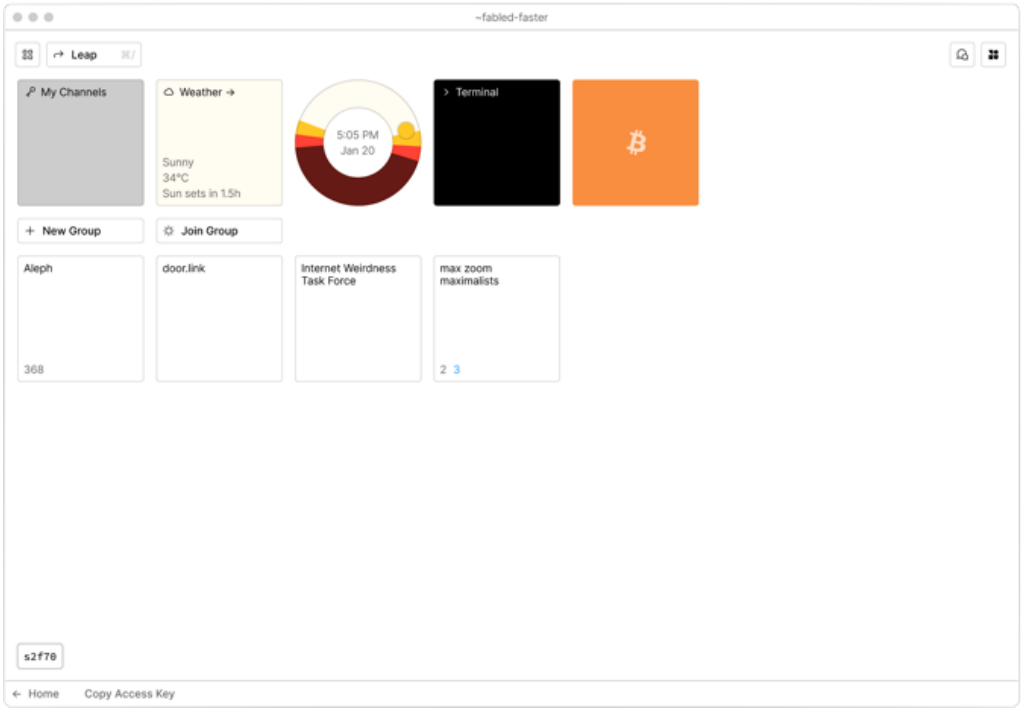

Figure 1. A screenshot of the UrbitOS desktop page in 2021. Source: urbit.org, accessed at July 2, 2021.

Urbit markets itself as similar to other free and open source software initiatives that aim to restore the ownership and control of data to its users, such as the Signal messaging platform or Tim Berners Lee's Solid initiative to "re-decentralize the web": and in many ways it is [3, 4]. While other projects in this space are typically associated with the political undertakings of the Left, however – partly due to the expectation that their introduction and use will disrupt the monopolistic behavior of firms like Facebook and Google – Urbit is entangled in the fiscal and intellectual economies of the neo-reactionary Right. It was founded and originally developed by the far-right blogger Curtis Yarvin, and is funded by Peter Thiel's Founder's Fund [5].

"Between cyberspace and outer space lies the possibility of settling the Oceans," wrote Silicon-Valley entrepreneur and billionaire Peter Thiel in his 2009 article, "The Education of a Libertarian" [6]. In this article, Thiel outlined the core mission of the Seasteading Institute, a non-profit organization Thiel funds, founded by Milton Friedman's grandson, Patri Friedman, in 2008. The Seasteading Institute states that its aims are to "build floating societies with significant political autonomy." The initiative can be viewed as an infrastructural vehicle for Thiel's commitment to "authentic human freedom," which he sees "as a precondition for the highest good" [6]. Like all concepts of freedom, Thiel's concept of freedom is political: imagined to work in a particular way for some, and in others (or not)

for others [7]. The Seasteading Institute is interested in a very particular kind of freedom, available only to an exclusive financial and ideological echelon.

The idea of floating cities on the expanse of the oceans is not a new one, and it opens a range of interesting historical questions.[1] In this paper, however, I only want to use the Institute as a starting point: to unpack the Seasteading Institute's project to create sovereign ocean colonies in order to home in on the libertarian definition of freedom it floats upon. By fixing a definition of libertarian "freedom" as it manifests in the project of the Seasteading Institute, I aim to highlight that Urbit produces similar politics by way of sharing that definition.

This chapter treats the concept of freedom as political, and uses it to trace and articulate the ways in which Urbit is political. Abstract concepts are instrumental to both the conception of infrastructure, and to what space is likely to be produced by it. This entanglement of concept and matter is what makes infrastructure inherently political, and is the reason that reasoning analytically about the politics of infrastructure matters.

To put it more plainly, infrastructure is political philosophy materially at work. The physical infrastructures that we live with – hospitals, homes, schools, office buildings – produce space in the Lefebvrian sense [8]. Just as the physical constitution of a building parameterizes the scope of social relations that can exist in and around it, the contours of code in an operating system are the precondition for data that can emerge from its use. Space's particular productions – that is, infrastructure – whether they are analogue or digital, make some kinds of lives possible, and foreclose others. Consequently, the production of space is an inherently political operation. The capacity to determine the structure of spaces is a matter of power. Power produces space, and space produces life.

The deconstruction of libertarian infrastructure is particularly crucial in the domain of software given the influence of neo-reactionary political philosophy in Silicon Valley [9]. Urbit is an important site of analysis for infrastructural critique not only, however, because it is funded by Peter Thiel and founded by a libertarian ideologue. There are many other pieces of infrastructure, arguably much more influential, politically significant and potentially damaging than Urbit, that fit this same description[2]. Urbit is useful and interesting to think with because it is something of an anomaly among infrastructures that might be considered libertarian in that it is completely open source. The software's code is available for free online under the MIT license [10]. It can be downloaded, run locally, modified and/or replicated by anyone with an Internet connection. The fact that its code is transparently available makes Urbit a valuable site to learn about how the libertarian conception of freedom can manifest as infrastructure.

Urbit is also important to critique as it is not yet generally recognized as infrastructure associated with libertarian ideals per se. Though there has been significant press regarding Curtis Yarvin's embroilment in neo-reactionary white supremacist thought, Tlon has made a conspicuous effort to remove its creator's political associations from the company's image

[1] Seasteading can be historically situated within a history of communities taking to the ocean and sea and building micronations. For example: The Republic of Rose Island in the Adriatic Sea; the Principality of Sealand off the coast of the United Kingdom.

[2] The software developed by Palantir and SpaceX, for example, would be front-running candidates.

and marketing materials [11]. To further complicate the matter of the software's politics, Yarvin officially 'left' the Tlon company in 2019, meaning that Urbit's development and commercialization is arguably no longer directly influenced by him [12]. Commentary about Urbit has often struggled with holding in tension the admiration for the software's technical design principles on the one hand, and the neo-reactionary politics of its founder on the other, leaving some unsure whether to laud or lambast the system[3]. Significantly, as I will detail later in this chapter, Urbit has often been regarded as apolitical due to the fact that it is open-source software. This line of argumentation cliams that the politics of software's developer(s) should not be taken into account when evaluating it as infrastructure, as they do not directly impact the code's performance. The claim, in other words, is that code is a medium that ought to be evaluated in a vacuum, without considering how or by whom it was written.

To start on what will be a recurring refrain in this chapter, far from being a neutral undertaking, an infrastructural initiative such as Urbit is political to the core. Infrastructure – especially infrastructure that presents itself as having no bearing on or stake in politics as such – can never be apolitical. My methodological position in this chapter is to posit that one way to map the power relations of the computational apparatus, revealing the fact of its non-neutrality, is to treat its products, ie. software, as infrastructure.

This chapter is divided into three sections. The first section, *Infrastructure; software and architecture*, traces some of the ways in which software exists as infrastructure, and is thus inherently political. I argue that computing is a medium devoted to the control of space and time, and that software is a constitutive media of urban space that looks to leverage computing's temporal and spatial capabilities towards political ends. No piece of infrastructure, neither architectural nor computational, can be apolitical, as it produces space for living. This section draws first on the work of Keller Easterling (2014) and Shannon Mattern (2017) to draw a line that connects architecture to software, and then turns to John Durham Peters (2015) to furnish a notion of software as infrastructure [14, 15, 16]. My argument here follows the thinking of authors such as Wendy Chun and Stephen Graham in considering code as a fundamentally political substance [17, 18].

The second section details how decentralization and centralization are not polarized and mutually exclusive traits, but rather tendencies that coexist in many infrastructures. This analysis shows that, in contrast to what is generally assumed, so-called decentralized applications are not always more freeing or egalitarian than centralized ones. This slice of computing history contextualizes what is at stake in Urbit being open source, and sets the scene for how it can service a political program such as libertarianism.

The third and final section, inspects and critiques Urbit as an infrastructure in which libertarian politics materialize as software. I examine the political philosophy of a related initiative, the Seasteading Institute, the metaphors in Urbit's documentation and its marketing material, the tone of its source code, and its operation both as a company and as an

[3]For a snapshot of the divisive opinions about Urbit in the software community, see the HackerNews listing, [13]. More recently, many have settled on a line of critiquing Urbit that Francis Tseng articulates clearly in his 2019 article, namely that one shouldn't support Urbit because Yarvin stands financially to gain from the project's success [2].

open-source infrastructure over the last decade. This analysis reveals Urbit as infrastructure that materializes an ideology of neo-reactionary and exclusionary freedom.

The chapter close by indicating what an analysis of Urbit might be able to contribute to the discourse in architecture and infrastructure studies in general.

Infrastructure, software, and architecture

> The repeatable formulas or recipes for space-making... are something akin to software – an operating system for shaping the city.... Like any operating system, it makes some things possible and some things impossible. As architects, we can see the way in which that organization is doing something. We can see the agency and information immanent in the arrangement.

[19]

In her book *Extrastatecraft: The Power of Infrastructure Space* (Verso, 2016), architect Keller Easterling employs the language of computing in order to detail how certain urban spaces operate politically [14]. As "space itself is an information system," it is the pedigree of architects – trained to understand how forms of space bear on their environment – to understand that system's operations [20]. Moreover, according to Easterling, architectural analysis can open up forms of tactical intervention in the politics of particular spaces, such as the three case studies Easterling addresses in her book: the Free Trade Zone (FTZ), the construction of broadband wireless infrastructure in Africa and similar economies, and the documents minted by the International Organization for Standards (ISO).

As this range of case studies suggests, Easterling's conception of space as a system of things extends beyond just physical infrastructure. Her conceptual terrain, "infrastructure space", encompasses both brick and mortar itself, and the concepts that constitute it. She calls some of the operations that occur at this scale "extrastatecraft", a practice that enacts and distributes political power through architecture, rather than through its more traditional mode: governance. Extrastatecraft can be harder to critique than statecraft, because it is not always recognized as power as such, allowing it sometimes to go unquestioned under the pretense of a- or non-politicality.

In order to make extrastatecraft legible as a concept, Easterling often leans rhetorically on the discourse of computing, as in the citation opening this section. In an article in 2012 titled "Zone: The Spatial Softwares of Extrastatecraft", she refers to the Zone – a field in which extrastatecraft takes place – as "a relatively dumb form of urban software" [20]. Easterling leverages the term 'software' to refer to the intentional arrangement of space, drawing on the understanding that software controls flows of data and is expected to work with limited leakage or excess of intention. The qualifier "relatively dumb" indicates that the Zone, in Easterling's estimation, does not live up to software's supposed standard of uncontaminated control.

Easterling's rhetorical leverage of the term 'software' in her project of architectural and spatial analysis is an example of how drawing on computing discourse can help in detailing the political dimension of physical infrastructure. The analogy to software, an intentional and scripted form of control, helps to carry Easterling's argument that certain

spatial arrangements, such as the Zone, are expressly political, even as they claim to be neutral.

There is a vast historical and epistemological lineage that could be drawn between software and architecture through comparative analysis of the technical rhetoric, market circulation and contemporary practice of each. To unravel these threads is not my intention here. Instead, I want to draw on Easterling's method of cross-pollinating architecture with software in reverse, and leverage her methodological contribution to architectural discourse to detail virtual infrastructure, to better show that, like the Zone, it can be political even as (and perhaps because) it claims to be neutral. Throughout this chapter, I lean on Easterling's use of the word 'infrastructure' and extend it to refer also to virtual infrastructures, software such as the Urbit operating system, in addition to architectural infrastructures such as buildings and railroads. The term 'infrastructure' can be useful bridge between the discursive contexts of software and architecture [21].

I use 'infrastructure' also because the term has certain currency in media theoretical discourse. Media theorist John Durham Peters describes media as the "vessels and environments, containers of possibility that anchor our existence and make what we are doing possible," and as the "equipment for living" that is taken for granted, that often goes unnoticed, yet that profoundly and concretely structures (produces) space and, thus, human life [16, p.2]. Media are human-made contexts such as houses, ships, and tools, and also natural ones like the ocean, fire, and sky, and infrastructure is media contexts made durable.

Using Peters' definitions to support Easterling's idea of infrastructure, I thus argue that software is *ontologically* (inescapably) political, as all media are political. Brick and mortar are one kind of media; software is another.

Anthropologist Shannon Mattern's work can help to support this claim, as it shows how it can be analytically productive to think spatial and computational media as variations of the same stuff. She points out in her book *Code and Clay* that the computerization of the city has a history that runs as long as the history of cities [15, p.10]. The encroaching smart city movement, which wants to repave the streets with self-driving cars, turn telephone booths into Wi-Fi routers, and more generally inseminate public infrastructure with communications infrastructure, which are often privately owned, is just its latest turn. Since at least the advent of radio, the city has been "a realm where electromagnetic waves confront architecture" [15, p.19]. Mattern notes that in the 1920s-1930s, though invisible, radio was audible and therefore integral to the sensing of the city as a "communicative space" [15, p.6]. Mattern pushes the reader to hold elemental matter such as clay and dirt alongside code and data when considering and investigating the architecture, power and politics of the city. She emphasizes that both historically and materially, architecture and communications (which here stands as a proxy for software) cannot be disentangled:

> Calculation, coding, and "embedded" technologies have long been integral to urban infrastructures.... [O]ur cities have been smart and mediated, and they've been providing spaces for intelligent mediation, for millennia. That intelligence is simultaneously epistemological, technological, and physical; it's codified in our cities' laws and civic knowledges and institutions, hard-wired into their cables

> and protocols, framed in their streets and architectures and patterns of development. The city mediates between these various materialities of intelligence, between the ether and the iron ore. Clay and code, dirt and data intermingle here, and they always have.

[15, p.xii]

As communications are a component of software, this passage re-emphasizes together the argument that software and architecture should be thought together. Mattern notes that the city's space is composed of various materialities, and proposes that a way of understanding their functioning together is through the notion of mediation. Mediation, whether it is of clay, code, or something else, is understood as the process by which a materiality comes to mean and make other meanings possible. Mediation sets the scene for social relations, providing the context in which life takes place.

The term infrastructure is a way to bridge the gap between buildings and code. For Peters, both are quite simply made of the same political stuff: media. Peters', Mattern's and Easterling's work are in agreement about one aspect of infrastructure, whether it is soft or hard: this matter is a political substance. The presentation of infrastructure as apolitical serves the interests of power, as it justifies the operations that take place within infrastructural space by rendering them as pregiven rather than produced, and forecloses the possibility of otherwises, otherwheres. One way to denaturalize infrastructure is to detail the ways in which it is political. In other words, we as scholars must take careful stock of infrastructures that are depoliticized, whatever media make them, and seek to understand how that depoliticization functions in service of certain political agendas.

Urbit is an object (in this case of computational nature) whose logics we can unpack using infrastructure as a category to connect it to the infrastructures Easterling and Mattern analyze as architects. By detailing Urbit as infrastructure, the following sections of this chapter will argue that open source software is an irretrievably political substance and need to be considered as such. The next section will look at the ways in which open source and decentralized software infrastructure is often depoliticized, and how this depoliticization overlooks the intractably political aspect of infrastructural space.

The politics of open source and decentralized systems

I have thus far argued that treating software as infrastructure helps to reveal it as inherently political. Calling it infrastructure allows us to ask: what kinds of lives are enabled by a software, and which are foreclosed? Infrastructure offers an analytic vocabulary that can help us to answer this question for particular buildings and codebases.

One of this chapter's contributions is to recognize that software is infrastructure, and thus produces political space. As evidence for this claim, I offer an interpretation of the space that Urbit produces (or that it is likely produce if it were to be more widely adopted). My intention here is not so much to make the point that Urbit is exceptionally threatening as an infrastructure (although it may indeed be), but rather to use it as a case study to demonstrate how one might apply infrastructure as a category to articulate the politics

of a software, a politics that might otherwise remain hidden under a rhetorical banner of neutrality.

Code has often been construed as a neutral substance. This claim is usually supported through some variation of the idea that code is simply an implementation of mathematical logic, and mathematics is not political but rather absolute in some sense [22]. The neutrality of code, however, is an idea that is increasingly being challenged. In the case of software such as that developed by Peter Thiel's company, Palantir, a criminal search database used by US border security, the notion of neutrality seems misplaced. Indeed, one could argue that Palantir's software is explicitly political at some level, when it actively promotes and enables criminalization and deportation.

A viewpoint that is often put forward is that, while a software application such as Palantir may be political, the code itself is nonetheless neutral. Software theorist Alexander R. Galloway sketches some common lines of argumentation here, each amounting to some variation on the belief that abstraction itself (perhaps particularly or only when that abstraction is of mathematical nature) is not political [23]. While arguing that mathematics itself is political is beyond the scope of this chapter, my line of argumentation holds that software, as infrastructure that produces space, is always political, whether it is constructed to deport migrants or whether it is a general purpose operating system.

I further argue that software is political as infrastructure regardless of whether its source code is closed (private) or open (publicly accessible), and whether it uses centralized or decentralized data storage. These two spectra – from open to closed source, and from centralized to decentralized – are sometimes put forth as the axes on which the question of whether a given software is politically good or bad turns. The argument goes: open-source software is morally coded as good; closed source software is coded as bad. The abuses of centralized information networks such as those exposed by Edward Snowden (the NSA in cahoots with the communication empires AT&T, Google, etc.) has promoted a similarly Manichean approach to centralized and decentralized networks: the latter have become categorically preferable for those who recognize the danger of corporate monopoly.

Following this moral coding, one might aim to palliate the erstwhile claim that all software is neutral to a qualified assertion that all open source and decentralized software is neutral. This claim is comparable to the ones that Galloway rebukes regarding mathematics' neutrality, in that it discards the more obviously problematic kinds of software (closed source and centralized) from the category of neutrality, but still reserves a space for open source and decentralized software. The valorization of Urbit as software that checks both good boxes relies on the assumption of neutrality. As Newton writes in blog post endorsed by the Urbit team that explains Urbit titled "Urbit for Normies" (where normies is slang for software non-literates in a certain kind of freeware discourse): "Fundamentally, Urbit is **neutral** open-source infrastructure, so it can be for many things" [24].

The contention that Urbit is neutral overlooks the way in which software produces spaces, whether it is open or closed source, centralized or decentralized. If software produces space that forecloses some lives and makes others available, simply being able to see and download the code does not modify the fact of that software's political nature. Open-source

code may indeed be preferable to closed source code in many respects, as biased decision boundaries can be clearly identified and improvements may be suggested if the codebase accepts community contributions. This does not mean, however, that the space a software produces is wholly defined by the fact that it is open source. The code itself and the politics it produces still call for inspection.

The obfuscation at work in the claim that decentralized software is fundamentally neutral, as well as in the moralizing claim that it is better than centralized software, is reproduced by way of a slightly different but similarly faulty logic. In this line of reasoning, centralization and decentralization are presented as two poles of a binary spectrum, which imagines that there is a clear answer to the question of whether a software is more centralized or more decentralized. These characteristics can in fact work at various levels within the same software infrastructure, rendering an answer to this question at the very least more nuanced than simply binary.

What we could call the dialectical tension between centralization and decentralization outlined here is not specific to software. We can also observe it in other kinds of infrastructure. Architecture can create concurrent centralizing and decentralizing forces, meaning that some materials can operate away from each other in a decentralized manner at the same time that other materials are packed together as centralized. Ben Green (2019) gives an example of such an infrastructure from the 1900s: newly built roads in cities. While cars allowed many to live further out from the center city in the suburbs, roads concurrently lead to greater concentrations of pedestrians and related infrastructure to service cars, such as car parks [25]. Shannon Mattern argues that the introduction of electromagnetic infrastructure for radio in urban contexts had similarly duplicitous effects, proposing that centralizing and decentralizing forces often coexist within infrastructure:

> every decentralizing force seems to be joined by a corresponding centralizing tendency. While 'signal space' might enable greater flexibility of human motion, it also facilitates a greater centralization of information regarding users' data use and whereabouts, and potentially the ability to predict their trajectories and behaviors.

[15, p.37]

More than just coexisting, the forces of centralization and decentralization in an infrastructure can even cause it to tend towards both at the same time, Mattern suggests. The direction depends on what material forms you consider. Information space in cities creates a decentralizing force for human bodies, as communication infrastructures allow people to work remotely, and synchronize across much greater distances: yet at the same time, there is a coeval centralizing force for data, which is aggregated and centralized to enable corporeal separation.

Perhaps the most obvious example of centralization and decentralization as complimentary forces is the Internet. In its original conception it was an infrastructure that was fundamentally and resiliently decentralized, connecting disparate systems by way of a unified protocol (the Transmission Control Protocol) which allowed any computer that implemented a standradized interface (a relatively low barrier to entry) to be networked

[26, p.212]. Yet as we have seen in recent decades, although the Internet's architecture certainly does enable the decentralization of devices, other centralizing tendencies coexist with this force. The income streams that emerge from the Internet, for example, are far from decentralized: Amazon, Google, Facebook and Apple make the lion's share of profits.

What these examples show is that, while infrastructure can mandate the decentralization of some materialities, there are often countervailing forces of decentralization in others. For our purposes, what is crucial to take from this observation is the following: that decentralization of devices in hardware or data in software does not necessarily imply the decentralization of power. So-called "decentralized software" can have centralizing tendencies, depending on which affected materiality one observes, reinforcing the claim that software, whether open or closed source, centralized or decentralized, must be treated and interpreted as political in its own right.

With software confirmed as political, I will now turn to Urbit as a case study. Urbit claims neutrality as infrastructure by way of it having a peer-to-peer (p2p) architecture that needs neither a centralized identity broker nor a centralized data storage server, operating instead using cryptographically secure protocols, and a network architecture that needs no middle man. There is good reason to believe that both of these qualities are desirable in personal computing infrastructure. As Tim Wu argues in his book *The Master Switch* (2010), actors in the communications industry have a long history of abusing centralized infrastructure [26]. Switching to infrastructures that are p2p, which decentralize data and identity by design, could indeed lead to better privacy, and to more reliable guarantees around the democratic distribution of the power they produce.

But despite its arguable favorability in abstract comparison to existing centralized software infrastructure, p2p software is not better by virtue of being politically neutral. Wu agrees: "network design, like all design, can be understood as ideology embodied" [26, p.212]. Decentralization does not automatically mean better living for all. As I will detail in the following section, it can also mean an augmentation of power for certain private actors, and a corresponding decrease in power for those who are already marginalized.

"The design is all 'exit', no 'voice."' Urbit as political infrastructure [11]

My argument thus far is as follows: software is infrastructure, and infrastructure is inherently political; thus, no software can be neutral, despite the prevailing rhetoric that suggests open source and/or p2p codebases are. In this chapter's remainder, I will turn to Urbit as a case study to illuminate this claim.

Many of the foundational texts of the neo-reactionary movement were written in the years of 2007-2014, by an author under the pen name Mencius Moldbug. Moldbug's writings have inspired notable figures such as Steve Bannon and Peter Thiel, as well as far-right extremists who have committed mass atrocities in Oslo Norway, Christchurch New Zealand, and elsewhere. As Joshua Tait, a historian of right-wing thought, has argued, the neo-reactionary movement distinguishes itself from the right-wing conservative mainstream by bridging libertarianism with authoritarianism and rejecting any form of democratic governance [27, p.187]. The neo-reactionary philosophy is ultimately futurist, unlike

other alt-right movements. Atlantic journalist Rosie Gray notes that the aesthetic of neo-reactionaries is "hyper-masculine; soldiers with guns, tanks, spaceships, Greek gods" [28]. As Tait explains, neo-reactionaries believe in a "cosmopolitan and socially free" society; yet also in a monarchical and exclusionary philosophy [27, p.188]. The version of neo-reactionary freedom is one that is fundamentally a white-male freedom despite it ostensibly declaring itself as promoting personal freedom for all. It is a freedom that hinges on being able to make biologically racist statements without, as TechCrunch journalist Klint Finley writes, "being labeled racist" [11]. For neo-reactionaries, personal freedom is occluded by political correctness and social justice warriors. They blame this occlusion on what they call the Cathedral: "a meta-institution that consists largely of Harvard and other Ivy League schools, The New York Times and various civil servants" [11].

In 2013, Mencius Moldbug's identity was revealed as Curtis Yarvin, a San-Francisco based software-engineer, Berkley PhD dropout, and – central for this paper – the founder and creator of Urbit. Since this unveiling, there has been substantial criticism investigating Moldbug/Yarvin's personal affiliations with the alt-right and Trumpism [11]. Furthermore, in recent years there has been a growing focus on the relationship between the alt-right and the technology industry in Silicon Valley and beyond [29, 30].

For those of adopting a left-leaning political stance in the free software space, Urbit is something of a conundrum. In many ways it appears as a project that ought to be supported, and that showcases the exciting potential of p2p computing. Working from the assumption that the Internet as it currently exists is an infrastructure that exacerbates wealth and power inequality rather than democratizing it, the category of p2p software is one of the most promising leads towards a future in which living is more egalitarian living for all [2].

In a 2019 blog post about Urbit, software engineer and researcher Francis Tseng, locates the concept on which this conundrum hinges on self-sovereignty. As Tseng implies, however, data self-sovereignty does not necessarily directly imply a more egalitarian political organization:

> [M]any who regularly use the internet would agree that more [self-sovereignty] is valuable for a healthy internet: for being able to control who can access your data, who can and cannot contact you, and so on. But self-sovereignty is far too vague of a concept on its own.
>
> [2]

Ownership and control of one's data is often framed as the fundamental issue of the current Internet. By using services such as Facebook and Google, who store all data in their own servers, users own almost nothing in the present system, essentially ceding all power in exchange for the polished experience of the web that such services offer. Wu observes that this is a recurrent trade-off in information infrastructures historically. He argues that by and large, the telephone, radio and television sectors have tended towards centralization of services, which has led to more polished experiences [26, p.11].

While Yarvin officially left the Urbit company in 2019 (and has largely been scrubbed

from the company's public-facing communications), Urbit originated and was very much brought into its currents state as a viable technology and company by Yarvin, almost exclusively. Yarvin worked as inventor and lone developer on Urbit for more than a decade [2]. Even though Urbit and its parent company, Tlon, no longer officially employ Yarvin, he is still very much involved in the project's community on a day-to-day basis, and is still the principal shareholder in the company in terms of its planet and star system, which are assets comparable to shares in the sense that they represent a financial stake in the company's success [2].

Following Moldbug's reveal as Yarvin, there was substantial outcry in certain software communities about Yarvin's continued invitation to software conferences. This outcry was the likely reason that Yarvin was erased from Urbit's public-facing media. For some, the idea that software and politics should remain separate, a perspective whose argumentation a trace above and one that is common in many software communities (Coleman, 2012), was used to justify Yarvin's ongoing presence on the conference circuit [31, pp.187-190]. In the best known example, John A. De Goes, the founder and chief organizer of a functional programming conference called LambdaConf, justified Yarvin's presentation on Urbit there by stating: "Curtis is NOT allowed to talk politics at the conference. Rather, it's about respecting a separation between personal beliefs and professional life" [32].

Upon accessing Urbit's homepage, one is greeted with the image of the ocean, empty with gently oscillating waves (see 1), with the caption "Urbit is a clean-slate OS and network for the 21st century" [1]. Water is the classic metaphor for a clean-slate, as its substance metaphorically and literally can purify and wipe clean; or in software's case, "reboot" [33]. The trope of seawater as a blank slate (or space) is one that originates in European colonial seafaring. As Stefan Helmreich (2011) notes, aesthetic visions of seawater as empty are signs of a European colonial "nostalgia and fantasy"; or to use the words of Elizabeth DeLoughrey (2007) (cited by Helmreich), feminized spaces waiting "to be filled by masculine European voyagers" [34, pp.134-5].

This explicit reference and index to the ocean is an entryway to understanding the neo-reactionary political imaginaries that Urbit enacts. Yarvin-as-Moldbug wrote in a 2007 piece that he favors a "neo-cameralist" governance model, in which "a state is a business which owns a country. A state should be managed, like any other large business, by dividing logical ownership into negotiable shares" [35]. Moldbug's ideal state has at its top not a totalitarian dictator, but a neo-cameralist CEO: authoritarianism dressed in the keywords of capitalism [35]. Yarvin's neo-cameralist ideas are connected to Urbit by way of the notion it is desirable to exit contemporary national democracies (i.e., the US) and to manufacture a new system. Freedom here takes the form of choosing to opt out: "If residents don't like their government, they can and should move" [2, Yarvin quoted in Tseng]. Peter Thiel in 2009 similarly yearned for "an escape from politics in all its forms", stating that he "no longer believe[s] that freedom and democracy are compatible" [36, Thiel quoted in Haider]. Other Yarvin-inspired Silicon Valley libertarians, such as Balaji Srinivasan, have also espoused the notion of exiting society into an opt-in society "ultimately outside the US, run by technology" [37, Srinivasan in Pein].

Urbit materializes this idea of exit not only in proposing an alternative, independent

Internet and computing stack, but also through its hierarchical network system. Identities on the Urbit network operate as a self-governing republic that is divided into galaxies, stars and planets. Each individual can purchase address space in one of these tiers. Contrary to what many would consider a fundamental tenet of democracy, the political power that one wields in the Urbit system depends on how much address space an individual owns [2]. In a seeming attempt to justify this systemically unbalanced political (and financial) power, the system offers only the option to exit: "The extent of your political agency as a planet is exit – that is, the only meaningful action you can take is to move to a different host star" [2].

We can better read what is at stake in this identity system by looking at the original terms that were used for allocations. Instead of stars, galaxies and planets, originally, Yarvin had divided users into "Lords", "Dukes", and "Earls" [38]. Yarvin references "standard Lockean libertarian homesteading theory" as the justification for this design decision [38, Yarvin quoted in Lecher]. Naturally, Yarvin elected himself as the Prince, assigning himself some ten percent of address space in perpetuity by virtue of having created the system, a quantity that will be worth billions of dollars if Urbit becomes mainstream and widely used [2]. Urbit's self-sovereign, cosmopolitan and socially free internet is fundamentally based on principles of feudal sovereignty, with Yarvin and early Urbit investors and engineers as the most powerful.

Situating Urbit within the category of startups for which it found investment, namely those that support and realize homesteading in practice, is a starting point for revealing how it is ideologically similar to other Silicon Valley libertarian and neo-cameralist projects, such as seasteading and the colonization of Mars[4]. If Urbit is an attempt to reboot the Internet as a self-sovereign network, then seasteading and space colonization are its tangible and logical extensions. These are projects that call for rebooting civilization at large under the auspices of libertarianism. Urbit, seasteading and space colonization should be considered complementary and synergistic counterparts. As infrastructure bears on the production of space, we should consider the physical and architectural extensions for which digital projects like Urbit serve as groundwork.

While there are crucial differences between physical space and digital space, it is useful to think Urbit and seasteading together to see how they operate using the same ideologies and principles of governance. Seasteading is seen by its advocates as the intermediary step between human civilization moving from land-based settlement to outer space. In seasteading ideology, the oceans are constructed as a new frontier, a new New World. Seasteaders situate themselves within a lineage harking back to the U.S. settler-colonial movement of homesteaders on the Western frontier, imagining themselves as modern-day settlers [39]. Historical homesteaders saw no shortage of natural resources or land scarcity. The land was empty and divinely theirs for their exploitation, a divine right predicated on indigenous genocide and land dispossession. Similarly, seasteaders see the ocean as ripe for settlement: uninhabited, "a blank space between nation-states," and divinely theirs [34, p.134]. The relationship between the Californian technology industry and homesteading might also be

[4]Urbit received seed funding by Peter Thiel's Founders Fund, which also has sponsored the Seasteading Institute.

traced back to ideologies promoted by cybernetic founder and personal freedom proponent, Stewart Brand, who considered Space colonization as the natural continuation of his cybernetic project, as it was a "free space – never occupied and never inhabited" [40, p.127]. Seasteaders, space settlers and Urbit advocates alike do not usually frame themselves as colonizers, but rather as "well-equipped refugees from technocracy" or, in Yarvin's followers' case, "refugees" from liberal democracy [40, p.78].

Urbit's marketing visuals of blue, empty oceans is distinctly similar to the imagery that the Seasteading Institute uses to promote their project. A 2018 documentary produced by Jacob Hurwitz-Goodman and Daniel Keller documents a conference that brought prospective seasteaders to Tahiti to consult with the locals regarding their initiative [39]. The Seasteading Institute envisions a settlement in the territorial waters of French Polynesia as a prototype for an independent platform in international waters. In seasteading, as in Urbit, political power is directly proportional to infrastructure ownership. Seasteaders aim to create a governance structure in which citizens can "vote with [their] house", collapsing capital and political currency into the same substance [39]. The underlying idea is to subject government to the free market by making capital an explicit political scalar. In seasteading, one's capital is counted in floating platforms; in Urbit, in stars and galaxies. A sound bite from a French Polynesian radio host included in the documentary asks rhetorical questions that reveal what is problematic about these politics: will these self-sovereign floating cities sell homes to Polynesian climate refugees, or will they simply house white elites?

Urbit is incredibly ambitious in technical terms. It aims to rewrite the operating system, and includes low level languages that are comparable to Assembly and C, the two pillars of most of modern computing. It brings concepts from functional programming, an area of computing that usually pertains to high level languages, to low level languages and the operating system. It also includes transport protocols that are intended to replace TCP, the Internet's enabling technology. Yarvin went to all this trouble because he believes that the foundations of modern software and the Internet are "broken", and thus need to be rebooted from scratch.

To say the Internet is "broken" is to say that the space that it produces as infrastructure is disagreeable to one's own politics. In Yarvin's case, the Internet's brokenness is akin to democracy"s brokenness: it doesn't function in a way that allows for a libertarian conception of freedom. If seasteading is an attempt to exit the constraints of democracy, Urbit is the equivalent in computing. It wants to start again, beginning from a clean slate.

Conclusion

In this chapter, I have argued that software is always political because it is infrastructure. I have detailed one way in which Urbit, an ambitious software originally developed by neo-reactionary blogger and alt-right darling Curtis Yarvin, encodes libertarian ideals in its code and aims to produce a particular political space by means of its software architecture.

I conclude by retracing some of the claims that have emerged from Urbit's close-reading in this chapter, which have resonance in the fields of software studies, architecture, and infrastructure studies alike. The first is that infrastructure is often framed as politically

neutral. This dissimulation obfuscates power relations, augmenting the scope for exploitation in infrastructural space. It makes it possible for power to hide in plain sight, in the dust and code of buildings and software.

The second is that the political opinions and frameworks of those who build infrastructure matter. Put another way, it is important to contextualize infrastructure against the political ideas of its constructors. These viewpoints inform architectural and engineering decisions, both of which practices have direct bearing on the production of space, and thus the politics possible in any given place. One cannot separate Curtis Yarvin's neo-reactionary ideas from his software engineering; the former directly influences the latter.

Finally, discursive analyses of infrastructure, particularly software infrastructure, are urgently necessary undertakings that can help us to discriminate between which projects we should build and those we shouldn't. Particularly among software developers, there is a tendency for those who build and maintain software infrastructure to pretend there is nothing political about writing it. This cognitive dissonance is often held together by the assumption that infrastructure in general, soft or hard or otherwise, can be apolitical or neutral. Detailing software as infrastructure offers one theoretical vocabulary in which code can more widely be recognized as intractably political. Recognizing that infrastructure like Urbit is political not only allows us to recognize when certain infrastructures need redevelopment or rethinking, it also furnishes scholars with a greater surface from which to articulate how political ideologies work and what is at stake in their proselytization.

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