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Data and Technological Spatial Politics

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Introduction

This chapter traces the contested politics of data, shifting scales from the transnational to the national and local levels: from questions of the (extra-) territoriality of data, the role of jurisdictions and contested 'technical territories' (Munn, 2023a) to the concrete lived spaces where data are produced, stored, and circulated. The different contributions thus zoom in from global geopolitical struggles over digital sovereignty and hegemony over data infrastructure, to local contestations over subsea cable networks and landing stations, data centres, as well as neighbourhood gentrification driven by the development of artificial intelligence (AI). This multiscalar approach to data politics aims to emphasize the tensions between the abstract global logics of data circulation and the local realities of data, between historical state and corporate projects of extending data territories as a form of 'domination'. It points to the localized effects of such projects, including gentrification, expropriation, and the colonial erasure of local knowledges and sovereignty.

To deal with these complex issues, we introduce three key types of data power that help us understand better the agency not just of states, corporations, and citizens but also of data infrastructures themselves as mediating between different spaces, territories, jurisdictions, and temporalities. The three key concepts we introduce are:

- *Hegemonic data power* – to describe the ways in which states and corporations are mobilizing (and in some cases weaponizing) data infrastructure to further their geopolitical ambitions. The concept of hegemonic data

power at the same time invites questioning of the notion of hegemony in our multi-polar world and opens a broad field for exploring contested state–state relations (as observed in the recent rise of the doctrine of digital sovereignty) but also contested state–corporate relations (as seen in the recent banning of tik tok in the US). Recent decades have given rise to tech corporate monopolies that have become key players on the global stage, competing with states and taking on some state functions, but also collaborating with and furthering state ambitions, depending on changing configurations of power. Hegemonic data power has a long history in colonial ambitions (see Vaughan's contribution) and is currently undergoing a process of reconfiguration (see Rone's section).

- *Powering data* – the concept of powering data points to the environmental consequences of contested data power and draws attention to the materiality of data infrastructures, their energy and water demands, and the ways in which they are imbricated in processes of extraction at the local level – be it of minerals (Nobrega and Varon, 2020), electricity, or water. In fact, the reconfigurations of hegemonic data power and the race to develop AI can hardly be understood without paying attention to how states and corporations collaborate and compete over the extraction of resources at a planetary scale. At the same time, numerous researchers have put forward ideas for alternatives to the current AI models and extractivist approaches to data (see Frenzel and Renzi's contribution).
- *Data counter-power* – this concept draws attention to the multiple fields of resistance to both hegemonic data power and extractivist modes of powering data. Across the Global South and the Global North there have been bottom-up movements opposing data centre construction on the grounds of both their environmental consequences and the lack of democratic participation in decision-making (for example, Rone, 2023; Brodie, 2023). Data counter-power is also at the basis of nascent ideas around grassroots green AI and anti-extractivist data projects, data literacy education, as well as more established data privacy protection efforts and surveillance self-defence. In a similar vein, we frame approaches to data sovereignty as contributing to the emergence of data counter-power formations at a translocal scale. As a form of counter-power, data sovereignty emerges as a discourse on technological and cultural autonomy, as well as a set of practices developed by tech collectives of/for underrepresented or marginalized groups to assert their presence and agency (Couture and Toupin, 2019). This is visible in the work of indigenous scholars and practitioners who advocate for Indigenous Data Sovereignty as a framework to control data, its infrastructure, and use (Bruhn, 2014; Kukutai and Taylor, 2016), as well as indigenous epistemologies to produce and mobilize data (Renzi and Radjawali, forthcoming; Foxworth and Ellenwood, 2023). At the same

time, data infrastructure is envisioned as a pivotal element in building data sovereignty. This includes both indigenous data and research infrastructure (McMahon et al, 2015; Duarte, 2017; Carroll et al, 2020), and philosophical considerations and experiments in developing AI that is integrated in indigenous ontologies (Lewis et al, 2018). For grassroots and social movements, visions for data sovereignty include projects around data commons, free/open source software, autonomous servers, and encryption (Haché, 2017).

At the micro level, several of the contributors to this volume explore community activism through a case study of Montreal, where local activists oppose processes of gentrification and displacement driven by an emerging AI ecosystem meant to boost Canada's innovation and platform economies. We home in on instances of community mapping that produce data in a fair and equitable way; data that empowers communities to resist gentrification and expropriation and to support situated knowledges.

The idea of data counter-power driving socio-political formations that are (1) spatially situated, (2) often networked, and (3) constantly reframing how data can be prod/used for justice, draws attention to how data themselves are implicated in multiscalar struggles to wield power. Such examples fall in a long line of data activism projects, including attempts to fight corruption through data analysis and crowd-sourced data (Mattoni and Odilla, 2021). In examples such as these, data become not simply stakes, that is issues and objects of political struggle, but also repertoires, that is tools of political struggle (Beraldo and Milan, 2019).

In what follows, we lay out some of these multiscalar processes and tensions, starting with how settler and extractive colonialism are constantly reshaping physical and political geographies of power through amphibious infrastructural projects. Our look at the geopolitical dimension of data power(s) continues with a genealogy of hegemonic forms of data sovereignty and with some considerations about the environmental impact of data and AI economic innovation. We then show how forms of counter-power emerge and traverse these geographies as they harness social movement practices, research advocacy, and knowledge/data commons.

Spatial data colonialism and amphibious infrastructural data power – Hunter Vaughan

Coastlines are liminal spaces of interaction and points of contest between local and international zones of policy and law. They are spaces of shifting sovereignty and invasion, with local agency being challenged historically by military colonization, and today by the data infrastructural colonialism of tech insurgence. As climate destabilization threatens coastal spaces with

increasing sea level rise, extreme weather events, and species extinction, coastlines will prove a crucible for the challenges of community agency and environmental preservation amid accelerating climate crisis and exponential digital growth.

Coastlines also are unique in shaping – and being shaped by – oceanic amphibious infrastructures. Telecommunications infrastructural growth has been integral to colonial expansion, capitalist cartography, and the great acceleration of anthropogenic climate change from the 1850s to today. Since the first subsea telegraph cables were laid, cable landing stations and networks have been deeply enmeshed in the routes of maritime power and economics and the dynamics of resource use. Subsea cables are now central to the emergence of newly consolidated configurations of big tech power that challenge traditional power structures of the nation state and are also operative in the emergence of alternative energy futures.

The socio-technical morphology of infrastructures that have intruded and implanted on their shores carries historical tensions between traditional local knowledge and imposed hegemonic epistemologies – and now, increasingly, the guidance of algorithmic decision-making. New infrastructural configurations also build upon the role that coastal infrastructures of communication and energy have played in the post-colonial process of local economic development, resource subsistence, and identity construction, and as such present a key battlefield for agency, decision-making, and heritage preservation in the face of rapidly expanding digital hegemony. Consequently, such configurations have featured in recent work on digital media infrastructure studies (Johnson, 2023), energy futures (Watts, 2019; de Onís, 2021), and the geopolitics of colonialism and extraction (Ruiz, 2021).

Scholarly coverage of subsea cable networks and landing stations is beginning to emerge (Pasek et al, 2023; Vaughan et al, 2023), especially as these largely invisible infrastructures become more revealed through studies of their relevance to national security (Bueger et al, 2021; Keller, 2023) and marine ecology. Subsea networks have played a crucial role in the historical global organization of geopolitical power, technological expansion, and social connectivity. Today, they are one of the Internet's most vital infrastructures, carrying almost 100 per cent of transoceanic data traffic between continents (Starosielski, 2015). Geopolitically, they are bound up in the shift to a post-colonial and neo-imperial era, where previous global superpowers are being replaced by post-political forces of big tech and energy companies (Harvey, 2001; Kwet, 2019; Szeman, 2019). Despite growing literature on the geography and sovereignty of data (Bratton, 2015; Duarte, 2017; Mueller, 2017; Graham and Dittus, 2022), and the environmental impacts of the Internet (Maxwell and Miller, 2012; Hogan, 2015; Malmodin and Lundén, 2018; Marks et al, 2020), few studies have examined the role of subsea networks. To do so, we must also acknowledge

the crucial role these infrastructures played in the shift from maritime trade to submarine communication as dominant modes of transoceanic empire building, colonial occupation, and extraction (the latter now largely being in the form of data).

Coastlines were greatly altered, and communities built around the physical intrusions and economic systems of these cable networks. In many cases, unlike the record of social impacts and local grassroots resistance to data centre construction (Brodie, 2020; Lehuedé, 2022; Rone, 2023), these have yet to manifest in clear acts of resistance. This genealogy is marked instead by legacies of percolating political tension, social inequality, and socioecological change that may not be easily attributable to current infrastructures, but provide deeply contested backdrops for the arrival of digital tech empire building. For example, the west shore of the island of Oʻahu, where three major transpacific cable landing stations exist, has been a site of conflict and tension with local communities for several decades. This economically disenfranchised area is home to many Native Hawaiians, with some groups of people living houseless on the beach, and a crucial site of protest for Hawaiian sovereignty. The local community has struggled against lack of economic opportunities and negative portrayals in news media.

While the cable stations and their adjacent networks, crucial to transpacific connectivity of island nations and territories as well as US connectivity with Oceania and East Asia, may not have caused the disenfranchisement of Native communities, their presence is an infrastructural reminder of the global inequalities and invasive extractive dynamics by which the digital divide extends legacies of industrial military colonialism. Local communities are excluded from the economic and communications benefits of these infrastructures, while negative representations of this community are disseminated through the very infrastructures that have been built upon their unacknowledged sovereign land.

More directly, along the transatlantic route that remains the most highly trafficked data route in the world, telecommunications development is inseparable from imperial history, in particular England's 19th- and 20th-century colonial military expansion (Winseck and Pike, 2007; Campling and Colás, 2021). The subsea telecommunications implications of British colonial history are deeply evident throughout its transatlantic cartography, including: Bermuda, which has been a British colony since 1609 and remains a British Overseas Territory (Stockwell, 2008); Nova Scotia, which offered the crux of English–French colonial struggle over Canada from the mid-1800s until well into the 20th century (Conrad, 2022); and Ireland, which was a British colony for many years until its independence in 1921 (Kee, 2000). In rural west Ireland, from Valentia to Galway to Killala, debates around external investment into locally planned data infrastructures are loaded with vestiges of foreign occupation and complex national politics

between urban Dublin and the rural west and further complications regarding nationalized strategies and the mandates of Ireland's EU involvement.

From Puerto Rico to Hong Kong to Fortaleza, to the entire African continent being targeted for the 2Africa network financed by China Mobile, Meta, and Orange, subsea cable networks both carry and symbolize key shifts in 21st-century data power, whether in terms of geopolitics, resource, labour, or information. They are an icon and index of the invisibility of this circulation, converting liminal geographical and geological spaces into points of transformation between different kinds of energy, value, and capital. Moreover, they connect the constellation of terrestrial networks – with all their interlocking and shifting dynamics of power – from country to country, continent to continent.

Digital sovereignty and the geopolitical struggle over data and technological spatial politics – Julia Rone

While data infrastructures such as telegraph cables, data centres, or subsea cables have a very local presence, they have always also been imbricated in projects of hegemonic global data power (Starosielski, 2015) led by empires and/or corporations entering into complex relations of collaboration and competition with each other (Winseck, 2019). These processes have not gone uncontested and protests have been common (Brodie, 2020; Rone, 2023). It is against this background of global battles for hegemony in data power, that many local conflicts around data infrastructure unfold, tackling issues such as gentrification, environmental deterioration, and lack of democratic participation. In this section, I trace some of the key aspects of the global geopolitical struggle for data infrastructural dominance, focusing on key developments over the last 30 years, including the rise of the notion of 'digital sovereignty' and the ways in which data infrastructures have challenged and enriched traditional notions of territory and spatiality.

Data sovereignty is not always related to forms of counter-power. Most accounts of the rise of the concept of digital sovereignty date it back to the 2010s, when authoritarian states such as China and Russia first developed their doctrines of digital sovereignty, soon to be followed by democratic states, reacting to the 2013 Snowden revelations and the 2016 Cambridge Analytica scandal. Nevertheless, such debates are much older and can be traced to the rise of the New World Information and Communication Order movement (Nordenstreng and Schiller, 1978), which aimed to make global media communications more equitable. The problem of state sovereignty vis-à-vis powerful global corporations such as IBM was a central issue already in the bestselling Nora and Minc (1980) report to the president of France on the computerization of society. What lies between these early discussions of state sovereignty over communications and the so-called 'return of the

state' in the 2010s (Haggart et al, 2021) is the rise of the Internet, which started as a US-military project developed in the late 1960s (the ARPANET), underwent privatization in the 1990s and saw the consolidation of several US big tech monopolies over the 2000s, including the world's biggest companies in terms of market capitalization: Alphabet (parent company of Google), Apple, Meta (parent company of Facebook), and Microsoft.

The period of expansion of Internet's penetration and user base (as well as its increasing privatization) coincided with a hegemonic vision of an open global Internet as a guarantee for freedom and democracy. This powerful socio-technical imaginary of the open Internet was consistently promoted by the US and served well its political economy and geopolitical interests in a period in which most data infrastructure, hardware, and software were dominated by US companies (Powers and Jablonski, 2015). It has been argued that the spatial expansion of US private companies and government projects led to a 'weaponization of infrastructure' in which the US government was able to both *pull* information from data infrastructure through surveillance programmes (such as the ones revealed by Edward Snowden) as well as to *push* information into foreign societies by supporting different tools for circumventing government censorship (Ortiz Freuler, 2022).

Nevertheless, the hegemony of the US government and US big tech companies has been recently challenged by the rise of East Asian governments and corporations alike in the field of subsea cable construction (Winseck, 2019) but also in cloud infrastructure (Munn, 2023b) and especially in the development of 5G standards, where China has established itself as a global leader (ten Oever, 2022). In the late 2010s, the European Union also developed a doctrine of digital sovereignty as a way to foster innovation and more control over its citizens' data. In the context of rising trade wars between the US and China and the disruption of supply chains during the COVID-19 pandemic, the EU has attempted to assert itself as a global geopolitical player beyond its usual normative soft-power, through an ambitious combination of new regulations – such as the AI Act, as well as industrial strategy (Pohle and Thiel, 2020; Baur, 2023; Broeders et al, 2023).

The shrinking of the percentage of US Internet users as compared to global numbers and the rise of other global digital players such as China, and to a lesser extent the EU, have led first of all to a re-networking of the global Internet, which has become increasingly fragmented, a so-called 'splinternet'. In this new situation, the US government has used legislation to attempt to *cut* particular countries and their users from global supply chains and platform services (Ortiz Freuler, 2022). Similar actions have been taken also by the EU – for example, with its introduction of screening for foreign direct investment – a tool very clearly targeting Chinese investment in 5G projects in Europe (Broeders et al, 2023).

Second, the rising importance of markets other than the US has complicated the relationship and balance of power between profit-pursuing private US corporations and the US government. On the one hand, we have seen tech corporations increasingly taking on state functions such as attempting to develop their own currencies or hosting highly sensitive government data (Utrata, 2022). On the other hand, US corporations have increasingly accepted to 'play by the rules' of other states. For instance, both Microsoft and Google have embraced European notions of 'digital sovereignty', promising to localize data in Europe (Fox-Martin, 2022; Sanders, 2022). Of course, the extent to which US corporations have indeed escaped the reach of the US government is questionable. A decision by the French government to host national health data of French citizens on Microsoft Azure has led to a strong contestation by civil society and the national data protection authority on the grounds that the US government could still potentially ask for access to information under the US Cloud Act (Pannier, 2021).

All in all, rather than talking about hegemonic data power as the power of a single hegemon (formerly the US), what we see currently is a competition between different hegemons – both states and private corporations – that plays out through the development of strategic technology but also through careful placement of data infrastructure at key domestic locations as well as global chokepoints (such as Hong Kong or Singapore) where East and West meet (Munn, 2023b). In this 'war of position' we often see collaborative projects between competitors, with Chinese and US state companies sometimes collaborating in building subsea cables, for example (Winseck, 2019; Munn, 2023b).

Ultimately, the geopolitical struggle over data and technological spatial politics takes place through re-territorialization of data as seen in attempts by China and the EU to enhance data localization and guarantee that the data of their citizens will be processed on their territory. But it also takes place through the expansion of data infrastructure across the globe that allows each of the big geopolitical players, but especially the US and China, to *pull* data from and *push* information into other territories. A case in point was the massive data hack of the African Union building in Addis Ababa, Ethiopia, in which China was deeply implicated. The hack involved not only the bugging of the building but also the transfer of data between midnight and 2 a.m. from the Union's servers to Shanghai, 8,000 km away (Munn, 2023b).

It is this important affordance of data infrastructure to be able to operate both within and beyond any given jurisdiction that has led to the introduction of the concept of 'technical territories' (Munn, 2023b). Technical territories are both highly localized *and* extend beyond the local to far away territories in their operations. As such, technical territories become key loci of power – loci where both state and corporate power is performed, but also where it

is increasingly contested – by states and citizens alike as we will see in the next sections of this chapter.

Powering the data ecosystem: AI and climate change – Janna Frenzel and Alessandra Renzi

One such example of technical territory is located in Canada, where, in recent years, the city of Montreal has become a hub for AI research and development – or, as the industry has popularized it, an 'AI ecosystem'.[13] This loose network of entities includes 5,000 businesses and start-ups with nearly 100,000 workers, academic R&D units with special appointees, and some 9,000 students (Brandusescu, 2021). Important players are the University of Montreal, Element AI, the Quebec Artificial Intelligence Institute (known as MILA), but also multinational tech giants such as Google, Meta, and Microsoft (Startup Montréal, 2021).[14]

The ways in which the AI industry's underlying infrastructures and their material manifestations are changing the urban and environmental fabric of Montreal can be described as a specific instance of what Mimi Onuoha (2018) calls 'algorithmic violence'. But here, algorithmic violence is not limited to the impacts of AI data and software. Instead, it includes a variety of layers that obfuscate different kinds of violence. One of these layers pertains to the digital infrastructure for climate change mitigation that heavily relies on greenwashing and resource extraction. Another layer covers how the AI industry's power to purchase or rent real estate for office spaces and R&D units, and the arrival of white-collar tech workers and students contribute to an ongoing housing crisis. As the next sections will explain more in detail, this kind of spatial power reconfigures access to basic needs such as housing within primarily low-income neighbourhoods.[15]

The identity of many actors within the Montreal 'AI ecosystem' is firmly grounded in the 'AI for good' or 'responsible AI' narrative. From its beginnings, the availability and affordability of hydropower has played a key role in the marketing of Montreal's AI ecosystem as 'greener' than other locations. For instance, at the 2022 AI World Summit in the Americas held in Montreal, representatives from Forum AI and Investment Québec praised Montreal's 'unique' AI ecosystem as 'green from the start' (and allegedly contributing to 'saving the world').

While statements like this can easily be dismissed as just another iteration of greenwashing for marketing purposes, they also conceal the long history of the links between extractive infrastructure development for hydroelectricity, Quebec nation-building, and indigenous dispossession in the province (see Desbiens, 2013; Nungak, 2017). The question of environmental impacts of AI systems cannot be limited to assessing an AI system in isolation – it needs to include the question of what purposes these systems fulfil, who

benefits and who loses out, and whether the systems in question are desirable. Reducing the question of AI's environmental impact to whether or not it is powered by renewable energy not only ignores these complex connections; it also obscures the fact that AI systems are employed by the fossil fuel industry to identify yet unextracted reservoirs and distribute, refine, and market oil and gas (Donaghy et al, 2020).

In techno-optimist narratives, AI and machine learning are often touted as a 'solution' to climate breakdown. For instance, the agenda of 'Sustainability for the Digital Age' (SDA) (which involves Mila and CIFAR, among others), proposes that 'digital disruptors' can act as levers for systemic change, leading to a 'climate-safe and equitable world' (SDA, 2020).

While it can be a useful tool in climate monitoring and modelling, AI also contributes to resource extraction and greenhouse gas emissions. AI is built on specific sets of knowledge in the form of data, but also relies on raw materials for hardware production, energy, labour, affect, and networked infrastructures (Pasquinelli and Joler, 2020; Crawford, 2021). As AI models grow continuously larger, for example, most recently with the development of generative AI, the more computationally intensive these models become to train and deploy, which in turn means they consume more electricity and other computing-related resources (Amodei and Hernandez, 2018; Schwartz et al, 2019; Saenko, 2020; de Vries, 2023; Li et al, 2023; Zewe, 2023).

However, measuring the impacts of AI systems is not an easy task since there is currently a lack of reporting mechanisms that would be necessary for a systematic assessment. In the absence of any meaningful regulation, it is up to the developers of AI systems to determine what environmental factors they want to consider. The lack of data and accountability mechanisms for the material footprint of digital technologies in general, and of AI in particular, means that they are also mostly absent from institutional pledges to sustainability. The University of Montreal, for instance, did not include computing infrastructure and data processing in its overarching sustainability strategy for 2021–2023. Housing was not included either (Université de Montréal, 2021).

Could AI be done differently? Possible taxonomies and computation principles that would better respect planetary boundaries have been put forward by scholars and practitioners, such as sustainable computing (Toyama, 2015), limits-aware computing (Chen, 2016), computing sufficiency and self-sufficiency (Hilty, 2015), benign computing (Raghavan, 2015), and degrowth computing (Sutherland, 2022). 'Tiny AI' is gaining traction in industry (Hao, 2020). It remains to be seen whether any of these ideas will find widespread adoption in the field of AI.

While extractive conditions remain in place throughout the AI supply chain and 'externalities' – be it environmental impacts of hardware production or the displacement of urban residents through gentrification – are largely

ignored, the hard questions around the AI industry's power, ownership and control, financial gain, and the extraction of liveable spaces on both the local and planetary scales must be asked. The 'ecosystem' metaphor may signal the arrival of a specific realm of algorithmic violence where boundaries between business, academia, and government are increasingly blurred, and where points of intervention are not easily identifiable. As the next sections discuss, this may limit the potential for resistance, unless intersectional organizing succeeds at making alliances that are able to look at the whole picture of algorithmic oppression.

Tech-led gentrification and community hardship: the case of Parc-Extension, Montreal – Yaya Baumann and Emanuel Guay

Beyond the greenwashed façade of AI and knowledge industries, their impacts on gentrification is particularly salient in Parc-Extension (Parc-Ex), a low-income neighbourhood in Montreal which is home to a large and diverse community of first- and second-generation immigrants, as well as numerous support networks and community services. While processes of gentrification and displacement, along with the in-migration of predominantly white, better-off population and creative workers in Parc-Ex were previously sporadic trends, the opening of the Université de Montréal's new campus, the MIL, in 2019, and the creation of an AI supercluster on its outskirts signal a pivotal shift in the neighbourhood's socio-economic trajectory. Although this is new to Parc-Ex, the requalification of the area into a new hi-tech hub is paradigmatic of Montreal's strategy of targeting new spaces for accumulation. This strategy aligns with the city's post-industrial approach of encouraging the development of a creative knowledge economy to attract both local and international investments (Sprague and Rantisi, 2019). For instance, the construction of the MIL campus, whose name stands for 'Middle of the Island' and 'Montréal Innovative Lab', benefited from $350 million offered by the three levels of government (that is, municipal, provincial, and federal), while the AI supercluster also benefited from massive public investments (for example, $500 million in Foreign Direct Investments, and $230 million from the federal government).

In the midst of a persisting housing crisis, the city of Montreal's enthusiasm for this new hi-tech hub raises particular concerns, as its development has deep ties with the increased precarity of Parc-Ex's most marginalized communities. For instance, it has been shown that investments in these two projects have led to a sharp surge in average rent prices over the past few years, exacerbating the already precarious situation of many tenants, and putting a disproportionate pressure on the neighbourhood's rental market (Jolivet et al, 2022; Renzi et al, 2022). In turn, the support networks that have been vital to Parc-Ex's tenants in mitigating the adverse effects of

gentrification, racism, exploitative working conditions, and social exclusion have been seriously shaken by this increased pressure. Furthermore, an increasing number of speculating landlords are acquiring properties, adopting an investment strategy that relies on evicting long-term tenants to maximize rent and attract a supposedly more 'profitable' clientele (Guay and Megelas, 2021). More alarming still, are the shared failure of both public and private actors to mitigate their negative impacts on the neighbourhood, let alone acknowledge their responsibilities.

Among the many consequences of tech-led gentrification in Parc-Ex, our sustained engagement with the community has led us to focus on four particularly pressing ones. A first major consequence is the increased residential precarity of the neighbourhood's most marginalized tenants. This can be seen in the significant increase in evictions since the opening of the MIL campus (Parc-Extension Anti-Eviction Mapping Project, 2020), and the new branding for Parc-Ex's rental market, which manifests itself in ads and discourses held by real estate developers. This new branding targets students as well as young professionals, and seeks not only to increase rent, but also to install (new) practices of gentrifiers (Jolivet et al, 2022), creating overlapping processes of gentrification, youthification, and studentification (Moos et al, 2019). This worsened residential precarity for long-term tenants comes with a set of challenges (for example, harassment, fear of displacement, increased housing costs burden), as well as increased difficulties for collective organizing, which is caused, among other things, by the displacement of tenants and community groups (Reese et al, 2010: 321). Notwithstanding this looming threat of displacement faced by community groups in Parc-Ex, the transformation of the neighbourhood, coupled with the disproportionate allocation of resources towards the tech industry, exacerbates the sense of powerlessness among community workers. They contend with mounting demands for support without a corresponding increase in available resources. A third consequence is that the development of community housing projects is becoming harder in Parc-Ex, as the cost of land goes up and real estate speculation increases competition to acquire buildings. Together with funding cuts for community housing projects, this notably means that community groups struggle with acquisition costs, are more likely to lose sites to private real estate developers, and have a harder time convincing public authorities to acquire sites and buildings in the neighbourhood (Guay and Drago, 2023). Finally, a fourth consequence is the reinforcement of a cynical and distrustful point of view on public institutions by the neighbourhood's most marginalized tenants, who perceive these institutions as inattentive to their needs and unable to support them when faced with a major crisis such as the potential or actual loss of their dwelling. This cynicism and distrust encourages disengagement and impedes the capacity of local community groups to lead campaigns for housing justice (Exentus, 2022).

The Parc-Ex Anti-Eviction Mapping Project – Sepideh Shahamati and Tamara Vukov

The Parc-Ex Anti-Eviction Mapping Project (PEAMP)[16] emerged in 2019 to highlight housing struggles and to support residents and community groups of Parc-Ex in their fight against intensifying gentrification and displacement in the neighbourhood (Parc-Extension Anti-Eviction Mapping Project, 2020). By using digital mapping tools, quantitative and qualitative data, research, writing, and creative practices, the project works to highlight and counter the role of institutions and businesses such as the University of Montreal and tech companies in driving housing speculation, rent increases, and displacement in the Parc-Ex neighbourhood.

In resonance with Maharawal and McElroy (2018), this project adopts a counter-mapping approach to make the landscapes of displacement and resistance visible. As described by Dalton and Stallmann (2018), counter-mapping, as a combination of critical tools and practices for social change, can create opportunities 'for grassroot data science initiatives' (Dalton and Stallmann, 2018: 93). Through this counter-mapping approach, we do not abandon the use of maps for their long traits of manipulation, distortion, and misconception of knowledge (Wood, 2010). Instead, we work through and sometimes against the grain of maps as a way of creating alternative narratives, by and for the community and at a distance from those produced by the real estate sector. As Gutiérrez (2018) argues, the situated use of data that abound in counter-mapping projects provides opportunities for data activism.

As part of our counter-mapping approach, and in conjunction with housing justice community groups in Parc-Ex, PEAMP has developed maps to make visible the dramatic rise in evictions and to advocate for emerging struggles against rent hikes and displacement in Parc-Ex, as well as to support the rich community fabric in this neighbourhood. It was the care for the community that became particularly important in a context where the mistrust in institutions that are mandated to uphold the right to housing of vulnerable residents is at an all-time high. The project followed upon a longer-term collaboration and jointly co-authored a report with a network of community groups in Parc-Ex that was released in the first months of the COVID-19 pandemic to widespread media attention and community circulation (Parc-Ex Anti-Eviction Mapping Project, 2020).

Two online maps were developed and launched in 2021:[17] a map of evictions in Parc-Ex[18] and a Community Power Map.[19] Working closely with a housing justice and tenant support association in Parc-Ex, the *Comité d'action de Parc-Extension* (CAPE), PEAMP collaborated on co-constructing the first map based on data CAPE has been gathering in the course of their front-line support work for tenants. The joint aim is to document the dramatic rise in evictions in this area since 2017 (the first

year that a rise in evictions became evident to CAPE), particularly in the political context of a government that denies that a housing crisis is in full swing (Bergeron, 2021). Given that wider eviction patterns are notoriously difficult to document (as often noted in literature on gentrification, for instance Chum (2015)), the aim with this map was to make visible the extent of evictions and to break the broader invisibility of the gentrification process due to the lack of public access to public data on evictions. In the absence of an open system to publicize evictions and the intricacies of the gentrification process, we do not claim the eviction map to be exhaustive (unlike many dominant approaches to mapping) but specify that it is merely the tip of the iceberg given that the map only shows the evictions of some residents who are willing to push back against their landlords. Nevertheless, the counter-mapping renders the effects on housing justice in the neighbourhood clear and publicly visible, while safe-guarding a degree of opacity to avoid overexposing vulnerable tenants to possible landlord reprisals (for instance, PEAMP did not publish exact points on the map, but approximate ballpark locations).

The second map, the Community Power Map, visualizes recent community actions and resistance, as well as the needs and desires expressed through their emergence. As community members and activists embedded in these issues in addition to being researchers, we were aware of the depth and value of community endeavours being conducted by residents, activists, and organizers in the neighbourhood. We did not want to focus solely on evictions in a decontextualized manner without also showing the agency, mutual aid, and active community power that undergirds the neighbourhood. While a range of community groups and residents were undertaking remarkable works to mobilize against gentrification, offer support, and increase public awareness of housing rights, these efforts were sometimes dispersed or invisible. Our Community Power Map aims to shed light on the importance of community work in Parc-Ex and create a resource to spatialize and characterize the various community efforts, struggles, victories, and capacities in the neighbourhood. More than being a representation of community work in the neighbourhood, the Community Power Map remained a tool of engagement and discussion. The map is used both as a resource depicting the stories of struggles and success in the neighbourhood, and a tool for igniting community exchange. The representational role of the map gave way to a more than representational one; the map became less important than the process of engaged activism that it ignited.

We have used maps to surface and make visible the landscapes of evictions and community work in Parc-Ex. However, as argued by Kitchin, Gleeson and Dodge (2013), maps do not always reflect the claims desired by their creators. The lives of maps continue to exist after their creation, and are being ceaselessly unfolded in different contexts shaped by 'personal, social,

embodied, political and economic relations' (Kitchin et al, 2013: 494). The reliance on one visualization tool in one specific moment is not the goal of the project. Rather, the counter-mapping approach we have co-constructed is an ongoing, open process that situates data visualization and representation within a larger process as a vantage point and tool for discussion, mobilization, collaboration, and engaged activism. The maps are not instrumentalized as mere representation, but act as a point of reference and tool for igniting various talks, presentations, workshops, educational, and community exchanges. Alternative narratives of Parc-Ex are being re/created and revised, not only on our maps, but also in our public discourses and exchanges.

A key element and takeaway that anchors the counter-mapping approaches we have sought to put into practice is the importance of constructing thoughtful and sustainable community relays and infrastructures for their emergence. The creation and use of maps became possible due to an ongoing, durable community collaboration. It continues to live and be accountable to the social context for which these maps and discussions were being created. In emphasizing the importance of building durable community collaborations and data co-creation, we also foreground the less visible but no less important work of building social infrastructures and community relays to undergird effective and accountable data visualization and data activism.

Data activism through community research: CBAR, Digital Divides and Parc-Ex Curry Collective – Alex Megelas and Leonora King

Community relays, research accountability, and data activism can take multiple forms of alliance between researchers and community organizers. While, as seen earlier, the intersection of these practices centres data as a resource and a tool for counter-power, the solutions developed for the problems tackled are not necessarily technological in nature. In this section, we consider the practice of research as institutional confrontation and the extent to which the Parc-Ex community-based action research network (CBAR) proved to be an effective means of challenging institutional narratives relating to social impact stemming from the AI environment in Montreal, and advocated, via the Digital Divides research project (2022) for increased specificity in naming and documenting social impact. At the same time, importantly, the project created the conditions for autonomous, grassroots solutions.

The Parc-Ex community-based action research network (CBAR), coordinates the presence of university stakeholders in the neighbourhood, according to relational commitments that commit to reciprocity across all aspects of a research project. The network is autonomous and is not linked to any one university. It holds meetings every two months, at which area

residents, local organizers, and students and researchers can attend to consider potential collaborations.

In 2019, at the request of local residents, an attempt was made by the network to reach out to noted Université de Montréal AI researcher Yoshua Bengio, who had led creation of the Montreal Declaration for a Responsible Development of Artificial Intelligence[20] to see if he might be willing to influence the Université de Montréal and the Campus MIL project towards the development of a housing mitigation strategy for the impact of its students on the neighbourhood. After meetings with Bengio's private firm, Element AI, came to a standstill, the CBAR network opted to expand on some of these exchanges as part of Digital Divides, a research project that committed to considering the impact on housing by the AI entrepreneurial sphere.

The report explored solutions to the inequitable distribution of the economic benefits of Montreal's AI sector and the evident economic disconnect between Montreal's AI tech hub, and the adjacent Parc-Ex neighbourhood. The report included recommendations on alternative housing models, collective benefit agreements, and AI Commons, in addition to smaller-scale, grassroots efforts. These initiatives aim to empower communities affected by the development of the AI sector while also democratizing its top-down governance structure. The researchers behind Digital Divides conclude the report by calling for a number of reforms to AI and housing policy that prioritize justice-oriented, rather than for-profit aims and involve meaningful community consultation. The report highlights the importance of social movement building – rather than just academic and government intervention – as key forces in the pursuit of these goals.

In an effort to address some of the systemic inequalities facing Parc-Ex residents, one of our community-based researchers, Leonora King, co-created a neighbourhood-led mutual aid initiative that sought to move resources from more privileged Montreal residents to vulnerable ones. Parc-Ex is home to many newcomers to the country who face economic, employment, and language barriers. Through her connections to community organizations in Parc-Ex and her close ties to residents themselves, Leonora founded the Parc-Ex Curry Collective (PECC). PECC provides a means of financial support to asylum-seeking women living in Parc-Ex by hiring them as chefs for catering and food distribution services. The Collective essentially empowers women who face economic barriers by leveraging one of their best assets – their cooking skills. PECC is based on a model of redistribution of resources in two ways: (1) more affluent residents can purchase meals made by asylum-seeking women, providing them with a source of regular income, and (2) some of the meals prepared go back into the community to feed more vulnerable residents who struggle with food insecurity. The Curry Collective partners with the Welcome Collective to identify vulnerable newcomer families who could use some warm, home-cooked meals. In terms of real impact, women

facing employment barriers gain some financial autonomy, more vulnerable residents receive free meals and Montreal residents can sample authentic South Asian cuisine while contributing to a mutual aid network. The initiative continues to be an evolving grassroots solution to systemic barriers, enabling the integration of newcomers, raising awareness about the realities of asylum seekers and the barriers they face, and promoting equity by shifting resource allocation. In terms of longer-term impact, PECC chefs can rely on a stable source of income, enabling them to be more engaged residents as well as active participants of positive change.

The relationship between the Digital Divides project and the PECC demonstrated a new form of relationship within the sphere of university community partnership creation in the Parc-Ex community, and allowed for a deeper range of calls for socio-economic equity stemming from the scholarship which it furthered. The alignment between a research project and a community-led community economic development initiative, allowed for the creation of consistent brokering sites, through which relationality could be explored between neighbourhood residents and organizers, and researchers. It also led university students and researchers to commit to a broader range of outputs to academic work – through grounded participatory field work, through the creation of advocacy tools alongside an academic paper. In so doing, it nuanced and enriched the definitions of a kind of scholarship that can more fully and organically exist in the realms of organizing and advocacy.

DISCUSSANT RESPONSE

The nature of spatialized data power and politics – Rob Kitchin[21]

In recent years, data power and data politics have become key frames of analysis for making sense of the ways in which data and their associated systems and infrastructures are produced within, at the same time as they (re)produce, social and spatial relations. Power is vested in data through what they denote and how they can be used to reveal aspects of the world and inform decision-making (Beer, 2019). The lifecycle of data unfolds within socio-technical relations that can be highly contested, with political struggles over the means of production (ownership and control of systems, platforms, infrastructures), what is captured, in what forms, and how the resultant data circulate and are used (Kukutai and Taylor, 2016; Cheney-Lippold, 2017; Ruppert et al, 2017). These struggles are informed by ideological views and political narratives, and the work of data, their infrastructures, and data actors takes place within and helps shape political economies (Sadowski, 2019; Zuboff, 2019). In other words, increasing attention is being paid to the contested ways in which data and their attendant socio-technical assemblages

of actors and actants are (re)produced, whose interests they serve, how data power in its manifest forms is exerted in practice, and how expressions of power are contested in practical, political, and normative ways through data activism and claims for data sovereignty, citizenship, and justice (Hintz et al, 2019; Dencik et al, 2022; Kitchin, 2022).

The short interventions in this section add to the ongoing work under way in digital geographies concerning the spatial politics and geographies of data power (for example, Ash et al, 2018; Graham and Dittus, 2022; Thatcher and Dalton, 2022). The essays provide a scalar and geopolitical analysis of the clustering of AI industries in Parc-Ex, Montreal, from their embedding in the global Internet, their siting in a global digital economy in which geopolitical rivalries between the US, China, and the EU are playing out, their reliance on extractive resources, and their framing with respect to environmental and climate concerns their grounding within a city-region and the effects on a neighbourhood community, and the embodied data subjectivities of residents and the limits to their data sovereignty. Collectively, they make clear the scaled, material, and contested politics of digital infrastructures, in which there are alliances and contestations between state, businesses, and communities, and the technologies themselves become the means of resisting data power and conducting politics through counter-data actions. Moreover, they highlight that data power is thoroughly interwoven into other political and power struggles: as with smart city developments, the AI ecosystem in Montreal is imbricated with real estate, property development, and rentier capitalism, and is a driver of urban-regional restructuring, housing crises, and spatial divisions of labour (Shelton et al, 2015; Kitchin et al, 2019). Data power and politics cannot be understood in isolation, but as contingent, relational, and contested relations that are intwined with other markets and vested interests constituting a complex 'power geometry' (Massey, 1993).

The analysis does useful work then in detailing the spatialized nature of data politics and power through a largely descriptive account of what is occurring and how expressions of data power are being resisted (in part, a function of consisting of seven short pieces). To take this analysis further, the varied and contested nature of concepts such as 'data power', 'technical territories', 'algorithmic violence', 'data sovereignty', and 'data activism' that are evoked could be examined, as could how they help make sense of the socio-spatial processes in action. Data power is noted to consist of hegemonic power and data counter-power (the authors' third category of 'powering data' refers to how data power is dependent, in a secondary sense, on resource extraction, rather than to the nature of power per se). Yet, power is a highly contested concept theoretically, its nature and operation diversely understood across philosophical viewpoints (Avelino, 2021). Such diverse conceptualization extends to understanding how power is spatialized (Allen, 2003; Coleman and Agnew, 2018). Moreover, at a practical level, power is expressed in varying ways

(for example, domination, coercion, co-option, self-discipline, punishment, modulation, intervention, mediation, coordination, direction) and countered through diverse resistance tactics (for example, protest, non-compliance, disobedience, and so on). And power is mobilized and expressed in context; in this case, within a capitalist, neoliberalized, racialized, and gendered political economy and entrepreneurial urbanism. It is not enough, then, to say data power is at work without unpacking in nuanced theoretical terms how power is understood to work, through what means, and to what ends.

Similarly, the response to data power might be further elaborated by moving beyond political action and the noting of data activism to its normative framing. What should be the normative grounding of data counter-power? The pieces allude to data sovereignty and a sense to which citizens should have some level of autonomy in how data shape their lives. But what notion of sovereignty is being evoked? Other useful concepts might be data citizenship (rights, entitlements, and obligations delimited through data and with respect to data; Isin and Ruppert, 2015) and data justice (that people are treated in just, fair, and equitable ways by data-driven processes and systems; Dencik et al, 2022). Like power, each of these concepts is diversely understood and it is not enough to say we want data justice. For example, egalitarian data justice seeks equal treatment for all citizens, utilitarian data justice prioritizes the greatest good for the greatest number, and libertarian data justice contends that the free market is inherently just and people are treated as they deserve or can afford (Kitchin, 2022). What kind of data justice does and should underpin the data counter-power enacted in Montreal and the other interconnected sites that enable the city's AI cluster?

The pieces then provide a useful overarching analysis of the spatial and scalar politics of data power and my response is a call to extend and deepen this kind of analysis in order to provide a more theoretically nuanced explanation of the socio-spatial processes and emergent power geometries at play.

Acknowledgement

The analysis in this commentary was funded by European Research Council Grant no. 101052998, titled 'Data Stories'.

Notes

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[2] Concordia University
[3] Université du Québec à Montréal
[4] Université McGill, Afrique au Féminin
[5] Concordia University
[6] Concordia University
[7] European University Institute
[8] Concordia University
[9] Minderoo Centre for Technology and Democracy, University of Cambridge

[10] Université de Montréal
[11] Discussant
[12] Facilitator
[13] For a history and critique of the ideology and impact of the ecosystem metaphor see: Krivý (2023), Norris and Suomela (nd), as well as the Digital Divides Project (2022).
[14] For a comprehensive analysis of the policies, financing mechanisms, and actors within the Canadian AI industry, see Brandusescu (2021).
[15] Similar processes have been observed in other 'tech hubs', like San Francisco and the Bay Area (Opillard, 2015; Stehlin, 2016; Maharawal and McElroy, 2018).
[16] https://antievictionmontreal.org/en/maps/
[17] https://antievictionmontreal.org/en/maps/
[18] Eviction Map of Parc-Extension – Interactive Version. Available at: https://antievictionmontreal.org/en/maps/evictions-map/
[19] Community Power Map of Parc-Extension – Interactive Version. Available at: https://antievictionmontreal.org/en/maps/community-power-map/
[20] https://recherche.umontreal.ca/english/strategic-initiatives/montreal-declaration-for-a-responsible-ai/
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