

Reimagining Digital Public Spaces and Artificial Intelligence for Deep Cooperation

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■ **RESEARCHERS WHO HAVE** worked in computer science or artificial intelligence for more than a few years will have experienced a profound shift in the public perception of their field from being something that people rarely cared about outside of sci-fi or niche academic or “geek” interest to something that is suddenly everywhere all over the world and seems to be permeating every field and every product. How should we respond to this?

This challenge was raised recently by the inclusion of artificial intelligence (AI) into a debate around the concept of place, triggered by an invitation to the Securitization for Sustainability of People and Place Workshop at the IEEE International Symposium on Technology and Society 2022.

How should we think about the role of technology, and, in particular, AI, in the context of place?

Digital Object Identifier 10.1109/MTS.2023.3277115
Date of current version: 7 July 2023.

What role does and can it play in us being able to enjoy security in our places and spaces? And how has this changed?

On the one hand, we can consider the proliferation of AI-enabled surveillance, deployed in various forms of sensor networks ranging from traditional security cameras now being connected to computers to networks of “doorbell” cameras, to body instrumentation in the form of smart “watches” and on smart “phone” platforms. On the other hand, we can also consider *digital public* spaces, how public spaces are being reimagined through digital transformation, how artificial intelligence shows up in those places, and how we might want to think differently about that.

Let us first consider the distinction between public and private physical spaces. Anyone who has organized, or possibly even simply attended a public protest will have received a rather rapid education in the distinctions between public and private physical

spaces. At least in many jurisdictions, public protest is largely permitted and tolerated within public areas, such as parks, streets, and public squares.¹ Indeed, the fact that nonviolent protest happens in the public sphere is core to promoting and improving the quality of democracy [1]. Doing so in a public place where other citizens and institutions gather to enjoy free association and expression is part of why it can be effective.

And public protest remains essential today (Maugham [11] provides one example of many we could choose). Legitimate concerns from the “algorithmic” treatment of students [9] and inhumane treatment of refugees [18], to the insufficiency of global, national, and corporate responses to the climate crisis [19] require and will continue to require effective public protest if they are to be overcome at all. It is not hard to argue for the importance of public spaces when the right to self-organize for collective action is both essential to democracy and perhaps even our survival as a species. As UN Secretary-General Antonio Guterres noted, “Climate activists are sometimes depicted as dangerous radicals. But the truly dangerous radicals are the countries that are increasing the production of fossil fuels” [19].

Yet, should a protest stray into a privately owned space, such as a commercial shopping center, other interests take hold, and one can be quickly asked to leave: the purpose of the private square is different from the public one, and the interests of its owners, while supporting the activities of their customers, are typically not aligned with the public interest more broadly. Of course, in some cases, attracting the attention of others is part of the protest, and the subsequent legal attention that might follow doing this in a private space can be a useful “tactic” [21]. But for our purposes here, this alternative affordance of a private space is beside our point.

Often in the modern urban world, the distinction between public and private physical spaces can appear subtle and not even particularly apparent. When visiting any city or medium-sized town in a country known to have public spaces amenable to protest, it can be challenging to identify which spaces are public (and hence provide these affordances) and which are private (and typically do not). Often small signage is used to indicate that one

¹Notwithstanding recent changes to this, for example, in the United Kingdom. See, for example: https://www.libertyhumanrights.org.uk/advice_information/pcsc-policing-act-protest-rights/

has passed into a different realm, but in some cases, the owners of the private space intentionally make the space appear like a nearby public one. The blurred nature of these boundaries quickly ceases to exist however, when attempting to exercise one’s rights within such a space.

So, public spaces are important in that they provide the affordances to be able to engage collectively as citizens in creating change. And protest is an obvious example to lead with, but far from the only one. Others are more subtle, and more broadly what is important is that there are spaces for community building and self-organization that enable groups to take collective action in their own interests. One such example of these is people’s assemblies, exercises in deliberative democracy [13] that can enable people to come together to tackle wicked problems that affect us all, and that require listening and understanding of the perspectives of others. This technique is being used to tackle challenges of food security in Wales [17], bringing together local farmers, young people, families, senior citizens, shopkeepers, and others. In this case, as in many communities around the world, the bilingual nature of the community brings added challenges and sensitivities. Done well, as in these examples, this exercise can break down barriers between not just socio-economic groups, but between communities using different languages as well. Core to this is a public space that has no interest other than to enable what needs to emerge from the process.

There are many forms of public spaces that exist to enable this kind of community self-organization to happen and create change. One very different example we are familiar with, from communities in The Gambia, is that the shady areas under large trees in the village provide essential spaces for community meetings, where people can come together. Here, community meetings can listen, deliberate, and make decisions that affect the community at large. This idea of public space has been core to self-organizing forms of democracy since antiquity [12].

Moving online

These examples are all physical spaces. Yet, as the digital transformation continues, and our personal, work, and social lives increasingly move online, a question arises: what happens when we move community self-organization to the digital world?

It is now commonplace to talk of “Zoom rooms” and “Slack spaces,” and while these are not rooms or spaces in the physical sense, this is not merely a metaphor. These are the digital equivalents of physical spaces where people meet, listen, organize, and act. Such a “room” may appear as a private space for the group, but it exists, such as it does, on a privately owned platform. Note that the private nature of the ownership and the private nature of the room refer to alternative meanings of the word “private.”

Much public discourse today happens in apparently more public digital spaces, such as on social media. Traditional web presences, perhaps classically represented by the personal website or blog, have largely given way to a discourse that lives on Twitter threads, WhatsApp, and Facebook groups, in Zoom rooms, as well as more niche places like sub-Reddits.

Considering how groups “move online,” let us consider one of the aforementioned people’s assemblies on food security with which we are familiar. This physical event took place in Canolfan Eirianfa, a charity-owned “community center providing fully accessible venues for voluntary and community groups.”² The event itself was supported by both government and charitable funds. And community centers, libraries, public squares, and town halls have fulfilled this role in many countries, for generations.

However, when this community moved online, suddenly instead of being in a public community space, as a participant, we are directed to Instagram and Facebook. This digital version of the space where community self-organizing is happening is instead owned privately and commercially, in this case by Meta. There is nothing unusual about this example. A cursory search for local community groups in your area will most likely lead to a Facebook group, online-first communities may use a platform such as Discord or Reddit, and many neighborhoods coordinate community safety and organize events through hyperlocal WhatsApp groups. None of these are “public” spaces in the way we traditionally think about them in the physical world.

The privatization and corporatization of the internet will be nothing new to those who have charted its evolution, but we argue that we are reaching a critical point in its dominance—likely accelerated by COVID—where the consequences of this on democracy and social action bear further examination.

²<https://www.facebook.com/EirianfaCommunityCentre/>

We already discussed some of the challenges in moving *physical* democratic self-organization into private *physical* spaces. So, why does it, on the face of it, seem less problematic to do this in the digital world? And does it matter?

Question of power

Clearly, the off-limits affordances of private physical spaces, such as there is no right to protest—and we would suggest deliberative democracy exercise held in a private retail square would likely be similarly interrupted—do not transfer obviously into the digital realm. Social media is a known place for certain forms of protest, and community organizing clearly does take place on Facebook and Zoom, the latter often most effective. So, what is going on here?

In the physical cases, we have explored so far, the activity may have been designed to inhibit the purpose of the space (e.g., successful antifur protests outside department stores inhibit the purchasing of fur coats), but purposes can also be partially compatible. Some community action meetings commonly take place in coffee shops. Here, the purpose of the meeting and the private space can be aligned (e.g., even the most rebellious community group meetings in coffee shops tend to involve the purchasing of substantial amounts of coffee and cake). And, in many cases, a simple room rental fee model may solve the alignment issue for most purposes; the modern use of Zoom rooms by community organizing groups might be thought of in an equivalent way. Yet, there remain limits to this. For example, a meeting of a proto-labor union among nonunionized coffee chain workers taking place in the place that employs them may not be tolerated [22]. In the specific case of Zoom, the limits and consequences are still unclear, and many organizations have taken their own view.³ To take advantage of the space, we must hope or ensure that the private owner perceives an alignment, and this creates a power differential.

Limits and risks of private online spaces

This disempowering nature of partially incentive-aligned private spaces is, we argue, what we see transferred to digital spaces. And it so happens that the

³For example, privacy and security concerns over Zoom were part of a significant anti-Zoom movement throughout the COVID pandemic. See <https://www.cbc.ca/news/science/taiwan-zoom-video-conference-1.5524384> as an example.

business models of the hosts of private digital spaces are such that they tolerate limited community action.

Consider that Facebook, Twitter, and other similar platforms are commercial entities centered around data-harvesting platforms to support advertising revenue. In this way, the aim is to create a comfortable environment, similar to a shopping mall, that entices you to stay and return. And people do use shopping malls in this way: a classic example would be teenagers choosing to meet their friends there. Yet, we know that even if these are places where you can go to meet your friends and have discussions, the purpose of the place is to sell you things, and the place only exists because it is effective at that.

So, if these online platforms are shopping centers and not town squares, why do they apparently tolerate more community organizing than their physical equivalents?

There is a key difference and interesting dynamics to observe here. The owner of the private digital space often not only tolerates, but wants to encourage dissent or activity other than its primary revenue-generating purpose, so long as this draws more attention or retains a population within the space, which can then be a source of greater current or future advertising revenue or data value. Indeed, given the “attention economy” [2], and given that controversy attracts attention, there is in fact commercial value in having dissent permitted or even encouraged by the platform (not to mention that the platform owner can then build a model that you have an “interest” in whatever the community group is about). This is a commodification of democracy to sell more eyeballs.

Returning to the power differential that exists in partially compatible private spaces, from coffee shops to global social media platforms, we can see that a greater dominance of the space creates a greater power differential, indicated at the extreme with (near-)monopoly. Consider the controversy about the ownership and role of Twitter in 2022. A private text message conversation between Jack Dorsey, Twitter’s founder, and Elon Musk, its eventual purchaser and (at the time of writing) the world’s richest person,⁴ illustrates this. The conversation was made public in a court filing for Twitter versus Musk (2022)⁵:

⁴<https://www.forbes.com/billionaires/>

⁵<https://www.documentcloud.org/documents/23112929-elon-musk-text-exhibits-twitter-v-musk>

Jack Dorsey: I’m off the Twitter board mid-May and then completely out of the company. I intend to do this work and fix our mistakes. Twitter started as a protocol. It should never have been a company. That was the original sin.

Elon Musk: I’d like to help if I am able to

Jack Dorsey: I wanted to talk with you about it after I was all clear, because you care so much, get its importance, and could def help in immeasurable ways. Back when we had the activist come in, I tried my hardest to get you on our board, and our board said no. That’s about the time I decided I needed to work to leave, as hard as it was for me.

Elon Musk: Do you have a moment to talk?

Jack Dorsey: Bout to head out to dinner but can for a minute

Elon Musk: What should it look like?

Jack Dorsey: I believe it must be an open-source protocol, funded by a foundation of sorts that doesn’t own the protocol, only advances it. A bit like what Signal has done. It can’t have an advertising model. Otherwise, you have a surface area that governments and advertisers will try to influence and control. If it has a centralized entity behind it, it will be attacked. This isn’t complicated work, it just has to be done right so it’s resilient to what has happened to Twitter.

Elon Musk: Super interesting idea

What matters here is not whether you agree with Dorsey or Musk, and Dorsey, in particular, alludes to what we believe to be a very reasonable point about the consequence of app-based models for internet platforms rather than protocol-based ones. What matters more is that our community organizing spaces in the digital world are governed by conversations like this one. Fundamentally, this shows us that the health of our digital space is dependent on the whims, ideas, and goodwill of a small number of highly privileged people. Here, a chat between two billionaires will influence the form of the space in which dominant public and community discourse occurs.

Geographers Zook and Graham [24] liken the dominance of the corporate internet today to the enclosure of rural England. The enclosures, a process

that led to the eradication of the commons and the privatization of farming land, took many centuries, and was a cause of major struggle and civil strife. It was met with a very organized protest movement that lasted generations, and there is now substantial evidence that the process led to an increase in inequality [3]. A common saying is that while “England” was better off, the people of England were not. This is a thought-provoking comparison to make when we think about the early origins of the internet, where we are today, and where we might be going.

So, what are the risks of the private model for digital spaces? Given Twitter’s prominence in generating and hosting controversy in the last year, let us again consider some examples of its use. In Pakistan, we saw so-called “blasphemous” tweets blocked by the owner of the platform, at the request of a government agency [10]. In Türkiye, the government similarly requested Twitter to block certain pieces of content [23]. Twitter complied, even despite an order from the country’s highest court saying that such a block was not permitted on the basis of freedom of expression. The power differential and locus of control here are apparent.

In another more recent example, Musk apparently made a decision about whether former U.S. President Donald Trump should be allowed back onto the platform on the back of a straw poll. This is perhaps an equally obtuse exercise in power as the company has the absolute right to exclude a prominent but divisive political figure from “public” discourse on the platform in the first place. This is not how we usually make decisions about how our national and community discourse carries on, about what can be said and who can participate.

There is a lack of sovereignty over these apparently public but in-fact private spaces in the digital world. Their governance models are not the same as those of public physical spaces—because they are not public spaces, and this brings with it limits and risks.

And it also brings with it lost opportunities.

Missed opportunity

In addition to these limits and risks, there is a further issue: these sorts of digital spaces are simply not designed with a community action purpose in mind. This is less an intentional limit, and more a missed opportunity.

Let us consider such an opportunity. It is a common trope or desire today that digital spaces are

becoming increasingly “smart.” What is typically meant by this is a form of pervasive sensing or data gathering (surveillance, if you will) over these digital or physical places that can be harnessed to solve problems and add conveniences. Techniques sometimes termed “Artificial Intelligence,” but often rather more mundane things [8] are often used. A common one is the recommender system, used to suggest or point the user toward possibly desired things. Another is the algorithm designed to retain your attention and increase the amount of time you spend scrolling on the site—again, to gather preferences and to sell eyeballs and data to advertisers.

Yet, it is who is doing the *desiring* here that is influenced by the power, sovereignty, and affordances discussion we explored above. Often, these are couched in terms of making “more relevant content” appear to a user, with the owner of the algorithm (typically also the owner of the space) exploiting a hopeful alignment between a user’s economic preferences as an individual and the company’s commercial aspirations. If it were this simple—or we could ignore the complex results emerging from research on polarization and filter bubbles [5], [6], [7] and pretend it is—then this is not troubling.

But what is less talked about is the lost opportunity here. Consider what “smart” algorithms could achieve if their purpose was not to exploit alignment between commercial interests and people as individual economic actors. Imagine, if you will, what an AI system designed with the purpose of strengthening community, building social capital, enabling and facilitating social action, tackling inequity, and supporting empowerment, might be able to achieve instead?

If this sounds fanciful, we ought to be mindful of the scale with which the aforementioned commercial AI has been pursued over the last 20 years; its rise has been meteoric. According to one survey conducted by IBM [4], 35% of companies globally had adopted AI by 2022, with an additional 42% actively exploring it. Adoption and development have quickened and continue to do so, and this has dominated the academic and career interests of many of a generation’s best minds. According to the Wharton School of Business [20], common examples include improving customer service, improving product recommendations, segmenting

audiences, analyzing customer satisfaction, and optimizing supply chain operations. This focus in the areas of AI adoption has, we argue, colored our very understanding of what “smart” systems are: economics-driven and individualizing. That is not to say the use of AI technology in commercial applications is unwelcome (though in some cases it has been). Rather, there is a missed opportunity for this technology in other spaces, and such an imbalance may bias our assumptions about what is possible or where the opportunity lies.

So, how could AI show up in digital *public* spaces? What could it be used to achieve? And how might we build that?

In many ways, it has seemed as if we are on the back foot when it comes to defending rights online. Indeed, even the common narrative of “defending” rights, rather than securing or furthering them, betrays the way many of these platforms have operated.

There is, of course, a strong and healthy technical community motivated to present alternative platforms and respond to emerging threats. For example, a simple individual choice one can make is to use Signal instead of WhatsApp, or Mattermost instead of Slack. As researchers, we can work on projects that expose unfair and socially harmful biases in machine-learning models, and we can challenge design assumptions. Yet, all these acts are essentially defensive.

Possibilities of artificial intelligence for digital public spaces

What might positive, creative, socially focused uses for emerging AI technology look like? If we could divert some resources to being proactive instead of defensive, perhaps we would have the space to create new, interesting, and empowering things in the public digital realm. Perhaps, we could design technology-enabled spaces for the purpose of strengthening the community and empowering community action instead.

Perhaps, the most important are mechanisms for self-organization, facilitating deliberative democracy, and enabling collective action based on common knowledge. These are examples of the kinds of things that we are largely missing in the AI that we conceive of today, certainly in the corporate world. To have the right to do these requires sovereignty over space, to secure the space for such purposes,

without the need to rely on an alignment with the owner’s commercial interests.

As one example, we are exploring how to design “smart” systems based on the principles and mechanisms to create deeper cooperation in neighborhood communities. The core idea is around building and sustaining social capital through community-oriented recommender systems. This is something some of us have been codesigning with community housing groups, community leaders, and nurses in the Black community in Toronto, with the aim of empowering communities to solve food security challenges.

There is precedent for this form of technology-enabled social action: during the COVID pandemic, the virtual “Auntie Betty” app, developed in the public interest by The Pamoja Institute created a network of essential community support resources able to connect with vulnerable people in meeting health, wellbeing, and poverty needs, at one the most difficult of times [15]. This in itself was hugely impactful, but what quickly became apparent was the structure and value of the community network that emerged. Qualitatively speaking, the app’s social network contained a ring of “aunties,” each supporting one or more subgroups while also mutually supporting each other. This was not predetermined; it had emerged as being effective.

Yet, at scale, network issues exist, and people can “fall through the cracks,” leading to pathologies such as isolation of individuals, bottlenecks where individuals are over-relied upon, and weak points in the network, where the absence of one or two people could risk the whole community’s resilience. In our ongoing research, we are exploring how to harness recommender systems to strengthen these community networks. The core idea is that we do not simply make recommendations based on what an individual is perceived to need (or might buy), but based on what the community needs to thrive, and, with all the appropriate level of transparency, explain why such a recommendation is important. This enables us to build social capital, both to bond existing networks in more resilient patterns and to bridge between subcommunities, to provide additional resources and flexibility when necessary.

The food security challenge of the 21st century will not be solved by more food banks. Instead, its solution lies in communities that are empowered to be able to address and ensure their own food

security. This sort of collective action problem is precisely the type that we ought to be able to tackle with today's emerging "smart" technology—if it is to be of any social value at all.

This represents a challenge to us as technologists and AI researchers and creators: how can we use technology to build the kind of resilient communities that are empowered to solve their own wicked problems? How can technology be used to strengthen norms of reciprocity, mutual aid, kindness, and trustworthiness in social networks?

This form of deep cooperation goes beyond the classic models of cooperation that are studied in classical and evolutionary game theory, and most work in multiagent systems. Many of those models favor analyzability to the extent that they abstract away crucial nuances of human interaction and relationship. These "ecological" models are often so simplistic that the human element essential to the cooperation is missed entirely, instead almost treating humans like bacteria, with in-the-moment decisions based on minimal cognition, and with little broader or historical social context. It is no surprise that, under those kinds of ecological assumptions, defection-based strategies prevail, and we end up believing in the inevitability of tragedies of the commons everywhere we look.

Yet, we know from Ostrom [14] that humans do more than this. We know that we use our cognitive capabilities to create norms around trust and reciprocity and generosity and that we change the rules of the game when it does not suit us. We intentionally engineer our societies to motivate acts that create outcomes that we desire. As we move into the world of digital public spaces and begin to consider what *platform intelligence* is needed to bring these outcomes about at scale, in the digital world, this seems like a ripe area for AI to be able to contribute.

So, how do we do it? A starting point is AI systems that are able to reflect on their social context, to learn norms, morals, kindness, and the consequences of their actions. We would also need AI systems whose algorithms target socially beneficial qualitative outcomes, not just the maximization of individualized and often economic metrics.

If we begin to think this way, perhaps we will be able to reimagine an alternative "intelligence" in AI, intentionally targeted at our collective good: something that empowers and collectivizes, rather than metricates and individualizes. This will also bring

into sharp focus the affordances we need in our digital spaces, perhaps providing the reasons to reclaim the sovereignty needed over public digital spaces to be able to realize them.

FINALLY, IN THIS article, we have focused on the notion of ownership as a means of exercising power. This and transparency over ownership are important determiners in whether or not platforms and services become public goods, or something else [16]. But ownership is far from the only way power can show up in spaces—physical or digital. We would encourage a broader and more nuanced debate on the political, cultural, and economic power held over digital spaces, and how these can be established such that democracy and cooperation can flourish. The aim here is not to idealize face-to-face, nor to diminish the immense positive and transformative potential of online spaces. As one example, Zoom "rooms" have hosted the facilitation of community deliberation and action in ways that are far more accessible than previously possible, removing barriers to participation. What is important is that we identify and strengthen the features and affordances of spaces physical and digital that encourage democracy. By doing this, we give ourselves the opportunity to reinvent our digital spaces in the right way. ■

Acknowledgments

We are grateful to the Registered Nurses' Foundation of Ontario (RNFOO) for their generous support in funding part of this work through the Nurse Innovator Award Program under Project "Zero Hunger App."

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