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Making a Scene via Counter-Data Mapping: The Digital Cartography of Hong Kong's Resistant Economy

Tin-Yuet Ting

Department of Applied Social Sciences, The Hong Kong Polytechnic University, Hong Kong SAR

Correspondence: Tin-Yuet Ting (tyting@polyu.edu.hk)

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Abstract

Studies of contemporary social movements have explored the role of digital maps and mapmaking in the organisation and visualisation of protest events, yet little is known about the contentious political potential of maps when the political opportunities for street politics fade. This article examines the digital cartography of Hong Kong's yellow economic circle, a networked system of retailers and consumers linked by political values that support pro-movement stores and boycott pro-establishment businesses, for which citizen activists amassed crowdsourced data to create and update counter-maps that galvanised political consumerism to uphold dissent. Drawing on a renewed conception of the networked movement scene, I contend that counter-data mapping demonstrates a connective structure of self-mobilisation that affords the (trans)formation of (a) dissent spatiality, (b) sociality, and (c) solidarity during the declining stages of movements. Based on digital ethnography and archival research, I show how this nascent cartographic data-as-repertoire not only helped establish and sustain a resistant economy but also allowed people to maintain and refashion their contentious political participation via everyday engagement with data. While the state authorities attempted to expand their territorial control amidst the crisis, counter-data mapping, as a digitally enabled, joint practice of scene-making, (re)invented dissent territory, enabling dispersed citizen activists to continue to connect and mobilise amidst intense urban policing and social distancing protocols. This article casts new light on the utility and capacity of digital cartography during movement latency while illuminating the understudied contours and consequences of counter-data mapping in a non-Western context.

Keywords

counter-data mapping; digital cartography; Hong Kong; movement scene; yellow economic circle

1. Introduction

Whilst urban authorities in Hong Kong clamped down on street protests and imposed strict controls in public spaces during the Anti-Extradition Bill Movement (AEBM) and throughout the Covid-19 pandemic that immediately followed (Pit, 2024), a citywide "counter-data mapping" (Jeppesen & Sartoretto, 2023, p. 150) campaign aimed at creating a "yellow economic circle" (YEC)—a networked system of retailers and consumers linked by political values to support pro-movement stores and boycott pro-establishment businesses—was mobilised by citizen activists to carry on the pro-democracy movement. As police repression escalated and street protest risks mounted, protesters, movement supporters, and sympathisers migrated online to produce digital counter-maps that curated shop data and categorised retailers by political alignment through the intensive use of social media and mobile technologies.

Studies of contemporary social movements have explored the role of digital maps and mapmaking in the organisation and visualisation of protest events (del Biaggio et al., 2019; Rodríguez-Amat & Brantner, 2016), yet little is known about their contentious political potential when the "political opportunity" (Tilly & Tarrow, 2015, p. 60) for street politics fades. In contrast, more recent studies have started to show that digital cartography constitutes a new "repertoire of contention" (Jeppesen & Sartoretto, 2023, p. 153; cf. Tilly, 1978, p. 155) that can be leveraged to disrupt traditional power asymmetries and may have policy or political impact on its own. This recent strand of research has identified the production of counter-maps for a myriad range of agendas such as housing justice, indigenous rights, and labour equality (Counter Cartographies Collective et al., 2012; Kidd, 2019; Maharawal & McElroy, 2018). However, relatively limited attention has been paid to the utility and capacity of digital cartography for contentious politics, especially in non-Western contexts. Much remains to be understood about the ways in which digitally savvy citizens develop counter-maps and corresponding practices and networks to challenge autocratic state power in the Global South.

This article investigates the latest contours and consequences of counter-data mapping in the case of Hong Kong where citizen activists converged and crowdsourced resistant data to (re)produce counter-maps that galvanised political consumerism to engage in political contention. Drawing on a renewed conception of the networked movement scene, which describes a specific network of places, people, and events that denotes shared forms of countercultural expression and counter-hegemonic activities (Creasap, 2012; Leach & Haunss, 2009; Silver & Clark, 2014; Ting, 2021), I contend that counter-data mapping demonstrates a connective structure of self-mobilisation that affords the (trans)formation of (a) dissent spatiality, (b) sociality, and (c) solidarity during the decline stage of political movements. Based on digital ethnography and archival research, I show how such nascent cartographic "data-as-repertoire" (Beraldo & Milan, 2019, p. 6) in Hong Kong not only helped establish and sustain a resistant economy but also allowed people to maintain and refashion their contentious political participation via everyday engagement with data. Whilst the state attempted to expand its territorial control amidst the crisis, counter-data mapping—as a digitally enabled, joint practice of scene-making—(re)invented dissent territory out of quotidian territory which enabled dispersed citizen activists to continue to connect and self-mobilise despite intense urban policing and social distancing protocols.

2. Conceptual Framework

2.1. Digital Cartography and Contentious Politics

Studies on maps and mapmaking in the digital age have shifted focus from the state and its "cartographic authority" (Gautreau & Noucher, 2022, p. 9) to networked individuals and their "collaborative, experiential cartographic praxis" (Miner, 2022, p. 433). Modern cartography developed in parallel with the rise of the nation state (Mason-Deese, 2020; Miner, 2022) and traditional information technologies and techniques, such as government statistical systems and databases, served state authorities in their publication of top-down spatial representations that draw fixed borders in support of colonial conquest and the imposition of capitalist property relations (de Souza et al., 2025; Kidd, 2019; Miner, 2022). Yet the rise of many-to-many mobile social media has significantly expanded the communicative capacity and mobilisation opportunities of (counter-)publics (Castells, 2009). In particular, digital media have been found to help render the alternative spatial narratives and visions of marginalised communities and their struggles over territory more visible and effective (Kidd, 2019; Miner, 2022), thereby contesting "maps of power" (Mason-Deese, 2020, p. 428) from the bottom up.

Whereas traditional cartography "from above" has been employed by state authorities worldwide to influence and shape public opinion, knowledge, and behaviours (Salerno et al., 2020), recent research on contemporary digital cartography has highlighted its counter-hegemonic nature, noting that it helps challenge institutionalised landscape discourses by representing the perceived spaces of marginalised communities and subaltern groups. For instance, many studies have shown how indigenous groups and sovereignty movements produce their own digital maps that represent local spatial knowledge and visualise hidden spatial power relations to counter the development plans of the state, such as pipelines for non-renewable resources crossing territories of the Dene and the Inuit in Canada and state-imposed irrigation projects in Licto, Ecuador (de Souza et al., 2025; Kidd, 2019). Another strand of research on Covid-19 cartography has also looked at how amateur mapmakers created alternative Covid-19 maps that revealed inequality and promoted mutual support (Jeppesen & Sartoretto, 2023; Kent, 2020), thereby "compensating for the loss of external movement" (Pase et al., 2021, p. 150) among ordinary people proscribed by state authorities.

Research has also paid particular attention to the collaborative and participatory nature of many contemporary counter-mapping projects. Digital cartography involves and invokes horizontal organisation among networked individuals who interact in digital environments to create new spatial knowledge and contest hegemonic spatial power through counter-mapping (Jeppesen & Sartoretto, 2023; Kidd, 2019). From this perspective, the power of digital cartography derives from its role in enabling or promoting grassroots collaboration and cooperation among ordinary people who (re)appropriate information and data to fight social injustice and inequality, facilitated by the use of social media and mobile technologies (Miner, 2022). Yet the openness of digital cartography may simultaneously expose mapmakers and contributors to state surveillance as state authorities and power actors can identify activists more easily, leading to a high(er) risk of participation (de Souza et al., 2025; Duggan & Gutiérrez-Ujaque, 2025).

In studies of mapmaking in political movements, the literature has foregrounded the counter-hegemonic and participatory potential of digital cartography focusing on how activists and movement organisers produce

counter-maps, particularly during protest events and large-scale demonstrations. This strand of research has outlined the production of protest maps that visualise possible safe routes and shelters and map ongoing police suppression and violence. For instance, Hind (2021) explored the role of anti-police or anti-arrest maps in the anti-austerity movement of the United Kingdom and in the AEBM of Hong Kong. The study looked at how the digital cartographies of protest helped ensure the safety of protest participants by providing "navigational knowledge" to allow protestors to remain mobile and safe in fast-moving and chaotic protest situations. Drawing on the case of the Yellow Vest Movement in France, Lobbedez (2023) and Baisnée et al. (2022) also contended that protest cartography helps reveal state repression by mapping police brutality and countering media distortion. Albeit from a different perspective, Abers and von Bülow (2021) examined how "catalogues and collaborative maps that listed solidarity projects and campaigns [of] movements, civic organizations and collectives" (Abers & von Bülow, 2021, p. 94) invite other social actors to join protests and to feel united. Likewise, del Biaggio et al. (2019) and Rodríguez-Amat and Brantner (2016) argued that digital cartography may facilitate protest mobilisation and the recruitment of participants by visualising the size and prevalence of street protests.

However, although studies have examined digital cartography at the peaks of mass mobilisation, they have not sufficiently addressed how digitally enabled citizen activists (re)produce counter-maps during movement "latency" (Melucci, 1989) at quiet(er) times when mobilisation and organisation are not publicly visible. In particular, studies have thus far failed to consider the importance and impact of counter-mapping beyond street politics and instead focus on the role of digital maps and mapmaking in facilitating the organisation and visualisation of protest events, rather than how it matters in its own right. The utility and capacity of digital cartography at quiet(er) moments of mobilisation, particularly in how counter-mapping advances and alters citizens' political-contentious participation during movement latency, deserve research attention.

2.2. Counter-Data Mapping as Scene-Making

A renewed conception of the networked movement scene is useful for understanding the significance of digital cartography during movement latency. The original notion of the "social movement scene" was introduced by Leach and Haunss (2009) and further developed by social movement scholars to investigate how seemingly mundane cultural activities taking place in European and North American cities—such as discos, punk clubs, rock performances, and street art—facilitated or preserved anti-segregation, anti-gentrification, radical feminist, and anarchist movements, although such activities are not conventionally recognised as contentious political participation. Described as "a network of free spaces that encompasses one or more subcultures and/or countercultures" carved out of the dominant space (Leach & Haunss, 2009, p. 259), the social movement scene is closely related to Melucci's (1989) notion of "submerged networks" of everyday life, which considers contentious politics as "a commitment to a prefigurative praxis" (Leach & Haunss, 2009, p. 262) characterised by an array of alternative lifestyles and corresponding counter-hegemonic practices that are often "submerged" in mundane activities.

More recently, going beyond examinations of the physically bounded places in which countercultural practices and counter-hegemonic activities unfold, research has shed light on the digitalisation of the social movement scene. For instance, Ting (2021) observed that "in emerging digital environments, the movement scene helps to illustrate the innovative ways in which cultural praxis, increasingly facilitated by new information and communication technologies, can inform and shape public engagement at movement

protests in significant ways" (p. 163). This revised notion of the networked movement scene is, in part, derived from Jenkins' framework of "convergence" or "participatory culture" (Jenkins, 2006; Jenkins & Couldry, 2014) which prioritises digital prosumption over consumption and focuses on people's digitally enabled experiences of media production (e.g., citizen journalism, podcasting, video production, graphic design) and other tech-based activities (e.g., building apps and websites) as a gateway for more engaged citizenship. Its alternative focus on the "participatory promise of contemporary culture and politics" (Jenkins & Couldry, 2014, p. 1107) thus signals a shift in the possibilities of contentious political participation in which citizens assume active roles as social interventionists by mixing new and digital media tactics with more tried-and-true approaches to "make a scene" (Creasap, 2012, p. 183) in and for contentious politics.

In this article, I contend that the digital cartography of Hong Kong's resistant economy is an example of a networked movement scene through which networked individuals came to "create and sustain within the live practice of the movement relationships and political forms" (Breines, 1980, p. 421) and that its contentious political potential can be observed and analysed in terms of the "spatial, symbolic, and relational dimensions of social movement scene" (Creasap, 2012, p. 182).

The spatial dimension refers to the social and physical spaces in which a social movement can (continue to) develop. Embedded in and across particular landscapes of urban life, such as squatted spaces, music venues, and community centres, a social movement scene may act as a recruitment ground and serve as a pool for grassroots mobilisation by offering spaces for people to directly participate in or stay connected with a social movement and its ideas or culture (Haunss & Leach, 2007). However, whereas the traditional notion of the social movement scene rests on the tight connection between counter-hegemonic activities and physical places, the revised notion of a networked movement scene revolves around digitally enabled praxes of creating, sharing, and connecting content that take place in online communities and mediated networks.

The symbolic dimension concerns the development of a sense of belonging and shared identity through participating in political or protest rituals. Characterised by "(para-)social interactions and public events collectively performed by digitally enabled citizens around particular cultural phenomena" (Ting, 2021, p. 164), a networked movement scene does not maintain rigid boundaries or strict membership criteria. Rather, its membership "is ultimately constituted through a process of self-identification" (Haunss & Leach, 2007, p. 164) as the scene allows the articulation of "multiple loosely binding, more flexible arrays of local meanings" (Silver & Clark, 2014, p. 428).

The relational dimension focuses on the articulation of new socio-cultural relationships in the process of scene-making and whether such relationships help advance a movement's political and societal influence. As a movement forges its own culture through which participants engage with one another in joint practices to advance a particular socio-political agenda (Leach & Haunss, 2009), a networked movement scene may serve as a site for refashioning new movement relationality, albeit sometimes temporarily, amongst like-minded people who work together and engage with one another in joint struggles.

Shifting the analytical emphasis to networked praxes of scene-making therefore invites us to rethink contentious political participation in terms of the everyday local practices of digital media and mobile social technology or repertoires of "everyday networked activism" (Ting, 2019) that simultaneously operate outside and yet interact with political movements. As shown in my analysis, many of the characteristics and

potentials of a networked movement scene can be observed in the digital cartography of Hong Kong's resistant economy through which networked individuals connected and contested the despotic power of the state based on data (re)appropriation. Through the lens of the networked movement scene, I show that such a data-as-repertoire "is in itself political work" (Creasap, 2012, p. 184) which not only helped preserve the legacy of and keep alive the AEBM but also re-enacted particular movement convictions, norms, and routines in everyday life (Haunss & Leach, 2007), allowing citizen activists to experiment with new styles and alternative modes of contentious political participation during movement latency.

3. Methodology

3.1. The Case Study

This article is based on a case study and its goal is to enrich our understanding of the contentious political potential of counter-data mapping, particularly in geo-political settings that have been thus far underexplored. With the aim of arriving at a "thick description" (Geertz, 2000, p. 6), the article seeks to contribute to theoretical transferability, rather than statistical generalisability (Yin, 2009), regarding the utility and capacity of counter-data maps during the decline stage of mass mobilisation. To contextualise, for a prolonged period of time between mid-2019 and 2022, the Hong Kong government instituted restrictions on public gatherings throughout the AEBM and strict social distancing rules during the Covid-19 pandemic that immediately followed. In the face of the imposition of a dominant spatial order (Ting, 2022b), (former) protestors and their supporters converged in the digital realm instead, calling on people to buycott "yellow" businesses—which were pro-democracy and movement supporting—and boycott "blue" businesses—which were pro-government and police supporting (Chan & Pun, 2020).

To coordinate and mobilise a citywide campaign based on the yellow/blue divide, citizens employed mobile social media and digital platforms to collect, fact-check, analyse, and visualise shop data in collaboration with each other in the hope of encouraging pro-movement citizens' consumption activities to take place within the YEC. They developed a set of user-friendly digital maps that guided movement participants and sympathisers to identify yellow and blue businesses and to make conscious and strategic political choices in their everyday lives. Various web- and app-based maps were designed and launched at different stages to prompt and guide users to locate and distinguish businesses to patronise or boycott.

The counter-data mapping campaign catalysed an unprecedented wave of political consumerism in Hong Kong and sustained self-mobilisation in constrained urban spaces. Street interviews documented widespread adoption of maps such as WoliEat and WhatsGap with users consulting them several times a week for faster decisions and as a low-risk mode of political expression (Apple Daily, 2023; Miller, 2019). Economic effects were significant and asymmetrical. While yellow eateries (e.g., Cheung's restaurant chain, JarGor 1996) drew persistent queues, blue-aligned firms (e.g., Maxim's Group, Best Mart 360, Yoshinoya, Fulum Group) faced boycotts, reputational damage, and reported losses (Yau, 2020). During acute moments—such as the Apple Daily finale in June 2021—Punish Mee launched five rapid-reporting portals that crowdsourced newspaper availability across districts, triggering a citywide "buy-crazily" surge (Davidson, 2021). These maps thus produced an "ephemeral queuing landscape" at yellow shops (Pit, 2024), exemplified by events like the 2020 "5.1 Golden Week" which mobilised over 2,000 participating businesses, generated an estimated HK$100 million in turnover, and drew over 400,000 participants (Ho, 2020; Yau, 2020).

As a particular type of data-enabled activism, citizens harnessed and represented shop data on a range of digital infrastructures including the prominent online forum LIHKG, a Reddit-like platform that has been the most prominent forum in Hong Kong especially during the AEBM (Ting, 2020), and digital mapping tools such as Google Maps and OpenStreetMap. Open-source databases, often based on an open licence for their code and data, were also set up to preserve the data and share it with different map teams, and an unrestricted application programming interface for collaboration with other mapping teams was provided. Whenever a digital map encountered technical problems or ceased operating, people shared alternative options online and relied on backed-up data from the terminated map. For instance, after the Yellow–Blues Map ended its operation in 2023, citizen activists exported and mirrored its crowdsourced dataset to public GitHub repositories—a US-based code-sharing platform widely used by developers and activists to collect, store, and curate sensitive material through a combination of crowdsourcing and scraping (Sun & Wright, 2024). By cloning the cloud-stored repository to their local devices and then pulling updates or pushing revisions to the central version, interested citizen activists could continue the counter-mapping work at any time. Citizen activists also circulated access links via LIHKG threads and Telegram channels and directed one another to alternatives such as WhatsGap and NeoGuideHK.

The case study is, therefore, illustrative of the underexplored contours and consequences of counter-data mapping during movement latency. It unveils not only how the creation of digital maps contested and challenged the state's hegemonic representations and restrictions of urban public space but also how mapmaking as a particular type of data-enabled activism provided opportunities for contentious political participation based on resistant data appropriation. As I demonstrate, by connecting contentious politics with everyday life, such mapping helped redirect political struggles from street politics to opposition politics both during and after the abrupt end of the AEBM in early 2020, when police brutality and the outbreak of the pandemic largely halted street protests.

3.2. Methods and Data

I drew on digital ethnography and archival research to examine the digital cartography of the Hong Kong resistant economy. Digital ethnography involves unobtrusive, observational analysis of content on digital platforms to understand communications and interactions in online communities and the points of view of their members (Kozinets, 2010; Langer & Beckman, 2005). In particular, conducting non-participant online observations on open-access platforms allows for "uncovering mechanisms and tracing processes" (Small, 2009, p. 22) and minimises the (potential) risk and harm to researched subjects as it avoids intruding on privacy or disturbing the natural behaviour on these sites, particularly where a potentially sensitive topic is concerned (Kozinets, 2010; Langer & Beckman, 2005). Following this approach, I focused on observing the cartographic practices of networked individuals and changes in those practices over time in relation to the development of counter-data mapping. Drawing on Coleman (2010), I examined the self-constructed culture, discourse, and conventions in the activist communities on and across digital platforms.

During the two-year period between August 2019, a few weeks after the start of the AEBM, and July 2021, one year after the local version of the National Security Law was enacted, I collected materials on major platforms that were key to the counter-data mapping campaign. These included threads and posts on LIHKG regarding both the YEC and the digital maps (Figure 1), and comments and replies that were publicly available on six mapping platforms (Table 1). Collecting materials across platforms allowed me to study

online behaviours and interactions across a digital media ecology rather than on a single specific platform (Feuston et al., 2020). Although collecting empirical materials on these selected platforms may not have included all of the materials available, analysis of the content posted on the most popular platforms helped achieve "societal significance" (Small, 2009) and offered insights into the (re)production of digital maps along with the corresponding activities and experiences of citizen activists.

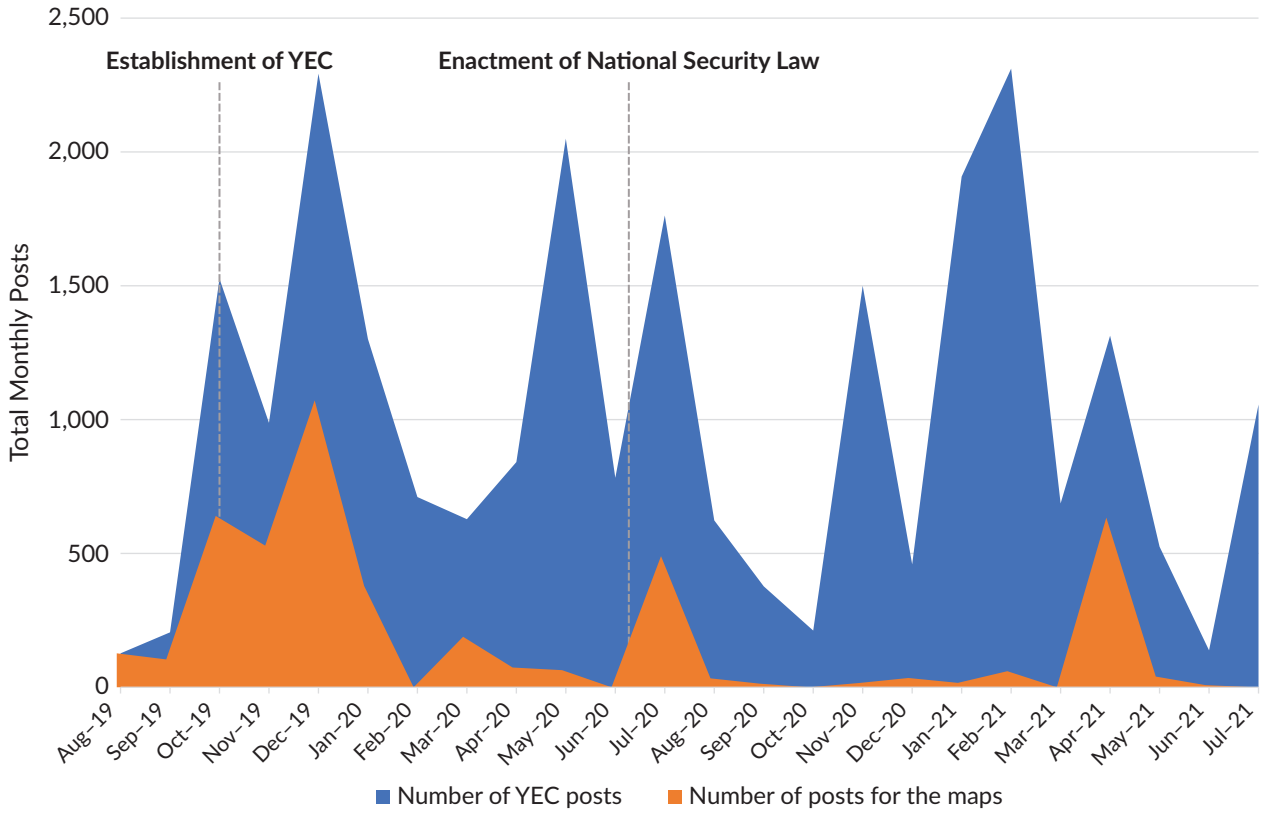

Figure 1. Distribution of LIHKG posts about the YEC and digital maps.

An archive of materials was collected and curated, and immersive readings of media coverage, documents, and records were carried out. The archival research served two complementary purposes. First, it guided the non-participant observations on the digital platforms as it helped connect them to the antecedents and targets of the counter-data mapping campaign and identified the relevant unfolding events and processes by noting the key time points when they occurred. Second, it supplemented the digital ethnography by providing evidence of the acts and results of counter-data mapping and their ramifications in real-life contexts that might not have been fully captured by the online observations.

Following Schreier (2012), I used qualitative content analysis to examine how and why resistant data practices tied to Hong Kong's digital cartography were articulated online. Using LexisNexis keyword searches, I retrieved 304 press articles in both Chinese and English from major local outlets (e.g., *South China Morning Post*, *The Standard*, *HK01*, and *Hong Kong Free Press*) and international news agencies (e.g., Reuters, Bloomberg, AFP) mentioning the six map names, as well as 35 government announcements and press releases mentioning the "yellow economy" or "YEC." I scanned the headlines to locate appropriate press articles while including all the government documents in the analysis. Through the archival research,

Table 1. Six popular web- and app-based maps examined in this study.

Type	Name	No. users/members	No. data/shops	Start date	End date
Web	Yellow–Blue Map (aka. Lemon Map)	97,000+ followers on Facebook	10,000+ entries	August 2019	August 2023
Web	NeoGuideHK	6,000+ daily	4,000+ entries	June 2019	February 2021
App	WhatsGap	N.A. (ranked as the #1 free app in both the iOS and Google Play app stores)	4,000+ entries	July 2019	July 2020
App	WoliPay	8,000+ daily	N.A. (granted permission to access shared data from the Yellow–Blue Map)	December 2019	November 2020
App	WoliEat	N.A. (2,000+ 5-star reviews and ranked as the #1 free app in the iOS app store)	N.A. (granted permission to access shared data from the Yellow–Blue Map)	October 2019	July 2020
App	Punish Mee	250,000+ members	N.A. (a key app for YEC activities)	April 2021	July 2023

I process-traced the emergence, diffusion, and transformation of these practices over time, rather than outlets' editorial stances. Analysis proceeded in two cycles: First-cycle coding distinguished specific mapping initiatives, their evolving affordances (e.g., crowdsourcing, crowdsensing, political labelling, shareable links), and contentious political capacities (e.g., mobilisation, coordination, consumer action); second-cycle coding generated a coding frame comprising three thematic dimensions—spatiality, sociality, and solidarity. This process enabled the contours and consequences of the cartographic data-as-repertoires to be identified and analysed.

The analysis of the online observations was integrated with information derived from the archival research to provide a contextual analysis. To achieve a context-specific account, I used an iterative and dialogical process that moved between empirical materials and theorisation (Carspecken, 2013; Spiggle, 1994) and gradually refined the themes until sufficient levels of interpretive convergence and theoretical saturation were achieved (Belk et al., 2012). In presenting the research findings, I refer to evidence and examples that illuminate the networked processes and real-life consequences of counter-data mapping at work. To protect privacy and anonymity, the names of people and businesses are not mentioned and their pictures are blurred.

4. Findings

4.1. Producing an Alternate Spatiality of Dissent

In Hong Kong, whilst the local government imposed strict restrictions on public gatherings through urban policing and rejecting applications for public assembly to clamp down on street protests (Ting, 2020), two

web-based maps—Lemon Map (formerly the Yellow–Blue Map) and NeoGuideH—were established based on Google Maps to contest the hegemonic spatial order within commercial settings that were less susceptible to overt governmental intervention. These freely accessible web-based maps sought to guide consumers to make politically informed decisions about their everyday purchases through the "counter-data visualisation" (Jeppesen & Sartoretto, 2023, p. 155) of pro-movement retailers and businesses with opposing political affiliations using category-specific icons such as cutlery icons for restaurants and scissors for barbershops. Aside from showing the locations of the "coloured" businesses nearby, the map gave users information through clickable icons about what the businesses had done for the movement, whether shops had a relationship with the police, and whether businesses were involved in the strikes.

By visualising the territories of the YEC and of its counterparts with geo-referenced data, the use of digital maps rendered Hong Kong's resistant economy visible to the public at large. Figure 2 shows NeoGuideHK's desktop view which classifies businesses into four main categories: restaurants, shops, chain stores, and organisations. Map users could select which sectors they wanted to view by clicking the corresponding block in the map legend. The map in the figure displays "blue" and "yellow" eateries with icons indicating type (fork and knife for restaurants, cake for bakeries, noodle for noodle bars, and cup for cafés; Figure 2). These visualisations offered alternative ways to interpret urban space, turning routine consumer choices into political acts and creating a networked movement scene that allowed citizens to reclaim agency in everyday life.

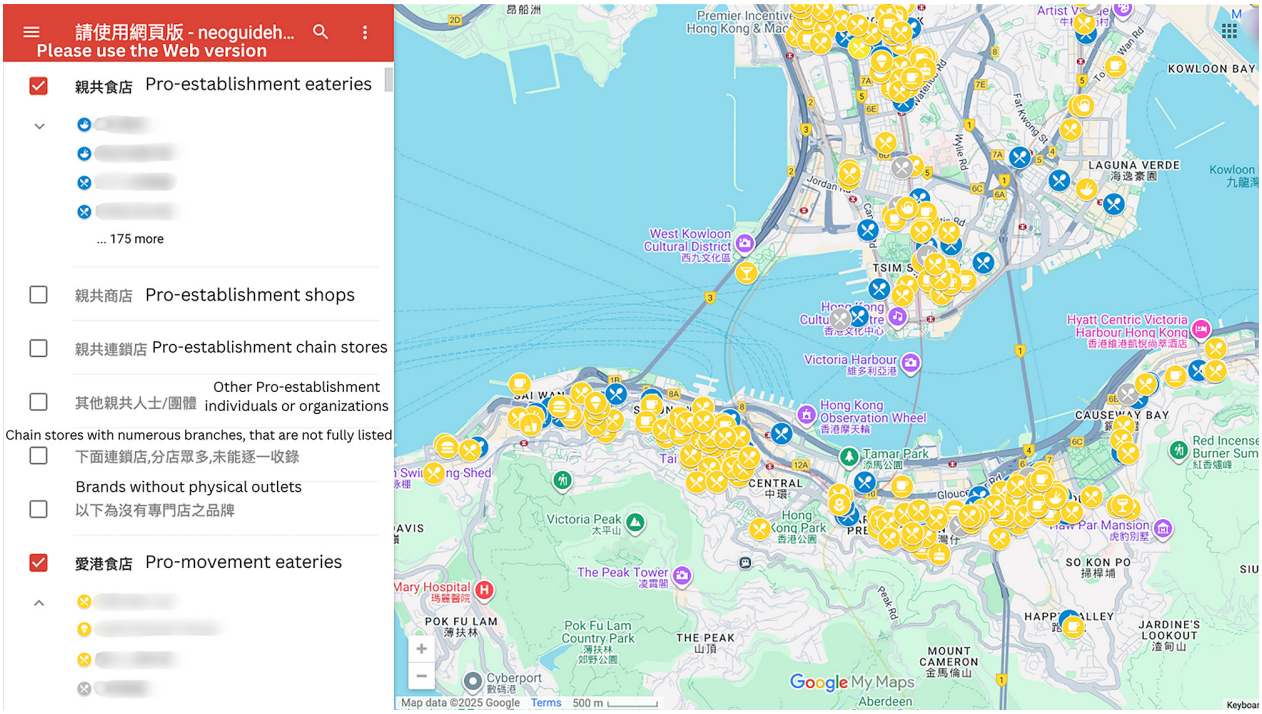

Figure 2. NeoGuideHK's desktop view (translated by the authors).

While the networked movement scene entailed "a struggle over territory" (Haunss & Leach, 2007, p. 260) in that it disrupted and subverted the spatial control of the emergent authoritarian regime, its materialisation involved a series of connective endeavours among networked individuals who collaborated to collect, organise, and visualise the shop data with the aim of discovering and uncovering the locations, distribution, and details of "yellow" businesses and their "blue" counterparts. The scene's affordances were thus

assembled as a set of resistant data practices undertaken by self-joining citizen activists who (re)produced resistant datasets to create and update web-based maps in a largely ad hoc and networked manner. At the earlier stage of the YEC, mapmaking primarily involved crowdsourcing data, with networked individuals analysing and synthesising shop data that had not necessarily been produced using high-tech tools or activities. On the one hand, citizen activists converged on LIHKG and social media platforms such as Telegram to gather information from publicly accessible online sources like businesses' official websites. On the other hand, the Yellow–Blue Map and NeoGuideHK online portals enabled the submission of first-hand reports via Google Forms and spreadsheets. Anonymous contributors, including whistleblowers, ex-employees, and consumers, were encouraged to submit detailed, first-hand witness data about businesses including names, addresses, (perceived) political stance, and visual evidence of the suggested political affiliation of the businesses.

To uncover hidden pro-establishment businesses that were pretending to be or had been mistaken for being yellow, citizen activists employed data doxxing tactics by investigating public and private social media accounts linked to business owners. The crowdsourced data were then systematically sorted and compiled by the mapmaking teams. For instance, the Yellow–Blue Map teams received over 2,000 entries in the last few months of 2019 alone, which were later turned into a comprehensive database covering over 10,000 entries as of 2023. The mapmaking teams then created digital maps using accessible visual mapping platforms to overlay the data onto Google Maps interfaces to provide the public with instant and intuitive, politically informed spatial awareness of their surroundings. To ensure the usability of the maps and legibility of the shop data, they marked certain businesses with "green" pins, indicating debatable cases that were subject to verification. The sharing of these web-based maps through embedded links, QR codes, and social media integration facilitated their rapid dissemination, making the digital maps widely adopted tools that helped reinforce the YEC.

However, local authorities contested the YEC and its digital maps. Government officials—most notably Secretary for Commerce and Economic Development Edward Yau—cast the YEC as unsustainable and discriminatory (Pang, 2020), while state media, including *People's Daily* and China Central Television, portrayed it as "Hong Kong independence" in disguise ("Gao jingji 'Gangdu'?," 2020; "Huang lan shidian ditu," 2020). A CCTV editorial also singled out the maps' "blue/yellow" classifications for deepening social divisions and purportedly harming the economy (Pang, 2020). During the pandemic lull, the Health Department and police enforcement also drew criticism for selective targeting "yellow" businesses, including unusually frequent social-distancing inspections and checks of customers' LeaveHomeSafe app usage for digital contact tracing at pro-movement restaurants (Ting, 2025; Wan et al., 2020).

Responding to fears of surveillance and arrests via corporate data disclosures, Hong Kong's counter-data mapping campaign attempted to balance public discoverability with participant security through strict data minimisation and pseudonymous infrastructures. Developers and users thus moved away from data-hungry platforms (e.g., Facebook, Instagram) toward LIHKG, Telegram, and Google Sheets which supported anonymous submissions. While LIHKG pledged to erase personal logs and adopt one-way encryption, Telegram's perceived strong encryption and pseudonyms enabled crowdsourcing without collecting identities. Map teams also deliberately used web-based overlays that did not capture personal or location data. Thus, while the digital maps themselves were publicly accessible, participation remained shielded, allowing a widely discoverable resource to sustain a counter-data mapping campaign without exposing contributors.

Through the cartographic practices of resistant data, user-friendly counter-maps were created and constantly updated by citizen activists. By identifying and linking "enclaves" of politically aligned businesses, these web-based maps articulated a network of political consumerism across urban spaces that was relatively removed from the direct territorial control of the state. By enabling ordinary citizens to convert everyday activities (shopping, dining, leisure) into deliberate acts of political contention, they played a pivotal role in (trans)forming an alternate spatiality of dissent beyond street politics.

4.2. Prosuming Sociality and Neighbours of Dissent

In addition to the web-based maps, there emerged a series of app-based maps that were developed by volunteers in response to demands for more mobile-friendly interfaces. These app-based maps adopted mobile cartographic techniques and interactive social media tools such as allowing users to subscribe to and follow businesses, vote on and rate these businesses, write reviews and comments, and upload photos to provide richer detail. Drawing on the mobile practices of data crowdsensing, referred to as the collective gathering and verification of data via users acting as distributed "sensors" to collect and share data by using mobile devices (Liu et al., 2019), these app-based maps mobilised networked individuals to share their everyday observations and connect their personal experiences during neighbourhood explorations and shop visits.

Serving as both replacements and alternatives, especially when some of the web-based maps were occasionally disrupted and after they were removed by Google due to alleged policy violations, some of the tech-savvy activists employed the iOS app store and Google Play Store to disseminate independent apps, rather than fully relying on Google Maps, for mapmaking. While allowing users to differentiate nearby businesses and make politically informed shopping decisions based on industry categories and political affiliations, these app-based maps differed in design, features, and practical function. For example, WoliEat was focused on the catering sector, whereas WhatsGap and WoliPay covered a broader range of industries and service providers ranging from catering to logistics and sales. Despite these differences, these app-based maps all commonly employed interactive interfaces such as text-based list views of businesses that users were following, the bookmarking of favourite shops to receive promotional updates, and the ability to add and report new business entries by users on their mobile devices on the move. In addition to improving in-app users' experiences and facilitating their journeys of political consumption, they actively involved networked individuals mapping their "coloured" communities by developing new features for personalisation through which networked individuals participated in the production and distribution of resistant data in the form of captioned pictures and user-generated textual content including comments, reviews, and ratings.

For instance, Punish Mee—a widely used app-based map that curates "yellow-only" shop data and served as the YEC's first shop aggregator—mobilised a wider public to contribute situated, personal data by logging everyday activities, immediate encounters, and embodied experiences, thereby maintaining a dynamic, continuously updated database (Figure 3). As Figure 3 illustrates, users often post close-up images of meals with Cantonese vernacular and sensory captions that signal endorsement and convey the satisfaction of family members and friends, thereby prompting likes and cross-references to other venues in support of nearby "yellow" restaurants. Through the visualisation and circulation of personal consumption, counter-data maps operated as living, social media–like databases in which first-hand, real-time experiences were continuously curated, turning personal encounters into connective political practices.

Figure 3. A close-up image and user comment in support of a "yellow" restaurant on Punish Mee (translated by the authors).

Therefore, by enabling users to craft their own "stories" about nearby businesses and review shops in their neighbourhoods, app-based maps integrated subjective evaluations and personal perspectives to enhance their credibility of being "yellow." In the case of WoliEat, map users were invited to report new businesses in a photo display section featuring food and drink menus, interior design features, and cues such as "Lennon walls," slogans, and event flyers (Figure 4). While "Lennon Walls"—citywide mosaics of sticky notes and posters that facilitated information sharing, emotional expression, and mobilisation during the AEBM—later re-emerged as symbolic outlets and a repertoire of contention (Li & Whitworth, 2022). Figure 4 shows users photographing an indoor "Lennon Wall" to substantiate a "yellow" business aligned with the movement.

Albeit in a different guise, WoliPay developed the mobile-friendly function of "coloured" ribbon icons that users could tap to confirm or contest a business's political stance, whilst WhatsGap offered thumbs-up and "anger" buttons for users to express their opinions on shops' affiliations. Wolipay also enabled in-app discussions by building comment sections where users could elaborate on a busineses' political stance or service quality and could comment on other users' reviews on the move. Punish Mee took the further step

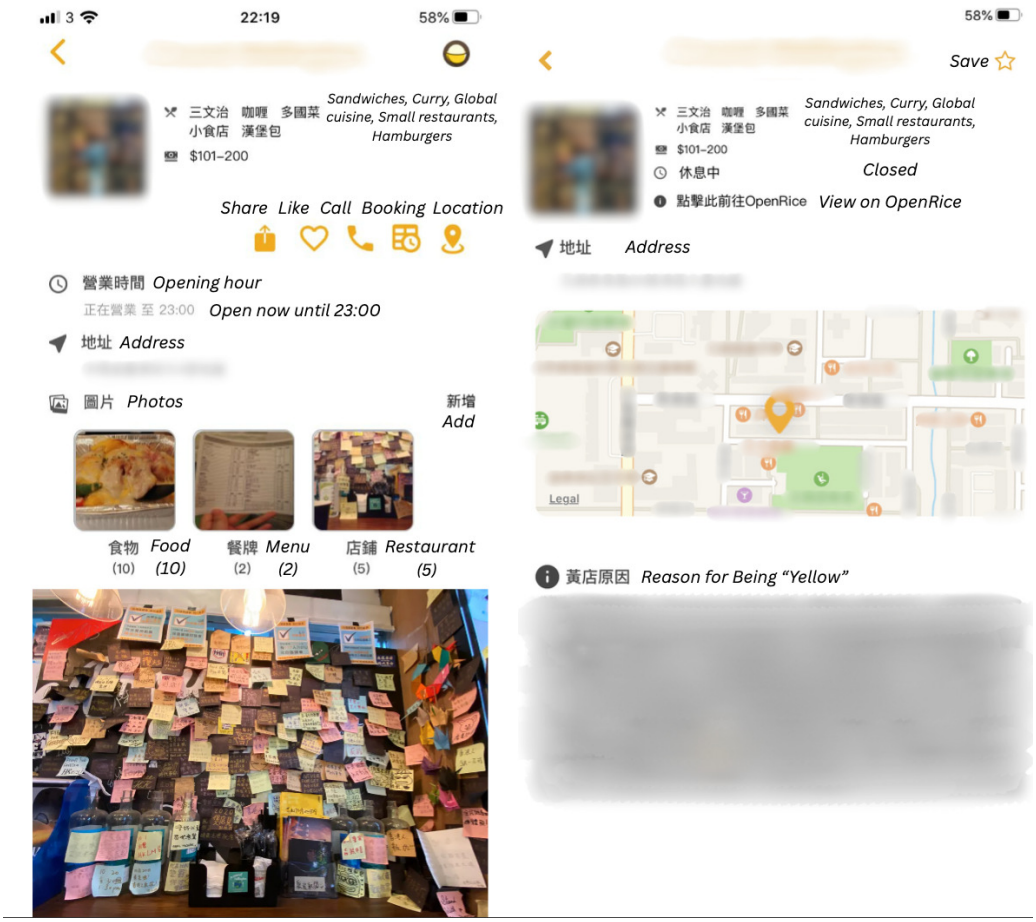

Figure 4. Photo display section of a "yellow" restaurant on WoliEat and the corresponding map shown after tapping "location" (translated by the authors).

of establishing a membership and loyalty programme called "Mee Rewards" which mobilised user participation through points earned from submitting user-generated data such as reports, reviews, comments, and photos after visiting yellow businesses. These points could be redeemed across participating businesses. Punish Mee sought to reinforce citizens' networked participation by nurturing and sustaining their everyday engagement in data crowdsensing.

Just as popular access to mobile devices and digital cameras has enhanced real-time communication regardless of location, so resistant data are not restricted to numerical figures but can also include instant personal updates and online streaming (Ting, 2022a; Ting & Chen, 2021), often loaded with personal perspectives. By introducing more personalised ways to participate, these apps constituted a flexible infrastructure of data crowdsensing and took a more participatory approach to engage networked individuals in the joint practices of mapmaking. In reclaiming and protecting their pro-movement neighbourhoods from pro-establishment corporate power and governmental territorial control, networked individuals joined in an array of cartographic practices of digital prosumption, rather than mere political consumption, to maintain their dissent. In turn, through these highly "personalised action frames" (Bennett & Segerberg, 2013), a buzz was created to attract people to "yellow" neighbourhoods and pro-movement places.

4.3. Perpetuating Solidarity and the Relationality of Dissent

As an essential constituency of Hong Kong's resistant economy, counter-data mapping played a prominent role in reproducing dissent solidarity and community relationships throughout the Covid-19 pandemic. As most yellow businesses were run by small and medium-sized enterprises that were not tied to the mainland Chinese market (Chan & Pun, 2020), citizen activists attempted to concentrate resources within the YEC. As retailers and eateries were impacted by the social distancing measures imposed due to the pandemic, digital cartography periodically created events of political consumerism in the city during the lockdowns. In so doing, it not only contributed to the sustainability of the YEC but also (re)vitalised dissent relationality by perpetuating mobilisation and promoting mutual aid within the activist community.

Amidst the public health crisis, a series of cartographic practices was invoked to identify vulnerable yellow businesses and to instruct consumer activists to patronise stores particularly in need. This involved cartographic practices that selected, filtered, and ranked shop data to turn them into useful and crucial information for timely collective action and prompt economic support. The app-based maps opened comment sections to allow citizens to report struggling businesses. Citizen activists actively identified struggling "yellow" shops either through social media monitoring or first-hand neighbourhood observations and they then put urgent appeals and updated statuses onto the map platforms. This continuous flow of data was integrated into the digital maps by the mapmaking teams, allowing the struggling businesses to be treated as priority cases deserving immediate attention and support. Central to this data-enabled activism were tagging systems that enriched the counter-maps with narratives and urgency markers, creating an "attention backbone" (Bennett et al., 2014, p. 250). For instance, time-sensitive tags such as "Yellow Business Now Gou3 Gap1 (Urgent)," "Countdown to Closure," and "Urgently Needed to be Punished" appeared in a timely manner on counter-data maps like NeoGuideHK to identify vulnerable yellow shops and inform people about the current hardship that these enterprises were facing (Figure 5). WoliPay also had a page

Figure 5. Screenshot from NeoGuideHK showing the system of alerts for businesses. Notes: After tapping the green tag entitled "Double Ten Thanksgiving Day to Yellow Shops," the shops involved in this campaign were marked with a green circle; red tags refer to "Yellow Business Now Gou3 Gap1 (Urgent)."

that curated lists of businesses at risk and included information on the contributions these businesses had made to the AEBM, providing urgent appeals and explanations of why users should support these shops.

In response to the absence of tourists and a lack of shoppers during the prolonged pandemic, counter-data mapping also contributed to the mobilisation and organisation of shopping campaigns that sought to periodically mobilise people to support yellow businesses by leveraging cartographic features. In addition to using tags to highlight politically aligned shops and curate businesses participating in the buycotting campaigns, such as "5.1 Golden Week," in-app notifications and subscription features allowed users to follow and receive real-time updates and discounts from yellow shops to boost engagement during festive celebrations and themed shopping events such as "Double Ten Day Thanksgiving" and "Thanksgiving to Yellow Shops." These features provided users with geo-referenced and actionable guidelines on when and where to shop on symbolic dates. Functioning as a networked movement scene during movement latency, Hong Kong's digital cartography thus linked scattered individual consumption activities and branded them with a common identity, conviction, and purpose.

Beyond visualising and promoting "yellow" businesses, some of the digital maps evolved into support infrastructures in the aftermath of the AEBM. For instance, WhatsGap guided pro-movement citizens to donation points for former protestors, directed citizen activists in need to nearby shelters and pre-paid meal schemes, and highlighted shops distributing free masks and sanitisers during the pandemic ("Huang lan shidian ditu," 2020). NeoGuideHK also created a new in-app section of "Bowl Together" feature solicited and posted job openings without fees, complemented by voluntary vocational training for former protestors (Leung & Wong, 2019). They thus extended beyond political consumerism to include and support those with disrupted education and employment during the AEBM (Yau, 2020) and those unable to consume by building non-consumerist networks, strengthening relational ties, and facilitating mutual aid.

By mobilising acts of political defiance, Hong Kong's digital cartography not only gave rise to a series of highly spectacular performances of dissent but also (re)fashioned movement relationality within the YEC throughout the pandemic. Repeated mobilisations of boycott campaigns and events of mutual aid thus helped manifest solidarity among pro-movement businesses and consumers despite adverse conditions.

5. Conclusion

This article examines the underexplored contours and consequences of counter-data mapping at times of movement latency. Using the case of Hong Kong, it investigates the development of a digital cartography of dissent through which citizen activists came to take part in a series of collaborative practices of mapmaking that simultaneously exposed and nullified the dominant spatial order imposed by an increasingly authoritarian (local) state. Unlike conventional accounts of protest cartography, which have concentrated on the instrumental uses of digital maps during the peaks of street politics, the article explicates how counter-data mapping allowed an alternate, popular form of political resistance and defiance to take shape through everyday engagement with resistant data, especially when large-scale protests were halted due to urban policing and social distancing measures.

Whilst recent studies of counter-data mapping have highlighted the role of data (re)appropriation in constituting a novel repertoire of contention to advance social justice agendas, this article incorporates the idea of data-enabled activism to illuminate the utility and capacity of digital maps and mapping both in and

for contentious politics in the Global South. Specifically, it invokes the renewed conception of the networked movement scene to provide a three-dimensional analysis of the contentious political potential of counter-data mapping during movement latency. First, the analysis shows how the emergence of digital cartography in Hong Kong and the corresponding joint practices of data crowdsourcing facilitated the formation of a network of latent movement spatiality vis-à-vis the hegemonic spatiality of political repression and contagion, thus (re)opening urban spaces to contentious political struggles. Second, highlighting its participatory nature and features, the article reveals that counter-data mapping as a scene-making practice helped prompt a participatory culture of digital prosumption and offered a new avenue for political consumerism via data crowdsensing. As shown in the analysis, this process of mobile data crowdsensing was significant for the formation of an "ideological neighbourhood…[in which people] came to socialize and engage in cultural activities together" (Li & Whitworth, 2022, p. 1378). By leveraging the latest affordances of mobile social technology, digitally enabled citizen activists, albeit loosely connected, thus became able to continuously exhibit and exercise their political agency while critically scrutinising their neighbourhoods and proactively updating counter-maps. Third, focusing on the refashioning of dissent relationality during the lockdowns, the analysis further demonstrates how counter-data mapping not only enabled physically dispersed individuals to continue to engage in data-enabled activism but also perpetuated movement solidarity by (re)producing landscapes of mutual aid and rhythmic spectacles of political resistance.

Although many Hong Kong counter-data mapping platforms are now inactive, their contentious political effects remain evident in the repertoires of contention they seeded. Locally, counter-data mapping helped cultivate a durable counter-culture of political consumerism—such as sustained patronage of independent bookstores and attendance of book fairs promoted and rendered visible by earlier maps—even under the National Security Law ("Indie book fair," 2025). Their value thus lies not only in maintaining a single live map but in nurturing routines of support and low-risk engagement that have preserved movement identity and solidarity in post-movement Hong Kong. Transnationally, these novel data-as-repertoires have proliferated among diaspora communities. In the UK and Taiwan, Hong Kong emigrant networks adapt similar strategies to identify "yellow" and "blue" businesses by using crowdsourcing and shareable Google "My Map" features to keep dissent legible across borders ("'Nuanqi junshi' tui Ying," 2021). Regionally, counter-data mapping diffused via the Milk Tea Alliance. Thai activists developed the "No Salim Shopping List," while Myanmar activists relied on "Way Way Nay"—an app-based counter-map—to steer covert sanctions (Chan, 2024). Taken together, these trajectories exemplify the "rhizomatic" (Deleuze & Guattari, 1987) dynamics of Hong Kong's counter-data mapping campaign which has become a template for modular replication and local adaptation of political resistance through everyday data practices.

This article enriches our understanding of how counter-data mapping manifests a connective structure of self-mobilisation "by providing an infrastructure for bridging politics and everyday life" (Leach & Haunss, 2009, p. 275) amidst and despite unfavourable conditions. Developed in and across both physical and virtual spaces, Hong Kong's digital cartography offered flexible gateways for contentious political engagement and contributed to the achievements of the YEC. Moreover, it engendered new opportunities for grassroots collaboration and interaction, helping otherwise isolated individuals and groups converge and assert their political agency and movement identity. These actions, although individually modest, collectively contributed to the broader pro-democracy movement. Although they alone fell short of achieving structural social change, they made a significant impact on how people practised political resistance and upheld dissent in post-movement Hong Kong and beyond.

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Conflict of Interests

The author declares no conflict of interests.

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About the Author

Tin-Yuet Ting (PhD, University of Illinois Urbana-Champaign, USA) is associate professor of sociology in the Department of Applied Social Sciences at The Hong Kong Polytechnic University, Hong Kong SAR. His research lies at the intersections of mobile social media, data technology, platform creative economy, and techno-politics.