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Negotiating digital urban futures: The limits and possibilities of future-making in Singapore

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Abstract

This paper brings into dialogue recent critical scholarship on smart cities and geographies of the future by examining how city dwellers encounter normative visions of the future supplied by government actors under smart urbanisation. I focus specifically on the prosaic but significant ways in which people (re)interpret and (re)produce urban futures in and through their everyday affective and material engagements with digital technologies. Drawing on ethnographic fieldwork and semi-structured interviews, I discuss the extent to which state-promulgated imaginings of digital urban futures projected by electronic payment infrastructures are negotiated by urban inhabitants in Singapore, at both the levels of the individual and the collective. Although there is a tendency in Urban Studies to read the smart city as depoliticising, the findings in this paper suggest that urban dwellers' lived encounters with digital urban futures are characterised and bound up with politics. Furthermore, this paper casts attention on forms of negotiation that emerge not from grassroots movements and/or democratic activism that have so far attracted social and cultural geographers working on the future, but everyday lived practice around the digital. Such a fine-grained, practice-based approach productively foregrounds emancipatory potential for reworking and reimagining normative digital urban futures. Equally importantly, it takes seriously the diverse and uneven future-making capacities of urban inhabitants in the digitally mediated city, contributing to ongoing projects that seek to develop a globally oriented alternative smart urban agenda for cities and urban spaces in the 21st century.

KEYWORDS

electronic payments, everyday, future-making, negotiation, Singapore, smart urbanism

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1 | INTRODUCTION

The rise of the smart city as a development paradigm over the past two decades has intertwined visions of urban futurity with the digital more than ever before. Not merely is digital technology now widely regarded as a catalyst for realising more 'progressive' urban worlds, but it is also often seen as a definitive feature of future urban landscapes. This dominant view of the future, alongside the preponderance of digital technologies in urban governance, has offered urban elites and state authorities around the world a handy justification for introducing interventions and implementing policies around smart urbanism (Datta, 2015; Hollands, 2015). Correspondingly, work in urban and geographical scholarship has largely been about the prospect and ramifications of smart urbanisation for urban environments and their inhabitants (for recent papers in this journal, see Caprotti & Cowley, 2019; Datta, 2018; Faxon & Kintzi, 2022). As the latest iteration in the 'history of urban imaginaries' (Vanolo, 2014, p. 885), smart urbanism has been variously described as a technoutopia (Luque-Ayala et al., 2014), a 'normative aspiration for the urban future' (Kong & Woods, 2018, p. 681) and an 'important future-oriented concept, which has potential to integrate new technologies, social systems and ecological concerns' (Anttiroiko et al., 2014, p. 332). Critical scholars have also observed that narratives around smart urbanism tend to be 'rooted in seductive and normative visions of the future, where technology stands as the primary driver of change' (Luque-Ayala & Marvin, 2015, p. 2105).

Yet, despite a general recognition among urban scholars and geographers that smart urbanisation has deep implications for the future of cities and an ever-increasing body of academic research on its possible outcomes, there has been surprisingly little sustained critical work on how people on the ground encounter imaginings of the future in their everyday interactions with digital urban interventions. Indeed, much existing research on smart and digital urbanism has tended to concern how dominant institutions such as the state (Chang et al., 2021; Datta, 2015, 2018) and corporate organisations (Hollands, 2015; Sadowski, 2021; Wiig, 2015) prescribe imagined and possible futures for technocratic and neoliberal ends. These interventions are necessary and important in their own right but focusing solely on the role of urban elites in future-making exercises may reproduce a view of the future as teleological and monolithic, colonised and narrated by dominant institutions within society to serve their own interests (Datta, 2019). If urban and geographical scholarship is to develop an alternative account of smart urbanism that 'begin[s] with ordinary urban places, knowledges and needs' (McFarlane & Söderström, 2017, p. 313), then people's lived engagements with the future through their use of digital technologies and everyday experience of discourses surrounding sociotechnical transformations cannot remain implicit and marginal to its debates.

Against this wider context, this paper makes two interventions. First, it seeks to illuminate interpretations of the future by inhabitants in the digitally mediated city that are often drowned out by popular dominant normative imaginings of futurity. Such an approach will provide critical empirical resources to expand our imaginings of digital futures and how urban landscapes are understood beyond the reductionist tendencies of techno-utopian urban imaginaries (Bina et al., 2020). In doing so, I contribute to ongoing projects in Geography and Urban Studies to decolonise futures from hegemonic market-oriented and technocratic ways of knowing and governing urban lives and spaces that ostensibly perpetuate unsustainable patterns of uneven urban development (Lynch, 2020a; McFarlane & Söderström, 2017). Second, this paper aims to underscore how projected and imagined futures are engaged as part of urban inhabitants' everyday lives and cultural imaginaries. Adopting this account will bypass the unproductive 'weak and passive victim of technological change' thesis that is symptomatic of the current literature on smart cities in Geography and Urban Studies, which in some ways reproduces a top-down/bottom-up analytical frame that approaches digital urban futures as deeply depoliticising (see, for example, Cardullo & Kitchin, 2019a; Greenfield, 2013). Focusing on the relations between everyday agency and normative temporalities thus allows for a recuperation of the creative albeit uneven capacity of people on the ground to make and remake possible futures in and through their own ways, without necessarily downplaying the diversity of agencies and powers that surround such engagements (Rose, 2017).

In this paper, I take the E-Payments programme, one of the six strategic national projects of the Smart Nation initiative in Singapore, as a case study to evaluate the extent to which urban dwellers contribute to the shaping or steering of future pathways through and around smart urbanisation. Drawing on ethnographic fieldwork at a local hawker centre (an open-air public food court) marked by the intervention over a period of 8 months as well as in-depth semi-structured interviews with stall owners and customers, I show that the normative projection of the future by the state through the E-Payments programme in Singapore is not monolithic and fixed, and that people on the ground can complicate the realisation of possible digital urban futures through various acts of reworking, contestation, and participatory accommodation. This finding holds particular significance when considering the socio-political context of Singapore, a city-state where future-making has historically been and continues to be the prerogative of state actors

(see Oswin, 2019). More broadly, urban dwellers' lived encounters with futurity are political insofar as people negotiate, however seemingly insignificantly, the ways in which normative digital urban futures unfold in practice. Taking seriously urban dwellers' affective and material everyday interactions with digital technologies and the futures they project thus re-politicises existing smart-cities scholarship, building on recent work by feminist digital geographers that is concerned with the ways in which power and existing socio-spatial inequalities along lines of age, ability, and so on are (re)configured by and around digitality (Elwood & Leszczynski, 2018; Lynch, 2020b; Rose et al., 2021). In addition, this paper casts attention on forms of negotiation that are not typically examined by urban scholars as resistance or practices that emerge from grassroots movements which have so far attracted social and cultural geographers working on the future (see, for example, Cinnamon, 2020; Lynch, 2020a), but mundane, everyday lived practices around digital technologies. Such a fine-grained, grounded approach is helpful for enlarging emancipatory potential for reworking and reimagining normative digital urban futures, as well as foregrounding the diverse and uneven future-making capacities of urban inhabitants in the digitally mediated city.

In the next section, I review how the future has been mobilised in the smart-city literature by geographers and urban scholars. I suggest that insufficient attention has been paid to how urban dwellers negotiate digital urban futurity in their everyday lives. The third section describes the case study, situating it within the national smart urbanisation movement in Singapore, and outlines the methodology underpinning the paper. I then consider how alternative practices of future-making to authoritative narrations of digital urban futurity are problematised in Singapore, before drawing on the findings to explore how state-promulgated conceptions of the future through the E-Payments programme are negotiated by people through their everyday practices in the hawker space. This paper concludes by delineating the significance of studying everyday negotiations of digital urban futures for geographical research concerned with urban cultural politics and development.

2 | PROSPECTING THE FUTURE IN AND THROUGH THE SMART CITY

Contemporary discussions of the smart city have enlivened two longstanding tropes of urban futurity. On one hand, policymakers and city elites around the world have emphasised the potential of smart technologies to solve the pathologies of 21st century urbanisation, pledging visions of digital urban futurity that are ostensibly more efficient, productive, competitive, and sustainable. Imaginings of the future projected by smart-city proponents have therefore tended to be double-barrelled: not only do they frame smart urbanisation as the most ideal pathway, an 'obligatory passage point' (Söderström et al., 2014), through which better futures may be realised, but they also position smart cities as a telos, an 'authorised image of city success (so people can buy into it) which also establishes an end point of development for ambitious cities' (Robinson, 2002, p. 546). On the other hand, critical scholars concerned with the empirical realities of digital urban developments have argued that most smart-city programmes have intensified and extended the contemporary neoliberal economic agendas of cities (see, for example, Datta, 2015; Watson, 2014), rather than improving urban lives as guaranteed. This body of research challenges the universal promise of smart urbanism as a way to create better futures for urban dwellers and, correspondingly, introduces a rather different depiction of the future, one that portrays smart urbanisation as 'a kind of dystopian imposition of technological rationality onto cities' (Wiig & Wyly, 2016, p. 488). More broadly, whether framed as utopian or dystopian, what is clear in existing debates around smart urbanisation is the centrality of digital technologies to the governing and organising of everyday urban life in the present as well as into the future.

A prominent topic of inquiry in geographical scholarship has thus been around the conduct of sovereignty and power through everyday life and associated digitally mediated subjectivities in the aspirational smart city. Digital and urban geographers have explored the possible relationship between state power and everyday agency vis-à-vis smart urbanisation through the conceptual lens of citizenship. Much of this literature takes issue with the technocratic and top-down approaches to smart-city planning which, scholars argue, create 'passive' and 'subaltern' citizens (Cardullo & Kitchin, 2019a; Vanolo, 2016) and foreclose any 'real' democratic participation (Gabrys, 2014; Hollands, 2015; Joss et al., 2017). As corrective, these scholars have highlighted the need for 'active' smart citizens, people who engage in 'alternative' bottom-up smart-city design such as hackathons and citizen-science to resist top-down state power and algorithmic modes of urban governance (Cardullo & Kitchin, 2019b). More recent interventions have sought to respond to this need by detailing alternative modes of digital development in urban life that are not initiated by state, military, and/or corporate actors. Lynch (2020a), for instance, mobilises a grassroots movement towards 'technological sovereignty' in Barcelona as an example to highlight the possibilities offered by digital technologies in terms of forms of political organising and democratic decision-making as well as arrangements of

work, property, production, and consumption in urban life (see also Lynch, 2020b). Additionally, beyond outright refusal, scholars have begun to consider forms of engagements with mundane technologies that are not wholly antagonistic to state power (Michael, 2015; Nemer, 2022), highlighting accommodation as a disposition some people adopt in relation to digital innovation. As a whole, this body of scholarship troubles the depoliticising undertones of existing smart-city initiatives and argues for a more inclusive conception of participation and citizenship that accounts for the different and multiple practices city dwellers employ in their engagements with dominant visions of digital urban futures.

Given that smart cities are centrally oriented towards the future, it is surprising that there has hitherto been little serious reflection on the way futurity works in and through smart urbanisation. Other than a handful of notable exceptions, the future is often reduced to notions of false promise and invoked as a foil in different ways for examining the prospect of digital urban experiments but does not itself become the focus of critical attention. Kitchin's (2019) framework for unpacking the temporality of smart cities is particularly salient here. Not only are smart-city technologies reconstituting the space-times and spatiotemporal relations of cities, but they also, Kitchin (2019) argues, employ and reorganise the relationship between the past, the present, and the future. Following Adam and Grove (2007), Kitchin (2019, p. 782) further identifies two common ways in which the future is mobilised as a temporal modality in smart cities: (i) 'present future', which refers to use of present events to forecast into the future and (ii) 'future present', that is, working backwards from a desirable future. Indeed, smart cities are often shaped by the anticipatory logics of present future and future present supplied by corporate actors (Kinsley, 2010, 2011, 2012; White, 2016) and government/city officials (Datta, 2019; Leszczynski, 2016; Reid, 2022).

This paper contributes to recent efforts in Urban Studies and Geography to understand the relationship between futurity and smart urbanisation. I explore how imaginings of the future projected by smart-city programmes are experienced and negotiated by urban dwellers in their everyday lives and geographies, departing from most existing ruminations that are concerned with the anticipatory ways in which urban elites engage with digital urban futurity. To that end, I mobilise the terms 'futurity' and 'future-making' to connote future events and the ways in which urban dwellers prospect, prefigure, or shape the future respectively (Bunnell et al., 2018; Jeffrey & Dyson, 2021; MacLeavy et al., 2021) and situate this paper within recent work in social and cultural Geography on aspirational futures. For Bunnell et al. (2018), the concept of aspirations is useful insofar as it shifts the optic of analysis from technoscientific probability and expert calculation to the cultural frames and strategies people use in their everyday lives and spaces to imagine and prospect for possible futures. This concept is furthermore explicated through Appadurai's (2013) contention that aspirations are more than merely individual wants and desires but are embedded in wider systems of ideas about the good life, health, and happiness. Notably, this aspirational capacity is unevenly performed by different people in their everyday attempts to secure viable presents and prospect emergent possibilities, rather than an ability to articulate definitive blueprints or settled future plans. Focusing on aspirations will thus enable a nuanced evaluation of the interplay between human imagination and action as well as between discourses of digital urban futures and everyday future-making practices around digital technology.

In addition, I draw on Fredric Jameson's (2005) literary engagement with utopian thought to locate futurity's potential for difference. In his reading of the legacy of the Cold War, Jameson argues that while utopian thinking was initially associated with the Stalinist project of uniformity and conformity, it subsequently became adopted by an anti-authoritarian Left whose micro-politics embraced Difference as a slogan. And as the idea of utopia developed, the future came to be increasingly seen as a disruption of the present, bound up with imagining a new social order, one that seeks to move beyond the enslavement of money and capitalism. In this form, the future can be taken and thought of as a radical or systemic break from a predicted and colonised future that is merely a prolongation of the capitalist present (see also Gibson-Graham, 1996 for feminist work on post-capitalism). Imagining alternative futures has therefore always been a political act, but in the context of smart cities what we now conceive as the future seems, as many critics have warned, to be more aligned to that 'predicted and colonised future'; that is, an extension and deepening of the power of capitalism into everyday lives and spaces (Datta, 2015; Sadowski, 2021). Especially in Singapore, the socio-political context discussed in this paper, the kinds of future urban dwellers are exposed to today seem to have lost that political edge insofar as they are wrapped up in a post-political discourse of a 'better' future supplied by the state – a point to which I will return in the subsequent sections. In sum, I mobilise this specific reading of futurity alongside an everyday understanding of aspirations to open up a discussion around if, how, and to what extent state-promulgated conceptions of the future projected by smart urban interventions in Singapore are negotiated by urban dwellers in their everyday lives.

3 | CASE STUDY AND METHODS

While there is a genealogy of technologically enabled urban interventions in Singapore (Kong & Woods, 2018), the term ‘smart technology’ arguably only became common and deeply entwined with popular discourses of urban futurity following the launch of the Smart Nation initiative in 2014. A national digitalisation project led by the Singapore government, the Smart Nation initiative seeks to harness the promises of digital and smart technology not just in matters of national governance but also to shape the present and future conditions of urban life and living. This state-led vision of the future has since animated several smart-city experiments – all aiming to encourage the adoption of smart and digital technologies throughout the city-state, across almost every domain of urban life (see Yeo, 2023 for work on smart urban living). Against this backdrop and given that the city-state does not typically have much in the way of organised opposition to state visions, it seems as though the future of Singapore is decidedly digital – a popular narrative that doubles as a self-fulfilling prophecy, celebrating digitalisation as an ideal pathway of urban development for the city-state in the 21st century.

This paper takes the E-Payments programme as a case study to evaluate how urban dwellers appraise digital urban futures. The programme integrates legacy payments infrastructure, including some very early electronic payment modes (see Tan, 2022), with a national platform that operates across various digital payment systems so as to facilitate simple, swift, seamless, and secure digital financial transactions for citizens and businesses in Singapore. Some of its key initiatives so far include the introduction of Fast and Secure Transfers in 2014, which enables direct real-time interbank transfers; the launch of the PayNow fund transfer service in 2017, facilitating real-time peer-to-peer transfers with only a mobile or personal identification number; and the adoption of the Singapore Quick Response Code (SGQR) standard in 2018, which allows merchants to accept mobile payments from different service providers with just one QR code. The programme has been rolled out island-wide but specifically implemented as a ‘solution’ at several hawker centres, coffee shops, and canteens with the expressed aim of making transactions more convenient and efficient for people in these spaces. What that means, according to the official narrative, is that customers can just scan a QR code at the hawker stall, input the amount of their purchase on their application, make payment digitally, and a terminal at the stall will notify hawkers of the successful transaction by printing out a receipt, bypassing the presently time-consuming but social process of cash exchange between stall owners and their customers, supposedly allowing hawkers to be more efficient and make more transactions.

Furthermore, the projection of digital urban futures onto these foodscapes, particularly hawker centres, is interesting empirically for two reasons. First, these are vital everyday spaces of socialities for Singaporeans from various socio-economic backgrounds (Kong, 2007). For some hawker centres are a space of work and livelihood, for others a space of consumption, and for almost everyone a space of social interaction to varying degrees. Superimposing the E-Payments programme onto an everyday space will thus reconfigure urban life and practices around the digital as well as facilitate effective propagation of discourses of digital urban futurity via informal social interactions. Second, hawker centres are commonly seen as vestiges of the past, national emblems of heritage, and as one news article reports, the ‘last frontier’ of digitalisation (*The Straits Times*, 2014). In this vein, the E-Payments programme can be read as a disciplining strategy that the state uses to mould individual and collective Singaporean conduct to one ‘suitable’ for the digital economy in the 21st century (see Ho, 2017), as well as reorient a traditionally ‘backward’ landscape in Singapore towards the future. The E-Payments – specifically, the use of smart and digital technologies – is, in short, conceived by state authorities to have the potential to reshape how people interact with each other as well as with the hawker space, realising in the process the national aspiration for a more convenient and efficient future, starting from a ubiquitous everyday site/sight in Singapore.

The findings in this paper are based on ethnographic research conducted at a small-sized local hawker centre marked by the intervention over a period of 8 months, from July 2019 to February 2020 (before the WHO declared the COVID-19 pandemic), and 20 in-depth semi-structured interviews with individuals who either work at or frequently dine at the site. Research participants were identified and recruited through convenience sampling during my ethnographic observations. The extended period of fieldwork, coupled with my longstanding connection to the hawker centre as a customer, helped establish familiarity and trust with stall owners and other regular diners, which made participant recruitment fairly straightforward. Interviews offered a means for people to assess their engagements with digital urban futures in their (non-)use of electronic payments, whereas ethnography provided a way to observe practices of negotiation as and when they happen in space and across time (Yeo, 2022). The project received ethical approval from the National University of Singapore, and all participant data were anonymised.¹ In the next section, I draw on the findings to discuss the limits of future-making in Singapore. Establishing first the strictures around future-making will provide a better contextual frame for examining how urban dwellers negotiate smart urbanism, enlarging the inconspicuous and unremarkable everyday practices of future-making.

4 | THE LIMITS OF FUTURE-MAKING IN SINGAPORE'S SMART NATION

For many of the urban inhabitants I interviewed, future-making is perceived as a challenging, technical, and even esoteric process. When, for example, asked if futures other than smart urbanisation are possible, most interviewees tended to adopt a resigned viewpoint and were sceptical of other future possibilities:

I cannot really think of other alternatives at the moment. [...] We are already so far in this cycle that it is hard to stop and undo digitalisation. I think it is too late because it is going to take a huge mindset shift for Singaporeans to go back to this so-called 'non-digital way of life'.

(Paul, M/26)

I have not thought about this question before. I mean, if smart urbanisation is what the [Singapore] government has planned, then I believe that this plan will be good for the people. [...] I feel that the government has always taken care of its people and has not failed us thus far.

(Peishan, F/62)

Similar reflections were surprisingly common among interviewees despite differences in their lived experiences, and they point more broadly to the presence of structures that are defining urban dwellers' future-making practices (Appadurai, 2004; Simone, 2008). Importantly, these constraints, this paper suggests, are not a priori but geographically and historically specific, produced by an assemblage of powerful actors/actants. In the context of smart urbanisation in Singapore, I identified three 'barriers' to urban dwellers' capacity to imagine futures. I contend that these circumscriptions of urban inhabitants' capacity to aspire are as much geohistorical as they are political, technological, and sociocultural.

First, smart and digital technologies, which are central to contemporary imaginings of the future, often only provide a narrow range of pathways for urban inhabitants to undertake. Practices around electronic payments, for instance, can largely be distilled into a matter of use and non-use, foreclosing other ways of engagement in the process. Furthermore, the possibility of alternative future-making is impaired by the fact that these technologies are regarded by most urban inhabitants as 'too complex and sophisticated' to appropriate. Eugene (M/55), a stall owner, raised these issues when he was asked to reflect on the potential of future-making vis-à-vis the E-Payments programme:

Interviewer: Do you think alternatives to smart urbanisation are possible?

Eugene: What do you mean? Do we have alternatives? [Laughs] [...] We can only choose between accept and reject – there is no other choice, right? [...]

Interviewer: Why do you think that there is no other choice?

Eugene: Digital technology is the future. [...] What else can we do with these technologies? They – all these [Information Technology] stuff – are too difficult for the layperson to understand. And, if we already do not understand them, what can we do with them?

Subconsciously or otherwise, Eugene drew from a techno-deterministic view of the temporality of smart urbanisation in his responses; that is, urban technological change is 'inevitable' and 'there is no other way around it'. Causal power is in this view uncritically and asymmetrically attributed to smart urbanisation (see Bissell, 2018), rendering individuals such as Eugene seemingly powerless in the face of digital urban transformation. Often, this mindset is a result of an overwhelming focus on the predetermined outcomes of technological interventions instead of the emergent processes and practices that underpin smart urban experiments. While the former precludes other configurations of relation, the latter arguably provides more generative time-spaces for urban dwellers to negotiate technology. It is, nevertheless, this pervasive and hegemonic understanding of smart urbanisation and the limited technological pathways available that serve to restrict the imagining of alternative futures by people on the ground.

Second, apart from the fact that the success of past state-led efforts at writing the future has provided the legitimising resource for the emergence and enactment of digital urban futures in Singapore, it has also, as Peishan's account in this section's opening paragraph alludes to, diluted the need for urban dwellers to make futures. Notably, this view was not just endorsed by elderly individuals like Peishan. Kelvin (M/32) also finds it 'comfortable and natural' to follow the prescriptions of digital urban futures by the Singapore government. When probed further, he justified his point of view by mustering the selectively curated and popular success stories of urban development in Singapore:

I think that there is no need for alternatives. The Singapore government has done well in the past. They have led us from a 'third-world fishing village' to a 'first-world country', and I think that the Smart Nation initiative will also have the same, if not better, outcome. I believe in the foresight of our government to create a better future for Singaporeans, not least because they have done so in the past.

Kelvin's remark is underpinned by a simple faith in the Singapore state, specifically, in its track record of future-making and the political will to act on its aspirations. Like many other Singaporeans, it is precisely because of the paternalistic state, one that is largely seen and accepted by urban inhabitants as effective, and its 'achievements' in governance that Kelvin does not see the need for alternative visions of urban futurity and is willing to partly absolve to the state the responsibility of future-making. What may then result is a future-making deficit syndrome among urban dwellers in Singapore – a disposition that was already detectable in many of my interview respondents – especially since urban futures are planned by state authorities and past plans have been widely accepted as 'successful'. The succinct reply by Ming (M/26) to a question on future-making perhaps best demonstrates this deficiency:

No, I don't think I know, or, for that matter, need to know [how to think of alternatives]. [...] I guess I just don't see the need. Why do I need to think about this kind of things when it is usually taken care of by the government?

The political context which Kelvin, Ming, and many others find themselves in has thus in some ways suppressed the need for urban dwellers to engage with futures at a personal level. To be sure, the argument being made is not a call to invalidate or discredit the state's role in future-making, not least because, as many scholars have noted, the state is central to the realisation of progressive futures (Watson, 2014). Rather, the point here is to shore up how the socio-political structures of the nation-state – in this case, the paternalistic and interventionist approach of the Singapore state to futurity – can severely inhibit people's future-making desires and opportunities.

Third, to the extent that people in Singapore are engaging with futurity, it has tended to concern the preservation of traditions rather than the need for new, slick futures associated with smart urbanism. As an example, questions about the future of hawker culture in the face of fast-paced urban development in Singapore often emerged as an important topic in my interviews and ethnographic conversations. This issue was most obvious in a conversation with a group of stall owners regarding renovation works that were scheduled for the hawker centre:

When I joined them at the table, Uncle Choo and a few other stall owners were discussing the upcoming renovation works. [...] One of Uncle Choo's statements struck me while we talked: that being a hawker is laborious and a 'dying' trade, especially with the increasing rent and food prices, so even with all these renovations, he was not sure what good could come out of them.

(Field notes, 29/2/2020)

The fear that hawker traditions will soon die off as urban development marches ahead is similarly noted by Amy (F/37), whose parents are hawkers:

What is the use of upgrading and installing electronic payments in the hawker centre if there is no one to carry the torch? [...] My dad always laments that being a hawker is a dying tradition in Singapore. Young people do not want to pick it up because it is difficult, pays little, entails long hours, and is backbreaking!

Clearly, some urban dwellers like Amy and Choo are more concerned with the future of hawker culture, 'something more personal and immediate' to them, instead of abstract visions of digital urban futurity. More critically, these comments suggest that there are competing temporalities of futurity at play – for example, the long term versus the short term (Adam & Grove, 2007) – which could channel people's attention from considering alternatives to smart urbanisation to other more 'pressing and everyday' concerns around livelihood and the perishing hawker culture. In this way, it is not too difficult to see why some urban dwellers are seemingly not as active in their engagements with digital urban futurity and in fostering alternatives to those normative imaginings.

As a whole, these constraints serve as a timely reminder that future-making does not occur in a vacuum but is instead situated within wider prevailing political, sociocultural, and technological milieux (May & Thrift, 2003). Identifying how these parameters of future-making work is thus imperative because they allow us to appreciate the efforts urban

inhabitants need to put into negotiating and navigating hegemonic, normative state-programmed imaginings of digital urban futurity in Singapore.

5 | NEGOTIATING DIGITAL URBAN FUTURES

Despite the presence of effective strictures of future-making in Singapore outlined in the previous section, urban dwellers are still capable of negotiating digital urban futures. Here, everyday practice is an especially generative space in which people appropriate to imagine and make futures in praxis, as Bunnell et al. (2018) show in their ethnographic work on aspirations. These practices, although mundane and quotidian, constitute people's lived experience and, more significantly, hold the potential to give rise to new imaginings of the future as well as new relations with futurity. Focusing on everyday practices around futurity, I detail in this section two operative modes urban inhabitants in Singapore employ to negotiate digital urban futures: (i) tactics exercised by individuals and (ii) arrangements set up by a collective of stall owners.

5.1 | Future-making tactics of individuals

Negotiation of digital urban futures can occur at the level of the individual. Urban inhabitants do not passively accept normative imaginings of the future in their interactions with smart and digital technologies, but they can over time cultivate tactics to imagine and reimagine futures by working with and around those projected by smart urban interventions. I use the term 'tactics' to gesture towards the position that these practices emerge from – the weak and subaltern, as Eugene's account in the previous section indicates – as well as their deployment as interferences to normative authoritative imaginings of digital urban futurity (de Certeau, 1984). Based on my findings, I outline three tactics that individual Singaporeans use to negotiate digital urban futures.

One of the most extensively employed tactics by interviewees was postponement; that is, the act of delaying the adoption of electronic payments to 'sometime in the future'. For Vanessa (F/63), electronic payments are a 'supplement' to the already-existing payment methods available in hawker centres and more widely across Singapore. She thus does not 'see the immediate need to adopt them', although at the same time acknowledging the possibility that she 'might have to end up picking up electronic payments in the future', a prospect that became unavoidable during the COVID-19 pandemic (Das & Zhang, 2021):

I do not need them now although I know they are convenient and good. [...] Maybe I will install the application and use electronic payments in the future, say, two or three years later, but for now, I am comfortable with paying with cash since it is my habit to bring cash wherever I go.

Vanessa's take on the necessity of electronic payments and her decision to delay their adoption to a later time can partly be read as resistance to the state-led push for smart urbanisation. This 'resistance', however, is not one of outright renouncement of digital urban futures per se since she is aware and buys into the promises of smart urbanism, but rather of non-compliance and of buying time before the eventual transition (see Hughes, 2020). While not everyone is in the position to delay the adoption of electronic payments, Vanessa's employment of postponement has conferred her with some extent of agency to decide and shape how her futures will unfold instead of succumbing blindly to the pressure of technological change and the fatalistic rhetoric of inevitability. Concomitantly, dominant normative visions of digital urban futures are also stymied by these delay tactics since they encumber the effective and timely realisation of those imaginings in spaces of intervention.

Just as it is possible for individuals to contest the crystallisation of digital urban futures through postponement, so too can urban dwellers more directly reject these future-oriented imaginings. Mike (M/63), a stall owner, shared that he deliberately chose not to participate in the programme and adopt the electronic payments system at his stall simply because he does not believe in it. Instead of the futures outlined by the E-Payments programme, which Mike identifies as 'dehumanising' and 'anti-social', he promotes an alternative view of the future around notions of 'trust', 'friendship', and 'goodwill'. For Mike, that is because cash exchange is experienced as a highly social process, infused with the material traces of his relationships with others (see Maurer, 2015), providing an opportunity for him to connect and communicate with his customers that will not be possible with electronic payments. Putting his philosophy into practice, he offers his customers the option to 'pay another day' if they do not have enough money with them:

I do not think e-payments are good. [...] If [the customers] do not have enough money for payment, I will tell them to pay another day. But if they do not return to pay, I really don't mind. It is not like I will lose out much from it. I will just take it as a goodwill gesture for someone in need. [...] I think [the society needs] to develop on this aspect. Everything these days revolves around technology and money! We definitely need to focus on caring for one another more like how we did in the past.

Mike's comment shows that it is possible to imagine an alternative to the normative vision of the future organised around the ideals of efficiency and competition projected by Singapore's Smart Nation initiative. In his opinion, the future 'should not be dictated by the offerings of digital technological interventions' but should be organised around 'conviviality and mutual care'. More critically, the alternative imagining of the future depicted here is informed by his experiences and memories of the past, of a society (selectively) remembered for its collectivism and neighbourliness. In this sense, the past is more than a resource for future-making by dominant institutions (see, for example, Datta, 2019; Lagerkvist, 2010) but can likewise be recruited by urban dwellers to imagine alternative and more desirable futures (Bunnell, 2022; Jeffrey & Dyson, 2021).

Besides the critical modalities of postponement and rejection, people can also work with smart urbanisation as a springboard to make futures, and a popular way of doing so among my interview participants was through the notion of learning. This group of individuals sees smart urbanisation as a learning opportunity to equip themselves with the necessary digital skills to 'survive in the future', internalising the narrative delineated by state officials. This sentiment was most forcefully expressed by Nigel (M/57). He argued that it is critical for people like him, 'of his age and education background', to 'upgrade themselves' by learning how to use technology, including electronic payments:

If you do not know [how to use electronic payments], you have to learn! I am trying to learn as much as I can from my kids too. [...] The world is evolving very fast, and if you do not want to fall behind, you have to learn. If not, you will not be able to fit into the society in the future. For people like me, we have to learn if we want to look for jobs in the future and, not to mention, stay socially connected to the younger generation.

Nigel recognises the importance of keeping up with technological change, and he does so by investing time and effort to learn how to operate digital and smart technologies. For him, learning how to use electronic payments, as with other digital technologies, is a tactic used not merely to establish a sense of security for his economic futures vis-à-vis his lack of formal education but also to assail his social and ageing worries, of being 'excluded' in the future. Nigel's attitudes and actions can thus be interpreted as a way of accommodating the promises of state-led smart urbanisation to forge more desirable futures for himself. Despite the existence of challenges in digital access and competency, particularly among vulnerable groups such as low-income households and elderly people in Singapore (Ng et al., 2023), it remains possible for seniors like Nigel to utilise learning as a negotiation tactic to equip themselves with the knowledge and skills necessary to write their own futures in relation to broader national development objectives.

These three accounts suggest that individual Singaporeans can rework normative digital urban futures projected by the E-Payments programme in and through their own ways. In this sense, the findings in this paper echo Perng's (2019) observation that technocratic and neoliberal digital urban futures can be disturbed in practice by urban inhabitants. Yet, this paper also shows that not all negotiation tactics are framed in entirely oppositional terms to state-led normative imaginings of digital urban futurity. As the case of Nigel demonstrates, digital urban futures can be appropriated by individuals as a starting point to work out 'better' futures for themselves. Regardless which tactic is deployed, or whether a combination is used, these practices empower individuals to imagine and make their own futures within the bounds of the prevailing power structures.

5.2 | Engagements with futurity through collective formations

Apart from tactics individuals deploy to work around digital urban futures, urban dwellers can also collectively engage with these imaginings. As Tan and Bunnell (2020) illustrate in their ethnographic work on street performers in Taipei, urban inhabitants collaborate to navigate around the wider environments of opportunity and constraint, challenging the stereotypical individualistic characterisation of cultural workers on the one hand, and exceeding conventional neoliberal logics of inter-city competitiveness on the other hand. This observation is similarly valid for hawkers in Singapore, who form groups to navigate the prospect of digital urban futures. I use the term 'formations' here to signal the emergence and temporariness of these groupings, rather than an involvement of contractual relations or permanence that words like

'partnership' or 'alliance' connote. Specifically, there are two ways in which these collective formations are operationalised by stall owners to negotiate imaginings of the future projected by the E-Payments programme.

First, stall owners can group together to tackle the prospect of smart urbanisation. At my field site, there was already a committee formed voluntarily by a small group of stall owners to represent the interests of the hawker community. This committee, acting on behalf of other hawkers, primarily serves to negotiate with authorities on issues concerning maintenance, upgrading, and renovation works, and development projects including the smart urbanisation of hawker centres. Jake (M/62), a stall owner and a member of the committee, disclosed that before the E-Payments programme was officially introduced in the hawker centre, there were several rounds of dialogue with government officials to assess the costs and benefits of the project. He further shared that in these discussions the committee members have the platform to present their opinions and communicate the concerns of the other stall owners:

Before [the E-Payments programme] was introduced, we had several meetings with the relevant authorities to discuss, for example, how the programme should be introduced, if incentives are to be given, how to encourage hawkers to participate and so on. [...] We were given the power to decide whether the hawker centre will go ahead and adopt this system. And after consulting other stall owners, we decided to go ahead because there seemed to be more positives than negatives.

What is clear from Jake's reflection is the fact that stall owners, at least some of them, had the opportunity to influence how the programme and, more broadly, the futures associated with it will eventually be implemented. The discussions provided a time-space for urban dwellers to negotiate these state-promulgated futures and contribute to shaping them to align better with the group's desired vision of the future, for example, by requesting for more incentives. Conversely, what might also be true from this account is the possibility of co-optation, where ideas from stall owners shared in these platforms are co-opted by state officials and incorporated into their programme to encourage better rate of uptake. In any case, the hawker centre committee, and these platforms to negotiate with state officials, provides a valuable opportunity for urban dwellers in Singapore to directly contend state-enacted digital urban futures and shape them in more desirable ways.

Second, after the decision was made to introduce electronic payments at the hawker centre, all participating stalls were invited to attend a workshop to learn how to operate the system. Some stall owners shared that they felt the workshop, and learning how to use digital technologies, would pose a problem if they were to attend it individually, partly because of their age and education backgrounds. In this context, several of the stall owners banded together to form groups, comprising of a mix of technophobes and technophiles, of younger stall owners and older vendors, to attend the workshop and learn about the E-Payments programme and visions of digital urban futurity that the programme entails. Michelle (F/58), a stall owner, is one who attended the workshop with other hawkers. She narrated this experience as 'heart-warming' and 'memorable':

We seldom have the opportunity to learn from one another because we are always so busy at our own stalls. So, participating in the workshop together was especially meaningful to me. [...] Having younger hawkers attending the workshop together also really helped me to learn how to use electronic payments and how to track my income with the application. When I have questions, I can ask them. If not for them, I would not have learnt it well and would still be clueless about how to operate it.

Being part of a collective thus helped Michelle to overcome the initial perceived difficulty of using electronic payments, especially since she could 'ask younger hawkers for help' in the workshop, which would not have been the case if she attended the workshop on her own. More significantly, the temporary grouping generated the space for individuals who otherwise are unable to negotiate digital urban futures because of their subject position to do so by drawing on the knowledge and strength of others – and herein lies the potential of a collective. Of course, the point here is not to romanticise the notion of the community, since lines of power still clearly exist between stall owners (e.g., more experienced hawkers and newer hawkers), but rather to highlight the enhanced potential of a group of individuals to negotiate normative futures. Indeed, for Michelle, attending the workshop together with fellow stall owners facilitated her learning process and, in turn, equipped her with the knowledge and enhanced her capacity to make futures in the face of smart urbanisation.

Understanding how individual stall owners group together to negotiate digital urban futures thus complements accounts of tactics individuals employ in future-making. These collective formations, both the hawker centre committee and the act of learning together, empower people with the capacity to negotiate the prospect and process of smart urbanisation, even if they mean most people are following a few leaders. And, sometimes, it might be better to negotiate

normative futures and dominant structures of power as a group, rather than as individuals, since there is critical mass for power to accrue among urban dwellers in the collective.

6 | CONCLUSIONS

Normative visions of the future delineated by urban elites through smart-city programmes are never absolute but subject to constant negotiation by urban dwellers as they materialise in practice and are encountered in everyday life. This paper has shown that interacting with discourses of smart urbanisation as well as their associated materialities (i.e., digital infrastructures, devices, platforms, and so on) in everyday life can enable urban dwellers to develop practices to work around, through, and with digital urban futurity in both individual and collective capacities. In the context of the E-Payments programme in Singapore, against a seemingly abstruse digital technology like the electronic payments system, urban dwellers have employed future-making practices that range from postponement and rejection to accommodation to negotiation and arbitration and to cooperation. These everyday practices of future-making may at first glance seem to romanticise individual agency, but they have to be read and appreciated in relation to the existing structures of power limiting urban inhabitants' capacity to aspire. In contemporary Singapore, many continue to find future-making a difficult and esoteric process, especially when digital urban futures are currently hegemonic in the public imagination. Moreover, the sociocultural and political environments within which Singaporeans are found tend to foreclose the possibility for imagining (alternative) futures.

Still, despite the Singapore state commonly being seen to have a monopoly on futurity and its dominance in the projection of normative futures, urban inhabitants are able to participate in future-making on their own terms, through and around smart urbanisation. Furthermore, the fact that most of my participants had difficulty expressing alternative visions of the future but enact them nevertheless points to a schism between how people think about the prospect of future-making in Singapore and the way they actually engage with it in their lives. As this paper has suggested, that is because some urban dwellers do not see themselves as political actors or their actions as political, whereas for others there is culturally a lack of meaningful engagement with political processes. Focusing on small, seemingly insignificant everyday practices around future-making, even if they are not explicitly articulated as political, then, becomes particularly productive to unpacking the nature of politics in a socio-political context like Singapore where visions of the future are programmed by state authorities. While alternative interpretations of the future enacted by urban dwellers may not be able to replace dominant visions of digital urban futurity, at least not in the short term, such politics calls attention to everyday agency in shaping urban futurity by multiplying ways of engaging with digital technologies and their discourses. Taken together, the findings in this paper destabilise the notion that (urban) futures are entirely pre-determined and instead illuminate their openness and indeterminacy (Adam & Grove, 2007), opening up the possibility for the making and imagining of more desirable futures.

At the same time, it is important to note that the findings in this paper were collected before the COVID-19 pandemic, which in many ways has accelerated digitalisation efforts around the world, including in Singapore (Das & Zhang, 2021). The COVID-19 moment, as a potential rupture in temporality, necessitates further reflection as the national narrative of digital transformation and people's engagements were being reconfigured by more-than-human forces, beyond human control. While certain digital technologies and services were already starting to gain popularity among urban dwellers (e.g., delivery platforms) before the COVID-19 pandemic, they became more widely adopted as the pandemic pushed a larger segment of the population, including people who were previously reluctant, into digital worlds, for example, by mandating the use of biometric technologies to track the movement of people into certain public spaces or risk being excluded. In this regard, the empirical materials in this paper can potentially offer comparative resources for urban scholars and geographers interested in spatiotemporal implications of COVID-19 in digitally mediated cities.

More broadly, focusing on how city dwellers engage with normative visions of the future supplied by government and corporate actors under smart urbanisation contributes to urban and geographical scholarship on smart urbanism in two important ways. On one level, I show that there are forms of participation in the smart city other than those defined in terms of grassroots movement, rights-based, and/or democratic activism with which urban scholars have hitherto been preoccupied (Cardullo & Kitchin, 2019b; Lynch, 2020a; Vanolo, 2016) that are equally important, arguably more prevalent, but often neglected. Without close attention, the everyday future-making practices this paper discussed would appear to be what the scholarship on smart citizenship terms 'non-participation' and 'consumerism', both commonly diagnosed as not needing much 'active' citizen labour. Yet, as the paper highlights, urban dwellers participate in the imagining and making of futures around smart urbanisation in their everyday lives and

lived engagements with digital technologies on their own terms, in ways that are not reducible to outright resistance, empathy, or what Johnson et al. (2020) call a 'transactional' form of participation on one level, and trouble models of smart citizenship based around republican ideals (see Hollands, 2008; Vanolo, 2016) on another level. In other words, giving due consideration to everyday practices and engagements with digital urban futurity as political events can foster a more inclusive understanding of citizenship and participation in the smart city (Elwood & Leszczynski, 2018; Shelton & Lodato, 2019). On another level, I detail alternative conceptions of the future by urban dwellers that do not conform neatly to the rhetoric of the smart city. Such work is imperative if we are to develop an 'alternative vision that is more open to the assemblages of individuals and temporalities currently being paved over by the smart city' (Olmstead, 2021, p. 245). This paper thus challenges how knowledge about the future city is currently produced in the scholarship by focusing on interpretations of digital urban futurity by people on the ground, multiplying our readings of the future (Bina et al., 2020) and contributing to, what McFarlane and Söderström (2017) urge, the development of a globally oriented alternative smart urban agenda.

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DATA AVAILABILITY STATEMENT

Research data are not shared.

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ENDNOTE

¹ Basic information about interview participants is provided in the following manner: Pseudonym, Gender/Age.

REFERENCES

- Adam, B. & Grove, C. (2007) *Future matters: Action, knowledge, ethics*. Leiden, The Netherlands; Boston, MA: Brill.
- Anttiroiko, A., Valkama, P. & Bailey, S.J. (2014) Smart cities in the new service economy: Building platforms for smart services. *AI & Society*, 29(3), 323–334. Available from: <https://doi.org/10.1007/s00146-013-0464-0>
- Appadurai, A. (2004) The capacity to aspire: Culture and the terms of recognition. In: Rao, V. & Walton, M. (Eds.) *Culture and public action*. Stanford, CA: Stanford University Press, pp. 59–84.
- Appadurai, A. (2013) *The future as cultural fact: Essays on the global condition*. London, UK: Verso.
- Bina, O., Inch, A. & Pereira, L. (2020) Beyond techno-utopia and its discontents: On the role of utopianism and speculative fiction in shaping alternatives to the smart city imaginary. *Futures*, 115, 102475. Available from: <https://doi.org/10.1016/j.futures.2019.102475>
- Bissell, D. (2018) Automation interrupted: How autonomous vehicle accidents transform the material politics of automation. *Political Geography*, 65, 57–66. Available from: <https://doi.org/10.1016/j.polgeo.2018.05.003>
- Bunnell, T. (2022) Where is the future? Geography, expectation and experience across three decades of Malaysia's vision 2020. *International Journal of Urban and Regional Research*, 46, 885–895. Available from: <https://doi.org/10.1111/1468-2427.13105>
- Bunnell, T., Gillen, J. & Ho, E.L.E. (2018) The prospect of elsewhere: Engaging the future through aspirations in Asia. *Annals of the American Association of Geographers*, 108(1), 35–51. Available from: <https://doi.org/10.1080/24694452.2017.1336424>
- Caprotti, F. & Cowley, R. (2019) Varieties of smart urbanism in the UK: Discursive logics, the state and local urban context. *Transactions of the Institute of British Geographers*, 44(3), 587–601. Available from: <https://doi.org/10.1111/tran.12284>
- Cardullo, P. & Kitchin, R. (2019a) Being a 'citizen' in the smart city: Up and down the scaffold of smart citizen participation in Dublin, Ireland. *GeoJournal*, 84(1), 1–13. Available from: <https://doi.org/10.1007/s10708-018-9845-8>
- Cardullo, P. & Kitchin, R. (2019b) Smart urbanism and smart citizenship: The neoliberal logic of 'citizen-focused' smart cities in Europe. *Environment and Planning C: Politics and Space*, 37(5), 813–830. Available from: <https://doi.org/10.1177/0263774X18806508>
- Chang, I.C.C., Jou, S.C. & Chung, M.K. (2021) Provincialising smart urbanism in Taipei: The smart city as a strategy for urban regime transition. *Urban Studies*, 58(3), 559–580. Available from: <https://doi.org/10.1177/0042098020947908>
- Cinnamon, J. (2020) Attack the data: Agency, power, and technopolitics in south African data activism. *Annals of the American Association of Geographers*, 110(3), 623–639. Available from: <https://doi.org/10.1080/24694452.2019.1644991>
- Das, D. & Zhang, J.J. (2021) Pandemic in a smart city: Singapore's COVID-19 management through technology & society. *Urban Geography*, 42(3), 408–416. Available from: <https://doi.org/10.1080/02723638.2020.1807168>
- Datta, A. (2015) New urban utopias of postcolonial India: "Entrepreneurial urbanisation" in Dholera smart city, Gujarat. *Dialogues in Human Geography*, 5(1), 3–22. Available from: <https://doi.org/10.1177/2043820614565748>

- Datta, A. (2018) The digital turn in postcolonial urbanism: Smart citizenship in the making of India's 100 smart cities. *Transactions of the Institute of British Geographers*, 43(4), 405–419. Available from: <https://doi.org/10.1111/tran.12225>
- Datta, A. (2019) Postcolonial urban futures: Imagining and governing India's smart urban age. *Environment and Planning D: Society and Space*, 37(3), 393–410. Available from: <https://doi.org/10.1177/0263775818800721>
- de Certeau, M. (1984) *The practice of everyday life*. (Translated by S. Rendall). Berkeley, CA: University of California Press.
- Elwood, S. & Leszczynski, A. (2018) Feminist digital geographies. *Gender, Place and Culture*, 25(5), 629–644. Available from: <https://doi.org/10.1080/0966369X.2018.1465396>
- Faxon, H.O. & Kintzi, K. (2022) Critical geographies of smart development. *Transactions of the Institute of British Geographers*, 47(4), 898–911. Available from: <https://doi.org/10.1111/tran.12560>
- Gabrys, J. (2014) Programming environments: Environmentality and citizen sensing in the smart city. *Environment and Planning D: Society and Space*, 32(1), 30–48. Available from: <https://doi.org/10.1068/d16812>
- Gibson-Graham, J.K. (1996) *The end of capitalism (as we knew it): A feminist critique of political economy*. Cambridge, MA: Blackwell Publishers.
- Greenfield, A. (2013) *Against the smart city (the city is here for you to use)*. New York, NY: Do Projects.
- Ho, E. (2017) Smart subjects for a smart nation? Governing (smart)mentalities in Singapore. *Urban Studies*, 54(13), 3101–3118. Available from: <https://doi.org/10.1177/0042098016664305>
- Hollands, R.G. (2008) Will the real smart city please stand up? Intelligent, progressive or entrepreneurial? *City*, 12(3), 303–320. Available from: <https://doi.org/10.1080/13604810802479126>
- Hollands, R.G. (2015) Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society*, 8(1), 61–77. Available from: <https://doi.org/10.1093/cjres/rsu011>
- Hughes, S.M. (2020) On resistance in human geography. *Progress in Human Geography*, 44(6), 1141–1160. Available from: <https://doi.org/10.1177/0309132519879490>
- Jameson, F. (2005) *Archaeologies of the future: The desire called utopia and other science fictions*. New York, NY: Verso.
- Jeffrey, C. & Dyson, J. (2021) Geographies of the future: Prefigurative politics. *Progress in Human Geography*, 45(4), 641–658. Available from: <https://doi.org/10.1177/0309132520926569>
- Johnson, P.A., Robinson, P.J. & Philpot, S. (2020) Type, tweet, tap, and pass: How smart city technology is creating a transactional citizen. *Government Information Quarterly*, 37(1), 101414. Available from: <https://doi.org/10.1016/j.giq.2019.101414>
- Joss, S., Cook, M. & Dayot, Y. (2017) Smart cities: Towards a new citizenship regime? A discourse analysis of the British smart city standard. *Journal of Urban Technology*, 24(4), 29–49. Available from: <https://doi.org/10.1080/10630732.2017.1336027>
- Kinsley, S. (2010) Representing 'things to come': Feeling the visions of future technologies. *Environment and Planning A: Economy and Space*, 42(11), 2771–2790. Available from: <https://doi.org/10.1068/a42371>
- Kinsley, S. (2011) Anticipating ubiquitous computing: Logics to forecast technological futures. *Geoforum*, 42(2), 231–240. Available from: <https://doi.org/10.1016/j.geoforum.2010.12.005>
- Kinsley, S. (2012) Futures in the making: Practices to anticipate 'ubiquitous computing'. *Environment and Planning A: Economy and Space*, 44(7), 1554–1569. Available from: <https://doi.org/10.1068/a45168>
- Kitchin, R. (2019) The timescape of smart cities. *Annals of the American Association of Geographers*, 109(3), 775–790. Available from: <https://doi.org/10.1080/24694452.2018.1497475>
- Kong, L. (2007) *Singapore hawker centres: People, places, food*. Singapore: National Environment Agency.
- Kong, L. & Woods, O. (2018) The ideological alignment of smart urbanism in Singapore: Critical reflections on a political paradox. *Urban Studies*, 55(4), 679–701. Available from: <https://doi.org/10.1177/0042098017746528>
- Lagerkvist, A. (2010) The future is here: Media, memory, and futurity in Shanghai. *Space and Culture*, 13(3), 220–238. Available from: <https://doi.org/10.1177/1206331210365247>
- Leszczynski, A. (2016) Speculative futures: Cities, data, and governance beyond smart urbanism. *Environment and Planning A: Economy and Space*, 48(9), 1691–1708. Available from: <https://doi.org/10.1177/0308518X16651445>
- Luque-Ayala, A. & Marvin, S. (2015) Developing a critical understanding of smart urbanism? *Urban Studies*, 52(12), 2105–2116. Available from: <https://doi.org/10.1177/0042098015577319>
- Luque-Ayala, A., McFarlane, C. & Marvin, S. (2014) Smart urbanism: Cities, grids and alternatives? In: Hodson, M. & Marvin, S. (Eds.) *After sustainable cities?* London, UK: Routledge, pp. 74–90.
- Lynch, C. (2020a) Contesting digital futures: Urban politics, alternative economies, and the movement for technological sovereignty in Barcelona. *Antipode*, 52(3), 660–680. Available from: <https://doi.org/10.1111/anti.12522>
- Lynch, C. (2020b) Unruly digital subjects: Social entanglements, identity, and the politics of technological expertise. *Digital Geography and Society*, 1, 100001. Available from: <https://doi.org/10.1016/j.diggeo.2020.100001>
- MacLeavy, J., Fannin, M. & Lerner, W. (2021) Feminism and futurity: Geographies of resistance, resilience and reworking. *Progress in Human Geography*, 45(6), 1558–1579. Available from: <https://doi.org/10.1177/03091325211003327>
- Maurer, B. (2015) *How would you like to pay? How technology is changing the future of money*. Durham, NC: Duke University Press.
- May, J. & Thrift, N. (2003) *Timespace: Geographies of temporalities*. London, UK: Routledge.
- McFarlane, C. & Söderström, O. (2017) On alternative smart cities: From a technology-intensive to a knowledge-intensive smart urbanism. *City*, 21(3–4), 312–328. Available from: <https://doi.org/10.1080/13604813.2017.1327166>
- Michael, M. (2015) Engaging the mundane: Complexity and speculation in everyday technoscience. In: Chilvers, J. & Kearnes, M. (Eds.) *Remaking participation: Science, environment and emergent publics*. London, UK: Routledge, pp. 81–98.

- Nemer, D. (2022) *Technology of the oppressed: Inequity and the digital mundane in favelas of Brazil*. Cambridge, MA: MIT Press.
- Ng, I.Y.H., Lim, S.S. & Pang, N. (2023) Making universal digital access universal: Lessons from COVID-19 in Singapore. *Universal Access in the Information Society*, 22(3), 1073–1803. Available from: <https://doi.org/10.1007/s10209-022-00877-9>
- Olmstead, N.A. (2021) Data and temporality in the spectral city. *Philosophy & Technology*, 34, 243–263. Available from: <https://doi.org/10.1007/s13347-019-00381-8>
- Oswin, N. (2019) *Global city futures: Desire and development in Singapore*. Athens, GA: The University of Georgia Press.
- Perng, S.Y. (2019) Anticipating digital futures: Ruins, entanglements and the possibilities of shared technology making. *Mobilities*, 14(3), 418–434. Available from: <https://doi.org/10.1080/17450101.2019.1594867>
- Reid, L. (2022) Anticipating technology-enabled care at home. *Transactions of the Institute of British Geographers*, 47(1), 108–122. Available from: <https://doi.org/10.1111/tran.12476>
- Robinson, J. (2002) Global and world cities: A view from off the map. *International Journal of Urban and Regional Research*, 26(3), 531–554. Available from: <https://doi.org/10.1111/1468-2427.00397>
- Rose, G. (2017) Posthuman agency in the digitally mediated city: Exteriorisation, individuation, reinvention. *Annals of the American Association of Geographers*, 107(4), 779–793. Available from: <https://doi.org/10.1080/24694452.2016.1270195>
- Rose, G., Raghuram, R., Watson, S. & Wigley, E. (2021) Platform urbanism, smartphone applications and valuing data in a smart city. *Transactions of the Institute of British Geographers*, 46(1), 59–72. Available from: <https://doi.org/10.1111/tran.12400>
- Sadowski, J. (2021) Who owns the future city? Phases of technological urbanism and shifts in sovereignty. *Urban Studies*, 58(8), 1732–1744. Available from: <https://doi.org/10.1177/0042098020913427>
- Shelton, T. & Lodato, T. (2019) Actually existing smart citizens: Expertise and (non)participation in the making of the smart city. *City*, 23(1), 35–52. Available from: <https://doi.org/10.1080/13604813.2019.1575115>
- Simone, A.M. (2008) The politics of the possible: Making urban life in Phnom Penh. *Singapore Journal of Tropical Geography*, 29(4), 395–418. Available from: <https://doi.org/10.1111/j.1467-9493.2008.00328.x>
- Söderström, O., Paasche, T. & Klauser, F. (2014) Smart cities as corporate storytelling. *City*, 18(3), 307–320. Available from: <https://doi.org/10.1080/13604813.2014.906716>
- Tan, G.K.S. (2022) Citizens go digital: A discursive examination of digital payments in Singapore's smart nation project. *Urban Studies*, 59(12), 2582–2598. Available from: <https://doi.org/10.1177/00420980211039407>
- Tan, X.W.A. & Bunnell, T. (2020) Extending aspirations: Taipei street performers and collaborative possibility. *Transactions of the Institute of British Geographers*, 45(2), 299–312. Available from: <https://doi.org/10.1111/tran.12344>
- The Straits Times. (2014) *Hawker centres to offer contactless, cashless FlashPay system soon*. Available from: <https://www.straitstimes.com/singapore/hawker-centres-to-offer-contactless-cashless-flashpay-system-soon> [Accessed 25 October 2022].
- Vanolo, A. (2014) Smartmentality: The smart city as disciplinary strategy. *Urban Studies*, 51(5), 883–898. Available from: <https://doi.org/10.1177/0042098013494427>
- Vanolo, A. (2016) Is there anybody out there? The place and role of citizens in tomorrow's smart cities. *Futures*, 82, 26–36. Available from: <https://doi.org/10.1016/j.futures.2016.05.010>
- Watson, V. (2014) African urban fantasies: Dreams or nightmares? *Environment and Urbanisation*, 26(1), 215–231. Available from: <https://doi.org/10.1177/0956247813513705>
- White, J.M. (2016) Anticipatory logics of the smart city's global imaginary. *Urban Geography*, 37(4), 572–589. Available from: <https://doi.org/10.1080/02723638.2016.1139879>
- Wiig, A. (2015) IBM's smart city as techno-utopian policy mobility. *City*, 19((2–3)), 258–273. Available from: <https://doi.org/10.1080/13604813.2015.1016275>
- Wiig, A. & Wyly, E. (2016) Introduction: Thinking through the politics of the smart city. *Urban Geography*, 37(4), 485–493. Available from: <https://doi.org/10.1080/02723638.2016.1178479>
- Yeo, S.J.I. (2022) Prospecting digital urban futures in practice. *Area*. Available from: <https://doi.org/10.1111/area.12853>
- Yeo, S.J.I. (2023) Smart urban living in Singapore? Thinking through everyday geographies. *Urban Geography*, 44(4), 687–706. Available from: <https://doi.org/10.1080/02723638.2021.2016258>

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