Glitch epistemologies for computational cities

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Abstract
This intervention advances glitches as epistemological vectors for apprehending and engaging the significance of digitally-mediated spatialities that appear nonperformative against normative scripts of urban computational paradigms. Drawing on two strands of contemporary thinking about glitches as systemic design features of digital systems and as generative fissures within them, we mobilize a queer orientation that stays with the generative tensions of urban spatialities that present as idiosyncratic and as interrupting. We mobilize this epistemological approach through illustrative U.S. based examples of seemingly abandoned shared e-bikes, performatively ‘ugly’ homes, and wilful property dilapidation wrought through the registers of desire and aesthetics. In so doing, we show how glitch epistemologies render visible how the technocapitalist manufacturing of normative spatial desires for particular kinds of urban sociospatialities and aesthetic visual signatures are both secured and interrupted on digitally-mediated and -mediatized terrains. Glitch epistemologies establish the significance of small-scale disorientations in digital urban mediations, engaging these nonperformativities and non-computes as unexceptional openings onto everyday possibilities for politics in computational cities.

Keywords
Aesthetics, computational cities, desire, glitch, queer theory

Introduction
Over the last decade, bikesharing systems have rapidly expanded across cities worldwide. While they have their antecedents in the 1960s (DeMaio, 2009), contemporary urban bikesharing systems are almost ubiquitously digitally mediated, relying on digital interfaces to unlock a bike, initiate and/or terminate a ride, and complete payment. These systems represent an instance of the broader platformization of mobility by which everyday practices of getting around cities are being progressively datafied and, in the process, transformed into for-profit services brokered by a digital intermediary that promises to optimize city travel through the rationalized delivery of urban services (Stehlin et al., 2020). The platformization of mobility via
bikesharing constitutes but one component of what Shannon Mattern (2017, 2021) has termed the ‘computational city’: an urban paradigm centred on urban governance through data-driven and algorithmic processes.

Yet the roll-out of bikesharing has not always proven to be optimal or rational. In cities from Beijing to Seattle, there are reports of a global oversupply of shared bikes (Harris, 2018; Taylor, 2018); of large proportions of shared e-bikes being inoperable due to broken parts and drained batteries (Lindblom, 2019); and of damaged and vandalized bikes piling up on city streets and in urban waterways (e.g. Harris, 2018). These apparent failures of mobility platformization have spurred a series of reactionary discourses that attribute these inefficiencies and excesses to systemic urban inequalities, namely housing and homelessness. Local media coverage in Los Angeles has decried widespread stripping and repainting of the city’s distinctive yellow bikes, blaming this on underhoused people in deeply stigmatizing terms, writing that the bikes were ‘treated like a piece of trash on the street’ only to end up ‘in homeless encampments around town’ (Goldstein, 2019: n.p.). Similarly alarmist coverage about how shared bikes ‘turn up stolen and vandalized’ in Seattle features commentary from a local executive commenting on the bikeshare vehicles piling up in the parking lot behind his business being disassembled and salvaged for parts used to cobble together rideable ‘frankenbikes’ (Markovich, 2017, n.p.).

These discourses arise, in part, as a result of the ‘filtering [of] urban design and administration through [the] algorithms and interfaces’ of the computational city, which ‘tends to bracket out those messy and disorderly concerns’ – such as the materialities of frankenbikes built from the piecemeal detritus of discarded and damaged shared bikes – that simply ‘do not compute’ (Mattern, 2021: 4). Yet it is precisely these materialities which do not compute with scripts of the kinds of subjects envisaged as the intended beneficiaries of platformization.

In this intervention, we take up Mattern’s (2017) call for new languages and frameworks for apprehending and engaging with the significance of materialities, such as ‘frankenbikes’, that are always-already digitally mediated and touched by computation, but which nevertheless ‘do not compute’ by virtue of presenting as irreducible to the imperatives and rationalities of platformization, algorithmic optimization, and datafication in cities. More than a simple problem of theoretical vocabularies, we understand this to be a challenge of identifying and devising fundamentally new epistemological orientations that allow us to reclaim ‘frankenbikes’ and related urban materialities, practices, and artefacts as generative fissures within the logics of computation that exceed the tightly bounded normative imaginaries of digital mediations of cities as the preserve of the urban elite. We respond to this challenge by advancing the glitch as an epistemological vector for apprehending the significance of urban spatialities that appear not to reconcile with theoretical metanarratives or conditioned expectations of digitally mediated urban presences, aesthetics, and practices, yet which are nevertheless digitally mediated (transduced by digitality) and/or mediatized (circulated via digital media platforms; Aiello, 2021).

Our epistemological intervention draws on two strands of contemporary theorizations of glitches as both non-anomalous design features of (Benjamin, 2019) and as generative fissures within the spaces and practices of the digitally-mediated
urban everyday (Russell, 2012, 2013, 2020). Mobilizing Sundén’s (2018: 73) notion of queering as ‘a way of noticing or getting hold of’ non-normative relationalities, we espouse a queer orientation to glitches that stays with the counterintuitive tensions of the glitch as simultaneously systemic and interrupting. From these origins, we tender glitch epistemologies as an entry point for engaging with and producing knowledge about the multiplicities and complex potentialities of the confluence of digitality and cities. In this context, the glitch is a queer vector of what Roy (2016) promotes as a sensory immersion in urban fields as a mode of knowledge production through reflexive practices of noticing, cultivating attentuements to the simultaneity of how urban technology capital presents as idiosyncratic, and the modalities by which disorienting socio-spatial orderings of digitally-mediated cities are ruptured and evade subsumption to technocapitalist machinations and their spatial fixes. In other words, the glitch is not an answer to the question, ‘what is the computational city?’ (a matter of ontology), but rather names a response to the question, ‘how do we know the translation of the logics of computation to urban environments? (a question of epistemology). We advance glitch epistemologies as an intentional ethos of taking notice of seemingly superficial incongruities on urban landscapes that appear to interrupt the transduction of city spaces by digital logics, and for engaging with these instances as always-already revealing of how these digital mediations of city spaces can be interrupted and made differently.

We activate glitch epistemologies as an orientation toward these kinds of material-spatial incongruities through illustrative examples selectively drawn from U.S. cityscapes: bikeshare clutter and its resignifications in San Jose, California, and wilful architectural dilapidation tactics and provocatively ‘ugly’ homes in Seattle, Washington and Manhattan Beach, California. These instances are not case studies that show evidence of ‘the glitch’. Instead, we develop a close reading of these examples to demonstrate how glitch epistemologies may be enacted, and the kinds of insights that may be activated through this orientation to computational cities. We show how glitch epistemologies trace digitally-mediated and -mediatized spatial incongruities across two key registers of urbanism transduced by computational logics in many North American cities: desire and aesthetics. We show how orienting to bikeshare clutter and ‘ugly’ houses via glitch epistemologies illuminates how digital mediations and mediatizations of cities simultaneously solidify the programmatic hegemony of digital technology capital while also opening up new horizons onto other vital paradigms and politics of digitality in cities. In these ways, glitch epistemologies offer an on-ramp toward more nuanced understandings of how computational cities are always being simultaneously made and unmade, and by and for which kinds of urban subjects.

**Glitchy departures**

We follow Ash et al. (2018) in conceptualizing digitality as multivalent, comprised of material technologies arising from computing architectures (hardware, software, and data); aesthetics informing sensory experiences of spaces that are inflected by but not reducible to digital systems; discourses that legitimize and sustain the increasing ubiquity of digital technologies; and logics through which digital systems transduce particular socio-spatial configurations. A plethora of terms have been circulated to signal the confluences of digitality, urban spatialities, and politics over the last several decades, beginning with ‘cybercities’ in the 1990s (e.g. Graham and Marvin, 1999), and followed more recently by smart cities (e.g. Hollands, 2008), platform urbanism (e.g. Barns, 2020), and the computational city (e.g. Luque-Ayala and Marvin, 2020; Mattern, 2017). These terms describe different though overlapping aspects of the translation of digital logics to urban environments through imperatives for automation, optimization, datafication, and platformization (Maalsen, 2021).

Within a broader ‘digital turn’ in recent urban scholarship (Datta, 2018), these efforts to name the interdependencies of digitality and cities are paralleled by efforts to identify what these co-articulations mean for what cities are: spatial agglomerations that concentrate digital devices (e.g. Hecht and Stephens, 2014); platforms for
data generation (e.g. Rabari and Storper, 2015); marketspaces for digital services (e.g. Artioli, 2018); experimental sites for digital technologies and technology capital (e.g. Rodrigues et al., 2020); and spatialities that cast disproportionately large data shadows (e.g. Shelton et al., 2014). Here, we step back from preoccupations over digital infrastructures (e.g. Mukherjee, 2019, Plantin et al., 2018), as well as from debates about what the digital or computational city is as an ontological object. We start instead from feminist relational theorizations of digitally mediated/mediatized urban environments as ‘throwntogether’ (Massey, 2005) in ways that are always open to being reconfigured and knowable through glitch epistemologies.

‘Glitch’ in its conventional usage refers to obvious accidental dysfunctions in digital systems, most notably software programmes – sometimes referred to as a ‘bug’ (Goriunova and Shulgin, 2008). More recently, glitches have been taken up in critical race, feminist, and queer theorizations of sociotechnical cultures and relations, both online and away from keys (AFK) (Benjamin, 2019; Elwood, 2021; Leszczynski, 2020; Nakamura, 2013; Russell, 2012, 2013, 2020; Sundén, 2018). Here, we draw from two strands of recent work that conceptualize the glitch as both a regular design feature and an interrupter of digital mediations of everyday urban spatialities. In the first sense of ‘glitch’, Ruha Benjamin (2019) details how digital mediations that present as trivial anomalies are not bugs but features, revealing systemic inequalities that are hard-coded into dominant techno-social orders. In Race After Technology: Abolitionist Tools for the New Jim Code (2019), Benjamin (2019) draws attention to a tweet in which @alliable describes being directed by Google Maps voice navigation to “‘turn right on Malcolm Ten Boulevard’” (Bland, 2013: n.p.), as natural language processing algorithms incorrectly parsed the name of civil rights leader Malcolm X as the Roman numeral ‘ten’. Benjamin (2019) argues that this misapprehension is neither a minor error nor an idiosyncratic singularity, but rather the outcome of entrenched structural inequalities within tech industry and startup cultures whose technologies impose computational logics on the fabrics of cities. These inequalities both empower and are empowered by a white male majority to prioritize some technical problems (e.g. programming that parses ‘X’ as ‘ten’) to the exclusion of other possible modes of practice, such as testing and refining digital technologies in reflexive engagement with multiracial communities. Glitches in this sense designate instances where inequalities present as banal by-products of seemingly innocuous digital design flaws in ways that functionally obscure their genesis in systems of oppression that ‘default [to] discrimination’ (Benjamin, 2019: 78; see also Nakamura, 2013). The glitch in this first sense is a trick, revealing ‘seemingly innocent directions…[that] reflect and reproduce racialized commands that instruct people where they belong in the larger social order’ (Benjamin, 2019: 80). Glitches, in this meaning, are not singularities or idiosyncrasies, but rather signals of discriminatory orderings.

The concept of glitch is also used to name interruptions to these systemic orderings. Legacy Russell (2012, 2013, 2020) theorizes that even as glitches may present as regular, non-anomalous features of systems of oppression and domination, they may also generate ruptures in sociospatial fabrics. That is, the glitch inserts ‘positive irregularities into… systems as errata, activating new architecture through these malfunctions’ (Russell, 2020: 13). For instance, gender binaries cannot reconcile or even recognize queer, nonbinary people as anything other than ‘error’, yet they exist anyway, on their own terms, as people assemble ways of being and living that elude the programmatic limits of gender codes (Russell, 2020; see also Cockayne and Richardson, 2017). Russell centres the significance of digital mediations for embodied and material relations, arguing that for instance genderqueer personas adopted online may be amplified through embodied (re)performances that consolidate these identities AFK. Relatedly, Sundén (2015) theorizes trans existence as a generative glitch that reveals the ‘intrinsic brokenness’ of gender as a technology that requires continuous maintenance through enforced conformity to its codes, and simultaneously short-circuits this technology by defying them. In this
second sense of glitches as generative fissures, failures to execute or adhere to a normative programme are not only ‘errors’ but also generative errata: corrections that assemble ‘other urban intelligences’ (Mattern, 2017, n.p.).

These conceptualizations of the glitch as systematic design features that present as idiosyncratic and as generative errata have prior valence in feminist relational digital/platform/cyber urbanisms. Leszczynski (2020) for instance deploys these notions of glitch to attend to instances where platforms fail to appear as expected in cities, where platformization is not inevitably realized and where platforms are challenged by subsequent mediations, tracing how these absences, surprises, and casualties unmask the incompleteness and non-inevitability of platform urbanism. Elsewhere, Dattani (2021) mobilizes the glitch as an analytical category to capture the surprising failure of on-demand domestic platforms – a highly feminized sector of the gig economy – to actually deliver these services in Delhi, despite investor and platform operator confidence. Yet framing glitches as states of exception risks treating them as idiosyncratic singularities, rather than traces of broader patterns of ‘discriminatory designs [that are] a durable feature of the [socio-spatial] order’ (Benjamin, 2019: 88).

Our urgent question, therefore, is how these contemporary theorizations of the glitch can orient an epistemological attunement to digitally-mediated and mediatised spatialities that ‘do not compute’ and to what may be at stake in these material configurations. We turn to the glitch as an epistemology oriented around ‘noticing or getting hold of’ (Sundén, 2018: n.p., also Roy, 2016) seemingly irreconcilable spatial-material (non)appearances, affects, and practices on cityscapes as glitch/glitch. Here, glitch/glitch refers to simultaneous potentialities for glitches as systemic non-exceptions within urban technocapital (Benjamin, 2019), and as materialities, aesthetics, and practices that elude the programmability of computational city paradigms, for instance through performative failures or nonperformative thwartings of efforts to programmatically ‘fix’ the glitch (Russell, 2020). Russell’s sense of fantastical failure does not signal instances of breakdowns of smart city systems (Houston et al., 2019; Thiem, 2021), nor intentional vandalism of urban digital and data infrastructures (Hoyng, 2016) and ensuing senses of crisis (Sundaram, 2009). Rather, failures are generative fissures within digitally-mediated spatialities by which the transduction of urban spatialities by logics of platformization, optimization, and datafication may be interrupted.

Our appeal for learning from urban spatialities that present as irreconcilable with the imperatives of computation draws inspiration from scholars theorizing Global South urbanisms, who have called for and articulated epistemologies that apprehend urban spatialities that ‘do not compute’ with theory abstracted from North American and European cities. Roy (2005) for instance identifies urban informality as an epistemological orientation to producing urban theory from the informal urbanisms of Majority Worlds, such as slum settlements, that have been castigated as the unplannable ‘Others’ of Western planning rationalities. Simone (2017: n.p.) frames blackness as an epistemology for understanding urban power through the situatedness of marginalized communities often presumed to be infinitely (re)moveable, even as their ‘embodied enactments of urbanization… always threaten the consolidation of any particular’ power formation. We too argue for an epistemology of urban knowledge production rooted in heterogeneities whose trajectories [and] dispositions can never be definitively mapped’ by or reduced to theoretical crystallizations of the cyber, smart, platform, or computational city (Simone, 2017: n.p.). As an epistemological vector, however, glitch is uniquely sensitive to digital mediations and mediatizations of urban spatialities. We argue that producing theory from and about digital mediations and mediatizations of urban spaces requires epistemologies acclimated towards the co-presence of both systemic ‘nonanomalous anomalies’ and nonperformances against the imperatives of computational city logics. That is, knowing translations of the logics of platformization, algorithmic optimization, and datafication to cities requires apprehending what we refer to as the simultaneity of glitch/glitch, where instances that appear not to compute may reveal simultaneous tensions of urban technocapital securing itself (by presenting as idiosyncratic) and being interrupted (by evading or eluding programmability).
Our attention to the simultaneity of *glitch/glitch* as an epistemological orientation to computational cities draws from queer theorists attending to creative potentialities intrinsic to the relation between norms and their transgressions. Queer theory in particular emphasizes transgression as a wellspring for aesthetics, desires/imaginations, and social, spatial and embodied forms (e.g. Ahmed, 2006; cárdenas, 2016; Crawley, 2017; Johnson, 2001; Muñoz, 1999). This framing animates our argument that glitch holds epistemological potential as a ‘disorientation device’ (Ahmed, 2006): a mode of apprehending and learning from creative contradictions and generative tensions of ‘incommensurate geographies’ that do not compute (Berlant and Warner, 1998). Queer orientations to holding oppositional forces in generative tension are evident in, for example, Cockayne and Richardson’s (2017) dual readings of ‘code/code’, a formulation from which we draw inspiration for the articulation of ‘glitch/glitch’. In Cockayne and Richardson’s (2017) theorization, code/code signals ‘code’ as the coming-together of social rules (code in the sense of norms), and ‘code’ as algorithmic rules governing the operations of software systems. This queer epistemological orientation holds open the possibility that the inter-workings of code/code do not overdetermine control and compliance, but might instead open onto plural possibilities for assembling illegible yet actually realizable modes of being beyond the limits of code. For instance, the complex sociolegal, biomedical and everyday life arrangements through which LGBTQ people create ‘family’ are entangled with myriad social and digital codes, yet come together in ways that thoroughly confound their normative limits.

Glitch epistemologies take up this mode of queer theorizing in two key ways within the context of knowledge production about the co-articulation of digitality and cities. First, glitch epistemologies cultivate noticings of empirical instances of digital materialities and mediations that appear disorienting (as ‘not computing’), reorienting attentions towards considering them non-exceptional. And second, the queer tension of *glitch/glitch* informs a reading of digital-urban mediations as simultaneously indicative of how technocapital operates and secures itself in cities as well as as interruptions in ‘normative digital-social-spatial relations of technocapitalist urban life’ (Elwood, 2021: 209).

We mobilize glitch epistemologies in the context of two sets of material spatialities that ‘do not compute’ against discourses, visions, and paradigms of computational cities in the American urban context: dockless bikeshare clutter in San Jose, California, and seemingly idiosyncratic ‘ugly’ streetscapes in Manhattan Beach, California, and Seattle, Washington. These instances arise from our iterative process of taking notice of striking or surprising digital-material presences on urban landscapes, and our reflexive attention to the contours of urban theory that catalyze this apparent strangeness or disorientation. We start from this attentional openness to urban instances, materialities, and presences that prompt an initial sense of, ‘what’s up with THAT?!’, and develop a close reading of these instances and their evidential traces in social and news media.

The instances through which we trace the glitch are not intended as representative examples nor as case studies of ontological breakdowns at the confluence of digitality and urbanism. Instead, these illustrative examples serve three key purposes. First, they show how glitch epistemologies are sensitive to capturing different sites at which digital mediations (digital transductions) and mediatizations (digital circulations) come to ground in cities – here, shared e-bikes and residential housing. Second, they demonstrate how calibrating attention to evidences and logics of the glitch actualizes what Jackson (2013: 17) terms ‘thin-slicing’ into urban worlds as a way of tracing connections across manifold empirical slivers, without overdetermining them as only evidences of contours and relations that theory anticipates. For instance, while much writing about the interworkings of digitality and cities anticipates relations of political economy, our illustrative examples show how the logics of computational cities are also negotiated in the vital registers of *desire* and *aesthetics*. And third, these instances constitute fertile ground for demonstrating how a queer orientation to the generative tensions of material-spatial incongruities on cityscapes reclaims them as politically significant despite their seeming
incommensurability with digital logics of computational city paradigms.

**Orienting toward urban desires and aesthetics**

**Bikeshare clutter and desires for orderly streetscapes of platformized mobility**

As the opening salvos of this paper attest, the proliferation of bike and e-scooter share programmes in cities around the world has been paralleled by a proliferation of debates about micromobility sharing vehicles appearing out of place: dozens of abandoned bikes and e-scooters strewn across sidewalks, dumped in fountains and waterways (Glaser, 2018; Ho, 2018), tossed up into trees (Lu, 2020), turned into ‘pavement blocking sculptures’ (Rushe, 2017: n.p.), and stacked in ‘mountains and rivers of bicycles without end’ in bikeshare graveyards (Clapp, 2019: n.p.; Taylor, 2018). The Twitter hashtag #docklessbikefail that briefly trended in 2017 and associated public debate explains these instances of micromobility ‘clutter’ as a failure of management, regulation, and oversight that produces urban eyesores and inconveniences, and also as the failures of urban subjects to align their responses to the platformization of mobility towards the prevailing goals of the computational city.

We contrast this with a 2020 post on the Silicon Valley Bicycle Coalition blog that included photos of an e-bike parked in the middle of a bike path above a tent encampment in San Jose, California. In the post, the blogger, shiloh, calls attention to the preconditioned reaction which would have viewers see this presence as ‘yet another pesky shared bike parked in a way that is disrespectful’ (shiloh, 2020: n.p.). Yet shiloh quickly reorients readers’ attentions by arguing that the images signal the possibility that ‘…someone who lives in this encampment has a bike share membership’ (shiloh, 2020: n.p.), and that perhaps the location of the e-bike suggests local programmes intended to make bikesharing accessible to impoverished people are having their desired effect. This post itself enacts a glitch epistemology, as shiloh reorients the affective disorientations provoked by visual encounters with supposedly misplaced shared bikes on cityscapes, engaging them as openings onto other vital possibilities for the translation of computational logics to cities, such as bikesharing calibrated for equitable access by those especially in need of on-demand, affordable modes of transportation. This vision for bikesharing decidedly ‘does not compute’ with the imperatives of mobility platformization organized to produce and capture self-optimizing subjects who generate both the reams of data on which the computational city runs (Gabrys, 2014), and revenue streams that sustain the speculative business model of platforms (Stehlin et al., 2020).

Engaging the e-bike positioned above a tent encampment in San Jose as intentionally parked precisely how and where it should be allows us to see possibilities for equitable community-building that interrupt technocapitalist productions of desire for aestheticized landscapes populated by shared bikes and e-scooters and urban subjects self-responsibilized for their orderly use and placement. Revanchist outrage directed at the conjured irresponsible ‘people [who have] chosen to ‘park’ their rented scooters wherever they want’ (Applin, 2018: n.p.) is informed by imaginaries of how a mobility-platformized city should function, and for whom. These imaginaries are conditioned by technocapitalism’s promises of perfection, latent in the efficiencies of digital mediations yet to come: autonomous navigation, independently roasted coffee delivered on-demand by drone (McBride, 2020), and self-parking e-scooters (Glon, 2021). These desires are cultivated through serializations of particular hallmarks of the rational, orderly ‘good’ life in digitally mediated cities – such as shared micromobility vehicles arranged neatly in a row in gentrified neighbourhoods – and are consolidated through mediatization via the hypercirculation of representations of these serialized presences via digital media. Such hypercirculations of idealized sociospatial aesthetics are evident in Google image searches for ‘bike sharing’, which return images of upright identical bikes aligned in neat rows, docked correctly at stations, or placed unobtrusively on sidewalks. The few images that do include a human presence tend to feature young, well-clad, mostly white urbanites interacting with bikesharing
systems in desirable ways: unlocking a bike, riding a vehicle, or using their mobile device, presumably to access a bikesharing app.

Glitch epistemologies read these mediatized circulations as evidence of the technocapitalist conditioning of urban desire functioning exactly as intended: to frame who platformized mobility is for, where its materialities should be sited, and how these visible presences should appear on cityscapes. Understanding the manufacturing of desire as a systemic design feature of technocapitalism allows us to apprehend the ‘out-of-placeness’ of a shared e-bike parked above a tent encampment as regularity rather than exception. Glitch here does not point to a breakdown of tenuous social relations or business arrangements that make bikesharing ‘work’, nor to incorrect urban planning or policy. Rather, reading for the glitch illuminates a fundamental, recurring and significant trick of computational cities, that in the previous section we referred to as the ‘glitch trick’: systemic features that present as anomalous – here, what appears to be an incorrectly placed e-bike. The glitch trick directs attention away from a system of algorithmic enrichment that floods city streets with surplus dockless bikeshares whose graveyard terminus is preordained in order to turn attention towards the supposed failure of the impoverished undersheltered class to behave properly vis-à-vis digitally mediated materialities intended to be preserved for urban elites. A glitch epistemology, however, allows us to hold the non-anomalousness of these systematic orderings on cityscapes in tension with the possibility that they simultaneously operate as generative interruptions of manufactured desires for urban platformization, algorithmic optimization, and datafication to deliver supposedly greater ‘efficiency, connectivity, and social harmony’ (Mattern, 2017: n.p.).

Attending to the ‘out of place’ e-bike parked near a tent encampment as a regularity makes it possible to apprehend how the often-violent translations of computational logics to cities are being reassembled around counterlogographical logics. Reading for the glitch as regularity conditions desire for cities in which the translation of computational logics to cityscapes prioritizes collectivity over hyperindividualism, equity over equal opportunity to consume, and mutual support over competition – logics that technocapitalism renders unimaginable and beyond desire. The e-bike stationed near a tent encampment interrupts aestheticizations of urban micromobility sharing that offer privileged denizens the means to ‘swiftly glide over the debris in a city, without ever having to come in contact with it’ (Applin, 2018: n.p.). The presence of the platformized micromobility vehicle in a space where it appears ‘out-of-place’ forces confrontation with homelessness and profound inequality in cities, drawing attention to materialities (shared transportation amenities) and arrangements (free and nominal fee access to these amenities for impoverished people) that begin to challenge these inequalities.

More profoundly, attuning to the glitch reveals claims to land, life, and self-determination by deeply marginalized urban dwellers in the face of myriad forms of governance and violence aligned to contain or remove them. Here, the non-computability of the e-bike’s stationment generatively interrupts the glitch tricks used to manufacture desires for aestheticized cityscapes. These aestheticized cityscapes are undeniably a vital register through which technocapitalist urban ‘programmes’ operate. We turn next to glitchy urban aesthetics themselves, asking, what is at stake in these interruptions?

‘Ugly’ architecture and the pluralities of un-Instagrammable urban aesthetics

Scholars have written extensively about how the circulation of urban images via social media conditions urban desires and imaginaries in ways that inform reconfigurations of urban material aesthetics (Aiello, 2021; Degen and Rose, 2022). The rising circulation of digital-visual content via platforms such as Instagram, Snapchat and TikTok shapes visual signatures of urban built environments by amplifying demands for and expectations of ‘Instagrammability’ that ensure social media circulations (Bronsvoort and Uitermark, 2021; Jennings, 2019; Rose and Willis, 2019). This Instagrammable aesthetic has readily-identifiable characteristics: a ‘minimalist monoculture’ (Summers, 2019: 17), ‘sharp-lined building facades[s]’ (Baginski and Malcolm, 2019: n.p.), architectural dimensions that readily fit the
frame of smartphone cameras (Jennings, 2019), ‘newly built cubed houses’ with ‘large glass windows’ (Delgado, 2020, n.p.), ‘faux-artisanal’ flourishes (Chayka, 2016: n.p.), and neutral and pastel tones (Jennings, 2019). Urban enclaves featuring such aesthetized material forms draw in social media influencers whose posts featuring image content captured and geotagged to specific places heighten the visibility of these places and confirm their privileged status in urban spatial hierarchies (Boy and Uitermark, 2017). This manufactured hyper-visibility of places drives increases in foot traffic, consumption, real estate values, and displacements of residents. In these ways, visually-oriented platforms enable recursive feedback loops between a homogenized aesthetic to which the visual signatures of cities begin to conform and increased social media circulations from sites expressing this look (Paoletta, 2021).

This harmonization around an idealized urban aesthetic both accrues and imparts value to its material (re)expressions on cityscapes. The replication of platform-circulated urban aesthetics drives the inflation of real estate values not just on a property-by-property basis, but neighbourhood-wide. Analysing the relationship between property values and the visual appeal of real estate listings, Glaeser et al. (2018) found that even marginal changes enhance a home’s attractiveness through modifications aligned with desired architectural styles, types of exterior finishes, and building condition correlate with property value increases of tens of thousands of dollars. So too do neighbouring homes, even if the neighbouring structures have not been similarly improved. As the visual field of an urban district becomes dominated by Instagrammable houses, the consequent neighbourhood-wide inflation of property values and rents displaces long-term residents (Delgado, 2020).

Against this backdrop, what are we to make of ‘ugly’ houses that do not compute within these mediatized circuits of idealized urban aesthetics through platforms such as Instagram? A glitch epistemology illuminates how intentional de-aestheticizations constitute a significant mode of placemaking through ‘anarchitecture’ that refuse prevailing aesthetic regimes and sociospatial transformations that accompany them (Russell in McCulloch 2021, n.p.: emphasis ours). In recently calling for architects to ‘design provocatively ugly’ houses in order to disrupt the conditioning of desire for Instagrammable urban aesthetics, Jennings (2019: n.p.) entreats for a collective, concerted turn to urban design as a site of nonperformance against the replication of mediaitized cityscapes as ‘urban capitalist simulacra’ (Summers, 2019: 3). Reading manifestations of ‘ugly’ architecture for the queer duality of glitch/glitch opens onto the possibility that such aesthetic transgressions also function as nonanomalous anomalies, presenting as idiosyncratic but nevertheless deeply implicated in circuits through which technocapital secures itself. In other words, orienting to the simultaneity of glitch/glitch makes apparent that not all uncooperative aesthetics are in fact performing nonprogrammability. Some de-aestheticizations function not as anarchitectural interruptions to technocapitalist regimes of property value, but rather are systematic design features leveraging their own idiosyncrasy.

Consider a Manhattan Beach, California, duplex infamously dubbed the ‘emoji house’. In 2019, the building façade featured two garish emojis – variations of a zany face and a zipperface with exaggerated eyelashes – on its bright magenta exterior, changes that allegedly occurred after the owner was fined for illegally offering the units as short-term rentals (themselves part of the platformization of residential housing markets). Media coverage reported neighbours’ charges that the emojis were the owner’s aesthetic revenge on them for reporting her illegal rentals, with the owner denying this, claiming she merely intended to instil a sense of cheer in the neighbourhood (Diaz, 2019; Lodi, 2019, McDermott, 2019). The emoji house at first glance appears to be a wilfully incommensurable aesthetic performance of out-of-placeness. Juxtaposed with the serial banality of the aesthetic monoculture of Instagrammable architecture, the emoji house is spectacularly ‘ugly’, a quality that emerges not from our personal taste or judgement, but rather because it breaks from the expected aesthetic regime. By situating this manufactured ugliness within aesthetic harmonizations of cityscapes via platformized social media circulations of urban
images (see also Degen and Rose, 2022), a glitch epistemology brings the emoji house into view not as an aberration, but rather as an orthogonal cueing of these very same aesthetic regimes of value. As Datta and Odendaal (2019) underscore, banal violations of ‘good taste’, comic distortions, and other deployments of a visual vocabulary of grotesqueness may be channels through which capital legitimizes itself. When cities are subsumed to the logics of platformization, algorithmic optimization, datafication, and ‘Instgrammability’, the ubiquitous mediatization of cityscapes aestheticizes everything, ensuring that even those materialities that lie outside this programme may nonetheless be calibrated in relation to its logics and aesthetic circuits of value (Shaviro, 2013).

Through comically grotesque analog representations of digital vernacular (emojis) on its façade, the emoji house is a striking datum in the otherwise undifferentiated streetscape monotony of Instagrammable neutrals and uniform cubed houses. A material presence in the city, the emoji house exists outside of the confines of the digital screen. Activating a glitch epistemology opens onto engaging it as a presence that mediates and mediatizes in accordance with aesthetics and logics arising ‘within an economy of likes, self-promotion, and social currency’ (Jennings, 2019: n.p.). The spectacle of the emoji house functions as a viral Instagram post enacted AFK. Spectators flooding into the neighbourhood to gawk at, photograph, and Instagram the house (Iati, 2019) are the embodied equivalents of the digital transaction of a ‘like’. The attention economies of social media are literally transduced onto the streets through people queueing to see, take selfies in front of, and share the emoji house. Here, ‘ugliness’ functions as aesthetic currency, an axis of distinction for attracting eyeballs and bodies, cuing digital (re)circulations and generating revenue by interrupting the normative aesthetic regime. This amplification of aesthetic regimes of value extends across place and platform, far beyond a performatively ugly house on a residential street in Manhattan Beach, California. Airbnb listings visualize remarkably similar interior design elements worldwide, (re)iterating visual signifiers that become a sterile ‘blank’ aesthetic of homogenized tastes at a global scale (Chayka, 2016). Even particular colours iterate globally, with Airbnb guests offered any number of pink houses around the world to choose from: a ‘Pretty In Pink’ apartment in Desert Hot Springs, ‘The Summer Pink House’ in Lachania, Greece, ‘The Pink Elephant’ in Niagara Falls, or ‘La Vie en rose’ in Jaipur, India. Johnson (2018) chalks up this plethora of pink to its eye-catching potential as backdrop for photovisual social media posts.

Against homogenized aesthetic canvases, such intentional cultivations of ‘ugliness’ can be deployed to cue the algorithmic profit machine, functioning as nonanomalous anomaly: the countersignal that appears to be a glitch, but is not. Travel publisher Fodors profiled the ability to book an Airbnb stay ‘ugliest house in America’, in Indianapolis, Indiana (Annis, 2018: n.p.), while AirBnB hosts advertise a ‘Beautiful 1 Br in “The Ugly House”’ on Long Island, New York; a private room in a ‘Good, ugly, nothing bad’ house in Christchurch, New Zealand; and countless similar listings. A glitch epistemology apprehends these ‘uglies’ not as glaring idiosyncrasies on the cityscapes, but rather as a systemic design feature of technocapitalist urbanism in which iconoclastic aesthetics help drive circuits of value that rely on replicating simulacra of the Instagrammable city. Staying with the trouble of performatively ‘ugly’ homes illuminates that while some aesthetic interruptions may at first seem to punk these computational logics of city making, they actually cue and amplify these digitally-mediated aesthetic regimes of value production and circulation in spectacular fashion.

Yet glitch epistemologies nevertheless remain persistently open to the possibility that something besides iteration of an idealized ‘Instagrammable’ aesthetic might be at play in visual-material transgressions on cityscapes. We recently learned of several adjacent homes in a Seattle neighbourhood whose owner intentionally cultivated exterior dilapidation while the surrounding area was gentrifying. As the neighbourhood was remade toward a uniform upscale aesthetic, the owner allowed the exteriors of these homes to become ever-more shabby as a tactic for depressing property value and taxes to sustain low rents for long-term tenants, vulnerable individuals reliant on a housing assistance voucher programme (Faustino, 2021,
personal communication). Countless analyses of North American urbanism have theorized such glitchy presences as holdouts to programmes of recapitalization through aesthetic upscaling, seeing them as only futile resistance to inevitable displacement (e.g. Miller, 2021; Myers, 2000; Watkins, 1993). An attunement to glitch/glitch sustains an oblique orientation to narratives of the doomed holdout, bringing into view how intentional dilapidation might evade and exceed both the programme (instructions) and programmability (digital mediation) of urban aesthetic circulations and replications. In contrast to the aforementioned spectacular ‘uglies’ monetized and mediatized through digital platform circuits, these dilapidated presences impede the execution of mediatized urban aesthetic programmes/ programmability. That is, through their de-aestheticization, these houses elude the algorithmic visual production of property values that fuels neighbourhood-scale real estate speculation, exchange, and removal.

Approached via a glitch epistemology, this ‘intentional dilapidation’ tactic (Sandler, 2016) can be reclaimed as more-than-anecdotal anarchitecture manifesting sociospatial transformations with broader reach. The aesthetic non-programmability of these run-down exteriors is a nonperformance against forces aligned to ‘correct’ that which does not compute by eradicating it (Russell, 2020). This plays a vital role in keeping precarious housed people in housing through the wilful pursuit of aesthetic failure that ruptures the transduction of urban environments guaranteed to evict by interrupting logics of computation that drive mediated and mediatized circuits of property inflation. Tracing this glitchy ‘spatial intervention’ (Russel in McCulloch, 2021: n.p.) reveals how de-aestheticization can function as a (re)politicization of urban material forms that work in the interests of precarious households remaining in place and in community. Orienting to these dilapidated houses in Seattle as anarchitecture disrupts tropes of the inevitability of displacement that are unwittingly reinforced through constant critiquing of the emplacement and enrichment of property speculators, developers, incoming residents, and real estate professionals. A glitch epistemology refuses the foregone conclusions of displacement, and by instead attuning to practices of anarchitecture, reclaims actually-existing ‘landsapes of possibility’ (Russell, 2020: 8) in which precaritized people targeted for removal are able to stay in place.

Glitch epistemologies and urban theory

Drawing on glitches as systematic design features of digitally mediated cityscapes that present as idiosyncratic (Benjamin, 2019; Nakamura, 2013), and as generative interruptions of ‘nonanomalously anomalous’ urban configurations (Russell, 2012, 2013, 2020), we argue for an orientation to knowing the translation of computational logics to urban spaces through encounters with presences that, on the surface, appear ‘not to compute’. We orient toward materialities and presences that come into view as nonprogrammatic (confounding and disorienting) and/or nonperformative (evading correction) against the imperatives of computational city paradigms by drawing on queer modes of knowledge production to take dual notice of such urban configurations and hold them in the creative tension of glitch/glitch. These ways of knowing define glitch epistemologies as a vector through which to retrieve and reclaim out-of-place, digitally-mediated and -mediatized spatialities in ways that deepen our collective understandings of the co-articulation of cities and digitality. Retrieving these spatialities matters for urban theory in four key ways.

First, glitch epistemologies attune us to the ways in which instances that present as out-of-place on cityscapes signal the simultaneity of how technocapitalism secures itself in cities through idiosyncrasy as a distraction (glitch trick), and of how it is always-already being interrupted. An epistemology that intentionally holds the simultaneity of these material realities in creative tension challenges the ease with which we as scholarly communities have tended to fast-forward to several well-rehearsed theoretical heuristics that read digital/urban configurations as solely neoliberal and capitalist (e.g. Grossi and Pianezzi, 2017; Krivý, 2019; Sadowski and Gregory, 2017; Wiig, 2016), post-political (e.g. Carr and Hesse, 2020), and surveillant and carceral (e.g. Krivý, 2018; Sadowski and...
Pasquale, 2015). Approached via a glitch epistemology, computational cities come into view as all of these things, and also as a generative site of creative subversion, generative interruption, wilful nonperformance and nonprogrammability. These unanticipated excesses unmake and remake the translation of platformization, algorithmic optimization, Instagrammability, and datafication to city spaces, even as urban landscapes are pervasively transduced by these logics and imperatives. Short-term rental platforms expand across racialized neighbourhoods, displacing long-term residents, at the same time that architectural ugliness itself is aestheticized and monetized in social media attention economies, at the same time that purposeful dilapidation tactics interrupt neighbourhood-scale inflations of aesthetic value that make select enclaves attractive for these activities.

Second, glitch epistemologies work to nuance understandings of the workings of power in computational cities. By power, we mean agential capacities for generativity that interrupt, are nonperformative against, elude, and make otherwise the translation of computational logics to urban spaces — such as the cobbling-together of frankenbikes, or anarchitectural de-aestheticizations that disrupt the neighbourhood-level accrual of ‘Instagrammability’. Beyond abject failures of urban technologies and smart city developments, instances of small-scale digital disorientations, appropriations and adaptations, repurposings, and maintenance work in cities have received scant attention within critical urban scholarship (c.f. Houston et al., 2019; Hoyng, 2016; Kitchin and Dodge, 2019; Matern, 2018, 2021). As a result, invocations of cyber/smart/platform/computational city paradigms, practices, and digital infrastructures tend to conjure an already-castigated urban Other (e.g. Attoh et al., 2019; Byrd and Mandal, 2017; Krivý, 2019; Tironi and Valderrama, 2018). This sets up dialectical framings of cooptation/resistance that preclude everyday possibilities for ‘being political’ in city spaces that have been mediated and mediatized by digitality in its myriad instantiations of ontics, logics, aesthetics, and discourses (Bissell, 2020; Degen and Rose, 2022; Elwood, 2021; Leszcynski, 2020; Rose, 2017), and underwrites a dialectic of inclusion/exclusion from even these binary possibilities for urban politics. Glitch epistemologies engender a tracing of power and political subjectivities that are otherwise off limits.

Third, glitch epistemologies further decentre the presumed distribution of political capacities around binaries of resistance or acquiescence. These framings centre already-privileged subjects as political by virtue of, for instance, their ability to take time to organize and partake in formal acts of resistance against technocapital, or to be selective about when to disengage and re-engage with ridehailing, bikesharing, Instagram, or on-demand meal delivery and other technocapitalist conveniences and entertainments. Meanwhile, those who cannot disengage from urban technocapital because their livelihoods have been reduced to gigging for a platform, or who are seen as peripheral to urban technocapital and its imperatives by virtue of being undersheltered, are castigated as not possessing capacities for political expression at the intersection of digitality and urban life, or are assumed to be apolitical in the face of its vagaries and violences. By retrieving spatialities that express nonperformances and other generative interruptions that do not compute, glitch epistemologies expands our capacities to apprehend marginalized subjects as potent political actors who may enact more equitable and cooperative digital urban futures through their everyday practices vis-à-vis digitally-mediated and -mediatized materialities, embodiments, and presences.

Finally, glitch epistemologies intervene against an enduring epistemological skepticism within white masculinist instantiations of ‘T’heory (Ahmed, 2017; Katz, 2017). This skepticism is expressed as persistent reticence to engaging materialities, modes of being, and socio-spatial relations that exceed its heuristics and sustained questioning of their significance and transformative potentials. The effects of this skepticism are twofold. First, the hegemonies of critical theory’s heuristics and political economy’s dialectics — norm/counter-norm, margin/centre, extraction/dispossession, resistance/acquiescence — become sedimented through their reiteration. And second, this epistemological skepticism anticipates defeat of micropolitical tactics and resurgence of structural power and oppression (see e.g. Leszcynski, 2020; Rose, 2017). A queer commitment to taking notice of out-of-
placeness, or that which does not compute, reveals the non-inevitability of these scripts. For all these reasons, we offer glitch epistemologies as a vector of knowledge production predicated on queer attunements toward retrieving already-existing material spatial configurations in which alternate urban futures are demonstrably always-already underway. What could urban theory that starts from an activation of the glitch look like?

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**Notes**

1. The term ‘frankenbikes’ is our moniker for these assembled vehicles, not that of the journalist writing about them.
2. Arising at the intersection of humanistic and social scientific modes of knowledge making, ‘close reading’ involves sustained fine-grained interpretive attention to a phenomena (here, material-aesthetic ruptures in digitally-mediated cityscapes), especially what is revealed through orientation to paradoxes and tensions (Lukić and Espinosa, 2012; Love, 2013).
3. ‘Away from keys’ has emerged as a preferential acronym to IRL (‘in real life’) as it avoids false bifurcations between virtual and real, effectively capturing the always-already digital mediations of identities and practices, everywhere these are not expressed/enacted through digital media (Russell, 2020).
4. The non-capitalization of ‘blackness’ adheres to Simone’s (2017) usage.
5. [https://bit.ly/2Y9rzu](https://bit.ly/2Y9rzu); search conducted from Canada.
6. These regimes of value extend beyond real estate, including for instance the professional artist who painted the emoji house and posted its photo on his Instagram page, densely hashtagged to cue amusement, outrage, and, ultimately, recirculation.

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