

Platforms and Dwelling: Topologies of Distributed Domesticity

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Under contemporary capitalism and platform urbanism, domesticity is distorted into new forms. The spaces and processes of dwelling become extended across digitally mediated and data-driven network technologies – ‘platforms’ – to realms outside the traditionally conceived domicile. Even the most mundane contents of domesticity are recast as services provided by and exchanged across platform capitalist networks – from Alexa to Airbnb and beyond. Mirroring this, the home is increasingly mobilised for economic productivity through the expansion of work into the domestic sphere. The platformisation of dwelling thus reverberates across urban space, with housing, mobility, and even human labour increasingly incorporated into various platforms like those of the so-called sharing economy, complicating and dispersing simple dichotomies of interior/exterior, private/public, and home/work.

As Tarleton Gillespie notes, platform-based organisations capitalise on the multiple, specific, yet elusive meanings of ‘platform’ – alternately evoking computational infrastructure, architectural condition, figurative space and political programme. These ultimately coalesce in the literal sense of a ‘raised level surface’ that ‘suggests a progressive and egalitarian arrangement, promising to support those who stand upon it’.¹ On the contrary, as intermediaries, platform companies ultimately retain a tremendous amount of control.² Despite a rhetoric of sharing, the late-capitalist logic underlying platforms restricts the possibilities of collective governance and instead pushes users – and dwelling – towards

an individualistic, optimised, financialised and post-political condition.³

Extending earlier economics-oriented theorisations of platform-based corporations, recent scholarship has begun to address the broader socio-spatial implications of platform urbanism.⁴ These critiques situate platformisation in relation to the ascendant form of governmentality of our era, theorised variously as ‘cybernetic’, ‘algorithmic’, ‘cognitive’, ‘affective’ or ‘surveillance’ capitalism.⁵ This proliferating regime is built upon fundamental shifts in the nature of control, operating on the environment of the subject rather than the subject itself and distributing control into the structures that underlie society. This transition from a disciplinary form of governance to a distributed, ecological-relational formation was notably described by Gilles Deleuze as a shift from enclosures or ‘moulds’ to controls or ‘modulation’.⁶ Erich Hörl refers to this shift as *environmentalisation*, ‘the becoming-environmental of media, of power, of subjectivity, of world, of capital and of thinking’.⁷ Following Michel Foucault’s coinage of the term, ‘environmentality’ for Hörl denotes a restricted formation within a broader techno-ecological genealogy, propelled by the evolution of control technologies since the eighteenth century but especially since the post-war development of cybernetics.⁸

Operating within this regime of environmentality, platform urbanism manifests in a distinctive shape (and shaping) of space and subjectivity. Three aspects are key. First, platforms are more than companies or digital algorithms with an on-screen

interface. Rather, they are geographical agents operating in a distributed manner. Platforms coordinate and modulate urban networks through seemingly contradictory processes: decentralisation of physical form and sometimes even material ownership, but a subtle re-centralisation and redeployment of control.⁹ Second, the probabilistic, pre-emptive rationality underlying platform algorithms manifests as the mining and monetisation of data towards behavioural manipulation, into which the ‘hardware’ of the city and the ‘software’ of urban life are equally incorporated.¹⁰ Urban activity is not only the source of data extracted by digital platforms, but is itself ‘a medium of capture’.¹¹ Third, environmental-algorithmic modulations presuppose and reproduce a new kind of subject, one reduced to the quanta of their behavioural data and conditioned to constantly engage within a telematic milieu that also manifests in spatial and temporal ‘flexibility’. Individuals thus become ‘dividuals’, ‘simultaneously hyper-subjectified, and de-subjectified’.¹²

Based on this premise, we argue that an examination of the architecture of dwelling in relation to platform urbanism necessitates contextualising both ‘dwelling’ and ‘platform’ within the aforementioned trajectory of environmentalisation, the becoming-environmental of control. This shift in condition in turn necessitates a shift in methods of analysis. The contemporary redistribution of dwelling – its simultaneous extension and integration under platform urbanism – complicates the ‘flatness’ of the platform metaphor. As Maroš Krivý notes, scholars across various disciplines converge in observing that platforms ‘operate with a similar topology of power, one in which a core or a ground is constructed so as to enable or facilitate the production of difference’.¹³ The etymology of the term – from the Middle French *plateforme*, literally ‘flat form’ – is indicative of this nuance: platform as an ‘*arrangement* of objects on a level surface’.¹⁴ It is therefore our contention that rather than topographical and typological frameworks, the ‘falsely flat’ surface of platform urbanism requires a topological, systems-relational lens to

map, critique, and reshape its arrangements of space, subjectivity and power.

Accordingly, in the first half of the article we prepare the ground for this discussion by outlining this topological framework in relation to the environmentalised history of dwelling. Building on an overview of topological thinking across disciplines, we establish its role in the reconceptualisation of architecture as an environmental apparatus of boundary-drawing. We then retrace the always-already topological genealogy of modern dwelling to demonstrate the ways in which manifolds of interpenetrating edifices, mediating membranes and prosthetic environments have prefigured present-day digitally mediated formations of domesticity. In the second half of the article we train this topological apparatus onto three contemporary manifolds of dwelling – condividual networks, commoning boundaries and distributed protocols – to probe the changing relations of subjectivity, space and power under platform urbanism and environmentality. We conclude by revisiting questions concerning politics and architectural agency that are brought into renewed focus by a topological lens on dwelling.

Topological thinking

As the study of continuity, boundaries and relation, topology offers an ‘anexact yet rigorous’ model of the (re)configurations and (de)formations of space, subjectivity and power under environmentality. As such, it supplements typological and topographical lenses in architecture, offering an alternative conceptual and analytic approach towards dwelling in its environmentalised, digitally platformised condition.

In its mathematical formulation, topology constitutes a reconceptualisation of metric models of space and time, such as Euclidean geometry and Newtonian ‘container’ metaphysics. These models are premised upon an extensive conception of space, with objects located in an infinite container and described through *extrinsic* properties (such as position or distance) with reference

to a transcendent coordinate system. A representative tool of such 'topographical' space is analytic geometry, in which relations between points located on two-dimensional curves or three-dimensional surfaces are expressed as relations between numbers.¹⁵ Topology, on the contrary, is the study of *intensive* space, grounded in the intrinsic, self-referential, relational qualities of entities, such as their (dis)continuities and deformations through folding, stretching or squeezing. Its corresponding analytical tool is differential geometry, which is concerned not with Cartesian positionality but with the local rate of change (differential) in the curvature of a surface of any 'shape' and dimension, often referred to as a manifold. Topology dispenses with the need for a higher-dimension 'global embedding space', insofar the complexity of a manifold is apprehended *in relation to itself*, instead of against an external frame of reference.¹⁶ A topological lens does not oppose, but rather extends the normative topographical understanding of space.

Beyond the formal language of mathematics, 'topological thinking' has proliferated across the sciences and the humanities, from physics and developmental biology to philosophy and architecture. Following Deleuze – a topological philosopher par excellence – Manuel DeLanda describes topology as offering an '*anexact yet rigorous* style of thought', less concerned with quantity and positionality than with differential relationality and connectivity.¹⁷ As Brent Blackwell similarly suggests, 'topology analyses the nature of the ground upon which its own self-construction lies', revealing the inherent continuity between figure and ground: 'As the study of boundaries, topology widens the scope of the definition of the object to include its context (what topology refers to as the "embedding space"). In this way, an object is not distinct from its context.'¹⁸ Topology, then, constitutes a radically relational conceptualisation of the environment in the twofold sense of 'milieu', as simultaneously a middle and a surrounding.¹⁹

Boundary-drawing

Through its intensive conception of relationality and boundaries, topological thinking engenders new critical and analytical approaches to the built environment and architecture. Parallels can be found in the way topology has enjoyed a renaissance in human geography and social theory over the past two decades. The heterogeneous applications of post-mathematical topology, Lauren Martin and Anna Secor suggest, share a concern for '*relationality itself*', questioning 'how relations are formed and then endure *despite* conditions of continual change.'²⁰ Investigations in these fields are thus concerned with the material-discursive apparatuses that engender and reproduce particular relations. For Celia Lury, Luciana Parisi and Tiziana Terranova, the changing nature of mediating apparatuses evinces a 'becoming-topological of culture', insofar as 'topology is now emergent in the practices of ordering, modelling, networking, and mapping that co-constitute culture, technology, and science.'²¹ This topologisation manifests in the way "borders" or "frames" of mirrors, windows, screens and interfaces have become surfaces of sensation themselves by operating the opposition between inside and outside in a dynamic re-making of relations to each other.'²²

The agential realist philosophy of Karen Barad further extends the topological understanding of boundaries through the notion of 'boundary-drawing apparatuses'. Incorporating quantum physics and post-structuralist constructivist thought, Barad advances a radically relational reconceptualisation of matter, space, causality, agency and difference, placing topological thinking at their core. Considering the nature of reality, 'the primary ontological units are not "things" but phenomena – dynamic topological reconfigurings/entanglements/relationalities/(re)articulations of the world.'²³ In turn, agency is not an external, interactive property of a subject or object, but an intra-active 'doing' or 'being' *within* phenomena, an ongoing redrawing of boundaries.²⁴ Boundary-drawing for Barad is thus

a process of 'cutting together-apart', through which the world is configured in particular ways, while other possible worlds are necessarily excluded. This ontology also demands a renewed conception of ethics, a response-ability to both entanglements and exclusions involved: 'Particular possibilities for (intra-)acting exist at every moment, and these changing possibilities entail an ethical obligation to intra-act responsibly in the world's becoming, to contest and rework what matters and what is excluded from mattering.'²⁵

These observations concerning boundaries, in turn help to reorient the formal(ist) applications of topology predominant in architecture and urbanism since the 'digital turn'. As Robert A. Gorny observes, the pursuit of topological processes of form-finding and associated 'diagrammatic' vocabularies since the 1990s has transpired in the context of an increasing bifurcation between architectural history and theory. A reductive version of topology thus became associated with the 'projective' tendency in theory and practice, with a coherent elaboration of its broader implications for a (re)conceptualisation of architecture remaining wanting in critical-historical discourse.²⁶ Yet, a heterogeneous and growing body of post-Foucauldian and post-Deleuzo-Guattarian architectural scholarship, building on the respective notions of *dispositif* (apparatus) and *agencement* (assemblage, arrangement), supports a topological conception of the built environment.²⁷ Their convergence contributes to a rethinking of architecture, from an apparatus of separation and enclosure – a long-held misreading of Foucault's spatial project – to its more general, techno-ecological role in selecting, filtering and framing the material conditions of existence. In this sense, architecture can be understood as a topological machine 'determining what is related to what'.²⁸

Synthesising these trajectories with Barad's rearticulation of boundary-drawing apparatuses, Gorny formulates 'the built environment ... as an open system of reciprocal self-organization through its production of constitutive boundaries.'²⁹

As 'enabling constraints' that frame and filter relation, 'architectural arrangements thus "cut together apart" ... specifically entangled social, technical, cultural, economic, and ecological systems'.³⁰ In other words, a topological lens foregrounds the 'relational architectural ecologies' through which, as Peg Rawes articulates, 'modern subjectivity, and our habits, habitats and modes of inhabitations, are co-constituted.'³¹

Manifolds of dwelling

To begin to apply a topological lens to dwelling, one must recontextualise the present-day digital distribution of domesticity as the latest manifestation of an environmentalised, always-already topological trajectory of modern dwelling. This, in turn, allows the identification of specific topological patterns – manifolds – that can act as critical-analytical lenses.

The aforementioned historical trajectory is strikingly articulated by Georges Teyssot via the notion of a 'topology of everyday constellations'. Teyssot examines the dynamic reconfiguration of technical apparatuses, social collectives and more-than-human milieus, tracing a techno-ecological genealogy of modern dwelling from nineteenth-century Parisian interiors to our contemporary digitally mediated condition. He characterises the project as an inquiry into 'the nature of spaces, public or private, at the moment they become part of the innumerable series of devices and technical equipment that control the movements of people and things.'³² Informed by Foucault's theorisation of material apparatuses – as evinced by the specific use of the term 'equipment' – the investigation thus situates dwelling within the history of environmentalisation.³³ Instead of emerging as causal responses to societal needs, collective equipments produce their own production, generate new needs, and partake in regimes of social normalisation.³⁴ Accordingly, Teyssot underlines the reciprocity between 'habit(us)' and 'habitat', with the former comprising the collective equipments that condition repetitive acts of inhabiting, including 'the

house itself, conceived as a receptacle of practices, routines, and customs'.³⁵

Building on Teysso's work, we propose three historical manifolds as conceptual lenses to analyse present-day permutations of digitally platformised domesticity: interpenetrating edifices, mediating membranes, and prosthetic environments. These manifolds exemplify the modern reconfiguration of the demarcation between interior and exterior, organism and environment, domestic and public, and the redistribution of dwelling across these boundaries.

The first manifold, interpenetrating edifices, is characterised by the dissolution of spheres previously understood as separate. This condition is beautifully described in Walter Benjamin's *Arcades Project*. Benjamin observes the emergence of a modern topology and contrasts it with its antecedent: 'The twentieth century, with its porosity and transparency, its tendency towards the well-lit and airy, has put an end to dwelling in the old sense.'³⁶ Richly furnished domiciles and expansive arcades are equally symptomatic of the interpenetration of formerly distinct spheres of public and private, interior and exterior, whereby a sense of permanence gives way to transience and instability. Domestic interiors are progressively exteriorised through environmental technologies such as electric illumination, their outwardness also exhibited in popular 'cutaway' illustrations: 'like a reversible surface, the interior opens out into an exterior.'³⁷ In parallel, the arcades, railway stations, winter gardens and other public edifices inaugurate 'vast "interiors" for the collective, so huge that they do not have exteriors as such.'³⁸

In Hilde Heynen's reading, Benjamin oscillates between a nostalgia for the sense of belonging offered by 'the notion of dwelling as leaving traces behind', and an enthusiasm for the perceived emancipatory potential of the transitory 'habitation' that followed it.³⁹ This latter, 'new, nomadic way of living' is well illustrated by Hannes Meyer's 1926 manifesto for a radical, anti-bourgeois lifestyle in Co-op

Interieur, conveyed through a single photograph of a sparsely furnished yet idiosyncratic room.⁴⁰ Through its implied nomadic subject linked to a collective, this proposal equally resonates with an ethos of cooperation and solidarity, and aligns with the modernist development of 'minimum dwelling' (*Existenzminimum*).⁴¹ It similarly prefigures contemporary digitally platformised nomadism, in both its convivial and precarious permutations. [Fig. 1]

The second manifold, mediating membranes, concerns the nature of the boundaries defining the surfaces that host relations. This tendency emerges through the more fundamental topological reconceptualisation of life itself that was propelled by mid-century developments in cybernetics and biology. Henceforth, life (and dwelling) is seen as an entanglement between organism (or system) and its environment, occurring 'at the limit, on the borders'.⁴² Following Gilbert Simondon, relations are primary: the individual and its environment emerge together from the process of individuation, 'which literally coproduces the individual and its associated milieu together. As such, the individual must be defined as an encounter, a result, but also as the milieu of individuation, through a succession of configuring phases', as a result of which 'the individual invokes neither unity nor identity ... there are only multiple processes of individuation.'⁴³ The membrane that folds back on itself is not only a zone of contact between inside and outside, but the very source of their dynamic, chrono-topological becoming.⁴⁴

The crystal and the egg, representative morphogenetic figures of individuation, became key motifs of architectural speculation during the 1960s: 'Blobs and bowels, bubbles and balloons, shells and membranes, capsules and cells, warped surfaces, crystals and nappes, cables and webs, labyrinths and topological surfaces'.⁴⁵ In these examples, 'the primary elements of architecture (basement and attic, wall and partition, floor and ceiling, passage and disruption, ground and roof)' come to 'metamorphose and transmute into topological surfaces of contact.'⁴⁶ However, these experiments often

verged on the formally iconic and the reductively geometric rather than being relational or truly topological, and have in turn been succeeded by the ongoing computational (ab)uses of topology characteristic of 'architectural Deleuzism'.⁴⁷

The third manifold, prosthetic environments, rethinks dwelling as a technological milieu of iterative reconfiguration. Drawing on Donna Haraway's seminal conceptualisation of the posthuman subject as a cyborg and Jean-Luc Nancy's notion of ecotechnics, Teyssot asserts that 'it is not so much a case of devising new dwellings for cyborgs. Those semihuman, semisynthesized, constantly mutating entities are already environments, milieus, surfaces where relationships between self and world come into play.'⁴⁸ In this sense, dwelling can be understood as a co-production: always-already cyborgian bodies interacting (and intra-acting) with prosthetic technologies, with the lines between the two perpetually blurred.

The prosthetic entanglement of humans with their milieu is also central to Peter Sloterdijk's immunotopological spherology. Refuting a 'romanticism of openness', Sloterdijk contends that as 'ecstatic beings' humans are 'forever held outside in the open; ... but they can only be outside to the degree that they are stabilized from within from something that gives them firm support. ... Buildings are thus systems to compensate for ecstasy.'⁴⁹ Conversely, Teyssot articulates the inverse, redefining the interior of the dwelling

as the movement of the body towards the exterior, in a state of *ekstasis*, through the various filters – thresholds, frontiers, wireless networks – that delimit our surroundings. ... Like a Klein bottle – or an ordinary sock – the interior will conceivably be able to turn itself logically, and topologically, into an exterior. Architecture is thus transformed into a device that participates in this staging of an 'ecstasy'.⁵⁰

These historical manifolds of dwelling thus prefigure our unprecedented contemporary interconnectivity.

Interpenetrating edifices describe the longer trajectory of the dissolution of the boundaries between interior and exterior and between public and private spheres. Likewise, mediating membranes formulate dwelling as the dynamic modulation of relation that in turn defines living entities. Finally, prosthetic environments recast dwelling as a co-production with(in) a technical milieu – whether 'smart' or inert, enveloping or handheld. From these historical insights we can discern the outlines of a topological lens on contemporary dwelling, which incorporates but is not limited to its current digitally inflected permutations.

Contemporary manifolds

Topological thinking allows one to see patterns of relation – what we call manifolds – that are otherwise challenging to discern. These topological manifolds allow designers to push beyond established analytical approaches such as typology, which are challenged by contemporary socio-spatial shifts.

The limits of typological analysis are apparent in a recent study on the relationship between dwelling design and the dominant mode of economic production under industrial versus cognitive capitalism, by Francesco Spanedda and Matteo Fusaro. Compared to previous eras, the effects of the cognitive (or digital) economy on housing are more varied and difficult to discern via spatial taxonomy.⁵¹ The authors highlight four transformations: the reintegration of work into the domicile, occasionally through dedicated home office spaces; the revalorisation of housing as a means to attract knowledge workers to specific locales; the commodification of housing driven by digital platforms such as Airbnb; and the decoupling of private-public and interior-exterior correlations via the integration of the home into various digital networks.⁵² [Fig. 1] Observing the overlay of 'completely new ways of working and living, like home working, guest hosting, and media production' onto 'spaces that were designed with separation, privacy, and different functions in mind', the study questions the veracity of typology for describing the contemporary condition of dwelling.⁵³



Fig. 1: Home '14: Pavilion based on Hannes Meyer's Co-Op Room, exhibited in *AirBnB Pavilion*, Venice, 2014, organised by âyr collective (Fabrizio Ballabio, Alessandro Bava, Luis Ortega Goveia and Octave Perrault). Rendering courtesy of âyr.

Instead, the environmental genealogy of dwelling and its digitally platformised permutations calls for analysis attuned to what Eyal Weizman describes as 'a more dynamic, elastic, topological, and force-field-oriented understanding of space, as well as an understanding of the immanent power of constant interaction between force and form.'⁵⁴ Whereas Weizman's pioneering analysis has primarily focused on territories in states of exception and misuses of power, we second Adrian Blackwell's call to also train this topological lens onto the 'more banal territory' of (platform) capitalist property relations, insofar 'it is precisely through the lens of architecture that the spatiality of power can be analyzed most effectively.'⁵⁵

Accordingly, in the remainder of the article we draw out three contemporary manifolds of dwelling through a topological (re)reading of representative urban conditions and theoretical positions. While not intended as an all-encompassing series, the three manifolds – comprising condividual networks, commoning boundaries and distributed protocols – respectively foreground the changing shapes of subjectivity, space and power under platform urbanism, and environmentality.

Condividual networks

The first contemporary manifold concerns the nature of relations engendered by networked forms of dwelling that result from the interplay of physical mobility and digital connectivity. It revolves around the dispersion of domesticity across urban networks and the subsumption of the domicile within commodified platforms. Central to this manifold is the ambivalent notion of the dividual, which encapsulates the aporia of networked subjectivity as a topology of belonging and dispossession.

The networked form of urban nomadism evoked by Meyer's Co-op Interieur and other architectural speculations have since the 1980s found their consumerist counterpart (and counterpoint) in the megacities of Tokyo and Seoul, where the combination of high urban densities and extensive

public transportation networks have precipitated the dispersion of certain domestic activities – such as singing, net-surfing, movie-watching, comic-reading, bathing, or sex – into commercialised spaces. Jorge Almazán and Sanki Choe theorise this phenomenon of monetised access to personal spaces on a short-term basis as 'dividual space', complicating the predominantly negative reading of the concept in Deleuze's original formulation.⁵⁶ Rather than being mere desubjectification, dividual space is seen to enact a liminal form of domesticity spread across the urban realm: it 'compensates, reproduces or replaces spaces and qualities associated with home' and 'serves as a kind of buffer zone for disparate and fragmented lifestyles produced by rapid demographic and cultural shifts in East Asia' (and beyond).⁵⁷ It also offers alternative forms of association beyond normative domestic arrangements such as the nuclear family. Through these temporary, non-committal forms of socialisation, domesticity is recast as 'a social condition that expands the possibilities of city dwelling.'⁵⁸

Yoshikazu Nango similarly notes that networks of 'intermediate' spaces and services in Tokyo represent an extension of home into the entire city.⁵⁹ Often characterised by solitary occupation in physical proximity with others, such spaces are entangled with the global increase in single-person households and individualised lifestyles, and the condition of non-stop digital connectivity. Nango stresses that amid this intensification of connection and disconnection across online and physical networks, it is important to distinguish between quantitative and qualitative forms of solitude – isolation and loneliness, respectively – that can greatly differ in degree and tenor depending on the context. Although such (in)dividualised forms of dwelling might be deeply conditioned by platformised patterns of consumption, they also harbour potential for new modes of sociability.

The problematic of dividual connectivity in the digital age is explored in two recent exhibitions of Japanese experimental housing: *House Vision 2*,

subtitled *Co-Dividual: Split and Connect/Separate and Come Together*, and *What is Co-Dividuality?*⁶⁰ The projects included in these exhibitions speculate (with mixed success) on novel forms of collectivity under the pretext of post-individualism, social media and the digital or sharing economy.⁶¹ [Fig. 2–3] More importantly, the interpretation of co-dividuality as ‘reconnecting individuals’ appears to gloss over the ambivalence inherent in Deleuze’s dividual subject, and risks reproducing the problematic status quo of contemporary co-living discourse, often permeated with an extractive platform logic. As Gorny summarises, ‘novel forms of shared living are not simply an extension of reformist/socialist debates on *Existenzminimum* spaces and collective forms of living’, but instead ‘must be approached through the (neoliberal) political economies (and ecologies) in which their capsular spaces facilitate a newly capturing form of relationality, which may well be at the verge of turning into a new kind of captivity.’⁶² A similar issue is latent in Sloterdijk’s aforementioned immuno-topological model of ‘co-isolation’, epitomised by the cellular modern apartment and its ‘autogamous’ inhabitant, who aggregate with others in ‘foams’ and interact within a digital ‘tele-socialism’.⁶³

Addressing this contradiction through the etymology of the term ‘dividual’, Gerald Raunig proposes a more nuanced topology of networked subjectivity as ‘condividuality’. Raunig contrasts the individual, characterised by dissimilarity, to the dividual, marked by similarity as con-formity: a partial, non-total relationality comprising a singularity in relation with others.⁶⁴ He distinguishes two restrictive modes and one generative mode of dividualisation: partition, ‘a procedure of counting and measuring, producing equivalence and quantifiability’ and inhibiting the concatenation of parts; participation, an organic partaking towards a totalising whole, in which the singularity of parts is erased; and conversely, division, a ‘re-singularization ... that engenders singular unambiguity in multiplicity.’⁶⁵ Corresponding to the third modality,

condividuality synthesises ‘the component of the singular, an affirmative mode of separation, and the component of composition, of concatenation, of the *con-*’.⁶⁶ In turn, Gorny builds on this notion of condividuality to theorise apartments as a topology that ‘transgresses the fine conceptual line between forms of separation (addressed in terms of living “alone together”) and modes of relationality (as living “together apart”).’⁶⁷ This (re)conceptualisation of apartments can also be extended to a broader consideration of networked subjectivity and forms of dwelling, involving not only spatial arrangement but a topology of mental belonging and material (dis)possession.

This topology finds resonance in a series of conceptual speculations by Cristina Díaz Moreno and Efrén García Grinda of the architecture practice *amid.cero9*, collected under the title ‘A Civilization without Homes’ (2000–2019), alluding to social historian Arthur W. Calhoun’s observation a century ago, with reference to the then-proliferating residential hotel lifestyle in the United States, that ‘our current capitalism is willing to try the experiment of a civilization without homes.’⁶⁸ This proposition is reworked in relation to the contemporary era. The first in the series, ‘hOH: Houses by the Hour’ comprises flexibly programmed domestic spaces as ‘incubators for anomalous forms of inhabiting’ in dense urban centres that opportunistically build on the decentred aspect of dividual space.⁶⁹ Conversely, the fictional city of Nocturnalia addresses the darker side of digital capitalism, drawing on Jonathan Crary’s notion of ‘24/7’, the non-stop temporality of global capital that has eroded even the boundary between wakefulness and sleep.⁷⁰ There are no conventional domiciles in Nocturnalia, and sleep – a profoundly useless and intrinsically passive activity – is practised collectively in a monumental edifice as a form of resistance ‘to a life exposed to the machinic process of the exploitation of our awakened existence.’⁷¹ Chapel of Collective Sleep and Peckham House represent variations on this idea, with the latter taking inspiration from a type



Fig. 2: House with Refrigerator Access from Outside by Yamato Holdings and Fumie Shibata, *House Vision 2 Tokyo Exhibition*, 2016. Photo: authors.



Fig. 3: Rental Space Tower by Daito Trust Construction and Sou Fujimoto Architects, *House Vision 2 Tokyo Exhibition*, 2016. Photo: authors.

of 'dividual space', the *jimjilbang* – a large public bathhouse equipped with shared sleeping areas, common in South Korea. [Fig. 4–5] The proposal comprises a dwelling prototype where 'collective rest and dispossession are practiced as a way of life.'⁷²

Taken together, these manifolds of condividual networks exemplify both the (platform) capitalist erasure of distinction between the will of the economy and the life of the subject through the modes of dividual partition and participation, and their convivial potentials as condivision. By reducing or relinquishing domesticity in the conventional sense, such experiments gesture towards radical forms of inhabiting and (dis)possession.

Commoning boundaries

The second contemporary manifold is a study in paradoxes. It consists of numerous instances in which contemporary architects, faced with the destabilising, boundary-eroding, atomising and desubjectifying forces of contemporary capitalism, seek to turn their attention back to the definition and composition of boundaries within systems. Despite it often being criticised as anti-systems or anti-relational rhetoric, commoning is in fact a deeply topological practice – one often based in a rejection of connection and reconstitution of boundaries. At the same time, apprehending these configurations topologically foregrounds their broader concern with the politicisation of boundaries, and the aforementioned (re)conceptualisation of architecture as a process of boundary-drawing. This pattern has recently reappeared in force in reaction to the rise of platform urbanism, seeking to resist or repurpose it through manifolds of collective assembly.

At one end of the spectrum, boundaries are conceived as limits that define both material form and political capacity. This position is well-illustrated in the research project *Platforms: Architecture and the Use of the Ground* by Pier Vittorio Aureli and Martino Tattara of Dogma.⁷³ [Fig. 6–7] As a counterpoint to the discourse of platform urbanism, the

project centres on the platform archetype as a material-ordering apparatus. Platforms are defined, in their physical, political and digital manifestation, as 'spaces that at once facilitate and condition use. The platform therefore embodies the quintessential meaning of institutional power since, like institutions, such structures are apparatuses of social order, their functions based on the stability of recurring patterns of behaviour.'⁷⁴ Dogma's architectural genealogy of the platform as a raised level surface spans from its prehistoric role in the beginnings of sedentary lifestyles to subsequent manifestations as 'means for both communal gatherings and social asymmetry.'⁷⁵ Through this emphasis on framing and delineating functions, the research aligns with Dogma's broader stance that architectural form serves to define and delimit space, thereby constituting a common ground from which to resist the commodifying flows of global capitalist urbanisation, including platform urbanism.⁷⁶ For instance, in an earlier text Aureli links the concept of the 'common' in architecture to that of 'type', interpreting the latter (via Aldo Rossi) as a structuring principle tied to a particular historical, social and political condition. Actualised in tangible urban artefacts, types constitute a common, inexhaustible, ideal realm of potentiality for giving form to the city.⁷⁷ In 'Platforms' Aureli and Tattara draw on formally austere examples such as Adolphe Appia's scenographic designs and Aldo van Eyck's playgrounds to espouse their 'defined and yet-unbound', utopian character that opens them to alternative uses 'beyond possession and control.'⁷⁸

Architectural form alone, however, is insufficient to realise spatial justice, as Dogma themselves admit. Underlining this limitation, Tim Gough asks: 'is not the reduction of architecture and its possibilities of resistance to questions of architectural form precisely that – a *reduction* to a limited area of concern which disturbs neoliberalism not one bit.'⁷⁹ Similarly, fixation on the autonomy of formal archetypes risks overlooking the politics inherent in the more fluid boundary-topologies crisscrossing



Fig. 4: Charcoal Bang. Drawing courtesy of amid.cero9. A Civilization Without Homes research project (2018–19) on Korean jimjilbangs presented in the SBAU 2019.

Fig 5: Sleeping Room Bang, detail. Image courtesy of amid.cero9. A Civilization Without Homes research project (2018–19) on Korean jimjilbangs presented in the SBAU 2019.

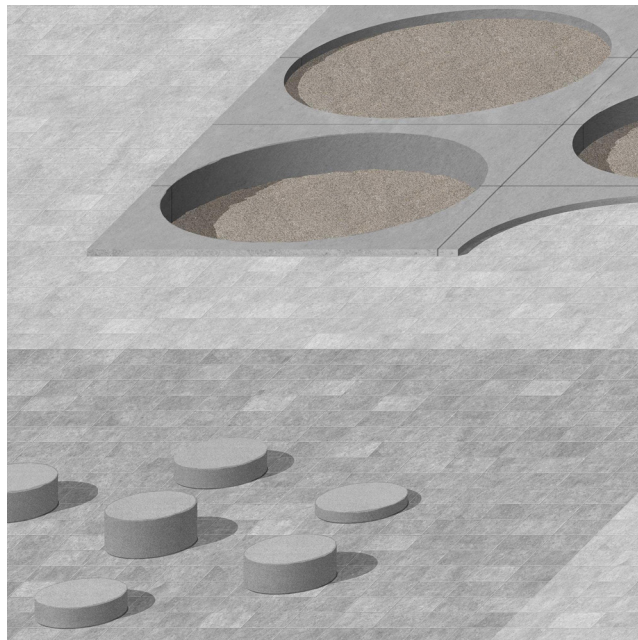


Fig. 6: Scenography for Christoph Gluck's *Orpheus und Eurydike* designed by Adolphe Appia, Festaal, Hellerau, 1909. From *Platforms: Architecture and the Use of the Ground*, 2019. Drawing courtesy of DOGMA.

Fig. 7: *Sumatraplantsoen*, Aldo van Eyck, Amsterdam, 1950–60. From *Platforms: Architecture and the Use of the Ground*, 2019. Drawing courtesy of DOGMA.

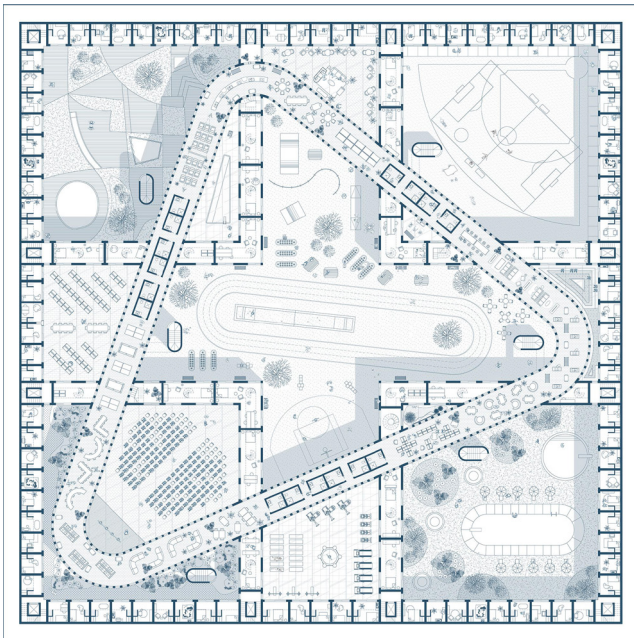


Fig. 8: 'Fields', from Commune Prototypes, 2021. Drawing courtesy of The Open Workshop.

Fig. 9: 'Figures', from Commune Prototypes, 2021. Drawing courtesy of The Open Workshop.

the contemporary city, including those of digital platforms. As Douglas Spencer reminds us,

The production and articulation of networks, the channelling of subjects according to preferred patterns of movement and association, in fact the very act of dismantling limits and boundaries is ... a political practice. It is the politics of this practice ... that needs to be contested, rather than discounted *tout court* as a manifestation of the unlimited.⁸⁰

Another, more processual approach considers the ways material assemblies interface with less formally determinate systems. This move parallels the shift from the relatively static notion of commons to that of dynamic 'commoning', as outlined in 'Commoning Domestic Space' by Neeraj Bhatia of The Open Workshop. Incorporating case-study research and speculative design, the project explores 'the dialectic of individual distinction and collective equality' through which 'the public realm becomes the arena for political negotiation.'⁸¹ It takes a critical stance on the proliferation of private micro-apartments and the individualistic lifestyles they promote, which are in turn enabled and complemented by services offered across digital platforms, from food delivery to remote storage. Conversely, the research surveys realised and unbuilt examples of co-housing, analysing the configuration of three components: 'hardware' (spatial arrangements and public-private interfaces), 'software' (social profiles of inhabitants, including family structure and practices of sharing) and 'orgware' (structures of governance and the distribution of labour, resources and power).⁸² In turn, five 'Commune Prototypes' derived from the study – titled 'Grids', 'Rooms', 'Figures', 'Fields' and 'Surface' – 'examine differing relationships between the private and public realm – from highly defined and delineated to fluid and malleable. In each case, a technique of form informs the typological arrangement.'⁸³ [Fig. 8–9] The focus on the interface between spatial, social and organisational arrangements provides a

critical lens onto the commodified permutations of co-living under platform-urbanism, which are often collective in name only. Yet despite the interest in relationality across hard/soft/orgware, the preoccupation with formal or geometrical distinctions in these prototypes hinders a more generative, topological understanding of the modulation of boundaries.

A thoroughly processual topology of boundaries is articulated through the notion of the threshold by Stavros Stavrides. As he argues, 'Thresholds may appear to be mere boundaries that separate an inside from an outside, as in a door's threshold, but this act of separation is always and simultaneously an act of connection.'⁸⁴ Against the 'archipelago' model of urbanism that informs a positive conception of limits (such as in Aureli's work), Stavrides conceives commoning as an ongoing process characterised by threshold spatiality and temporality. Common space is thus a liminal experience, 'not an accomplished state of things, a concrete materiality, but a process ... [that] keeps on producing those who produce it. The production and uses of common space cannot be separated.'⁸⁵ It follows that a radically relational notion of collective assembly exceeds spatial taxonomies based on legal, political or economic criteria as well as the binaries of public versus private and collective versus individual: common space 'keeps on destroying the boundaries between public and private not by absorbing one into the other ... but by transforming their historically shaped antithesis into a myriad of new syntheses.'⁸⁶ The threshold-characteristic of commoning, then, resonates with the broad assortment of boundary apparatuses elaborated in Teyssot's techno-ecological topology:

Unfolding their 'duplicity,' walls and fences, doors and windows – today, the various screens that organize the face (surface) and the interface of our mediating with the world – can lead to inversions and displacements. The door that closes is precisely that which may be opened, as the river is what makes a crossing possible.⁸⁷

Seen topologically, a common thread running through these manifolds is the way in which dwelling is enacted through the always-politicised process of articulating boundaries – whether amid a physical urban platform, across architectural thresholds or via electronic interfaces, or most likely, involving all of the above.

Distributed protocols

The third contemporary manifold takes the form of zooming out from the game pieces to the rules of the game, rethinking the topological protocols that underlie architecture and dwelling. It focuses attention on the relational substrate of environmentality – its modulatory, ‘protocological’ mode of control – and seeks to alter and subvert it through counter-protocols. Responding to the shift from disciplinary to control societies, Alexander Galloway appropriates the notion of the computer protocol – the rules that define and govern the operation of digital networks – using it to describe the underlying distributed logic of technological control of our environmentalitarian epoch. Insofar as ‘shared protocols are what defines the landscape of the network – who is connected to whom’, Galloway contends that resistance to the protocological forces of contemporary digital capitalism needs to take place ‘*through* protocol ... not against it’, by unfurling its restrictive topologies into more empowering ones.⁸⁸

These provocations find a clear architectural analogue in the work of Keller Easterling, whose conceptualisation of ‘infrastructure space’ and ‘medium design’ is inflected by topological thinking. For Easterling, space constitutes a medium in the sense of a milieu. Far from a backdrop to the objects of architecture, it is an information-rich substrate, ‘a soupy matrix of details and repeatable formulas that generate most of the space in the world’, from communication networks and global production chains to highway design specifications and suburban subdivisions.⁸⁹ Easterling argues that the architectural discipline, for the most part, is preoccupied with making ‘unique objects – like stones in

the water – whereas a constant flow of repeatable spatial formulas constructs a sea of urban space’.⁹⁰ In order to extend their reach and relevance, Easterling suggests that architects become proficient in the language of this ‘infrastructure space’ and learn to rework the logics underlying its relational arrangements. She refers to these logics as ‘disposition’, ‘the agency or potential immanent in an arrangement – a property or propensity within a context or relationship’.⁹¹ Topology is often used by Easterling in the specific sense of the ‘wiring’ of networks, but underlies her work in its broader sense of intensive relationships. It forms a part of the repertoire of redesigning disposition through spatial software or ‘*protocols of interplay* – not things but parameters for how things interact with each other.’⁹² Importantly, these protocols are not premised or based on digital networks or ‘smart’ devices; rather, digitality is recast as one among the many mediums of infrastructure space.

To illustrate this approach in the context of dwelling, Easterling’s ‘Subtraction Protocols’ explores various unfolding scenarios in which the demolition of housing becomes an opportunity for more convivial spatial arrangements. [Fig. 10–12] For instance, the ‘Forest/Jungle Protocol’ proposes to manage suburban sprawl and deforestation in Kenya through housing densification by leveraging a reduction in road infrastructure with burgeoning broadband connectivity.⁹³ Similarly, her ‘McMansion Protocol’ considers the North American single-family home through its capacities in addition to being a financial asset, such as material assembly, energy production, biodiversity, carbon storage and resilience to natural disasters. The protocol compounds these interdependencies to facilitate urban densification through strategic demolition.⁹⁴

In a recent co-authored article on relational infrastructures, Easterling and activist Kenneth Bailey explore public kitchens as an example of ‘relational platforms’.⁹⁵ Bailey and Easterling argue that, conceived as ‘essential infrastructure’, public, accessible kitchens have the potential to rewire

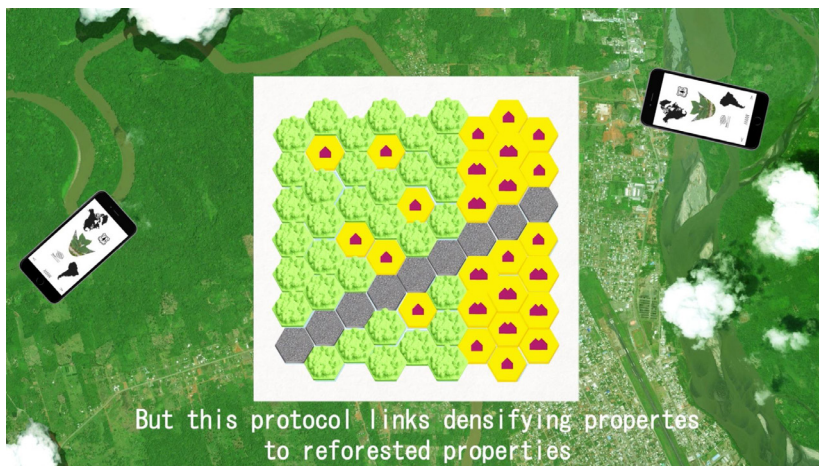


Fig. 10: Subtraction Protocol Forest/Jungle, 2014. Drawing courtesy of Keller Easterling.

Fig. 11: Subtraction Protocol Forest, 2019, video still courtesy of Keller Easterling.

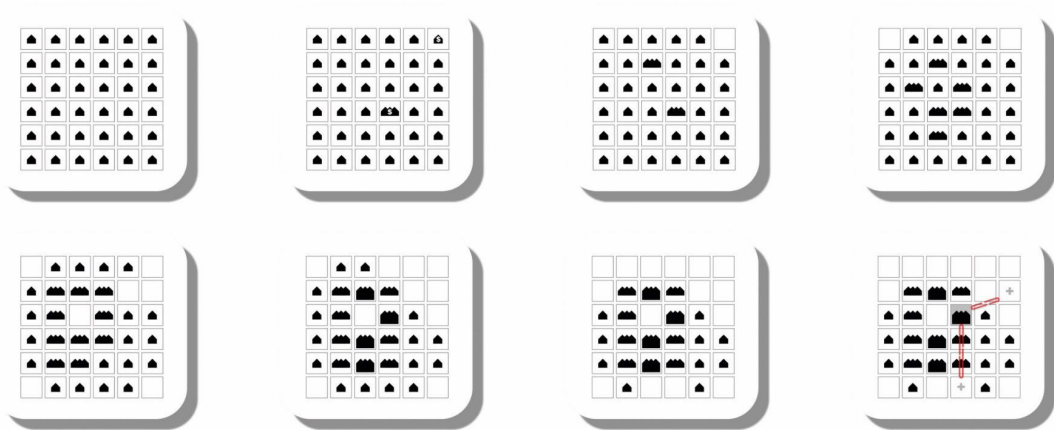


Fig. 12: Subtraction Protocol 1 McMansion, 2011. Drawing courtesy of Keller Easterling.

relationships in the city and ‘model completely new arrangements of communities’.⁹⁶ They further suggest that

the real power of relational infrastructures like transportation switches or alternative land holding organs and public kitchens is the way that they can make something from almost nothing in a way that benefits many. They do not always require steel or concrete. Even a modest investment can generate new physical arrangements in space and create compounding decommodified values in a community economy.⁹⁷

Involving both ‘heavy’ spatial variables and reconfigured material, economic and social relationships, these protocols exemplify a topological rethinking of (platform) urbanism and domesticity beyond the limited sense of digitally mediated interactions. In a sense, architects and designers already tacitly engage systems in this manner; however, this approach can be made more explicit, extended, and refracted into theory. In this way, the examples from the previous two sections may also be productively read through this counter-protocological approach, recasting them as protocols of conviviality and commoning.

Conclusion

In all of the aforementioned examples, the key shift is toward a topological understanding of architecture and space, using its relational character to critically reflect on the way designs relate to systems of power and control. This shift positions architects to respond to the increasingly relational, systemic, protocol-shaped, and digitally mediated nature of both governance and dwelling. A topological approach creates potential by allowing new modes of mapping, critiquing, resisting and subverting the unequally distributed agency and power underlying the circuits of platform urbanism, and environmentality more generally.

Topology provides resources to analyse and critique these restricted manifolds, and also

engenders a broader, radically relational reconceptualization of dwelling across spatial, technical and social ecologies. For instance, the examples under ‘convivial networks’ engage the reality of digitally mediated, networked living and speculate on its potentials beyond extractive models such as platform-managed co-living or the encroachment of Big Tech on housing. Crucial in these proposals is the particular topology of conviviality – the delicate interplay of belonging and dispossession – which determines where they land on the spectrum of conviviality and alienation. Conversely, experiments in ‘commoning boundaries’ generally begin from an opposition to the often depoliticising force of distributed networks and rally around forms and practices of collectivity. Seen through a topological lens, the efficacy of these approaches hinges on the extent to which they conceive commoning not as ground-making but boundary-drawing – selectively filtering, framing and connecting entities across material, technical and social realms. Finally, ‘distributed protocols’ take aim at the environmentalised, modulatory logics underlying platform urbanism, simultaneously unmasking its restricted topologies of decentralised power, and pursuing alternative entanglements. This last trajectory remains largely to be explored by architects, and thus harbours the greatest potential.

Topological modes of thinking help us apprehend the boundary-drawing processes through which relations are materialised and articulated – ‘cut together-apart’, as Barad puts it.⁹⁸ Contemporary manifolds of dwelling involve both entangled material arrangements and digital networks. They are not static enclosures or flat surfaces; instead, they are dynamically (re)configured and, in turn, they reconfigure us. The topologies embodied in these interactions shape varying degrees of agency, democratic control and possible forms of association. Architects and designers have recently employed topological modes of analysis to treat these as key arenas of investigation and sites of spatio-political struggle. For these designers,

thinking the architecture of dwelling topologically brings questions of ethics and politics into sharper focus.

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Biography

Roy Cloutier, Nicole Sylvia, and Lőrinc Vass are the founding members of Contingent, a multi-disciplinary research and design collective established in 2017 in Vancouver. Contingent's work seeks out new material and social arrangements and forms of coexistence attuned to contemporary social and ecological challenges. Recent drawn and written speculations examine agency, control and indeterminacy in design, specifically focusing on spatialisations of collectivity, decentralised domesticity, emergent nature-cultures, and drawing as a commoning practice. These have been published in numerous books, journals, and conferences – most recently in *Footprint*, *Bracket Journal*, and the book *Design Commons: Practices, Processes, and Crossovers* (Springer). In 2022, Contingent's design and research project *Lots in Common* received first prize in the Urbanarium Mixing Middle Competition. Roy Cloutier and Nicole Sylvia are adjunct professors at the School of Architecture + Landscape Architecture at the University of British Columbia, and architectural designers at Patkau Architects in Vancouver. Lőrinc Vass has taught at UBC SALA as a sessional lecturer and is an architectural designer at Pechet Studio in Vancouver. Web: www.contingent.site