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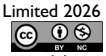
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Image, screen, projection: Conceptualising the urban (imaginary) in digital visual culture

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Abstract

This article examines the implications for theorising the concept of the 'urban imaginary' in the context of digital visual culture. In digital visual culture, the vast majority of images are designed, circulated and displayed using software, data networks and screens of various kinds. The literature on urban imaginaries has long acknowledged that cities are mediated by images as much as by various kinds of other media, and significant attention has been given to specific visual media including films, documentary photography and maps. This remains the case when visual culture is digital. However, digital images have a particular techno-cultural materiality which also has implications for their co-constitution of the urban. In digital visual culture, visual imagery is dominated by animations, shaped in part by the affordances of computer graphics software. These images require screens and data networks to become visible, which also mediate the infrastructure of cities both materially and imaginatively. Moreover, onscreen digital visual content materialises as an ambient atmosphere projected across and between screens and gazes (human and not). This networked, screenic projection is now sufficiently pervasive to constitute a significant form of urban spatiality. Hence the paper proposes that in digital visual culture, visual urban imaginaries can no longer be theorised only as representations of an urban reality. Instead, onscreen images must be theorised as enacting a form of the urban itself, in three ways: in their visual content, in the material emplacement of their networked screens, and in their projection into and as urban space.

Keywords

urban imaginary, digital visual culture, urban screen, technocultural, projection

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摘要

本文探讨了在数字视觉文化背景下，对“城市想象”这一概念进行理论建构的意义。在数字视觉文化中，绝大多数影像都是使用软件、数据网络和各种屏幕进行设计、传播和展示的。关于城市想象的相关文献早已指出，城市的媒介化建构既依托其它各类媒介，也同样借助影像来实现，其中，电影、纪实摄影与地图等特定视觉媒介尤其受关注。即使视觉文化是数字化的，情况仍然如此。然而，数字影像具有特殊的科技文化物质性，这一属性也对其与城市的共同建构进程具有影响。在数字视觉文化中，视觉意象主要由动画构成，这在一定程度上受到计算机图形软件可供性的影响。这些影像需借助屏幕和数据网络实现可视化，后者也会从物质和想象两个层面，对城市的基础设施产生媒介化作用。此外，屏显数字视觉内容会具象化为周遭环境氛围，这种氛围既投射于各屏幕和各类（人类与非人类的）凝视，也流转于它们之间。这种网络化的屏显投射如今已高度普及，足以成为重要的城市空间形态。因此，本文提出，在数字视觉文化中，视觉城市想象不能再仅仅被阐释为城市现实的表征。相反，屏显影像应被阐释为城市形态的践行载体，具体体现在三方面：视觉内容、网络化屏幕的物质空间布局、影像的城市空间投射及空间化。

关键词

城市想象、数字视觉文化、城市屏幕、技术文化、投影

Received: 25 October 2024; accepted: 1 December 2025

Introduction: Imagining cities in digital visual culture

This paper offers a theorisation of the contemporary entanglement of cities and digital imagery. It has been clear for several decades now that the world is being mediated more and more by images that are produced, processed, circulated and displayed through various digital devices. Nakamura (2007: 1) suggests that the release of the web browser Netscape Navigator in 1995 ‘heralded [the Internet’s] transformation from a primarily textual form to an increasingly and irreversibly graphical one’, and a few years later Manovich was confident enough in the significance digital imaging software and displays to announce ‘the shift of all culture to computer-mediated forms of production, distribution and communication’ (Manovich, 2001: 19). Various key aspects of this shift have been identified. Most obviously: there are simply more images in existence now, they circulate through digital networks, and they are visible in very many more situations: photographs have been described as ‘ubiquitous’, their numbers as ‘off the scale’ (Dvořák and Parikka, 2021; Hand, 2012), for example, not least because all the major social media platforms are image-intensive. Moreover, the sheer number of digital images has been argued to be changing human relations with the world. By the turn of the century, many scholars were noting that

> we live in a world of the image. The very idea of the self, the ways in which we make sense of the world, the means by which we communicate, have all become invested in, and developed through, the visual. (Fuery and Fuery, 2003: xiv; and see Mirzoeff, 1999)

Two decades later, it is suggested that being surrounded by digital imagery is generating a constant, anxious ‘camera consciousness’ (McCosker and Wilken, 2020), and that the digital visual effects so pervasive in popular cinema are reconfiguring affective sensibilities (Christiansen, 2017; Denson,

2020; Shaviro, 2010). Although much of this scholarship is somewhat hyperbolic and over-generalised, lacking any reflection on exactly who might be so disoriented, where and why (Bassett et al., 2020; Degen and Rose, 2024), it is the case that something seems to have shifted in contemporary visual culture.

'Visual culture' is a term coined by the art historian Alpers (1983) (with a nod to Michael Baxandall), in an examination of images in (and often of) the towns and cities in 17th-century Holland. She noted the proliferation of images there too: book illustrations, tapestries, table linens and tiles, as well as paintings and prints; there were many kinds of images, including maps, rural landscapes, scenes of domestic life, panoramic city views and illustrations of scientific instruments and human body parts. Alpers used the term 'visual culture' to refer to a specific way of understanding the world which was expressed across this wide range of image media and genres. In Alpers's work, 'visual culture' thus refers to the importance of pervasive images in understanding the world, and to the way that so many different images constituted a specific form of that understanding.

The notion of 'visual culture' has been widely discussed and debated since then. For many critics, it aligns too closely with a humanist form of art history, and certainly the notion of 'culture' is not very popular in digital media studies currently. The preferred term seems to be 'imaginary', and this is a term that has for some time also convened significant urban scholarship. In their investigation of the urban imaginary, Lindner and Meissner (2018: 1) note that 'contemporary urban studies increasingly acknowledges the role that imagination plays in shaping cities'. Visual imagination is a particularly important means of making sense of the urban. As very many scholars have demonstrated, there is a long history to the display, interpretation and management of urban environments and urban life, using a vast range of visual media and techniques, in many situations: planning, entertainment, infrastructure, speculation, navigation, sociality, to name a few. What these images show co-constitutes how the urban is seen, spatialised, what it signifies and how it is acted upon. To the extent that similar ways of seeing are distributed across many such images, they can be conceptualised as a visual culture – which is now predominantly digital.

This article argues that one of the most important consequences of the mediation of urban imaginaries in digital visual culture is a need to understand images not only as representations of the urban, but also as themselves materialising a distinctively urban technocultural environment (cf. Leszczynski, 2015). That is, the significance of a digitally-mediated visual imaginary for the urban emerges both from what images display but also, crucially, from their presence on networked screens in cities and the effects of the constant flow of images that scroll across, project from and hybridise between and across those screens in urban space. There is a 'material politics' to this imagery which requires attention if analyses are to be adequate to the present moment of very many urban situations (Bissell and Fuller, 2017).

The article proposes that there are three component parts of digital visual urban imaginaries – animated images, networked screens and luminous projection – and that these are technocultural because they are co-constituted by both their material affordances and imaginary framings. This article also argues that the digital urban imaginary both pictures the urban and is located in the urban, and that it is reconfiguring the urban itself in both these registers: as visual content and as a kind of infrastructure or atmosphere. Visual urban imaginaries can therefore no longer be conceptualised only in

terms of images' visual content, but must also be theorised as a technocultural enactment of the urban as a screen-dependent, digitally-networked environment. Conversely, the urban environment must also be conceptualised as mediated by the technocultural materialities of the digital screens it hosts. The paper thus offers a conceptual framework for understanding the visual urban imaginary in digital times which also reframes the urban itself.

Conceptualising visual urban imaginaries

The notion that there is a relation between 'the urban' and imagery of cities has been elaborated in various ways. This article draws on two approaches to that relation. These are by no means exclusive, and the short summaries offered here inevitably obscure nuance and complexity. Nevertheless, these sketches clarify this article's conceptualisation.

One body of work elaborating the relation between imagery and the urban is in a humanist tradition and focusses on unpacking the many meanings embedded in urban imaginaries. Often working with archival materials, these accounts carefully excavate meaning from images, often through iconographic analyses of cultural signs and symbols. In this literature, urban imaginaries are 'the interpretive grids through which we think about, experience, evaluate and decide to act' in and on urban spaces (Soja, 2000: 324) ,

> constituted by the interplay between [urban] spaces and its imaginations. The bricks and mortar do not exist apart from representations, nor are our ideas without material consequences […] The city is both the actual physical environment and the space we experience in novels, films, poetry, architectural design, political government, and ideology (Prakash, 2008: 7).

This body of work draws upon a range of theorisations – of imaginaries as worldviews, or semiotic systems – but it configures urban imaginaries most often as shared cultural interpretations lightly theorised as 'representational discourse' (Watkins, 2015: 508) in which the materiality of the city is a text to be read (cf Duncan, 1990).

The emphasis on the imaginary as an act of human interpretation – both a subject of study and a methodology – is also evident among some digital media scholarship, where the concept of the imaginary has been mobilised to refer to the values, meanings and feelings which configure the material affordances of technologies (for a review of this work, see Mager and Katzenbach, 2021). This use of the term imaginary is not dissimilar to its use in the literature on urban imaginaries: imaginaries are collectively held interpretations of the (urban/digital) world. Moreover, both literatures tend to approach images as pictures, in the sense that Berger defined a picture. A picture, according to Berger (1972: 9–10),

> is a sight which has been recreated or reproduced. It is an appearance, or a set of appearances, which has been detached from the place and time in which it first made its appearance and preserved – for a few moments or a few centuries.

Berger's definition was implicitly based Benjamin's analysis of the circulation of photographs of paintings (Manghani, 2013: xxv); it assumes that an image is a single object, which represents an entity in the world, and which can be studied using interpretive techniques. This approach to images is pervasive in humanist approaches to imagery, which tend to assume that images are representations of an urban that exists separate from them, even if it can only be interpreted imaginatively.

A somewhat different approach to imaginaries is more attentive to the co-construction of the urban by particular

deployments of various visualising technologies. Scholarship in this vein is often embedded in science and technology studies, and thus tends to focus more on the agency of technical devices and on the practical techniques which deploy them. Hence Schulz (2023) argues that the notion of the imaginary should encompass not only human perceptions about technologies but be extended to describe the material logics of a technology itself: in his discussion, to algorithms. Many studies of urban mapping, aerial photography and photogrammetry, both historical and contemporary, argue that various technologies – including cameras, balloons, aeroplanes, lidar, drones and satellites – have specific material affordances which are mobilised by the 'professional vision' and techniques of planners and urban managers, among others, to generate their technocultural comprehension of the urban (Goodwin, 1994; see also Dawes, 2014; Carlsson, 2022; Kurgan et al., 2019; Söderström, 1996; Wilken and Thomas, 2022). Hence:

> Through its entanglements with the evolution of urban planning, we can see the role of urban media as not simply representing the diverse conditions of urban transformation, but as helping to constitute the very production of urban space. This history sheds a different light on the nature of urban media technologies, suggesting it is not so much that urban media – whether those of historical eras or the smart technologies of more recent times – finally capture the true complexity of cities, but rather that they recalibrate urban knowledge and expertise in their own image. (Barns, 2020b: 236–237)

This work thus also has a strong sense of the way that images, technologies and practices mutually assemble and co-constitute. It tends to what Watkins (2015: 509) describes as more 'performative' conceptualisation of imaginaries, in that it is attentive to how specific technologies and practices enact imaginaries. As a consequence of this emphasis on the co-constitution of objects, practices and imaginaries, this approach often generates more-or-less ethnographic accounts of the epistemic consequences of the use of specific (visualising) technologies in particular locations: dashboards in control centres, for example (Luque-Ayala and Marvin, 2020; Tkacz, 2022), or post-it notes in the workshops held as part of urban redevelopment processes (Mattern, 2020), rather than the textual interpretation favoured by the previous approach described in this section.

The argument of this article adheres most closely to this second approach. It assumes that the digital technologies that picture cities have some distinctive qualities, which are interpreted and put to work in particular ways. These are multiple, but the paper is particularly interested in how specific forms of imagery are themselves agential in the urban environment. The materialisation of visual media in the urban environment is a strong theme in some feminist accounts of the visual mediation of cities a century ago, from Friedberg's (1993) discussion of department stores and cinemas (and see Bruno, 1993) to Sluis's (2016) discussion of posters, films, advertisements, architecture and window displays in post-revolutionary Mexico City. In these discussions, the material manifestation of visual culture is critical not only for its visual content which displayed specific forms of urban life and which thus co-constituted that life, but also for its embedding in everyday urban spaces; and that embedding also constituted the urban in the enactment of an ongoing multiplicity of images and ways of seeing. In this work, the visual mediation of the urban consists not of pictures or images alone, then, but in the situation of their embodied experiencing in and as the urban everyday (see also Eggeling, 2025; Klausen, 2017; Lundberg, 2025).

Citing that feminist scholarship brings the paper into a relation with a number of recent discussions about what are often described as the 'affective' qualities of living with digital urban technologies. Attention has been paid to the 'intimate entanglements' between platforms and everyday urban life (Barns, 2020a: 157; and see e.g. Bissell, 2020; Leszczynski, 2019), and to smartphone apps more broadly (Rose et al., 2021), and there are discussions of a more general sense of urban atmosphere generated by particular configurations of digital devices and urban practices (Degen and Rose, 2022; Sumartojo and Pink, 2019). The notion that mediation should be understood as a habitat or environment is also current in media studies (for a review, see Bao et al., 2023). Such atmospheres are not only visual, of course: aural technologies are also often described as immersing their human users into spaces assembled by the materialities of a device and its digital content (Bull, 2007; Walsh, 2024). Whether visual or aural, though, all this scholarship emphasises the mediated entrainment of bodily experience into the organisation of urban spatiality as environmental surround.

This article aligns with these latter approaches to the technologically mediated co-constitution of urban life and environment. Given the importance of images to digital technologies, including many of those that are configuring urban space and experience now, it focusses on theorising the visual imaginaries of cities and their mediation of the urban. The following section conceptualises the digital visual mediation of the urban as a material environing in more detail.

Conceptualising the digital mediation of visual urban imaginaries

The task of conceptualising urban imaginaries as mediated by visual culture means tracing the complex interrelations between the visual content of imagery, its technological affordances, and embodied forms of seeing, all of which are both material and imaginary. Onscreen images mediate the urban world, and in digital visual culture they also enact a particular form of urban environment. This is a theoretical point relevant to all forms of urban imagery and the practices in which they are embedded (Rose, 2022). This section analyses how the specificity of digital visual culture configures those interrelations.

Animated images

First, the content of imagery. The appearance of digital images remains critical to the understanding of their effects. Digital images can show all kinds of content, although many still resemble photographs, maps and movies, as those visual genres have emerged historically, and continue those histories of making specific epistemic claims about the urban (Dawes, 2014). However, many scholars have proposed that contemporary digital visual culture should be theorised as animation. An animation is, simply, an image with visual content that changes as it is watched. The vast majority of digital imagery is animated: the content of an image itself transforms, its point of view moves, images constantly scroll across screens offering changing visual content, even the liquid crystals in digital screens morph as images are displayed. Hence animation is 'the dominant medium of our time' (Levitt, 2018: 1; see also Buchan, 2013; Denson, 2020; Leslie, 2017).

Animation is not an inherently digital medium, of course, but the affordances of computer graphics software have intensified its effects. Such software enables the mutation of what an image pictures, and a single flowing image to integrate multiple components. The seamless mutation of one kind of

remediated image into another is a key feature of digital animations: 'digital environments blend such disparate image sources as live action and animation, still and moving photographic images, paintings in 2D and 3D, and objects modelled in computer space and textured with photographic or painted details' (Prince, 2012: 7). This remark is made in the context of a discussion of the digital effects used in movies, but it is also evident in many digital animations of cities: an aerial photograph morphs into an glowing wire-frame, or a map into a massing study (Rose, 2017), to the extent that it is hard to know how to describe them as anything other than an animation. That blurring of what were once distinct visual genres – and which could be studied as such by scholars of the urban imaginary – is a defining characteristic of digital visual culture. This visual fluidity should be understood as articulating the many ways in which contemporary life is mediated by data and software (Rose, 2026), such that animatic visual culture is 'moving away from the categorical, ontological distinctions of the cinematic regime to the modes of appearance, metamorphosis, gesture and affect' (Levitt, 2018: 17).

The transformative potential of software-generated animations is configured by (at least) two powerful constraints that are both technological and imaginary, however. As Gaboury (2021) and Cardoso Llach (2015) demonstrate in their histories of computer graphics software and computer-assisted design, fundamental to the softwares that create digital animation is an assumption that the world must be visualised as 'a spatially embodied field of discrete computable objects' (Gaboury, 2021: 17). Urban life in digital visual culture is thus frequently visualised as an accumulation of objects defined geometrically and positioned in three-dimensional space, in imagery as diverse as city digital twins, movies and computer games (Rose, 2025). Buildings are objects, people are objects, and light is ray-like and beams onto and bounces off such objects. 'Volumetric representation becomes the so-called natural infrastructure of computer animation' (Galloway, 2014: 66) . While certain genres might stretch and bend volumetric space (and some film scholars argue that certain 'post-cinematic' action movies break its rules (Christiansen, 2017)), very many more hold to them. The second constraint is what Prince (2012) terms 'perceptual realism', which strives to make animations look as if they were photographs. This points to the widespread use of standards of photographic realism in for example computer games, advertising and movies, in which software is used to build 'something which has perfect photographic credibility, although it was never actually filmed' (Manovich, 2016: 22). A few examples would include the second version of the hugely popular city-building computer game Cities: Skylines, which replaced the cute graphics of its first version with an increasingly familiar mash-up of photographic realism and computer-game glow; Massive, the most widely-used professional software which processually generates crowds of people for movies and architectural renders, and which boasts again and again of the realism of its figures and their interaction; and Unreal Engine (Malazita, 2024). Unreal Engine is a software for building and playing computer games and is now used to create many animated urban scenes, from games to architectural renders to virtual reality experiences to city digital twins to movie visual effects, and which again repeatedly valorises its visual 'realism'.

While various versions of three-dimensional geometry and perceptual realism are so widespread as to be hegemonic in digital visual culture, animations can deploy many visual conventions, and these certainly require specific analyses in terms of their

epistemic claims to know the urban. However, this paper moves now to conceptualise how, in addition to their visual content, onscreen imagery in digital visual culture also constitute particular 'habitats and materials through which we think and act' (Peters, 2015: 15).

Networked screens

In digital visual culture, 'the image coincides with the screen' (Hoelzl and Marie, 2015: 6). Screens are necessary for digital images to become visible to human perception, and they are also material objects that occupy urban space. In other words, as well as 'a surface/means for displaying images holding their own spatial representations', the screen is also 'an object that in itself has spatial extension and that parts and defines the physical/actual space in which it is placed' (Sœther and Bull, 2020: 14). This subsection and the next interrogate the form of that screenic 'spatial extension'. The form of that extension is not self-evident, because, like the images displayed onscreen, it is both material and imaginary.

Just as digital imagery has been described as ubiquitous, so too have screens (see for example Bruno, 2014). Indeed, many urban dwellers frequently encounter screens: watching a film on a streaming platform or YouTube on a phone or tablet; watching a sports spectacle on a giant screen; posting a selfie on Instagram; sending a video message via Snapchat or a photo on Whatsapp; travelling with Uber, StreetMapper and Google Maps; playing games; glancing at advertisements on Facebook; searching for hashtags on X or TikTok; checking in on FourSquare; glancing at animated onscreen advertisements in buses and train carriages. Held in hands, propped up on shelves, installed on the walls of buildings and metro subways, in buses or freestanding in squares and piazzas, screens substitute for shop names and cafe menus, or show 24/7 news channels and sports events; they display advertisements and public health messages, art installations and public transport information; orders in fast food outlets are now placed onscreen in the shop or on an app (Krajina, 2014; McQuire, 2016). These screens:

> are not partitioned off from the popular realm of consumption, and which proliferate and multiply in heterogeneous spaces. These images are not only in multiplex cinemas, but […] appear on buildings throughout our cities in the form of public projections and advertising screens. These images fold themselves around material objects and are inset into corners, walls, and floors, perceptually distorting the contours and edges of our familiar spaces […] they form a constantly present other dimension, just next to us, looming above us, or around the corner, where consistency and predictability break down, like another world pressing against our own, trying to lure us in. (Strutt, 2019: 30)

The sense that screens carry 'another world pressing against our own' indicates that the 'spatial extension' of screens exceeds their display frames. A fundamental feature of digital images is that, like any data, they move between various screens and storage devices. Digital visual culture requires digital infrastructure (Dewdney and Sluis, 2022). Without the digital infrastructure that processes and circulates digital image files, digital images are data invisible to human perception. And cities are increasingly full of that infrastructure. Indeed, it has been suggested that the extension of digital networked media throughout urban space is 'one of the key features distinguishing 21st-century urban experience from earlier modes of urban inhabitation' (McQuire, 2016: 1). This infrastructure is diverse, and, like other communication technologies, its screens and

also its cables, dishes, towers, servers, data centres and so on all change urban morphologies (Mattern, 2017). It enables digital images to move from location to location, with screens acting as temporary materialisations of visual data content:

> [Digital screens] serve to capture these images, to make them momentarily available for someone, somewhere – perhaps even in order to rework them – before they embark again on their journey. Therefore screens function as the junctions of a complex circuit, characterized both by a continuous flow and by localized processes of configuration or reconfiguration of the circulating images. (Casetti, 2013: 17)

Images become temporary events as much as signifying texts (McQuire, 2016: 5), 'a succession of "nows" ' as they stream across screens (Rodgers, 2022: 226).

However, screens are both networked and imagined as such; networks are as much part of 'our contemporary connectionist imaginary' as they are an infrastructure (Munster, 2013: 1; see also Albrecht et al., 2021). Wilson (2014), for example, demonstrates the work that was done in the 1990s to sell the Palm Pilot handheld device by making continuous connection to communication networks a requirement for the modern businessman (sic), and an imaginary of connectivity is fundamental to digital visual culture. Some public screens livestream video to offer 'global interconnectedness' – as was claimed for a screen 'portal' between Dublin and New York in 2024 (Salam, 2024; and see Mcquire, 2010) – but ordinary smartphone use is also imagined in terms of networked connections. There is that widespread sense among social media users that 'beyond' the app's interface, on the platform or in the cloud, for example 'the algorithm' is at work shaping what appears to the user (Barns, 2020a; Bucher, 2017); or that phones are listening to conversations. The constant delivery of new onscreen content in what is imagined as 'real time' also contributes to a sense that screens are part of a broader web that scaffolds everyday urban life (Weltevrede et al., 2014). Both infrastructure and imaginary therefore contribute to 'these new environments of vision [which bring] an "elsewhere" to our "here", by reaching us where we already are … It fills our "here" with all possible "elsewheres"' (Casetti, 2015: 131). The spatial extension of screens is thus configured in part by their networked-ness which is both imaginary and material.

Environmental projection

Digital visual culture displays particular kinds of imagery of cities, then; and that imagery is seen on urban screens experienced as networked. This subsection argues that the third distinctive characteristic of urban imaginaries in digital visual culture takes the form of 'projection'. Bruno (2022) defines projection as the situation in which an image is created on a screen by the transmission of light; in their account, the projection of onscreen imagery constitutes an atmospheric environment which is a 'compenetration of the body and the body of things' (Bruno, 2022: 11). In the context of networked screens, projection should also be understood as the way an image on a screen emits light, since that luminous projective transmission also generates certain kinds of environmental atmospheres. Projection, then, is a form of screenic spatial extension – like networks (see also Casetti, 2023). This subsection elaborates that extension as technocultural, and argues that it constitutes the third component of digital, visual, urban imaginaries.

Like Strutt (2019), quoted earlier, Bruno is keenly aware of what she describes as:

> the ever-present environmental screen-effect within which we now live. We no longer face

> or confront a screen only frontally but are rather immersed in an environment of screens. We move within a continuous world of projections that extend from the exterior walls of the architectures of our cities all the way to our homes and offices, and to the screen extensions constantly attached to the palms of our hands. (Bruno, 2014: 102)

While this is empirically over-generalised – not all places are intensively networked, or imagined as such – the previous subsection has already listed many examples of screens in the urban everyday, emphasising their animated, networked display. Working with the notion of projection emphasises their throwing forth of light: the luminous beams and colours of the many screens that inhabit urban space. As well as extending through the networks of electronic data on which they depend, screens of all kinds extend glowing, changing digital animations as images twinkle and stream. Animated imagery fluctuates, dilates and expands out from screens large and small, bright and dim, hyperreal and wretched (Steyerl, 2012), in a morphing, luminous energetics.

Although the importance of luminous animated colour has been remarked as part of the digital mediation of life under 'knowing capitalism' (Thrift, 2012: 154), there has been rather little discussion of either the material affordances of onscreen colour or its imaginary constitution (though see Kane, 2014; Leslie, 2017). While considering the effects of light in urban space is not new (McQuire, 2008; Otter, 2008), the animated qualities of digital screens are somewhat distinct. Colours can be particularly intense; they can appear across very large screens; they shift as onscreen images transform; they envelop visitors in 'immersive experiences' (Christie, 2024). This projective environment of data and/as light is also as much imaginary as technological; Bruno (2022) insists that projective atmospheres are imaginative as much as material. Indeed, the digital itself is frequently visualised – onscreen, by computer graphics software – as webs of (usually blue) light streaming over and through urban environments in online advertisements, puff pieces, stock image archives and movies (Rose, 2018); conical Wi-Fi icons pulse outwards carrying data; and digital neon glow is central to the visual imaginary of sci-fi images of future urban life from *Bladerunner* to *Ghost in the Shell* to *Andor*. The glow of screens held in hands, or on/as walls, glanced at, studied or glimpsed, is therefore now an unavoidable element of many urban environments, as a presence both material and imagined.

The projective, environmental quality of networked screens is intensified in many city spaces by its participation in a more extensive, ongoing efflorescence of multiple gazes, transmissions, displays, recordings, observations and operations, by humans and by many kinds of cameras and other sensing devices. Humans take and share innumerable photos with phone cameras, but many visualisations of urban life are also produced and processed automatically by light-sensing devices, not all of which are made perceptible to human vision. Many urban locations are watched by surveillance cameras of various kinds; in some cities, bodies are scanned by the devices attached to autonomous road vehicles, or robots; Google Street View cars photograph streets and their inhabitants; cyclists wear GoPro cameras and cars carry dashcams; in some cities, drones map people (as well as terrain and buildings); cameras monitor traffic and recognise car number plates. Popular culture is full of discussions about, and picturing of, surveillance and privacy, figured as an ubiquitous harvesting of visual data, from the *Bourne* movie franchise to the tv series *Black Mirror* (Cirucci and Vacker, 2018; Flaxman, 2018). The notion of projection could perhaps be expanded therefore to reference the many forms of digital signals which saturate the urban,

including Wi-Fi and Bluetooth, in multiple configurations of cameras, screens, image-making and image processing: what has been described as 'the network of spatio-temporal relays through which technical objects are diffracted' (Munster, 2014: 151). In many urban spaces, then, human life is enfolded in 'a decentralized, always-incomplete network of ubiquitous computation and calculation, one that incorporates the myriad perspectives of environmental objects in its matrix of observation and action' (Sherman, 2023: 1210).

In this context of digital visual culture gone environmental, it is no surprise that more and more urban screens now resemble less flat windows which frame imagery (cf Friedberg, 2006) and more animated walls, floors and ceilings – nor that research methods are adapting to engage with this environmental matrix (see e.g. Powell, 2024; Van Es and de Lange, 2020). Remediating earlier immersive installations including panoramas and 3D cinema screenings, many cities have IMAX screens; some also host three-dimensional billboards that loom out from the sides of buildings, or buildings carapaced with external screens like the Orb in Las Vegas or the semi-open build of London's Outernet, with its apparently huge roof volume; or immersive art shows, all of which are networked. They are also projected still further in that 'matrix of observation' by their visitors' constant use of camera-phones to film the screens and themselves (Christie, 2024). All of this both enacts and displays this form of environmental projection, in which multiple luminous screens and flows of light and data are embedded in, and constituted as, urban experience as visual surround.

Digital visual urban imaginaries should therefore be theorised in terms of their configuration of the everyday urban as an energetic, luminous accumulation of animated screens and networked flows. Interrogating the urban imaginary as mediated by digital visual culture demands attention not only to images but to their dispersal across urban space and to the 'embodied registration of ambient co-habitation' with them (Frosh, 2019: xix), in a projective environment of data (as) light. In short, imaginaries of the urban in digital visual culture must be understood not only in terms of the content of images but also in terms of an extended technocultural environment configured through their networked projections.

Conclusion

The digital mediation of cities has been addressed for decades by a very wide range of critical urban scholarship, of course. Much of that work has focussed on the materialities of digital infrastructure and the political economy of data extraction in the context of smart cities and platform capitalism. This is vital work, and this paper could have said much more about the alignment of the urban imaginary it has evoked with the datafication of life advocated by an overwhelmingly corporate 'smartness mandate' (Halpern and Mitchell, 2022; Rose, 2026). Moreover, this paper shares with that work its deep interest in infrastructure and data. After all, onscreen visual content is digital infrastructure and data all the way down:

> The image is no longer a passive and fixed representational form, but is active and multiplatform […] It is no longer a stable representation of the world, but a programmable view of a database that is updated in real-time. It no longer functions as a (political and iconic) representation but plays a vital role in synchronic data-to-data relationships. (Hoelzl and Marie, 2015: 3–4, 7)

To emphasise the centrality of (visual) imaginaries to urban data is not, therefore, to be distracted by seductive ornamentation or ideological spectacle or excitable hype.

Rather, it goes to the very constitution of much urban life now, and suggests that accounts of digitally-mediated urbanism need to take its visual imaginary much more seriously, as a constitutive part of that mediation. To ameliorate this neglect of visuality as a relation and not (only) an image (Lancione and Simone, 2025), this paper has identified three related aspects of that culture: its imagery, its infrastructure and its projection. It evoked the digital qualities of urban visual culture not only as the animatic content of screens, but also as electronic signals that glitter and scurry through cables, through the air, through screens and wires and chips and conductors and servers, passing from one device to another, from cable to dish to screen, from human to nonhuman processing, and flowing across and beyond glowing screens, pausing, emanating, glowing.

Several accounts of the transmuting mesh of urban data argue that it is reconfiguring the human experience of the urban (cf Deleuze, 1992: 4).

> The digital means of production of street imagery – never delivering a clear end product and always in circulation between material and virtual networks – and the fleeting glance with which consumers relate to that imagery, point to a distinctly performative visual language. (Dibazar and Naeff, 2019: 10–11)

This not only describes certain kinds of urban scenes but also enacts particular urban environments. Hence there are references to a new(ish) expressive sensibility (Shaviro, 2010) and to the accumulation of everyday sensations configured through this technocultural environment (Strutt, 2019). Leszczynski (2019), for example, has unpacked a number of dispositions anticipated as smartphone apps and their user send messages, hail a ride, order food, prompt a laugh, pass the time, plan a route, play a game… all of these activities are approached in anticipation of a smooth and seamless interaction with the screen and its network which, when achieved, generates bodily affects. Digital visual culture is mediating urban life similarly. Films with spectacular digital visual effects that picture cities folding and bodies flying 'are best regarded as affective maps, which do not just passively trace or represent, but actively construct and perform, the social relations, flows, and feelings that they are ostensibly "about" ' (Shaviro, 2010: n.p.; see also Christiansen, 2017). The argument of this article is also for the need to understand less the content of specific images – what they are 'about' – and more the cumulative effect of seeing onscreen animations in, and as, urban environments. If the theorisation of the urban imaginary must therefore now also engage with the technocultural presence of environmentally-extended screens in everyday urban life, conversely, studies of urban life must also reckon with the animatic technocultural dynamics of networked screens.

Certainly it remains necessary to critique the visual and textual content of contemporary visions of smart and platform urbanism. Borderline-absurd corporate publicity assumes very specific versions of 'platform city people', for example (Wood, 2025), while the digital visual effects used across both popular culture and urban management reiterate longstanding assumptions about what cities and their managers and inhabitants look like and do: enacting white, professional, masculinist ways of inhabiting the urban (Rose, 2025). But it is also necessary to grasp that such imagery matters because it is not only imagery: it is also an animatic, projective infrastructure (cf Bissell and Fuller, 2017; Lancione and Simone, 2025). Its technocultural form matters as much to its effects as what it shows. And this projective, animated infrastructuring is no less complicit with the differentiation and

hierarchisation of the urban human life it configures than other regimes of white, masculinist and bourgeois ways of seeing, knowing and acting upon the city. Projective luminosity is surveillant of some bodies differently from others, for instance (Browne, 2015; Degen and Rose, 2024). Urban studies scholars and practitioners must therefore reckon not only with the technological and economic dynamics of digitalised cities, but also with its reconfiguration of urban life as variously animated, connected and environmental.

Critical urban scholarship may thus start to look a little different(ly), in part at least. Thinking about form as well as image – about animation, infrastructure, projection – shifts attention to the effects of different kinds of technocultural visible geometries beyond the volumetric regime and the tainted legacies of photographic realism, for instance. Bruno (2014, 2022) deploys a rich vocabulary to describe the multiple ways that luminous urban projections might be organised spatially: projection is plastic, she suggests, and might therefore unfold and layer; it might be sculptural and draped, or coated and textured; it can beam or transpire; it can be felt as currents, energies, fluidities; it might be pleated, making visible both an inside and an outside, or darkness as well as light; there might be introjection as well as projection. This attention to and scrutiny of spatio-visual infrastructure may enable a range of different urban sites to materialise, beyond the 'base map' of three-dimensional volume (Wilmott and Wood, 2024). It suggests and enables other modes of mapping and exposure: on which speculative note this paper concludes.

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Funding

The author received no financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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