Video Game Urbanism

How we Design Virtual Game Spaces to Engage new Audiences with the Architecture of Tomorrow

Luke Caspar Pearson

We do not have to look far to see that most contemporary videogames are highly spatial, both thematically and in their mechanisms of play. *Minecraft* (2009) is the most notable example, producing numerous collaborative building practices straddling the virtual and physical. But even the phenomenon *Fortnite* (2017), which is ostensibly just a "battle-royale," last-person-standing shooter game, lets players recycle materials to build structures within the game world. The most talented players are equally adept in shooting and construction, in order to shield themselves or access better vantage points. Other games challenge architecture in different ways, such as presenting caricatures of urban planning systems—*Cities: Skylines* (2015)—integrating scanned real-world geometry into virtual environments—*The Vanishing of Ethan Carter* (2014)—creating spaces that defy logic—*Manifold Garden* (2019)—or even new forms of spatial practice through generative world-building—including games by indie developer *Strangethink* since 2011. As games are a meeting of computational and visual arts cultures, and their tools, both the world and the rules that structure it are designed together. In this sense, game spaces become architectural representations that are highly programmatic and specific.

It is in this context that I will discuss my work with Sandra Youkhana, as leaders of the Videogame Urbanism studio at the Bartlett School of Architecture, University College London. Over the last three years we have established a research studio that uses game engine technologies to conceptualize and realize urbanism projects. This has produced over forty games (and counting!) of various complexities and scopes. Students

arrive in our studio with backgrounds ranging from architecture to urban and landscape design, but have no prior knowledge of game software. Our research together examines how the future of cities—and how they are regulated—can be communicated to new audiences and challenged through game technologies. We use speculative game scenarios, drawn from real-world research, that incorporate narrative as well as architectural theory into their structure. Using games as pedagogical tools allows our students to understand the forces and systems that shape contemporary urbanism, manipulating them to explore how the educational and immersive qualities of game environments can be used to challenge those existing power structures.

We see game spaces as reminiscent of Bernard Tschumi's (*1944) notion of *event architecture*, in which "actions qualify spaces as much as spaces qualify actions".[1] These actions place architecture into a productive contingency, where the spaces of games support *failure* as well as success against the game's rules. This might present itself as a gap to jump in *Fez* (2012), environmental puzzles in *The Witness* (2016), or the more complex architectural ecologies of a game such as *Frozen Synapse 2* (2018), which uses procedurally generated building floor plans. This architectural context exists because, as game theorist Jesper Juul (*1970) has argued: "Video games are the art of failure, the singular art form that sets us up for failure and allows us to experience and experiment with failure".[2] Game systems and the architecture contained therein are therefore generally not tools for problem-solving in the conventional sense, but can also be problem-*producing*. However, their responsive systems can also be highly reflective. As Greg Costikyan (*1959) argues, "in designing games, a degree of uncertainty is essential",[3] and this uncertainty allows us to echo the complexities of urban environments and their future in new and innovative ways. Much of our research involves exposing urban systems to scrutiny, allowing for a deeper critique of how cities are shaped, rather than simply proposing another modernist reinvention of the city.

1 | Bernard Tschumi, *Architecture and Disjunction* (Cambridge MA/London: MIT Press, 1996), p. 123.

2 | Jesper Juul, *The Art of Failure: An Essay on the Pain of Playing Video Games* (Cambridge MA/London: MIT Press, 2013), p. 30.

3 | Greg Costikyan, *Uncertainty in Games* (Cambridge MA/London: MIT Press, 2015), p. 16.

The intellectual basis of our research reflects upon the properties of video games as a medium and places them within the wider architectural discourse. In our studio, we discuss game structures as tools for learning and engagement, but also how game environments resonate with experimental approaches and architectural projects from the past. We also examine games as cultural objects, drawing from the work of other architects who quantified the effects of pop-cultural technology upon the discipline. In the 1950s, Alison Smithson (1928-1993) and Peter Smithson (1923-2003) remarked "but today we collect ads",[4] arguing that the "pace-setting" of the advertisement industry's creation of public desire through "impulses" challenged architectural design. Likewise, Denise Scott Brown (*1931) and Robert Venturi's (1925-2018) *Learning from Las Vegas* fieldwork was predicated upon "form analysis as design research"[5] of the city, in order to understand how it worked through attraction and iconography. Half a century later, escapist equivalents to the Las Vegas strip can be found in the innumerable virtual worlds we can inhabit, widely and rapidly communicated through *YouTube* and *Switch*. The pace-setting and iconography of game spaces challenges architecture in new ways, which we examine and then apply to our own design research.

Playful Precedents

We position our work within the wider field of historical, conceptual architectural design. While the ability to synthesize worlds using free game engine technology is relatively new, the "virtual" environment—or unrealized architectural project—is not. In 2017, our studio ran a brief called *Playing the Metropolis of Tomorrow,* a direct reference to the 1929 book by Hugh Ferriss (1889-1962), which contained his famous zoning diagram drawings from 1922.[6] These drawings show the architectural form of real legal rules, published alongside imaginary city designs. Such a relationship between rules, representation, and narrative is key to the construc-

4 | Alison Smithson and Peter Smithson, "But Today We Collect Ads," in *Ark Magazine* Nr.18 (November 1956), pp. 49–50.

5 | Stephen Izenour, Denise Scott Brown and Robert Venturi, *Learning From Las Vegas* (Cambridge MA: MIT Press, 1977), p. xi.

6 | Hugh Ferriss, *The Metropolis of Tomorrow* (New York: Washburn, 1929).

tion of virtual game spaces; moreover, Ferriss shows that such relationships have existed for a long time.

Fig. 117: Yingying Zhu, Beyond "The Bubble," 2017, Digital Screenshot Drawing from Game, Bartlett School of Architecture, UCL

The task outlined in this brief asked students to recreate seminal, unrealized urban projects from the past as game spaces. These ranged from superstructures such as Constant's (1920-2005) *New Babylon* or Arata Isozaki's (*1931) *Clusters in the Air* (1960-62) to the polemics of Superstudio's *Continuous Monument* (1969), the spatial compositions of Kazimir Malevich's (1879-1935) *Architectons* (1923), and Iakov Chernikov's (1889-1951) *Architectural Fantasies* (1925-33)—alongside the social visions of Frank Lloyd Wright's (1867-1959) *Broadacre City* (1932) and even Walt Disney's (1901-1966) *EPCOT* (1966). Using these projects as precedents not only quickly

introduces students to experimental and conceptual urbanism, but also demonstrates the ways in which a game space can be used to establish a critique that goes beyond the formal, interrogating the ways of *being* proposed in these historical projects.

The games produced in this eight-week study moved far away from simple virtual reproductions. *Living with the Continuous Monument* (2017) extrapolated individual Superstudio collages to investigate how different cultures would react to the monument, by providing a series of scenarios and tools with which to engage the blank grid. And *Beyond 'The Bubble'* (2017) took Disney's idea for a city encapsulated under a dome, turning it into a spherical urbanism using miniature planetary gravity.

Precedents can also be textual and theoretical. A prior project entitled *Back Up Culture* asked students to make games exploring the urban morphology of Los Angeles through key writings on the city. Renyer Banham's (1922-1988) conception of "autopia"[7] structured a car-based urbanism where pedestrianism had been eliminated at every scale. Michael Hardt (*1960) and Antonio Negri's (*1933) definition of "ether," the controlling influence of cultural production, underpinned a game that collapsed various movie spaces into their real-life locations. *Homestead* (2017) explored Banham's notion of housing in L.A. through a series of "case-study" homes in a suburban sprawl that responded to the user's interactions; *Temples of Consumption* (2017) created a *walking simulator* of an alternative L.A. with an urban design structured around consuming iconography and advertising.

Another game, *AirSpace* (2017), took writings on the internationalized aesthetics of *Airbnb* listings and coffee shops[8], creating a game in which the player entered and exited a generic café interior, while the city outside shifted from London or Tokyo to Tel Aviv or Taipei. And precedents can also be morphological, such as two games exploring Manhattan's urban configuration: *Greatest Grids* (2018), a "reverse city-builder," where players terraform Manhattan's island into a grid system allowing buildings to

7 | Reyner Banham, *Los Angeles: The Architecture of Four Ecologies* (Berkeley/Los Angeles: University of California Press, 2009).

8 | Kyle Chayka, "Welcome to Airspace: How Silicon Valley helps spread the same sterile aesthetic across the world," *The Verge* (August 3, 2016), https://www.theverge.com/2016/8/3/12325104/airbnb-aesthetic-global-minimalism-startup-gentrification (accessed June 22, 2019).

grow; and *Automonument* (2018) was a rhythm game where players would build ever-taller skyscrapers, inspired by Rem Koolhaas's (*1944) definition of Manhattan's monumentality.[9]

Fig. 118: Mingpei Liu, Yingying Zhu, Yu Zhu, Greatest Grids, 2018, Digital Screenshot Drawing from Game, Bartlett School of Architecture, UCL

The effect of such projects is twofold. Firstly, they give students a clear entry point into the use of game technologies, allowing them to focus on acquiring skills and expertise in the software, with precedents providing a basis for making design decisions. Secondly, and more importantly for their research, they establish platforms for understanding how the structure of game spaces can be applied as speculative and critical architec-

9 | Rem Koolhaas, *Delirious New York* (New York: The Monacelli Press, 1994).

tural practice. They also reinforce the validity and importance of design methods that use fictional worlds and narratives to make critical arguments about reality. This also allows us to establish a research agenda that reflects the structural capacity of game engines—which, as Ian Bogost (*1976) argues, move "far beyond literary devices and genres." For Bogost, "unlike cultural categories like the modern novel or film noir, game engines regulate individual videogame's artistic, cultural, and narrative expression".[10] Our use of *Unity* as a specific platform allows us to develop structures that can work across different types of game and research agendas, integrating real-world data into projects that reinvigorate the utopic as a vehicle for architectural experimentation.

Utopics vs. Engagement

The historical projects we reference often tackled issues of society's relationship to technology, labor, and play, which persist today despite technological shifts. In fact, they may have predicted an interchange between playful, engaged citizens and the modern smart city. For instance, Marie-Ange Brayer (*1964) argues that Constant's *New Babylon* is "a 'dynamic labyrinth' ... the forerunner of our globalized and dematerialized society, a purely informational system".[11] Of course, the inhabitants of Constant's structure were called *homo ludens* (people at play), not coincidentally after the title of Johan Huizinga's (1872-1945) seminal text on games and game playing.[12] The playful interaction with informational systems was a tacit structure of other experimental projects of the era, such as the work of Cedric Price (1934-2003), and most notably the Italian group Archizoom's *No-Stop City* (1969-1971). By creating a conditioned, isotropic grid that allowed citizens to assemble flexible elements in a free space, Francesca Balena Arista argues: "for Archizoom, the height of their

10 | Ian Bogost, *Unit Operations: An Approach to Videogames Criticism* (Cambridge MA/London: MIT Press, 2006), Kindle edition for iPad, Loc 784.

11 | Marie-Ange Brayer, "Work and Play in Experimental Architecture, 1960-70," *PCA-Stream*, https://www.pca-stream.com/en/articles/work-and-play-in-experimental-architecture-1960-1970-57, (accessed February 22, 2019).

12 | Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture* (London: Routledge, 2003).

technology would instead be invisible technology, that is, electronics".[13] *No-Stop City* was utopian, but under a strict structure. Andrea Branzi (*1938) argued "nowadays the only possible utopia is quantitative",[14] which reinforces Arista's point that their imaginary, conceptual city closely resembles the logic of electronic systems.

Games, built on information and code, are almost entirely quantitative—underneath the surface, at least. McKenzie Wark (*1961) takes this further, claiming that game spaces should not be considered utopian but *atopian*. Wark argues that "if utopia thrives as an architecture of qualitative description, and brackets off quantitative relation, atopia renders all descriptions arbitrary. All that matters is the quantitative relations".[15] While I would argue that games do still retain qualitative descriptions, this emphasis on quantitative structure allows us to unpack urbanism in new ways. Our studio developed the game *Carbon Neutral Living* (2018) with a typical roleplaying game structure; however, the data profile of the player was built not on their mastery in swords or spells, but around their real-world carbon footprint (using World Wildlife Fund indicators).

As a player makes decisions in the game, it responds by calculating changes to their footprint, opening or foreclosing parts of the city in response. Another game, *The Ludic Sanitorium* (2018) suggested that a post-work society would be structured through play, replacing the individual meaning of labor. As the player undertakes different forms of "play-work," from logistics to proof-reading (by typing directly into the game), the qualities of work become encased in a quantitative world performed by rote.

While framing game spaces as utopian (even quantitative ones) could be seen as a retreat from the pressing issues of the real world, this offers the potential to conceptualize new architectural conditions that can challenge normative readings of the city. Graeme Kirkpatrick (*1963) argues that "all video games are a kind of opening up of the machine and begin the process of prising it away from the dominant historical narrative of

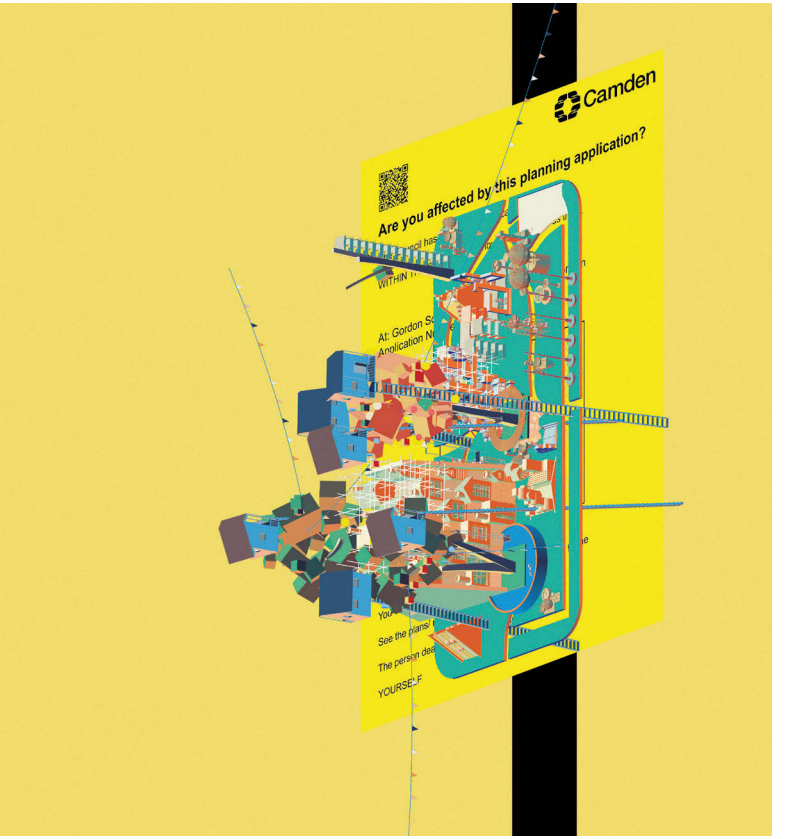
13 | Francesca Balena Arista, "Archizoom Associati," *Radical Utopias*, ed. Brugellis, Pettena and Salvadori (Rome: Quodlibet Habitat, 2017), p. 102.

14 | Andrea Branzi, *No-Stop City Archizoom Associati* (Orleans: HYX, 2006), pp. 176–179.

15 | McKenzie Wark, *Gamer Theory* (Cambridge MA/London: Harvard University Press, 2007), Note [119].

'technological progress'"[16]; similarly, when Ian Bogost calls algorithms "caricatures" of systems, he argues games are the only form that admits this truth.[17] -

Fig. 119: Zhibei Li, Shenghan Wu, Meiwen Zhang, The Playable Planning Notice, 2017, Digital Screenshot Drawing from Game, Bartlett School of Architecture, UCL



16 | Graeme Kirkpatrick, *Aesthetic Theory and the Videogame* (Manchester: Manchester University Press, 2011), p. 115.

17 | Ian Bogost, "The Cathedral of Computation," *The Atlantic* (Jnauary 15, 2015), https://www.theatlantic.com/technology/archive/2015/01/the-cathedral-of-computation/384300/ (accessed February 22, 2019).

Rather than seeing this playful and ironic use of computation as a deficit, our studio offers it as a counterpoint to trends in architectural discourse towards the pure modernist efficiency of smart city technologies, parametric simulation, or robotic fabrication. We see the potential of game spaces for architects to rethink the ambitions and ideas of architecture.

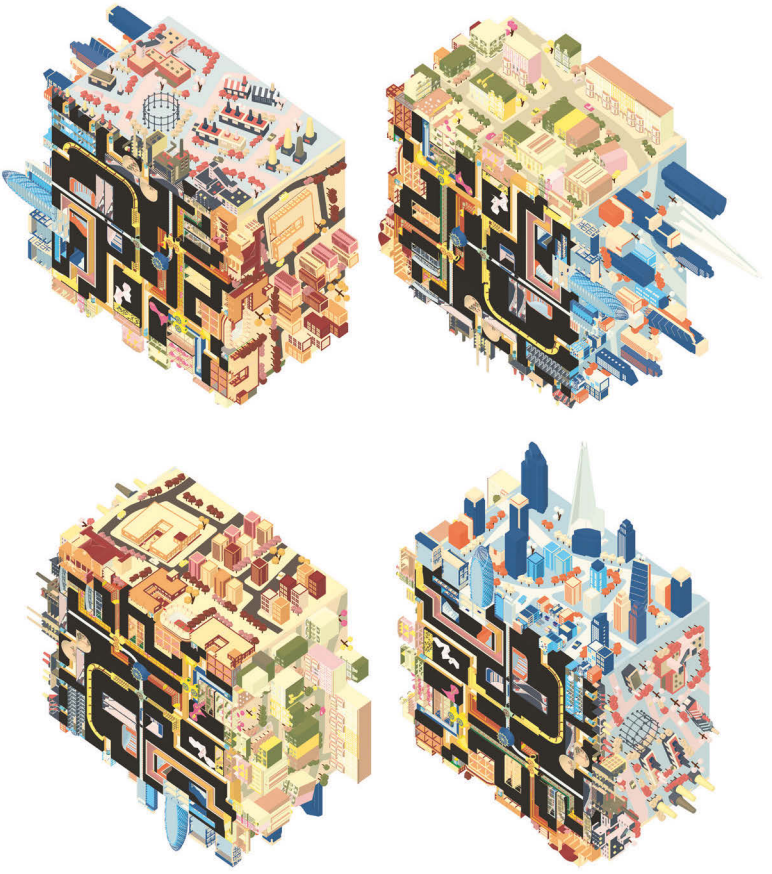
A part of these ambitions also resides in establishing new ways of engaging people with architecture and urbanism. Games offer us the opportunity to make tools that people can use, and that provide direct feedback for designers. They are also easily accessible for people without the means or voice to participate in the typical processes of architectural design. *The Playable Planning Notice* (2017) was a game developed in response to the U.K. planning system, which generally notifies citizens of impending changes to the city through laminated A4-notices hung on lampposts. While these notices provide links to applications online, the written description of changes is often hard to understand. Examples can be very technical, but also include things like "various works to various trees" or "erection of a plinth and statue." The game, designed using real planning notices in London, allowed players to prototype what terms like "various works" might mean and design divergent futures for each of the sites under consideration. While the game has a visual resemblance to construction or "city-building" games, it is positioned as a social tool to increase the visibility of changes taking place within the city, far from the typical elevated overview and control of "God games." As Kars Alfrink argues, this hints at a future in which "a gameful city promises increased autonomy and influence to individuals".[18] We believe that this could be extended into the upper echelons of our democratic structures. We directly tackle existing public policy frameworks, the planning process, and placemaking initiatives (*Play Making*, 2017; *Clone Town*, 2017). *Smart Democracy* (2017) was a game proposing that the Mayor of London's office could be connected to a citywide virtual network, where citizen's needs and complaints could be addressed in real time using Internet of things technologies.

However, another means by which games can challenge existing power structures is in how their worlds and systems are presented to players. *SimCity* (1989) or *Cities: Skylines* (2015) both frame urbanism from above,

18 | Kars Alfrink, "The Gameful City," *The Gameful World*, ed. Walz and Detarding (Cambridge MA/London: MIT Press, 2015), p. 556.

as a top-down construction. This is equally true of more socially engaged urban games such as *Block'Hood* (2016) or *Nova Alea* (2017), which use isometric cameras.

Fig. 120: Mingpei Liu, Yingying Zhu, Yu Zhu, Sub-Urban, 2018, Digital Screenshot Drawing from Game, Bartlett School of Architecture, UCL



Minecraft, in contrast, uses a first-person perspective, which is more reminiscent of pre-Renaissance architectural practices, in which the designer would directly participate by guiding building work on site. Perhaps this direct relationship to construction is why it has blossomed into such an

effective tool of spatial design. While aerial viewpoints are appropriate for understanding the systems behind urbanism, our studio also explores divergent ways of seeing and experiencing the city. *E-London* (2017), for instance, uses a first-person perspective and multiple different cameras (rendering different layers of the game space) to explore life in a post-Brexit United Kingdom, where citizens can opt back in through augmented reality technologies. Inspired by Estonia's E-Citizenship system, the game explores the impact of Brexit on London's urban realm through its effect on people within the city rather than on larger organizational scales. Another game, *Sub-Urban* (2018), uses a spinning camera as the player builds underground infrastructure beneath London, producing a block of pure subterranean urbanism. This is not, of course, realistic, but instead represents a distillation of complex urban issues (such as "iceberg" houses excavated far beneath the city by the super-wealthy[19]) into a clear and accessible game space.

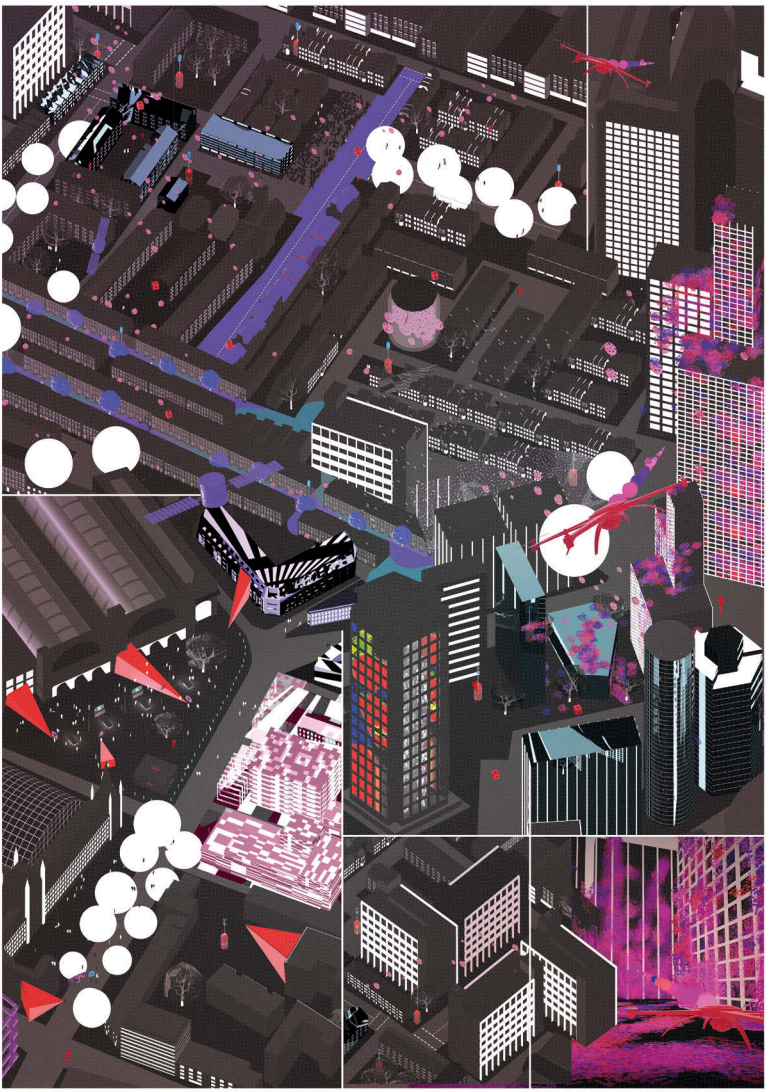
Non-Material Materials

Of course, the resolution and appearance of game worlds is inextricably linked to how they are seen by a virtual camera. Within the studio, we do not place an emphasis on "photorealistic" depictions of space, despite the architectural visualization industry increasingly using VR-game technologies to make realistic portrayals of urbanism for clients and stakeholders. In contrast, we disrupt the idea that such depictions will be the only future for game technologies in architecture, and instead explore new forms of materiality that are only possible in the virtual world.

Virtual materials in a game engine are entirely different to real-world materials, despite heavy investment in technology to simulate reality as convincingly as possible. Even the most realistic looking concrete or brick, upon which light falls believably in-game, will be constructed from multiple flat image files that contain information about color, reflectivity, shadows, and so on. This is still the case, even when the construction of game

19 | Oliver Wainwright, "Billionaires' basements: the luxury bunkers making holes in London streets," *The Guardian* (November 9, 2012), https://www.theguardian.com/artanddesign/2012/nov/09/billionaires-basements-london-houses-architecture (accessed June 22, 2019).

Fig. 121: Daniel Avilan, Aradhana Kapoor, Sanjana Samant, Snooper's Charter, 2017, Digital Screenshot Drawing from Game, Bartlett School of Architecture, UCL



worlds draws directly from the real, as in *The Vanishing of Ethan Carter,* which used photogrammetry techniques to scan real locations for the

game.[20] As these raw models are much too detailed for use in a real-time game, the models were used to "bake" sets of shadow and texture information that would then be applied to more simple geometries.

As such, in game worlds, it is impossible to divorce architectural materiality from the regime of the image. With that in mind, we regularly employ materials and techniques that emphasize the unreal qualities of game spaces to explore the potential gap between representations and buildings, but also to suggest that there are now challenges to our normative conception of how materials and environments should behave. Because most of these material qualities are attached to values, they can be manipulated within the game. They can become roughly hewn or smooth; reflective, stretched or grossly distorted depending on the interactions of the player. Further techniques such as level of detail (LOD) allow us to nest multiple versions of a virtual building within the same space. This is typically used to replace complex models with simpler versions as the player moves further away, but we have often reversed this process, calling the resolution of visualization tools into question.

Many of our studio projects, such as the surveillance-based game *Snooper's Charter* (2017), use what are called "unlit" or "triplanar" shaders—materials that do not respond to virtual lights, and thus do not receive or cast shadows. This can subvert perspective and depth: when two objects with the same material coincide, they will be indistinguishable. This effect has been used in the game *Vignettes* (2017), where unlit materials allow objects rotated by the player to morph into different shapes at points where their silhouettes combine. It has also been used in the work of developers such as indie collective *Sokpop*. In our game *Projectives* (2018), for the Royal Institute of British Architects, we used four shifting "split-screen" panels with different camera angles that were combined by players into one perspective view.

Using these shaders produces an aesthetic that operates between the flat and the volumetric; this challenges the relationship between the two-dimensional matrix of the screen and the 3D model by removing its relationship to light and shadow. The effect of this is to emphasize the game-like qualities of these worlds, and to draw them away from "real-

20 | Andrzej Poznanski, Visual Revolution of The Vanishing of Ethan Carter, *The Astronauts* (March 25, 2014), http://www.theastronauts.com/2014/03/visual-revolution-vanishing-ethan-carter/ (accessed June 22, 2019).

istic" depictions of urbanism. However, if we recall Peter Eisenman's (*1932) contention that "real architecture" only exists in drawings",[21] then underlining the fact that these spaces are not buildings—nor are they designed to be—can be considered a technique of productive separation. Embracing the synthetic allows us to more clearly articulate messages about reality.

Fig: 122: You+Pea, Projectives, 2018, Screenshot from Game

In turn, many of our games might be considered to look "cute," which places them in stark contrast to both realistic depictions of architecture (which are rarely ever truly that) and the increasing ubiquity of "datascapes" and other means of spatializing computational information. Such cuteness is drawn from the technology of the game engine and the lineage of game aesthetics, but also allows us to develop a nuanced and layered relationship to the observer. As Simon May has argued: "Cute unsettles the habitual by toying with it from a position of playful vulnerability. It lightheartedly probes the established ways in which we invoke power to order our priorities and to understand who we are".[22] The "teasing indeter-

21 | Iman Ansari, Peter Eisenman, Architectural Review (April 20, 2013), https://www.architectural-review.com/essays/interview-peter-eisenman/8646893.article (accessed June 22, 2019).

22 | Simon May, *The Power of Cute* (Princeton/Oxford: The Princeton Press, 2019), p. 47.

minacy"[23] of many of our games is a conscious effort to explore these power structures. In another example, *Peep-Pop City* (2018)—a physical city-building game developed by Sandra and myself for *Now Play This 2018*, used five hundred candy-colored, 3D-printed pieces derived from London along with cue-cards for players to enact events in the city's urban morphology.

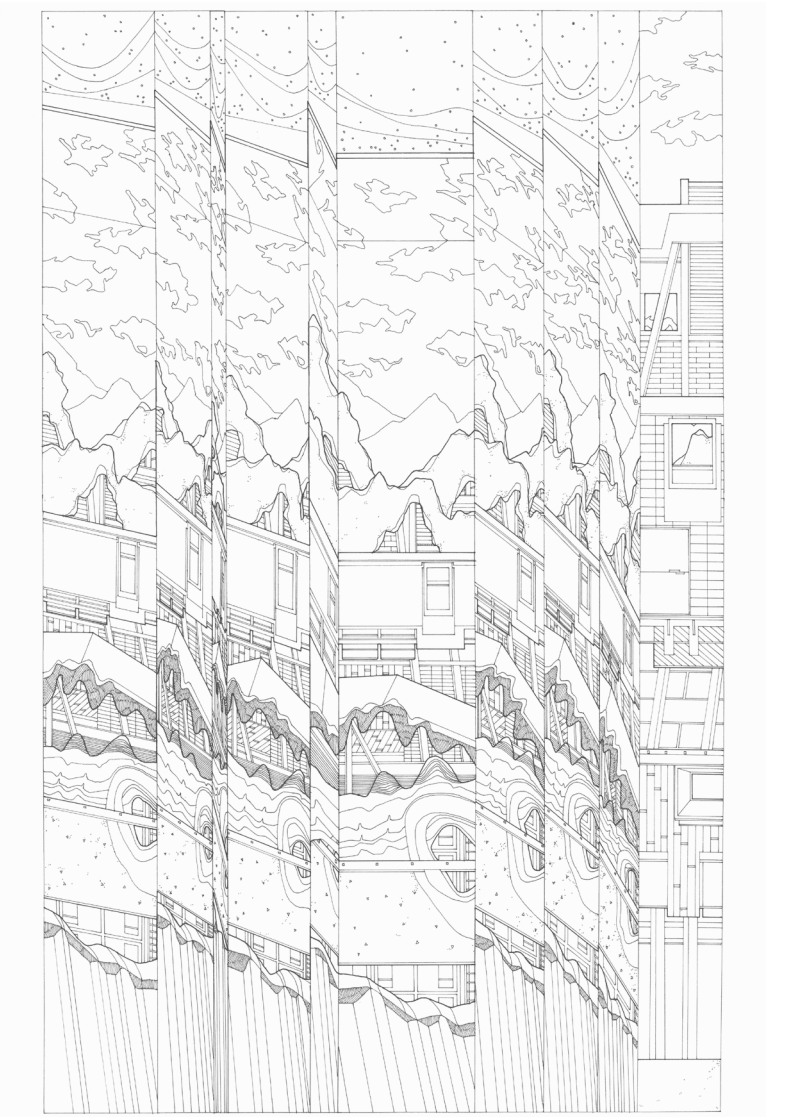
Through its cuteness, it was especially popular with children who visited the event allowing them to engage with urban power structures, even if unwittingly.

Fig. 123: You+Pea, Peep-Pop City, 2018, Photograph of Game

Despite the game industry's drive towards realism, many games now consciously reemphasize video game aesthetics in and of themselves. This is true in the new wave of game remasters, in which older worlds are updated with new textures and graphics in a similar way to buildings that are recreated with new technologies, such as Antoni Gaudí's (1852-1926) *Sagrada Familia*. Nightdive Studios work almost exclusively on updating game worlds from seminal titles such as *System Shock* (1994) using contemporary game engines. But, more realistic depictions can still be unpacked, such as in my research project *Noclip World*, in which I use architectural drawing and cheat codes to interrogate the construction of realistic-looking game worlds.

23 | Ibid., p. 27.

Fig. 124: Luke Caspar Pearson, NoClip World, 2015, Pen and Ink Drawing on Paper



This relates to John Sharp's readings of similar art practices as "a space for exposing the questioning the peculiar trajectory of 3D videogames toward even greater verisimilitude".[24] Such work can also be compared to that of artists such as Harun Farocki's (1944-2014) *Parallel I–IV* (2012–2014), and JODI's *Max Payne Cheats Only* (2006). They have also questioned the role of realism in games and how it can be subverted. What this suggests, and our studio promotes, is a new form of architectural practice that operates between the virtual and real, both in its tools and its aesthetic approach.
We also subvert traditional forms of architectural drawing by asking students to follow our own methods of screenshot-based collage. Screenshots are typically used by game designers to promote their games, capturing certain key moments and enticing the consumer towards a purchase. Certain figures such as Duncan Harris of *Dead End Thrills* have elevated screenshot-making into a form of photography, using various tools to push the fidelity of game worlds to their limit. Rather than taking inspiration from photography, we instead explore how multiple screenshots from our games can be composed into new forms of temporal architectural drawing that reflect the dynamic nature of the world. This allows us to establish a direct connection to the history of architectural representation and image-making, while also accounting for the aesthetic particularities of our game worlds. In our *Tokyo Backup City* (2016-) project we used screenshot drawings to explore the "afterglow" of a neon-lit city, suggesting an imprint on the retina, not unlike the moment a game world breaks down when we transgress its borders.

The Future of Video Game Urbanism

Our research with the Videogame Urbanism studio has formed the basis for new ways of practicing spatial design, framing the video game as an alternative way of addressing computation in architecture. There are many technological developments that are and will reshape the urban, from machine learning and A.I. to the internet of things and big data. As designers, we can operate as mediators between all of the new information cities give us and the citizens who live within them. Games allow us

24 | John Sharp, *Works of Game* (Cambridge MA/London: MIT Press, 2015), p. 47.

to make complex and temporal systems visible, and create environments in which players and observers can interact with these to prototype new futures.

Fig. 125: You+Pea, Tokyo Backup City, 2016, Digital Screenshot Drawing from Game

Video game urbanism leverages games as a familiar medium, which allows for an increased level of engagement between designers and the public. But we also emphasize the importance of using games to dream and experiment with what cities can be. Game worlds are places where the improbable can become normal; environments where space can twist and gravity can flip; where entire actions and ways of being can be opened or closed to us. As we continue to move forward, we believe that games will change what it means to represent architecture, to inhabit architecture—and indeed, what it means to *realize* architecture. There is a whole cabinet of tools and a whole universe of worlds to come.