arq (2015), **19.3**, 269–282. © Cambridge University Press 2016

How videogames produce architectures of the 'half-real' and animate new design logics operating between interface, computation, and representation.

Architectures of deviation: exploring the spatial protocols of contemporary videogames

Luke Pearson

On 18 November 2014, a new version of a city already visited by over 34 million people was introduced to the world.[1] This is the digitised metropolis of 'Los Santos', a facsimile version of Los Angeles that provides the backdrop for the videogame 'Grand Theft Auto V' ('GTA V').[2] The city is expanded, increasingly defined, and with more urban life when compared to its previous iterations. This arises through the rebuilding of a now two-year-old game for the 'latest gen' consoles, the Xbox One and PlayStation 4 (PS4). While the city of Los Santos creeps ever closer to an exacting visual verisimilitude of reality, its physics remain improbable and its logics cartoonish. As a videogame world, it must twist and warp the real, making it pliable in order to allow its spaces to be negotiated through an encapsulated set of rules that underpin the game. So while a cursory glance at what appears on screen may be startling in its resemblance to Los Angeles, the properties of objects, buildings, and tertiary information are all afforded symbolic meaning that diverges from reality *[1]*. Game theorist Espen Aarseth argues that for all of their increasing realism, videogames are ultimately 'allegories of space' that 'rely on their deviation from reality in order to make the illusion playable'.[3]

This article explores how the contemporary videogame affects our conception and delineation of space, and what strategies it offers for bridging between the representational and the computational in architectural design. For the architect – and gamer – seeking to understand the architectural implications of the spaces that videogames posit, we must regard them as a nuanced media. While they are obviously computational – software built to run on hardware directed through interfaces – they are also pop-culture artefacts. The article does not intend to focus on the arguments about whether videogames are art, but as a more than $100 billion industry, videogames clearly have some form of cultural impact on society.[4] Delving into this process of *deviation*, we can see that the aesthetic dilemma of the videogame – the tension between a depiction of space and the agency within that space we are afforded by its coded rules – is in fact its power as a media, and can define its potential impact on architecture.

Videogames are the meeting point of representation, simulation, and interface. Although the field of games is extremely diverse, they tend towards representations of reality that are constructed through the coded rules of a simulation, and are experienced by the player manipulating a



1 Screenshot of 'Grand Theft Auto V', Rockstar Games (2013). Obtained from: http://www.igta5.com/12-new-gta-v-screenshots. [accessed 29. 08. 15]

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controller of some form. The player will no doubt engage with the controller as both an interface and a manufactured ergonomic object held in the hands, but will also be subject to the proliferation of images and symbols the game displays in order to communicate its logics to us. As media typology we could propose videogames as a model means of expression in our contemporary society with its relationship to imagery, rules, and technology.

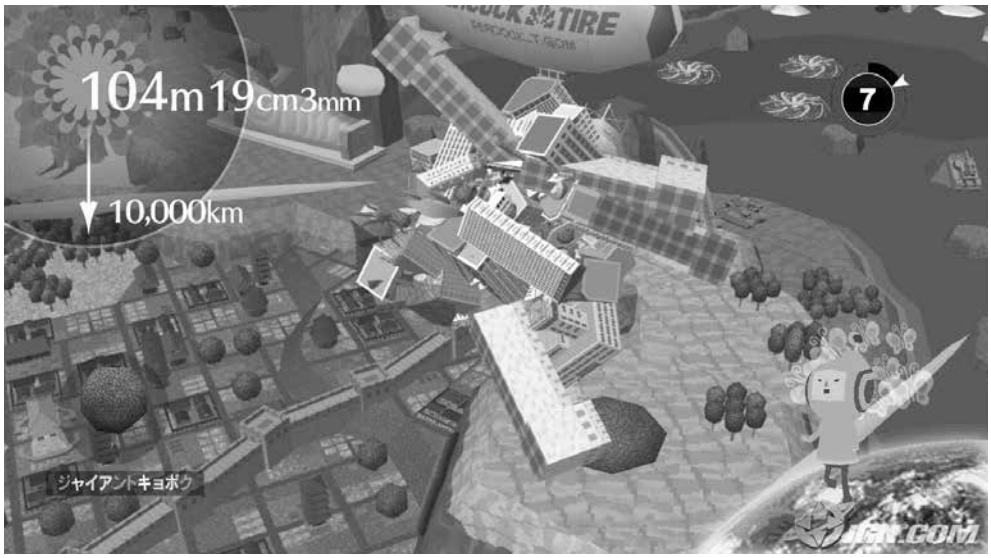
To regard the videogame as a pop-cultural artefact allows us to frame it in a number of ways, and not align it solely towards 'digital' architectural discourse. Despite their computational nature, videogames advance a renewed significance for the sign and symbol in our mediation of space, and their proliferation into new layers of information for experiencing the built environment. At the same time, their *deviations* force us into exploring their spaces under certain constraints. For example, while the city of Los Santos may look remarkably similar to Los Angeles, it is compressed and reformed into a topology of familiar moments. Comparing an earlier iteration of Los Santos (as portrayed in 2004's 'Grand Theft Auto: San Andreas') to the more 'geographically exact' Los Angeles depicted in 'True Crime: Streets of LA', Ian Bogost and Dan Klainbaum emphasise how deviations from reality result in 'equivalent, yet abstract representations of key Los Angeles spaces'.[5] The success of Los Santos's 'sprawl' comes from the fact that – compared to its real progenitor – it is a miniaturised amalgamation of *Los Angeles-ness*, structured around the operating logics of the game. In other words it is carefully cultivated: *sprawl* is not sprawl at all, but an encapsulated island *[2]*. In the words of developers Rockstar, Los Santos is also an 'absolutely handcrafted world'[6] – a city designed through an abstracted and compressed *ludic urbanism* for recreating the experience of a much larger metropolis.



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But despite the spatial ambition of their cities, critics such as Cameron Kunzelman have censured the Grand Theft Auto games for their underlying conservatism,[7] noting how the *mechanics* of the game (carjacking, shooting, and robbing amongst others) reinforce a less than positive worldview. The rules of simulation a videogame employs can make arguments back towards reality. Games theorist Ian Bogost has termed this 'procedural rhetoric'[8] – where the repeated rule-based actions that underpin a game may reinforce certain behaviours or opinions in the player. This in turn engenders certain behaviours in the player as they engage with the represented spaces contained within the game.

The idea that the mechanics of videogames may exert an influence over the player and therefore the way games dispense spatiality, suggests that we might judge them in reference to other architects who have sought to understand the currents of pop-culture and their impact on the built environment. Reyner Banham was fascinated by how popular



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2 'GTA V' Map, Rockstar Games (2013). Obtained from: http://gtaforums.com. [accessed 29. 08. 15]

3 Screenshot of 'Beautiful Katamari', Bandai Namco (2007). Obtained from: http://gamingsnack.com/beautiful-katamari-xbox-360/. [accessed 29. 08. 15]

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technologies were responsible for defining our modern landscapes, particularly those of America.[9] Similarly, in *But Today We Collect Ads*, Alison and Peter Smithson built a case for examining the 'impulses' that the advertising industry was enacting on society. For them, the advertisement was an artefact 'packed with information – data of a way of life and a standard of living which they are simultaneously inventing and documenting'.[10] Through its power as a technical image, they argued that the advertisement was 'infinitely stronger than the pace-setting of avant-garde architects'.[11] To regard the videogame in a similar spirit – as a melding of popular culture and technology – allows us to judge how it may seem to pull our conception of the built environment this way and that *[3]*.

Like the Smithsons and their ads, we can discern a set of impulses emerging from the videogame that challenge contemporary architecture. Their easy negotiation between different viewpoints and the scaling of visual fidelity on-the-fly makes the framed architectural rendering or glossy fly-through look rigid and sedate in comparison. The continuous interplay between a portrayed world and a sharply graphic interface suggests a renewed significance for the symbolic. In such conditions we may experience Robert Venturi and Denise Scott Brown's defined shift, as discussed in *Learning from Las Vegas*, towards 'an architecture of communication over space'.[12] Architecture as depicted in videogames reinforces interplay between a spatial fiction and the *heraldry* of symbols communicating rules of engagement to the player. On the other hand, while Patrick Schumacher argues that parametric computation means architecture can dispense with both simple geometry *and* repetition as methodologies,[13] videogames, with their liberal use of abstracted forms and 'prefab' objects, challenge this assertion and offer another – widespread – model. 'Minecraft' is an ideal case in point,[14] where an abstracted world of randomly generated repeating typological blocks operating as a 'sandbox' for experimentation has become a cultural phenomenon with adults and children alike, and has provided an ersatz 'pop-cultural' tool for architectural expression *[4]*.

Similarly, Torben Grodal argues that games produce an 'aesthetics of repetition' where repeated actions produce an expertise in the player in order to win against the rules of the game.[15] This aesthetic is present in the *gamification* of everything from nutrition, to education, to social interaction. This repetition of action reinforces Bogost's 'procedural rhetoric',[16] suggesting that the way games allow us to explore space has an effect beyond them. We can also argue for countless other examples that demonstrate the 'pace-setting' of the contemporary videogame; aside from the aesthetic influence we can see spreading back into cinema, music, and fine art practice.

This condition has more direct implications, which I will discuss later in the article, particularly in the interfaces of control and imaging that are becoming increasingly ubiquitous across the planet. Such technologies increasingly mirror or merge the real with the videogame aesthetic. Videogames typically expose the relationship between *diegetic* space – the represented worlds the player inhabits, and *nondiegetic* space – the layers of user interface that are laid 'atop' the world, communicating targets, scores, and further information pertaining to the operations of the game. Alexander Galloway argues that the presence of the interface in such



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4 Screenshot of 'Star Wars Galaxies', Sony Online Entertainment and LucasArts (2003). Obtained from: http://blightgaming.com/2013/05/11/star-wars-galaxies-come-back/. [accessed 29. 08. 15].

5 'Minecraft', Mojang (2009). Obtained from: http://xboxlive.com. [accessed 29. 08. 15].

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experiences is important because it 'indicates the implicit presence of the outside within the inside'.[17] For Galloway, the 'outside' means the 'social'[18] – the nondiegetic space of a videogame can communicate (social) logics that can diverge from the fictional settings themselves *[5]*.

This relationship between the diegetic and nondiegetic as laid out by Galloway, reinforces Aarseth's notion that videogames work through severing certain links to reality while reinforcing other rules through collapsing the inside/outside relationship of space. Jesper Juul has supported the idea that videogames have a structure that sits somewhere between a represented space and the rules that govern its simulation. In Juul's model, however realistic the representation of a space is, it is still a fictional depiction. On the other hand, the rules that underpin the game are demonstrably *real* – we can, and we do, 'succeed' or 'fail' many times while playing videogames. For Juul then, videogames create spaces of the 'half-real',[19] where fictional simulations of space are mediated by *real* rules. These rules are Aarseth's *deviations*, the divergence from reality that allows us to experience a city such as *Los Santos* through the logics of the game and the interface of the controller.

In the face of this, I would like to discuss a series of brief design case studies that outline some of the architectural implications of today's videogames. These examples, part of ongoing design research, are examinations of existing game worlds through the production of mappings, drawings, and models to firstly reveal, and then challenge their architectural logics. Within this framework, I also explore how videogames themselves may constitute critical architectural representations, and how architects might use games as a medium for experimental design work.

Working both within *and* outside the 'gamespace', these examples provide starting points for exploring the effect of the videogame, not only on our conception of space through its cultural 'impulses', but also in the ways by which we control and mediate our surroundings.

Scaleable symbolism

While much digital architectural discourse may advance 'high resolution' design tools such as agents and particles for creating space, in the videogame resolution and fidelity are mutable. The technological twists and turns performed by a *game engine* are executed in order to maintain its formal experience. The presence of *ludic* (game) rules and the ability to succeed and fail in relation to those rules requires reinforcement in the player, and these rules are predominantly issued visually within the game world. Within these digital structures then, the *trope* is rife. Playing a game is to repeatedly test ourselves against a consistent logic, and so the portrayed world needs to reinforce certain spatial consistencies even if we fly from location to location. Torben Grodal calls this condition the 'aesthetics of repetition',[20] and for a videogame space to be playable under these terms, it must continually and consistently reinforce the rules by which it can be engaged with, which is where the trope emerges as a spatial tool. Even in a *procedurally generated* game world where spaces are made at 'random' by an algorithm – such as that of 'Minecraft' or the forthcoming 'No Man's Sky' *[6]* – there will always need to be spatial elements that communicate to the player though similarity.[21] In terms of architectural – geometric – morphology, this tension between rules and representation continues to place a hierarchy upon the complexity of architecture in such virtual worlds. In many cases, it would be both computationally inefficient, and *spatially distracting*, to maintain a constant level of geometric complexity across the entirety of a game world. Hence the videogame becomes a forum where the complexity and resolution of space itself is constantly mutable.

The nature of staged 'generations' of consoles each lasting a number of years means that software has to eke out ever more realistic scenarios from the hardware even as it ages. A case in point is the 2013 release of 'Grand Theft Auto V', which had to render a whole city using *eight-year-old* technology. The ability to scale worlds around the performance of the hardware places the videogame world in an 'enforced myopia' where parts of the simulated city remain in the underlying code, but the ability to see and render space, and to what degree this retains its formal complexities, are mediated by the machine upon which it is being played. Play 'GTA V' on the newer PS4 version, and the camera will see further across a more densely populated version of the city with higher resolution textures, flora, and fauna *[7]*.

The fact that the game is being *played* is key here.

6 'No Man's Sky', Hello Games (2016 tbc). Obtained from: http://no-mans-sky.com/press/no_man%27s_sky/images/Creature.png. [accessed 29. 08. 15].

7 PS3 vs PS4 comparison of 'GTA V', Rockstar Games (2013). Obtained from: http://www.gamengadgets.com/category/gta5/. [accessed 29. 08. 15].



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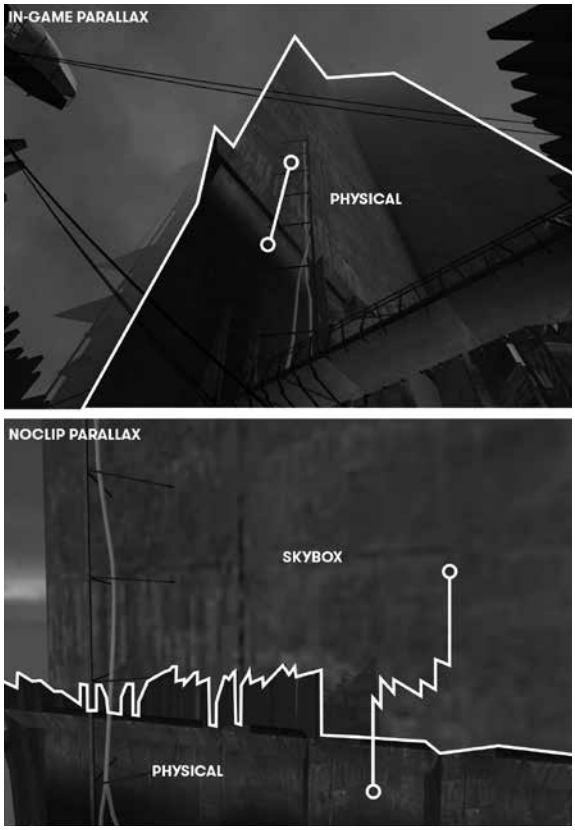


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8 Screenshot of 'GTA V', Rockstar Games (2013). Screenshot taken by author using digital SLR camera.

9 Screenshots of 'Half-Life 2' with overlaid diagrams by author, Valve Corporation (2004). Screenshots taken by author.

In the past, an idealised frame rate of 30 frames per second (fps) was considered, to (nearly) mirror the cinematic speed of experience. With advances in technology, developers have sought to push the industry-standard to 60fps. This produces a smoother, more 'playable' experience for the user. The desire to maintain 'playability' through a constant frame-rate has led to the development of software routines that can scale the complexity of the world around the player on the fly, taking into account the number of actors or opponents on screen. Recent articles in the videogames press have focused on the newly released game 'Call of Duty: Advanced Warfare' in relation to this.[22] While the PlayStation 4 version is locked to 1080p resolution (1920x1080 pixels), and has a variable frame rate as the action builds, the Xbox One version scales the resolution of the represented world to maintain a consistent frame rate.[23] In this case then, the interplay between coded rules and representation becomes manifest in spaces that morph in and out of resolution in their frame-by-frame instantiation. This produces an encapsulated world that comes into focus or blurs away, depending on the spatial complexity of the scene. The contingency of a virtual world that has perpetual resolution slips is perhaps not so far from the truth of bleary drone cameras in news reports or what Mark Dorrian has termed the 'suturing' of images together in Google Earth's version of the planet.[24]

Another strategy used to expand space in 3-D videogames is the *skybox*. This is typically a six-sided image 'box-mapped' onto a simple cube-like geometry that overhangs the main geometry of the level. Through this method, rolling hinterlands can be suggested beyond the confines of the navigable territory, creating a sense of context and place at very little cost to processing power. Even in an aged game

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such as 'Half-Life 2' (2004),[25] this 'sky' can move in relation to the parallax of the player, maintaining the suggestion of a much larger landscape beyond. In this particular game, a giant building – the Citadel – provides a constant architectural marker to the player. As we advance closer to it, the structure moves from an image mapped onto a skybox, into a navigable piece of geometry. At the junction of this transition, the architectural structure is rendered as half-image, half-geometry *[8]*. Positioned in relation to the player, it is read as one continuous structure – but with a swiftly entered cheat code, we can pull apart this architectural construction to reveal this joint. Space is constructed through such collages precisely because it is computationally efficient for running at a playable frame rate.

Even the most advanced games currently released, then, would challenge our expectation of a constant 'high resolution' in their architectural scenarios – despite this running counter to the industry-led narrative of increasing fidelity and realism.

Yet it is not simply a question of technology, but one of drawing the player's attention to elements that are more significant than others within the rules of the game. In a game world such as 'GTA V''s Los Santos, this could run through a number of different strategies. Lurid signs indicating 'objectives' clearly signpost the presence of a rule-system over and above the representation of a city. Operating as Venturi & Scott-Brown's *signs above space* they create a new order of symbolic markers in a landscape. Other methods may be subtler. For Los Santos, creating a whole city of inhabitable buildings would be extremely processor intensive. Only certain buildings within the game possess interiors for exploration, and this is often indicated to the player through *transparency*. When we can see an interior through glazed windows, it is significant in some way. Other structures have only mapped textures of windows upon their surface. Players exploring Los Santos will note the constellation of banks with transparent glass frontages, their interiority indicative of their importance preceding the *heist* missions that Rockstar released some 18 months after the original game. The buildings sat dormant, yet their symbolic interiority conferred importance *[9]*.

Many games, 'GTA V' included, take advantage of virtual street furniture branded with the tongue-in-cheek term *chest high walls*.[26] In many videogames, objects such as desks, boxes, crates and cars provide objects to take cover or hide behind. When the player is exploring a piece of innocuous urban realm that possesses enlarged bins and oversized benches, the chances are that this will be the site of some form of action. This symbolic language is not dissimilar to the bollards-as-planters urban realm we might experience outside an embassy or governmental building. Even in the post-pandemic detritus of a game such as 'The Last of Us',[27] a peaceful passage of the game is ruined as soon as we realise that the notionally impenetrable power station we are being guided through is studded with outcrops, barriers and furniture to take cover behind. Action will soon occur in this place *[10]*.

While such elements becoming overt can be a problem for the believability of the game world, as architects we can find interest in such symbolic tropes of the everyday being elevated into something more significant through a slight modulation of their appearance and their substantial importance to the rules and operations of the game. In reality, we may cite a project such as MVRDV's *Glass Farm*, which uses printed glass panels to recreate the form of a traditional barn through a collage of local buildings and details. Photographer Frank van der Salm produced an 'average façade composition' of local farmhouses at 1:1 scale and then resized this to fit the overall envelope of the building. With its oversized details and patchwork surface formed from local vernacular buildings, it resembles an emanation from a digital realm, the over scaled videogame structure made into a physical envelope of tropes forming curious juxtapositions with interior activity. Like the constellation of outsized ornaments and furniture that populate a videogame world, *Glass Farm* plays with our expectations of symbolism and scale *[11]*. These conditions suggest that the videogame can enliven the course of architectural symbolism, although perhaps in a distorted and twisted form. Their uncanny architectures present a new lexicon of strategies by which a building can assert its importance in reality through its (un)subtle deviations.



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10 Screenshot of 'The Last of Us', Naughty Dog (2013). Obtained from: http://www.eurogamer.net/articles/digitalfoundry-2014-the-last-of-us-face-off [accessed 29. 08. 15]

11 Glass Farm by MVRDV. Obtained from: http://www.archdaily.com/321503/glass-farm-mvrdv-2/50fb7053b3fc4b068c000000d_glass-farm-mvrdv_110113_04_pvenews-com-jpg/. [accessed 29. 08. 15].

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'Ludodromic' space and ubiquity

The ways in which space is represented in videogames can affect our expectations of the world around us. One such study into this is the work of Rowland Atkinson and Paul Willis (*Charting the Ludodrome*, 2007). Atkinson and Willis write of the relationship between represented versions of urban systems in videogames such as 'Grand Theft Auto', and their 'real world' counterpart. From their studies with gamers they found that 'this "copy" or representation of an urban system became a temporary envelope of urban reality'.[28] They define the ways in which players temporarily enmesh the represented spaces of a game with their understanding of the actual spatial context surrounding them.

In Atkinson and Willis's study, interviews with Australian gamers revealed perceptual similarities between cities such as Melbourne and the facsimile American urbanism of 'GTA III''s Liberty City, designed to resemble New York.[29] A further example they identify, which I have pursued in my own design research, is how uniform and ubiquitous corporate branding is another way that games can assert spatial slippages. Atkinson and Willis identify the 24/7 Supermarket chain – 'GTA''s answer to the 7-Eleven minimart – as an exemplar of a segue between the digital and physical evident in such a game. Discombobulated gamers report – perhaps bleary-eyed after terminating long sessions navigating Los Santos to go and buy groceries or cigarettes – the experience of the real minimart to be so similar to its digital equivalent that they felt 'all dazed up' and identified corporeal segues in their movement within such spaces, describing how 'your walk changes and you're like, this is how I was walking *in there*'.[30]

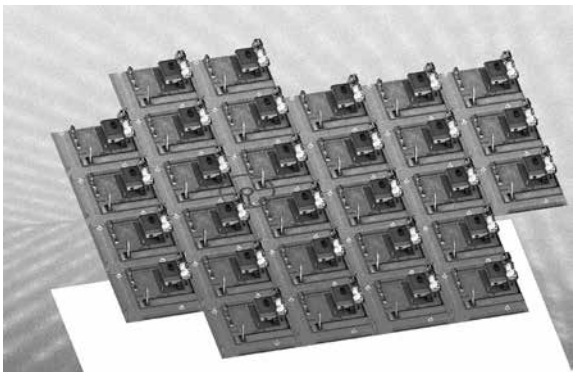
This abundance of generic slogans and branding, within an experience that is already a superfluity of signs holds the player in a condition that Atkinson and Willis term the 'ludodrome':

> *A mediated space between immersion in urban simulation and a real world that is simultaneously generated, destabilized and blurred by the effect of such gameplay.*[31]

Part of my research to explore this as an architectural tactic has been to begin designing through videogames themselves. This affords control not only over the production of architectural proposals through drawing, 3-D modelling, texture mapping, and so forth, but also through the implicit logics of the game and how these may exert control over the player. One such game that I have produced is

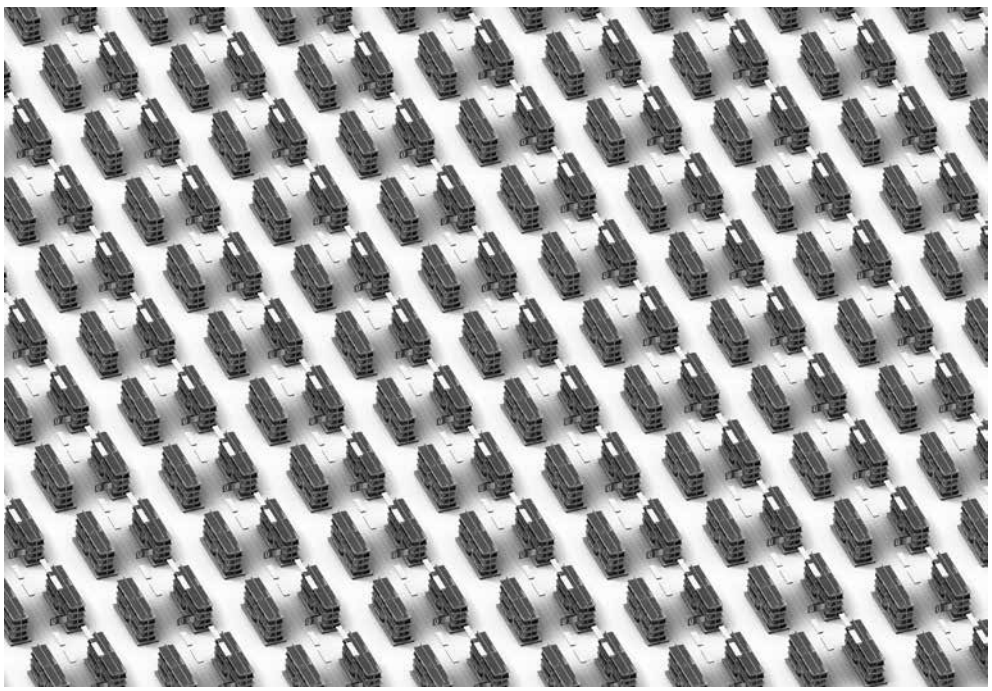


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12–14 Screenshot from 'Ubiquity game'.



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entitled 'Ubiquity' and it explores how the mediated space of the *ludodrome* might be extended around the player, and reinforced through the profusion of signs as an architectural manoeuvre.

'Ubiquity' is a test game built in the Unity3D game engine that presents a landscape of infinitely repeating minimarts and forecourts. As the player navigates the space, they encounter *markers* that appear to possess ludic significance. In this case, the process of hitting markers and collecting 'Ubiquities' is designed to push the player forward, exploring what they will soon come to realise is an infinitely repeating landscape of urban realm. The code behind the infinite repetition of 'Ubiquity' works through a *selective myopia* – infinitely repeating on a grid any object that is within the field of view of the camera. Switching to an *isometric* viewpoint, the player can see the 'ludodromic' landscape unfolding around them. In this case, the movement of the player-character *generates, destablilises*, and *blurs* space around it as it goes *[12, 13]*.

The relationship between a perspectival *first person* viewpoint and an overall *aerial* viewpoint holds the game experience in a contingency between space to be experienced, and phenomena to be remotely observed. In the case of my game 'Ubiquity', this aerial locatedness is designed to emphasise the position of the player within a landscape whose expanses are dictated by ludic rules – in effect, tracking those rules through the way they instantiate space.

As the player collects markers they will finally reveal a second type of symbol directing them to enter any of the innumerable 'front doors' surrounding their position. This will then take them to the next level – into a similarly infinite world of the minimart shelves stacked with cereal boxes and other products. After another steered exploration through the collection of a new set of tokens, the player is transported into a cereal box itself, drifting around inside an infinite world of ubiquitous rice krispie grains. This dystopic landscape of repetitive, 'ordinary' structures runs from mass produced architecture through to processed rice grains *[14]*.

By using the videogame as a tool for architectural investigation, both the mechanical and representational qualities of the game space can communicate ideas. The space of 'Ubiquity' becomes *half-real* through this interplay. The infinitely repeating grid is just that – a 'prefab' geometry that repeats endlessly. By extension, the urban realm this creates is a reinforcement of the American grid system, an expanding matrix of signs and branding bisected by a rationalised set of thoroughfares. Through the *selective myopia* of the camera, a balance is struck between how far one can see in order to keep the number of instantiated objects within this 'infinite' world manageable while maintaining a repetitive and extensive landscape. Videogame mechanics, then, can add a layer of information into a represented version of reality through the rules by which they disseminate – and allow the exploration of – space. Under a reading of Bogost's 'procedural rhetoric',[32] the game advances arguments about repetition, the ordering of space, and disorientation through overbearing branding. In this case, the production of a videogame by me, an architect, is seen as a way of applying this 'procedural rhetoric' in order to make a piece of work exploring the lived world. As a game engine offers opportunities to control both the representation of a space, and the logics by which one can engage with it, games can become multilayered critical tools for the exploration of architectural conditions outside of the game space.

The new gizmology

There are particularities to the aesthetic form of videogames that further support their spatial significance outside of the internalised worlds displayed on the screen. The fact that videogames are *played* is key. While different games offer different levels of player agency, to engage with the rules of the videogame space one must *operate* within it. These spatial actions, and the expertise they confer, have given rise to a generation of people comfortable with carrying out multiple dextrous procedures on the miniature scale of the 'joypad' or keyboard in order to experience the particular spatial form of the videogame.

While videogames engage with both simulation and representation, Graeme Kirkpatrick argues it is the controller that plays the key role in exploring the videogame form. He contends that 'to fully experience the form in a game we have to draw it out by playing well and we do this with our hands'.[33] In this case, while represented architectures within videogames may operate through deviations from reality – their position within the 'rule based representation' is formed through player engagement,[34] most likely using a joypad controller *[15]*. Kirkpatrick argues that the reduction and abstraction of actions in the 'real' world into a series of micro-manoeuvres taking place across the controller using fingers and thumbs represents a 'condensation' of physical actions into a new set of procedures.[35] The recent technological trends that seemingly move away from interfaces that read one-to-one, full-body gestures (such as Nintendo's Wiimote, or Microsoft's Kinect system)[36] implies that this particular relationship between hand-based manoeuvres and space is one that is valued by gamers – and one adopted into non-game technologies.

If the videogame controller is the linkage point between deviated architectural space and its formal experience, we can identify spatial implications of this in actual space. Videogame technologies raise geopolitical issues through their formal properties being applied into real territories. Writing in *Wired For War*, P. W. Singer discusses the increasing application of robotics and remotely piloted vehicles in modern theatres of conflict. In this case, we can identify Singer's discussion of drone pilots as evidence of the new role that the controller, and by association, videogame 'form' itself is playing in technologies for the control, viewing, and subjugation of space. The vigour with which videogame interfaces have been

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15 Sony Dualshock 4 controller, Sony (2014). Obtained from: http://www.gamespot.com. [accessed 29. 08. 15]



16 Page from 'iRobot 510 PackBot Specs', iRobot. Obtained from: http://www.irobot.com. [accessed 29. 08. 15]



17 Photograph of iRobot Logitech hand controller, iRobot. Obtained from: https://www.defenseindustrydaily.com/mtrs-to-the-rescue-radioshack-replaced-updated-01173/. [accessed 29. 08. 15]

co-opted into the contemporary military-industrial complex is startling.

Singer firstly cites the case of Joel Clark, an elite drone pilot whose proficiency with computers and videogames brought a 'high school dropout' into a role normally reserved for expensively trained fighter pilots.[37] He continues, quoting retired colonel Edward Ward:

> *'Those PlayStation 2s really do the trick', he says. 'I bought two hundred of them for training in Iraq.'*[38]

If the military has recognised the power of videogame controllers and interfaces as training tools for their soldiers, then the industry that provides military equipment enthusiastically adopts this as part of their ergonomic design. iRobot is the Massachusetts-based manufacturer of the military grade PackBot system, as well as the rather more civilian Roomba vacuum cleaner. PackBot is designed as a multipurpose robot that can be deployed for bomb disposal, search and rescue missions, or – with the right attachment – provide a mobile gun platform. Mindful of the relationship younger soldiers have between their videogame systems and their war-faring technologies, iRobot place the joypad information front and centre in their promotional material *[16]*:

> Hand Controller
>
> *Modeled after video game-style controllers, PackBot's hand controller makes the robot easy to use, resulting in less training time and faster operations in the field.*[39]

In this context, a videogames console is both a training interface and a leisure device for downtime that continues to reinforce its rules and relationship to space even when off-duty. This slippage between actual and fictional applications of videogame form raises many questions. If videogame form is experienced through visualised worlds drawn out through the play of hands upon a controller, what do such military technologies do to the real world? Navigating a battlefield through the remote camera of a PackBot, on a Sony Dualshock 3 style controller might reinforce the 'videogame-like' qualities of a modern battlefield. However, without the presence of 'deviations' from reality, the rules and consequences of such operations remain all too real.

Similarly, Kirkpatrick argues that there is a 'unique disunity' in the way videogames attribute actions to button presses.[40] Button presses constitute the interface for interacting with videogame space, but he contends that there is no moral or intellectual connection between a given button and its in-game meaning, save for ergonomics.[41] The button press can therefore become an absurd connection between the operator and an action in space. This might be a rhythmic dimension-swapping jumping

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18 Screenshot of 'Titanfall', Respawn Entertainment and EA (2014). Obtained from: http://www.gamespot.com/reviews/titanfall-review/1900-6415690/. [accessed 29. 08. 15]

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choreography for traversing the world of 'Guacamelee!' or holding trigger buttons to hack away at, or deposit materials in 'Minecraft'.[42] The recently released 'Call of Duty: Advanced Warfare', provides a surreal example of this, asking the player to 'Hold X to pay respects' while navigating a cemetery at a colleague's funeral. As it is, it would appear that unique, and sometimes absurd, aspects of videogame form are increasingly being drafted into new technologies of remote imaging and control, meaning that reflection upon the ways in which videogames regulate and disseminate space is important in order to understand the implications of this trend *[17]*.

As videogames and their handheld interfaces seemingly play a large role in underpinning the ways in which soldiers mediate modern battlefields, perhaps we could see them as a new eruption of Reyner Banham's *Great Gizmo*. Banham's *gizmo* offers a model for quantifying the ways in which small devices can have much larger spatial implications in defining space into territory and cultivating place. Writing in *Design by Choice*, Banham defined the link between the American landscape, and the gizmo's role in colonising a vast landscape through small, portable, mass-produced devices for framing and encapsulating space. While the console controller is nowadays part of a wider organising network (the Internet) in relation to both its civilian and military use – judged purely as a point of interface between a user and software (or hardware) systems, it holds some intrinsic similarities that appear to place it in the same lineage as Banham's mass produced *gizmo*.

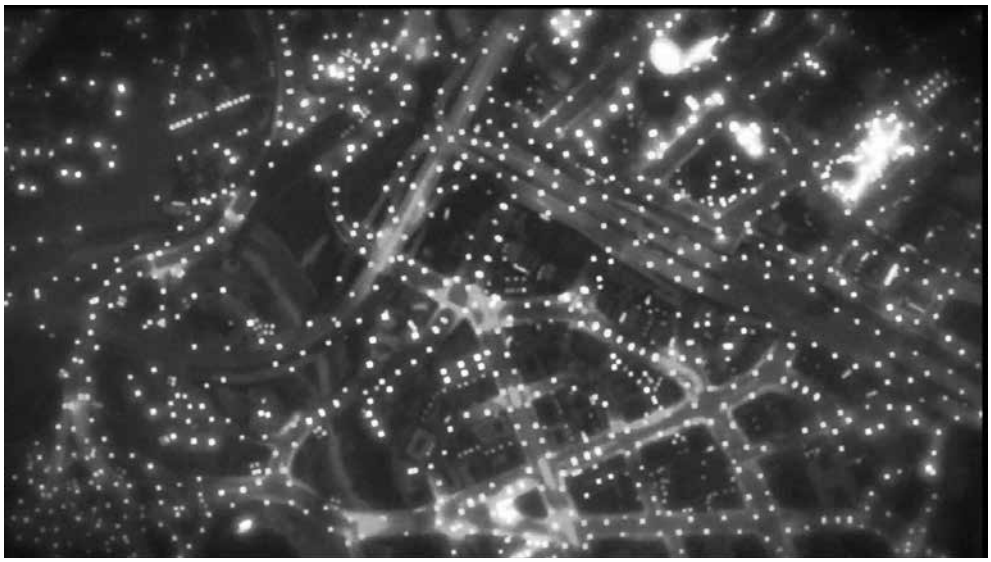
One of Banham's primary arguments about the *gizmo* in relation to defining space was that it 'does not require high skill at the point of application'.[43] Software and hardware interfaces have replaced – or augmented – Banham's idea of 'craftsmanship left behind at the factory'.[44] A PackBot is primed and ready for the colonisation of space, using the miniature choreographies and commands that a soldier may have unwittingly become an expert in through intensive 'Call of Duty' sessions. While the pilot of an RQ-20 Puma UAV may have *high skill* in such interfaces compared to his commanding officers, these skills may be quite ordinary in relation to those of millions of other people playing on Xbox Live or PlayStation Network. Indeed, Singer states that 'the typical young PackBot operator just needs about a day and a half of training to get down to the basics' becoming experts in a few weeks.[45] The day-to-day experience of playing videogames on console controllers has resulted in military technology coming to meet the new normality of civilian technoculture.

Videogame culture and the aesthetic experience of drawing out form through the hands provides millions of potential recruits able, in Banham's terms, 'to transfer some undifferentiated set of circumstances to a condition nearer human desires'.[46] Or at least, the desires of the military-industrial complex of which the videogame is increasingly part. Perhaps Banham actually foresaw such a situation when he argued:

> *Because practically every new, incomprehensible or hostile situation encountered by the growing American Nation was conquered, in practice, by handy gizmos of one sort or another, the grown Nation has tended to assume that all hostile situations will be solved by gadgets.*[47]

A new spatial order has emerged whereby robotic operators conduct operations in far-flung lands that often appear indistinguishable from fictional spaces through the proliferation of information, signs and markers on the graphical user interface. Nick Dyer-Witheford and Greig De Peuter tackle such spatial constructions within the game 'Full Spectrum Warrior',[48] through reference to media theorist Jordan Crandall. This military tactical simulation game allows one to switch between a third person experience and an aerial viewpoint for issuing squad orders. They assert Crandall's argument for the difference between what he terms *horizontal* and *vertical* vision. For Crandall, the horizontal, 'civilian' viewpoint deals with 'the advance or retreat of sightlines and perspectives' while the vertical deals in 'positioning, tracking, identifying'.[49] These modes of vision mediate the interplay between people on

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19 Screenshot of 'GTA V'. Obtained from: http://www.techhive.com article/2055515/grand-theft-auto-5-review-small-men-in-a-big-world.html [accessed 29. 08. 15]

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the ground and drones hovering above. The videogame form compresses this, allowing us to flip between the horizontal and vertical vision at will, or indeed enmesh one on top of the other. The 'civilian' eye is similarly co-opted into detecting patterns and tracking trajectories when applied within the videogame, as we regularly see in *first person shooter* games *[18]*.

While the martial regulation of space using videogame technologies is not particularly comforting, it is interesting to see examples of military technology drawn up from the domestic, rather than trickling down into it. As civilian drones become increasingly sophisticated, the player's ability to produce videogame form through interfacing between rules and representations appears set to continue impacting upon the way in which we see and traverse our cities and landscapes. Architects now need to come to terms with a multitude of 'half-real' spaces that are navigated with the hands, for their logics are increasingly being applied into the exploration, regulation, and visualisation of our fully-real landscapes.

Long-zoom landscapes

While the interface of many modern surveillance and military technologies has been altered to match the prevailing ergonomics of the videogame controllers, games themselves have also contributed to this slippage between virtual and actual through their incorporation of imagery and interfaces that closely mirror our tools for mediating the world around us.

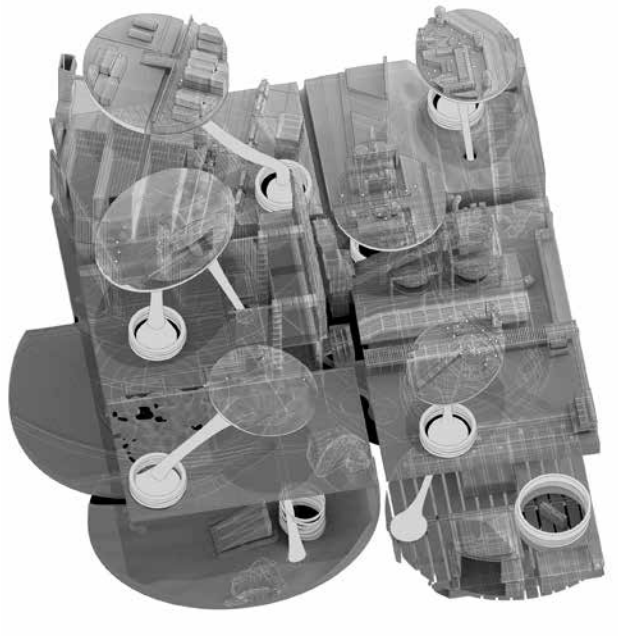
For example, in order to facilitate 'Grand Theft Auto V''s *character switching* and *Quick Missions* features (the latter enables gameplay remote from the player) the game's designers have employed a 'long-zooming' loading screen that pulls the camera away from the player, to a quasi-Google Earth aerial view – before plunging back toward a new *spawn point*. Via this out-of-body parabolic flight, the player is witness to the transformation of the city from navigable space into a composited 'satellite' image and back again *[19]*.

This masking of a loading screen is not unique to 'GTA V', but its resemblance to many of our actual tools of imaging is uncanny. The action of loading and updating space within the game is hidden behind the shifts in resolution that one typically experiences while navigating a remote location using such tools. As mentioned before, Mark Dorrian argues that this typically represents the 'suturing'[50] of a landscape by connecting fragmented imagery into a single territory and 'GTA V' takes advantage of our familiarity with such limitations of contemporary mapping software to increase its sense of verisimilitude. The jump in and out of Los Santos takes place in a number of stages of resolution, resembling the laggy loading and updating of the Google Earth terrain as one zooms ever further in.

These efforts to smooth over the loading sequence are notable because they exploit what Steven Johnson has termed the cultural paradigm of the *long-zoom*.[51] Johnson outlines the long-zoom as both physical, such as the satellite tracking a vehicle's license-plate on the ground, and conceptual – a movement through DNA, to personality and subsequently politics – oscillating back and forth. A notable historical example of this would, of course, be *Powers of Ten* by Charles and Ray Eames.[52] The long-zoom as an aesthetic regime is bound in the relationship between new *eyes for seeing* and how they are affecting the nature of vision in contemporary culture. The Google Earth-style view used by 'GTA V', legitimises Los Santos as a city – like a real city, it possesses a facsimile version of itself.

My research into the spatial implications of these jumps across space produced a series of drawings entitled *Zoom and Marker Landscapes*. These were developed around scenarios from 'Grand Theft Auto' through which the player ascends, shifts, and descends across the city using these fluid movements. The slowing down of time that takes place during a character switch transition also emphasises the smoothness of the exchange between constructed reality and the decisions of simulation. By transcribing such spatial phase shifts into a landscape bricolage, I start to define these multiple

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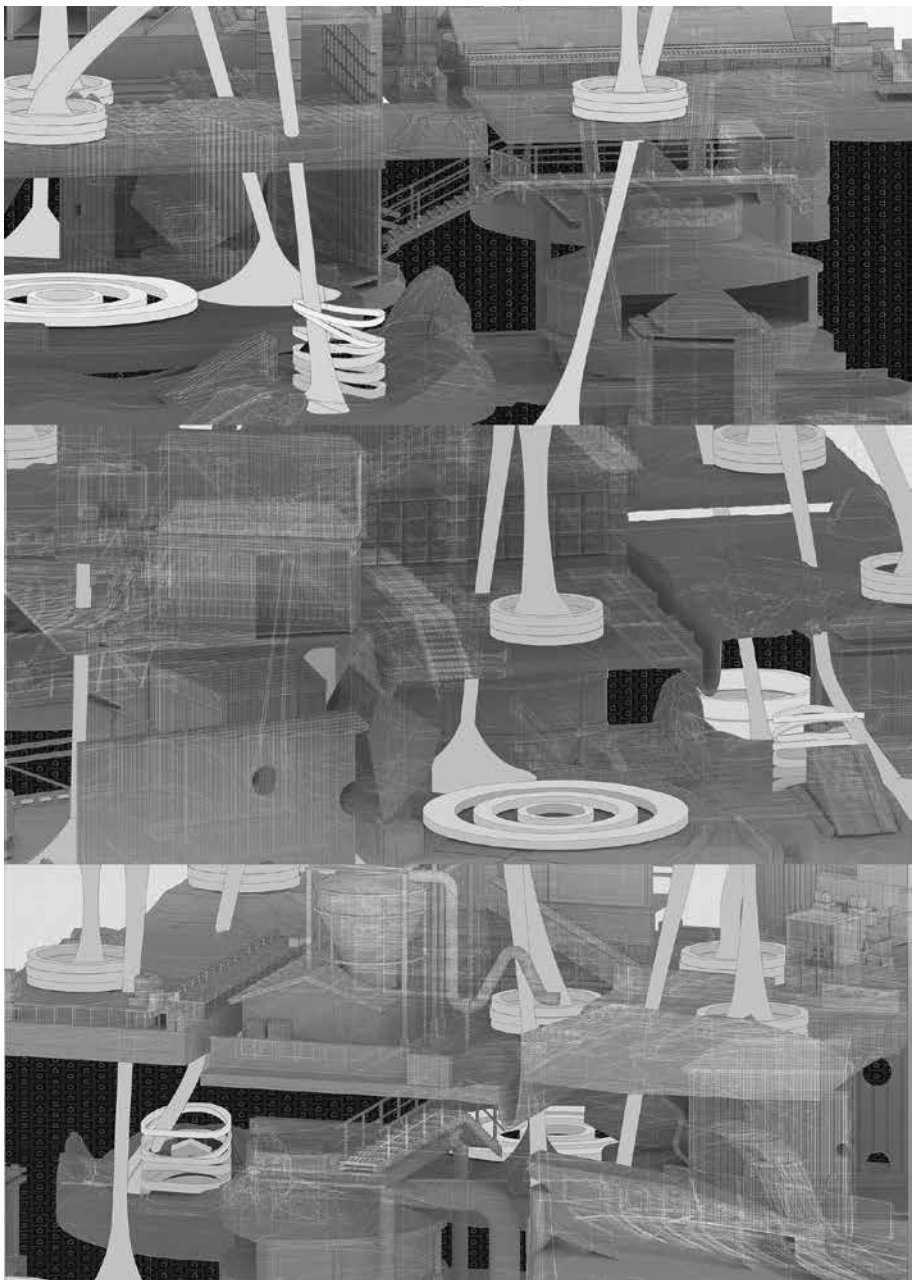
20

territories as one contiguous space, where changes in scale and context are equalised by the aesthetic condition of the player 'drawing form out through their hands'.[53] In effect then, these become architectural crystallisations of the virtual city as experienced by the player through this long-zoom strategy *[20, 21]*.

Architectures of deviation

Games may claim increasing likeness to reality, and an increasingly complex remediation of the real world but, as Aarseth argues, we rely on deviations, designed breaks from reality, in order to make these representations playable and immersive. Videogame spaces with their curious symbolic rules and facsimile architectures project new forms of cultural impulse onto architectural design.

When we look at the effects of videogames as media – we are addressing a new form of cultural artefact that combines the computation, high-level



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20 Zoom Trigger Landscapes 01.jpg.

21 Zoom Trigger Landscapes 02.jpg.

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coded structures synthesised together into a procedural artefact – but one that has a layer of meaning-making and symbolism laid atop it. When we inhabit the 'absolutely handcrafted world' of Rockstar North's Los Santos for instance,[54] we open up possibilities for further negotiations between the haptic and the coded in the virtual world of video game design. But moreover, the fact we must *play* videogame space out has tacit implications for architectural design in the world mediated by *new gizmos*.

If architectural modernity, and the 'cutting edge' are under the constant pull of various protagonists who claim simulation and computation might destroy representation, repetition, or symbolism as architectural mechanisms, then videogames are the locomotion that pulls the debate the other way. Good code in the video game is ideally experienced as seamless; ideally it should flow and feel naturalistic to the player as the game is played, a paradoxical existence Kirkpatrick argues draws the videogame away from dominant narratives of technological progress.[55] Even the most simply adorned of games tends towards a symbolic relationship with the player that fluctuates as one plays them.

Ultimately, the deviations of the modern videogame present architecture as unsteady – an oscillating facsimile, at once both corrupted and irresolute. As we see the tacit knowledge gained through playing videogames being co-opted for other interfaces of spatial control, we can see how the contortions of the half-real have the potential to become fully real architectural conditions. Videogames are not a-political folly, and increasingly take on new agencies outside of themselves. If the *gamer* has taken to the skies and now controls space through a new order of gizmo – what conditions might emerge when new generations of architects implicitly experienced in the *deviated* world start to drive the design of the actual one?

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