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System Cities: Building a 'quantitative utopia'

The projects of radical architects working in the 1960s and 70s had a resounding effect on architecture by redefining the discipline and cutting through modernism's relationship to technology. These conceptual projects— 'negative utopias'¹ such as Andrea Branzi's *No-Stop City* (1969)—presaged architecture's current obsessions with digital data and information systems. Branzi said as much, positing that utopia was only now possible through 'quantitative' means.² Marie-Ange Brayer argues that Branzi, along with the rest of his collaborators in the Italian radical group Archizoom, developed positions where 'the city was now a concept, a "behavioural model," and no longer a place'.³ Yet what we cannot forget is that many of these concepts and models emerging at this time were allied to subversive thoughts and an emphasis on civic playfulness and leisure.

Archizoom were not alone in this respect. Fellow Italian radicals such as Superstudio and UFO were designing hippyish collages, mobile systems and reconfigurable cities alongside wearable structures and nightclubs. Ettore Sottsass had developed a collection of trippy drawings explaining a post-work society that probed the depths of human pleasure in *The Planet as Festival* (1972). Elsewhere, Yona Friedman, Archigram and Cedric Price had all proposed infrastructural projects that could accommodate the mores of playful users. Constant Nieuwenhuys' *New Babylon*, begun in the 1950s, represented an architecture where 'there is only the playful drifting' of *homo ludens* (man at play) 'through an infinite and endlessly manipulable interior space'.⁴ *Homo ludens* was of course the title of Johan Huizinga's seminal 1938 work on play and games that is still much referenced today. Some of Archizoom's famous mirrored-box models for *No-Stop City* [IMG1-2] were built using the same Pepper's Ghost techniques used in arcade games of the day (such as the 1972 title *Dune Buggy* by Midway), allowing them to express their repetitive landscape through a prototypical form of virtual space.

These radical architects foregrounded the relationship between concept and cutting-edge technology, society and leisure. Their methods pose interesting questions for contemporary digital discourse in architecture focussed on the utility of computation in fabrication, machine learning or parametric technologies. Although *No-Stop City* programmatically predicted the quantitative world of the automated Amazon warehouse or the numerically controlled assembly line, in fact what the *project itself*—as an unrealised utopia—may have truly foreseen is the rise of virtual spaces, the world of videogames and virtual reality. Here technology allows for the parallel existence of worlds that allow us to partake in fictions, synthesise new identities and hold a mirror up to society in a similar manner to these historical projects. Most virtual worlds are entertainment media and regarded by many as folly, yet their structure and particular forms of kitsch in fact reinvigorates ideas of what a quantitative utopia could be as an echo of the conceptual spaces originally produced by the avant-garde.

From Utopia to Atopia

The megastructures and 'negative utopias' of the 1960s and 70s were never realised. They existed on paper or in models, and their organisational systems were mainly metaphorical yet often inherently playful and game-like. As games theorist Jesper Juul argues, all game structures require a form of 'immaterial support',⁵ a mutually agreed establishment of certain rules that are not physically manifest. In Archizoom's world, these invisible rules were the

flows of information that structured the city and allowed for new, unlimited possibilities within the isotropic grid. This ties closely to French philosopher Louis Marin's definition of utopia as 'the product of a process by which a specific system is [...] changed into another system with its own coordinates, structures, and grammatical rules.'¹⁶ If this manipulation of elements within an infinite grid was the quantitative utopia Branzi had spoken of, such utopias exist almost everywhere today in all manner of navigable virtual worlds. The popular building game *Minecraft* (2009)—which has become a form of ersatz architectural design software—uses a voxel-based structure that is an isotropic system where each block in the world requires another block to attach itself to. Visually and ontologically, a three-dimensional grid system structures the world, a form of immaterial support defining the operations of the playful world within. *Minecraft* is a visually striking example of this, but isotropic grids are ubiquitous to nearly all modern 3D design software used to create architecture and virtual environments. Relationships between objects in virtual worlds (in games or in CAD) are always defined in relationship to their cartesian position, orientation and movement. If Archizoom's *Superarchitettura* (1966) was informational 'super-consumerism, of the supermarket, superman, and super-petrol'¹⁷ then today we could add *Super Mario* to this list.

Interestingly, research conducted by Rowland Atkinson and Paul Willis found that supermarkets portrayed in game worlds are spaces where players blend the virtual with reality in a condition they called the 'ludodrome'.⁸ The proliferation of branding and graphic iconography, along with quantitative spatial organisations makes the supermarket a space that is just as banal in the virtual or the real and therefore becomes a portal between the two. Not only has *Superarchitettura* become the prevailing logic of our physical world, but it also serves as a syntactic junction point between the real and the virtual.

Super-Ubiquity

The connection between paper-projects and virtual spaces brings utopian thought into the present. McKenzie Wark describes virtual game spaces as *atopian*, which is the quantitative utopia by any other name. Wark argues '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.'⁹ In this context, *Superarchitettura* inspired the videogame-based project *Ubiquity* (2016) which replicates the landscape of generic signs and symbols contained within the modern supermarket into a game world that unfolds and spreads around the movements of a player within an isotropic grid. In *Ubiquity*, *Superarchitettura* is explored at several scales. The player moves from an urban realm of generic minimarts, to an infinite landscape of shelves filled with processed products [IMG3]. After some time wandering through this repetitive landscape, the player can enter a box of cereal and mingle amongst the grains within. Here we see a negative utopia of super-consumerism at the micro scale, blobs of toasted rice-and-sugar paste forming an architectural landscape of super-manufactured foodstuffs. [IMG4]

In *Ubiquity* the virtual world and its extents are defined at an informational level like *No-Stop City*'s mirrored infinities, but through computational code rather than optics. As the player moves, the game code builds and destroys objects upon a grid dynamically based on the view extents of a virtual camera. Switching to an isometric viewpoint, the player can see the landscape of minimarts unfolding around them from above, as these extents are defined in real-time by the perspective camera of the main first-person view. The movement of the player-character expands the isotropic system as it goes, establishing a feedback loop that shapes the world itself. Yet the invisible isotropic grid is always there, providing a datum point as architecture is assembled in real-time. As Brayer argues, Archizoom established a

project where architecture was ‘an environment that was constantly being reshaped, inscribed in the moment,’¹⁰ which could almost serve as a dictionary definition of how the virtual game world—or indeed any other—works. This can be evidenced when attempting to understand their logics through drawings and other cartographic practices such as in the research project *Noclip World* (2016), that peers beyond the edges of game spaces. [IMG5] In such an environment, any disruption to this constant inscription can cause atopia to build up into a distorted landscape, a city lost in an abundance of informatic signals.

Rules vs. Representation

Of course, an atopia growing around a singular player is solipsistic. Similarly, Archizoom’s mirrored box assembles an isotropic world only when viewed. However, computational developments have meant that in virtual worlds, systems can now self-produce quantitative utopias. Techniques known as ‘procedural generation’ are used by game developers to produce worlds through algorithms. This typically involves the design of architectural components (not dissimilar to Superstudio’s *istogrammi*) which are then composed through a programmed system. The world generated is entirely quantitative, but also possesses the qualities of the original components placed into the system. The game *No Man’s Sky* (2016) autonomously creates a whole universe from scratch, with each planet different for every player. Game developers Big Robot also created a system called *The British Countryside Generator* (2014) for creating a virtual world based on the rolling hills of the UK as a procedural parochialism, a romantic fantasy of a picturesque landscape created with advanced computation.

Another game designer, *Strangethink*, develops procedural worlds including a game (*Secret Habitat*, 2014) that produces a series of buildings containing a network of art galleries. Every piece of art within these galleries (and their title) is also generated through the algorithm [IMG6]. Here the quantitative utopia taken to its ultimate extent with the system-driven creation and dissemination of human culture, all borne from the same algorithm as the architecture which houses it. This negative utopia deals with the contemporary world of images: their creation and dissemination which has been radically changed by computer systems. Such techniques are often conceptual and ironic in their definition of spatial relationships. A procedural world is formed through the connection between the symbolic component objects and the system governing their placement. Such a relationship between playfulness of experience and a systemic playfulness of meaning was of course explored by Archizoom at the object-scale in their furniture series for Poltronova (1967), where beds and chairs became satirical, ironic objects that conveyed messages about consumerism through the context in which they could be placed.

In response, the game-based project *DWG Hunter* (2017) also uses procedural generation to explore these informational relations in which the player must find and repair deviations while jumping on revision clouds. The world is assembled through architectural units that are automatically attached to one another at designated junction points alongside layers of random objects assembled upon a grid, defining an isotropic world that is arbitrary and yet carefully cultivated. By pressing a button, the player can reassemble a new world around them. Here multiple different quantitative utopias reside within one programme. Each discrete unit of architecture is defined through its relationship to the next, but each of them also possesses a symbolic position. A grid of tiled plazas is generated, upon which monumental entrances lead to bridges that go nowhere or towers that hover in the air. [IMG7] All these architectural paradoxes are, like Archizoom’s utopic projects, the result of the rational pushed to its tipping point. The irrepressible march of the frame-by-frame

computer code creates a utopian space only to be overwritten the moment the player interjects once more. The system only cares about connections and quantitative relations even if the architectural elements resemble something like John Hejduk or Aldo Rossi's architectural characters assembled human centipede-style into a snaking conga line. The game space becomes a form of random monument generator where architectural tropes become combined together over and over in the isotropic realm [IMG8]. In this respect, the virtual architecture seeks to question the relationship between history, symbolism and computational systems. The real-time computation of the game engine can be used to assemble architecture quantitatively through algorithms while the qualitative properties of that architecture carries relations to historical forms and typology. As a conceptual space it enmeshes avant-garde influences with the atopian structure of our contemporary (virtual) worlds.

The system cities of the architectural avant-garde were conceptual spaces that questioned the logics of capitalist reality and the discipline of architecture itself. Computational technologies have allowed for all manner of quantitative utopia and atopia to be realised, most of which do not carry the subversive charge of the radicals. But this does not mean that they could not. By inviting people into isotropic domains and foregrounding relationships between systems, virtual environments are both an extension of the critical world-building projects of the avant-garde, and a new medium by which avant-garde architectural practices can be reinvigorated and reimagined. We will build new system cities, where computation meets concept, rules meet representation and interface meets ideology. Here we can come to terms with architecture in our information age through building new negative utopias, moving from the factory towards the hyper-connected threads of virtual and theoretical worlds.

Footnotes

1. Pino Bruggellis and Manuel Orazi, "Radicals Forever," *Radical Utopias*, Quodlibet Habitat (Rome), 2017, p.38.
2. Andrea Branzi, *No-Stop City Archizoom Associati*, HYX (Orleans), 2006, p.176-179.
3. Marie-Ange Brayer, "The Radical Architecture Project as "Territorial Design"", *Radical Utopias*, Quodlibet Habitat (Rome), 2017, p.50.
4. Mark Wigley, *Constant's New Babylon The Hyper-Architecture of Desire*, Witte de With Center for Contemporary Art/010 (Rotterdam), 1998, p 13.
5. Jesper Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*, MIT Press (Cambridge MA, London), 2005, Kindle edition for iPad, Loc 526.
6. Louis Marin, *Utopics: The Semiological Play of Textual Spaces*, Humanities Press (Atlantic Highlands, NJ), 1984, p.242.
7. Text from *Superarchitettura* poster, Andrea Branzi et. al, *Superarchitettura*, Galleria Jolly 2, 1966.
8. Rowland Atkinson and Paul Willis, "Charting the Ludodrome", *Information, Communication & Society*, Vol. 10, No. 6, 2007, p.818.

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

10. Marie-Ange Brayer, "The Radical Architecture Project as "Territorial Design"", *Radical Utopias*, Quodlibet Habitat (Rome), 2017, p.50

Image Captions

[Img1] Archizoom, *No-Stop City: Residential Parking*, 1970. Archizoom's mirrored boxes created prototypical virtual spaces using Pepper's Ghost techniques, and cabinetry that recalled arcade games of the period, blurring the lines between architecture and media, play and concept.

[Img2] Archizoom, *No-Stop City*, 1970. Peering into mirrored boxes, viewers could see a virtual space unfold in front of their eyes. Through optical reflection the quantitative utopia could emerge as a repetitive infrastructure of information to be appropriated by citizens.

[Img3] Luke Caspar Pearson, *Ubiquity*, digital game, 2016. This screenshot drawing of the game demonstrates an infinitely repeating landscape of 'superarchitettura': generic supermarket buildings that grow around the eye of the player and follow their movements.

[Img4] Luke Caspar Pearson, *Ubiquity*, digital game, 2016. A drawing showing the player's journey from the generic architecture of the supermarket to the air-conditioned environments of innumerable shopping aisles and ultimately into the world of super-processed foods.

[Img5] Luke Caspar Pearson, *Noclip World*, 2016. As part of a research project examining virtual environments, this drawing explores the invisible forces and rules that act on architecture experienced within a game world and how they structure the experience of the world.

[Img6] Strangethink, *Secret Habitat*, digital game, 2014. This screenshot taken from the game shows a virtual gallery space procedurally generated by an algorithm, housing artworks and names also produced by the same computational system.

[Img7] Luke Caspar Pearson, *DWG Hunter*, digital game, 2017. One of the compositional outputs produced by a procedural system. Various symbolic built components are arranged through a computational system that can be manipulated by the player to create infinite variations.

[Img8] Luke Caspar Pearson, *DWG Hunter*, digital game, 2017. A screenshot composition drawing of the architectural spaces generated by the procedural system. Spatial tropes are combined and exploded at will through the actions of a player who can reshape their atopia around them.