

Space in New Media Conception – With Continual Reference to Computer Games and Game Graphics

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ABSTRACT

This article, partly philosophical and partly practical, challenges the notion of space (and time) in new media conception such as it is outlined in Lev Manovich's seminal book *The Language of New Media* (2001) by testing it against (other) notions and representations of spatiality. This leads to a discussion of computer game spaces and the way they remix earlier media. It is argued that computer game spaces, and, more generally, the layered techniques of computer mediated graphics, can be seen as the combined result of Renaissance geometry, topological space in Modernism, and the moving images of cinematography.

Keywords: Computer graphics, new media, computer games, space and game space, philosophy of space, art history.

1. INTRODUCTION

In a reading of the Berlin-based ART+COM multimedia work *The Invisible Shape of Things Past* (1997), Lev Manovich notes that this artwork, or this particular "cultural interface", in following "the general trend of computer culture towards spatialization of every cultural experience", "spatializes time". It does so, we are further informed, by "representing it as a shape in a 3-D space" (Manovich 2001: 87). ART+COM's medialisation of cinematography maps historical films of Berlin "into new spatial structures that are integrated into a 3D navigable reconstruction of the city".¹ Interestingly enough, ART+COM seems to pay tribute to avant-garde art forms, most notably the 1960's Situationists and their idea of reconfiguring urban spaces. Additionally, this reconfiguration is witnessed every hour and every second in the 'webification' of Potsdamer Platz, i.e. the subtle interplay of web-cams, panoramas, corporate buildings, and multinational media houses.

Another example that Manovich calls upon is the software developed by Steve Amber that enables the user to "map" a feature film

into a matrix of still images where each image represents a shot from the film. "Here time is mapped into space"², Manovich concludes. The art projects of Amber and ART+COM can be seen as *mapping* strategies in new media, which also signals what Manovich refers to as *meta-media*: objects that contain both language and meta-language, i.e. "both the original media structure (a film, an architectural space, a sound track) and the software tools that allow the user to generate descriptions of this structure and to change this structure".³ Meta-media are, in a manner of speaking, bones and skin in one.

In the following I shall contextualise these quotes and use them as a background for challenging the notion of space (and time) in new media conception such as it is outlined in Manovich's book *The Language of New Media* (2001) by testing it against (other) ideas and interpretations of spatiality. This will lead me to a discussion of computer game spaces and the way they remix earlier media. Overall, my critique can be rendered into an explicit interrogation:

What kind of spatial model do we speak of when we claim that temporal forms are indeed mere representations within an overall – cultural as well as technological – spatialization trend in new media strategies?

2. SPACE AS FORM – SPACE AS REPRESENTATION

What is space? It is incongruous to believe that one could effortlessly and incidentally answer such a highly complex question. First of all, philosophers, scientists, and artists have been debating this issue for thousand of years. In his mytho-rational philosophy Plato deemed space to be of lesser value than time, since time, at least, is a reflection of eternity and therefore of form itself. In Greek natural philosophy space is merely a frame, which environs an object, or, as it were, the place for a thing. When you 'carve' out this thing, by cutting out place from space, you get a rupture in

¹ Lev Manovich: "The Anti-Sublime Ideal in Data Art", www.manovich.net.

² Ibid.

³ Ibid. See also Lev Manovich: "'Metadating' the Image", www.manovich.net.

the representation of eternity. Time is not, however, that which directly connects space to eternal forms thereby preventing space from falling apart when it is otherwise occupied by places and things; rather, time is an incomplete echo, a representation of recollection, which mimics the mundane form that is already a copy of a copy. This lesson of mortal existence as extensively disconnected from the proper world of ideas is gently elaborated in Plato's best known philosophical text: the cave myth.

Much later, Kant declares in furtherance of Newtonian laws of gravitation and ideal geometry space an absolute entity, even if he simultaneously reveals its latent brittle eminence. In *Kritik der reinen Vernunft* (1793) he argues that space and time are the perception forms – or modes – of reason (*Verstand*). One 'thinks' with these forms, but one cannot transgress them. Which is to say: one cannot turn them into objects of a 'pure' philosophical enquiry. To Kant space is consequently both the underpinning and curb of reason. If space is indeed a kind of optical machinery that we use in order to observe objects and relations *within* space (that Kant thought of as a Cartesian grid), then the Kantian dilemma exactly consists in the paradoxical fact *that we cannot observe the conditions of our observations*. We do not have access to the optical machinery as long as we – knowingly or unknowingly – use this machinery. The problem is that we always deploy this machinery – even when we assumingly try to surpass it by observing it as an object (Walther 2003c).

Secondly, it seems that space is not a 'pure' concept at all, since it is connected with time. This interweaving of categories can be registered in common physics as well as in everyday language: we utilize temporal metaphors with the intention of describing spatial topics. Temporalisation is that which donates a certain dynamics to space; time is space dimensioned; time is that which ensures a trajectory through space; time is precisely that which enables navigation. Time provides space with depth, relations, and maybe – some would assert – it assigns narratives to space. Whenever there is space there is a story, since – and this would be the argument – space needs to be perceived not only as an available abstract plane of coordinates but also as a set-up for lines and trails that precisely move in time. Space tells stories; and space facilitates the act of storytelling. Even later, Einstein challenges this view in which space is primarily conceived as synchronized representation. In his special theory of relativity, Einstein delivers a precise report of contingency that numerous painters and authors have portrayed during the 20th Century. In fact, it was one of Einstein's contemporaries, Henri Poincaré, which similarly launched an assessment of rigid space conceptualisation that apparently turned Marcel Duchamp away from painting and into functionalism. Space that was earlier rationalized as a coordinated medium of continuity and endlessness is now, in the hands of Einstein and modern physics, a secondary facility that is inevitably attached to the system – i.e. the point – of observation, whereas the speed of light is the constant of the universe.

Thirdly, space differs when we look at it from a human and a strictly mathematical angle. The mundane space that a human subject inhabits is not by nature geometrically; rather, it is structured in accordance with matter-of-fact actions. In such a spatial environment various orientations are related to directions – practical vectorizations – places, ranges of space, and things, in contrast to dimensions, points, lines, and absolute objects. The space of action is a praxis-architecture – a phenomenological space, one might call it – that does not entail length, height, and width, but instead possesses territory, proximity, and distance (Nielsen 1996;

Bøgh Andersen 2002). A personal space zeroes in on equipments and relations that are required to institute qualities of meaning, whereas a geometrical space is incessant and unbounded. The space of every day life is *heterotrophic* in its design of multiple layers by which it constantly confronts its user with a surplus of potential strategies of spatial couplings. The space of mathematics is *isotrophic* in which all matter and every coordinates are evenly spread in all directions. Thus, when a human subject navigates through space it becomes *contingent* – where to go next? – and *intentional*: the use of space through motives and affects. Following from this, my assumption is simple: it is Einstein, Poincaré, and Husserl that paved the way for the computer graphics and the computer games of the present era.

3. NAVIGABLE SPACE – COMPUTER GAME SPACE

Now, in order to illustrate this duality embedded in our conception of space we can point towards the computer game as an example of "navigable space" (at least if we consider games after 1992). Importance should be placed on the fact that a game space exactly projects both a semantic and a mathematical space. The game space is constructed – it is made up of polygons, object relations, textures, rendering strategies, etc. – and, at the same time, it is 'nothing' without the presence of the user within this represented world. The game space is the result of numerous mathematical calculations, but it is furthermore a space that exports meaning and is open for meaning.

In *The Language of New Media* Manovich talks about the "navigable space" of the computer game where "narrative and time itself are equated with movement through 3-D space, progression through rooms, levels, or words" (Manovich 2001: 245). Again, we are confronted with a general new media trend – that of spatializing temporal forms. Manovich goes on to compare *Doom* and *Myst* and claims that whereas the player in *Doom* moves in straight lines, "abruptly turning at right angles to enter a new corridor", the navigational structure in *Myst* is much more open and liberated: "The player, or more precisely, the visitor, slowly explores the environment: She may look around for a while, go in circles, return to the same place over and over, as though performing an elaborate dance" (ibid., p. 244f.). And yet the two games are basically identical since they are both "spatial journeys":

Navigation through 3-D space is an essential, if not the key, component of the gameplay. *Doom* and *Myst* present the user with a space to be traversed, to be mapped out by moving through it. Both begin by dropping the player somewhere in this space. Before reaching the end of the game narrative, the player must visit most of it, uncovering its geometry and topology (ibid., p. 245).

However, I do not entirely agree in Manovich's classification. First and foremost, there is a larger degree of visual and spatial variability in *Doom* than in *Myst*. In the latter the user's relative independence in terms of vision and motion is limited to 45 and 90 degree pans – or, rather, cuts between 2D graphics – and the unimpeded exploration that has otherwise been ascribed to *Myst* (cf. Bolter 1991) is partly an illusion because the user is forced to follow certain pre-programmed paths within the game (cf. also Pold 2001). Secondly, the artistic openness that Manovich observes in *Myst* is not connected to the navigational potentials of the user. Rather, it is present because the player has a vast amount of *time* at hand with regards to investigation, and also because the

narrative plot seems to *demand* that the player wafts out into the picturesque branch points and grey zones of the *Myst* universe.

In contrast, *Doom* is condensed to the here-and-now story of the user: a fast tracking through space. Espen Aarseth comments upon game spatiality:

[*Myst*] presents a graphical "click'n'go" interface over the classical adventure game structure: explore the paths, solve the puzzles, and win the game. The representation seems three-dimensional, but consists of a network of still life pictures, with "hot spots" that the user clicks on to "move". What seems like an outdoors game is very much of the indoor variety: discontinuous, labyrinthine, full of carefully constructed obstacles. What looks like an open area is really a closed labyrinth with a few possible directions, indicated by the stairpaths (Aarseth 1998).

It is true that contemporary computer games present themselves as navigable spaces in which the trajectory of time is integrated into spatial journeys. Nevertheless, we must not overlook that this 'inclusion' of time – the subordination of time onto 3D space – behaves differently in shooters and adventure games. Let me briefly explain this supposition.

In general, the creation of new and powerful game technologies is correlated with realistic renderings of textures in 3D spaces by using real-time based motion procedures that are represented relatively to the user's perspective. There are basically two ways of doing this: In *binocular parallax* the user's vision (and, of course, the body) is tied to an exact point in space. The optical performance can easily be experienced by focusing on a spot in front of the eye while the other eye is covered – and vice versa. What happens is that space itself seems to move! More advanced is *motion parallax* that simulates the fact that body movements create different visual inputs (Qvortrup 2002: 10). Actually, computer games simulate this simulation technique: when playing a game it is not the physical body movements themselves that modify the game space (this would instead be genuine VR); rather, it is the *represented* body, i.e. the corporeal viewpoint, which has been transported 'inside' the game's space.

3D shooters such as *Doom* and *Duke Nukem* suffer from visually imperfect textures (which are easier to render than bitmap images and high-polygons) and at times iridescent depth perception. These games put the freedom of motion feedback over image depth and photorealistic neutrality. The *Half-Life* modification *Counter-Strike* exploits to a large extent textures as a cover-up for geometrical forms and the so-called 'blurring' that is produced by photo technical distortion, sharpening of edges, use of patina, etc. is far from realistic. Similarly, the central perspective in the game (or, rather, in the copious *maps*) is basically accurate, but the manufacturing of shadow effects is rather simple, and the texture gradients are reduced to blurring (Kolstrup 2002: 251).

Yet, the consistency of computer game spatiality not only bases itself on the capacity of the 3D engine, which is the 'motor' that quantizes ('calculates') the images on the screen as well as renders them (i.e. by 'moving' them). The consistency is further tied to constituents of *genre* and hereby intimately related to the user's expectations prior to the game. Take adventures as an example: *Grim Fandango* is not realistic and action packed like the current successor of *Doom* – *Doom 3*. The former game primarily consists of static, cartoon-like scenes. When the avatar – Manny – enters a new location within the "Land of the Dead" the game immediately switches camera mode, lightning angle, and architectural structure.

Indeed, modern adventure games are much more attracted to mood, graphical richness, and narrative complexity than to the user's physical presence, real-time rendering, and the facilitation of simple conflict schemes. Thus, the crucial aspect of space representation in adventures becomes the constant and 'natural' transformation of centre and periphery in the depicted game world. The entire aesthetic effect is based on this realistic potential of transformation, which is obvious in games like *The Longest Journey* and *Myst III: Exile*.

Typical action game still struggles with the fact that the user's orientation in the 3D space is established through the use of central perspective and not through the singular textures that one encounters during the spatial journey. In *Counter-Strike* the player needs to navigate quickly in space. Where are the snipers; where is the bomb located; will the competing team reach the target before us? That is why the space in *Counter-Strike* is not crammed with niceties and interesting objects – and if they do exist it is likely because they serve a functional role: The user can climb up the ladder and get a better view of the killings at hand, or he may hide behind the wall of a broken country house and slowly sneak in on the terror unit. In adventure games it is the other way round. Here, constant orientations within space are not the average requirement. Spaces in *Myst* and *Riven* are highly complex – so what one does is draw a map, learn about the structure of the landscape one is traversing, and enjoy the details.

However, this mapping of spatial information is grounded in a functional desire for control. Playing *Myst* is not just about envisaging and seeing the sights of a striking world. Also, and more decisively, the player's desire is intended for the 'secret' structure underneath the surface, tracing the atlas behind the puzzles.⁴ As Guattari puts it: "We're strict functionalists: What we're interested in is how something works, functions – finding the machine. But the signifier is still stuck in the question 'what does it mean'?" (Guattari, in Deleuze 1995: 21f.).

4. SPACE PERCEPTION – ART – COMPUTER GAMES

But what is a computer game space? In addition, how did it come about? I would like to propose that an emblematic 3D game spatiality combines the features of Renaissance painting as well as those deployed by the topological geometry found in Modernism. Allow me therefore to highlight a short history of space representation (Walther 2003d). Needless to say, this is not the average computer games lineage (cf. Walther 2003c).

From ancient Greece, Roman painting, and Giotto's medieval techniques we are aware of how perspective, space, light, and planes can be skilfully manufactured (Gombrich 1982). However, it is not until the Italian Renaissance and the invention of the central perspective that spatial objects and environments, which simultaneously depict realistic panoramas and create imaginary worlds, are made operational in the modern sense. Masaccio's *La Trinità* in Florence from 1425-26 is considered the first piece of art that is based on an entirely correct, mathematical conceivment of space (Qvortrup 2003: 64). The specific painting method described by Leon Battista Alberti in his famous *Della Pittura*

⁴ See Walther 2003a for a more detailed discussion of the relation between structure and experience in play and games.

(1435) consists of the interconnection of orthogonal lines within the image so that they all crawl into own point: the vanishing point. By stretching the lines further symmetrically into the picture as well as from the picture and outwards to the viewer/painter a geometrical relation is created as if the viewer/painter were part of the scene and as if what they were seeing were the three dimensional relationship that would be seen with the eye (Hetherington 1999: 55).

The mathematical concept of *projective space* formalizes the elements that are put forward in Renaissance perspective. It is exactly this projective principle of a form's identity - for instance the identity of the dinner table in Leonardo's *Last Supper* (1495-98) - that vaporizes in the visual art form of Modernism. The geometrical principles that support figural compositions within the works of Klee, Magritte, Picasso, and Escher seem to be more fragile, bendable, and topological (Østergård 1999: 28). Take a look at Magritte's painting *La tentative de l'impossible* (1928). It shows an artist in the process of painting a nude woman *ex nihilo*, as if she were carved quite literally out of the canvas itself. Magritte's two-dimensional trick folds the representational and conceptual space into one, so that it becomes impossible to figure out the 'inner' and 'outer' form of the picture. This is a space representation that, in its ironical portrayal of art's formal rationality, seems to locate itself in the midst of infinite spatiality and, at the same time, very close to a strictly territorialized space. The idea of endless space in Magritte is not imported from elements of Renaissance's ideal anthropocentrism in which man and the human eye is in the centre of things. Rather, it is a spatiality that folds layers of (representation of) reality into other layers, on top of each other, and next to each other, hereby nesting forms within forms and strange loops. Think of Escher's peculiar drawings in this respect. Magritte evokes the essence of 20th Century's pivotal negativity: that truth is hidden in the eye of the beholder, but that it does not make any sense to proclaim the foundation of this very visibility. In other words: space is deceitful. Space is not to be grasped *in itself*; rather, it must be *explored*.

Computer game spaces conclude this dense history of spatial representation. What one sees on the screen is obviously presented in the manner of Alberti's recipe. However, the projected game space furthermore entails a kind of n-dimensionality, meaning the computer's ability to juxtapose infinite layers and grids in a complex environment. One can always 'stack' another layer on top of the previous one, or, as it were, add worlds upon rows of worlds. The Alberti space of computer game modelling basically works as a bottom-up technique; take the wire frame, juxtapose textures, lights, and ambient objects; then add movement, and the illusion of depth. Such a space one could label the topological geometry of computer game design, while the other, the Renaissance vanishing point, is the ideal geometrical game space. To put it briefly: the computer game space consists of both vanishing points and infinite layers. When located directly in front of a prototypical *Doom*-milieu, one is in a kind of 'Leonardo-mode'; the eyes follow quickly textures and paths only to observe a monster coming directly towards one's heavily armed torso. But, as all of this happens, space itself is constructed *on the fly*, it literally unfolds itself in the course of gameplay, as if one was painting the environment and routes oneself, and as if one was cutting and pasting the nude woman out of nothing in the work by Magritte.

Graphical game spaces move in time. Without time, there is no space. Space takes time. It takes time to comprehend space - and 'it' is in space (or: it is always already spatial). Furthermore, with-

out time there probably wouldn't be any space to comprehend. Nothing occurs that is not in time, writes Kant in *Kritik der reinen Vernunft* (Kant 1998: 106ff.). Certainly, game spaces are intriguing also because they touch upon cinematographic modalities. As such, they are "dynamic screens" (Manovich 2001: 96ff.). Such screens may be peepholes into depicted scenarios (as in Renaissance), but furthermore they convey images that change over time. The duration of time within geometrical space is of course also inherent in Renaissance art since the viewer's ability to gaze along the lines of the representation presupposes a dynamic space that needs time as its medium (i.e. time equals depth). However, with film and cinematography time, space, and movement become transparent with respect to each other. Though the spectator may not be moving himself (as in Virtual Reality), cinematography provides the illusion of portable perspectives. Not only do images move in front of the camera lens; the camera is itself mobile in relation to observation (Bolter 1996). Therefore, computer game spaces consist of vanishing points, infinite layers, and cinematographical movability.

In short: Renaissance realism + Modernist painting + cinema = computer games.

5. TENTATIVE CONCLUSION

With the arrival of the Renaissance painting time both as autonomous appearance and method of perception became entrenched within the representation. Speaking in a mesh-mash of cultural analysis and technological teleology, the geometrical construction of Renaissance is a snapshot of the time-image: it is time dimensioned; time understood and pictured *as* space *in* space. Impressionism and Modernism both criticize this ideal correlation of time-lines and space-perspectives - it precisely *takes time* to figure out the chaotic granularity of Monet's depictions; and an even more 'outrageous' deconstruction of steady geometry can be witnessed in the artworks of Magritte. In Renaissance time was build into the picture. In Modernism time point towards the contingency of observation. While the former spreads chunks of stories evenly across the uninterrupted lines of the representation, the latter problematizes the true origin of observation by lifting the 'uni-verse' of Renaissance into the 'multi-verse' of Modernism. Cinema, finally, instantiates both illusions.

What I am arguing for, then, is not that we should renounce Manovich's statement about the spatialization of time and new media's navigable space. However, what I do want to bring into focus is a view upon computer game spaces as 'perfect forms' because they synthesize central perspective, topological space, and cinematic motion. An interesting case study would be the software known as the *level editor* that - occasionally - comes with the games themselves, e.g. *Unreal-Ed* for *Unreal Tournament*, or the *Quake* editor that engines numerous games on the market. Working with a level editor or a graphical engine such as *GameMaker* is, as it were, an enterprise of continuous art history: One begins with the wire frames (Renaissance), add textures, light, angles, trajectory points, layers, etc. (Modernism), and, finally, a scene or a gameplay is brought to life through various cinematic motion and simulation techniques.

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