

The Space-Image

Interactivity and Spatiality of Computer Games

In recent computer game research a paradigmatic shift is observable: Games today are first and foremost conceived as a new medium characterized by their status as an interactive image. The shift in attention towards this aspect becomes apparent in a new approach that is, first and foremost, aware of the spatiality of games or their spatial structures. This rejects traditional approaches on the basis that the medial specificity of games can no longer be reduced to textual or ludic properties, but has to be seen in medial constituted spatiality. For this purpose, seminal studies on the spatiality of computer games are resumed and their advantages and disadvantages are discussed. In connection with this, and against the background of the philosophical method of phenomenology, we propose three steps in describing computer games as space images: **With this method it is possible to describe games with respect to the possible appearance of spatiality in a pictorial medium.**

The Spatial Approach in Computer Game Studies

Within the last few years, there has been a paradigmatic shift within the philosophy of computer games: while computer games were primarily conceived of as interactive fiction or texts in the 1990s, starting around the turn of the millennium computer game research took a turn, trying now to define games in opposition to texts and other media like film. Even though it is obvious that computer games are games – a fact that is analytically true – it seems that such a statement does not grasp the essence of computer games. This essence is actually well captured by the old term “video game”; transcendently speaking, it is a precondition of computer games that the player

in: *Conference Proceedings of the Philosophy of Computer Games 2008*, ed. by
Stephan Günzel, Michael Liebe and Dieter Mersch, Potsdam: University Press 2008, 170-189.
<http://pub.ub.uni-potsdam.de/volltexte/2008/2456/> [urn:nbn:de:kobv:517-opus-24561]

must perceive the game as an image before it can be played. In contrast to the reception of static images and even in opposition to moving yet determinate images, what is essential to this type of image is their ability to be actively manipulated. Thus, computer games as interactive pictures are constituted by both: reception and interaction.

The paradigmatic shift in question becomes apparent by a frequent reliance on the spatial description of computer games (e.g. Poole 2000, Aarseth 2001, Tong/Tan 2002, McMahan 2003, Newman 2004, Ryan 2004, Borries et al. 2006, Stockburger 2006). Indeed, space is the one category that has come to be accepted as the central issue of game studies, and the one in which all previous categories are integrated – a situation that supports the hypothesis that a paradigm change is taking place. According to Thomas Kuhn (1970) paradigms can only change when the new paradigm is able to assimilate central elements of the old. This case is illustrated, for example, in the concept of computer game as “narrative architecture,” as Henry Jenkins (2004) proposed; he thus transposes the view that games are stories into the new paradigm, which claims that games are to be conceived of as things that are essentially defined by their spatial configuration (according to Jenkins, the narration in games is not to be found in the story line of the adapted story; but rather in the environmental setting within games.) At the same time, this paradigmatic shift means not only a renewal of computer game studies, but also image studies and picture theory itself: in respect to a theory of the pictorial medium, it can be argued that a new type of image is distributed through computer games, namely simulation pictures, the perception or reception of which includes interaction. There is a central medial difference between simulation pictures and classical forms of pictures, namely that while conventional pictures were constituted by pictorial space or an “image-space,” interactive pictures on the contrary present a “space-image.”

To put it in Alberti's terms, in traditional pictures (a category consisting predominantly of Renaissance perspectival paintings) the viewer looks "through" the picture frame into an illusive space created through the picture as an "image-space" (Heath 1986). The viewer envisages a pictorial space defined by certain attributes like flatness or depth, which relies on certain techniques like *sfumato* or the interplay of shadow and light. All these elements or techniques occur in computer games, albeit with the essential medial difference that can be reformulated in terms of spatiality: by interacting with the pictorial appearance – hence the "image" – the viewer also experiences a phenomenon that cannot be experienced in traditional imaginative space, namely the experience of motion as navigation. In contrast with the image of a film, which presents a determinate movement that is passively received by the viewer, the movement in an interactive image must be induced by the viewer. Here the experience of the picture is constituted by the possibility of active navigation through a pictorial space (Manovich 2001); by this the picture becomes a "space-image." Thus, while movies are characterized by the fact that they present artificial motion, computer games are characterized by the fact that they present artificial navigation.

Space "On" and "Off" the Screen

Within computer game studies exist some systematic analyses, which practice or actively thematize the shift towards a new approach on the basis of space. The earliest is that of Mark Wolf (1997), who has analyzed computer games looking at the difference between *off-screen space* and *onscreen space*. According to Wolf, video games can be categorized by the nature of the relation between these two. While early computer games consist mainly of contained spaces where there is no possibility to transgress the framing, three-dimensional computer games since the 1990s allow a transgression of the frame in any direction. In *SPACEWAR!* (1962), for example, all

realms of navigable space are onscreen from the very first moment of the game, and this is the only space the player can navigate. Even though one may assume the existence of an off-screen space beyond the visible field, it can never be experienced by navigating it – simply because it has not been programmed. In a first person shooter-game like *QUAKE* (1996), on the other hand, the navigation in off-screen space is extended beyond the picture's frame.

Wolf has borrowed his category “off-screen space” from film studies, namely from Noël Burch (1981), and it is of no surprise that he does not and particularly *cannot* pay tribute to formal differences in navigation as such in his categorization, but only to the visual result of interaction. If applied to text-only adventure-games like *ZORK* (1980), for example, one would have to say that the onscreen-space of the game (in the sense of visible space) occurs entirely “off (the) screen.” However, navigation through the game space is still possible – indeed it is the very basis of the game. Granted, this is a border case, but it shows, firstly, that an analysis of computer games as pictures would be incomplete without addressing the aspect of interaction; and secondly, that the aspect of space is even more fundamental than that of the picture.

Typology of Game Space

In this respect, recent categorizations have considered the navigational aspects of games; the most notable work on this topic being that of Clara Fernández-Vara's team of researchers and a group lead by Aspen Aarseth, whose paper “A Multi-Dimensional Typology of Games” at the first DiGRA-Conference at Utrecht proposed to analyze space by three “dimensions”: *perspective*, *topography*, and *environment* (Aarseth et al. 2003). To say nothing of the second two, their first “dimension” comes as a surprise: in contrast to most computer space analysis, Aarseth and his co-authors explicitly do not distinguish between the perspective of the first and third person, but

instead they declare the primary difference to lie rather between a “vagrant” and an “omnipresent” view.

Wolf’s characterization thus could be reformulated as follows: SPACEWAR! is not only a single screen-contained game space, in which a supposed offscreen-space beyond the frame never reveals itself, but it is also a good example of an omnipresent view, for all areas of the navigable space are evident. In QUAKE, on the other hand, the player has to navigate vagrantly, i.e. the ego has to wander through game space in order to apprehend the spatial setting or game space. The difference between these two games, then, is said to be more fundamental than the difference between a subjective and a semi-subjective view (focalization) as put forward by narratologists (Neitzel 2005), to which the difference between the two views is relevant in respect to the identification with an avatar. As it turns out, Aarseth does not systematically ground this reduction, for he argues that games in present and future will have the option to switch between the two views.

Because it operates within the difference between *geometrical* and *topological* movement, the second category demonstrates the same insight. Even though “geometrical” is not an accurate name for what is at stake, the difference itself is vital: it is the difference between continuous movement and discrete movement. Whereas in a First Person Shooter game there is a constant variation of the picture according to input control, ZORK on the contrary allows only distinct movement like “north,” “south,” “east,” or “west.” The final difference suggested by Aarseth et al. is of that between a static environment and a dynamic environment; which, for example, means the difference between a filmic background and an interactive foreground or figures.

```
West of House 0/0
ZORK I: The Great Underground Empire
Infocom interactive fiction - a fantasy
story
Copyright (c) 1981, 1982, 1983, 1984,
1985, 1986 Infocom, Inc.
All rights reserved.
ZORK is a registered trademark of
Infocom, Inc.
Release 52 / Serial number 871125 /
Interpreter 8 Version J

West of House
You are standing in an open field west
of a white house, with a boarded front
door.
There is a small mailbox here.

>_
```

Fig. 1: ZORK (www.infocom-if.org)

Even though these primary differences – especially the first two – cover essential aspects of game space, they do not acknowledge the fact that, in computer games, there can be a difference between the space that is displayed and the space that is navigable; an omission which becomes particularly apparent when it is considered that these judgments do not take into account the difference between first and third person perspective. And even though it might be obvious that the main binary in games is the difference between an external perspective of interaction and a perspective from within game space, the schema especially does not address the tension between pictorial presentation and image navigation. For example, what this schema fails to account for is the limitation of space apparent especially in early shooter games like DOOM (1993), which did not allow for a vertical view. In other words, even though a continuous (geometrical) movement is possible, the topological limitation allows the player to navigate only on the surface, thus acting in a two-dimensional

game world even though three dimensions are displayed. In contrast, in DESCENT (1995) the player can steer a vehicle continuously in any direction of a three-dimensional space. This is a fundamental difference: as the first version of QUAKE shows, three-dimensional game-play results in a different (two handed) interface-configuration, which in turn means a different game(space)-experience.



Fig. 2: DESCENT (gamasutra.com)

Visuality and Cardinality

At the second DiGRA-conference, Clara Fernández-Vara (2005) and her research team suggested differentiating between space presented (by the image) and navigable space: this was supposed to allow not only to describe ZORK in terms of a “non-presentational, yet topologically navigable” type of space, but also to focus on the conditions of game space as such: what their schema shows is that it is possible to not present the space one navigates (i.e. to have a “zero-dimensional” pictorial presentation of space, as is the case in ZORK), but that it is impossible to have a space of interaction with

less than one dimension, i.e. a one-directional game. A game needs two spatial directions of interaction or at least the option between stop and go like in the sprinting event in SUMMER GAMES (1984). Most games have at least a 1.5-dimensional space of interaction, as one finds in car racing games, where topologically speaking the road provides only one direction (forward), but the possible deviation from the path is what the gaming principle hinges on. This does not constitute a true “second dimension” of interaction, as would be the case if one took a turn at an intersection and then had to decide how best to reach the goal, but it is a navigation that consists in continuous movement.

According to Fernández-Vara et al., it has thus to be distinguished between the *visuality* of the presentational space and *cardinality* of the navigable space, and categorize games by the tension between them. This consecutively leads to descriptions resulting in being able to say that there is a difference between shooter-games before and after 1995; this difference being tantamount to a difference in the cardinality of spatial interaction: before that year it was only possible to see the third dimension, but not to move within it.

Three Essential Steps in Describing a Space-Image

At this point it shall not be discussed how a sufficient categorization of computer games' interactive spatiality would look like in detail. This is certainly a desideratum that requires further investigation. Instead, in the final part it is explicated how a method for describing games in respect to spatiality can be justified in regard to philosophy, and how against this background a description of the spatiality of games should proceed.

The philosophical approach that has to be considered to be inevitable for the description of computer games is that of phenomenology; understood literally and in its original meaning as the “logic of phenomena,” which sets out to describe the essential structure of

possible experience (Husserl 1982). Without explicitly calling on it, in their analysis of the space of games, all three studies discussed above contribute in some way to the phenomenology of computer games: Wolf insofar as he claims that every image is constituted by the difference between space onscreen and space off-screen, whereby only the relation between the two can differ, notwithstanding in many ways. But a case with neither onscreen nor off-screen space is inconceivable.

The same goes for the proposal of Aarseth et al.: the difference between “vagrant” and “omnipresent” is less a contradiction and more a definition of two extreme situations to be situated in a game. The difference between omnipresent and vagrant can therefore be reformulated in terms of spatial projection: phenomenologically speaking, there is no pictorial presentation conceivable that does not lie either within the realm of perspective or linear projection, or within the realm of non-perspective or oblique projection (Willats 1997). In other words, it is possible to switch between a subjective and an omniscient or “godlike” view, but it is not possible to have a picture in which space is presented in a way that lies outside the two possibilities (with early interactive fiction as border cases, in which space is not visible, but only navigable.) With some recent real-time strategy games like *WORLD IN CONFLICT* (2007), players can also morph between the omnipresent and vagrant view, with which the possible, phenomenological realm of pictorial space itself is presented.



Fig. 3: WORLD IN CONFLICT (www.worldinconflict.com)

Granted, a description based purely on visual aspects would be incomplete and would also have to take into account the possibilities of interaction. This is precisely what Fernández-Vara et al. did when they reflected on the phenomenological possibility of action space, and the results of their labor show that it is possible to have different dimensions of visibility and of interactivity (cardinality), and that both are limited in different ways. It is possible for there to not even be a visible dimension at all, but interactivity (an interactive picture) – indeed, a game – requires “more than one direction.” Even though it is possible to program it, the result is that of a non game, as is the case in the experimental TETRIS 1D (2002), in which players score points by doing nothing and merely watching the bricks fall down, only able to speed them up. As the pieces are all only one brick wide, adjusting them does not pose a challenge.

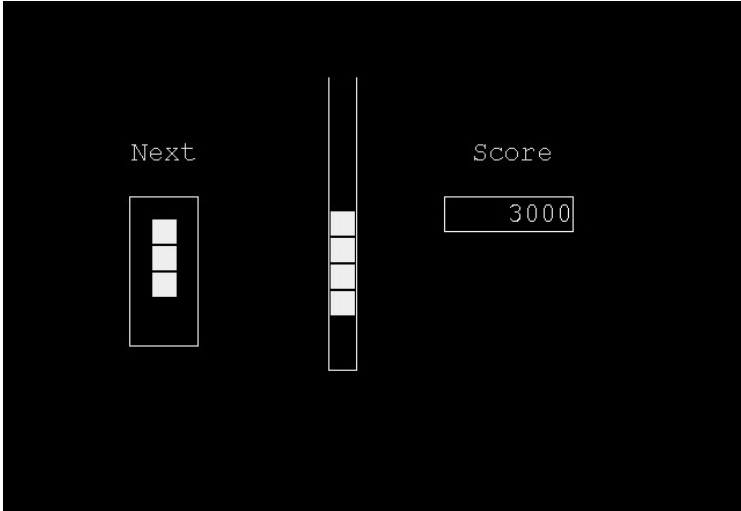


Fig. 4: TETRIS 1D (www.tetris1d.org)

The following procedure in describing video games can therefore be proposed (this constitutes a guideline for describing the spatiality of computer games – not against the background of a totality of all games, but in respect to games in their own specificity):

Step 1: One should start by looking at the *gap between movement or navigability and the presentation* video games. This gap often goes hand and hand with the difference between foreground (i.e. avatars and targets), and background (environment and filmed sequences). On the level of interactive pictorial objects, Ian Bogost (2006) calls this the “simulation gap” as the difference between what is visible and can be influenced by the player and what can only be seen. In respect to space, there is a difference of the action within game space and the perception of movement. The distinction hinges on whether said game space results only in a change of visibility, or also in a change within the environment, i.e. a reaction on the part of the objects. With this step, one can thus identify all spatial aspects

relevant for interaction, and separate them from aspects of film-like, pseudo-interactive space as well as from imaginary space (as in text-adventures).

Step 2: The next step is to describe whether the interaction within the game space relies on *symbolic or tangible properties of the objects*: that is, whether the principle of interaction derives directly from the way objects are presented, or if the presentation is actually the *representation* of attributes that are not embodied by the object's appearance or behavior. In a chess game, for example, one does not interact with the figures on the basis of their materiality, but rather on the basis of their symbolic properties, which in this case are essentially spatial. This does not address a hidden symbolic meaning of the figures as warriors, but rather the "ludic meaning" of the chess symbols, which is spatial, too: each chess piece represents a capacity of discrete movement in the topological organization of the game space that cannot be derived from, and is not visible in, the respective piece.

To put it in Nelson Goodman's (1976) terms of semiotic picture theory, what is at stake here is the difference between "pictorial exemplification" and "symbolic denotation": while pieces in a chess game symbolically *denotate* the ability of a certain movement in game space, the virtual appearance of a zombie – physical as well as iconic – in a shooter game *exemplifies* the very attributes that become apparent while the figure moves, and in particular while it is being moved (such as when it gets shot). Even though pictorial exemplification is predetermined in action games, the two types of (re)presentation – denotation and exemplification – can also coexist in a game; this is the case in most platform-games and maze-games, where symbolic denotations exist in the form of power ups that do not "behave" the way they look, and at the same time there are figures that behave just as they appear (which, put quite simply, means that a player can crash into them with his avatar).

Step 3: The third spatial feature of games one should attempt to describe is the *perspective of interaction* in the game, which, according to Aarseth et al., can be either omnipresent or vagrant. But it also implies the question of the first, third, and even the second person perspective, in singular as well as in plural – an instance hardly recognized in game research: For example, playing a war shooter like CALL OF DUTY one plays in the first person plural perspective – “we”; as being with the group (which is run by the game’s AI). Here again tribute must be paid to the fact whether or not it has effects on the pictorial presentation: Thus, in CALL OF DUTY, acting in the first person plural perspective makes no difference in visible game space, but it does in action space. On the contrary, in GHOST RECON (2001), a first person plural perspective exists which is also visually manifest – here, players can send part of their group or an accompanying group to a certain place in the game space and switch the perspective to any person in that group. This has a tremendous effect on the game space, as it allows players to view game space from an intersubjective multiplicity of standpoints. Very rare, but nevertheless possible, is the second person perspective experience of game space; in 2006 Julian Oliver released a second person shooter in which the origin of the perspectival view and the place in which pictorial interaction is rooted are interchanged: The inverted control in game play allows one to perceive space through the eyes of the opponent (YOU) while moving the body of the avatar (ME).



Fig. 5: 2ND PERSON-MISSING-IN-ACTION (*selectparks.net*)

At this level of game space, one must also make note of what, in philosophical terms, could be called the difference between a Cartesian ontology and a Wittgensteinian world-view, which addresses the status of the avatar. In *PITFALL!* (1982) the user has to react to the world as if *Cartesian ontology* applied, i.e. the player is excluded from game space as *res extensa* and is situated in the place of the *res cogitans*. The underlying projection is of parallel or isometric nature: it is neither subjective in the sense of the first person, nor is it omniscient, observing the whole territory of play. Here, the distance from the world to the point of action is characterized not by a possible range, but rather by total disjunction. This is, indeed, a third person perspective in the most literal sense, a situation in which the “avatar” at point of action is perceived by the player as a “he,” “she,” or “it,” and not as “me.” The game space is a “representation” in the full Cartesian sense of the word: it is represented to the autonomous ego (the user in front of the screen), who is not involved as a first person, either visually or interactively.



Fig. 6: PITFALL! (www.atariage.com)

On the other hand, what can be called the *Wittgensteinian world-view* is what is typically referred to as first person perspective. According to Ludwig Wittgenstein (1961) the ego “does not belong to the world,” but must be defined as its “limit,” which, again, is an eminent phenomenological insight: for instead of claiming the existence of a first person, this observation describes what it means to be in the position of it. Finally, this is why in respect to the space-image it is unfounded to refer to games such as MAX PAYNE (2001) as “third person shooters.” Here seeing and acting have nothing to do with the Cartesian situation. What in narratological respect is classified as a semi-subjective view can be addressed accurately as “heautoscopy”; a partial disembodiment in which the cogito is still restricted by the limits of the corporeal range.

Even though the foci of these three steps (navigability and presentation, symbol vs. icon, perspective and space) do not cover all aspects of games or gaming, they are essential and indispensable for computer game research at the present stage – the present stage being characterized by a “spatial turn” in the philosophy of computer games and the focus on their specific medial aspects.

References

- Aarseth, Espen** (2001): "Allegories of Space", in: *Cybertext Yearbook 2000*, ed. by M. Eskelinen and R. Koskimaa, Jyväskylä: University of Jyväskylä, 152-161.
- /**Smedstad, Solveig Marie/Sunnanå, Lise** (2003): "A Multi-Dimensional Typology of Games", in: *Level Up. Digital Game Research Conference*, ed. by M. Copier and J. Raessens, Utrecht: University of Utrecht, 48-53.
- Bogost, Ian** (2006): "The Simulation Gap", in: I.B., *Unit Operations. An Approach to Video Game Criticism*, Cambridge/London: MIT, 129-136.
- Borries, Friedrich von/Walz, Steffen P./Böttger, Matthias** (Ed.) (2006): *Space Time Play. Games, Architecture, and Urbanism: The Next Level*, Basel/Boston/Berlin: Birkhäuser.
- Burch, Noël** (1981): "Nana, or the Two Kinds of Space", in: N.B., *Theory of Film Practice*, trans. by H.R. Lane, Princeton: Princeton UP [1961], 17-31.
- Fernández-Vara, Clara/Zagal, José Pablo/Mateas, Michael** (2005): "Evolution of Spatial Configurations in Videogames", *Changing Views – Worlds in Play. Proceedings of DiGRA 2005 Conference*, digra.org/dl/db/06278.04249.pdf.
- Goodman, Nelson** (²1976): *Languages of Art. An Approach to a Theory of Symbols*, Indianapolis: Hackett [1968].
- Heath, Stephen** (1986): "Narrative Space", in: *Narrative, Apparatus, Ideology. A Film Theory Reader*, ed. by Ph. Rosen, New York: Columbia UP, 379-420 [1976].
- Husserl, Edmund** (1982): *General Introduction to a Pure Phenomenology*, trans. by F. Kersten, *Collected Works*, Vol. 2, Dordrecht: Kluwer [1913].

- Kuhn, Thomas S.** (²1970): *The Structure of Scientific Revolutions*, Chicago: Chicago UP [1962].
- Jenkins, Henry** (2004): "Game Design as Narrative Architecture", in: *FirstPerson. New Media as Story, Performance, and Game*, ed. by N. Wardrip-Fruin and P. Harrigan, Cambridge/London: MIT, 118-130.
- Manovich, Lev** (2001): "Navigable Space", in: L.M., *The Language of New Media*, 244-285.
- McMahan, Alison** (2003): "Immersion, Engagement, and Presence. A Method for Analyzing 3-D Video Games", in: *The Video Game Theory Reader*, ed. by M.J.P. Wolf and B. Perron, New York/London: Routledge, 67-86.
- Neitzel, Britta** (2005): "Narrativity in Computer Games", in: *Handbook of Computer Game Studies*, ed. by J. Raessens and J. Goldstein, Cambridge/London: MIT, 227-245.
- Ryan, Marie-Laure** (2004): "Cyberspace, Cybertext, Cybermaps", dichtung-digital.org/2004/1-Ryan.htm.
- Newman, James** (2004): "Videogames, Space and Cyberspace. Exploration, Navigation and Mastery", in: J.N., *Videogames*, London/New York: Routledge, 109-125.
- Poole, Steven** (2000): "Solid Geometry", in: S.P., *Trigger Happy. The Inner Life of Videogames*, London: Fourth Estate, 125-148.
- Stockburger, Axel** (2006): *The Rendered Arena. Modalities of Space in Video and Computer Games*, stockburger.co.uk/research/pdf/Stockburger_PhD.pdf.
- Tong, Wee Liang/Tan, Marcus Cheng Chye** (2002): "Vision and Virtuality. The Construction of Narrative Space in Film and Computer Games", in: *ScreenPlay. Cinema/Videogames/Interfaces*, ed. by G. King and T. Krzywinska, London/New York: Wallflower, 98-109.

Willats, John (1997): *Art and Representation. New Principles in the Analysis of Pictures*, Princeton: Princeton UP.

Wittgenstein, Ludwig (1961): *Tractatus-logico philosophicus*, trans. by Ch.K. Odgen and B.F. McGuinness, London: Routledge [1921].

Wolf, Mark J.P. (1997): "Inventing Space. Towards a Taxonomy of On- and Off-Screen Space in Video Games", in: *Film Quarterly* 51, 11-23.

2ND PERSON-MISSING-IN-ACTION (2006), Julian Oliver,
selectparks.net/modules.php?name=News&file=article&sid=284.
 DESCENT (1995), Interplay Productions, PC.
 DOOM (1993), ID Software, PC.
 GHOST RECON (2001), Ubisoft, PC.
 MAX PAYNE (2001), Rockstar Games, PC.
 PITFALL! (1982), Activision, Atari 2600.
 QUAKE (1996), GT Interactive, PC.
 SPACEWAR! (1962), Steve Russell, PDP-1.
 SUMMER GAMES (1984), U.S. Gold, C64.
 TETRIS 1D (2002), Ljubljana Digital Media Lab, tetris1d.org.
 WORLD IN CONFLICT (2007), Sierra Entertainment, PC.
 ZORK I: THE GREAT UNDERGROUND EMPIRE (1980), Personal Software,
 Amiga.

Biography



Stephan Günzel, PhD

Assistant Professor at the Department for
Arts and Media, University of Potsdam.

Research:

Mediality of Computer Games, Theories of Cultural
and Medial Spatiality, Picture Theory.

Publications:

- “Space, Map, and Pathway in Computer Games”, in: *Game Over!?*,
ed. by Jan Distelmayer et al., Bielefeld 2008, 113-132.
- “Eastern Europe, 2008, Geopolitics in the Video Game”, in:
Space Time Play, ed. by Friedrich von Borries et al., Basel et al. 2007,
444-449.
- *Topology. On Spatial Descriptions*, ed. by S.G., Bielefeld 2007.

www.stephan-guenzel.de
sguenzel@uni-potsdam.de

