Game Studies
the international journal of computer game research
volume 1, issue 1 July 2001

The Gaming Situation

by Markku Eskelinen

Markku Eskelinen is an independent scholar and experimental writer of ergodic prose, interactive drama, critical essays and cybertext fiction.

He holds a cand. philol. in comparative literature and is now co-editing a series of Cybertext Year Books with Raine Koskimaa.

Excerpts from his early fiction were published in The Review of Contemporary Fiction (Summer 1996) according to which he's also "easily the most iconoclastic figure on the Finnish literary scene."

He has given paper and other presentations at various international conferences, including the series of Digital Arts and Culture conferences and the ACM conferences on Hypertext and Hypermedia.

1. Introduction

The first point of departure for this article is a kind of paradox or contradiction. Outside academic theory people are usually excellent at making distinctions between narrative, drama and games. If I throw a ball at you I don't expect you to drop it and wait until it starts telling stories. On the other hand, if and when games and especially computer games are studied and theorized they are almost without exception colonised from the fields of literary, theatre, drama and film studies. Games are seen as interactive narratives, procedural stories or remediated cinema (1). On top of everything else, such definitions, despite being successful in terms of influence or funding, are conceptually weak and ill-grounded, as they are usually derived from a very limited knowledge of mere mainstream drama or outdated literary theory, or both. Consequently, the seriously and hilariously obsolete presuppositions of Aristotelian drama, commedia dell'arte, Victorian novels, and Proppian folklore continue to dominate the scene. To put it less nicely, it's an attempt to skip the 20th century altogether and avoid any intellectual contact with it, a consumerist double assassination of both the avant-garde and advanced theory. The final irony is of course that in the long run such a practice may turn out to be even commercially incorrect.

In any case, in what follows I'll try to make some sense of what I call the gaming situation by trying to pinpoint or at least locate the most crucial and elementary qualities that set it apart from dramatic and narrative situations, both of the latter being rather well-studied constellations by now, and existing slightly beyond the necessary formalistic phase that computer game studies have to enter in order to gain independence, or at least relative independence. Historically speaking this is a bit like the 1910s in film studies; there were attractions, practices and very little understanding of what was actually going on, not to mention lots of money to be made and lost.

As we study computer games, we need to have some idea of digital media as well as of games. For that purpose we'll use the theories of Espen Aarseth, Roger Caillois, Warren Motte and David Parlett in particular. They form a filter through which the possibly heuristic findings and borrowings from various neighbouring disciplines and predatory theory formations are viewed, tested, modified and transformed. While discussing articulation, materiality, functionality, typology and orientation, among other things, we are confronting the bare essentials of the gaming situation: the manipulation or the configuration of temporal, spatial, causal and functional relations and properties in different registers.

2. Gaming as configurative practice

Regarding the so-called remediation or cross-media influence the simplest possible statement would be that computer games are remediated games (and not presentations or narratives). So what are games then? According to David Parlett formal games are systems of ends and means (Parlett 1999, 3). The latter part consists of specific procedural rules of how to manipulate the equipment (pieces or tokens or whatever).

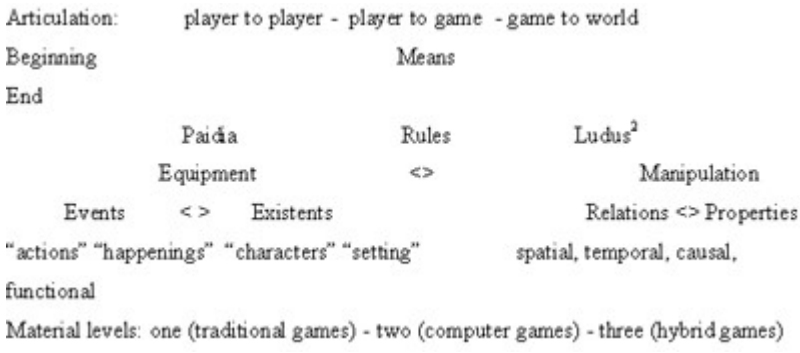

Figure 1. The gaming situation

Gaming is seen here as configurative practice, and the gaming situation as a combination of ends, means, rules, equipment, and manipulative action. There are one or two parallels to draw. First, the equipment (the "what" of gaming) and manipulation (the "how") of this ludology-in-progress resemble the story and discourse of narratology. Still, according to the famous statement of Christian Metz "one of the functions of narrative is to invent one time scheme in terms of another time scheme" (Metz 1974, 18). Contrary to this, in games there's only one necessary time scheme: the movement from the beginning to the winning or some other situation. In cases where another time scheme is invented, it is not as important as the first one.

In discussing computer games we should take into account the unique dual materiality of cybernetic sign production (see Aarseth 1997, 40), and the resulting difference between strings of signs as they exist in the game (textonic game elements) and strings of signs as they are presented to the player (scriptonic game elements). It may well be that events in computer games should be described in three interplaying registers. In addition to textonic events, there are two kinds of scriptonic events: prefabricated and completed. The former are events presented to the player, and the latter the combination of the former and the player's actions.

Another quick look at Espen Aarseth's typology of cybertexts (Aarseth 1997, 62-65) should make us see that the dominant user function in literature, theatre and film is interpretative, but in games it is the configurative one. To generalize: in art we might have to configure in order to be able to interpret whereas in games we have to interpret in order to be able to configure, and proceed from the beginning to the winning or some other situation (3).

In literature, theatre and film everything matters or is conventionally supposed to matter equally - if you've seen 90% of the presentation that's not enough, you have to see or read it all (or everything you can). This is characteristic of dominantly interpretative practices in general. In contrast, in computer games you either can't or don't have to encounter every possible combinatory event and existent the game contains, as these differ in their ergodic importance. Some actions and reactions in relation to certain events will bring the player quicker to a solution or help her reach the winning situation sooner or more effectively than others. There are events and existents the player has to manipulate or configure in order to progress in the game or just to be able to continue it. Events, existents and the relations between them can be described at least in spatial, temporal, causal and functional terms. It's equally self-evident that the importance of these dimensions varies from game to game and sometimes also within the phases and levels of an individual game.

3. The equipment: situations, events and existents

Situations. In order to understand the equipment side better, it's useful to explore traditional, but sophisticated accounts of narratives, stories and their basic components. According to Gerald Prince's well-known definition a narrative

is "the recounting (as product and process, object and act, structure and structuration) of one or more real or fictitious events communicated by one, two or several (more or less overt) narrators to one, two or several (more or less overt) narratees." Before going into the details of this definition it is important to note one of its most obvious consequences: "a dramatic performance representing (many fascinating) events does not constitute a narrative either, since these events, rather than being recounted, occur directly on stage." (Prince 1987, 58) This is perhaps the most efficient way of distinguishing narrative situations from dramatic and performative situations. We can show the main differences among four major situations in the following chart:

Elements	Activity	Situation/frame
Story (events and existents)	recounted	narrative
Story (events and existents)	enacted	dramatic (matrixed[4])
Events and existents	taking place	performative (non-matrixed)
Equipment	manipulated	gaming (with rules and goals)

Figure 2. Elements, activities and situations

So a mere story is not sufficient to make something a narrative, as there must also be a narrative situation implying the presence of narrators and narratees. To continue this digression, the story "always involves temporal sequence (it consists of at least one modification of a state of affairs obtaining at time t0 into another state of affairs obtaining at time tN), and this is its most distinctive feature" (Prince 1987, 59). This definition leaves the degree of causality between the situations and events making up the story open to a wide variety of tastes to the greater or lesser annoyance of plot-lovers. The latter often conceive stories as mere plots or closed sequences of events, in which case they should come to grips with games containing open series of events, and that probably can't be achieved without major revisions in their favourite narrative theories, which are not my concern here at all.

The fundamental constituents of the story are usually divided into events and existents. It should already be obvious that it is possible to combine existents and events in ways that do not form or become stories. In abstract games like *Tetris* there are settings, objects and events but definitely no characters. In addition there are events in games that change situations but do not convey or carry or communicate stories. A goal in a soccer game is an event that changes the situation, but there's no story in it; a goal is a goal is a goal. The same can be said for most actions and happenings in performance or circus art. The main thing is of course that any element can be turned into a game element, and only one element is enough to constitute a game if it allows manipulation, and this fact alone allows combinations not witnessed in narratives or drama. Consequently, both the number of game elements and the relations between them can be different in specific ways that are typical of (computer) games and only of them, and don't have to respect any conventions and traditional boundaries inherited from oral or written narratives, drama, theatre or films.

Events. In narratology, events are divided into actions and happenings based on their agency, and into kernels and satellites based on their relative importance. There's also a difference between punctual acts and more durational actions, and that's about it (Chatman 1978, 32-56). As games require configurative approaches from the players, satellites are of no importance to them, and in principle they could and should be skipped (something that's not advisable to do in interpretative practices). Instead of actions and happenings, we have user events and system events (or intransient

and transient events) in computer games, and events are either independent or dependent of the player (5). Those latter could be divided into successful and unsuccessful ones that are a bit like happy and unhappy performatives in speech act theory (6), in contrast to true or false and more or less important narrative constatives describing (what exists and happens in) the fictive world(s).

Existents. Traditionally, existents are divided into characters and settings based on their significance for the plot, and they are also divided according to different degrees of permanence into identities, traits and moods (Chatman 1978, 267). Regarding the significance for a game, it is entirely a matter of usability or functionality, affecting equally well settings (or event spaces), objects, tools, NPCs and player representations. Consequently, in computer games the distinction between static settings and dynamic characters transforms into a more complex continuum of combinations, alterations, and middle terms, because the distribution of static and dynamic game elements doesn't have to mimic any practices in other modes of expression and communication.

4. Manipulation and articulation

In discussing Jacques Ehrmann's close reading of Huizinga and Caillois Warren Motte introduces three basic articulations suggested by Ehrmann's article: the relations of player to player, player to game and game to world (Motte 1995, 26-27). They can be combined with the most important types of potentially manipulatable relations in games: the temporal, causal, spatial and functional ones. The resulting preliminary taxonomical grid can be seen below (Figure 3).

Relations:	Temporal	Causal	Spatial
Functional			
Type:	static/dynamic	static/dynamic	static/dynamic
static/dynamic			
Articulation:			
Player to player			
Player to game			
Game to world			

Figure3. Manipulation and articulation

Let's take the player-to-player dimension first, as it helps to describe the player's position and positioning in the game. In this register static relations are those guaranteed to be and remain equal (or unchanging) between players in and during the game. Static temporal relations indicate turn-based arrangements whereas dynamic temporal relations refer to action taken in real time without fixed turns - here time is a resource not shared or distributed equally among players. Static and dynamic causalities are somewhat similar to intratextonic and textonic dynamics in cybertext theory (Aarseth 1997, 62), dynamic causality referring to the player's possibilities to add new elements triggering novel chains of causality into the game (e.g. by building characters, objects and rooms in a MUD). Spatial relations are static if the players can't change the spatiality of the game world in which case it's only a ready-made playground however complex it might be in other respects. In contrast, spatial relations among players are dynamic if the game space can be built or expanded by the players as in *Civilization* (7). The static and dynamic functional relations among players refer to the functional capabilities of their representations (characters) in and during the game: they can either acquire new qualities and capabilities in the course of the game, or not. One should also make a distinction between functional similarity and dissimilarity of available

roles in a game, as whenever there's a team there is usually also a division of labour.

When discussing the third articulation, the relation of game to world, it should be remembered this is not an interpretative or referential question (or if it is then it focuses on the relation between the simulation and the simulated whatever the latter is interpreted to be). Instead of that I take it to be operational and pragmatic. Here the category of static relations implies ready-made relations not to be tampered with. This means that the game is every way closed or separated from the rest of the world. There are alternatives to this: causal, spatial, temporal and functional connections could well exceed the confines of a game (8). The dynamic dimension could then be understood as containing various violations of this default separateness of games.

The second articulation between the player and the game concerns first and foremost the aspect of manipulation or configuring: what relations can be affected, how deeply, for how long, under what conditions and so on. Basically, static relations can only be interpreted but dynamic relations allow manipulation. To continue any further with this, we must study our four types of relation (spatial, temporal, causal, functional) more closely and find suitable subcategories in each of them. That will be the focus of the latter half of this essay.

The static/dynamic opposition could be made more detailed by introducing the cybertextual concept of user function (Aarseth 1997, 64) that could easily be applied to our four major types of temporal, causal, spatial and functional relations. Each one of the latter may potentially be interpreted, explored, configured, or changed permanently with the constraint that at least one of these relations must always be configurable. For example: in *Tetris* the player can only interpret the space or arena (9), in adventure games the space exists to be explored; in *Civilization* the space can be configured; and in many MUDs you can build permanent new spaces and objects to be shared with other players. Obviously, there are totally irrelevant things too, but they may be important to learn too, as the concealed dividing line between relevance and irrelevance can be an essential part of the game structure.

5. Relations and properties

Causal relations. Let's say your character is an average U.S. president in a relatively complex environmental world simulation with climate changes. Your task is to represent the complexities of this world in a simple model the presidential puppet can comprehend and act upon, in a word to reduce them to suit his worldview. To prevent the game turning into an orgy of continuous annihilation, there's an extra mechanism for determining what the puppet can and can't do in the game: the central artificial intelligence responsible for running the president is responsive to a stock exchange and the second-by-second fluctuations in the market value of certain lobbying industrial complexes. The point being that in this pompous age of the Internet we could easily design computer games in which real-life or real-world parameters further limit the player's freedom of action.

The underlying question is where to limit or expand the system of causalities and dependencies; they can be networked to the user space too, that is, to a complex of home or office or mobile appliances communicating with each other via Bluetooth. The pokemons on the screen and in your living room will pretty soon be able to team up and steal your credit card numbers to order reinforcements. In a little less nightmarish setting, there's potential for connecting games and toys in a player's PAN (personal area network).

Spatial relations. The spatial dimension could be studied from the perspective of abstract animation as a combination of spatial co-ordinates and durational

values of pixels, but that would not be a very useful way to approach movement within the projected spaces. In any case, and in addition to on- and off-screen spaces (all six types of the latter, see Burch 1973,17), it's also important to pay attention to the uses of both the sonic space (in anticipating visual events, building suspense and surprise, or preparing the player for the next encounter etc.) and the user space.

In some games the player may have to decide or try to decide exactly where some event should take place. In others, that's not possible or even important: the killing can happen everywhere in the arena, and only the rate of occurrence counts. There are at least four important factors affecting the possibilities and constraints of space: positioning, movement (including its freedom, speed and direction), the so-called point of view and the access to information. The latter dimension may have to be divided into interplaying channels, at least one each for audio, visual and textual information. Spatiality is also a matter of perception; one can only wonder why the military paradigm of complete clarity and visibility of targets is so prevalent in computer games. There are countless possibilities for conditioning the player's perceptions by playing with the sharpness of focus, lightning, visibility, distance, angle, transition and various continuity matches common to cinematic and pre-cinematic conventions of visual representation, in the spirit of Noel Burch's parametric cinema (see Burch 1973 and Bordwell 1985, 278-279). But for some reason, I can't blacken my opponent's screen.

Conventions. There are a few curiously infrequently discussed conventions of spatial representation in computer games. They concern reliability, subjectivity and normality. Ask yourself why 2D maps should always be reliable, or first- and third-person POV's compatible, why everything should be represented objectively to a player who is always assumed to be in a normal and not altered perceptual state - and why the space or spatiality in a game is seldom or never self-contradictory. Or why the player can move a virtual camera but doesn't have to deconstruct or reconstruct or peel its multi-layered images. Maybe the reason for these peculiarities is that we are still stuck with defining moving images in terms of pre-digital cinema and its reality-capturing mythology, and with the idea of the playground that can't be manipulated on the fly as all the players are supposed to share it as a neutral field all the time.

Unreliability. In narratives and many other kinds of fiction it is acceptable and sometimes even preferable that users are misled by being given wrong instructions. But in games the deliberate frustration of action seems clearly to be an intolerable option. One might think of unreliable maps giving false and incorrect information about the location of the player or of the objects he's seeking - that's something almost every writer would like to do, and almost every player and game designer to avoid - the explanation for this difference in taste lies perhaps in the ergodic (pseudo) physicality of the game. Or in the difference between two kinds of obstacles or modes: lies and riddles.

Interface. There is also an important connection or at least a functional similarity between computer games and so-called lower forms of cinema, especially the genres that cause or arouse physical reactions in the viewer-spectator, including melodrama (tears), comedy (laughing), horror (fear) and pornography (sexual excitement). Certain simulations, especially those loaded with action to be handled with quick reactions and excellent hand-eye-coordination, often cause physical or physiological reactions, the control of which is in the best interest of the player. In this respect computer games are situated in between physical and non-physical games.

This is also a question of interface as there's no reason why the playing of a game could not also be physically demanding or even exhausting - obviously to achieve the latter goal, we'd need paraphernalia very different from keyboards

and joysticks, or the pressure mat of *Dance Dance Revolution*. The relation between the player's psychophysical presence and his or her virtual presence in a game is usually designed to be both control- and consciousness-oriented (another military paradigm). However, there are alternatives to this, like *Brainscore* by Slovenian media artists Darij Kreuh and Davide Grass, where the users' eye movements and brain waves direct audiovisual objects and processes. Fully conscious control is thereby denied, and the performers must stay in a relaxed state of body and mind in order to direct the presentation successfully. *Brainscore* is not a game, but its partly parasympathetic control mechanisms could be (and perhaps already are) transported into the realm of computer games.

6. Example of Temporal Relations: The Phenomenology of *Tetris*

Temporality can be studied using the same abstract categories as those used for narratives in narratology, since the categories are neither narrative nor game-like in themselves: order, speed, frequency, duration, simultaneity, and time of the action. These are specifications of both the actions of the player and the events the player encounters and is perhaps able to modify in the course of a game (10).

Janet Murray's approach to *Tetris* (Murray 1997, 143-144) is an ultimate counterexample to this. She's quite content to interpret this Soviet game as "a perfect enactment of the over tasked lives of Americans in the 1990s - of the constant bombardment of tasks that demand our attention and that we must somehow fit into our overcrowded schedules and clear off our desks in order to make room for the next onslaught." It would be equally far beside the point if someone interpreted chess as a perfect American game because there's a constant struggle between hierarchically organized white and black communities, genders are not equal, and there's no health care for the stricken pieces. Of course, there's one crucial difference: after this kind of analysis you'd have no intellectual future in the chess-playing community.

Instead of studying the actual game Murray tries to interpret its supposed content, or better yet, project her favourite content on it; consequently we don't learn anything of the features that make *Tetris* a game. The explanation for this interpretative violence seems to be equally horrid: the determination to find or forge a story at any cost, as games can't be games because if they were, they apparently couldn't be studied at all. In contrast, here's a provisional attempt to apply some key temporal concepts to *Tetris*, probably the most successful abstract computer game ever (Figure 4).

	story time < narratives > discourse time/event time < games > user time
Order	---- X (random)
Speed	---- X (accelerating)
Frequency (repetition)	---- 0
Duration	---- 0
Simultaneity	---- X (no simultaneity)
Time of narration/action	---- X (during and after)

Figure 4. Temporal relations in *Tetris* (11)

The dominant temporal relation in (computer) games is the one between user time (the actions of the player) and event time (the happenings of the game)(12), whereas in narratives it's between story time (the time of the events told) and discourse time (the time of the telling). Despite possible hybrids the underlying restrictions of temporality remain the same: there's no narrative without story and discourse times and no game without user and

event times - everything else is optional.

7. The goals and progression of the game

Goals and sub-goals could also be divided into spatial, temporal, causal and functional ones. At least it's usually easy to choose the dominant one of these, whether it's the task of traversing the space, completing something in time, plotting out an enemy, gaining more power and wealth in the game world, or something completely different. In order to understand the progression of a game it is important to study the deictic orientation of the player. Keir Elam's dramatological model divides this into spatial, temporal, object, person (13) and action deixis with the further specification between present and absent entities and processes (Elam 1980, 185-191). It might help us to see the difference between two game dynamics: the one between present and absent elements, and the other between present components.

Roger Caillois argued there are four broad types of games, those of agon (competition), alea (chance), mimicry, and ilynx (vertigo). In all these categories there's also an inherent division into paidia and ludus, similar to the distinction between play and game. It's only reasonable to suspect we can find different combinations of these eight possibilities distributed among and inscribed into the manipulatable relations of game components. It's also clear these broad types create different expectations and orientations in terms of goals, sub-goals and rules, and in the dynamics of ends and means; for example in ilynx and alea the player is a passive intrigant (14) whereas in agon and mimicry she has to be more active.

Not all of these components go or combine easily with the other elements, which is also the reason to use the concept of the dominant once more. This goes slightly against Caillois' study that excludes certain combinations like agon-ilynx and mimicry-alea - on the other hand I'm just arguing this is only or mainly a question of level and hierarchy. It should be easy to imagine a scene dominated by competitive orientation containing embedded elements of chance, role-play and vertigo, especially if the latter is taken to mean shocking or perceptually challenging action.

8. Conclusion

The old and new game components, their dynamic combination and distribution, the registers, the necessary manipulation of temporal, causal, spatial and functional relations and properties not to mention the rules and the goals and the lack of audience should suffice to set games and the gaming situation apart from narrative and drama, and to annihilate for good the discussion of games as stories, narratives or cinema. In this scenario stories are just uninteresting ornaments or gift-wrappings to games, and laying any emphasis on studying these kinds of marketing tools is just a waste of time and energy. It's no wonder gaming mechanisms are suffering from slow or even lethargic states of development, as they are constantly and intentionally confused with narrative or dramatic or cinematic mechanisms.

Finally, one could argue that computer games, literature and drama/theatre are all equally distant from the traditional or non-computer games where there's something at stake like death or some other irrevocable loss. I'm thinking about such all time classics as Russian roulette, certain events, actions and happenings that took place in the Roman arena and Mesoamerican ball courts, and extreme cases and consequences of serious gambling. If these are the roots of computer games too, then we may want to think what to think of possible hybrids of non-computer and computer games (to come via mobile phones and technologies like Bluetooth or X-10). And with thinking I actually mean thinking and not various kinds of moral panic witnessed before with comic books, videos, movies, rap, rock, jazz and other forms of popular culture.

Acknowledgements

I'd like to thank Gonzalo Frasca for getting me interested in ludology or game studies, Espen Aarseth for providing heuristic theory to be exploited and abused, Ragnhild Tronstad for valuable comments and suggestions during the writing process, and Julianne Chatelain for saving my English from myself. Needless to say, mistakes are all mine.

[To the top of the page]

Notes

1. "Curiously", there are no attempts to define games as narratives in Elliott M. Avedon's and Brian Sutton-Smith's classic *The Study of Games* (1971) that contains and compresses a century of Western game studies. The words and contested concepts like narrative, story, drama, or theatre do not come up even in its subject index. So should we believe that suddenly, by the advent of computer games, games turned into narratives? Maybe something happened in the marketing department instead.

2. Gonzalo Frasca divides rules into paidia rules defining how the simulation functions and ludus rules defining the winner or the outcome of a game (Frasca 2001, 9). The concepts of paidia and ludus were coined by Roger Caillois in his classic study of games *Les jeux et les hommes* (see Caillois 1979).

3. Despite occasional references I'll exclude MUDs from consideration in what follows. MUDs and MUD adventure games may very well turn out to contain situations, events and functions too complex to be fully or adequately conceptualised by the scheme presented here, or perhaps within any one traditional scheme, be it narrative, performance, or games. See Tronstad 2001.

4. The distinction between matrixed and non-matrixed performances is based on Michael Kirby's "The New Theatre". For example: "The actor functions within subjective or objective person-place matrices. The musician (□) is non-matrixed. He attempts to be no one other than himself, nor does he function in a place other than that which physically contains him and the audience." (Kirby 1982, 326) It should also be clear that I'm not reducing theatre here to the most boring theatre of words, as there is a huge continuum and variety of theatre and performance art, and matrixed and non-matrixed performances, between the two extreme positions presented in Figure 2. In other words, the "dramatic" is just an extremely story-oriented form or genre of matrixed performances. Alternatively, we might perhaps construct another continuum from interpretative (theatre) to non-interpretative (performance art) and configurative (games) performances.

5. For more detailed description of events one could apply four cybertextual categories, those of dynamics, determinability, transience and perspective. This would give us 24 basic types of events.

6. On theatrical and real performatives, and performatives turning into constatives in MUD adventures and quests see Tronstad 2001.

7. Alternatively, one could state computer games are usually spatially static in contrast to physical games like soccer and mobile games, where the players constantly change their (physical and spatial) positions to each other.

8. These transgressions could be modelled after gambling, hybrid games, Noah Wardrip-Fruin's *The Impermanence Agent*, or the presidential example coming up later in this article.

9. We should make a distinction between the arena or spatial setting and the operational space it gives to the player. The former is only interpretable in Tetris

while the latter changes throughout the game.

10. For more detailed specifications see Eskelinen 2001. There might very well exist other temporal categories worth examining than the six mentioned here. See for example Eskelinen and Koskimaa 2001.

11. Explanation: dotted line = non-existent relation, X= non-manipulatable relation, 0 = manipulatable relation. Discourse time in narratology is similar to event time in ludology. The former could be seen as a series or a combination of individual event times, either fixed or semi-fixed as in print or hypertext narratives or variable as in games. Still, because the time needed to complete a game usually varies considerably from player to player I prefer to call it event time instead of discourse time.

12. See Aarseth 1998b, 31-41.

13. Person (and object) deixis could be combined with Elliott M. Avedon's interaction patterns. See Avedon 1971, 424-425.

14. On intrigants, intrigees and intrigues in adventure games see Aarseth 1997, 97-128.

[To the top of the page]

References

Aarseth, Espen (1997) *Cybertext: Perspectives on Ergodic Literature*. Baltimore: The Johns Hopkins University Press

Aarseth, Espen (1998a [1995]) "Dataspillets diskurs" in Espen Aarseth, *Digitalkultur og nettverkskommunikasjon*, 75-98. Bergen: Espen Aarseth

Aarseth, Espen (1998b) "Aporia and Epiphany in Doom and The Speaking Clock: Temporality in Ergodic Art" in Marie-Laure Ryan (ed.) *Cyberspace Textuality*, 1-14. Bloomington and Indianapolis: University of Indiana Press

Aarseth, Espen (2001) "Allegories of Space. The Question of Spatiality in Computer Games" in Markku Eskelinen and Raine Koskimaa (eds.) *Cybertext Yearbook 2000*, 152-171. Saarij&#65533;rvi: Publications of The Research Centre for Contemporary Culture, University of Jyv&#65533;skyl&#65533;.

Avedon, Elliott M. (1971) "The Structural Elements of Games" in Elliott M. Avedon and Brian Sutton-Smith (eds) *The Study of Games*, 419-426. New York: Wiley

Avedon, Elliott M. and Brian Sutton-Smith (1971) *The Study of Games*. New York: Wiley

Bolter, Jay David and Richard Grusin (1999) *Remediation. Understanding New Media*. Cambridge, MA: The MIT Press

Bordwell, David (1984) *Narration in the Fiction Film*. Madison: University of Wisconsin Press

Burch, Noel (1973 [1969]) *Theory of Film Practice*. Translated by Helen R. Lane. Princeton, NJ: Praeger

Caillois, Roger (1979 [1958]) *Man, Play, Games*. Translated by Meyer Barash. New York: Schocken Books

Chatman, Seymour (1978) *Story and Discourse*. Ithaca: Cornell University Press

Ehrmann, Jacques (1968) "Homo Ludens Revisited" in *Yale French Studies* 41: 38-57.

Elam, Keir (1980) *The Semiotics of Theatre and Drama*. London: Routledge

Eskelinen, Markku (2001) "Towards Computer Game Studies". Forthcoming in the proceedings of *SIGGRAPH 2001*.

Eskelinen, Markku and Koskimaa, Raine (2001) "Discourse Timer - Towards Temporally Dynamic Texts" in *Dichtung Digital*, June 2001. Available online at http://www.dichtung-digital.de

Frasca, Gonzalo (1998) "Ludology meets Narratology " http://www.jacaranda.org/frasca/ludology.html

Frasca, Gonzalo (2001) *Videogames of the Oppressed: Videogames as a means for critical thinking and debate*. MA thesis, School of Literature, Communication and Culture, Georgia Institute of Technology. Available online at http://www.jacaranda.org/frasca/thesis

Genette, Gerard (1980 [1972]) *Narrative Discourse*. Translated by Janet E Lewin. Ithaca: Cornell University Press

Genette, Gerard (1988 [1984]) *Narrative Discourse Revisited*. Translated by Janet E Lewin. Ithaca: Cornell University Press

Kirby, Michael (1982) "The New Theatre" in Richard Kostelanetz (ed.) *The Avant-Garde Tradition in Literature*, 324-340. Buffalo: Prometheus Books

Metz, Christian (1974) *Film Language. A Semiotics of Cinema*. New York: Oxford University Press

Motte, Warren (1995) *Playtexts*. Lincoln & London: University of Nebraska Press

Murray, Janet (1997) *Hamlet on the Holodeck*. New York: The Free Press

Parlett, David (1999) *The Oxford History of Board Games*. Oxford and New York: Oxford University Press

Prince, Gerald (1982) *Narratology*. The Hague: Mouton

Prince, Gerald (1987) *The Dictionary of Narratology*. Lincoln and London: University of Nebraska Press.

Tronstad, Ragnhild (2001) "Performing the MUD Adventure" in G. Liestoel, A. Morrison, and T. Rasmussen (eds.) *INNOVATIONS -Media, Methods and Theories*. The MIT Press (forthcoming)

Wardrip-Fruin, Noah (1999) *The Impermanence Agent*. http://www.impermanenceagent.com/agent

[To the top of the page]