

The Elements of Simulation in Digital Games: System, representation and interface in *Grand Theft Auto: Vice City*

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Abstract

The article focuses on one genre of simulations: computer and video games. The author presents a generic model of the elements that co-operate in producing a simulation that is also a game. The model is applied into practice with a case study that focuses on one particularly interesting game: *Grand Theft Auto: Vice City* (Rockstar Games, 2002), a game that frames its gameplay by simulating certain traits of popular culture in the 1980s.

Simulation as a tool for digital game studies

In this paper I will focus on the concept of simulation. Following another games scholar, Gonzalo Frasca, I will argue that *simulation* – i.e. modeling the behavior of a particular system to a certain extent - is the key to understanding how a host of different digital media products work, particularly games.

All simulations are not games, however. As Frasca states, "games are just a particular way of structuring simulation, just like narrative is a form of structuring representation." (Frasca 2003). There are simulations outside digital media and with other purposes than gaming and entertainment, especially ones designed for various scientific or pedagogic purposes (see, e.g., Greenblat 1988).

We will focus on one genre of simulations constructed with the means of digital media, i.e. games played with computers and game consoles that will be summed up under the heading 'digital games'. I will first offer an overview of simulation theory and a definition that my contribution to game/simulation theory, or 'ludology', will be based on. Then, I will present a generic model of the elements that co-operate to produce a simulation that is also a game. To end with, I will apply the model into practice by providing the reader with a case study. It focuses on one particularly

interesting game: *Grand Theft Auto: Vice City* (Rockstar Games, 2002), a game that frames its gameplay by simulating certain traits of popular culture in the 1980s.

Simulation theory: definitions

Many definitions of simulation in research literature are quite technical, i.e. associated with creating different simulations with the means of computers (e.g., Zeigler et. al. 2000), or alternatively, they are philosophical in nature, drawing from critical theory and the social sciences (see Cubitt 2001). Encyclopædia Britannica Online offers the following definition:

[...] in industry, science, and education, a research or teaching technique that reproduces actual events and processes under test conditions. Developing a *simulation* is often a highly complex mathematical process.¹

For the purposes of this paper, a definition that helps us to understand the aesthetics of simulations is necessary. The definition has to take note of uses of simulation for entertainment purposes – i.e. not only reproducing or modeling actual events but also creating make-believe worlds. Definitions with similar premises have been hard to find, but we will refer to a pair of them in what follows.

Cathy Stein Greenblat has written about designing games and simulations for pedagogic purposes. The simulations created and proposed by Greenblat are not computer-mediated but mostly board games and role play scenarios with a simulative logic. Greenblat (1988, 14) defines simulation: "A simulation is an operating model of central features or elements of a real or proposed system, process, or environment." Greenblat emphasizes certain critical dimensions of simulations: first, simulation is a *dynamic model*, second, only *selected elements* of the referent system are included, and finally, that there can be several *different sorts* of referent systems (ibid.).

Gonzalo Frasca, games scholar and ludologist, has promoted simulation theory in relation to games. He pursues the notion of 'simiotics'. It presents an applied form of semiotics for the purposes of understanding how simulations work, produce meaning, and are interpreted.

Whereas Frasca applies Peirce's triadic model of the sign to pursue a simiotic model, my interest is in studying how different gameplay elements (interfaces, audiovisual elements, representations, rules, etc.) combine to produce simulations, and how do those elements and their relationship to each other make one simulation *formally* different from another. This is an interest for knowledge that is essentially design-driven.

Frasca's definition of simulation is a result of rethinking previous, technology-based definitions employed in, e.g., research into computer graphics. He wants to broaden the notion of simulation from computer-based simulations to non-electronic devices such as toys. Computer simulation is the primary method that has been used to study the modeling of systems (Frasca 2001a, 24), as computers can be employed "to explore mathematical models of structures and processes" (Greenblat 1988, 18.). Computer simulation has been defined as "the use of a computer to represent the dynamic responses of one system by the behavior of another system modeled after it."²

Frasca adopts the notion of system from cybernetics, where different systems have been scientifically simulated in order to predict their behavior. He builds his definition on the notion of 'system', as it is defined and used in the study of cybernetic systems. System is understood as "a set or arrangement of entities so related or connected so as to form a unity or organic whole"³. Adapting this definition of system has the advantage that it encompasses the different 'processes' and 'environments' that were mentioned in Greenblat's definition.

Frasca also refers to similar approaches in studying the aesthetics of electronic texts, particularly Espen Aarseth's studies on cybertexts that operate in a triad of operator, verbal sign, and medium (Aarseth 1997, 21). Frasca states his premise as follows:

Since both videogames, non-electronic games and toys can be separately understood as "a set or arrangement of entities so related or connected so as to form a unity or organic whole" [...] I propose to use simulation theory to analyze these games as simulations, in order to understand how they work and, particularly, how players interpret its content. (Frasca 2001a, 24.)

Frasca formulates his definition of simulation around the goal of modeling the behavior of a particular system to a certain extent:

"to simulate is to model a (source) system through a different system which maintains to somebody some of the behaviors of the original system". The key term here is "behavior". Simulation does not simply retain the – generally audiovisual– characteristics of the object but it also includes a model of its behaviors. This model reacts to certain stimuli (input data, pushing buttons, joystick movements), according to a set of conditions. (Frasca 2001b.)

I will name the source system, i.e. the object of simulation, as A (cf. *ibid*). The resulting model, i.e. a particular instance of simulation, is named B. It is useful to think the relation of the model to the source system as a circle located within a larger one (see figure 1 below). The large circle represents A. If one reduces B, the smaller circle, from A, the result of the equation points out the features of the source system

that have been left out or simplified in the simulation (B). This relationship will be illustrated in more detail later. [Figure1]

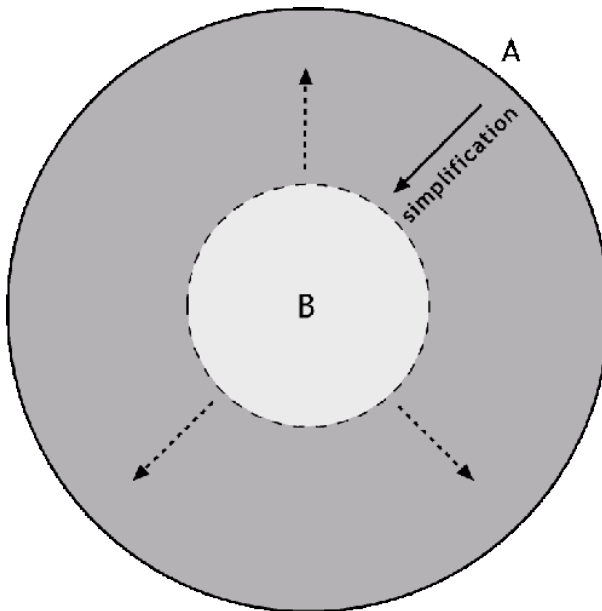


Figure1: Simulation (B) in relation to its referent system (A).

Simulation/game?

So, when is a simulation not a game? This question needs to be answered in order to avoid terminological confusion. Frasca (2003) writes: "The key trait of simulational media is that it relies on rules: rules that can be manipulated, accepted, rejected and even contested." Frasca leads us to believe that both games and simulations have rules. But there is a difference between *SimCity* and a simulation tool used by city planners, surely? The rules must have different functions in simulations intended for other purposes than gaming?

Greenblat (1988, 14) writes about the specificity of game-simulations: "The term *game* is applied to those simulations that work wholly or partly on the basis of players' decisions." She goes on to describe gaming simulations that incorporate characteristics of games, such as roles, goals, constraints and payoffs. Greenblat finishes with the following statement: "*Gaming-simulation, then is a hybrid form, involving the performance of game activities in simulated contexts.*" (Ibid. 14-15.)

Another aspect that Greenblat discusses is the distinction between role playing and gaming-simulation. She argues:

Role playing is an *element* of gaming-simulations, but the latter also include other components. In most role-playing exercises the participant is assigned a role and given the general outline of a situation; from there the action is freewheeling. In gaming-simulations, on the other hand, roles are defined in *interacting systems*. That is, emphasis is on the role as it interacts with other roles; the model creates the basis for the dynamic interaction, and includes the constraints, rewards, and punishments referred to above. (ibid, 15.).

The latter half of the cited passage actually describes quite accurately what happens in role-playing *games* (both so-called table-top and live-action role-playing games), where it is the game master that governs the interaction (possibly with the help of a rule book) by giving out challenges, rewards, punishments, and so on. The point here is that when thinking about role play in relation to simulation, it is necessary to make a distinction between role-playing games and role-playing exercises.

Overall, Greenblat's discussion is useful for our purposes but does not provide entirely satisfactory answers, because it is clearly bound by her premise of creating simulations that, on one hand, have references in reality, and on the other hand, serve mainly pedagogical purposes.

Although these aspects do not run contrary to current forms of digital games, they do not exhaustively cover the field either. In many games designed for fun and entertainment, the whole point is that the reference system is entirely fictional, a make-believe fantasy world, for instance. Any learning that takes place while playing the game is either related to the game itself (rules, general accumulation of skill and knowledge) or secondary in relation to the primary purpose, i.e. entertainment.

Frasca explains the difference between games and other simulations with the help of Roger Caillois' (1961, 13–14) distinction between *paidia* and *ludus*, the different nature of 'play' and 'game'. Basically *paidia* refers to spontaneous forms of play, where there exist few rules or they can be changed, whereas *ludus* refers to the more inherently game-like structure with clear goals and pre-determined rules.

Frasca argues that simulations structured with *ludus* rules follow a binary logic (winning/losing) that is suited for traditional game structures, whereas simulations with *paidia* logic have potential to illustrate more complex relations and processes, such as human relationships. However, in this process, the latter become other kinds of simulations rather than simulations structured as games. (Frasca 2003.) We will return to Frasca's typology of simulation rules later.

So, clearly every simulation is not a game. Games, with their rules, are one particular way of creating a structure for simulation (cf. Ibid.). Therefore it is justifiable to

discuss certain kinds of simulations as games. I will use the term 'game-simulation' when I want to emphasize the fact that a particular simulation is structured according to *ludus*.

But does every game have some simulative characteristics? Is *Tetris* or *Solitaire* a simulation, and if so, what are their referent systems? Are some games more relevant to discuss from the perspective of simulation than others? Probably yes. We can begin to answer this question by looking at games' tendency to create a system or transform an existing one for gameplay purposes. After that, we will move on to deconstructing game-simulations in order to understand how they produce the behavior of a system.

Real vs. make-believe referent systems

Frasca (2001a, 25) points out that a 'real-systems premise' has been the dominant method of implementing computer simulations and theorizing about them as well. He suggests that the reason is historical: simulations have had their roots in scientific, mathematical experiments. With the emergence of computers as entertainment medium, and digital games as one particular form of computer-mediated entertainment, they present possibilities for simulating systems that "that do not exist or even contradict the rules of physics of our universe." (Ibid.)

Frasca continues with an important point that also illustrates what 'simiotics' essentially is in relation to semiotics:

To claim that there is a need for a real referent in simulations is similar to say that the word *unicorn* is not a sign since its referent is not real. Therefore, I will apply the term "simulation" to the representation of processes that mimic a system by the behavior of another, even if its source system is not real. (Ibid., 25-26)

My premise will be the same. Following it, *Tetris* has simulative characteristics, as it creates a system that behaves according to certain rules. A computer version of *Solitaire* simulates the card game; in other words, it has a system referent that is real.

Whether the simulation refers to real, actual system(s) or not, there is also the questions of interpretation, previous knowledge of games, and a larger cultural context. In order to interpret a game simulation as one, the player who engages with the simulation has to interpret the rules as the 'simauthor' (Frasca 2003) intended them to be interpreted. Frasca gives an example how a simulation can be misinterpreted, or not taken full advantage of, if the referent system is not known in

detail: a player who does not recognize that the archaic and highly abstract video game *Pong* (Atari, 1972) simulates table tennis, might not understand the game or simulation at all (Frasca 2001a, 30-32). On the same topic, Karen Carr (1995, 6) writes: “[...] a simulation is a pretence which depends upon interpretation by a person who is familiar with the rules of representation.”

In digital games, the player gets to manipulate objects, and thus the course of events. Therefore objects in a game have to be represented in a way that the player can realize that s/he is able to interact with them. The concept of ‘affordance’, originating from J.J. Gibson’s studies in perceptual psychology, is worth of note here (see, e.g., Gibson 1977). It refers to the observer’s understanding of what an object allows her to do; what it *affords*, so to speak. When designing game-simulations, it is not only necessary to both constrain and guide the player with rules, but also craft representations with affordances so that the player understands how to invest her effort into the game. Objects should not only look and sound coherent, but behave coherently, and according to the players’ expectations.

But then again, it is the nature and power of games to *reverse* real-world causalities and behaviors. This has to do with the general make-believe nature of many games, and especially forms of play. Often when playing, people transform the nature of the playing environment for the purposes of playing: a domestic room becomes a doctor’s office, a playground becomes a battlefield, and so on. This effect has been described as the ‘second-order reality’ of play and games (Cailliois 1961, 8). Everyone who accepts this pretence for some duration is ‘playing along’. Digital games, when they simulate make-believe worlds, rely on this same pact between the game and the player, which is essentially about understanding and accepting the rules of the game.

In this sense, I argue that games are less open to different interpretations than media representations in general, as they are formal systems that need to be operated by the player in order to make sense *as games*. This does not mean that the role of the player is somehow diminished, but quite the contrary, as both interpreting rules and gameplay structures and playing within the constraints and possibilities they produce require active participation in the simulation.

On these grounds, I define games’ relationship to simulations as follows: *Games are simulations that allow a player or players to influence the behavior of the modeled system in the context of pre-defined rules.*

The three reference points of simulation: system, representation, and interface

In the following, I will present a model with which we can think how different games' simulative elements function in relation to each other. In the model, three reference axis of simulation are added into the previous figure. Each axis presents one aspect of the referent system. The model is based on the idea that simulation operates between three nodes:

1. *System*: the behavior of the referent system (A, 'the organic whole') of simulation.
2. *Representation*: the sign layer that represents the system with (animated) images and sounds.
3. *Interface*: the input schema that gives the player access to the system via representation, and henceforth access to the simulation itself.

We need a model that illustrates the relation of A to B and the degree of simulation implemented into each node. To give an example, if A is football, we need an investigative model that we can 1) for the purposes of analysis, apply to any football game (B_x) that simulates the sport, and 2) for the purposes of designing simulations, to help in thinking how to select the elements to be simulated, their relation to each other, and their implementation.

The following model in Figure B is essentially about deconstructing simulations. It allows us to map a particular game into it according to how the three elements are simulated:

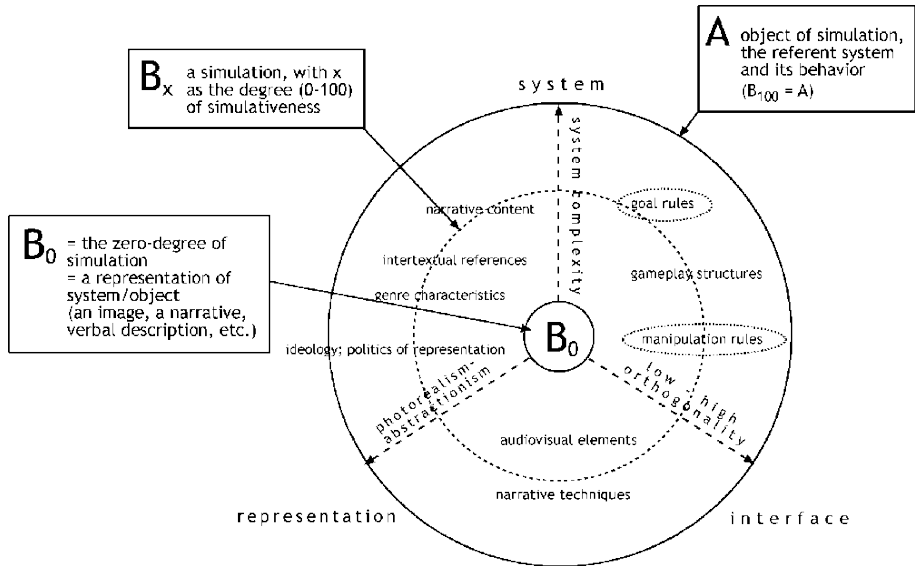


Figure B: The generic model of game-simulation with the three elements: system, representation, and interface. Different elements that contribute to the gameplay and outlook of the game are situated in the sectors between them. (It has been brought to my attention that the three-fold model somewhat corresponds to the 'view-model-control' schema that has been used in conceptualizing interface and software application design.)

The referent axes, sectors and simulational rules

Let us look at the model in more detail. Each node has an axis that leads from B to A. The axes' function is to indicate the variation of detail in a particular instance of simulation. System, representation and interface present three vantage points with which to carry out analysis between different games.

The relationship of each axis to each other is not constant, because in some games the system, interface, and representation function in closer relation to each other than in others. For example, in strategy games (such as different sports fantasy leagues) that are based on controlling different resources via mostly numeric interface, the system and the interface are almost the same, and the representation is bent on numerical representation.

In quite a different subgenre of games, the First-Person Shooter, the system (usually a fantastic world), the representation (a detailed three-dimensional world), and interface (controlling the subjective point of perception as if 'being' the player) are

very closely connected to each other. The game-world might have a real-world referent, or a counterpart familiar from other forms of fiction (e.g., as with game adaptations of films). The length of each axis depends on the degree of behavior implemented in the simulation as opposed to a representation of the system, where it is impossible to include the behavior in any dynamic way.

Let us look at the different sectors between the axes. The sectors include elements of game-simulations that work between two axes. In the sector between representation and interface there are the basic audiovisual elements that function in relation to the player and her concrete means to affect them via the interface. The so-called dimensionality, point of perception, and soundscape and other audiovisual elements (see Järvinen 2002) operate between interface and representation.

These structures are the plain, wire-frame building blocks of the audiovisuality of a particular game. They are topped with representations, which operate in another sector, the one between system and representation. In the sector between system and interface, there resides the means of manipulating the behavior of the system. These work hand in hand with the gameplay structures. The latter define the causal relationships, criteria of success, and possible rewards and punishments of the player's actions.

Rules

The rules of simulation operate along the different axes, and through their interrelations. Frasca distinguishes three levels of rules that affect the nature of the simulation and the ideology it conveys through causal and representational means. The first has to do with representation, especially how characters, objects, etc. are represented. The second are what Frasca calls manipulation rules: "what the player is able to do within the model". The third level is the goal rules: "what the player must do in order to win". (Frasca 2003.)

These rules each map to the different sectors that reside between the system, interface, and representation axis. This varies across different games and genres. For instance, when the goal rules state that there is a certain amount of skill involved in winning, and this has to do with a thorough knowledge and execution of the control schema (e.g., in a skateboarding game), the goal rules function in close connection to the interface axis. They might be indistinguishable from the manipulation rules altogether. In case of a game that is more focused on understanding certain causal relationships the goal rules function in closer connection with both the representation and system axes. Examples abound in the strategy game genre where understanding the logic and interrelations of resources are keys to winning. In games where narrative sequences, with their causal logic, are used for giving the player information regarding solving the game's tasks, this is the case as well.

System axis

The system axis points out how accurately the general behavior of the referent system is simulated. In games this behavior is governed by rules and the actions of players within those rules. In case of a football game, then, the axis indicates in how detailed fashion are the official rules of football implemented into the simulation, and also, how detailed is the simulation regarding the physical behavior of human body in the context of playing football. Different institutions and structures (leagues and competitions in the football example) can be included in the simulation. These elements sum up the length of the axis.

The distance between B and A depends on the complexity of the system. For game purposes, then, the axis might end up quite short, as numerous traits of the system are either omitted or simplified. This does not necessarily produce a simple, or a 'bad' game. Often the degree of simplification has to do with interface issues: it is not possible to map a highly complex system, and means to manipulate it, to such a control device as the present console gamepads, for instance. These kinds of limitations have usually been solved by design solutions where a simple press of button is programmed to execute a number of behaviors in the system. This is often the case in game-simulations such as the *SimCity* or *The Sims*, where complex processes (e.g., the construction of buildings, or social interactions) are automated once the player has 'pushed' them into motion.

Representation axis

The representation axis tells us about the game's audiovisual representation: it runs from absolute photorealism and aural recreation of a particular soundscape to simplified abstractionism (the football equivalent of *Pong*, to keep with the same example). In highly abstract games, such as *Tetris* or *Othello*, there is virtually no representation at work. The tetraminoes in *Tetris* and the pieces in *Othello* do not represent anything but themselves as tokens of the game's rules. The fact that a deck of cards has rooks, queens, and kings, is one step towards representation. However, a deck of cards is a game system that could be represented with other means and symbols as well (and there are numerous examples of this).

To sum this up: regarding digital games, the more photorealistic the game's audiovisual style is, the more relevant is the question concerning politics of representation.

The representation axis has particular relevance for thinking about the relationship of simulations and digital games, especially when one thinks about the dominating trend of three-dimensional graphics and sound in games from the mid-1990s onwards. In an article on the 'virtual realism' of different virtual reality applications, Christou and Parker (1995, 67) write: "In pictorial art, the brush strokes and markings

are placed on the canvas in order to mimic the visual product of the projection of light. In three-dimensional computer graphics, the light projection process itself is simulated.” This kind of notion about increased realism in computer graphics through simulation is somewhat technology-driven pursuit, which has dominated game production. It is only lately that pictorial forms of representation have become popular, or even trendy (the ‘cel-shading’ movement apparent in games like *Legend of Zelda: the Wind Waker*, Nintendo 2003)), in creating audiovisual outlook for digital games.

The means of representation a particular game employs are in close connection with both the interface and system, but this varies between and within game genres. The representation, or a specific element in the audiovisuality of a game, can dictate the choice of interface. A completely textual representation, as in the numerous text adventure games of the 1980s, meant that the interface took the form of a text parser and participation in the simulation was conducted by typing commands (in a specific syntax) from the keyboard. Then again, by placing the point of perception as first person, the FPS games led to the development of interfaces that try to fuse the interface logic to the first person viewpoint as ‘naturally’ as possible in order to pursue the illusion of non-mediated game experience.

Interface axis

The interface axis points out the complexity of the control scheme and its accuracy or complexity in relation to the actual physical experience of playing football or the fictional experience of piloting a spaceship, for instance. For game simulation purposes, often a highly simplified control schema is relevant for the sake of playability, as, e.g., in *Virtua Tennis* (Sega, 2000) where only two buttons are used for different strokes. The complexity or simplicity of control schema has been discussed under the concept of orthogonality (Dietrich 2002). I will employ high versus low degrees of orthogonality as the continuum that runs along the interface axis.

The journey from B to A

The simulation, B, operates in the interconnection of the axes. The referent system is a superstructure that is basically a sum of the axes as they would present the actual, 100 percent implementation of the referent system. The generic model is applied to practice by evaluating the length of each axis, and mapping and analyzing what resides in each sector (in between two axes) in a particular game.

Simulating media representations: *Grand Theft Auto*

Grand Theft Auto is a series of games (by RockStar Games, 1996–2002) focused around criminal underworld, drawing its influences from hard-boiled crime fiction. The games consist of different missions where the player controls a character whose job is to carry out a task of one sort or another (often a crime such as bank robbery or assassination, or working as a bodyguard or chauffeur). The series third part, *Grand Theft Auto III* (2001, henceforth *GTAIII*) was immensely popular and was handed many awards for its innovative game design. *Grand Theft Auto: Vice City* is (at the time of writing) the most recent sequel, building on the innovations and success of *GTAIII*.

The two latest installments in the series are particularly fruitful to study from the perspective of game-simulation theory. *GTAIII*'s important difference to the first two games was that it set its gameplay into a detailed simulation of an urban environment (called 'Liberty City' in the game). Technically and representation-wise, the change became apparent as a shift from a two-dimensional, top-down presentation to a seamlessly three-dimensional, detailed audiovisual environment.

In the context of this paper, *GTAIII* essentially presented a change in the detail, degree and referent system(s) of its simulation. Not only did the system, representation, and interface axis change in orientation, but their relationship and reference points changed, too. The complexity of the referent system was increased as many more behaviors of urban environments, vehicles, weapons, etc., were incorporated to the game. On the sector of representation, another dimension was added quite literally. Consequently, the interface had to be adapted for the requirements posed by the modifications.

Vice City (henceforth *VC*) brings another layer to the simulation. Instead of intertextual references to popular culture and crime fiction on a general level, as in *GTAIII*, in *VC* RockStar Games has tried to recreate a city of a certain era by using numerous pop-cultural elements in crafting the simulation. For instance, the game has an extensive soundtrack of 1980s pop music, and simulation-wise, the most important feature is that they are mostly played through the radio stations within the system, not as so-called off-game-world sound that functions in similar fashion as non-diegetic film sound to provide different atmosphere. The radio stations are part of the referent system that *VC* is a simulation of. However, as with any game-simulation, the choice of songs presents an interpretation of what 1980s popular music is and sounds like.

This dimension of interpretation is an important difference between simulations crafted for scientific and entertainment purposes. For instance, every sports game-

simulation is an interpretation of the sport rather than universally generalized model built out of the dynamics of a particular sport.

What makes *VC* particularly interesting is its relation to representation. The referent system is not so much a time period of the 1980s in a city somewhere in the United States, but the crime-flavored representations that we know from fictional detective TV series, comics, gangster films, and so on. Despite the more obvious references to the TV series *Miami Vice*, for instance, the overall *B_{Vice City}* is a pastiche of numerous elements. These intertextual elements operate within the domain of simulation, but also within the ones of representation and narrative (especially during the cut-scenes).

***Grand Theft Auto: Vice City* as game-simulation**

Next, we will study *VC*'s elements of simulation and apply the generic model to its analysis. Basically the referent system of *VC* is a sum of an environment of urban crime, with a distinct style of a certain era, and a collection of conventions from crime fiction (scenarios, character stereotypes, etc.). These constitute the intertextual references and genre characteristics of the game. The voice acting of different characters, with numerous well-known actors behind the voices (actor Ray Liotta provides the voice for the player's character Tommy Vercetti) is another noteworthy aspect of the game. Genre-wise, the voice acting plays a considerable part. Strictly speaking, because *Vice City* is not a direct adaptation of an existing fictional universe (such as the TV series *Miami Vice*), all the elements (the soundtracks, voice-acting, missions, etc.) do not produce a game-simulation of 1980s crime fiction, but an interpretation of 1980s crime fiction in the form of a game-simulation.

The conclusion is that *VC*'s referent system is not as easily recognizable as with game adaptations of films and television series or sports, for that matter. With games like *Enter the Matrix* (Shiny Entertainment, 2003) or *NH2K3* (Sega, 2002) the referent systems – the fictional universe of the film series and ice hockey in the National Hockey League as televised by ESPN sports – are unambiguous. Rather than having an unambiguous referent system, *VC* substitutes it with a more general theme that is influenced by numerous phenomena of popular culture.

This has to do with the politics of representation in *Vice City*. It clearly operates in a particular domain of irony and parody with its retroish pop-sensibility. "Vice City is the first nostalgia sim", as Wagner James Au (2002) wrote in a Salon.com article. Its particular blend of nostalgia and parody brings us back to the relationship of the underlying game system and its representation (the deck of cards example, above).

Actually, with its three-dimensional graphics engine, character and object models, and gameplay structures, *GTAIII* produced a game system that *VC* is built upon. This observation shifts the focus on *VC*'s particular means and politics of representation.

A more thorough analysis would focus on the notion of parody and how it is employed in *VC*. There is no space to analyze it here, but let us point out some directions for ideological analysis of this particular simulation: Questions to ask this particular game-simulation include: Does parody as a rhetorical technique reinforce what it parodies? Is parody used in *VC* as a scapegoat for sexism – does *VC*, by reintroducing a typical masculine character familiar from 1980s crime fiction, actually reinforce this type of masculinity? Do the manipulation rules and the causalities implemented through them into the game resist or invite this kind of interpretation?

In a game that is built around conveying a certain atmosphere, the audiovisual means to create the simulation are important. *VC* embodies so-called caricaturistic style (see Järvinen 2002) with three-dimensional game environment and third-person point of perception as its core audiovisual elements. The animation of characters and objects (vehicles etc.) is somewhat stylized, with conventions of popular fiction as reference points. Thus, their sets of behaviors are modeled according to familiar stereotypes (mafiosos, rock stars, femme fatales, etc.). As a simulation, *VC* does not aim for 100 percent accuracy of real-life behavior. Rather, its elements of simulation are in line with its general, nostalgic sensibility. Narrative cut-scenes are used to inform the player about the background story of the game and to motivate the missions given to her. They relate to the bottom sector (representation–interface) in the sense that they interrupt the gameplay and prevent the player from accessing the simulation, thus shifting the focus momentarily from the simulational to the representational domain. - In the Figure C, elements of simulation in *VC* are mapped into the general model.

As with *GTAIII*, 'Vice City' the city lives and breathes in a complex way independent of the player's efforts: the sun rises and sets, traffic operates, and so on. In other words, urban behavior is simulated to quite a high degree, but the manipulation rules and means to take actions that the rules govern are located on street-level – as opposed to the 'high' level manipulation of *SimCity*, for example.

The gameplay functionalities are implemented according to this approach. They are simple actions: the player can walk, run, drive different vehicles (cars, motorcycles, boats, helicopter), fight, and operate different weapons (from baseball bat to guns).

Essentially, these are tools given to the player to play the game. The use and behavior of each tool is simulated in a simplified manner, and following similar interface logic: the control pad is used in aiming a weapon or steering a vehicle, and the tool is operated (shot, accelerated, etc.) with the press of a single button on the

gamepad. Tasks such as reloading ammunition, changing gears, etc. are made trivial in the sense that they are automated. These methods of simplification are the steps that differentiate B from A, and most importantly, make it playable.

The manipulation rules, i.e. “what the player is able to do within the model”, are materialized as the gameplay functionalities discussed above. In VC, the manipulation rules regarding different vehicles are also important, as interacting with these types of tools makes up a considerable amount of playing the game. Even though the driving models are simplified when compared to such ‘real driving simulators’ as the *Gran Turismo* (Konami 1997–) game series, still, a car in VC behaves like a car, and can be wrecked like a car.

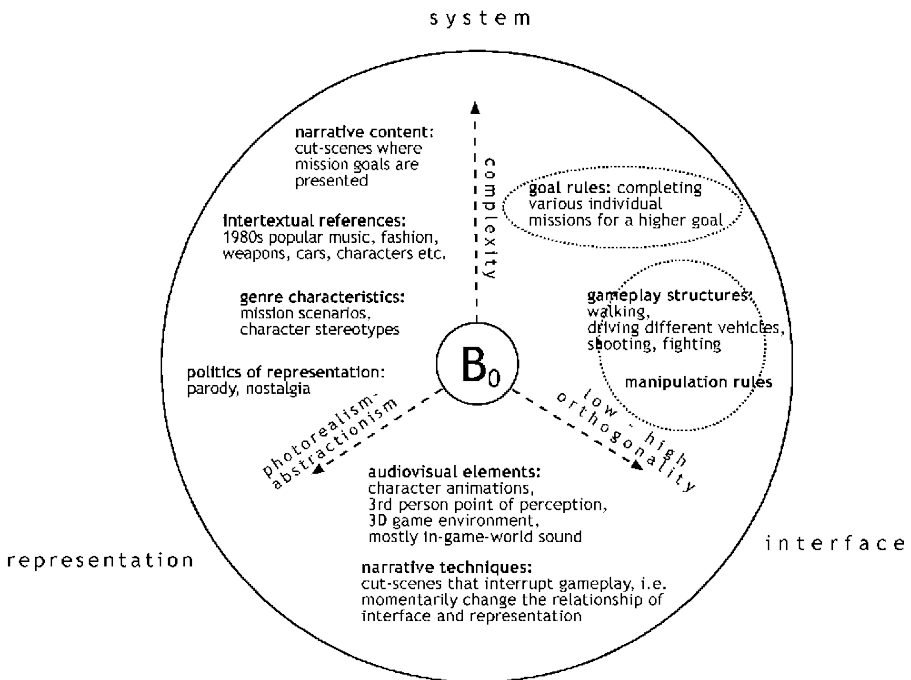


Figure C: Case analysis: the elements of simulation in *Grand Theft Auto: Vice City*

Affordances and rule hierarchies of Vice City

In order to thoroughly uncover how VC operates as a simulation, a detailed analysis of the different causal gameplay structure would be needed. This kind of

deconstruction, where the details of the simulation are analyzed, sheds light on how the system is designed to behave in response to the player's actions.

This has to do, on one hand, with the coherence of the simulation: if a single character in *VC* can be killed, then the possibility of death should apply to any character; if one building can be entered, then all buildings should be enter-*able*. We return to the concept of affordance. In practice, as games are about rules, the rules often serve to constrain the players in this sense as well: only the buildings that are relevant in order to progress in the game, can be entered, and so on. The less simulative a game is, the more of these kinds of constraints it is bound to have. The use of narrated cut-scenes is one example, employed in *VC* as well, that divorces the player momentarily from the simulation and its particular rules. More and more, however, we are beginning to see examples of games that simulate very complex systems, and in an increasingly coherent manner. The development of the *GTA* series presents one particular trend in this direction, while Will Wright's Sim-games present another approach (see Wright 2003).

On the other hand, analyzing the causalities of actions within the simulation produces observations about the politics and rhetorics of a particular simulation. The key question here regarding analysis is, whether the simulation rules can truly be contested, as Frasca (2003) claims of simulations in general, or not. If not, it is likely that the game includes elements that are not simulative, such as narration. This is the case in *VC* but still, it does convey meanings with its simulative logic as well. Even though this makes different solutions to the game's challenges possible, they take the form of missions, i.e. specific tasks within the system, and the player cannot contest their purposes and goals, and the means to achieve them. It is Frasca's category of goal rules that governs these aspects.

However, there is a certain hierarchy to the manipulation rules: if the player does not want to pursue the missions, s/he can choose to take control of a taxi (or an ambulance, for instance) and start earning money transporting passengers around Vice City. This presents a *paidia*-orientated approach to the game. If, however, she takes on a mission, she has to pass it in order to keep playing the game. This, on the other hand, is a goal rule shaped according to *ludus* logic. Completing the game requires the player to pass a number of these subtasks. This means that in *VC*, as with majority of games, the manipulation rules are ultimately subordinated to goal rules.

Despite the brevity of the analysis presented here, these arguments help to understand *VC*'s particular techniques of balancing simulation and game elements, and the potential methods of conveying meanings that are characteristic to the two.

To give a comparative example: Another recent game, *Legend of Zelda: The Wind Waker* (Nintendo, 2003), presents the player with a massive fantasy world, which has numerous simulative elements, such as a vast sea that simulates a system, 'an

organic whole', that is easily recognizable and behaves accordingly. However, this particular game-simulation has quite many incoherencies between the different sub-systems it simulates, and there are frequent narrative sequences, which prevent the player from contesting any of the rules, both those governing the simulation and the ones conducting progress in the game. Both manipulation rules and goal rules are less flexible than in *VC*. This does not necessarily mean that one of the two games is better than the other, but rather that they both employ elements of simulation with different balances and emphasis between system, representation and interface.

From system to theme: the ethics of popular simulations

Whoever designs a strike simulator that is extremely hard to play is describing his beliefs regarding social mechanics through the game's rules rather than through events. (Frasca 2003)

The quotation from Frasca brings us to the politics and ethics of simulation. These have not been the focus of the theory presented here. Still, it is important to recognize the fact that all game-simulations are interpreted and played in specific cultural contexts. This is when the formal elements analyzed here enter the domain of play and gaming, and give birth to informal experiences and interpretations. Although the resulting reasoning or emotions can not be thoroughly anticipated, I argue that deconstructing simulations allows us to both produce readings of their ethics and politics, and point out methods to design future simulations with specific political and ethical premises.

Increasing the degree of simulation means increasing complexity as the referent systems get multiplied. For instance, the elements of simulation in the beach volleyball game *Dead or Alive: Xtreme Volleyball* (Tecmo, 2002) have various referent systems: most visibly volleyball, the female body, dating, and a casino house. With simulational methods, the game conveys potentially quite different meanings and beliefs than the strike simulator that Frasca imagines. The fact that the game is quite easy adds to this impression.

The volleyball game example serves the point of illustrating the tendency of digital games to 'disguise' the referent systems under a specific game theme. Whereas the referent systems, or their combination, functions as the context of the behaviors in the simulation, the theme functions as the context of the meanings that the simulation produces. A simulation that simulates the behavior of atoms does not have any other theme than the atoms themselves. In game-simulations, system,

representation and interface co-operate in the context of a theme in order to produce complex set experiences and meanings that accompany them.

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Notes

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