

Digital Games as Ethical Technologies

/* */

Introduction

What are the values of an object? How can philosophy illuminate the inherent rhetorical, social, political and moral meanings inscribed in any designed technology? And how can we do this without falling in the intentional fallacy, ascribing all responsibility to the designer? Because, as design researcher Nigel Cross has stated, "design is rhetorical [...] in the sense that the designer, in constructing a design proposal, constructs a particular kind of argument, in which a final conclusion is developed and evaluated as it develops against both known goals and previously unsuspected implications" (Cross: 2007, p. 51). In this chapter I will look at game design and how it is used to create ethical experiences, only I will not start from the perspective of the designer, but of the finished product as experienced by a user. In this sense, I am extending the rhetorical analysis of design proposed by Cross, and suggesting a way of understanding the ways in which design conveys meaning.

My focus will be ethics, or the way in which game design can be used to create experiences in which moral thinking is central to the ludic activity. By doing so, I will argue that digital games are ethical technologies, capable of embodying values and projecting them into the user experience. The relation between computer games and ethics has been approached from a variety of academic perspectives. There is a large body of work on the alleged effects of violent computer games (Bushman and Huesman: 2000; Anderson et al: 2000; Anderson et al: 2001; Funk et al: 2004; Endresen et at: 2005). These studies use psychological methods to evaluate the impact of violent games in their users, deriving their ethical conclusions from the interpretation of those

results. These are not studies on the ethics of computer games, but on the psychology and physiology of computer game players.

Other research has focused on issues of cheating (Consalvo: 2004), the ethical interpretation of playing violent computer games (McCormick: 2001), and the political and moral nature of serious games and simulations (Penny: 2003). There are also popular press reflections on the ethical nature of computer games (Takahashi: 2004), and introductions to the ethical analysis of computer games targeted to a game developer audience (Reynolds: 2002). Most of these works are focused on the act of playing games, or on the audiovisual elements of computer games, without any focus on the actual design of computer games.

This chapter is focused, then, on design. I will investigate what the relation between ethics and game design is, with the intention of describing games as ethical technologies that can be experienced as challenges, or exercises on moral thinking. I will analyze these types of experiences using a postphenomenological framework. The results of this analysis will then be formalized into an ethical interpretation using Information Ethics. My goal is to provide a convincing framework for the study of game design from an ethics perspective.

The examples that illustrate this analyses are taken from the Xbox 360 versions of *Bioshock* (2KBoston/2KAustralia: 2007) and *Grand Theft Auto IV* (Rockstar North: 2008). The analysis of these games as designed systems for interaction is based on design (Norman: 2002) and game design theory (Salen and Zimmerman: 2004; Rouse: 2005; Rollings and Adams: 2007), as well as game research (Juul: 2005; Järvinen: 2008). As previously stated, the philosophical framework is double: the analysis of games as technologies will

use Ihde's postphenomenology (Ihde: 1990; Verbeek: 2005); the ethical analysis will apply an Information Ethics perspective (Floridi: 1999, 2003, 2004). These two approaches are complementary: postphenomenology allows for a low-level analysis of the design of a game; Information Ethics contextualizes the findings of postphenomenology in a high-level theory encompassing systems, agents, and their relations.

This article is divided in six sections: the first section briefly introduces a design vocabulary. The second section presents and discusses the philosophical theories that will be used in the analysis of games. Section three presents the case studies. Section four performs a postphenomenological analysis of the case studies, while section five provides an Information Ethics interpretation of the experience analysis. The paper is closed with a short reflection on the scope and future of this research.

A Brief Design Vocabulary

To analyze the elements of a game design, it is necessary to use a formal, abstract, precise design vocabulary. Designers (Church: 1999) and theorists (Bateman and Boon: 2006; Järvinen: 2008) have addressed the need for a design vocabulary. This article requires concepts that can be easily translated to the philosophical analysis of games. The vocabulary I propose here translates from the actual analysis of a digital game design, to the interpretation of design elements by both postphenomenology and Information Ethics.

From a high-level perspective, a game is a system designed for the interaction of agents with an environment and with each other. These agents intend to achieve predefined goals by means of interaction methods allowed by the system. Unlike other definitions of games (Suits: 1978; Salen and Zimmerman: 2004; Juul: 2005), I am not taking into consideration player motiva-

tion, psychology, or emotions. While games are designed for players, my interest here is to have concepts that allow for the precise description of the game system.

A game system can be described as a state machine (Turing: 1937; Audi: 1999, pp. 933-934): 'Briefly stated, a state machine is a machine that has an *initial state*, accepts a specific amount of *input events*, changes state in response to inputs using a *state transition function* (i.e., rules), and produces specific outputs using an *output function*' (Juul: 2005, p. 61). This vocabulary is based on this premise.

A game has a number of different states, two of which are always present: the initial state, prior to any agent interaction, and the end state, when the game halts. It is important to distinguish the end state of a game from the winning condition: a game like *Grand Theft Auto IV* has a number of winning conditions, but no apparent end state. The player can keep interacting with the system also after all the goals proposed by the game are achieved. The end state is only reached when the player exits the game. In most games, the end state is determined by the winning condition: when we win or lose, the game is over. But some other games decouple winning from ending the game, which leads to ethical and political interpretations: *September 12th* (Newsgaming: 2003) bases its moral discourse on the absence of a winning condition.

The game system has a number of properties and attributes that define the different states, as well as the modes of interaction, the winning and losing conditions, and the instructions to change these properties and attributes. These are the rules of the game. A rule determines properties of a state, or any game object, and how it will react to input. Rules can be translated to al-

gorithms (for example, *if(playerlife = 0) player.death()*¹), or to constants, variables, and other properties of a state (for example, *playerlife = 100*).

In computer games, agency is designed: users interact with the system in predetermined, sanctioned ways. This interaction is mediated through game mechanics, defined as methods for interaction by the agent with the game system. Methods should be understood as an Object Oriented Programming concept: objects have behaviors, which “are contained in *methods*, and you invoke a method by sending a *message* to it” (Weisfeld 2000, p. 13). Methods can be described as verbs (Järvinen: 2008, pp. 263), for instance “shoot”, or “die”.

Playing a game is interacting with a rule-bound, rule-determined system by means of a number of game mechanics. Game designers create these systems, the rules, and the mechanics for interaction. These elements constitute the procedural level of a game (Murray: 1997; Bogost: 2006, 2007), the elements of the system that describe the computational input and output processes.

Computer games also present what I shall define as a semiotic level (Eco: 1979). Game systems, rules and mechanics are communicated to players by means of an audiovisual construct, a game world or, as Juul (2005) defined it, a fiction. It is not my intention here to discuss the ontology of fiction or simulation. By semiotic level I am referring to those elements of the procedural level experienced by the player. The semiotic level comprises fiction and simulation (Aarseth: 2005), as well as metaphors of the procedural level. For instance, a health bar is a visual metaphor of the health property.

When players experience a game, they do so mediated by the semiotic level, but conditioned by the procedural level. Gameplay, or the experience of a game, is the phenomenological process of an epistemic agent interacting with a formal system. Players are epistemic agents because they relate and interpret their experience of the game by using their previous experience as players (Juul: 2005, p. 95-97), and their cultural, ethical, embodied being. A player will play within rules, by game mechanics, in a game world. Game design is the craft of creating interesting procedural levels and communicating them through the semiotics of the game.

What I Talk About When I Talk About Ethics

The goal of this chapter is to formulate a number of questions regarding the relations between morality, ludic experiences, and game design, as well as to provide a philosophical framework that can explain those instances of play in which morality plays a key role.

Let's start with the assumptions. In this chapter I assume that some games can create what I have called an "ethical gameplay experience". With this terminology I am referring to those instances of play in which an agent will take a decision crucial to her progression in the game based on heuristics derived from a moral evaluation of said instance of play. Ethical gameplay should be read here as opposed to instrumental gameplay, or the rational, game-economic decision-making heuristics that can inform many play experiences. I have chosen to define this type of experience as ethical gameplay because, as I will argue, those heuristics can be described from an ethical point of view, leading to potential normative and metaethical arguments. That is not, however, the goal of this chapter.

In this chapter I assume that some agents, on particular instances of play, take decisions based on ethical thinking, that is, with a clear idea that a certain choice is *right* or *wrong* not for game-economic purposes (optimization of results) but for moral reasons. Given this assumption, I want to investigate how the design of a game can foster this particular types of experiences. Since games are designed technologies, created to engage agents in the activity of play. Games are technologies for the creation of a particular designed experience. Play is not, however, a unified experience - play consists of a complex interrelation of needs, emotions, rational thinking and moral thinking. The question is, how is that experience created by the game understood as designed technology?

First, some terminology needs to be explained. In this chapter, I will often be referring to ethical experiences, ethical technologies, and ethical gameplay. The use of the term "ethical" to modify each of this substantives needs to be explained in detail. By ethical gameplay I am referring to the experience of a game by an agent that takes choices based on moral principles, rather than instrumental ones. In playing games, agents are often encouraged by the design of the game to take choices based on optimization, creating the best strategies that will allow them to reach their goals (by means of in-game rewards, for example). It is in this sense I refer to instrumental gameplay: that experience which is led by the logical, goal-driven and goal-oriented heuristics for decision making. Classic economic game theory was focused on this kind of instrumental play (Heide Smith: 2006). Ethical gameplay, on the other hand, substitutes the heuristics of the decision making process from goal-oriented to ethically-oriented ones. Players will take choices based on their morality, and philosophers can understand play as a moral activity by looking

at the ethics that justify those actions. For instance, ethical gameplay could be informed, and analyzed, by a number of different values, and therefore Virtue Ethics could be used to understand the experience of play. Or, in other cases, consequentialism can be applied to the understanding of particular solutions to particular dilemmas by computer game players. All those gameplay experiences in which players take choices based on moral assumptions, ideas or values, are examples of ethical gameplay, and are usually identifiable in the way players communicate their experiences in fora, interviews, or game reviews. The gameplay instances I will describe in later sections of this chapter are all designed to create these type of experiences.

In this chapter I will also argue that digital games can be defined as ethical technologies. Again, this wording can be problematic in the context of philosophy of technology - what is it meant by games as technologies? Without going too deep into a discussion that is external to this paper, games as technologies should be understood as the objects created by humans in order to create, explore and experience the activity of play. In this sense, games are technologies of play, designed to foster the playful activity and the experiences central or peripheral to them, from Callois' vertigo (Caillois: 2001) to DeKoven's lusory attitude (DeKoven: 2002). This interpretation of games as technologies will allow an analysis from traditions closely connected and/or central to the discipline of the philosophy of technology.

The claim that games can be ethical technologies is substantiated on the assumption that no technology is neutral, and that design is not only a way of creating new objects for particular, concrete purposes, but also to inscribe values, politics and behavioral patterns in the very structure of the object. A game, like any other technology, can embody a moral discourse in its being a

technology. A game, as an ethical technology, both embodies values in its design, as affordances, and in the type of experience it pretends to create in the player. The former is exemplified by the design of rules, rewards and other formal subsystems of the game: rules that reward particular sportsmanship, for instance, could be analyzed from a virtue ethics perspective as the reasons why a game can contribute to fostering the good life. The latter is present in games that present players with moral choices, which are then evaluated in terms of either the games' systems (quantized in points, for example), or in the ways the community of players relate to a particular choice.

In summary, computer games, like any games, can be understood as ethical technologies since they are objects designed for aiding and fostering the play activity, and like all technologies, they are non-neutral. The outcome of the play experience as mediated by a game can be of moral nature if the choices taken by the player are based not on an instrumental analysis of the conditions of the dilemma, but on an ethical evaluation of the morality of the potential choices presented by the game. In this sense, then, a game can be considered technology that can create ethical experiences.

(post)Phenomenology and Computer Games

It is precisely this focus on experiences what makes phenomenology the initial entry point for the investigation carried out in this chapter. While it is not my intention to discuss what phenomenology is, I believe some argumentations as to why phenomenology need to be in place.

Phenomenology is essentially concerned with experiences, or, to put it in a more Heideggerian way, ontology is only possible if understood from the experiences of a being in the world. Even though much work has gone into phenomenology since the early Husserlian days, experience remains a central

focus of any phenomenological analysis. What phenomenology does, then, is a “science of the experience”: it approaches systematically ontological questions using a method that starts from the being in the world and the perception of that world, and through phenomenological reductions concludes valid arguments about the ontology of said experience (Heidegger: 1988; Merleau-Ponty: 2002; Ihde: 1986).

The reason why phenomenology is an interesting starting point for the study of the morality of computer game design is its methodology. Phenomenology allows for the analysis of a experience, in this case one in which moral reasoning is triggered by certain game design decisions, and from that analysis it is possible to extract valid knowledge about the nature of the object that created that experience. Furthermore, in more contemporary works (Ihde: 1986), phenomenology has been understood as a multidisciplinary approach, one that can help understand the interconnections between philosophy, the natural and the social sciences, and other domains of knowledge and science. In this sense, it is worth noticing that computer games are complex objects that create experiences, but are also technologically bound to the limits of computation, as well as to the social context(s) in which play occurs. Only an analysis that can potentially take into consideration the technical and the social aspects of games, as well as their nature as systems for creating play, can be useful. This also implies that for studying computer games it should be a requirement to at least understand the fundamental technical basis of computing (Bogost and Montfort: 2009).

Phenomenology is then an interesting entry point because it allows the thinker to make ontological claims starting from experiences. The experience of a particular technology, then, can give us insights on the nature of that

technology. Phenomenology's interest in technology can be traced back at least to Heidegger's reflections on "modern technology" (Heidegger: 1977). Artifacts demand the attention of phenomenology since they mediate the experience of the world. Phenomenology "resembles an empirical science. It is 'empirical' in the sense that is observational in the first instance; it is 'scientific' in that its interest is in the structure of a given phenomenon; and it is 'psychological' in that its primary field is which occurs within experience" (Ihde: 1986, pp. 40-41).

Ihde's contribution to phenomenology, defined as "postphenomenology", is his focus on the specific relations between humans and technologies, and how those configure the experience of the world. Even though much of Ihde's work is based on Heidegger's take, his reading of Heidegger (Ihde: 1993) provides not only an appropriate critique of Heidegger's work, but also a way of phenomenologically approaching technologies in a more productive way. Ihde's postphenomenology is a systematic approach to technologies and the different types of relations that are established with humans, therefore bringing technology to focus together with humans, as part of their experience of the world.

Essentially, the focus on understanding the relations between human and world, and the technologies that mediate, facilitate or impede them, allow postphenomenology to move beyond the classic dichotomy between realism and idealism. Ihde's contribution is the claim that subject and object, human and world (and technology) constitute each other. The limiting element with regards to this article's goal in Ihde's classical works has been the exclusive focus on the human, leaving aside how a *designed* object should also be closely looked at. In other words, Ihde ignores the role of design as a discipline in

the way the technologies shape the relation of humans and the world. Therefore, Peter-Paul Verbeek's interpretation of postphenomenology, still very much based on Ihde's work, yet significantly focused on the design of the object, is much more appropriate for the understanding of computer games.

Verbeek's postphenomenology builds on many of the concepts of Ihde, and as such it is clearly a disciple's extension of the theory. What makes it particularly relevant for this chapter is the way Verbeek appropriates the concept of technological intentionality (objects are not neutral, they have "an inclination or trajectory that shapes the ways in which they are used" (Verbeek: 2005, p. 114)) with the practices of design. Verbeek traces, though not explores, a certain archeology of design, a process of tying together the experience created through an object with the actual practices and goals of designing that object. In this chapter I will appropriate postphenomenology in order to develop a certain approach to understanding how games create ethical experiences, and how those experiences can be tied to elements in the design. But, for that, I need to locate games in the context of phenomenology.

Computer games can "be understood phenomenologically, i.e., as belonging in different ways to our experience and use of technologies, as a human-technology relation, rather than abstractly conceiving of them as mere objects" (Ihde: 1993, p. 34). Playing is experiencing through the technology of computer games. Games are tools for play: "when somebody uses a tool or piece of equipment, a referential structure comes about in which the object produced, the material out of which it is made, the future user, and the environment in which it has a place are related to each other" (Verbeek: 2005, p. 79). In this article, I focus on what Verbeek calls the "material", the way the game is designed for interaction, and how that design predicts a type of ex-

perience. It is precisely this focus on the *material* what allows for a connection with design practices and experiences, and therefore postphenomenology is the most relevant take on the philosophy of technology for those of us interested in understanding how design creates experiences in users.

To understand this connection between design and experience, Verbeek's application of the postphenomenological method to industrial design practices (Verbeek: 2005), becomes a relevant framework. It is so because it emphasizes "that subject and object *constitute* each other. Not only are they intertwined, but they *co*shape one another" (Verbeek: 2005, p. 112). When playing a game, we become players, agents whose actions are conditioned by the procedural level of the game and the interpretation of the semiotic level. Even though classic economics would argue otherwise, recent relevant studies (Smith, 2006) show that players take choices for other reasons than optimizing results. There is a certain beauty in play, as well as a level of morality and ethical thinking. Playing is a co-creative experience. Players actively participate in the configuration of the ludic experience, based on the formal framework provided by the game, which is appropriated in the particular contexts of the play situation. The design of the game crafts the procedural and semiotic levels into processes that would optimally create an intended array of experiences. In other words: the design of a game could be used to encourage the creation of situations in which ethical gameplay, or ethical experiences, are a reasonable foreseen outcome.

The analysis of *computer games* in terms of their ethical design is possible because "designers engage in 'ethics by other means'; that is, their products codetermine the outcome of moral considerations, which in turn determine human action (...)" (Verbeek: 2005, p. 212). Any such analysis will make

use of postphenomenology's classifications of the relations between human beings and artifacts. These human-technology relations are the basis for the analysis of how games are ethical technologies, since "designed products play a mediating role in the moral considerations of people, and [...] the design process can involve moral choices with reference to this mediating roles (Verbeek: 2005, p. 217). My analysis will focus on the latter, mapping specific game design decisions to an ethical stance projected to the player experience. The goal with this move is to backtrack from the experience of a game a number of design elements that can be ascribed the role of primary generators (Darke: 1978) of a particular, situated type of ludic experience, an ethical gameplay experience. This experience is situated because it takes place in the context of a particular play session by a particular agent. These design elements will be described using postphenomenology's account for the different relations between humans and technologies. This move will disclose (Brey: 2000) the design of a game as a moral technology.

A postphenomenological analysis of the experience of the world through technology has to be understood in relational terms, that is, typifying the different modalities of mediation and experience created by technologies as experiences (Ihde: 1990, p. 25). These relations are classified in three major types: relations of mediation, in which "we are not directly related to the world but only are so via an artifact (...)" ; relations of alterity, "a relation not via an artifact to the world, but to an artifact itself (...)" ; and background relations, "in which technological artifacts shape our relation to reality but do so by remaining in the background" (Verbeek: 2005, p. 123). Games as technologies present different types of modalities of mediation, depending on the design's

intention. In these examples, game design uses its technological resources (mechanics, rules and semiotics) to create different types of experiences.

As much as (post)phenomenology is a valid analytic tool for understanding the ethical implications of games as designed technologies, it is not a theory powerful enough to overcome some controversial shortcomings. Phenomenology does not have, for instance, a strong model of the human agent as moral being. In order to have a more complete understanding of how game design models experiences we also need a better understanding of players as moral agents (Sicart: 2009). Phenomenology does not provide this insights. This implies too that it is not always possible to apply ethical theories, such as virtue ethics, to phenomenological approaches, since these theories require a moral agent. It is possible, though, to start the analysis from a certain ethical theory, and provide evidence through the phenomenological method. In this chapter, however, I have opted for a different model.

The initial analysis of any design structure in a game and its possible ethical implications has to be derived from a moral reading of the experience of the game. By applying a postphenomenological understanding of the relations of the player with the technological device, it is possible to establish the way in which this experience is created or, in other words, from which elements of the design the experience comes from. In other words: play is understood here as an experience that can be described, systematized and analyzed by means of the postphenomenological theory. This approach will give the research insights on what play may mean, and, more importantly, how a particular technology, in this case the computer game, focuses, constraints and affords the experience of play. Postphenomenology will not take the analysis further than the relation between a experience and the technology

that shapes it, but for an understanding of play as an ethical experience from a design perspective, this philosophical theory provides the arguments needed to access play as the starting point of the philosophical analysis of game design.

This initial analysis needs to be complemented with a high-level theory that incorporates these observations in an ontology and ethics that allow both for the understanding of the specificities of technology and its design and how they affect morality and ethical theory, and a solid moral anthropology that can be used to explain the morality of computer game players. This high-level theory is the Philosophy of Information.

Computer games and the Philosophy of Information

Computer games are complex technologies due to their dual procedural/semiotic nature. I have suggested that the postphenomenological method can help understand how computer games as designed artifacts create experiences with ethical content. However, this approach only explains how game design operates. Nevertheless, postphenomenology only provides an understanding of the relations between objects, design, and users. It allows us to formalize the intentions of design with plausible user experiences, yet it does not provide an ethical framework. Postphenomenology is a low-level approach to the basic question of ethics and game design. We understand how games operate, but we lack an overview on how games *are* ethical technologies.

Information Ethics will provide that overview, adopting the formal design vocabulary, and the result of the postphenomenological analysis, translating it into more general principles that account for the ontology of the game as system and the player as epistemic agent. In other words: through phenome-

nology we understand play and its relation with technology in particular instances; with Information Ethics we are able of formulating a comprehensive theoretical framework that situates the ethics of designed game systems in the larger context of ontological and ethical theories. Postphenomenology provides the description of the event, Information Ethics provides the general framework in which that event can be systematized and analyzed.

Information Ethics, as defined by Floridi, is based on the Philosophy of Information. In Floridi's terms, the Philosophy of Information is "the philosophical field concerned with (a) the critical investigation of the conceptual nature and basic principles of information, including its dynamics, utilisation, and sciences, and (b) the evaluation and application of information-theoretic and computational methodologies to philosophical problems" (Floridi: 2002, p. 137). This focus on information (Pierce: 1980; Wiener: 1961) provides the Philosophy of Information with "one of the most powerful conceptual vocabularies ever devised in philosophy (...) because we can rely on information concepts whenever a complete understanding of some series of events is unavailable or unnecessary for providing an explanation. In philosophy, this means that virtual any issue can be rephrased in informational terms" (Floridi: 2002, p. 139).

This informational ontology is explained through two fundamental concepts, and a method. The first concept is infosphere, understood as "the environment constituted by the totality of information entities - including all agents- processes, their properties and mutual relations" (Floridi: 2003, p. 44). Floridi argues that 'infosphere' can be used to describe the totality of Being from an informational perspective. As such, it is the cornerstone of his Philosophy of Information.

The infosphere should be understood as an environment of informational agents, patients, and their mutual relations. Infosphere delimits an ecosystem composed by informational agents, threaded by the methods with which they relate to each other - not only communicating, but also constituting each other. This co-constitution is similar to those relations between objects and humans described by postphenomenology. For example, a server is an infosphere, but also *Liberty City* in *GTA IV*, as well as New York City understood as the model from which *Liberty City* is created. All of those are infospheres. However, the Philosophy of Information will argue that the infosphere is the whole of existence, since the being is information. What these other infosphere are could be understood as mere instantiations of particular informational environments where it is not the totality of being which is being invoked, but only a partiality of it. In other words, a game is a limited, enclosed infosphere, within the larger infosphere of the world. The important element of this affirmation, for a philosophy of design, is that it allows an analysis of the design from an informational perspective, looking at the elements that connect both infospheres: what is kept, what is left out, and how agents relate within both ontological contexts.

The second key concept is informational agency, extended beyond anthropo-and-bio-centric approaches, and including any type of relevant agent in the infosphere, defining agent as "an *interactive, autonomous and adaptable transition system*" (Floridi: 2005, p. 16). This definition of agency allows for the inclusion of artificial agents in the ontological domain, including software like virus or adaptive software systems (Floridi and Sanders: 2004a).

Both the infosphere concept and the notion of informational agency can be used to overcome the analytical problems of a (post)phenomenological

reading of computer games. By having a clear agency model, and a way of systematizing design analysis through the notion of infosphere, it is possible to qualify the research on the computer game as designed object within the philosophical domain of technology studies, and particularly within the Philosophy of Information. However, in order to validate the interpretation of the (post)phenomenological results of a certain analysis of a game experience, a method is required. The Philosophy of Information provides such a method.

The method of the Philosophy of Information, the Method of Abstraction, is based on Object-Oriented Programming concepts. To understand the ontology of information, agents and patients should be treated as informational objects with methods, properties, and interactions (Floridi and Sanders: 2004b). In terms of analysis, the infosphere has to be approached from a certain Level of Abstraction. This term, originally defined by computer science, is understood as a finite but non-empty set of observables. No order is assigned to the observables, which are expected to be the building blocks in a theory characterized by their very definitionh (Floridi and Sanders: 2004b, p. 10). In more approachable terms, the postphenomenological analysis operates within a Level of Abstraction. A postphenomenological analysis consists on selecting some elements form the game, both structural (formal) and agentive, and their relations. This selection provides an initial insight into how the game operates as an ethical technology. It is then that the results from the postphenomenological analysis should be modeled using Information Ethics methods, so it is possible to describe their informational being and configuration.

The most relevant outcome of this informational approach has been the formalization of an Information Ethics, an *"ontocentric, patient-oriented, eco-*

logical macroethics" (Floridi: 2005, p. 10). Since it is based on the informational ontology of the Philosophy of Information, "the ethical discourse now comes to concern information as such, that is not just all persons, their cultivation, well-being and social interactions, not just animals, plants and their proper natural life, but also anything that exists, from paintings and books to stars and stones; anything that may or will exist, like future generations; and anything that was but is no more, like our ancestors" (Floridi: 1999, p. 43). Also, Information Ethics takes a clear constructivist approach: "ethics is not only a question of dealing morally well with a given world. It is also a question of constructing the world, improving its nature and shaping its development in the right way" (Floridi and Sanders: 2005, p. 2).

Information Ethics is a very abstract and somewhat verbose ethical theory. Its main strengths lie on the strong methodology that allows for the ethical scrutiny of agents, technologies and patients in the context of information systems. However, it can be complicated to understand how this method can be applied. Let's illustrate it with an example: a virtual world game like *World of Warcraft* is a highly complex human-technology construct. The game itself can be understood as an infosphere, and any approach to analysis will require to delimit a gradient of abstractions. For instance, studying player vs. player games would set a gradient of abstraction within the infosphere of the game. Within that gradient, in order to answer a particular question, the information ethicist needs to delimit a level of abstraction. For instance, analyzing the honor system would require to set a Level of Abstraction in which players are a part of the analysis, while artificial agents are not. That Level of Abstraction can also include technical elements: studying player vs. player games played over the internet can benefit from incorporating some material analy-

sis to the reflection, for instance the server-client structure or the ways in which designers cope with the inevitable latency between actions. So, the particular Level of Abstraction in which the honor system can be analyzed from a philosophical perspective consists of human agents, the network code that facilitates the exchange of information, and the designed game mechanics that mediate the interaction between players in the particular context of a player vs. player battle. In sum, a level of abstraction should be understood as the particular elements of a larger, complex construct that have to be taken into consideration to analyze a particular question - and it's theoretical power comes from the capacity for including, in the same level of abstraction, human and non-human agents, as well as technical elements.

Summarizing, the relevance of Information Ethics for the purpose of this article stems from its object oriented ontology, and its constructivist nature. Since the basic methodology and terminology are based in Object Oriented Programming, it can be directly applied to an analysis of design as rules, mechanics and systems designed to create specific experiences in agents. It is possible, then, to adapt the postphenomenological analysis to an Information Ethics framework.

Information Ethics offers a strong model of agency, one that not only includes software agents as morally relevant (an approach I will not take in this article), but also defines the ethical duties of these agents. Using the concept of *homo poieticus*, understood as the agent that "concentrates not merely on the final result, but on the dynamic, on-going process through which the result is achieved" (Floridi and Sanders: 2005, p. 18), I will define the role of players as agents that experience a design intended to create a number of

ethical experiences. Players are agents that have the responsibility of engaging ethically in their experience of the game as infosphere.

From an Information Ethics perspective, then, two elements determine the nature of computer games as ethical technologies: (a) the design of the system, understood as the properties and methods for agent interaction within and with the game as infosphere; and (b) the possibilities for players' creative stewardship to be applied in the context of the game experience, as determined by the methods available to agents and how these are interpreted. Information Ethics focuses on the design of the infosphere and the afforded capacities of the player as epistemic agent.

The application of Information Ethics to the analysis of game design defines some aspects of games as ethical technologies: computer games are informational systems where agents interact by means of a procedural system which is communicated to them (or embedded) in a semiotic system. Agents interact by means of creating Levels of Abstraction for their experience, usually encapsulating the procedural in the semiotic. Games as ethical technologies can use this process to develop interesting ethical experiences. Conventional game design and software usability theories claim that it is required for players/users to have as much unambiguous information about the system's operational procedures as possible. However, in games that would translate to the creation of semiotic elements that translate directly the ethical evaluation of a situation that is hardcoded in the procedural level of the game. If a design does so, it is effectively reducing the role of the player as moral agent, since the player will not need to use her own moral skills to navigate the ethical dilemma. Any decision regarding the potential ethical outcome of a particular design decision should always have in mind that players are moral

agents, and that this agency needs to be respected by the very design of the system, but also of the semiotic elements used to translate that system into a coherent set of metaphors that players can understand in order to interact with the game in an autonomous way.

Information Ethics also provides a framework for the understanding of players as ethical agents. Game design is the art of translating the skills and interests of players into original, accessible challenges. The concepts of epistemic agent and creative stewardship suggest how to design ethical experiences with computer games. The *homo poieticus* described by Floridi and Sanders is a powerful anthropology that overcomes Huizinga's *homo ludens*, and places ethical responsibility and capacities as part of the players skills.

Finally, Information Ethics describes those instances in which game design can create unethical experiences. When a computer game is designed with rules that evaluate values, and that evaluation is not directly communicated to players, then the game design is unethical. A computer game must always inform players of their state according to those rules. Otherwise, players are partially deprived of their creative stewardship, of what makes them ethical players.

Computer games as ethical technologies should be defined according to how the game system, understood as a procedural and semiotic informational object, relates and engages agents in value-based gameplay. These values can be afforded by players, but can also be an outcome of the different configurations of rules and methods in the game world. Game systems can, and ought to incorporate in their design the idea of an ethical epistemic agent that will interpret the actions, both in the procedural and in the semiotic Level

of Abstraction, as ethical experiences. Playing is engaging in a creative experiential process with a system that can be designed to challenge ethical skills.

Playing Values: *Bioshock* and *Grand Theft Auto IV*

Given the design vocabulary and philosophical framework I have described, I will now analyze two games, focusing on how their designs create ethical experiences. I focus on specific design decisions that illustrate why games can be described as ethical technologies. *Bioshock* illustrates the relation between game design and player ethical agency. *Grand Theft Auto IV* exemplifies how players as reflective, epistemic agents, can be challenged by means of design.

In *Bioshock*, a First Person Shooter game, players control a character named 'Jack', who survived a plane crash in the middle of the ocean only to find the entry to a strange underwater city, Rapture. It is fair to say that Rapture and its denizens are the true protagonists of *Bioshock*: founded by the objectivist engineer Andrew Ryan, Rapture is a marvel of technology and free market, the promised land for those chosen by Ryan as examples of humanity's finest.

Utopias don't last long: soon social differences and clashes began. A powerful network of smugglers commanded by Frank Fontaine, challenged Ryan until he ordered the death of Fontaine. Fontaine's death is coincidental with the rise of Atlas, a mysterious character who commanded the lower classes to a war against Ryan and his elite. Rapture is torn by a civil war and misguided genetic experiments that turned its population into psychopaths. This is the "dream" Jack encounters.

Atlas soon contacts Jack, encouraging him to destroy Ryan's defenses, and kill him. While the player explores Rapture following Atlas' instructions,

more and more information about the actual reasons behind this conflict are exposed: there are no innocents, but maybe Ryan does not deserve death. Yet, when confronted with Ryan, the plot unfolds: Jack is a puppet controlled by Atlas/Fontaine. Jack is Fontaine's secret weapon: he implanted a behavioral conditioning pattern in Jack that makes him follow any order Atlas gives. Throughout the game, Jack has been controlled by Fontaine/Atlas. In a dramatic sequence, the player loses direct control over the character and we are forced to see how Jack kills Ryan. This plot twist exemplifies the use of game design to create ethical experiences.

The other element has to do with the alleged ethical gameplay design of the game. Genetic modification in Rapture is based on a type of stem cells called ADAM. These cells are harvested by little girls, who are hosts of a type of slug that enables them to recollect of ADAM from the dead at the expense of becoming zombies. Since these cells are a valuable resource in the war-driven rapture, the Little Sisters are escorted by Big Daddies, huge biomechanical beings, once human, now beasts that will protect the Little Sisters.

Soon after accessing Rapture, Jack begins using ADAM. But ADAM is only available from Little Sisters. Jack will be encouraged to kill the Big Daddy, and face a moral decision: will he let the Little Sister live, extract the slug, and free her, or will he kill her and harvest the ADAM? If he does the former, a character that protects the Little Sisters will eventually reward him with ADAM. Choosing to kill only one Little Sister will lead to a different ending sequence to the game.

Let's analyze these two gameplay situations from a design perspective. In the case of the Little Sisters ethical dilemma, players are confronted with a direct choice. This choice is presented with an onscreen message: the button X

means harvesting (the ADAM, killing the Little Sister), while pressing Y will rescue her. In formal terms, the player has two different mechanics, harvest and rescue. These two methods send different messages to the rule system: if the player harvests, then she will be rewarded with x amount of ADAM, and the ending sequence will be tragic. If the player rescues, then she will not receive any ADAM. But, if the player has rescued some Little Sisters on a row, then some ADAM will be deployed in a nearby location. Additionally, a rule evaluates the number of Little Sisters rescued: if the player does not harvest any Little Sister, then the end sequence will be positive.

From a purely formal perspective, the Little Sisters ethical dilemma consists of two basic methods that have impact on player agency. From a semiotic point of view, players are faced with harmless little girls who are scared of the player. Yet, the narrative of the game has portrayed Little Sisters as zombified hosts for a slug. Besides, ADAM is necessary to progress and survive in Rapture. The player will take decisions based both on her understanding of the procedural elements of the game, and on her interpretation of the semiotic level.

In the case of the mind control sequence, players are devoid of any direct control over their actions. From a formal perspective, the player does not have any methods available. From a semiotic perspective, players will realize how all their actions have been guided by the same mind control. The semiotic level is suggesting players to revisit their previous interaction with the game in light of their current disempowerment. The mind control sequence operates in hindsight, contextualizing the semiotics of the otherwise rather conventional procedural level of the game.

Grand Theft Auto IV has succumbed too to the inclusion of ethical decision making in the game design: one of the earliest missions faces the player with a life or death choice. The outcome of that mission will influence the evolution of the narrative. This design element is similar to that of the Little Sisters in *Bioshock*. *Grand Theft Auto IV* is ethically interesting for a different design choice, one that brings to scene the meaning of actions and characters in the game world.

Niko Bellic, a serbian expatriate, army veteran and seasoned criminal, arrives to Liberty City in search of the American Dream. Niko wants to leave his past behind, and enjoy the promises of hard earned success that his cousin, a long time US resident, has narrated to him. As players, we soon gain control over Niko. Shortly after, we discover that there is no American Dream, and that our trip to Liberty City will be the return of Niko to the underworld.

Grand Theft Auto IV pays special attention to both character design and game world design. Niko is an ambiguous character. He traveled to Liberty City to begin anew, but also with the faint hope of finding someone for revenge. Niko does not like his sudden involvement with the criminal life of Liberty City: he may be losing his soul where he expects to find it.

Grand Theft Auto IV creates a duality between gameplay progression and character progression. When playing the game, there are two gameplay modalities: following the story line, completing missions that open up new branches of the narrative; or freely exploring the game world. From a design perspective, players use the same mechanics on both modalities, and only the semiotic level that varies. In more formal terms: Liberty City is a game world with rules; within that game world it is possible to engage in different activities, following different mechanics, that have specific rules.

What makes *Grand Theft Auto IV* interesting is the tension between Niko's character and the actions the gameplay forces on players. Niko dislikes the man he is becoming in Liberty City. But as players, we have to guide him in the downward spiral of crime if we want to make the narrative progress. *Grand Theft Auto IV* places the player in the role of driving a character, against his wishes, to the darkest areas of his soul.

If we want to play the game and enjoy the narrative and the game world, we have to fulfill Niko's destiny by character, and commit crimes, offenses not only against society, but also against himself.

Bioshock and *Grand Theft Auto IV* provide good examples for understanding computer games as ethical technologies. Games are systems designed for player interaction, with the intention of creating a ludic experience. To understand the implications of games as ethical technologies, and to analyze the ways these design systems operate, we need to understand how games mediate values in their design. In the next section, the first step of this process will be conducted by applying postphenomenology to the analysis of *Bioshock* and *Grand Theft Auto IV*.

Ethics by Ludic Means

In the cases I have presented in the previous section, games as technologies present different types of modalities of mediation, depending on the design's intention. In these examples, game design uses its technological resources (mechanics, rules and semiotics) to create different types of experiences.

Let's start with the Little Sisters from *Bioshock*. From a formal perspective, we have a choice between two basic mechanics, harvesting and rescuing. This choice is then evaluated by the game rules, producing different out-

comes depending on the player's choices. The game is designed to interpret the values of the player, and react to them: rules calculate the values of the players, and react accordingly, modifying the semiotic level of the game (in this case, affecting the narrative). In postphenomenological terms, this is a hermeneutic relation, in which the artifact "provides a *representation* of the world, which requires interpretation in order to import something to us about it (...) the artifact must be 'read'" (Verbeek: 2005, p. 126). The mechanics are evaluated, i.e. interpreted by the game rules, modifying the game world. Hermeneutic relations are schematized as follows (*ibid*):

I → (technology-world)

Or, in game design terms:

Player → (methods/rules-game world)

This relation implies a dominance of the procedural over the configuration of the semiotic: rules determine how methods change the meaning of the game world. Hermeneutic relations are popular in the design of ethical dilemmas: they can be found in games like *Knights of the Old Republic* (BioWare: 2003) or *Fable* (Lionhead Studios: 2004). This type of ethical design is characterized by affording mechanics to players that will change the configuration of the game world. From a design perspective, the choice of a mechanic is evaluated by a set of rules, which modify the state of the game world.

A different relation is established in *Bioshock's* mind-control sequence. Instead of affording mechanics for players to take choices, this sequence deprives players of direct agency. The game forces players to spectate while the system, using the same mechanics available to the player, dramatically interacts with the game world. In this sequence, the game as artifact controls the

player agency to interact with the world, in an example of an embodiment relation (Verbeek: 2005, p. 125).

My interpretation of the embodiment relation, though, is different from classic postphenomenology, where technology expanded agency. I look at embodiment relations from an agency perspective, regardless of the outcome of that relation. That is, I understand that an embodiment relation unifies agency and artifact in the interaction with the world. That unification does not need to expand agency. Embodiment relations are schematized as follows:

(I - technology) → world

Or, in game design terms,

(player - game system/game character design) → game world

Many games use this type of relation: for instance, cutscenes or cinematic sequences with a plotted set of events coherent with the previous use of game mechanics, in which players do not have the possibility of modifying the predetermined outcome of that sequence. Another, more subtle use of this embodiment relation, forces players into empathizing with the values of a character they are in disagreement with. This is a technique present in *Grand Theft Auto IV* as well.

Niko Bellic, the main character in *Grand Theft Auto IV*, is introduced as a tormented soul trying to avoid his own destiny. By using the conventions of the embodiment relation, the game presents Niko as a character with values, wisdom, and personality. In many computer games, the connection between events that use embodiment relations, and the rest of the game experience, are often coherent: the character is reinforced by game mechanics (what we

do) and game rules (being rewarded for acting as we are supposed to do). This match constitutes the fabric of interactive heroism in computer games.

Grand Theft Auto IV modifies this match. When players interact with the game, they are forced to do what Niko, the character, despises. There is a tension between the semiotic and the procedural: actions contradict the volition of the artificial agent, and players are cued to reflect upon these processes. The tension is created by the design of the mechanics afforded to the player and the rules that evaluate them.

Niko regrets violence and crime, yet the actions we have to take in the game, if we want to progress, are criminal. Most of the mechanics concern crime, and there are strict rules that remind us that these are crimes: for example, carjacking is a mechanic that, if invoked close to a police car, will trigger the system to send police agents to arrest us. Postphenomenology defines these type of relations as alterity relations, in which “technology (...) appears as quasi-other” (Verbeek: 2005, p. 127), and schematizes them as follows (*ibid*):

I → technology (-world)

Which translates in game design terms to:

Player → game mechanics/rules (-game world)

How does this relation operate in *Grand Theft Auto IV*, in connection with the embodiment relation? In alterity relations, artifacts abstract the world, and users experience directly the technology. In my game design interpretation, alterity relations imply the abstraction of the semiotic level so players experience the procedural level as dominant. In *Grand Theft Auto IV*, the semiotic level states that Niko dislikes the man he was, his past crimes. But when playing the game, that level is abstracted in favor of the procedural: missions

have to be accomplished by interacting with the game system using the afforded mechanics. A relevant part of the semiotics of the game world is abstracted to create a tension between action and reflection. In other words, the cutscenes suggest an embodiment relation, but the actual gameplay primes alterity relations.

Niko is a man whose character becomes his destiny. This prophecy is fulfilled, in terms of game design, by juxtaposing two different postphenomenological relations. The embodiment relation prioritizes the semiotic level of the game, while the alterity relation focuses on the procedures to play the game. It will be the player who has to reflect about the ethics of actions in the game world. Niko, as a Dionysian character, is a tragic hero because his will is beyond his control. Only now it is we, players, the controlling divinities.

Postphenomenology is a valid approach for identifying how specific design decisions create particular experiential relations with players. However, once these relations are identified, a better ethical theory is needed in order to understand how these design decisions project morality-based experiences in the users. Information Ethics will provide such an explanation.

Games are a Matter of Information (Ethics)

When applying Information Ethics to the postphenomenological description of game design, we can provide some notions on the ethics of game design and, by extension, of games as ethical technologies.

In the case of *Grand Theft Auto IV*, players are placed in a tension between the game world and their agency. When playing, we often resolve to some notion of Level of Abstraction in order to make sense of the gameplay experience (Juul: 2007). *Grand Theft Auto IV* uses this technique to construct a game system in which the player's goals are different from those stated by

the main character, when that character retains agency. As spectators of *Grand Theft Auto IV*, players in a Level of Abstraction devoid of any procedural agency (non-interactive cutscenes), that nevertheless modifies their perception of the semiotic level, their understanding of the game world and its characters. When players get to know Niko Bellic, the dominant Level of Abstraction is semiotic. But when playing, that is, when players are granted access to the procedural system, they are operating in a Level of Abstraction in which they can interact with the world. This interaction, as afforded by the game rules and mechanics, establishes a contradiction with our previous experience of Niko. The system is designed to juxtapose the semiotic and the procedural layers: Niko does not want violence, but as players, our only methods for the story to progress are violence and crime. In this tension, *Grand Theft Auto IV* is constructed as an ethical game design.

In more general terms, a game can create an ethical experience by modifying the Levels of Abstraction through which the player engages in gameplay. The procedural level takes care of rules and mechanics, the meaning of which is provided by the semiotic level. Oftentimes, both are deeply and logically interconnected: the semiotics show the player how to play, and what the state of the game is. But if the design creates an ethical tension between them, then the game will configure itself as a moral experience, where the player as *homo poieticus* will be challenged to complete the meaning of the game and interact with it.

Bioshock's mental control sequence appeals to the player as epistemic agent not by means of the methods for agency in the game world, but actually by depriving the player of any agency, and forcing her to reflect about the gameplay sequence thus far. When players are deprived of control over their

avatar in the game, they are temporarily forced out of their creative stewardship: they cannot influence their presence in the game world by means of mechanics. Yet, players are forced to reflect on the meaning of their actions by the narrative of the game.

In any other type of software system, depriving agents of their capacities within the system can create ethical harm, according to Information Ethics. But in computer games, this technique can be a trope. Players are agents capable of relating to the meaning and value of their actions. In *Bioshock*, this capacity is put to test when we are first deprived of our agency, of what makes us players, only to be told that all of our past actions were a lie. In fact, all of our actions were contrary to the values inspired by the semiotic level. This trope shows how games, by means of design, involve players in the creation of an experience with ethical meaning.

Nevertheless, Information Ethics also shows that there are risks in the inclusion of ethics in the design of a game infosphere. That is the case of the Little Sisters dilemmas in *Bioshock*. In the previous examples, the procedural and semiotic layers were meant to interact with an epistemic agent. Ultimately, the ethical interpretation of the game experience lies in that agent, the player. But in the case of the Little Sisters, it is the system that carries the ethical reasoning, effectively turning the game design into a system for evaluating the values of the player. If the player consistently chooses the “rescue” method, then the system will output a “positive” ending, while choosing the “harvest” mechanic will output the opposite ending. The game has rules for ethical values.

Returning to postphenomenological terminology, this type of relation was defined as a hermeneutic relation: the game system is designed to interpret

the players' values and change states accordingly. These types of designs, from an Information Ethics perspective, could be defined as unethical. The player is deprived of her epistemic capacities, which are incorporated in the game system. It is not the agent's ethical capacities what measures the values of the game experience, but a set of properties designed to evaluate the messages sent by the players in order to change the game state. This change is triggered by the values the player wants to incorporate to her experience, but the evaluation is placed in the rules, which determine the values of that choice. In this way, players are deprived of their moral agency, understood as the capacity to develop a moral sense of what is right and wrong. If players cannot become and act as ethical agents, then this design choice ought to be defined as an unethical design.

Hermeneutical relations are not necessarily unethical. As long as it is the agent who has to apply ethical thinking to interpret the game experience, then choices can be designed as hermeneutic relations. If the procedural level of the game is going to evaluate the players' actions based on predetermined understanding of values, then the semiotic level should communicate to players their ethical state according to those properties. In *Bioshock*, the game world does not change depending on the choices of the player, until the end of the game. Like K in Kafka's *The Process*, we have been judged and convicted, yet we don't know what our crime actually is.

Information Ethics, thanks to its formalized method and conceptual architecture, allows for the understanding of different design structures as morally relevant, provided the experiential analysis of postphenomenology. Starting from a clear description of how games attempt to create particular types of experiences, Information Ethics can be applied to those experiences in order

to make an ethical analysis of the design elements that constitute them, while respecting both the moral agency of players, and the nature of digital games as informational systems.

Conclusions

In this article I have introduced a philosophical approach to digital games understood as ethical technologies. I have analyzed several popular, commercial games from a dual perspective: postphenomenology offered a low-level approach to the actual design of a game as experienced by an (ideal) player; while Information Ethics interpreted these analysis from a high-level perspective.

With this article, I have:

- Provided a framework for analyzing game design from both an experiential and an ethical perspective, allowing for the reflection on particular design/technological decisions as origins of potential player experiences.
- Argued for the application of two distinct philosophical theories to the study of game design.
- Justified why computer games could be considered ethical technologies, therefore opening the possibility of studying the design of games from a moral theory angle.

This article is an introduction to the study of the ethics of game design. This work could ideally allow for a better understanding of the expressive potential of computer games. In this article, I have barely introduced this perspective. Yet, there are sufficient arguments to consider digital games capable of

creating complex, engaging, challenging ethical experiences. It is now our responsibility to live up to this promise and dare to play ethically.

References - Literature

Aarseth, Espen. "Doors and Perception: Fiction Vs. Simulation in Games." Paper presented at the Digital Arts and Culture, IT University of Copenhagen, 2005.

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

Abelson, Harold, and Gerald Jay Sussman with Julie Susman (1985), *Structure and Interpretation of Computer Programs*, Cambridge, Massachusetts: The MIT Press. Available online at <http://mitpress.mit.edu/sicp/full-text/book/book.html> (accessed: 26/3/2008)

Adams, Ernest and Andrew Rollings. *Fundamentals of Game Design*, New Jersey: Pearson-Prentice Hall, 2007

Anderson, Craig A. and Brad J. Bushman. "Effects of Violent Video Games on Aggressive Behavior, Aggressive Cognition, Aggressive Affect, Psychological Arousal, and Prosocial Behavior: A Meta-Analytic Review of the Scientific Literature." *Psychological Science* 12, no. 5 (2001): 353-59.

Anderson, Craig A. and Karen E. Dill "Video Games and Aggressive Thoughts, Feelings and Behavior in the Laboratory and in Life." *Journal of Personality and Social Psychology* 78, no. 4 (2000): 772-90.

Audi, Robert (ed.). *The Cambridge Dictionary of Philosophy. Second Edition*. Cambridge: University of Cambridge Press, 1999.

Bateman, Chris, and Richard Boon. *XXI Century Game Design*, Hingham, Massachusetts: Charles River Media, 2006

Björk, Steffan, and Jussi Holopainen. *Patterns in Game Design*, Hingham, Massachusetts: Charles River Media, 2005

Bogost, Ian. *Persuasive Games*. Cambridge, Mass.: The MIT Press, 2007.

Bogost, Ian. *Unit Operations. An Approach to Videogame Criticism*. Cambridge, Mass.: The MIT Press, 2006.

Brey, Philip. "Disclosive Computer Ethics." *Computers and Society* 30, no. 4 (2000b): 10 - 16.

Brey, Philip. "Method in Computer Ethics: Towards a Multi-Level Interdisciplinary Approach." *Ethics and Information Technology* 2:3, no. 1-5 (2000a).

Bushman, Brad J., and L. Rowell Huesman. "Effects of Televised Violence on Aggression." In *Handbook of Children and the Media*, edited by Dorothy G. Singer and Jerome L. Singer. Newbury park, CA: Sage, 2000.

Caillois, Roger. *Man, Play and Games*. Urbana: University of Illinois Press, 2001

Church, Doug. "Formal Abstract Design Tools." In *The Game Design Reader. A Rules of Play Anthology*, edited by Katie Salen & Eric Zimmerman, pp. 366 - 80. Cambridge, Mass.: The MIT Press, 2006.

Consalvo, Mia. "Rule Sets, Cheating, and Magic Circles: Studying Games and Ethics." *International Review of Information Ethics* 4 (2005): 7-12.

Cook, Daniel, "What are game mechanics?", blog post at lostgarden.com, available online at <http://lostgarden.com/2006/10/what-are-game-mechanics.html>, 2006(accessed: 26/3/2008)

Cross, Nigel. *Designerly Ways of Knowing*. Berlin: Birkhäuser Verlag, 2007.

DeKoven, Bernie. *The Well-Played Game. A Playful Path to Wholeness*. San Jose: Writer's Club Press, 2002.

Endresen, Inger M. and Dan Olweus. "Participation in Power Sports and Antisocial Involvement in Preadolescent and Adolescent Boys." *Journal of Child Psychology and Psychiatry* 46, no. 5 (2005): 468-78.

Feezell, Randolph. *Sport, Play, and Ethical Reflection*. Urbana and Chicago: University of Illinois Press, 2004.

Floridi, Luciano, and Jeff Sanders, "Levellism and the Method of Abstraction", *Information Ethics Group Research Report*. Available at http://web2.comlab.ox.ac.uk/oucl/research/areas/ieg/research_reports/ieg_r-r221104.pdf, 2004 (accessed: 26/3/2008)

Floridi, Luciano, and Jeff W. Sanders. "Internet Ethics: The Constructionist Values of Homo poieticus." In *The Impact of the Internet in Our Moral Lives*, edited by R. Cavalier. New York: SUNY, 2005.

Floridi, Luciano. "Information Ethics: On the Philosophical Foundation of Computer Ethics." *Ethics and Information Technology* 1 (1999a): 37-56.

Floridi, Luciano. "On the Intrinsic Value of Information Objects and the Infosphere." *Ethics and Information Technology* 4, no. 4 (2003a): 287-304.

Floridi, Luciano. "The Method of Abstraction." *Yearbook of the Artificial. Nature, Culture and Technology*, no. II (2004b): 177-220.

Floridi, Luciano. "Two Approaches to the Philosophy of Information." *Minds and Machines* 13 (2003b): 459-69.

Frasca, Gonzalo. "Videogames of the Oppressed: Critical Thinking, Education, Tolerance, and Other Trivial Issues." In *First Person. New Media as Story, Performance, and Game*, edited by Noah Wardrip-Fruin and Pat Harrigan, 85 - 94. Cambridge, Mass.: The MIT Press, 2004.

Funk, Jeanne. B., Heidi Bechtoldt Baldacci, Tracie Pasold, Jennifer Baumgardner. "Violence Exposure in Real-Life, Video Games, Television, Movies, and the Internet: Is There Desensitization?" *Journal of Adolescence* 27 (2004): 23-49.

Gibson, James J. "The Theory of Affordances." In *Perceiving, Acting, and Knowing*, edited by R.E. Shaw & J. Bransford. Hillsdale, NJ: Lawrence Erlbaum Associates, 1977.

Greco, Gian Maria, Gianluca Paronitti, Matteo Turilli and Luciano Floridi. "The Philosophy of Information - A Methodological Point of View. In Klaus-Dieter Althoff, Andreas Dengel, Ralph Bergmann, Markus Nick, and Thomas Roth-Berghofer (Eds.). *WM2005: Professional Knowledge Management, Experiences and Visions* (DFKI GmbH, Kaiserslautern 2005), 563-570. Available online at <http://www.philosophyofinformation.net/pdf/tpoiampov.pdf>, 2005.

Heidegger, Martin *The Question Concerning Technology and Other Essays*, translated by William Lovitt, London: Harper Collins (1977)

Heidegger, Martin. *The Basic Problems of Phenomenology*. Bloomington and Indianapolis: Indiana University Press, 1988

Honderich, Ted. *The Oxford Companion to Philosophy*. Oxford: Oxford University Press, 1995.

Horkheimer, Max and Theodor Adorno. *Dialectic of Enlightenment*. New York: Verso: 1997.

Hunicke, Robin, Marc LeBlanc, Robert Zubek. *MDA: A Formal Approach to Game Design and Game Research*. Available from www.cs.northWestern.edu/~hunicke/pubs/MDA.pdf, 2004

Ihde, Don. *Postphenomenology. Essays in the Postmodern Context*. Evanston, Illinois: NorthWestern University Press, 1993.

Ihde, Don. *Technology and the Lifeworld. From Garden to Earth*. Bloomington and Indianapolis: Indiana University Press, 1990.

Järvinen, Aki, *Games without Frontiers: Theories and Methods for Game Studies and Design*, Tampere: Tampere University Press. Available at <http://acta.uta.fi/english/teos.phtml?11046>, 2008 (accessed: 26/3/2008)

Juul, Jesper, *Half Real. Videogames between Real Rules and Fictional Worlds*, Cambridge, Mass.: The MIT Press, 2005

Juul, Jesper. "A Certain Level of Abstraction". Conference paper at the third Digital Games Research Association Conference, Tokyo, Japan. Available at <http://www.jesperjuul.net/text/acertainlevel/>, 2007

Latour, Bruno. "Where Are the Missing Masses? - the Sociology of a Few Mundane Artifacts." In *Shaping Technology/Building Society*, edited by W.E. Bijker and J. Law, 225-58. Cambridge: MIT Press, 1992.

McCormick, Matt. "Is It Wrong to Play Violent Video Games?" *Ethics and Information Technology* 3 (2001): 277-87.

Merleau-Ponty, Maurice. *Phenomenology of Perception*. London: Routledge, 2002.

Murray, Janet. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge, Mass.: The MIT Press, 1998.

Norman, Donald. *The Design of Everyday Things*. Basic Books. New York: Perseus, 2002.

Penny, Simon. "Representation, Enaction, and the Ethics of Simulation." In *First Person. New Media as Story, Performance, and Game*. edited by Noah Wardrip-Fruin and Pat Harrigan, 73-84. Cambridge, Mass.: The MIT Press, 2004.

Reynolds, Ren. "Playing a "Good" Game: A Philosophical Approach to Understanding the Morality of Games." Available from <http://www.igda.org/articles/rreynoldsethics.php>, 2002

Rollings, Andrew and Dave Morris, *Game Architecture and Design: A New Edition*, Indianapolis, Indiana: New Riders Press, 2004

Rollings, Andrew and Ernst Adams. *On Game Design*. Indianapolis: New Riders, 2003.

Rouse III, Richard, *Game Design Theory and Practice*, Plano, Texas: Wordware Publishing Inc., 2005

Salen, Katie, and Eric Zimmerman. *Rules of Play - Game Design Fundamentals*. Cambridge, Mass.: The MIT Press, 2003.

Simon, Herbert A. *The Sciences of the Artificial*. Cambridge: The MIT Press, 1981.

Suits, Bernard. *The Grasshopper. Games, Life and Utopia*, Toronto: University of Toronto Press, 1978.

Takahashi, Dean. "Ethics of Game Design." *Game Developer's Magazine*, December 2004.

Verbeek, Peter-Paul. *What Things Do*. University Park, Penn.: The Pennsylvania State University Press, 2005.

Weisfeld, Matt (2000), *The Object Oriented Thought Process*, Indianapolis, Indiana: Sams Publishing

Wiener, Norbert. *Cybernetics: Or Control and Communication in the Animal and the Machine*. Cambridge; Mass.: The M.I.T. Press, 1965.

Winner, Langdon. "Do Artifacts Have Politics?" In *The Whale and the Reactor: A Search for Limits in an Age of High Technology*, 13-39. Chicago: University of Chicago Press, 1986.

References - Games

2K Boston/2K Australia. *Bioshock*. 2K Games. 2007

Bioware. *Knights of the Old Republic*. LucasArts. 2003

Lionhead Studios. *Fable*. Microsoft Game Studios. 2004

Newsgaming.com. *September 12th*. Newsgaming.com. 2003

Rockstar North. *Grand Theft Auto IV*. Take-Two Interactive. 2008

Rockstar North, *Manhunt*. Rockstar Games. 2003