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The Fictional Incompleteness of Digital Gameworlds

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Transactions of the Digital Games Research Association
November 2022, Vol. 6 No 1, pp. 61-94. ISSN 2328-9422

La Incompletitud Ficcional de los Mundos de Juego Digitales

ABSTRACT

This paper presents and analyzes forms of fictional incompleteness that are commonly encountered as part of the experience of playing digital games. While some of these forms are recognized to be compatible with the incompleteness that characterizes non-

interactive fictions (such as novels, paintings, and films), some of the ways in which fictional worlds are only partially presented to their users are unique to computer-mediated, interactive fictions. In this regard, this paper specifically focuses on the inevitable incompleteness of in-game affordances, the unique ways in which players experience the boundaries of gameworlds, and how incompleteness in digital games becomes apparent in the encounters with repeated instances of the same game assets.

Keywords

incompleteness, fiction, representation, interactive fiction, simulation, poverty, indeterminacy, interactivity, affordances, fictional world

REPRESENTATION AND INCOMPLETENESS

Fictional works such as novels, movies, and plays are representational media: they represent fictional worlds, characters, and events. Following a Waltonian definition of fiction, these works are 'props', or objects that prescribe their audience to imagine certain states of affairs (Walton 1990, p. 37-38). Kafka's story *Metamorphosis,* for example, invites us to imagine a man named Gregor turning into a big insect (1972), the *Harry Potter* books mandate us to imagine a world where magic exists and is taught in boarding schools (Rowling 1997), and René Magritte's painting "The Son of Man" (Figure 1) prescribes its viewers to imagine a man with a floating apple in front of his face. In the context of a work, such prescriptions to imagine something bring about fictional truths (cf. Walton 1990, 39). It is, for example, fictionally true in the world represented in Kafka's story that Gregor Samsa has transformed into vermin, because this is what readers are prescribed to imagine based on the text Kafka wrote.

The focus of this paper is the fact that works of fiction are always incomplete, in the sense that they do not offer all the information about the world that they prescribe their audience to imagine (cf. Pavel 1986, pp. 105-113; Walton 1990, p. 66; Wesp 2014; Wildman & Woodward 2018; Williams & Woodward 2021). There are, in other words, always informational and conceptual gaps in the represented fictional world. Moreover, these gaps cannot be 'filled in' by the fiction appreciator with any authority, as the information is simply lacking [1]. As Walton describes, for example, Kafka's work *Metamorphosis* is incomplete with regard to the occupation of the main character's great-grandfather, as his great-grandfather is never mentioned in the text (1990, p. 66). The *Harry Potter* books are similarly incomplete, for example with regard to the character Ron having an even or uneven number of freckles, as the book only mentions that Ron *has* freckles without ever determining their exact number. Magritte's painting is incomplete with regard to what is outside the frame of the painting, as well as concerning the face of the depicted man: viewers cannot establish with any degree of certainty or authority whether the man is standing in the vicinity of an apple tree, if he has a mustache, and what shape his nose has (if he has one at all). It is not fictionally true in this painting that the man is smiling, nor is it fictionally true that he is not: it is simply undetermined.

Figure 1. René Magritte's 1964 painting "The Son of Man"

Simply put, fictional works are incomplete because they do not represent everything there is to imagine about the fictional worlds they represent: they "leave many things open" (cf. Williams & Woodward 2021, p. 423). For this reason, Maurice Blanchot writes that fictional universes are always "poor", going as far as claiming

that poverty is the very essence of fiction (Blanchot 1995, p. 75) [2]. A work of fiction, in fact, only ever accounts for a limited number of objects, characters, and a few crucial details, and tends to focus on facts and events that are functional to its narrative. As a consequence of the inevitable incompleteness of works of fiction, our experiences of fictional worlds are always poorer and less complete than our lived experience of the actual world. Seen in this light, fictional incompleteness can be understood as a potential source of dissatisfaction and frustration for the fiction appreciator, who may want to know more about the world and about the characters, or may simply wish for additional information to aid their imaginative construction of the fictional world. Some cases of incompleteness might be experienced as annoying plot holes, for example when a work of fiction neglects to sufficiently specify or justify a character's motivations.

It is important to emphasize that incompleteness, although undoubtedly posing limits to our appreciation of the fictional world in question, is not necessarily a detracting quality or a blemish in a work of fiction. We propose four reasons why we believe that to be the case. Firstly, the incompleteness of fiction helps to direct the attention of the appreciator towards certain events and details that are narratively relevant. In doing so, fictional poverty also helps frame the audience's expectations towards the development of the plot, and guides their interpretation of the work in question. If an author were to attempt to account for each and every fictional truth concerning the represented world of a novel, its readers would find it hard, or would even be unable, to discern a narrative, or even identify the characters and elements of the fictional world that might deserve particular attention.

Secondly, incompleteness only rarely stands in the way of appreciating a work of fiction, as the unanswered questions that characterize a work of fiction are often rather banal. Even though we might not know the eye color of a character in a novel, for example, we can assume that they have eyes, that their eyes have

a certain color, and that the absence of precise information in this regard should not significantly affect our understanding or enjoyment of the text. As Marie-Laure Ryan puts it, that which is left out of a work of fiction is most of the time treated "as unknown information", and not as a problematic ontological gap within the fictional world (2001, p. 360).

Thirdly, cases of incompleteness give the fiction appreciator a certain, and often pleasurable, freedom when interpreting a work (cf. Eco 1989). Gaps left in the fiction might permit the reader or viewer to imagine whatever they want (as long as it fits whatever *is* mentioned in the work), such as the sound of a literary character's voice [3]. When appreciating works like Magritte's painting above, this process of imagining (or at least thinking about) what is not explicitly represented might even be one of the most interesting aspects of the fiction experience.

And lastly, incompleteness is very often deliberately applied to elicit certain interesting narrative or emotional effects in fiction appreciators. Fiction creators might choose to leave obvious gaps in their narratives to deliberately give rise to ambiguity and to leave their audience guessing, to provoke discussion, or even to subvert their expectations (cf. Gualeni 2021, pp. 200-203). This is especially obvious in narratives with open endings.

INCOMPLETENESS IN DIGITAL GAMES

Digital games can plausibly be classified as works of fiction (cf. Tavinor 2009; Bateman 2011; Wildman & McDonnell 2019) [4]. Just like the novels, movies, and paintings described in the last section, digital games are representational works. They are, in other words, props that mandate their players to imagine certain worlds, characters, states of affairs, and events. More precisely, digital games are virtual fictions in the sense that the props they present to players are computer-generated, interactive models. A virtual depiction, as Tavinor explains, is a "depiction that preserves

some functional aspect of its target, and so allows for an interaction of the kind one might have with the target object" (Tavinor 2012, p. 195). Indeed, digital games allow their players to explore the world they represent, as well as interact with the characters they depict, and change the course of the events they prescribe their audience to imagine. As works of fiction, digital games represent these fictional entities and states of affairs in an incomplete fashion.

In the next section, we will discuss how the concept of incompleteness can, and has already been, applied to the fictional worlds represented by digital games. First, however, we will describe how digital games inherit the kinds of incompleteness that characterized non-interactive works of fiction such as novels, paintings, radio shows, comic strips, and movies. We will then turn our attention to a unique kind of incompleteness that has been ascribed to digital games as a result of their being interactive fictions: so-called "forced choice incompleteness" (Wildman & Woodward 2018). Lastly, we will argue that, despite the apparent completeness of contemporary computer-simulated worlds (cf. Ryan 2015, p. 66), these worlds are still inherently and necessarily incomplete.

Digital Games Inheriting Incompleteness from Non-Interactive Media

With the intention of exploring how fictional incompleteness manifests itself in the fictional worlds of digital games, we consider it useful to begin our discussion with forms of fictional poverty that digital games inherited from traditional media forms. Narrative games consisting exclusively (or almost exclusively) of interactions with text, such as *The Sumerian Game* (Addis 1964), the *Zork* series (Infocom 1977-1982), and contemporary text-based Twine games (Friedhoff 2013), inevitably inherit ways in which all kinds of textual representations are incomplete [5].

Despite the fact that they feature user input as a defining aspect of the narrative experience, and allow a degree of freedom in how a reader can traverse a text, they are still incomplete in concentrating their attention on certain fictional events and not others, in simply not mentioning some facts and details, and in only providing a finite set of information about objects or characters that populate their fictional worlds.

The same observation applies to games that employ static visual representations, such as bidimensional backgrounds. Point and click adventures or hidden object games, for example, are inevitably characterized by the same forms of incompleteness that fiction appreciators are exposed to when engaging with images, paintings, visual novels, or photo stories. When playing *Myst* (Cyan 1993) or *Monkey Island 2: LeChuck's Revenge* (LucasArts 1992; see Figure 2), for instance, one cannot obtain more visual information about the gameworld than that which is offered by the interconnected set of flat images that depict their gameworld. Similarly, laser games such as *Dragon Lair* and *Space Ace* (Bluth 1983) rely upon the visual and kinesthetic language of animated movies, and disclose fictional worlds for their audience that are incomplete in ways that films and motion-picture animations are. Despite the interactivity of these games, players cannot change the prescribed cinematographic framing or the pace of the experience, and are not free to explore the gameworld and interact with it as they please.

Figure 2. A Screenshot of Monkey Island 2: LeChuck's Revenge (LucasArts 1992)

The examples above show that classic kinds of fictional indeterminacy also characterize the interactive fictional worlds of digital games. The same holds true for the deliberate, narrative uses of incompleteness that we described in the first section of this article, such as ambiguity and open endings. Many game narratives also make use of these devices to elicit emotionally interesting effects. It is relevant to note, however, that the translation of these strategies of deliberate incompleteness to interactive media often entails complications, and might not have the same narrative effects as they do in non-interactive works of fiction. We can illustrate this using an example. Whereas open endings in movies prevent viewers from determining exactly what happened to the characters, these viewers at least know that this last scene is indeed the end of the movie. Let's compare this situation to an open ending in a digital game. The downloadable content (DLC) for the action-adventure digital game *Outer Wilds* (Mobius Digital 2019), called *Echoes of the Eye* (Mobius Digital 2021), ends when the player-character watches a slideshow which depicts them, together with another character they just met but who mysteriously disappeared soon after, sailing away towards the horizon. While

the developers of this game thought that this would be a poetically ambiguous way to end the game, players tended to misinterpret this open ending (Noclip Podcast 2021, 01:12:46). Instead of realizing that this was the end of the DLC, many players took the slideshow as a clue to finding the mysterious characters' whereabouts. In an interview with the game's designers, they refer to this moment as being a consequence of a possible "mistake" on their part, as ambiguous, open endings like this might work in non-interactive media like film, but might just confuse players of interactive fictions (ibid.).

Thus, although digital games can clearly incorporate kinds of incompleteness that characterized more traditional media, strategies of deliberate incompleteness do not necessarily work in the same ways within interactive contexts. Rather than being taken as cases of incompleteness, indeterminacy, or deliberate ambiguity, they could be interpreted by players as invitations to interactively complete the game's fiction or narrative. With this possibility in mind, in the next section, we will turn our attention to this notion of 'interactive completability', which some scholars have identified as a consequence of a kind of incompleteness that is unique to interactive fictions such as digital games.

Forced Choice Incompleteness

Many scholars have pointed out that the interactivity of digital games is closely tied to the incompleteness of their narratives and fictional worlds. When starting a game of *Mass Effect* (BioWare 2007), for example, the gender of player-character Commander Shepard is not yet determined: players get to choose whether they want to play a male or a female version of Shepard (cf. Ricksand 2020, p. 101). This interactive option is only possible because the game originally leaves Shepard's gender open. Nathan Wildman and Richard Woodward describe the incompleteness at work here as "forced choice incompleteness" (2018). Just like the kinds of incompleteness discussed so far in this paper, cases of forced

choice incompleteness are characterized by indeterminacy: neither "Shepard is male" nor "Shepard is female" is a proposition that is prescribed to be imagined by *Mass Effect.* Yet, unlike the examples of incompleteness that we discussed in the previous sections, these interactive cases of incompleteness also *force* players to fill in the gap left by the game. One cannot play *Mass Effect* without choosing to make either "Shepard is male" or "Shepard is female" fictionally true.

While forced choice incompleteness is indeed an insightful way of describing the interactive relation between player and digital games, we argue that it is actually not a kind of incompleteness. Rather, it is a case of interactive completability of the worlds and stories that are disclosed by digital games. By this we mean that the gaps in the game's fiction that amount to forced choice incompleteness will all eventually be filled in by players (provided they do not stop playing mid-game). As Marissa Willis points out, even though it is indeterminate whether Shepard is male or female in the game *Mass Effect*, Shepard's gender is very clear and completely determined in any one playthrough of this game (Willis 2020, pp. 105-106). As such, the phenomenon of forced choice incompleteness differs from the incompleteness that is the focus of this paper. While the latter refers to the impossibility of filling in the blanks in a work of fiction with any authority, forced choice incompleteness refers not only to the possibility of filling in the gaps, but also the mandate to do so.

We find it important to point this difference out, as incompleteness and interactive completability have been confused in the past. Jesper Juul, for example, argues that "[w]hile in an incomplete fictional world there are blanks that the player must fill in, an incoherent world prevents the player from filling in the blanks" (2005, p. 132). As Wesp (2014) argues, Juul's use of the concepts of incompleteness and incoherence is confusing. First of all, when Juul uses the word incompleteness, he refers to the fact that "there are blanks that the player must fill in" (2005, p. 132). This, however, is better described as forced choice incompleteness,

which – as we discussed above – is a manifestation of games' interactive completability, rather than their incompleteness. Secondly, Juul defines fictional worlds as incoherent when players are prevented from filling in the blanks that are left in these worlds. Yet, it is hard to see how his definition of incoherence diverges from classic fictional incompleteness. Within the philosophy of fiction and narratology (which Juul explicitly relies upon, cf. 2005, pp. 122-123), fictional worlds are defined as incomplete when the absence of some information in the work of fiction prevents the audience from "filling in" certain aspects of these fictional worlds with any authority (Wesp 2014). To maintain conceptual clarity in this paper, we will stick to this philosophical/narratological definition of incompleteness.

The (In)completeness of Virtual Representations

Having clarified our use of incompleteness in digital games, it is necessary to present one additional caveat. In fact, some scholars claim that virtual representations of gameworlds do not leave anything for players to fill in, as they are *complete*. When it comes to the virtual representation of fictional worlds in digital games, technological advances make it increasingly possible to attain realism and completeness. This becomes obvious when we look back at virtual representations in classic arcade games, such as *Space Invaders* (Nishikado 1978). In this game, there is a significant difference between the representations themselves (blocky groups of pixels) and that which they represent (aliens). Aliens in *Space Invaders* are, we argue, very incompletely represented, in the sense that their in-game rendition leaves many aspects of the extraterrestrials undetermined, like the texture of their skin, how (and if) they communicate, and what their goals are. In *Mass Effect 2* (BioWare 2010), on the other hand, aliens are represented by detailed and animated 3D-models and are programmed to have voice lines in their own respective languages and to somewhat intelligently react to players' in-game behavior.

Mass Effect 2's interactive renditions of aliens thus leave much less for the player's imagination to fill in than the aliens in *Space Invaders*. Indeed, many contemporary games go very far in simulating worlds as completely and realistically as possible. An extreme example is the behavior of horse scroti in *Red Dead Redemption 2* (Rockstar Studios 2018), which visibly retract when a horse is taken to colder locations in the gameworld. This example, as well as many others throughout the history of game development, could be invoked to identify a general aspiration towards a higher degree of fictional completeness that accompanies the technical and cultural evolution of games and game technology [6]. A related phenomenon is the pursuit of physical realism and player's explorative and interactive freedom as desirable values in games development (cf. Dormans 2011, pp. 610-611).

Figure 3. A comparison of the representation of enemy aliens in Space Invaders (left) and Mass Effect 2 (right) (taken from BioWare 2021, 93)

One notable consequence of this tendency towards completeness and realism is that it is sometimes hard to distinguish between the virtual representation (the interactive, computer-generated model) and that which is represented by it (the fictional entity that the representation prescribes us to imagine). We believe that this difficulty lies at the base of scholarly arguments about fictionality having no role to play within the experience of digital games. According to some scholars, the objects and characters presented in digital gameworlds are not fictional entities, but virtual ones. Both Aarseth and Chalmers, for example, write about "virtual dragons", explicitly stating that these dragons are not fictional

because they can actually be interacted with (Aarseth 2007, p. 37) or because they are not merely imaginary, but actually existent, computer-generated, interactive models (Chalmers 2017, p. 320). Such arguments, however, threaten to confuse the prop for what it represents: there is indeed an actual, computer-generated model of a dragon, but it only appears to us as a dragon because that is what this virtual object prescribes us to imagine. The model or prop is virtual, in the sense that it is interactive and upheld by the relevant software and hardware, but the dragon is fictional.

In the context of our discussion of incompleteness of digital game objects, the confusion between virtual and fictional objects in digital games is especially problematic. After all, virtual models are closed systems: as pieces of software, they are internally consistent and logically complete (cf. Ryan 2015, p. 66). One could learn everything there is to know about a virtual model of a dragon by simply examining the coding of the game in which it appears. This, however, does not mean one would thereby also learn everything there is to know about the fictional dragon that is prescribed to be imagined by this virtual model, such as its age or its motivations for attacking the player. Confusing the virtual model for the fiction it represents might thus lead one to mistakenly believe that the fictional worlds represented in digital games are complete.

James Ryan, for example, suggests that "due to the nature of computer simulation," storyworlds like the one procedurally generated in the game *Dwarf Fortress* (Bay 12 Games 2006) are in fact complete (Ryan 2015, p. 63) [7]. He states that everything that is true about the world represented in *Dwarf Fortress* will, at least at some point in time, be stored in the game data (ibid., p. 64). This means that, whenever a certain aspect of the fictional gameworld is not modeled or upheld by this data, it is simply not part of that world (ibid., p. 65). He gives the example of the player-character in a specific playthrough of *Dwarf Fortress*, whose avatar is not modeled as having a mole on his left shoulder. In a novel, Ryan admits, it would be weird to conclude that it

is fictionally true that a character does not have a mole on their shoulder simply because this mole is not described in the work: rather, it is indeterminate. In a simulated world "whose ontology is explicitly represented as structured data", on the other hand, he feels it intuitive to conclude that, as the mole is not modeled, it is fictionally not there (ibid., p. 65). Instead of interpreting the existence of the mole as undetermined, Ryan takes the system to represent the fictional absence of the mole.

Yet, as we will further elaborate on in the next section, things might very well be fictional within the worlds of digital games even if they are not explicitly modeled as such. When a player of a 3D digital game gets the game-camera stuck inside of the body of a game character and finds no organs there, for example, this does not necessarily mean that, fictionally, this character does not have organs. As virtual representations, gameworlds might be complete from a logical or mathematical perspective, but they remain incomplete as works of fiction: they inevitably lack representations of things and events that might nevertheless be fictionally true. It would be wrong to take this absence of representation as a representation of absence. The fact that the representation of the player-character's organs is missing in the game should not be taken to mean that the organs are represented as missing.

Vice versa, not everything that is modeled in a game is fictionally the case within the represented gameworld. Very often, virtual representations take shortcuts, using stand-ins or repetitions of game assets as representations that should not be taken literally by players. A forest in a game often consists of repetitions of the same tree, but that does not mean that the player is prescribed to imagine the forest as being composed of multiple instances of the same tree. Rather, the game is incomplete with regard to the specific appearance of every individual tree, because it would be time-consuming and expensive to actually model thousands of them. In the following section of this article, we will discuss some examples

of the kind of incomplete virtual representations mentioned in the last two paragraphs.

NEW EXPERIENCES OF INCOMPLETENESS IN DIGITAL GAMEWORLDS

By virtue of their interactively disclosing fictional content, virtual representations of digital gameworlds can avoid some of the types of incompleteness that characterize non-interactive works of fiction. Unlike when appreciating texts, images, theater plays, or movies, players are relatively unrestricted by the narrative directions and the cinematographic perspectives imposed by the fiction's creators. They often have control over the game camera movements and the pace and the development of the plot. As such, they have the possibility to bring into view parts of the fictional world that would not be part of the game experience if no actions were undertaken. In fact, as discussed before, many cases of incompleteness in digital games are actually cases of interactive completability.

Yet, the interactivity of virtual representations in digital games also has important consequences for players' perception of the incompleteness of the represented gameworlds. As mentioned in the first section of this article, appreciators of traditional, non-interactive works of fiction are usually not bothered by the incompleteness of descriptions and depictions of fictional states of affairs. Simply put, the gaps left in the fiction are not the focus of the fiction experience, which is concerned with what the work of fiction does describe, depict, or otherwise communicate for appreciators to imagine. Within the interactive experience of digital games, however, incompleteness is often explicitly encountered by players. As we will elaborate on in the following sections, the incompleteness of digital gameworlds, due to the interactive and often apparently fictionally complete contexts in which it appears, can have the effect of disappointing players.

Players might experience something akin to *Weltschmerz* whenever the artificial constitution of the virtual world becomes clear to them. The term *Weltschmerz* captures a feeling that is often translated in English as "world-weariness", and indicates the disappointing sensation that a world is inadequate to satisfy our intellectual and emotional aspirations (Gualeni 2019, pp. 8-9).

In the next three sections, we will focus on three types of representational incompleteness that are specific to digital games, and that can evoke the kind of dissatisfaction described above. Note, however, that these three categories are often non-mutually exclusive, and that there are some cases – even among the examples we will discuss – that fall under multiple categories at the same time. Section 3.1 will focus on the poverty of the affordances of virtually represented objects. Section 3.2 discusses the audiences' direct experience of the boundaries of virtual representations of gameworlds, and players' inability to authoritatively imagine what is beyond them. Section 3.3, lastly, focuses on repeated assets within digital gameworlds, and argues that these iterated representations can be interpreted as a kind of incompleteness. We consider all of these examples as exhibiting true incompleteness, that is: as incomplete fictional situations that cannot be completed by means of players' interactions during gameplay. It is also important to emphasize that the examples we will discuss are not mere cases of incompleteness that digital games have inherited from their non-interactive forebears, such as novels and movies, but are rather original and specific to the technologically mediated and interactive ways in which contemporary digital games represent their worlds.

Interactive Poverty

Not all objects within a videogame are created equal: only some of the objects that players can encounter in a game allow for some forms of interaction. The majority of game objects are an inert part of the experiential background, mostly serving as worldbuilding

devices and/or to limit players' possibility to navigate the digital gameworld (think of strategically placed bookcases, walls, or unpassable crags). Moreover, even when game objects are represented as interactable, they only allow limited and very specialized possibilities for action. In-game doors, for example, can typically be locked, unlocked, opened, or closed by players, but not lifted off their hinges, painted on, or used to build a fire [8]. What we identify here is a kind of incompleteness that emerges from the ways in which action possibilities and affordances are modeled and represented in interactive fiction. Many virtual models in digital games invite players to imagine undertaking certain actions on or towards the fictional objects that they represent, but are very specific as to which actions are possible. Often, these virtual models do not offer players any information on what could become fictional were other actions allowed, nor do they give clear reasons as to why these other actions are not possible in the first place.

There are, of course, practical reasons behind this incompleteness in the representation of action possibilities in digital games. Firstly, modeling every imaginable action possibility would likely be impossible, or at least unthinkably expensive and time-consuming for game developers. Secondly, similar to what we described in Section 1, the poverty of affordances in digital games might be helpful in framing players' expectations regarding the fictional world and the development of the plot, as well as guiding their interpretations of the game and expectations of it. The focused paucity of interactive options is likely what makes gameplay possible and enjoyable in the first place. Christopher Thi Nguyen describes how the limited agencies that players have within gameworlds cause a particular kind of pleasurable clarity: "[h]armonies between agent and world are easier to achieve when the agent is thinner, simpler, and clearer, and when the world has been temporarily cleared of various ambiguities and complexities" (2020, p. 68). The poverty of player affordances in *Dark Souls III*, for example, plays an important role in making the goals to be pursued in the game clear and intuitively graspable for their

intended audience. The fact that certain elements of the game, such as the blades of grass, the trees, and the walls of the buildings in Figure 4, respond to the player-character's actions in very minimal ways clarifies to players that they are part of the background, function as boundaries and scenographic props, and should not be the focus of attention while playing. Through this interactive poverty, the developers communicate their intentions to the players and establish for them what Nguyen calls a "crisper context for action and evaluation" (ibid.).

Fig. 4: This screenshot taken from Dark Souls III (FromSoftware 2016) shows the player-character performing a fire spell in the Undead Settlement

The incomplete representation of action possibilities in digital games can, however, also cause dissatisfaction and ambiguity. Let us briefly illustrate this using the example of the trees in the Undead Settlement level of *Dark Souls III* (cf. Figure 4). As mentioned before, the virtual props representing these trees are especially poor, not giving players the means to imagine this fictional tree being cut, burned, or chopped. This causes two problems. The first problem has to do with the fictional truths that can be ascribed to the trees in *Dark Souls III*. Clearly, despite what is seemingly represented in this game, it would be farfetched to conclude that the trees in Undead Settlement are fictionally

indestructible super-trees. It would be more charitable to interpret *Dark Souls III* not as representing non-interactive trees, but rather as non-interactively representing trees. That is, the trees in the Undead Settlement should not be taken as fictionally unresponsive to anything that happens to them, but as incompletely represented: numerous action possibilities have not been included in the representation of these particular trees, and players are left to guess how they would fictionally react to being cut, burned, or chopped.

The second problem has to do with player experience, and the negative appraisals players are likely to have of their overt encounters with incomplete representations of action possibilities in digital gameworlds. Obviously, all trees represented in novels, paintings, comics, or movies are incomplete with regard to interaction possibilities, as none of these works of fiction even allow for interactions with their represented content in the first place. However, due to the interactive context in which the representations of trees in digital games are encountered, and the expectations that come with this, the incomplete representation of their interactive possibilities might be a source of disappointment for players. Situations like these might lead to a break-down of "agency" in the sense described by Wardrip-Fruin et al., as a phenomenon "that occurs when the actions players desire are among those they can take (and vice versa) as supported by an underlying computational model" (2009, p. 1). Whenever a virtual model does not include action possibilities that players might expect on the basis of what this model represents within the fictional world, disappointment might follow. In relation to this experiential – and even existential – dissatisfaction that currently characterizes our experience of digital gameworlds, researcher and developer Mike Cook argues that "we dream of doing and being a particular thing in a world, and then we find ourselves unable to do it. It is a typical 21st century condition—to be trying our hardest to escape into a digital world and then realize that we cannot act in the way we wanted. It is almost like being in a nightmare where one is unable to move one's arms, or to speak" (Cook in Gualeni 2019, p. 12).

Experiencing the Boundaries of the World

Every fictional world is spatially incomplete. It is impossible to completely reconstruct Hogwarts based on the *Harry Potter* books, just like it is impossible to imagine with any authority what the fictional world represented by a painting looks like beyond the frame of the painting, or what is on the other side of a closed door in a movie if the camera never goes behind it (and it is not otherwise described or represented). Within non-interactive works of fiction, these boundaries of represented worlds rarely raise questions or problems. The fictional spaces that are not important to the narrative or depiction are simply not mentioned or represented. The incompleteness of digital gameworlds, on the other hand, is often obvious and directly experienced by players. The interactive and immersive qualities of the relatively rich and extensive fictional worlds of digital games make it so that players, in the guise of their avatars, often literally bump into the boundaries of the representation of these worlds. In a way that largely depends on game genre, these boundaries can coincide with the sides of the screen (for example in fixed-screen arcade games and many casual puzzle games), or exist as tridimensional elements that players are not supposed to be able to climb or traverse. Depending on the narrative context of the game, the latter can be represented as walls, ceilings, sturdy barricades, steep crags, force fields, walls of mist, empty stretches of open sea, or even unembellished and invisible colliders that preclude further advancement and exploration.

It is quite obvious why digital gameworlds have these kinds of boundaries: just like the poverty of affordances described in the previous section, the spatial incompleteness of these worlds is often motivated by practical and financial reasons, as well as the desire to give players clear directions as to how they should interact with the represented world and where they should go next. Yet, problems arise due to the overt way and the interactive context in which this incompleteness becomes apparent.

Once again, limitations of gameworld representations cause problems regarding the fictional truths that players are mandated to imagine. As mentioned before, in non-interactive works of fiction, what lies beyond the limits of the represented worlds is simply absent in the work. In digital games, however, the parts of the fictional gameworld that are not overtly represented become jarringly apparent to players in the shape of boundaries that they cannot overcome, but which they often literally bump into. One potential problem, here, is that players could take these boundaries of the representation of the fictional world as representations of boundaries within this world. But this would probably not be right. Instead of being mandated to imagine that the fictional world actually ends where its representation ends, players are prescribed to imagine that the fictional worlds of digital games are vaster than whatever limited portion of it they get to experience during gameplay.

A second, related problem has to do with player experience. The encounter with the limits of incompletely represented gameworlds reminds players that what they are exploring and interacting with is not a vast and mysterious world, but a glorified dollhouse: a plaything that was designed to be used and experienced within set confines. Due to the interactive context in which they are encountered, experiences of limits that are impossible to trespass can detract from player enjoyment. In non-interactive fiction, spatial incompleteness is often an appeal to the appreciator's creativity, and an opportunity for them to freely imagine what is not overtly represented in the work. In digital games, on the other hand, the same kind of incompleteness is often experienced as curtailing players' exploratory freedom. After all, spaces that are not overtly represented in games can still be painfully present in the shape of mercilessly impassable barriers that halt every attempt at further exploration and that can make players feel disappointed about the incompleteness of the gameworld.

A similar dissatisfaction can be elicited by the fact that the gameworld was developed to be experienced at a certain

perceptual scale. Some elements of games are supposed to be noticed only in passing (i.e., while busy pursuing more relevant in-game tasks), and not be the focus of detailed inspection. Examining certain game elements, such as a brick wall or the leather-bound cover of books, reveals that there is only a certain amount of detail and work put into them: they are poor props that were not supposed to be carefully scrutinized.

Fig. 5: This screenshot taken from Elden Ring (FromSoftware 2022) reveals how certain textures (for example the stone wall on the left) were designed to sustain close inspection, whereas others (the painting on the right) were optimized to be seen from a distance.

Upon closer examination, in fact, those poor objects do not offer players an increasing amount of information or detail. Instead, their crude geometry and the blurring of their textures demonstrate that the game can only hold up the appearance of a phenomenologically rich world within a narrow experiential bandwidth. As soon as we exceed that bandwidth, the illusion wavers and players are once again reminded that they are interacting with an incomplete construct that merely alludes to the experiential richness of the actual world.

To conclude this section, it is important to note that interactive incompleteness also systematically takes place in a gameworld in

ways that are not directly initiated or influenced by the player-character. Think, for example, of how tree leaves in a game might be animated to simulate the presence of a light breeze that does not, however, affect the mane of a nearby horse. This behavior may not necessarily indicate that the breeze is highly discerning in terms of what it affects, but rather that its effects may be incompletely represented.

Repetitions of Game Assets

One final and particularly interesting way in which digital gameworlds reveal themselves to us as incomplete props is the repeated appearance of game assets within these worlds. The incompleteness of the gameworld does not, in this case, manifest itself through gaps in its representation, but rather through the presence of obvious placeholders for elements of the gameworld that are not overtly represented. What we are talking about are game assets that make it impossible for players to imagine with any authority what is fictionally there, as they are placeholders for something the game designers did not actually include in the game. Typically, such placeholders consist of game assets that are repeated many times throughout the gameworld. Think, in this regard, of game characters repeating certain voice lines or movements, or of obviously recurring patterns within the texture of game assets, such as large bodies of water.

A clear example of this can be found in the digital game *What Remains of Edith Finch* (Giant Sparrow 2017; see Figure 6). Almost every room of the manor in which this game takes place features bookshelves and libraries. The manor can be said to house thousands of publications. The actual in-game assets of books are, however, very limited, consisting only of a few dozen. In other words, every single book can be encountered multiple times within the manor where the game takes place. Although it might not be obvious, we argue that this entails a kind of incompleteness. After all, this game is very probably not advancing the fictional

proposition that the family living in the manor decided to buy several copies of every single book they own, but rather prompts players to imagine that this family holds knowledge and literature in high regard, and thus owns a wide variety of different books. This means that there are gaps in the representation: after all, the game does not give any indication about what books players should imagine instead of the actually represented (and repeated) ones.

Fig. 6: This screenshot taken from What Remains of Edith Finch (Giant Sparrow 2017) shows a bookcase with two identical rows of books on different shelves (marked by the white rectangles).

There is thus a fictional problem connected to this type of incompleteness, as there is a contradiction between what is (and is not) virtually represented, and what is supposed to be imagined. Moreover, this type of incompleteness can also lead to player dissatisfaction. Mike Cook discusses the repetition and modularity of elements in digital environments as a potential source of weariness. He describes them as aesthetic components of gameworld experiences that are particularly problematic for someone, like himself, who aspires to generate interesting, playable environments algorithmically. Over time, Cook argues, players "become numb to the patterns inherent in the algorithms that constitute the world" (Cook in Gualeni 2019). Repeated game

assets are often deployed as easy ways of fleshing out the fictional world. Whenever players inspect them more closely, however, they see these assets as an indication of the poverty and incompleteness of the gameworld. That which, at first, seemed like an elaborate virtual library, is exposed as a poor prop.

Now, we should note here that the books in the in-game manor are assets that are not specifically interactable, and the presence of which merely contributes to the thematic background of the in-game locations. Books, trees, and similar assets that are often repeated in digital games are meant to be perceived in passing, and not to occupy the forefront of the experience of gameplay. The dissatisfaction players potentially feel about this kind of incomplete representation might, however, significantly increase when game designers repeat more important game assets. When just having saved a little girl who is being attacked by monsters in the woods in *The Witcher 3: Wild Hunt* (CD Projekt Red 2015), for example, a player might be particularly disappointed if, just a few minutes later, they happen to notice a number of girls with exactly the same face running around in the streets of a nearby city.

CONCLUSION

This paper's contribution to game studies consists of presenting and analyzing forms of fictional incompleteness that are commonly encountered as part of the experience of computer-mediated interactive fictions such as digital games. In doing so, we did not focus on the interactive kind of forced choice incompleteness that philosophers of fiction have discussed in the past. Rather, and with a focus on digital games, we distinguished various forms of incompleteness in digital games based on a more classic understanding of the concept. While some of those forms were recognized to be compatible with the incompleteness that characterizes non-interactive fictions (such as novels, paintings, and films), some ways in which fictional worlds are only partially presented to their users are unique to computer-mediated fictions.

Among these ways, we specifically focused on the inevitable incompleteness of in-game affordances, the unique ways in which players experience the boundaries of gameworlds, and how incompleteness in digital games becomes apparent in the encounters with repeated instances of the same game assets (sound effects, textures, objects, indistinguishable non-player characters, and so on).

In several sections of our paper, we tied these unique and new forms of fictional incompleteness to fundamental beliefs that can be recognized as guiding how games are currently developed, understood, and valued as social objects. To be more specific, we linked the emergence of those forms of indeterminacy to the emphasis that contemporary game design and game development arguably puts on values such as (physical and perceptual) realism and players' freedom in pursuing activities such as exploration, interaction, and in-game progress. What we hoped to show with this article is that the fictional incompleteness of digital gameworlds reveals the current (economical and technical) impossibility of fully pursuing those values, and fulfilling those aspirations.

ENDNOTES

[1] We do not consider unmentioned fictional states of affairs that are nevertheless obvious "gaps" of this kind. As Pavel writes: "The laws of nature that are not specifically contradicted by the text belong to its worlds: a few notorious cases aside, […] every child born in fiction having been engendered by a human father, there is no reason to doubt this regularity as long as the text signals no exception" (Pavel 1986, p. 105). Likewise, the *Harry Potter* stories are probably not incomplete with regard to Harry having a liver or not: knowing that he is human, we can with some authority assume that it is implied that he has one (see also Heintz 1979, p. 92; Walton 1990, pp. 142-143).

[2] It might be added that Blanchot's observation is not only true for works of fiction, but holds for any kind of representation.

[3] It is not uncommon for people, who see a movie based on a book that they have read, to be frustrated about the fact that the movie characters are not like what they imagined the book characters to be. This happens even when the actors have been cast based on the few details about these characters that could be found in the book (see also Iser 1978, p. 283).

[4] Aarseth (2007) argues that the content of digital games is better understood as having a virtual constitution, rather than a fictional one. As argued by Wildman and Woodward, however, there is no obvious incompatibility between Aarseth's understanding of 'virtuality' and an understanding of fictionality as 'that which is prescribed to be imagined' (cf. Wildman & Woodward 2018, p. 125). Our approach in this article follows scholarly analyses that discuss most digital games as interactive fiction (cf. Robson & Meskin 2012; Schulzke 2014; Van de Mosselaer 2020). The qualifier 'most' is necessary here because some digital games, such as *Tetris* (Pajitnov 1984), are not commonly discussed as interactive fiction. We do not elaborate on this issue here, as this article only references examples taken from games that are uncontroversially considered to be works of fiction.

[5] In referencing digital games, we followed the format proposed by Gualeni et al. in their 2019 paper *How to Reference a Digital Game*.

[6] As Françoise Lavocat writes, however, this possibility to minimize incompleteness in the representation of fictional gameworlds need not have an impact on a game's success (Lavocat 2019, p. 280). A game like *Undertale* (Fox 2015), which makes use of retro, pixelated two-dimensional visuals, arguably manages to evoke a vivid fictional world, and has been positively appraised by players.

[7] We do not think that Ryan's argument that we describe here would differ significantly if it were applied to non-procedurally generated storyworlds. Moreover, it is noteworthy that Ryan nuances his claim about the completeness of simulated storyworlds later in the same text, where he (somewhat paradoxically) admits that all simulations have gaps (2015, p. 67; 145). However, he contends that even if computer-simulated worlds are not in fact complete, it at least *feels* like they are (2015, p. 65). Ryan does not identify anything unique here about the worlds depicted in digital games, however. After all, every well-designed fictional world, be it one that is represented through text, images, or virtual models, will likely feel complete to the willing or immersed appreciator. As we argued before, appreciators of fiction will very likely fill in many of the gaps left by the work, or be unbothered by these gaps simply because they are an inherent part of any kind of fiction experience.

[8] The fictional poverty of in-game doors and the various ways in which they can be represented and understood as doors in interactive fiction are the themes of a small, experimental adventure digital game (a playable essay of sorts) titled *Doors (the game)* (Gualeni & Van de Mosselaer 2021; https://doors.gua-le-ni.com)

REFERENCES

12 Bay Games. *Dwarf Fortress* [PC]. Digital game designed by Tarn Adams and Zach Adams and published by 12 Bay Games, 2006.

Aarseth, E.J. "Doors and Perception: Fiction vs. Simulation in Games." *Intermédialités: Histoire et théorie des arts, des lettres et des techniques/Intermediality: History and Theory of the Arts, Literature and Technologies* vol. 9 (2007): 35-44.

Addis, M. *The Sumerian Game* [IBM 7090]. Digital game designed and written by Mabel Addis and programmed by William McKay, 1964.

Blanchot, M. *The Work of Fire*. Stanford, CA: Stanford University Press, 1995 [1975].

Bluth, D. *Dragon's Lair* [Arcade LaserDisc]. Digital game developed by Advanced Microcomputer Systems and published by Cinematronics Digital Leisure, 1983.

Bluth, D. *Space Ace* [Arcade LaserDisc]. Digital game developed by Advanced Microcomputer Systems and published by Cinematronics Digital Leisure, 1983.

BioWare. *Mass Effect* [XboX 360]. Digital game directed by Casey Hudson and published by Microsoft Game Studios, 2007.

BioWare. *Mass Effect 2* [XboX 360]. Digital game directed by Casey Hudson and published by Electronic Arts, 2010.\

CD Projekt Red. *The Witcher III: Wild Hunt* [PlayStation 4]. Digital game directed by Konrad Tomaszkiewicz, Mateusz Kanik, and Sebastian Stępień and published by CD Projekt, 2015.

Chalmers, D.J. "The Virtual and the Real." *Disputatio* vol. 9, no. 46 (2017): 309-352.

Cyan. *Myst* [Microsoft Windows]. Digital game directed by Rand & Robyn Miller and published by Broderbund Software Inc, 1993.

Eco, U. *The Open Work*. Cambridge, MA: Harvard University Press,1989 [1962].

Fox, T. *Undertale* [PlayStation 4]. Digital game developed and published by Toby Fox, 2015.

FromSoftware. *Dark Souls III* [PlayStation 4]. Digital game directed by Hidetaka Miyazaki, Isamu Okano, and Yui Tanimura, and published by Bandai Namco Entertainment, 2016.

FromSoftware. *Elden Ring* [PlayStation 5]. Digital game directed by Hidetaka Miyazaki and Yui Tanimura, and published by Bandai Namco Entertainment, 2022.

Friedhoff, J. "Untangling Twine: A Platform Study". In the *Proceedings of the 2013 DiGRA International conference* in Atlanta, GA, United States. Digital Games Research Association (DIGRA). http://www.digra.org/wp-content/uploads/digital-library/paper_67.compressed.pdf

Giant Sparrow. *What Remains of Edith Finch* [PlayStation 4]. Digital game directed by Ian Dallas and published by Annapurna Interactive, 2017.

Gualeni, S., Fassone, R., and Linderoth, J. 2019. "How to Reference a Digital Game." In the *Proceedings of the 2019 DiGRA International Conference* in Kyoto, Japan. Digital Games Research Association (DIGRA). http://www.digra.org/wp-content/uploads/digital-library/DiGRA_2019_paper_50.pdf.

Gualeni, S. "Virtual World-Weariness: On Delaying the Experiential Erosion of Digital Environments." In *The Architectonics of Game Spaces: The Spatial Logic of the Virtual and its Meaning for the Real*, edited by A. Gerber and U. Goetz, pp.153-165. Bielefeld, Germany: Transcript, 2019.

Gualeni, S. "Fictional Games and Utopia: The Case of Azad." *Science Fiction Film & Television* vol. 14, no. 2 (2021): 187-207.

Gualeni, S., and Van de Mosselaer, N. *Doors (the game)*, digital game developed with Diego Zamprogno, Rebecca Portelli, Costantino Oliva, et al., available to play online at https://doors.gua-le-ni.com, 2021.

Heintz, J. “Reference and inference in fiction.” *Poetics* vol. 8, no. 1-2 (1979): 85-99.

Infocom. *Zork*. Digital game series designed by Tim Anderson, Mark Blank, Dave Lebling, and Bruce Daniels and published by Personal Software, Infocom, and Activision, 1977-1982.

Iser, W. *The Implied Reader: Patterns of Communication in Prose Fiction from Bunyan to Beckett*. Baltimore, MD: Johns Hopkins University Press, 1978.

Jesper, J. *Half-Real: Video Games between Real Rules and Fictional Worlds*. Cambridge: MIT Press, 2005.

Kafka, F. *The Metamorphosis*. Edited and translated by Stanley Corngold. New York: Bantam, 1972 [1915].

Lavocat, F. “Possible Worlds, Virtual Worlds.” In *Possible Worlds Theory and Contemporary Narratology*, edited by A. Bell and M.L. Ryan, pp. 272–295. Lincoln: University of Nebraska Press, 2019.

LucasArts. *Monkey Island 2: LeChuck’s Revenge* [Microsoft Windows]. Digital Game directed by Ron Gilbert and published by LucasArts, 1992.

Mobius Digital. *Outer Wilds* [PlayStation 4]. Digital game directed by Alex Beachum and published by Annapurna Interactive, 2019.

Mobius Digital. “Echoes of the Eye” [PlayStation 4]. Expansion for the digital game *Outer Wilds* directed by Alex Beachum and published by Annapurna Interactive, 2021.

Nishikado, T. *Space Invaders* [Arcade]. Digital game developed by Taito and published by Taito, 1978.

Noclip Podcast. *Outer Wilds Developers Break Down Echoes of the Eye | Noclip Podcast #49.* Video. YouTube, 19 November 2021. https://www.youtube.com/watch?v=tz8Sw6X-knM.

Pavel, T.G. *Fictional worlds*. Harvard University Press, 1986.

Pajitnov, A. *Tetris*. Digital game developed by Alexiey Pajitnov and Vladimir Pokhilko, 1984.

Ricksand, M. "Walton, Truth in Fiction, and Video Games: A Rejoinder to Willis." *The Journal of Aesthetics and Art Criticism* vol. 78, no. 1 (2020): 101-105.

Robson, J., and Meskin, A. "Fiction and Fictional Worlds in Videogames." In *The Philosophy of Computer Games*, edited by J.R. Sageng, H.J. Fossheim, and T.M. Larsen, pp. 201-217. Dordrecht, The Netherlands: Springer, 2012.

Rockstar Studios. *Red Dead Redemption 2* [PlayStation 4]. Digital game directed by Imran Sarwar and published by Rockstar Games, 2018.

Rowling, J.K. *Harry Potter and the Philosopher's Stone*. London: Bloomsbury Publishing, 1997.

Ryan, J. "Curating simulated storyworlds." PhD Dissertation at the University of California, Santa Cruz, 2018

Ryan, M.L. *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media.* Baltimore: Johns Hopkins University Press, 2001

Schulzke, M. "Simulating philosophy: Interpreting video games as executable thought experiments." *Philosophy & Technology* vol. 27, no. 2 (2014): 251-265

Tavinor, G. *The Art of Videogames.* Malden, MA: Wiley-Blackwell, 2009

Tavinor, G. “Videogames and Fictionalism.” In *The Philosophy of Computer Games*, edited by J.R. Sageng, H.J. Fossheim, and T.M. Larsen, pp. 185-199. Dordrecht: Springer, 2012.

Van de Mosselaer, N. “The Paradox of Interactive Fiction: A New Approach to Imaginative Participation in Light of Interactive Fiction Experiences.” PhD Dissertation at the University of Antwerp, Belgium, 2020

Walton, K.L. *Mimesis as make-believe: On the foundations of the representational arts.* Cambridge, MA: Harvard University Press, 1990.

Wardrip-Fruin, N., Mateas, M., Dow, S., and Sali, S. “Agency Reconsidered.” *DiGRA Proceedings 2009*

Wesp, Edward. “A too-coherent world: Game studies and the myth of ‘narrative’ media.” *Game Studies* vol. 14, no. 2 (2014).

Wildman, N. & Woodward, R. “Interactivity, fictionality, and incompleteness.” In *The Aesthetics of Videogames*, edited by J. Robson and G. Tavinor, pp. 112-127. New York (NY): Routledge, 2018.

Williams, J.R.G., and Woodward, R. “The Cognitive Role of Fictionality.” *Philosophy and Phenomenological Research* vol. 102, no. 2 (2021): 423-438.

Willis, M.D. “Choose Your Own Adventure: Examining the Fictional Content of Video Games as Interactive Fictions.” *The Journal of Aesthetics and Art Criticism* vol. 77, no. 1 (2019): 43-53

Willis, M.D. “The Importance of the Playthrough: A Response to Ricksand.” *The Journal of Aesthetics and Art Criticism* vol. 78, no. 1 (2020): 105-108.