

Can the past save sustainability's future? Retro video games as a circular economy of nostalgia

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Abstract

Retro video games play a role in fostering a circular economy of nostalgia within the broader context of climate change. The reutilization of older games contrasts sharply with the increasing consumption of resources dedicated to the production of new video games and consoles, which, in turn, exacerbate the issue of technological waste. How does this material retro circular economy intersect with the environmental meanings embedded in these games? Employing Actor-Network Theory methods, we conducted an analysis of retro video games developed for the Atari 2600 console. The findings indicate that these video games encourage a gameplay experience that perpetuates unsustainable forms of engagement with the environment, representing it in an anthropocentric manner as 1) exploitable and controllable, as well as 2) gendered and racialized. However, these older games also reveal post-anthropocentric ways of relating to the environment when they depict nature as 3) morally neutral and 4) supernatural and unnatural, thereby opening up post-anthropocentric modes of environmental engagement.

Keywords

Video games; media; environment; sustainability; cultural and creative industries

Introduction

Video games are technical objects through which the definitions of what is natural, human, and technological are negotiated and disseminated on a global scale, actively shaping our engagement with the world – most notably illustrated by the increasing gamification of contemporary experience (Vanolo, 2018). Given the considerable impact of video games as mediators of messages and actions, it is unsurprising that they have become a prominent opportunity for the development of games designed to promote sustainability literacy and engagement (Ouariachi et al., 2019). Despite extensive research on the role of video games and ecogames in fostering sustainability literacy and engagement (Stanitsas et al., 2019; Seller, 2024) and the sustainability concerns linked to the carbon footprint of the creative and cultural industries responsible for video game production (Fazlagić & Skikiewicz, 2019; Harper, 2021; Mayers et al., 2015; Mills et al., 2019), there remains a notable lack of studies addressing the relationship between retro video games and sustainability issues.

The objective of this article is to examine the relationship between retro video games and the ways in which they depict nature. Our focus on retro video games stems from their enduring success (Wulf et al., 2018) and their potential to offer a unique perspective on addressing climate change. The contemporary popularity of retro video games embodies a nostalgia for the past, as these once-prominent games are now experiencing renewed engagement (Nolan, 2021; Harris, 2020). The resurgence of interest in these older games – evidenced by multiple re-releases on modern consoles and adaptations for smartphones – demonstrates the emergence of what can be termed a *circular economy of nostalgia*. Circularity in the economy is achieved through the prolonged reuse of a product over time, thereby enhancing its durability and extending its lifespan (Morseletto, 2020). This concept is thus equally applicable to retro video games, which are played on modern hardware while preserving their original software. By choosing to engage with these older video games, consumers reduce the demand for new video games and consoles, thereby mitigating the accumulation of technological waste. The virtual domain of video games functions as an immaterial mechanism for sustaining a circular economy of nostalgia, ultimately contributing to the broader environmental landscape. Thus, retro video games emerge as a significant force within a circular economy, playing a relevant role in addressing climate change (Zhang et al., 2021).

A relevant refutation: The reuse of retro games is not simply the reuse of the hardware for which they were originally created, because they are precisely played on different and more recent hardware, namely smartphones. What is being defended is that the circularity of retro games does not lie in the particularity of the software, but in the fact that the initial investment – the material and human resources made so that this software could appear alongside the hardware in which it is programmed and the old hardware on which it was played – created the potential for this immateriality to survive beyond that initial material investment. Whenever the game is replayed, it is not necessary to reinvest again

in all the initial resources that made this software possible. This happens with all games, and even with other media such as cinema. The difference is that older games have a greater temporal potential for circularity because the initial investments are diluted over time. Another important counter-argument refers to the fact that the immateriality of the retro game must be updated in concrete hardware. Its preservation and compatibility with new hardware so that the game can continue to be played imply a carbon footprint associated with retro games. Faced with this relevant objection, one can counter-argue that, in comparative terms with new popular games that are produced for consoles with more complex hardware and with the involvement of material and human resources to produce and promote the games in an increasingly profitable and competitive industry where millions are at stake, retro games, despite the various adaptations to more recent hardware, retain a gain in circularity in their initial creation investment that will tend to be more sustainable than contemporary games and consoles:

This is primarily due to the use of energy-consuming computational technology, for graphics, online gaming, and nowadays also streaming. Furthermore, high-end computer graphics solutions are being developed and systematically becoming obsolete because of the video game's pursuit of photorealism. (Garda et al., 2020, p. 2)

While, in material terms (Brevini, 2016), the resurgence of these games indeed fosters a sustainable circular economy within the video game industry, it raises a critical question: What environmental virtual meanings are embedded in retro video games? This question emerges from the recognition that video games function as “boundary objects that facilitate passage between the material and seemingly immaterial contexts of the physical world and virtual playspace” (Chang, 2019, p. 11). This inquiry holds particular significance within the sphere of environmental politics concerning the circular economy of retro games, as nostalgia may contribute to reinforcing certain aspects of sustainability while neglecting others. Specifically, while video games can promote sustainable environmental engagement, they also contribute to the perpetuation of violent interactions with the environment, as seen in games where players can destroy nature and kill animals (Vuong et al., 2021). It is plausible that some retro games contain gameplay mechanics that are not only environmentally conscious but also, in some cases, fundamentally opposed to environmental preservation, given that they were developed in an era when the video game industry lacked the strong sustainability concerns and policies of today (Whittle et al., 2022). In this sense, we consider that a greater subtlety is necessary in the distinction that can be made between “representations” in video games and the “materialities” of video games, as will be made clearer in the methodological considerations of our article. For Abraham (2022), there exists a clear division of political labor in the sustainability of games between representations and materialities:

I am not particularly swayed by representational or mechanical content of games matching this or that environmental or ecological process, and so while acknowledging these waste by-products is an important first step, this cannot simply be done representationally. [...] we are entering an era where the climate is becoming the greatest concern for many of us. [...] But that work cannot come at the cost of distracting us from the most pressing concern which is the necessity of real material improvements and concrete action on emissions and other environmental harms that are needed in the world. (Abraham, 2022, p. 38)

But when the re-use of retro games promotes material circularity *and* questionable environmental meanings, the separation between representation and materiality is not that easy, nor prudent, to do. As a follower of Latour, it is surprising to read this separation between materiality and meaning in Abraham's work. Therefore, it is crucial to examine the interplay between material and virtual practices within the circular economy of retro games, particularly in considering how virtual engagements that are environmentally detrimental might paradoxically contribute to positive material sustainability outcomes.

Methods and materials

To address this question, we will analyze the content of retro video games to examine the relationship between the material promotion of a circular economy in video game resources and the virtual meanings ascribed to the environment within these games. Our study will adopt Bruno Latour's Actor-Network Theory (ANT) as a methodological framework. Latour proposes an analytical approach that examines the interconnections between society, technology, and nature while avoiding three key reductionist pitfalls: 1) the risk of *sociologism*, in which nature and technology are reduced to purely social explanations (Latour, 2005); 2) the perils of *technologism*, where society and nature are the result of technological determinism (Latour, 1990, p. 110); and 3) the danger of *naturalism*, in which technology and society are reduced to natural determinants (Latour, 2009, pp. 20-22). This methodological approach is particularly relevant for examining the relationship between video games and the environment, as it prevents privileging either element as the primary explanatory factor. ANT is therefore crucial for environmental communication studies, as it offers a way to move beyond anthropocentric analyses that treat media as mere social constructions of the environment (Hansen, 1991).

ANT investigates the constitution of the social world without resorting to a circular explanatory model, wherein social institutions are presumed to be composed of social relations, which in turn consist of social individuals, who themselves are the product of social norms emanating from social institutions. Instead, ANT seeks to understand how society is constituted in a non-tautological relationship with technology and nature. The ANT framework highlights the role of "non-social" factors – those traditionally overlooked by sociology – such as syringes, bacteria, or wind, in shaping social relationships. In this regard, ANT examines how *non-human* factors, including nature and technology,

actively participate in the formation of human society (Latour, 1996, p. 369). The concept of *actor* (Latour, 1996, p. 371), central to ANT, is intentionally relational, ensuring that the analysis does not begin with predefined categories of technological, social, or natural entities. According to Latour (1996, p. 373), an actor is “something that acts or to which activity is granted by others.” This conceptualization allows for a fluid understanding of the links between technology, society, and nature, defining actors by their capacity to act or be acted upon in technological, natural, or social ways. Methodologically, ANT prescribes that actors should not be defined prior to their engagement in relations with other actors. Latour (1996, p. 374) emphasizes that the actor’s identity is contingent on the relationships established among social, natural, or technological entities.

ANT has been utilized in video game studies to challenge an anthropocentric perspective that prioritizes human players and anthropomorphic virtual actors as the central agents in gaming experiences. Instead, it advances interpretations in which games themselves influence players, questioning anthropocentric positions, exerting force through rules, scripts, and design elements of games. This perspective shifts the view of video games from passive objects to active agents that shape player interactions (Jessen & Jessen, 2014). Within the ANT framework, our analysis seeks to examine how nature materializes in video games as an outcome of various agents constituting the game – such as colors, gameplay mechanics, spatial perspectives, distinctions between activity and passivity, and the hierarchical structuring of elements. This approach treats the video game itself as a network rather than limiting the analysis to the broader network of industry stakeholders, programmers, players, gaming hardware, and peripherals such as chips and keyboards. The core strength of ANT lies in its rejection of predetermined definitions of networks. It does not assume that nature or technology exists as fixed entities external to the game, awaiting representation within it. Rather, the game itself enacts the emergent formation of networked meanings related to nature and technology by interlinking agents at multiple levels, ranging from the micro scale of pixels to the mobility and immobility of environmental elements in the game. In applying this ANT approach to video games, we resist reducing video games to mere human creations while also avoiding the notion that they entirely negate human agency (Ahn, 2018, p. 228). Instead, we acknowledge video games as dynamic sites where the meanings of nature, technology, and agency emerge through intricate interrelations between human and more-than-human actors.

We do not use classical ANT concepts (e.g., associations, obligatory passage points, inscription devices, etc.), given that they themselves derive from the context in which they were created – namely Science and Technology Studies of laboratories, Pasteur, Political Ecology, or Gaia – and thus are “actors” that cannot be simply transposed without changing in nature given the emergent relational principles of ANT. We therefore follow ANT’s performative imperative to describe how nature, humans, and technology take shape through their interactions within the video game – that is, how they are mutually constituted by what they “do” to one another in the game. This methodological

choice simply derives from the potential and difficulty of ANT being a “framework” that is an “anti-framework,” which does not begin from a defined set of concepts and theories to study specific cases, but instead makes each case the opportunity for a new framework:

A case study that needs a frame in addition is a case study that was badly chosen to begin with! [...] The frame, or the context, is precisely what makes no difference to the data, what is common knowledge about it. If I were you I would abstain from frameworks altogether. Just describe. (Latour, 2004, p. 64)

“Describing” may make ANT approaches appear akin to more formalist methods in ecocriticism or close reading, due to their textual character – a resemblance that is not unexpected given ANT’s Greimasian semiotic heritage. However, there are multiple modes of description, and, in the case of ANT, it is not about uncovering a hidden meaning beneath an explicit one. It is not, as in close reading, a hermeneutic exercise applied to the video game using concepts from literature or intellectual history. Rather, description is the demanding task of suspending received meanings of nature and culture in order to observe how they performatively – rather than symbolically – mutually define one another within the video game through their interactions. Remaining at this level of empirical description is, as Latour repeatedly emphasizes, a significant challenge:

You think description is easy? [...] For every hundred books of commentaries, arguments, glosses, there is only one of description. To describe, to be attentive to the concrete states of affairs, to find the uniquely adequate account of a given situation – I have, myself, always found this incredibly demanding. (Latour, 2004, p. 65)

The fact that there are cables inside a console, or chips connected in a cartridge, or that the console is shipped by airplanes does not necessarily make them a network. The network is a performative, relational result, not an acquired one. As Latour states:

With Actor Network you may describe something that doesn't at all look like a network; conversely, you may describe a network which is not all drawn in an “Actor Networky” way. You are simply confusing the object with the method. ANT is a method, and mostly a negative one at that; it says nothing about the *shape* of what is being described with it. (Latour, 2004, p. 63)

It is not the fact that a video game has the *shape* of hardware, chips, wires, soldering, plastic, electricity, pixels, frame rates, buttons, and controllers that makes it materially suitable or, automatically, available for an ANT analysis, nor does ANT analysis reduce itself to “physical,” “technical,” or “electronic” materialities. For ANT, what constitutes materiality, a network, and the materiality of the network, is an open question – a book can be a material network of words (with shapes, ink, and positions, marked on paper) to form a story, and the story itself can be about how to write about materialities, altering the way one acts upon those materialities. Let us not forget the fact that Latour wrote

books, and it is through them that one approaches the materiality of games differently – this already challenges a rigid separation between material and non-material. The fact that a video game has the *shape* of an individual object, unconnected, without a network, does not mean that what happens inside it, i.e., in its contents, is not a network of virtual actors that make the game a site where the definition of nature, technology, and the human is negotiated in a relational way. To assume that, within the game, nature, the human, and the technological are already defined separately is to miss the full potential of ANT principles to treat video games as a singular phenomenon in which those differences are established and questioned. If ecocriticism seeks to see in the video game a hidden hermeneutic meaning revealed through interpretation, an ANT approach to the content of the video game seeks to understand how nature is constituted in gameplay, among the various human and non-human actors of the game, without presupposing that nature already has well-defined characteristics (green, animal, vegetal, etc.), especially since a video game does not spontaneously appear in nature, nor does it contain living beings inside it, and is therefore forced to alter what is understood by “nature.” Hence, the importance of studying video games not as a “reflection” of common ideas of nature, but as a way of questioning those ideas, of approaching the video game as bringing something different, with its own agency.

According to Foucault (1971), the exegetical, interpretative, or hermeneutic “commentary” aims to explain what the fundamental text being commented on does not say, or what it says silently, thus maintaining the commentary in its secondary role of always being dependent on a text to be commented on as an inexhaustible source of meanings – meanings that are inexhaustible only because the commentary activates them. By contrast, in an approach based on ANT, the game does not contain hidden meanings that only a “commentary” would reveal, that would be a really simple “network” of a comment-commented and hidden-revealed relationship. The description of video game meanings aims to co-create with the game what constitutes the agency of the game and of the commentary – neither the game nor the commentary simply exists independently of each other. That would not be following ANT. One does not interpret the hidden. Rather, one co-acts with the game when attempting to describe what is natural, human, or technological. The goal here is not to force a meeting between ANT and textual description (i.e., a linguistic one), because it is the very definition of what constitutes a description that is at stake, and that description can be carried out in many ways as long as it does not assert that there is a principal actor commanding the entire network (the analyst, the story, the ideas, the matter, the video game, the technology, the human, the symbol, or nature). Being a description in the ANT style, it is not a “formal analysis” as typically practiced in some game studies methods because, in those, formal analysis is an approach that lacks something – either it lacks context, or it lacks the act of playing, or it lacks the description of software and hardware:

Theme Section: Can the past save sustainability's future?

Formal analysis is the name for research where an artifact and its specific elements are examined closely, and the relations of the elements are described in detail. [...] Formal analysis of gameplay in games takes a basis in studying a game independent of context [...]. Performing a formal analysis of gameplay can be done both with the perspective that games are artifacts and that they are activities; in most cases, it blurs the distinction because both the components of a system and how these components interact with each other often need to be considered. (Lankoski & Björk, 2015, p. 23)

This important conceptual uncertainty (“blurs”) already shows that a game cannot be purely described as a static formal object, because what is found in it “formally” will depend on the performativity that simultaneously *trans-forms* elements and their relations. Formalization is thus always “disturbed” by the fact that the video game is an object that acts, that “de-forms,” “con-forms,” “in-forms,” and “re-forms.” Also, as a space of co-action, the video game is already available to an ANT analysis that cannot tolerate the concept of “context” (including the context of playing and the player) as an addition to the description of the object, since context is also itself an actor that must be defined in an inter-relational way – it cannot come from outside to “situate” the “formal” description of the game, as if it were not made by the network and did not have to make a network:

At best they [the contexts] apply equally to all your actors, which means they are absolutely irrelevant since they are unable to introduce a difference among them. As a rule, context stinks. It's simply a way of stopping the description when you are tired or too lazy to go on. (Latour, 2004, p. 68)

That is, if the same context allows one to explain different objects in the same way – for example, two different games created in 1976, in Japan, by white men, in a capitalist and liberal system – then those two video games do not introduce difference in the world, they do not need to exist, they have no agency.

It is possible to carry out a “textualist” analysis of a video game without reducing it to the representational level, by thinking of the video game as a “text-in-action,” as a speech act, as doing something, and not as standing “in place of,” made present *a posteriori* in a re-presentation, because text and game are actors that, from the perspective of ANT, cannot exist separately. Hence the important collection *Thinking with Bruno Latour in Rhetoric and Composition*, where it is stated: “the world can be productively understood as a rhetorical machine fueled by both persuasion and technology, each shaping the other” (Rivers & Lynch, 2015, p. 5). Textual composition and rhetoric are not immaterial, nor are they anti-ANT. Rather, they are the material that ANT uses to question the distinctions between material and immaterial. They are ways of making networks – among concepts, *topoi*, letters, phrases – and, through them, ways of acting upon the world, not merely representing it. Ian Bogost (2007) is the one who formalizes this rhetorical approach to video games most explicitly: “*procedural rhetoric*, the art of persuasion through rule-based representations [...]. This type of persuasion is tied to the core affordances of the computer: computers run processes, they execute calculations

and rule-based symbolic manipulations" (Bogost, 2007, p. xix). Despite the interesting proposal, Bogost has an authorial and efficiency-focused view of "ideas," which makes it difficult to analyze how "nature," understood as something that does not aim to convince anyone, nor has a defined authorship, nor "ideas," is constituted through the video game: "Procedural rhetoric is a general name for the practice of authoring arguments through processes. [...] procedural rhetoric entails expression – to convey ideas effectively. Procedural rhetoric is a subdomain of procedural authorship" (Bogost, 2007, pp. 28-29). In some sense, it is too "unnatural" to think of nature in rhetorical terms, it is still too anthropocentric.

It is not because one does not study the materialities, gameplay, functions, or material specifications of the game that one is not conducting an ANT analysis. That would be to reduce ANT to a limited notion of technology – forgetting that any ANT analysis must resort to words, to text, to arguments, that is, it is already a writing technology – when what is technical can be something as simple as a "color" or a "shape," but this will depend on how the actors interact with each other to constitute themselves:

It depends entirely on what you make your actors, or actants, do. Being connected, being interconnected, being heterogeneous is not enough. It all depends on the sort of action that is flowing from one to the other, hence the words "net" and "work." (Latour, 2004, p. 64)

It must always be remembered that what is human, natural, technological, video game, text, or commentary is not rigidly defined from the outset, but, in ANT terms, will emerge from the very process of description:

ANT is pretty useless for that [providing frameworks]. Its main tenet is that actors themselves make everything, including their own frames, their own theories, their own contexts, their own metaphysics, even their own ontologies [...]. So the direction to follow would be more descriptions. (Latour, 2004, p. 67)

Description does not comment on the existing. It acts upon the existing, it networks with it. Writing about how the content of a video game emergently and relationally creates human and non-human actors already alters the way one writes, because writing is also an actor that changes together with the written-actor. The described-actor changes with the describing-actor. This is the dizzying difficulty of analyzing a network while being part of a network, without any principal actor commanding the others in a hierarchically superior manner, which is a good way to question anthropocentric approaches to nature, as a human detached from, or as sovereignly governing, nature: "No net exists independently of the very act of tracing it, and no tracing is done by an actor exterior to the net" (Latour, 1996, p. 378).

The materials used in our ANT analysis consist of a representative selection of retro video games that are set in natural landscapes or associated with natural elements. The

criteria for inclusion are as follows: 1) retro games developed for older consoles are prioritized, because of their extended replay potential in time, which enhances their sustainable circular value by allowing continued play long after their original release; 2) games with higher play counts on retro gaming websites are favored to ensure the inclusion of titles that remain accessible and impactful in terms of circular sustainability in contemporary contexts; and 3) games featuring elements of more-than-human nature.

While there are numerous websites and apps offering access to retro video games, only one platform, RetroGames (n.d.), maintains organized user metrics, and does not have any paywall, or subscription, to provide access to the games, contrary to newer Nintendo platforms, or collections of retro games purchased in Google PlayStore; hence, it is open access. The fact it has organized metrics, contrary to other similar sites, is a strong reason for choosing this site for the collection of the sample of retro games to be evaluated, ensuring an initial quantitative assessment of the dimension of the phenomenon under study. Furthermore, the existence of hundreds of similar online playable retro games, just on this site alone, collectively accumulating millions of plays, underscores the substantial dimension of this phenomenon. The significant play counts of these selected games ensure that our qualitative analysis addresses an aspect of considerable quantitative impact within the contemporary nexus of video games and the environment. Consequently, our analysis focuses on video games that hold paramount relevance for understanding how environmental meanings are performed in this circular economy of retro game software. It is important to note that the play counts provided in this text are conservative estimates, as they are derived solely from the playing times recorded on one retro gaming website.

The older the game, the greater the sustainability of its circular economy as an object, and not in terms of its ecological content or meanings – for example, the game *Pong* will have greater sustainable circularity than the game *Ecco the Dolphin*, despite the latter having a more evident ecological message, because *Pong* consumed fewer human and material resources in its creation and, when played in the present, the temporal distance since its creation increases the savings in resources compared to a more sophisticated and recent game like *Ecco*. In this sense, based on the database of RetroGames, we chose the oldest console possible to play on this platform as a way to select the greatest potential for circularity over time, i.e., playing games in the present whose initial investment in resources continues to be utilized and not wasted. On this website, the oldest console featured is the Atari 2600, with 373 games played 22,154,760 times as of February 9, 2025. Although it is not the oldest console in history, this site features it as the oldest console for which replay numbers can be measured, ensuring objectivity in sample selection. Obviously, other more popular consoles such as the PlayStation (e.g., PS1) or Nintendo (e.g., NES) translate into a larger number of players, which increases their circularity. However, our selection criterion aims to account for the retro dimension in its maximum temporal extent and not only in the number of times it is played, i.e., it focuses on the

moment of the appearance of the materiality of the console and its games that create a carbon footprint over time as far back as possible. In this sense, even if the PS1 and NES may be more sustainable materially, their retro temporal dimension is smaller than that of the Atari 2600. The PS1 and NES are sustainable mainly due to the replay factor, and the Atari is sustainable due to the time factor, i.e., its early appearance in the history of video games. However, considering that more recent consoles involve more resources in their production and energy expenditure in their conversion to emulators, it is possible that replaying more popular consoles may have a consistently larger carbon footprint than older consoles. Future studies would benefit from making a rigorous calculation of the costs of making a game for the Atari 2600 and the number of times it is replayed, compared to a popular game for the PS1, such as *Final Fantasy VII*, which, despite having greater resource expenditure in its production, may have a smaller carbon footprint due to the number of times it is replayed compared to the Atari. The Atari 2600 was one of the first video gaming consoles to use game cartridges. It was released in 1977 under the name Atari VCS (Video Computer System). In the 1980s, it was renamed as Atari 2600 and remained on the market until the early 1990s. It had 128 bytes of RAM memory, while the game cartridges typically contained 2 or 4 kilobytes of ROM memory, with later games reaching up to 32 kilobytes in size. The limited memory involved in the console and, particularly, the games, when compared to the technical specifications of current consoles, computers, and their games, demonstrates how Atari 2600 games contribute to the circular economy of software when played today.

A detailed qualitative ANT analysis must focus on a small sample of video games, given the intricate networked materialities and meanings that video games perform regarding the environment and the limited space of an article. For our analysis of environmental meanings, we have chosen to examine 8 games: *Dragonstomper*, *Pitfall*, *Custer's Revenge*, *H.E.R.O.*, *Donkey Kong*, *Seaquest*, *Jungle Hunt*, and *Air Sea Battle*, as they meet our inclusion criteria, totaling 324,443 plays as of February 9, 2025. It can be rightly argued that these games have little "nature" in them. For example, *Donkey Kong* takes place in an urban setting, while in other games nature has only a presence as a non-interactive "background." On the one hand, as defended in the introduction, what is sought to be studied is whether retro games that materially have a potential for sustainable circularity simply because the resources used many years ago to create them continue to be played, can paradoxically have weak or even questionable sustainability messages. Therefore, the study is not about games with environmental, natural, or eco-game themes in general, but about games that, materially and independently of their content, can contribute to a more sustainable world because they promote a temporal extension of the material heritage of video games. If those games are not thematically about nature, or if they are anti-nature, this will already be a relevant result, showing that material circularity does not always correspond to a "symbolic circularity" of meanings in favor of the environment. It therefore means that when we use replay metrics to select the most played games as a

marker of their greater potential for sustainable economic circularity, it is not to choose the games “symbolically,” i.e., thematically, focused on sustainability or nature-related topics, but to select the sample of games that are more sustainable materially, i.e., because they increase its circularity value when they are increasingly replayed, while potentially having anti-environmental messages. It is this contradiction that is sought to be detected and explored. On the other hand, following the methodological principle of ANT, to suspend what constitutes an actor as natural, social, or technological, in order to understand how, for example, a “natural actor” is constituted within the network of meanings and actions of the game, we seek not to define too rigidly what constitutes “nature.” What is “natural” will be a relational and performative result of the game itself. We attribute to the game the possibility of reinforcing or questioning what, in the history of video games, has come to be constituted as “natural.” In this sense, and as one of the anonymous reviewers well noted, “we can call almost any game ‘nature-based’”. That is precisely the openness that ANT methodologically allows, to question the rigid differences between humans and non-humans. What is more important is not simply to say that everything can be “nature-based,” but “how” it is constituted as natural, which actors are mobilized, what kind of nature emerges in the game.

Results

In this section, we will provide a description of the selected games based on the criteria outlined above, organized in descending order by the number of times they have been played online. This will familiarize the reader with these retro games, whose environmental meanings will be elaborated in the following discussion section.

Dragonstomper, released in 1982 and played 85,3943 times, is set in a kingdom once ruled peacefully by a king. After a druid magician enchanted a powerful amulet, believing it would subdue a dragon, the amulet was accidentally left in the hands of the dragon. This greatly increased the dragon's power, which it used to wreak havoc on the kingdom, causing crops to wither and creating monstrous creatures. With the king's knights defeated by the dragon's minions, only the *Dragonstomper* remained to restore the kingdom. The *Dragonstomper* journeys through the countryside and a township to prepare for the battle against the dragon. The game unfolds across three distinct in-game areas: The Enchanted Countryside, The Oppressed Village, and The Dragon's Cave. In the countryside, the goal is to gain the power required to enter the village. The *Dragonstomper* engages in battles with enemies in the field to gather enough gold to pass the bridge guard. These encounters are random, and each battle depletes the player's strength. When strength reaches zero, the game ends. Strength is gradually restored throughout the game. Combat is turn-based, and players choose actions from a text-based menu, including options to fight, use a magic spell, wield a weapon, or attempt to flee. Upon entering the village, players can purchase items and recruit additional warriors to assist in

the final battle before reaching the dragon's cave. Once the bridge guard allows passage, players advance into the Oppressed Village. There, three stores are available: a Hospital, a Magic Shop, and an Item Store. Unneeded items from the wilderness can be sold for extra gold to buy new tools. Similar to the bridge guard, the three soldiers require bribing, with payment options including gold, rubies, or sapphires, to enlist with the player. The village also offers healing potions, spells for detecting and avoiding traps in the dragon's cave, and various goods such as ropes and bows and arrows. Once prepared, the player may enter the Dragon's Cave. The cave itself is a long, narrow hallway lined with jagged rock protrusions, devoid of enemies but filled with dangerous traps.

Pitfall! was released in 1982 and has been played online 50,2018 times. The player controls Pitfall Harry, who has a 20-minute time limit to find a treasure in a jungle. The game world is filled with enemies and obstacles, which cause the player to lose lives and points. Pitfall Harry can move left and right, jump over and onto objects, swing from vines, and climb ladders to seek the treasure and avoid danger. Hazards such as falling into a hole or colliding with rolling logs cause the player to lose points. The player starts with three lives and loses one if they fall into quicksand, swamps, or tar pits, or if they are hit by a scorpion, cobra, or crocodile.

Custer's Revenge (also known as *Mystique Presents Swedish Erotica: Custer's Revenge*) is a sexual action game released in 1982 and played online 23,4544 times. The objective of the game is to sexually penetrate a Native American woman, named "Revenge," who is tied to a post. The player character is based on Lieutenant Colonel and Brevet Major General George Armstrong Custer. The game consists of four numbered modes. In modes 1 and 2 the player must avoid arrows, while in modes 3 and 4 cacti that appear and disappear at random intervals are added as obstacles. If Custer reaches Revenge, the player must repeatedly press the fire button for Custer to penetrate her and earn points.

H.E.R.O. (an acronym standing for *Helicopter Emergency Rescue Operation*) was released in 1984 and has been played 14,5062 times. In the game, the player uses a helicopter backpack and other tools to rescue victims trapped deep within a mine. The player is equipped with a backpack-mounted helicopter unit that allows them to hover and fly, as well as a helmet-mounted laser and a limited supply of dynamite. Some mine shafts are obstructed by cave-ins, which require dynamite to clear. The player must avoid standing too close when the dynamite explodes. The helmet laser can also destroy cave-ins, although it does so at a much slower pace than the dynamite. Some mine sections are illuminated by lanterns, and if the lantern is destroyed, the layout of that section becomes invisible. Exploding dynamite briefly illuminates the mine. The mine shafts are inhabited by spiders, bats, and other deadly creatures that can be destroyed using the laser or by being near exploding dynamite. In later levels, the player faces magma, which can also be cleared using dynamite, and, like the mine creatures, is lethal when touched. Lastly, some of the deeper mines are flooded, requiring players to hover safely above the water.

Donkey Kong was released in 1981 and has been played 14,2500 times. The gameplay centers on maneuvering the main character, Mario, across a series of platforms while avoiding and jumping over obstacles. The player must rescue a damsel in distress, Pauline, from a giant ape named Donkey Kong. A life is lost if Mario touches Donkey Kong or any enemy object, falls, or allows the bonus counter to reach zero. The game ends when all lives are lost. Stage one involves the player scaling a construction site made of crooked girders and ladders while jumping over or hammering barrels and oil drums thrown by Donkey Kong. Stage two takes place on a five-story structure of conveyor belts, each transporting cement pans. The third stage requires the player to ride elevators while avoiding bouncing springs. The final stage involves Mario removing eight rivets from the platforms supporting Donkey Kong, causing Donkey Kong to fall and saving Pauline. These four stages combine to form one level.

Seaquest was released in 1983 and has been played 12,0985 times. The game is an underwater shooter where the player controls a submarine. The player uses the submarine to shoot at enemies and rescue divers. Enemies include sharks and submarines, which fire missiles at the player's submarine. The player must defend against the enemies by firing an unlimited supply of missiles while attempting to rescue divers swimming through the water. The submarine can carry up to six divers at a time. Each time the player resurfaces before collecting a full load of six divers, one diver is removed. The submarine has a limited amount of oxygen, so the player must surface frequently to replenish it. However, if the player resurfaces without any rescued divers, they lose a life. If the player resurfaces with the maximum number of divers, they earn bonus points for the remaining oxygen. As the player resurfaces, the game's difficulty increases, with more enemies appearing at higher speeds. Eventually, an enemy submarine begins patrolling the surface, leaving the player without a safe haven.

Jungle Hunt is a one- or two-player side-scrolling platform game released in 1983, and has been played online 11,4248 times. The player controls a jungle explorer dressed in a pith helmet and safari suit, with the mission of rescuing his girlfriend from a tribe of hungry cannibals. To accomplish this, he must swing from vine to vine, survive a crocodile-infested river, avoid falling rocks rolling downhill, and rescue the girl before she is lowered into a boiling cauldron. In Scene 1, the explorer must swing from vine to vine, with timing being critical. Missing the vine results in falling to the jungle floor, causing the loss of a life. Occasionally, a gorilla may be swinging from the vine, requiring the player to time their jump carefully to avoid colliding with the gorilla. If the explorer hits the gorilla, he falls to the jungle floor and loses a life. Scene 2 has the explorer navigating a crocodile-infested river, where he can attack crocodiles with his knife unless their mouths are open. The explorer must periodically resurface for air, during which time he cannot attack the crocodiles. Bubbles rising from the bottom of the river may trap the explorer and carry him to the surface, potentially causing collisions with crocodiles. Scene 3 involves the explorer dodging various sized boulders rolling and bouncing toward him as he climbs the

side of a volcano. In the final scene, the explorer must avoid cannibals while attempting to reach the woman being lowered into a flaming cauldron.

Air Sea Battle was one of the nine original launch titles for the Atari 2600 when it was released in September 1977, and has been played 113,113 times. In this game, players shoot targets – such as enemy planes, ships, or shooting gallery targets, or even each other depending on the chosen game mode – competing to achieve the highest score.

Discussion

The ANT analysis reveals that there are two distinctly anthropocentric and two post-anthropocentric ways of relating humans, technology, and nature within the circular economy of retro games. Nature is presented in the following four modes across the eight video games analyzed: nature as 1) exploitable and controllable, 2) gendered and racialized, 3) morally neutral, and 4) supernatural and unnatural. These modes help to specify and expand upon the ways in which the literature on video games and the environment has described how nature manifests: “environment is largely subject to the activity of more lively entities that inhabit it: either an index of their movement (background) or subject to their extractive (resource), militarist (antagonist) or cognitive (text) gameplay” (Abraham & Jayemanne, 2017, p. 84).

Nature as exploitable and controlable

In this selection of games, two of them follow familiar patterns of interaction with nature as critiqued in environmental communication studies, where nature is depicted as passive, with interactions that do not lead to any significant change or danger for humans. This presentation of nature is shared between both past and present games, reducing it to a mere “passivity” exposed to human manipulation (Seller, 2024, p. 353). The video game thus situates humans within a manipulable nature while simultaneously shielding them from the consequences of the manipulation itself. In *Air Sea Battle*, nature – presented as green terrain, a sky, and a sea in shades of blue and white – serves as an indestructible backdrop to war. The warfare in the game has no impact on the environment, affecting only the moving war objects. The only exception is a level in which players have the option to shoot at ducks. In this case, the form of nature that is exposed to destruction is animal life, which is granted the same functional or performative status as airplanes and boats due to the way it is destroyed and how it moves within the game. This portrayal presents a fiction of nature as non-ecosystemic – animals may perish, but nature persists unaffected by their absence. Furthermore, this framing suggests that anything programmed to be destructible should indeed be destroyed: The mere possibility of destruction legitimizes its execution, rewarding the player with victory points. Conversely, in *H.E.R.O.*, subterranean nature is depicted, unlike in *Air Sea Battle*, as inhospitable to humans, who face the risk of being trapped within it. This inhospitality is conveyed

through darkness, proximity to lava, water pits, and the presence of creatures inhabiting these underground spaces. However, this hostility remains controllable, and it is precisely this control that ensures victory. The player is equipped with a set of aeronautical and military technologies that allow them to counteract the forces of nature in their mission to rescue humans trapped in the mines. These trapped humans represent a temporary barrier to human technological advancement within the Earth's crust – one that can be overcome because a hero, that is, a technologically enhanced human with flight and destructive capabilities, exists to rescue those affected by nature's adverse conditions. It can be claimed that for these games that they "naively reproduce a whole range of instrumental relations that we must reimagine" (Chang, 2019, p. 60).

Nature as gendered and racialized

Although, for ANT, analysis must suspend traditional ways of approaching the relationship between nature, technology, and society, even ANT itself must engage with the historical meanings embedded in society, technology, and nature. Without this engagement, ANT risks falling into idealism or becoming a purely formal analysis that disregards the historical formation of experience over time. An ANT analysis of the musealization of video games demonstrates that treating video games as artifacts of the past – granting them the status of "retro" – requires the involvement of multiple actors, including video games themselves, institutions, curators, and archives (Eklund et al., 2019). Even Latour acknowledges this necessity when studying historical figures such as Louis Pasteur (Latour, 1993). This means that ANT's methodological suspension of what is traditionally considered human and more-than-human should not come at the cost of disregarding historically sedimented injustices (Star, 1990). Since history, as a science of time and as part of the formation of living beings and the environment through natural history, is already a complex web of relationships – including those of power – between natural, social, and technical agents, its role must be acknowledged in ANT analyses. The history of injustice is not a fatalistic given; it is shaped by the interactions between society, nature, and video game technology, and, as such, can be altered or prolonged. The natural and social history embedded in the technology of the Atari 2600 video games analyzed here has crucial gendered and racial dimensions. Notably, there is a gendered and racial presentation of nature throughout history as either vulnerable or hostile (Leonard, 2006; Williams et al., 2009).

In *Custer's Revenge*, nature is depicted in a "Western" style, characterized by a desert-like beige terrain, cacti, clouds on the horizon, and brown mountains. Human nature is also present in the nudity of the military figure, Custer, and the Native American woman, *Revenge*, whose characterization is reduced to a cowboy hat and boots for Custer and a stereotypical feather for the Indigenous woman, reinforcing a certain representation of North American Indigenous peoples. Historically, the problematic association of women with nature (Hunter, 1976; Roach, 1991), constructed through the "male gaze" (Mulvey,

2001), has positioned them as bodies of sensuality, as objects of sexual drives tied to fertility, caregiving, lacking reason, and controlled by wild emotions. This association is materialized in the game through the depiction of the Indigenous woman, who is tied to a post, stripped of sexual autonomy, and subjected to rape, which the game presents as a form of racial “revenge” by the white male protagonist as a reward for overcoming the dangers posed within the game. The penetration of this Indigenous nature – this “other” nature, which, as a woman, is rendered vulnerable to male action – demonstrates the necessity of critically questioning the human/more-than-human divide in video game nature analysis. Such an approach exposes a continuum of violence enacted against different beings based on the kind of *nature* attributed to them – that is, a nature made available for destruction, violation, and exploitation, one that is gendered and racialized as distinct from the Western white man. This continuum between the human and the more-than-human in the constitution of what is deemed natural and social in video game technology also reveals the construction of white masculine nature – the “heroic” nature – which is itself shaped by so-called, natural drives, expressed in both the rape and the nudity present in the game. These impulses persist in the technological era of video games, where they become technologically mediated and made playable in virtual form. This demonstrates how video games function as performances of natural drives that, at any moment, threaten to destroy the supposed “nobility” and “superiority” of humanity – defined traditionally as the product of technology and culture against nature and unreason. These constructs are programmed into the game to regulate what is otherwise considered beyond control – what is deemed “natural” – and to impose order onto what the game defines as disordered and dangerous: plants, animals, women, and even male sexual impulses. A mix that reinforces the unjust modes of subjectivation associated to videogames,

[it is] this asymmetrical sexual composition that makes virtual play so perfectly fitted to global capital. The world market is a dynamo at drawing people into the circuit of production and consumption, but it neglects, to a catastrophic degree, social and ecological reproduction – care for households, community, and environment. (Dyer-Witheford & De Peuter, 2009, p. 22)

Gender functions as a crucial actor in distinguishing different types of nature within video games. In *Donkey Kong*, gender serves to differentiate two kinds of nature: that of the gorilla, portrayed as a naturally malevolent wild creature whose capture of the woman justifies the player's efforts to save her, and that of the woman, depicted as a passive object with a tameable and vulnerable nature (Summers & Miller, 2014). She is exposed both to the force of animal nature and to a dependence on male rescue. The male protagonist, by engaging in both the attack on the beast and the salvation of the woman, not only reinforces the moral distinction between these two natures but also constructs himself as masculine – positioned outside of nature, as a supra-natural human, that is, as not

capturable and without the need of being saved. In *Jungle Hunt*, the game introduces the ambiguous human-wild figure of the cannibal, a liminal entity that exists between nature and humanity. The cannibal, by treating humans as natural food, is framed as part of nature in the game's logic – an element of strangeness and danger. This characterization is visually marked by his bare torso, contrasting with the clothed player character, reinforcing a distinction between civilization and savagery through fashion as a signifier of urban civility. The non-civilized, non-urban, and non-Western figure is presented at its most threatening – the ultimate signifier of barbarity – through anthropophagy. The game thus inscribes wild nature within the human rather than confining it to animals, portraying the cannibal as a force that threatens to consume the very thing the male hero values most: the woman. Across the analyzed video games, there is a nuanced yet consistent distinction between various types of nature, each assigned specific gendered and racialized statuses. The dangerous nature of the environment – comprising animals and cannibals – is contrasted with the nature of the woman, who embodies vulnerability, exposure to danger, and dependence on the heroic man's technology and reason for survival. As one of the anonymous reviewers rightly noticed, this description of how nature appears in these games is "shallow," but it is not because we didn't describe them faithfully, but because these games are indeed shallow. The way they compose a network of actions and meanings reproduce shallow, that is, overused and unoriginal, forms of nature, which are, nonetheless, important to describe as common anthropocentric forms of approaching nature. As Latour would say, "the actors in your description make no difference whatsoever. [...] Which means they are not actors at all: they simply carry the force that comes through them" (2004, p. 72). That is, these video games tend to reproduce familiar ways of performing historically gendered and racialized versions of nature.

Nature as morally neutral

In this selection of video games, nature is also programmed as either an ally or an obstacle to the player's objectives. At times, it is randomly programmed as something indifferent to victory or defeat, constituting a post-anthropocentric relationship with nature – i.e., a nature that does not respond in a controlled manner to human goals. In this way, the video game performs "the idea of living deliberately in nature through a video game" (Chang, 2019, p. 2), demonstrating that achieving this effect does not require high technological power or a correspondingly large carbon footprint. Instead, it can be accomplished with just a few kilobytes of memory in Atari 2600 games. Nature is not used as a moral guarantor of whether in-game actions are right or wrong. Its normativity – programmed through the game's rules – is a normativity without *telos*, without an inherently good or bad purpose. The ethical implications depend entirely on the interaction established during gameplay. As a result, nature does not emerge as either victorious or defeated within the game. It remains indifferent to the game's objectives. This programmed indifference is not merely a given but is distinctly designed – nature appears, through the

technological mediation of software, as simultaneously available and unavailable to the player's goals.

For example, in the game *Dragonstomper*, nature appears as a green landscape featuring different types of trees, bushes, and lakes. Within this environment, the player can either discover gold – crucial for advancing in the game – or be caught off guard by animals such as spiders, monkeys, and snakes that inflict damage. Nature thus serves as an arbitrary space where the player can either perish or acquire the necessary resources to progress to the second level, where these resources can be exchanged for medicine and weapons. These, in turn, prepare the player for the third level, where they must confront the final boss: a dragon. In *Dragonstomper*, encountering nature is necessary, as it offers both essential benefits for victory and potentially fatal consequences. Nature is thus technologically constructed by the video game as both an ally and an adversary to the player's objectives. It is the space where one can lose everything or acquire the tools needed to combat a *supra-nature* – a fictionalized form of nature embodied in the dragon. In *Pitfall!*, nature, again presented in shades of green as in *Dragonstomper*, facilitates the player's movement. Vines allow the player to swing over lakes, and crocodiles with closed mouths serve as stepping stones. Yet, this same nature also functions as the player's primary enemy through its wild animals and fire hazards. Nature is not merely a backdrop in the game; it constitutes the gameplay itself. It is the process, rather than the goal, of play – it is the space, the objects, and the movements that make playing either possible or impossible. Even though this nature, whether as a supporting element or an obstacle, is technologically programmed, its role is only fully realized through gameplay. It is only in interaction with the player – through its *regular irregularities, that is, systematically random* – that nature reveals itself as either helpful or obstructive. This demonstrates that a relationship with nature, even when technologically constructed, is morally neutral regarding the correctness or wrongness of the player's objectives. However, this neutrality only takes shape through play itself. Nature's surprises emerge only in the act of playing. Nature, therefore, is not something that merely repeats itself. Rather, it is something that repeats itself *differently* with every new interaction.

Supernatural and unnatural and nature

Video game technology enables the construction of forms of nature that challenge the boundaries of the relationship between nature and the human, or between nature and society. The video game thus functions as a kind of “window” into non-anthropocentric forms of nature – forms that are designed to be perceived by the human, to be played by the human, thereby introducing the player into an unfamiliar world, distinct from the one they “naturally” interact with. This constitutes the agential role of the video game, its more-than-human contribution to the construction of a non-anthropocentric nature, thereby opening new possibilities for engaging with nature. This non-anthropocentric

window emerges precisely when human survival is placed at the center of the video game – when nature is programmed to be inhospitable to the human.

In *Donkey Kong*, the gorilla functions as a techno-natural agent, i.e., a *supranatural* entity, utilizing its abilities to climb technological structures such as scaffolding, hurl tree trunks at the player, and abduct the woman. Instead of climbing trees “naturally” in a “natural” environment, the gorilla navigates a technological setting of human-made architecture, transforming it into a hazardous space for the human player, who lacks the same climbing agility and is thus at a disadvantage within their own technological habitat. The world constructed for human habitation – the buildings – becomes a domain controlled by the gorilla’s vertical agility. Nature thus demonstrates its power outside what is conventionally considered “natural,” dangerously naturalizing its relationship with the very technological architectures designed to accommodate humans. The gorilla in *Donkey Kong* thus enacts, through a natural figure of the animal, the supranatural possibility of nature – the capacity to appropriate technologies originally designed to control nature, thereby endowing that nature with an uncontrolled power, a dynamic also present in *Dragonstomper*. In that game, the player interacts with both the dangers and advantages of nature in preparation for confronting the supranatural force of the dragon, a creature that is omnipotent precisely because it controls the magical element that was originally produced to subdue it. It was the failure of this technology that transformed a partially supernatural threat into a total one. This constitutes the supranatural quality of nature in relation to the human: the ability of nature to exist independently of human nature while simultaneously appropriating human technologies to challenge it. Through an alliance of more-than-human entities – natural and supernatural – the video game demonstrates that technology is not merely a means of defending against nature but also a threat to the human. Between a nature that is morally indifferent to human objectives and a supranature whose dangers emerge from technological attempts to control it, as in *Dragonstomper*, the human finds themselves navigating two forms of nature—both inherently inhospitable to human nature and both capable of controlling the very technologies intended to subjugate nature.

Video games also illustrate how, in its relationship with nature, the human is always at risk of claustrophobia – of becoming trapped within the limits of its own mammalian nature, which requires oxygen. The video game renders human nature something *unnatural* – in the sense of a *humanly contra-nature*, something that threatens human life, particularly when the materials that constitute the game (chips, electricity, algorithms, etc.) do not themselves require “breathing.” It is technology that, within the virtual world, defines the human as a limit to itself. The video game transforms human nature into an obstacle to victory, making nature within the human appear – through technological means – as an internal threat that destabilizes its own existence. In *Jungle Hunt*, where nature primarily serves as an obstacle to the human pursuit of its objective, whether in its organic or non-organic forms, respiration also becomes a defining limit to the human’s

ability to overcome nature. Breathing is a constitutive element of continued life, and in the levels where the player must swim and submerge, resurfacing for air is necessary in order to keep playing. Here, playing and living become inseparable within the video game. In *Seaquest*, this natural human limitation – oxygen – relates to the presence of animals that do not require it to survive. In this game, nature manifests as a threat through the sharks that endanger the player-controlled submarine, highlighting not only the technological capacity of submarines to kill sharks but also the sharks' ability to threaten the submarine. This dynamic reveals both technological vulnerability and the supernatural capability of the sharks. Once again, oxygen emerges as a crucial element. Despite its technological design, the submarine still contains natural elements – specifically, human beings who cannot survive underwater without oxygen. Nature, then, is both the primary danger and the boundary that makes the game challenging. The swimmers, whom the submarine must rescue from the ocean depths, are not affected by the submarine's ammunition, indicating a programmed distinction between two moralities of nature: human nature, which is invulnerable to destruction (unlike the sharks), yet fragile due to its dependence on oxygen. The human thus appears as an ambiguous nature – both a nature with limitations (as it requires oxygen) and an indestructible nature at the same time. That which must be saved cannot be destructible, reinforcing the logic that what is destroyable should indeed be destroyable – i.e., nature that does not survive is nature that is not meant to survive. The video game programs the human as the one who must survive and be protected, precisely because it can survive through its own unnatural nature – one that is ambiguous, simultaneously at risk and indestructible, i.e., unnatural.

Conclusion

Based on the Actor-Network Theory analysis of games made for the Atari 2600 console, it is possible to assert that nature appears, through the technological medium of video games, in the following anthropocentric and post-anthropocentric ways: nature as 1) exploitable and controllable, 2) gendered and racialized, 3) morally neutral, and 4) supernatural and unnatural. The case of retro games shows that the re-play of retro video games, which is crucial for a sustainable circular economy of the video game industry, is a highly nuanced mode of fighting climate change. Considering that the immateriality of what is placed in a circular economy includes content with its algorithmic potential – its capacity to continuously form playable images, which is what makes retro video games possible beyond their first appearance – i.e., their ability to continue existing in the future across different consoles and computers, it becomes clear that the circular economy is not only material but also consists of the performativities of play, its meanings, and the ways it relates nature, humans, and technology. On one hand, the relationship with nature in the video game as exploitable and controllable shows that this circular economy may be nostalgically dangerous, as it consumes fewer resources in game creation but

exhibits an unsustainable relationship with nature. It is also violent in terms of gender and race, which appear as the natural other of the white, male human. On the other hand, the technology of retro video games also portrays nature as something more-than-human, something that does not conform to human perspectives, questioning its sovereign place, particularly in how nature appears as morally neutral, supernatural, and unnatural. Here, nostalgia for retro games is not a reproduction of the sovereign white male human but a return to something impermanent, to a past that projects other, more-than-human times.

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