On the de-familiarizing and re-ontologizing effects of glitches and glitch-alikes

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ABSTRACT
Interactive digital experiences are understood as disclosing possibilities of being that can extend beyond the actual. The ways in which those experiences prompt their audiences to interactively apply and repurpose their cognitive faculties are constrained by the technical possibilities of the digital medium. This entails that the transformative activities invited and upheld by the computer depend on the functional affordances of digital technology as well as on the specific ways in which it errs and malfunctions.

In this paper, I discuss non-catastrophic computer malfunctions (i.e. glitches) as potentially introducing aspects of surprise, ambiguity, and humor in the interactive experience of a virtual world. Computer glitches can also be intentionally designed to be a constitutive part of a virtual world and triggered deliberately; these types of glitches are used as expressive tools that can stimulate critical thought and make us suspicious of the stability and the validity of our world-views.

Keywords
Glitch, Glitch-alike, Virtual Worlds, Modernism, De-familiarization, Re-ontologizing, Surrealism, DADA, Magical Realism.

1- INTRODUCTION
Software errors, hardware failures, and unanticipated behaviors are common occurrences during our interactions with the digital medium. They are typical of the functioning of the computer in general, for example in video streaming or image manipulation, but tend to be particularly frequent in applications that disclose interactive experiences of virtual environments [1]. This incidence can be attributed, first and foremost, to the degree of systemic complexity and interconnection that characterizes artefacts such as digital games and computer simulations (Berry 2011; Jayemanne 2017, 127).

Another circumstance that makes the encounters with anomalous computer interactions stand out with particular evidence is the fact that the user/players tend to impose specific kinds of expectations onto virtual experiences (Menkman 2011; Betancourt 2001). Allow me to explain what I mean: as for any other socio-cultural process, a number of metaphors and ideological stances contribute to our understanding of virtual experiences. Those expectations and preconceptions influence the ways in which virtual environments are designed, developed, played, experienced, sold, modified, criticized, and recognized as socially valuable.

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One of the preconceptions that are particularly relevant to examine in relation to the scopes of this paper is the one according to which self-consistency and verisimilitude are highly desirable qualities of virtual experiences (Švelch 2014a, 56). This ambition underpins the developers' pursuit of aesthetic fidelity in the representational modelling of computer environments (as well as their drive to simulate natural physics in progressively more granular detail). Going back to our encounters with glitches, I argue that the paradigm outlined above (i.e. the implicit preference for experiences that are self-consistent and verisimilar) is a central factor in making imperfections and technical anomalies particularly evident and unsettling for the audience of digital games.

In the current academic discourse surrounding digital games, the term 'glitch' generally refers to an unpredictable event that alters or disrupts our interactive experiences of a digital game: a defect, a gap in what is expected to be a predictable and reliable domain of perception and logic (Švelch 2014a; Janik 2017). This perspective can be exemplified by James Newman's often quoted definition of glitches as "audio-visual imperfections (graphics drawing incorrectly or audio breaking up), gameplay anomalies (the ability to get stuck in certain looping sequences), or even narrative inconsistencies (continuity errors either within titles or across series)" (Newman 2005, 63). In line with this tradition, in the present paper I will refer to a glitch as a non-catastrophic malfunction with computer software or hardware that is recognized as anomalous.

With this definition I am framing the glitch not as a mere technical occurrence, but as a socio-technical phenomenon in which both technology (the anomaly) and people (those recognizing it) play a constitutive role. In other words, I am not proposing to understand glitches as mere 'things', but rather as experiences that can take place in the context of a broader set of relationships between computers and their users.

Motivated by pragmatic, creative purposes, designers and artists have demonstrated a growing interest in the experiential effects of glitches and in the expressive possibilities that they offer (Moradi 2004; Menkman 2011; Betancourt 2011). From their perspective, the expressive (and more vastly cultural) potential of glitches does not need to emerge from glitches encountered 'in the wild', so to speak, but can also be triggered by non-catastrophic anomalies that were 'domesticated' (and replicated). In glitch-art, these effects are often manufactured with post–production techniques or by means of omissions, inconsistencies, and deformations that are deliberately fabricated. Iman Moradi labelled the latter 'glitch-alikes' (Moradi 2004).

With the intention of discussing the transformative effects of the interactive experience of a glitched work, this paper will almost solely concentrate its attention on glitch-alikes. This decision was taken for the sake of giving this text a clear focus and a manageable size, and not with the intention of downplaying the unsettling and transformative effects of encountering genuine computer glitches. This point will be further articulated in the concluding section for this paper. Another aspects of effective glitches that, I believe, cannot be ignored in a humanistic assessment of their cultural potential is the particularly explicit way in which they challenge the classical (i.e. pre-digital) understanding of notions such as 'agency', 'intentionality', and 'otherness'.

2- THE DE-FAMILIARIZING AND RE-ONTOLOGIZING EFFECTS OF GLITCHES AND GLITCH-ALIKES

A survey of existing literature on computer glitches in the fields of media studies and game studies reveals a few canonical ways to understand the cultural relevance of glitches and glitch-alikes. Among them, for instance, are scholars who concentrate their attention on glitches as unexpected occurrences that can advance human creativity (see Davies 2004; Vuillemot & Huron 2016). Others focus on glitches as unanticipated affordances that can influence in-game behavior and disclose new performative possibilities and advantages for the players (see Consalvo 2007; Meades 2013; Švelch 2014a). Others still, typically with a humanistic background, dedicate their academic efforts to analyze glitches in relation to notions like procedural humor and machine agency (see Švelch 2014a; Švelch 2014b; Janik 2017). This last group of scholars often recognize glitches and glitch-alikes as culturally relevant in their capability to reveal the artificiality and the precariousness of our experiences of- and interactions with- virtual worlds. They tend to approach glitches as the inconvenient resurfacing of the 'materiality' of digital mediation. In this sense, they value our encounter with the glitch in their capability to reveal the modern mythologies of 'virtual realism' and 'transparent immediacy' as inaccurate if not downright deceptive.

From similar angles, glitches can be recognized as inherently critical in their cultural function, as they have the potential to arise our suspicion concerning the stability and reliability not only of virtual worlds and their digital mediation, but also of our own mental models (Berry 2011, Betancourt 2014, 54-55; Janik 2017, 70-72). In line with the previous observations, Rosa Menkman attributed the ways in which glitches unsettle our expectations to "an elusive, divergent, inherently political moment(um) through which axioms are questioned, genres are broken open, and categories are created" (Menkman 2011, 42).

Michael Betancourt traced the recognition of the cultural role of subversive aesthetics in general back to modernist art, and, in particular, to Theodor Adorno's posthumously published book *Aesthetic Theory* (1970). In *Aesthetic Theory*, Adorno attributed an inherent critical value of art as, in his definition, art violates the functional demands of bourgeois society and defies its aesthetic expectations (Betancourt 2014). Even earlier than the seventies, several similarities could be identified between the methods and aspirations of glitch-art and the artistic strategies of the DADA movement.

DADA's subversive aesthetic strategies consisted in unfamiliar juxtapositions and nonsensical compositions that contended the existence of absolute aesthetic as well as social values. Rooted in- and in some cases directly associated with- anarchistic and nihilistic political currents (see Middleton 1962; Chipp & Seltz 1968, 366-396), DADA's artistic work insisted on the idea that no object could legitimately be privileged or considered ontologically superior or 'truer' than another. This expressive goal had its practical equivalents in artistic techniques such as found art, cut-up, and assemblage. In their early 20th century manifestoes, the Dadaists explicitly challenged the means/ends rationality that they identified as underpinning Western thought, and proposed to foster social change through acts of aesthetic insubordination. The experience of unsettling and unfamiliar works was expected to transcend the conceptual boundaries of art and foster real-world incredulity towards the values, the logics, and aspirations of both the bourgeoisie and nationalism. These aspirations, central to modernism in the arts, are evident, for example, in the words of Romanian poet, essayist, and founder of the European Dada movement, Tristan Tzara, who concluded his *Dada Manifesto 1918* with the following words:

> "The abolition of logic, which is the dance of those impotent to create: DADA; ... every object, all objects, sentiments, obscurities, apparitions and the precise clash of parallel lines are weapons for the fight: DADA; abolition of memory: DADA; abolition of archaeology: DADA; abolition of prophets: DADA; abolition of the future: DADA... Freedom: DADA DADA DADA, a roaring of tense colours and interlacing of opposites and all contradictions, grotesques, inconsistencies: LIFE."

In analogy with how the seditious and re-framing messages of modernism were supposed to work on their audiences, Betancourt further observed that the critical and political potential of glitches and glitch-alikes can only be actualized when the audience not only recognizes a glitched work as anomalous, but also actively chooses to interpret it in a critical fashion [2]. Betancourt's text particularly emphasizes the active role of the subject that resonates with the philosophical work of Michel Foucault, and with how the latter famously defined 'critique' as the act in which one gives oneself "the right to question truth on its effects on power and question power on its discourses on truth" (Foucault 2007, 47).

The wake of what was just outlined, the perspectives that I intend to offer in this paper rely on the idea that the potential of glitches and glitch-alikes to function as critical and transformative tools depends on the recipients' individual attitudes and dispositions. On that fundamental stance, and in a way that resonates with the experience of fiction more in general, I propose to understand the effects of our encounters with glitches and glitch-alikes as having effects and consequences in the actual world [3]. That is to say that the experience of glitches and glitch-alikes can change us in ways that go beyond our conceptualizations of- and relationships with-virtual worlds, and can affect how we interpret situations and possibilities in the world that we share as biological creatures. To be more specific, I argue that by making us question the validity and the stability of the expectations and conceptual frames that are customarily applied to the actual world, the experience of a glitched work can foster what I will later indicate as 're-ontologizing' effects.

In advancing this argument, in the next section of this paper I will discuss the expressive uses of glitch-alikes as having affinities with the expressive strategies and the political aspirations that characterized several artistic movements and currents associated with modernism in the arts. References that I consider worth mentioning in this regard are Viktor Shklovsky's notion of *ostranenie* ('estrangement', 'de-familiarization') and Ezra Pound's dictum "make it new" (Shklovsky 1917; Pound 1958). In several essays by the latter, "make it new" encapsulated what the American poet understood as the defining feature of modernist aesthetic: the aspiration to elicit a change of perspective that might allow the recipients of the work of art to rediscover their familiar world and to reshape their sensitivity and perspectives.

3- MODERNIST GLITCH-ALIKES

The work of the Argentine author of philosophical reveries and literary criticism Jorge Luis Borges is rich with imaginative alternatives to the ways in which Western thought understood and represented the world. In a short story titled 'The Analytical Language of John Wilkins', Borges informs his readers that, in a certain Chinese encyclopedia (the 'Celestial Emporium of Benevolent Knowledge'), the animals are divided into:

> "(a) belonging to the Emperor, (b) embalmed, (c) tame, (d) suckling pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (l) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies" (Borges 2001, 231).

A vertiginous chasm separates the fictional taxonomy of the Chinese encyclopedia from the scientific taxonomy of fauna initiated by Carl von Linné halfway through the 18th century. In the face of the incongruence between the two epistemological approaches, Michel Foucault commented that Borges's fabulous categorization had profound (and profoundly humorous) effects on him. Foucault wrote that Borges's taxonomy shattered the familiar landmarks of his thought, and demonstrated, through the "exotic charm of another system of thought", the "limitation of our own, the stark impossibility of thinking that" (Foucault 1994, xv).

Borges' literary work reveals a fascination with the capability of language (and literature in particular) for suggesting hidden, unexpressed possibilities of being, and alternatives to the ways in which humans commonly think and behave. His work insinuates that the world we share as biological creatures might not be univocal and unwavering in its functioning and meaning. These deliberate unsettling effects are not exclusive to Borges's literary production, but resonate with aspirations that are often associated with modernism in the arts. Particularly relevant to mention, here, is the literary current of magical realism, of which Borges is often cited as a representative. In their work, authors that are commonly labelled as 'magical realists' describe verisimilar settings that are "invaded by something that is too strange to believe" (Stretcher 1999, 267). In a comparable fashion, glitch artists purposefully trigger transient malfunctions and employ glitch-like-artefacts to elicit feelings of unfamiliarity and eeriness in their audience (see Figure 1).

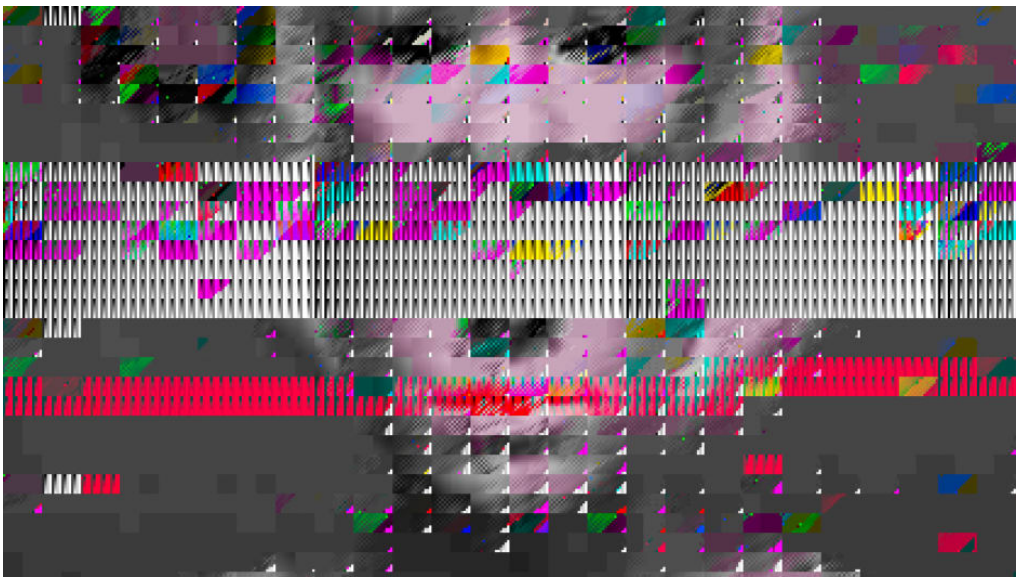

Figure 1: Rosa Menkman's *BLINX2* (from Rosa Menkman's FLICKR account, used with permission - https://www.flickr.com/photos/r00s/5981939039)

The analogy between glitch art and magical realism becomes especially evident when glitch-artists or game designers pursue ambiguous and exhilarating experiences by means of using glitch-alikes as constitutive parts of a fictional context. In other words, they can be compared to magical realists when they present glitch-alikes as common events (events that are potentially perceived and acknowledged by the characters within the fictional context) and not as failures and imperfections that are only experienced from a meta-fictional stance (that is, from outside the fictional situation, for examples about this specific expressive use of glitch-alikes, see endnote 4).

Artists can, conversely, employ glitch-alikes as surprising, non-contextual incursions in a certain experiential domain. In those cases, their work can be more suitably associated with the radical de-familiarizing effects sought after by strands of modernism other than magical realism. The often disturbing ways in which the precariousness and the materiality of a glitched work brings to mind the use of nonsense and techniques such as found objects, cut up, and decollage that we have already mentioned as characterizing the expressive arsenal of DADA (as well as surrealism).

With reference to the Borgesian excerpt discussed earlier, I consider it important to observe that all kinds of literary fiction necessitate its audience to both interpret text (a requirement shared by all types of literature) and engage with it through imagination (a mandate that all forms of fiction have in common). The way in which we actively relate with de-familiarizing glitch-alikes and with de-familiarizing literature have, thus, several points of contact and analogy. There, however, are also differences between the two that I consider relevant to examine.

Literature largely presents situations and events by using of signs and representations that are accessed by means of the readers' cognitive as well as imaginative faculties [5]. Similarly, experiencing the virtual environments of digital games and computer simulations requires cognitive engagement and a degree of collaboration from the users/players in terms of imagination (for example in developing hypotheses about the functioning of certain aspects of the virtual environment in question, or in speculatively 'filling-in' aspects of the narrative that were not explicitly presented in the content). Despite their similarities, I argue that the persistently intelligible and interactive experiences disclosed by digital games and simulations cannot be considered to be simple representations. By definition, those traits of virtual environments (interactivity, persistency, and intelligibility, together with the possibility to return to them at will) make them possible to be experienced as worlds by human beings [6].

When experienced as parts of a larger, persistent domain of cognition, perception, and interaction (i.e. as part of a world), the potential of glitches for unsettling our expectations and mental models is significantly different from that of imperfections and malfunctions that are merely encountered as representations (for example in the cases of databending and compression-losses in visual glitch art forms - see Figure 1 - or in the growing sub-field of textile glitch art). Understanding our encounters with glitches as part of our cognitive, perceptual, and interactive engagement with a world is a particularly useful and advantageous aspect of the proposed approach. Experiencing a 'glitched world' dynamically (that is interactively and repeatedly) invites unfamiliar ways to understand and negotiate the meanings and possibilities of that world in ways that are simply within the affordances of our subjective imagination.

In relation to this last claim, I want to advance the idea that the interactive encounter with glitched worlds have a 'fluidifying' effect on our modes of thinking. What I am arguing here is that experiencing glitches have a unique, experiential way to put us in a 'subjunctive mood', an attitude that fosters the development and the evaluation of alternative modes of thinking and behaving (see Gualeni 2015, 123). To borrow the words of Robert Musil, the encounter with glitches and glitch-alikes increase our "ability to conceive everything that there might be just as well as to attach no more importance to what is than to what is not" (Musil, 1996, 11). This intensified capability to develop and evaluate alternative modes of being in a world is what I previously indicated as the 're-ontologizing' effects of critically engaging with literary fictions, glitches, glitch-alikes, as well as any other transformative experiences.

To exemplify the use of the specific de-familiarizing and re-ontologizing effects of interactive glitch-alikes in artistic practices, I will briefly examine two computer games that make extensive uses of these expressive strategies: *ROM CHECK FAIL!* (Woods, 2008) and *untitled game* (*Jodi*, 1996-2001). The reason why I will be specifically looking at computer games, over the broader horizon of glitchy computer applications in general, is that paper was written for a Digital Games Research Association (DiGRA) Conference. Digital game examples that deliberately harness glitch-alikes were, thus, chosen with the hope that members of that specific community would find them either familiar or, at least, intuitively accessible.

ROM CHECK FAIL! (see Figure 3) is a free, web-game that was independently developed by Jarrad 'Farbs' Woods and published online in 2008. Its fragmented gameplay is composed of a small anthology of early-80's home-console landmark titles. *ROM CHECK FAIL!* begins with a mock boot-up screen, in which the player is informed about a technical failure with the ROM (Read-Only Memory) cartridge. From that moment onwards, the game intermittently reassembles and 'palette-swaps' the background over which its gameplay takes place while also scrambling the information in the interface field, distorting the background music, and playing corrupted sound effects.

Figure 3: A screenshot captured while playing *ROM CHECK FAIL!* that exemplifies the post-production glitch-aesthetics recurrently affecting its fixed-screen playfield.

The game's precarious glitch-aesthetic is not the only mode through which it attempts to unsettle and de-familiarize its players. *ROM CHECK FAIL!* also irregularly switches its gameplay from one game-genre to another. While maintaining its fixed-screen configuration and the positions of the playing character, non-playing characters (enemies), in-game obstacles, and breakable elements, the game keeps reconfiguring itself in order to match both the aesthetics and the gameplay of a landmark title of the so-called 'golden age of arcade videogames' (indicatively between 1978 and 1983). *ROM CHECK FAIL!* makes a playable (and playful) statement about the artificiality and the arbitrariness of our digital experiences as well as about the conventionality of our expectations as players. Initially offering interactions that align with the convention of the platforming genre (with obvious references to *Super Mario Bros.*, a 1985 action-platformer by *Nintendo*), *ROM CHECK FAIL!* quickly changes to match the aesthetics and the gameplay of – say – *Asteroids* (a 1979 multi-directional action-shooter by *Atari Inc.*).

What makes *ROM CHECK FAIL!* particularly interesting is the fact that the interactive experiences that it discloses refer to (and are disrupted by) what appear to be technical anomalies. These 'manufactured glitches' are contextualized, in the (meta)narrative of the game as hardware problems with the insertion (or perhaps the intentional 'tilting') of a fictional, faulty cartridge in a fictional home-console. In this sense, the game can be recognized as pursuing a manageable degree of 'de-

familiarization' that remains comfortably within the boundaries of the game's fiction. In this sense, the previously mentioned digital game *ROM CHECK FAIL!* harnesses the transience and the unsettling aesthetics of glitches in ways that can be understood as analogous to works of magical realism, where the instability, the unpredictability, and the unsettling effects of glitches are presented as constitutive components of the world that the game discloses fictionally and interactively. In other words, glitch-alikes are part of the (however quirky) fictional world disclosed by *ROM CHECK FAIL!*

The game can be also considered an example of expressive uses of glitch-alikes. Also, it can be embraced and studied as an example of self-reflexive use of the medium. What we mean by 'self-reflexive' is that *ROM CHECK FAIL!* is designed to interactively materialize critical and/or satirical perspectives on the ways in which videogames themselves are designed, played, sold, manipulated, experienced, and understood as social objects (see Gualeni 2016).

The second game-related example that I would like to discuss is a series of fourteen 'mods' for *Quake* (a three-dimensional action shooter computer game in first person originally released by *Id Software* in 1996). A 'mod' is a short, informal way to refer to a 'modification', that is an alteration of an existing videogame pursued by the community of players as a folk practice. These unofficial modifications might affect any aspects of the game and may involve small changes and tweaks, but they can also consist of substantial transformations and extensions to the original game. The mods I want to present as examples are collectively known as *untitled game*, and were manufactured by the Dutch/Belgian artist duo *Jodi* (Joan Heemskerk and Dirk Paesmans) by exploiting errors in the programming of the original game (Menkman 2011, 39). *Untitled game* is an example of playable glitch-art in which the audience navigates what are, in some respects, typical game spaces that are subject to various anomalies and unexpected transformations. In *E1M1AP* (one of the mods that are part of *untitled game*) *Jodi* modified part of the code of the original digital game that regulated the gravity-related behaviors to produce bewildering vortex effects.

Whereas *Quake* offered interactive virtual worlds that are interpretable through conventions that are typical of its game genre (such as linear perspective or the presence of a crosshair), *untitled game* often interactively discloses unstable spaces, unfamiliar signifiers, anomalous visual artefacts, and streaming real-time code that foregrounds the technical apparatus of the game (Galloway 2006, 115). Paraphrasing Menkman, *untitled game* is interesting in the context of this paper as it is an intentionally (albeit not completely) "ruined videogame" that subverts and interactively questions conventional videogame goals, for example those of self-improvement and winning (ibid.). 'Ruining' *Quake* in these particular ways, *untitled game* "rebels against the techno-social determinism of (game) technology and consumption" (ibid.). In this sense, *untitled game* could be associated with expressive strategies for aesthetic estrangement that were recognized in modernist currents such as DADA and surrealism.

4- CONCLUSION

This paper discussed virtual worlds as gateways through which we can extend our possibilities for 'being-in-worlds' and explore (and re-think) the meaning of those experiences and possibilities. The virtual environments of digital games offer several, clear examples of how the digital medium can disclose worlds that exist beyond the conceptual and experiential confines of the actual. This paper embraces an understanding of interactive virtual worlds as technologies that, even without the

presence of glitches or glitch-alikes, invite us to interactively repurpose, extend, and occasionally unsettle our cognitive and imaginative faculties (Gualeni 2015;2016) [7].

The dynamic (that is interactive and repeated) relationships that we can establish with virtual worlds were presented as depending on the functional affordances of the computer as well as on its specific kinds of malfunctions. On those conceptual foundations, virtual worlds were understood as inviting personal transformations and affording new 'avenues and landmarks' for thinking. These new possibilities inevitably inherit qualities and limitations that are typical of the functioning and of the modes of representation and interaction of the digital medium, as well as of its specific technical malfunctions and anomalies. In other words, glitches are understood as typical components of the experience of virtual worlds, and thus as factors in the transformative potential of our encounters with them.

Glitch-alikes are digital effects are often manufactured with post–production techniques or by means of omissions, inconsistencies, and deformations that are deliberately fabricated. This paper specifically focused on those kind of glitches in terms of their expressive possibilities (as forms of deliberate and unsettling miscommunication), and as a potential tool for extending and restructuring our mental models. In this light, they were conceptually associated with strategies and aspirations that are characteristic of artistic currents associated with modernism in the arts.

Differently from glitch-alikes and from other designed events, actions, and interactions that take place within virtual worlds, actual, unexpected computer glitches are not intended to be part of a virtual world. Having the possibility to resist, interrupt, and de-rail the original purposes of the developers, actual glitches are considered undesirable and potentially dangerous epiphenomena of digital technologies. As such, they are typically removed from virtual worlds by means of quality assurance processes and the release of software patches. In virtual worlds, actual glitches epitomize events that resist human understanding and interpretation. They clearly exemplify expressions of agency and intentionality that are, to a degree, 'other than' those of the human creators (see Janik 2017) [8]. From this standpoint, they constitute one of the most radical contexts where to further explore those notions and frameworks. In other words, actual glitches could be fruitfully used as philosophical testbeds for new perspectives in cultural posthumanism as well as in the philosophy of technology.

ENDNOTES

[1] Among the various possible interpretations of what it means for something to be 'virtual', in the context of this paper I am using it to refer to something that is generated by- and interactively accessed through- the computer (Vella & Gualeni 2019, 1). In accordance to this interpretation, I will refer to the experiential horizon disclosed and upheld by the digital medium as a 'virtual world'.

[2] To be sure, glitches and glitch-alikes can also be approached non-critically, meaning that they can be identified as mere mistakes or malfunctions. In this case, the audience of a glitched work can decide to focus on glitches as anomalies (at the expense of the perceived coherence of the virtual world in question and their psychological immersion within it), or can decide to turn a blind eye to them. This last possibility corresponds to what Kendall Walton describes, in the context of the experience of fiction, as the principle of 'charity'. Being 'charitable' towards a work of fiction indicates the deliberate disregarding of some of its aspects that are considered inaccurate or incorrect. According to Walton, the audience's decision to ignore mistakes and paradoxical aspects of a work of fiction can be motivated by their

will to continue to enjoy the experience in a way that is perceived as internally consistent (Walton 1990, 183). It might be important to point out, as Van de Mosselaer and Wildman did (2019), that disregarding glitches is only one strategy available to players to make the experience of the fictional world consistent. Players can also acknowledge the occurrence of glitches and incorporate them within the fictional world by imagining this world in such a way that the glitch event makes sense and consistently follows from other events within this world.

[3] In the context of this paper, the adjective 'actual' is used to indicate something that participates in the world that we share as biological creatures (see Gualeni 2015, 44). Similarly, Rob Shields uses 'actual' to appoint something that is concretely present to us (Shields 2003, 28-30).

[4] Two particularly obvious examples of this expressive strategy come to mind: the fifteenth episode of the fifth season of *Adventure Time* (an animated show) titled 'A Glitch is a Glitch' (OReilly 2013), and the cooking mini-game in the open-world action-adventure blockbuster *The Legend of Zelda: Breath of The Wild* (Nintendo EPD 2017). In 'A Glitch is a Glitch', the villain of the series is threatening the entirety of the fictional world of *Adventure Time* with a glitch-alike virus generating escalating malfunctions and omissions that are perceived and commented upon by the fictional characters themselves. In *The Legend of Zelda: Breath of The Wild*, Link (the player character) can prepare dishes by combining a number of ingredients (a maximum of five at a time) at a cooking station. Some of those combination are treated by the game as proper dishes and - as such - are given specific names, unique icons, and special status effects on the player character. The majority of among the hundreds of thousands of combinations are, instead, generic and unseemly combinations of ingredients with minimal nutritional value and no additional effects and a glitch-alike appearance (see Figure 2 below).

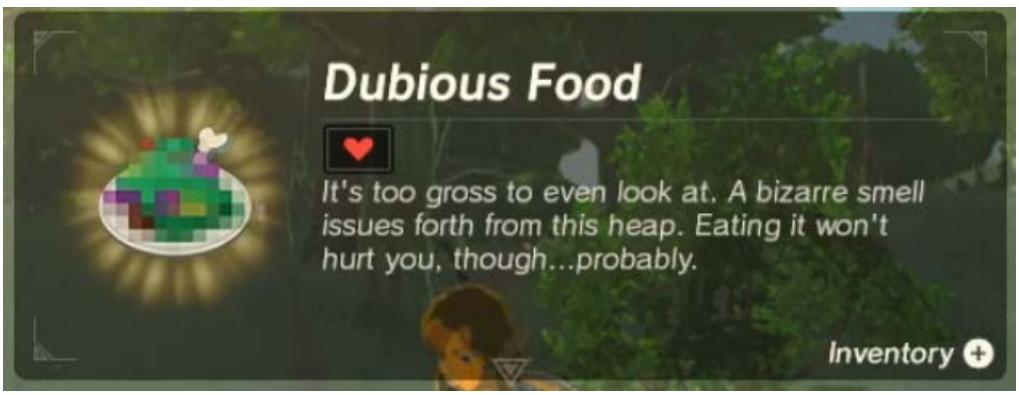

Figure 2: The cooking interface-overlay of *The Legend of Zelda: Breath of the Wild* informing the players that the ingredients that they put together did not produce anything useful or pleasant (presumably suggesting an analogy with our encounters with glitches).

[5] The amount of imagination involved in accessing literary fictional content differs depending on the kind of literature we are referring to. There is, for instance, an obvious difference in terms of the quantity and modality of the 'imaginative props' offered to the audience through exclusively textual literary contents and illustrated ones. Not only the amount, but also the type of imagination varies among different kinds of literary fiction; in these regards, it might suffice to think to the interactive possibilities disclosed by ergodic literature (for example in the case of gamebooks).

[6] In a way that aligns with the philosophical traditions of phenomenology and existentialism, I will use 'world' to indicate a domain of experience consisting of a set of beings understood together with their properties and mutual relationships. For a set of 'somethings' to be recognized as a world for a subject, it is necessary for that subject to be able to establish an interactive relationship with those 'somethings.' What I define as 'world' needs to be to a degree perceptually persistent, interactive, and behaviorally consistent from the perspective of the being experiencing them (see Vella & Gualeni 2019, note 2). This interpretation allows me to establish a distinction between worldly experiences and those accessed during dreams, hallucinations, or dissociative events (like the mild ones triggered by the experience of literature). It might be relevant to note, here, that the possibility to experience virtual environments as worlds is a particular 'mode of consumption', meaning that it is independent from the fictional content they represent.

[7] Experiences in virtual worlds can challenge us to interactively transcend, for example, our everyday understanding of space and time as homogeneous and isomorphic dimensions, or make us question our conceptualization of causation as irreversible. Some experiences of virtual worlds can propose new, experiential ways of understanding what the properties of a certain objects are, how they are maintained and transferred, what the notions of identity, presence, and indexicality can mean, etc.

[8] This is not to claim, however, that computers are – in the present day and age – conscious, autonomous agents, or that our encounters with actual software glitches constitute contacts with radically non-human forms of being. The ways in which the digital medium interprets, stores, represents, and manipulates information is understood here as analogous to approaches to human cognitive and biological processes that were popular at the time (that is to say they applied models of human intelligence biased towards a Cartesian rationality and mental representation, and not at all analogous to our current understanding of embodiment, and how cognition is intertwined with mood and context).

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