VIRTUAL WELTSCHMERZ

Things to keep in mind while building experience machines and other tragic technologies

Stefano Gualeni, Institute of Digital Games – University of Malta

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0. INTRODUCTION

Having made it this far into the present book, it is practical to assume that the readers are already familiar with 'The Experience Machine', a thought experiment that was proposed in the seventies by American philosopher Robert Nozick. To summarize: Nozick hypothesized the existence of a device capable of disclosing persistent virtual[1] experiences for the human being using it. The experiences upheld by his fictional machine are envisaged to be indistinguishable from those that we, as humans, can develop in relation with the actual world. In this outline of Nozick's thought experiment, I am using the descriptor 'actual' to indicate the analog contexts that we inhabit everyday as (and with) biological creatures.

Nozick's thought experiment challenged us to envision having access to a device that could indefinitely supplant our everyday experiences with virtual ones designed to maximize our pleasure and satisfaction. By presenting us with the possibility of an experience machine, he invited reflections on whether the way we live our lives is solely driven by the pleasure principle, or if there is something else that we value other than how we feel 'from the inside'. If such a machine existed, asked the American philosopher, "would you plug in?" (Nozick, 1974, 42)

As already mentioned in the introduction to this book, Nozick's mental exercise has been differently invoked and interpreted in various contexts. Some authors have understood 'The Experience Machine' as implicitly giving rise to arguments against utilitarianism; others have interpreted it as opposing hedonistic positions in both ethics and psychology (Sober, 2000; Feldman, 2010).

[1] The adjective 'virtual' was originally coined in modern Latin to encapsulate the idea of 'potentiality'. *Virtualis* is a late-medieval neologism the existence of which became necessary when Aristotle's concept of δύναμις (*dynamis*: potentiality, power) had to be translated into Latin (Van Binsbergen, 1997, 9). The concept of 'potentiality' at the etymological foundation of the adjective 'virtual' provides the background for understanding why, at least in one of its interpretations, it is used to indicate the latency of certain possibilities inherent in a specific artifact, combination of artifacts, or state of things. A more common connotation of the adjective 'virtual' was presented by Pierre Lévy, not in opposition to 'actual' in the sense discussed above, but to 'actual' in the specific sense of "pertinent to the world humans are native to." (Lévy, 1998, 14)

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More recently, Robert Nozick's *Gedankenexperiment* has been examined in fields of inquiry such as media studies and philosophy of technology. Stimulated by developments in virtual technologies, some of the questions originally raised by 'The Experience Machine' are presently used in those disciplines as springboards for reflecting on the qualities and on the effects of our interactive experiences in (and of) virtual worlds.

Having conceptualized his thought experiment in the early seventies, Nozick could not have fully anticipated the numerous and profound ways in which the diffusion of computer simulations and videogames came to affect the Western world. Besides, his imaginative exercise was meant to kindle questions concerning our ethical compass, not existential and phenomenological quandaries ensuing from experiencing interactive, artificial worlds. It is interesting to notice that in its original formulation 'The Experience Machine' does neither specifically focus upon the technical characteristics of the machine, nor upon those of the experience of what it is like to be plugged into it. Both elements of Nozick's scenario are in fact simply introduced as the implied preconditions for a reflection on our existences and our values in a supposed 'age of their technical reproducibility'.

In general, the renewed academic interest in 'The Experience Machine' can be understood as a way to further Nozick's original questions and perspectives with interrogatives that are specific to our present-day socio-technological milieu. This essay offers what are hopefully a few constructive and thought-provoking reflections to accompany us in our progress towards the actual, technical realization of experience machines.

In the Western world, social activities like the crafting of- and the access to- virtual worlds are increasingly more affordable and already deeply integrated in social practices (Gualeni, 2015a; Gualeni, 2015b). Moreover, devices that recall those outlined in 'The Experience Machine' appear to be already at the outer edges of our technological reach. It is hence obvious to me that today – more than forty years after the original formulation of Nozick's thought experiment – it would be paradoxical to think about those machines as if they were still imaginary, inscrutable gizmos, rather than the concrete aspiration of consumer-technology companies. In this context – a context in which the virtual worlds of videogames are already established as a prominent form of cultural mediation and meaning-making – I will try to supplement Nozick's reflections and to further elaborate on his thought experiment. With this objective in mind, I propose to begin my philosophical dialog with Nozick by identifying and developing two philosophical themes:

> **1 – I shall first approach 'The Experience Machine' from the perspective of philosophy of technology. In doing so, I will articulate an understanding of the experience machine *as a machine*.** The first theme will produce two possible approaches to answer Nozick's question concerning hedonism

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> (is there something else that we value other than how we feel 'from the inside'?) in a canonically philosophical fashion. Through reflections developed in a critical relationship with existing literature and approaches in relevant cultural fields such as game studies,

media philosophy, and philosophy of technology I will explain why I still believe we would be resistant to be permanently (or semi-permanently) plugged into an experience machine.

2 – I shall then explore the experiential aspirations and limitations that characterize our current efforts to develop experience machines. This effort will largely take a phenomenological (or rather post-phenomenological) approach to framing our existential relationships with virtual worlds, our irresistible attraction towards them and – ultimately – our aversion to the prospect of permanently plugging into one of them. This second section of my essay will draw upon my experience as a videogame designer and upon interviews with other videogame creators who have recently engaged the development of vast, experientially rich, interactive worlds. This will shift the focus of my inquiry from methodological concerns to practical considerations about the constructive and experiential relationships that we currently establish with virtual technologies and the imaginative worlds of videogames[2].

1 A MACHINE FOR EXPERIENCING

In his 1962 essay 'The Myth of Total Cinema', French film critic and theorist André Bazin interpreted the specific ways in which cinema reproduced images, sounds, and motion as the first, rudimentary steps towards building a machine that is capable of experientially recreating the world. From his point of view, the technical advancements of cinema – when not merely directed towards the pursuit of capitalistic gain – constitute an evolutionary process aimed at crafting progressively more accurate and sensorily complete artificial experiences. For Bazin, the myth guiding the evolution of cinema consisted in the aspiration to achieve those same experiential effects that Nozick later envisaged in 'The Experience Machine'. He believed that cinema ultimately aspires to be the "[…] recreation of the world in its own image, an image unburdened by the freedom of interpretation of the artist or the irreversibility of time." (Bazin, 1967, 21)

Pursuing academic research at the intersection of film studies and game studies, Mark J. P. Wolf noted that the ambitions expressed in 'The Myth of Total Cinema' and its underlying ideology are very much alive and well today, and are evidently materialized in the imaginary future of virtual worlds. As recent examples of cinematic incarnations of the 'myth', Wolf mentioned the

[2] In the philosophical tradition of phenomenology, the term 'world' generally indicates a set composed of beings that are understood together with all their (detectable) properties and mutual relationships. More specifically, a world comprises the set outlined above as experienced by one of the beings involved in it. To be identified as a world (and thus to have the quality of 'worldliness'), such experiences need to be meaningful in the sense that they need to be persistently perceivable and behaviorally consistent (thus intelligible, to a degree) for the being experiencing them. (Gualeni, 2015b, 6) This interpretation is not only conveniently encompassing, but also establishes a clear distinction between the experiences of virtual worlds and those of dreams or hallucinations. The virtual worlds of simulations and videogames are recognized as worlds precisely because they can be accessed and returned to at will, and because they emerge in ways that are repeatable and relatively stable in their mechanical and aesthetic aspects. (ibid.)

movies *Total Recall* (1990), *eXistenZ* (1999), and *The Matrix* series (1999 and 2003), in whose fictional scenarios experience machines

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exist and have various societal applications, from entertainment to the subjugation of humanity. In other words, these are movies in whose fictional contexts the myth of total cinema had been technically achieved in its complete immersivity and indistinguishability from lived experience (ibid.)[3].

In the current age of digital mediation, the disclosure of a convincing 'illusion of a world' can be similarly identified as one of the most evident aspirations guiding the advancements of virtual- and videogame- technologies (Gualeni, 2015a, 45, 46). Wolf accordingly proposed, in his 2015 essay 'Video games, cinema, Bazin, and the myth of simulated lived experience', to recognize videogames as expressive forms through which the myth of total cinema and its ambitions are still pursued in contemporary Western cultures (Wolf, 2015). This way of approaching videogames is in fact not only consonant with what Bazin described in 'The Myth of Total Cinema', but – as will become clearer later in this essay – can also be recognized as the ideological foundation to the ways in which we design, criticize, and attribute cultural values to videogames and, more generally, to virtual worlds[4].

Toward the end of the nineteenth century, the German philosopher Ernst Kapp proposed an understanding of technology according to which human beings develop and use artefacts with the fundamental purpose of overcoming the limitations and the insufficiencies of their native organism. In his vision, technologies are (conscious or even unconscious) artificial supplementations of certain functions that are originally accomplished by human organs (Kapp, 1877). Kapp's functional understanding of technology is not limited to the use of various artefacts to enhance our capabilities to perceive, transport, communicate, and interact with the world. He also recognized our artificial extensions as cognitive instruments (Gualeni, 2015a; Gualeni, 2015b, 68). The invention of the mechanical clockwork is an example that is frequently used to illustrate this point; that is to say, to demonstrate how our technologies (and our interconnected technological systems) influence and shape our thought in ways that are subtle,

[3] The surfacing of 'The Myth of Total Cinema' can also easily be identified in literary works, particularly in social science fiction. Examples are glaring in the works of Philip K. Dick (*UBIK*, *The Electric Ant*, *We Can Remember it for You Wholesale*, etc.), Neal Stephenson (*REAMDE*, *The Diamond Age*, *Snow Crash*, etc.), William Gibson (*Count Zero*, *Neuromancer*, etc.), and Greg Egan (*Permutation City*, *Zendegi*, etc.), just to mention a few. Another media form that is unsurprisingly sensitive to the tropes of artificiality and digital simulations is the videogame. Themes and premises such as being trapped inside a simulation, being unaware of the virtual constitution of one's world, or situations involving recursively entering a simulation from within a simulation, are often explored in videogames, and especially so in ones that reference the tradition of science fiction. The VR pods that can be encountered in *Bethesda Softworks'* recently revived *Fallout* franchise (since 2008) are particularly glaring examples of the videoludic materialization of Bazin's myth. Experience machines also play a cardinal narrative role in the popular videogame franchise *Assassin's Creed* (since 2007).

[4] In her 2006 book *Always Already New*, American theorist Lisa Gitelman explicitly understood all audiovisual media as aspiring to a comparable form of transparency; that is, attempting to efface their technical mediation from the content experienced by the user(s).

pervasive, and that transcend the practical functions for which those artefacts were originally designed. American historian Lewis Mumford, for example, famously viewed the mechanical clock as the defining machine of the industrial age. Unlike most of his contemporaries, who identified in the steam engine the key creation that propelled us into industrialism, Mumford realized that it was the clock, on account of its effectively 'producing' a regular and parcelized understanding of time, that paved the way for all the technical and social developments of that period (Mumford, 1934, 14, 15). Similarly, Dutch historian Edward Jan Dijksterhuis maintained that, in the early Modern period, the precise and ingenious mechanism of clocks persuaded the physicists that nature itself worked like clockwork, inspiring the development of classical mechanics (Dijksterhuis, 1986, 442f).

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In the mid-eighties, and in line with the understanding of the cultural effects of artefacts encapsulated in the examples above, American media theorist Neil Postman argued that we should avoid approaching our technical artefacts and media as if they were neutral tools, as they never purely accomplish instrumental tasks. Rather, our technical creations also always function as mediators, and in their mediating roles, they inevitably "classify the world for us, sequence it, frame it, enlarge it, reduce it, colour it, argue a case for what the world is like." (Postman, 2005, 10) Many philosophers of technology who have adopted a general interpretation of technological artefacts as mediators understand technical systems as dynamic realms for self-discovery and self-transformation (Verbeek; 2011; Gualeni, 2015b; Zarkadakis, 2015; Gualeni, 2015c). As well as any other technologies, virtual worlds could (and perhaps should) be recognized as systems that allow us to materialize our worldviews and ideas, as ways to make our beliefs and aspirations into objects of critical (and self-critical) evaluation.

This aspect of our relationship with technologies becomes, I find, particularly interesting when it comes to acknowledging the fact that virtual experiences and digital worlds are (still) encountered through devices, i.e. through interfaces and technological artefacts. From this perspective, we can approach Nozick's 'The Experience Machine' not only as a thought experiment meant to problematize ethical hedonism or utilitarianism, but also as a way to encourage and facilitate reflections on the ethical quandaries ensuing from creating and utilizing virtual technologies. To clarify this point and its relevance, I will discuss a few practical examples, which will reference the movies discussed in the previous section of this essay.

In both *Total Recall* and *eXistenZ*, the protagonists physically encounter a machine that is capable of disclosing persistent virtual worlds in ways that are indistinguishable from their everyday experiences. Albeit skeptically, and for different reasons, both Quaid (in *Total Recall*) and Pikul (in *eXistenZ*) willingly make the decision to plug into each respective cinematographic version of the experience machine and plunge into illusory worlds that are supposed to be pleasurable.

The case of Neo (the protagonist of *The Matrix* trilogy) is, I believe, significantly different as far as the objectives of this essay are concerned. At the beginning of the first movie of the series, Neo is unaware that he is plugged into a technological system that 'feeds' his brain the experiences of an artificial world. Since he had been conscious, Neo's world had always been a product of an experience machine, a machine that he never agreed to be plugged into and that he

never encountered as an object of experience (at least he did not at that point in the movie). In a large portion of the first instalment of *The Matrix*, Neo cannot thus develop a complete ethical and ontological understanding of his condition, let alone articulate a critical stance towards the artificiality of the virtual world into which he is immersed.

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The cited movies can be understood as presenting two different situations: one in which plugging into the machine is based on a consciously chosen relationship with a technological artefact, and one in which that is not the case. It is my conviction that the recent philosophical discussions stimulated by Nozick's thought experiment concerning our relationships with virtual worlds are largely a product of how 'The Experience Machine' presents a scenario that – paradoxically – encompasses both the situations described above. Allow me to elaborate on this point with more clarity resorting to extracts taken directly from 'The Experience Machine':

- On the one hand, Nozick clarifies that his fictional machine offers the possibility to "[…] pick and choose from their vast library or smorgasbord of such experiences, selecting your life's experiences for, say, the next two years. After two years have passed, you will have ten minutes or ten hours out of the tank, to select the experiences of your *next* two years." (Nozick, 1974, 42) Concordantly, to operate the machine and – crucially – in order to make the decision of whether to plug in or not, its users must first encounter the experience machine as an object. There must be, put in a somewhat simpler way, occasions before plugging into the machine and between experiential sessions when the machine is present to them as a mediating device, as the physical gateway to certain possibilities of being.

- On the other hand, the machine does not only need to provide an illusion of a world that is smooth, consistent, and experientially complete, but – for the *Gedankenexperiment* to work – the users need to have no recollection of the experiences and choices leading to plugging into (or plugging back into) the machine. As Nozick puts it, "while you are in the tank you won't know you're there; you'll think it's actually happening." (ibid.)

The hypothetical setup of 'The Experience Machine' as a thought experiment thus requires our making volitional choices in relation to a physical device. At the same time, for the fictional device to produce the envisaged experiential effects, the choices and the awareness mentioned in the previous passage must be removed from the users' consciousness as soon as they plug into an experience machine. What I want to suggest here is that if users could remember the various steps and choices leading to their plugging-in, they could not avoid filtering (at least initially) their virtual experiences through the awareness that the world that they are experiencing is a synthetic artefact.

Further complications arise in hypothetical scenarios like those of unplugging from the experience machine or in the case of an interruption of the streaming of artificial experiences (regardless of its accidental or scheduled nature). In those circumstances, memories and choices of our lives from before plugging-in will need to be recuperated and reactivated. Why?

If not to avoid psychological damage upon returning to the actual world, that awareness will at any rate be indispensable for taking significant existential decisions such as whether to plug back in or what future developments to choose for the continuation of our life in that virtual world (as outlined by Nozick himself).

In summary, approaching 'The Experience Machine' from the perspective of philosophy of technology allows us to identify a paradox at the core of Nozick's thought experiment: the situation he described is one of irreconcilable ambiguity, in which human beings are expected to be selectively aware and unaware of the mediating role of a virtual reality device in relation to their experience. To be sure, this paradoxical impasse can be sidestepped quite easily, albeit perhaps inelegantly, by hypothesizing yet another device: an apparatus capable of compartmentalizing our awareness and selectively activating areas of it. With this additional hypothetical device, we would be able to target and inhibit memories of our relationship with the experience machine, enabling us to forget having programmed one or having decided to plug into one. For the sake of simplicity, I will call this additional, fictitious apparatus the 'memory suppressor'.

Did Nozick implicitly think that a memory suppressor would be part of an experience machine? Let us suppose, as a first conjectural scenario, that he did not. If that were the case, and for the reasons articulated above, the immersion provided by plugging into his fictional device could not be expected to have a totalizing effect. Once plugged into the experience machine, in fact, people could not avoid remaining conscious of the artificial constitution of the virtual worlds that they were experiencing. As a consequence, the relationships that can be established with those worlds could not (or at least could not initially) smoothly and convincingly hijack those of the world that we index as actual[5].

At this point in the articulation of my arguments, and in support of the claim that we would indeed resist being permanently or semi-permanently connected with any world-feeding machines, I believe it is advantageous to introduce a perspective according to which virtual worlds can engender a peculiar kind of nostalgia[6]. What I am presenting here is the belief that if we experienced virtual worlds while remaining aware of the existence of the actual one (i.e. without the selective inhibition of actual memories), we would inevitably end up experiencing a desire to return to our 'homeworld'. As I have argued and explained in detail elsewhere[7], the

[5] Imagining myself in that situation – which would be analogical to a scenario that Greg Egan outlines in his novel *Permutation City*, – I believe that the awareness of the artificiality of the virtual worlds one finds oneself immersed into would be in itself almost unbearable from a psychological point of view (Egan, 2008, 3). It would be a state of mind similar to a paranoid fixation which is, however, unlikely to be a permanent one. Such attitude towards the world would be – Egan argues – "too bizarre to be sustained for long." (ibid.)

[6] 'Nostalgia' is a Modern Latin term that comes from the Ancient Greek words νοστος (*nostos*: 'return, homecoming') and αλγος (*algos*: 'pain, suffering'); it was coined in the 18th century to indicate the specific pain that we feel when we are far away from home and yearn to return there.

[7] I am referring here, in particular to chapters 3, 7, and 8 of my 2015 book *Virtual Worlds as Philosophical Tools* (Gualeni, 2015b).

world that we belong to as biological creatures is necessarily more complex and mysterious than any artificial one that could ever be disclosed in virtual worlds, as every artificial world depends from the actual one both technically and conceptually. On that assumption, the awareness that there is a deeper, more meaningful world outside of the tanks in which our bodies are floating will likely trigger a digitally-enhanced feeling similar to what Romantic writers and poets called *Weltschmerz*

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('world-pain', 'world-weariness'): the feeling that the world (or a certain world) is limited, and might be inadequate to satisfy the intellectual and emotional aspirations of the human soul.

Understood in this way, the Romantic idea of *Weltschmerz* can be recognized as antithetical to concept of the 'sublime' as embraced during the same period (Shaw, 2006). Whereas the Romantic sublime focused on the awe-inspiring vastness of nature and the impossibility for the human senses and the human intellect to ever grasp its functioning and meaning, to someone feeling *Weltschmerz* a world appears as ordinary and manageable in its complexity and scale. Whereas the Romantic poets finds themselves inadequate and fragile in relation to a sense of sublime that transcends all their capabilities, the sense of 'world-weariness' is a close relative of the feeling of boredom: it is the realization that our experiences cannot be anything than banal and foreseeable, thus excluding any possibilities of transcendence[8]. Virtual *Weltschmerz*, I shall argue, not only entails the feelings of triteness and predictability that were outlined above, but also triggers desires for things that are mysterious and extraordinary.

In this first hypothetical scenario, in which a 'memory suppressor' is not a technical component of an experience machine, my expectation is that the users will be able to temporarily suspend their disbelief (see footnote 15) towards virtual worlds, but that they will ultimately remain aware of the artificiality of that experience and painfully conscious of the existence of a world outside of the simulation. Thus, without a memory suppressor, the machine imagined by Nozick could not supplant our relationship with the world wholesale, but could still experientially complement it. In this situation, I expect that users would relate to Nozick's device in a way that is similar to how they currently engage videogame consoles or virtual reality gear. By that I mean that they would intuitively consider the experience disclosed by the machine as that of a derivative world meant for entertainment, relaxation, education, training, and so on. Conceived of as such, I imagine that people would choose to plug into an experience machine with the expectation of pleasure, or self-betterment through play, or communication, discovery, and escapism, but only for a limited period[9].

[8] A similar reflection concerning the sublimity and the domestication of videogame spaces was offered in 2011 by Paul Martin. In his article 'The Pastoral and the Sublime in Elder Scrolls IV: Oblivion' Martin identified the 'sublime' (a concept which involves nuances of both immensity, incalculability, and danger) and the 'pastoral' (what is familiar and non-threatening) as two successive moments of our experiential relationship with a certain videogame space (Martin, 2011).

[9] Mentioning several positive social uses for the experience machine in this paragraph, I am not intending to claim that the experience machine would only be used in those manners and with those intentions. In line with a long tradition of dystopian social science fiction, we can easily imagine the machine being put to negative social uses.

I consider this first, tentative answer to be quite dull. It is, to begin with, largely speculative and rooted in personal experiences and feelings. On top of that, it does not take into consideration determinants such as personal inclinations, states of depression and low self-esteem, physical and emotional loss, as well as any other form of psychological trauma that might encourage individuals to seek preferential meaning-making and extended relief in virtual worlds. The greatest deficiency that I can find in this answer to Nozick's hypothetical questions is, however, its negligible philosophical significance. The appeal and the immersive effects of virtual worlds of the kind just described can already be experienced, to a certain degree of aesthetical fidelity,

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with current virtual technologies, and could already be suitably explored with the tools and methods of empirical science. In other words, if the experience machine did not feature a way to selectively inhibit our awareness of the machine itself, it stands to reason that Nozick's interrogatives would be more efficiently tackled by fields such as cognitive psychology or game user research.

Abandoning this first hypothetical scenario, the upcoming section will embark on the more challenging and, I believe, more philosophically fruitful question of whether one would plug into an experience machine that *did* include a memory suppressor.

1.1 A THOUGHT EXPERIMENT WITHIN A THOUGHT EXPERIMENT

Reading *Anarchy, State, and Utopia* (the book containing 'The Experience Machine'), it is not entirely clear what broader ethical and philosophical objectives Nozick was pursuing with his famous *Gedankenexperiment*. What is, instead, obvious in his text is the fact that he considered that most people would not opt for plugging into an experience machine in a permanent or semi-permanent fashion (Nozick, 1974, 44). According to Nozick, there are other things that matter to people in addition to pleasure, and in his book he substantiated this belief by appealing to three motivations. Out of the three of them, I consider the third one to be the most interesting and provocative. In his third motivation, and in line with what was discussed in the previous section of this essay, Nozick predicted that many people would refuse the offer of a permanent connection with an experience machine on the basis of it being nothing more than a human artefact. We would be resistant, he claimed, to abandon the world that we index as 'actual' for a virtual one which is neither more unfathomable nor more meaningful. (ibid., 43)

Even if we were somehow technically capable of inhibiting the awareness that we were connected to an experience machine after having plugged into one, the conscious decision of plugging-in permanently (or semi-permanently) would still need to be taken by each individual user with the awareness that the machine is in fact a machine, and that the worlds that such machine discloses can neither be as complex nor as significant as the actual one. As explained in my 2015 book *Virtual Worlds as Philosophical Tools*, and as I already hinted in the previous

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For punishment and correction rather than for the pursuit of a liberal education; for psychological and physical torture rather than for pleasure.

section of this essay, virtual worlds are derivative products that are inevitably conceptualized and built around specific (and specifically human) ways to perceive and understand what the actual world is and how it functions.

To clarify this last point, I propose an imaginative exercise of my own: I encourage readers to imagine having at their disposal a specific kind of experience machine. This hypothetical device would generate and uphold 'single player' virtual worlds that are experientially indistinguishable

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from the one that we index as 'actual', and would allow its user to design his or her existential course in a way that it has an impact on the rest of the virtual world. The 'single-player' descriptor serves here to clarify that the phenomena, events, and relationships that constitute those virtual worlds are uniquely experienced by the one user who is plugged into a specific machine, and are not shared with other users plugged into similar devices[10]. The solipsistic machine described above would specifically allow its users to design their existence and produce any desired experiences. It would also feature a memory suppressor that would automatically activate after a user plugged in. Now, I ask each reader to imagine that, as an individual user, he or she decides to program such machine to fulfil the dream of becoming a prominent scientist, say an experimental physicist. This objective would include experiencing years of strenuous experimental research work, facing self-doubt and the resistance of peers, and finally rising to international (simulated) fame.

The premises for this thought experiment are designed to elicit feelings that I expect most people would find pleasurable. Witnessing one's efforts leading to positive outcomes, overcoming obstacles, and achieving notoriety for one's skills and contributions is likely not only to be inherently pleasurable, but also meaningful, in the existential acceptation of the term (that is, resorting to the consciousness of other people to achieve a personal sense of meaning and self-worth).

Let us take a step backwards for a moment, and let us suppose that the user that is about to plug into one of these hypothetical devices is informed that the machine can only disclose 'single player' virtual worlds, worlds that are – furthermore – strictly reliant on the current understandings of physics. This entails that the simulation of physical phenomena that are possible in the machine cannot be deeper or more granular than those that we managed to study

[10] I believe it is important to clarify that in his thought experiment, Nozick does not explicitly state that his hypothetical machine exclusively discloses single-user experiences. The reason why I believe that is the case anyway is that the machine could not uphold a consistent, believable world in which two or more users wanted to experience things that were in conflict with one another or contradicted one another. For example, if more than one user decided to use Nozick's fictional machine to experience being the current president of the United States of America, how could a 'multiplayer' world accommodate the wishes of all those users at the same time? If another user decided to experiment with a doomsday device that eradicates all human life on planet earth, how could a shared virtual world coherently allow other users to keep experiencing the existence that they chose and designed? The question remains open, however, concerning whether the machine could allow us to passively spectate somebody else's virtual experiences (as a disembodied observer), or temporarily participate in it with limited agency (for example impersonating virtual insects or simulated, ghostly beings).

and understand in relation to the actual world[11]. What I mean to say is that our capability to understand and experiment with physics in virtual worlds (and even to virtually manipulate and subvert it) is inevitably bound by the conceptual and experimental approaches to physics that are available to us as the creators of the experience machine. The very software and hardware components of the speculative machine in question can only be designed within those conceptual frameworks and on the basis of certain understandings of physics that were originally developed in relation to the actual world.

As a consequence of the machine's limitations, it should be clear to the reader that, as far as experimental science is concerned,

1) no phenomena or interactions beyond what we already know about physics will actually be observable (or even possible) when plugged-in. The experimental discoveries that the users will be responsible for

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in their simulated roles of prominent physicists will thus be fictitious, and could not be directly relevant to any actual scientific advancements;

2) no other conscious human being will witness or appreciate any of the work and achievements that the user will produce inside the virtual world, and even if anybody did, the value of those experiences and findings would be interesting only anecdotally or for research into the human psyche and behaviour (thus, producing new knowledge *through* virtual worlds and not *in* virtual worlds). For the reasons explained in the point above, no new particles or behaviours can actually be discovered in virtual worlds and no paradigm-shifting experiments can be actually run within them.

Having received this information, would one still decide to plug in and experience the life of the experimental physicist? Would one not, instead, find it more meaningful to dedicate the time span of his or her biological life to somehow participating in the actual progress of humanity, for example by contributing to the actual growth of scientific knowledge, rather than in its virtual simulacrum? What I am trying to emphasize here is not that experimental science is the only way (or a particularly desirable way) to develop knowledge, but rather that the experiences upheld by the experience machine are inherently derivative. To be sure, I do not believe in the categorical impossibility for acquiring knowledge (or for triggering personal transformations) from simulated events and experiences. It is evident to me that there are many ways in which observing the lives of people plugged into experience machines could further our understanding of who we are as human beings. In fact, if we could look into someone else's simulated experience (see note 10), and if that person granted us permission to observe and study his or her

[11] To be sure, this is not to say that simulated physics can be at best identical to actual physics; many videogame worlds offer virtual worlds that playfully subvert physical properties and behaviours that we are familiar and scientifically well-acquainted with in the actual world. It could suffice, for example, to think of the possibility granted in the world of *Portal* (Valve, 2007) to create wormholes in tri-dimensional spaces (portals that allow space to be short-circuited), or the ways in which the concepts of time and causation are manipulated and subverted in videogames such as *Blinx: The Time Sweeper* (Artoon, 2002), *Prince of Persia: Sands of Time* (UbiSoft Montreal, 2003), or *Braid* (Number None, Inc., 2008).

simulated experiences and record data about them (or we somehow obtained the legal and ethical clearance to do so, in the case – for example – of people in a coma or non-human users), then we could definitely derive meaningful insights from them. For example we could

- detect and study psychological and behavioural patterns of its users (human or non-human) in a number of different contexts and situations,
- design virtual worlds so that their inhabitants could unwittingly perform citizen-science actions involving the analysis of actual data (similarly to current projects such as *Foldit*[12] or *Play to Cure: Genes in Space*[13]),
- stimulate and test new heuristic approaches and generate new hypotheses in a variety of epistemic fields, including self-discovery and self-construction[14],
- stimulate and test new possible form of social and economic organization.

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Having outlined the experimental scientist scenario, would many people consciously choose that path? I expect the answer would be negative, as I am convinced that most of us would still be resistant to limiting our emotions, our social engagement, our professional efforts, and our personal aspirations (regardless of their merits) to artificial worlds. Nozick must have had the same intuition when he wrote that "[p]lugging into the machine is a kind of suicide." (Nozick, 1974, 43)

Following the same conceptual path, Nozick also stated that this rationale for rejecting a permanent connection with his machine would not only dissuade people who are seeking existential meaning and personal validation in the consciousness of others (for example the cases of some scientists, actors, videogame designers, etc.) from pursuing those values within the virtual worlds of the experience machine. The same argument would, in fact, similarly deter those people who pursue transcendence through spiritual experiences and/or the use of psychotropic drugs. In that respect, Nozick maintained that people who aspire to enrich their lives with a more profound significance in those latter ways would resist being permanently plugged into virtual worlds on the basis that those worlds could never be richer or more profound

[12] Originally released in 2008, *Foldit* is a cross-platform online puzzle videogame that allows the players to simulate control of some of the biochemical processes involved in protein folding. It was developed by the University of Washington's Center for Game Science in collaboration with the UW Department of Biochemistry. The analysis of players' creative solutions to protein folding puzzles in *Foldit* allowed scientists to develop cures to diseases and pursue innovation in biotechnology (Eiben et Al., 2012).

[13] *Play to Cure: Genes in Space* is a 2014 free, mobile videogame through which players, flying a spaceship through hurdles and resources in space, help researchers analyze real genetic data used in cancer research. *Play to Cure: Genes in Space* is an ongoing project that was developed under the guidance of Cancer Research UK.

[14] This auto-gnostic aspect of how human beings extend and objectify themselves, their ideas, and their desires in technologies and technological systems is a recurrent trope in the work of several academics in the field of the philosophy of technology. Dutch philosopher Maarten Coolen, for example, is "interested in precisely those anthropological ideas that one can associate with the act of technological transformation itself. What can man learn about himself from his own fabrications?" (Coolen, 1992, 165, 166; English translation by Peter-Paul Verbeek in DeMul, 2014, 234).

than notions, beliefs, and perceptions that human beings can understand rationally and simulate technically (Nozick, 1974, 43).

Thus far, I have problematized Nozick's imaginative exercise through the lens of a specific (phenomenological) approach to philosophy of technology. Beginning from the next section of this essay, I will depart from trying to frame the technical possibilities of Nozick's hypothetical device and from speculating about the experiential effects it could disclose. I will, instead, initiate an interdisciplinary reflection on some specific ways in which we are currently designing and experiencing virtual worlds. On the basis of two of the concepts discussed earlier, those of 'virtual *Weltschmerz*' and 'nostalgia', in the second part of this text my focus will shift to analyzing and historically contextualizing some design strategies that game developers employ with the intention of making artificial worlds feel logically consistent and experientially incompletable. This objective will be pursued through reflections upon my own hands-on experience as a videogame designer and in discussion with scholars and independent videogame developers who are facing (or recently faced) the challenges of crafting infinitely explorable, procedurally generated virtual worlds. My interlocutors and interviewees for the upcoming section were, in alphabetical order:

- Mike Cook – Independent videogame developer and game researcher (http://www.gamesbyangelina.org)
- Mark R. Johnson – Game studies scholar and independent videogame developer of *Ultima Ratio Regum* (http://www.ultimaratioregum.co.uk)
- Antonios Liapis – Researcher in the field of procedural videogame content generation (http://antoniosliapis.com)
- Nicolò Tedeschi – Artist and game developer at *Santa Ragione*, the independent videogame development team behind *Fotonica* (http://www.fotonica-game.com) and *Mirrormoon* (http://www.mirrormoongame.com)

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2 THINGS TO KEEP IN MIND WHILE BUILDING EXPERIENCE MACHINES

Analytical concepts such as 'ludo-narrative dissonance' and 'world-consistency'[15] are frequently invoked when discussing videogames. Those notions can be applied to a wide variety of game genres and are not specific to a particular style or age of videogame development. They are, I find, most useful when observing or criticizing playful virtual worlds that include and emphasize aspects of linguistic communication, folklore, and exploration. Both ideas have their conceptual

[15] These notions all refer to a particular way to frame creative works, and have a common, general understanding of what 'quality' means when analyzing such works. For Samuel Taylor Coleridge, that specific understanding of 'quality' is measured by how carefully and efficiently the authors of a certain work managed to provide "a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith." (Samuel Taylor Coleridge, *Biographia Literaria*, chapter XIV)

basis in the expectation that virtual worlds are only genuinely experienced as worlds when they are perceived as internally consistent and logically sound; that is to say, when the actions and decisions that we take within such worlds are meaningfully woven within a network of reactions and transformations. This ideology is often congealed in what is commonly referred to as an 'implicit contract' between the creators of virtual worlds and the human dwellers (the players) who are supposed to inhabit and experience such worlds.

That tacit agreement is bilateral: on the one hand, the world-designers are expected to disclose worlds that are experientially rich, meaningful, and consistent (or, more simply, 'worldly' – see note 2). Their line of work relies on the inherent promise that the worlds that they create will try to pleasurably facilitate and foster the players' sense of presence and immersion. On the other hand, the players willingly gloss over some of the logical and perceptual incongruities of their virtual playgrounds. In the current socio-technological context, for the reasons discussed in the previous sections of this essay, the players' end of this bargain is far from a trivial one. It is comprehensibly hard to believe in the 'worldliness' of virtual worlds when such worlds offer a relatively low aesthetical granularity when compared with the actual one, and when they are experienced through a painfully restricted gamut of perceptual modes. Another aspect of virtual experiences that currently contributes to our difficulties with achieving a sense of depth, consistency, and meaning can be recognized in their atrocious scalability. Presently, virtual worlds are designed to be experienced at very specific and very narrow perceptual scales: trying to observe something too closely or trying to get a comprehensive view of a phenomenon from a distance frequently result in the computer simulation revealing its clumsy artificiality through

glaring omissions and distortions. More generally, as soon as our aspirations for discovery and interaction exceed the affordances of a virtual world, the illusion of 'wordliness' shatters. In relation to this last point, it is not uncommon to experientially encounter the limits of virtual worlds in the forms of impassable walls, invisible boundaries, and puffy clouds shrouding the sharp edges of a world's geometrical extremities. Other deal-breaking phenomena can be recognized in textures degrading to blurry gradients when trying to examine them too intimately, artificial intelligences running against walls or looping erratically in response to unexpected situations, etc.

Finally, I find it important to emphasize that the virtual worlds of videogames and computer simulations are still exclusively accessed through external physical devices (screens, headsets, headphones, controllers, keyboards, motion sensors, microphones, etc.). In analogy with some of the points that I raised when discussing Nozick's thought experiment, the materiality of our relationships with computers presently constitutes an unavoidable dimension of how we are both designing and experiencing virtual worlds, and an often invoked cause for our incredulity and dissatisfaction with them. Bazin's famous statement according to which cinema – in its accomplished form – "has not yet been invented" still resonates today (Bazin, 1967, 21).

We are arguably approaching a technological age in which we will be capable of supplanting our actual experiences with artificial ones in the direct and quasi-immediate ways envisaged, among others, by Bazin and Nozick. In the upcoming section of this essay I will concentrate on how game designers are currently striving to disclose vast, believable, and internally consistent

worlds (or, in other words, how they are trying to comply with their end of the 'implicit agreement' outlined above). If it is true that we cannot yet bypass the problem of the materiality of physical devices to access virtual worlds, then what design solutions and what technological expedients are game developers presently devising and adopting to make the problems of scale, of limit, and of content generation less conspicuous and – consequently – minimizing the players' nostalgia for the experiential incompletability of the actual world?

2.1 SLOWING DOWN THE 'EROSION'

Game scholars Ian Bogost and Riccardo Fassone observed that videogames are inherently limited systems, given the necessity to compress their interactive dynamics into a digital simulation (Bogost, 2006; Fassone, 2013, 127). On that premise, videogame worlds cannot avoid letting people operate with (and around) those limitations and boundaries in order to extract meaning from them. It is interesting to observe that – in several languages including English – the term 'play' is not only used to signify an enjoyable, non-serious activity, but also indicates the limited space in which a mechanism can move

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and perform its operations. In this sense, the creators of virtual worlds are in a position of power in relation to the player, as the former have the responsibility to configure the possibility space of 'play' for the players: it is the developers' role to establish (at least partially) what is interactively and perceptually available in their virtual worlds, what elements and behaviors those worlds include and what is, instead, left out of their 'possibility horizon'[16].

The term 'possibility horizon' is used here with reference to the Ancient Greek origin of the term 'horizon', ὅρος (*oros*), which denotes a frontier – a spatial limit. On that etymological foundation, 'horizon' is employed, in this context, to indicate the geometrical boundaries of the game space, boundaries that can manifest themselves as material borders, edges or, as previously discussed, as the limited perceptual and interactive scale that the world in question affords. Such perceptual and cognitive limitations of videogames are obvious indicators of their finitude and artificiality and – as such – they were earlier identified as crucial triggers for a specific kind of discontent. It follows that the most common techniques employed by designers try to prevent the emergence of 'world-weariness' involve making those limitations as inconspicuous and difficult to encounter as possible.

[16] I believe it should be pointed out that this 'possibility horizon' is not uniquely determined by the projectual intentions of programmers, designers, or creative directors. It cannot be recognized as a purely authorial (or authoritarian) process, as it always involves a degree of compromise with the players, whose aspirations and actions are not always possible for the developers to contain and shape. Videogame glitch-runs, and the 'modding' of videogames and videogame worlds, together with various approaches to play that are overtly rebelling against the ideologies and forms of power that are materially-embedded in games are especially evident examples of how our relationship with virtual worlds is effectively one of compromise, and not of imposition. Transgressive approaches to game rules, game affordances, and game conventions are recognized as forms of social subversion in the works of several authors including, notably, Espen Aarseth and Mary Flanagan. From their theoretical standpoint, subversive play is an important cultural tool that stimulates independent, critical thought, self-reflection, and promotes social change (Aarseth, 2007; Flanagan, 2009). To quote Fassone, the rigid borders of a game's formal structure "do not prevent playing from being an intrinsically transformative, interpretative and ideological act." (Fassone, 2013, 30)

A very obvious example of this design strategy can be recognized in the way the literal horizons of videogame worlds are usually presented as the aesthetical/thematic illusions of distant lands, buildings, cities, islands, planets, and star systems that cannot be reached by the players or examined closely. Similar strategies of unknowability or concealment of the frontiers of virtual worlds also include the intuitive aesthetical translation of boundaries into something impossible to overcome or obviously deadly. Among the 'translations' that are more frequently encountered in the virtual worlds of videogames are precipitous mountain ridges, impassable lakes of magma, cliffs, broken bridges, tall walls, electrified fences, and endless stretches of water. Other strategies to prevent the experiential encounter with a virtual world's borders and boundaries involve creating game spaces that have 'periodic boundary conditions' (worlds that wrap onto themselves). This is the case in the Atari 1979 arcade classic *Asteroids*. Including the possibility for a virtual world to procedurally generate new content as soon as the players move beyond spaces that were previously designed and mapped is yet another approach for making the boundaries of a videogame evanescent and inconspicuous (as do Mojang's *Minecraft* and CCP's *EVE Online*).

The masking and/or the removal of limitations concerning both the perceptual scale and the spatial extension of virtual worlds are not the only ways in which designers are trying to disclose experiences that absorb our interest while not immediately giving rise to feelings of nostalgia and discontent. With a particular emphasis on the interactive limitations imposed by videogame worlds, researcher and developer Mike Cook argued that "we dream of doing

and being a particular thing in a world, and then we find ourselves unable to do it. It is a typically 21st century condition – to be trying our hardest to escape into a digital world and then finding that we cannot act in the way we wanted. It is almost like being in a nightmare where one is unable to move one's arms, or to speak."

In his interview for this essay, Cook also attributed reasons for dissatisfaction to the repetition and modularity of elements in virtual worlds, especially when parts of those worlds are generated algorithmically. For Cook, in those cases, "[…] it is not so much dissatisfaction with the granularity of the world, but with its regularity". He believed that the more familiar we become with a world and its logics, the less interesting and surprising this world gets, progressively shying away from any sense of sublimity. Over time, argued the researcher, "we become numb to the patterns inherent in the algorithms that constitute the world."

Among the most common solutions to the problem posed by the familiarity and triviality of videogame spaces, all the developers and researchers I interviewed mentioned the intentional masking or breaking of computer-generated patterns with hand-created content. The integration of procedural content with hand-made content can trick the human brain into misinterpreting the complexity of a generator and overestimating the experiential richness of a virtual world. "The player builds a mental model of how content is generated in a certain world," explained Cook,

> "and then they encounter something that does not fit that model. Their assumption that the hand-made content comes from the same algorithm that

> generated the rest of the world prompts them to re-evaluate their initial mental model, and in this way their respect and interest for that world erodes a little slower."

Further ideas shared by most of my interviewees that specifically address ways to mask the regularities and the repetitions of procedurally generated content in virtual worlds also include

- adding 'noise' to pre-designed game content; that is, allowing a generator to introduce small aesthetical and functional variations to pre-designed game modules in order to make it hard for the players to recognize them as something already 'known' (this is the case with Mossmouth's videogame *Spelunky*, among others);
- giving the players themselves the possibility and tools to modify, destroy, or reconstruct shared virtual environments. These tools, Liapis explained in his interview for this essay, allow the players to provide additional complexity and richness to interactive, digital worlds that will, because of that, inevitably feel less artificial and more 'lived';
- using data from the internet to both disguise procedurally generated patterns and to allow a virtual world to feel more 'worldly' by means of referencing recent, actual events;

- erasing all the saved states and information about a world when a game session ends. According to what Johnson argued in his interview for this essay, losing information and access to a world as well as the civilizations that inhabited it, its undiscovered religions and tales, and its unvisited lands after a game is over not only makes it harder to reverse-engineer the ways in which that world was generated, but also triggers a lingering feeling of mystery about it.

In addition to the virtual *Weltschmerz* elicited by experientially encountering the boundaries of virtual worlds (in both extension and scale) and to the stale repetition of spatial patterns, both Tedeschi and Johnson recognized a third, supplementary trigger for 'world-weariness' in contemporary videogames: the fact that our virtual worlds tend to be poorly consistent in terms of their themes. According to both game developers, we are not only constantly (and painfully) comparing virtual experiences with actual ones (our 'phenomenological bedrock'), but also measuring the former against the backdrop of established genres and canons. Tedeschi clarified his specific way to understand this problem with an example:

> "in *Red Dead Redemption* (Rockstar Games, 2010), a videogame that amply borrows its themes and aesthetics from the Western genre, it is possible to walk into various saloons and engage non-player characters in a game of poker. The premises of what I am about to discuss resonate with the representations of the American Old West that we all are likely used to: I am in a saloon playing poker in the world of *Red Dead Redemption*. After a few hands, I have almost lost all of my money and so, while the game is still ongoing, I decide to stand up, shoot all of the other players, and walk out with all the money. Once I have killed all of the other players, however, no money is to be found on their bodies or on the table where we were playing. Apparently, *Red Dead Redemption* treats the game

> at the poker table as a technically separate instance of the world, rather than a part of it. My actions, which were completely consistent with the Western genre, are not acknowledged by the game. At that point, the world revealed its artificial constitution and lost its 'worldliness' for me… To a point that everything from that point on felt phoney and pointless."

In response to the problem of thematic inconsistency, Tedeschi and Johnson each suggested design strategies that digital world creators could start to employ with today's technologies and tools. In his interview, Tedeschi argued that the problem of world-inconsistency can be overcome by striving to set up independent worlds; that is, by making games that do not reference the actual world aesthetically or thematically. Resorting to his words referring to *Santa Ragione*'s design for their 2013 game *Mirrormoon* EP, we learn that they tried

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> "[…] to propose a very abstract experience narratively, interactively and aesthetically. The world of *Mirrormoon* is never wholly defined: it is an open world, a minimal world that is simply 'suggested' to the player. This 'openness' might not be the final solution to the problem of thematic inconsistency, but I think it goes in the right direction, that is letting the players interpret what they encounter rather than pre-determining for them how a world is to be understood on the basis of previous, common experiences. This could be understood as a Duchampian approach to game design: *ce sont les regardeurs qui font les tableaux*."

Discussing the same problem in relation to procedurally generated worlds, Johnson foresaw developments and new techniques that could ensure the emergence of more believable and coherent worlds. Johnson, who pioneered some of those techniques himself in his 2012 game *Ultima Ratio Regum*, insisted that part of the solution consists in striving to generate each of the things that constitute a virtual world in an interconnected fashion, in such a way that each aspect relates to every other aspect and does not feel like a brutal break with the world, or a random addition of content to it:

> "[i]t is relatively easy to make a generator that spits out Game-of-Thrones-esque names for cities like 'Wolfweald', or 'Queen's Throne', or 'Dragonlance', or whatever… But the real challenge is making those generated things to 'percolate' down through the remainder of the world, to reflect in everything from how people speak, to what they wear, how they act, what their history is, etc."

2.2 CONCLUSION

Besides his fitting comments on the design and the procedural generation of less 'painful' worlds, Liapis pointed out something that I consider interesting; something with which – in the

cautionary spirit typical of the concluding sections of some literary works – I would like to close this essay.

In response to one of my interview questions – or, rather, as an amendment to it – Liapis called my attention to the fact that it would be paradoxical to think of our sense of unease in videogames as simply meaning that we would prefer to pursue any task in the actual world (such as laundry, homework, or grocery shopping) rather than exploring enchanted kingdoms in a high-fantasy virtual worlds. Although he agreed that the feeling of virtual 'world-weariness' is something that he also commonly experienced, and something that is inherent in how we currently design and experience videogame worlds, Liapis claimed that his way of coping with virtual *Weltschmerz* does not primarily involve the idea of 'returning to the actual'. He argued, in fact, that his ways of dealing with virtual nostalgia usually consist in simply starting a new game altogether: exploring a new world with new possibilities and different promises of 'worldliness' and 'mystery'. Liapis appeared to be

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well aware that his expectations cannot be fulfilled by means of the systemic artificiality of today's virtual technologies (or even at all), but he seemed equally dissatisfied with the prospect of considering actual experiences as the only possible answer to our shared malcontent with virtual ones.

To be sure, I would like to clarify that I did not mean to imply (in this essay or elsewhere) that the actual world will ultimately satisfy us, or that our expectations and aspirations will find an adequate response in our experiential relationship to it. If the romantic age had not offered enough examples as to why that might not be the case, Ancient Greek tragedies and the artistic and philosophical currents of Existentialism and Absurdism could also be mentioned as historical landmarks of Western culture's awareness of the meaninglessness of our existential struggle in this world. What I want to propose with this essay is the idea that *all* worlds are ultimately absurd, and that technologies can never be expected to offer definitive solutions to the boring, painful, and even tragic dimensions of our existence. They are, I argue, better understood as existential tools: not as the contexts where we can find completion and satisfaction, but rather as instruments that enable us to embrace ourselves and negotiate with various aspects of our (individual as well as collective) existence in previously-unexperienced guises. It is in relation to this standpoint that I claim that human beings cannot be existentially 'completed' by technological means. In my perspective it is not simply a problem with the current technologies or our mastery of them: we are constitutively bound to dissatisfaction, and driven to constantly explore and experiment with new worlds and unfamiliar possibilities of being. Virtual worlds, in their peculiar ways, arguably offer those experiences and possibilities, and in doing so, they contribute to our existential struggle both in allowing us to transcend some aspects of our everyday relationship with the actual world, and in disclosing new ways in which our very incompleteness can be experienced and understood.

BIBLIOGRAPHY

Aarseth, Espen (2007). 'I Fought the Law: Transgressive Play and The Implied Player'.

Bazin, André (1967) [1962]. *What Is Cinema? Volume I* (Translated by Hugh Gray). Berkeley, California: University of California Press.

Bogost, Ian (2006). *Unit Operations: An Approach to Videogame Criticism*. Cambridge (MA): The MIT press.

DeMul, Jos (2014). *Artificial by Nature. Plessner's Philosophical Anthropology. Perspectives and Prospects.* Amsterdam (The Netherlands): Amsterdam University Press.

DeMul, Jos (2009). *Awesome Technologies*. In Curtis Carter (ed.) *Art and Social Change. International Yearbook of Aesthetics*. Volume 13. Milwaukee (MI): Marquette University, 2009, 120-139.

Dijksterhuis, Eduard J. (1986). *The Mechanization of the World Picture: Pythagoras to Newton*. Princeton (NJ): Princeton University Press.

Egan, Greg (2008) [1994]. *Permutation City*. London (UK): Gollancz.

Eiben, C., Siegel, J., Bale, J., Cooper, S., Khatib, F., Shen, B., et Al. (2012). 'Increased Diels-Alderase activity through backbone remodeling guided by Foldit players'. In *Nature Biotechnology* Vol. 30, N. 2: 190–192.

Fassone, Riccardo (2013). *Every Game Is an Island: Borders, Endings, Extremities in Video Games.* Doctoral thesis discussed at the department of humanistic studies of the University of Turin (Italy).

Feldman, Fred (2011). 'What We Learn from the Experience Machine'. In John Meadowcroft and Ralf Bader (eds.). (2011). *The Cambridge Companion to Robert Nozick's Anarchy, State, and Utopia*. Cambridge (MA): Cambridge University Press.

Flanagan, Mary (2009). *Critical Games: Radical Game Design*. Cambridge, MA: The MIT Press.

Gitelman, Lisa (2006). *Always Already New*. Cambridge, MA: The MIT Press.

Gualeni, Stefano (2015a). 'ENLARGE YOUR MESOSCOPY: A philosophical reflection on projectual ontologies and the human scale'. Paper presented at the 2015 euSLSA conference in Furjana, Malta, June 15-18, 2015.

Gualeni, Stefano (2015b). *Virtual Worlds as Philosophical Tools: How to Philosophize with a Digital Hammer*. Basingstoke (UK): Palgrave Macmillan.

Gualeni, Stefano. (2015c). 'Self-transformation through Game Design'. Paper presented at the 2015 Philosophy of Computer Games conference, held at the BTK University of Art and Design of Berlin, Germany, October 14-17, 2015.

Lévy, Pierre (1998). *Qu'est que le Virtuel?* Paris (France): La Découverte.

Martin, Paul (2011). 'The Pastoral and the Sublime in Elder Scrolls IV: Oblivion'. Game Studies, 11, 3. Retrieved from http://www.gamestudies.org/1103/articles/martin

Mumford, Lewis (1934). *Technics and Civilization*. London (UK): Routledge.

Nozick, Robert (1974). *Anarchy, State, and Utopia*. New York (NY): Basic Books, Inc.

Postman, Neil (2005) [1986]. *Amusing Ourselves to Death: Public Discourse in the Age of Show Business* . London (UK): Penguin Books Ltd.

Shaw, Philip (2006). *The Sublime*. New York: Routledge.

Sober, Elliot (2000). 'Psychological Egoism' in *The Blackwell Guide to Ethical Theory*. Malden (MA): Blackwell Publishers.

Van Binsbergen, Wim (1997). *Virtuality as a Key Concept in the Study of Globalisation*. Den Haag (The Netherlands): WOTRO.

Verbeek, Peter-Paul (2011). *Moralizing Technology: Understanding and Designing the Morality of Things*. Chicago (IL): The University of Chicago Press.

Wolf, Mark J. P. (2015). 'Video Games, cinema, Bazin, and the myth of simulated lived experience'. In *G|A|M|E – The Italian Journal of Game Studies*, Vol. 4, N. 1, September 2015. ISSN: 2280-7705. Available online at http://www.gamejournal.it/wolf_lived_experience

Zarkadakis, George. 2015. *In Our Own Image: Will Artificial Intelligence Save or Destroy Us?* London (UK): Rider Books.

LUDOGRAPHY

Artoon (2002). *Blinx: The Time Sweeper* (videogame). Microsoft Xbox, Microsoft Games Studio.

Atari Inc. (1979). *Asteroids*. Arcade.

University of Washington's Center for Game Science (2008). *Foldit* (videogame). Windows.

Cancer Research UK (2014). *Play to Cure: Genes in Space* (videogame). Windows.

Mark Johnson (2012). *Ultima Ratio Regum* (videogame). Windows.

Mojang (2011). *Minecraft*. Various platforms.

Mossmouth (remake) (2013). *Spelunky*. Various platforms.

Number None (2008). *Braid* (videogame). Various platforms.

Rockstar San Diego (2010). *Red Dead Redemption*. Various platforms.

Santa Ragione (2012). *Mirrormooon* (videogame). Various platforms.

UbiSoft Montreal (2003). *Prince of Persia: The Sands of Time* (videogame). Sony PlayStation 2.

Valve Corporation (2007). *Portal* (videogame). Various platforms.