Discovering a Threshold: a Novel Approach to the Ontology of Virtual Realities

Mathias Lange Kofoed-Ottesen

Independent Researcher
Oeverseestraße 45/4
1150 Wien
0043 0660 9935013
m.kofoedottesen@gmail.com

ABSTRACT

This paper critically examines the predominant reductionist-materialist approach to the ontology of virtual realities, as exemplified by the ontological theory of David Chalmers. Following this discussion the paper presents a novel analytical approach informed by a longstanding tradition within the phenomenological tradition which focuses on the analysis of phenomenal break-downs. Based on the analysis of the breakdown of immersion an ontological threshold between the virtual and the non-virtual domains is revealed, which theoretically equips us to understand the two as disparate realities in their own right.

The paper concludes by briefly discussing how this new ontological understanding can be relevant for theoretical discussions within the field of Game Studies.

Keywords

virtual reality, phenomenology, metaphysics, ontology, realism

STARTING FROM THE WRONG PLACE; CONTEMPORARY APPROACHES

In much of the contemporary realist work on the metaphysics of virtual reality, there seems to be a preference for a certain type of reductionist materialist approach. This approach is characterized by an attempt to explain virtual reality by reference to the material hardware and processes that make the virtual reality available to us.

In the following, I will contextualize the issue of this type of realist virtual ontology with a discussion of the issues present in David Chalmers' (2017) "digitalism". I will then go on to present the basis for another realist approach that takes its outset in the experience of the virtual itself by employing a phenomenological analysis. Finally, I will conclude with a brief consideration of the relation of this ontological issue to theoretical issues in the field of Game Studies.

The Digitalism of David Chalmers

Chalmers (2017) claims that in order to ground the reality of virtual objects, we should look to non-virtual, digital objects. However, I argue that Chalmer's approach shows how adapting such a reductive foundationalist realism introduces a positional epistemic divide, which should at least make us question whether such an approach can actually deal with the object that it claims, namely the virtual itself. Chalmers wants to defend virtual realism (as opposed to virtual irrealism or virtual fictionalism) in the form of what he calls virtual digitalism. He proposes that in general virtual realism consists of four (separable) claims (Chalmers 2017, 310):

"1) Virtual Objects really exist.

2) Events in virtual reality really take place

3) Experiences in virtual reality are non-illusory

4) Virtual experiences are as valuable as non-virtual experiences"

His own view, virtual digitalism, consists in the following interpretations of the first two claims (Chalmers 2017, p. 311):

"1) Virtual objects really exists and are digital objects

2) Event in virtual worlds are largely digital events that really take place"

Now, it might actually be saying too little, when Chalmers claims that virtual objects really exist and are digital objects. Rather, it seems that his position actually entails that virtual objects only really exist insofar as they are digital objects; virtual objects are digital objects. Digital objects really exist. Therefore virtual objects really exist.

So what are digital objects? In the original paper the notion was presented such that

"the first-approximation view is that virtual objects (and digital objects) are data structures. The second-approximation view is that virtual objects (and digital objects) are related to associated data structures as nonvirtual objects are related to associated physical entities, for example by constitution relations." (Chalmers 2017, p. 317)

In a reply to critics in the special issue of *Disputatio* devoted to his view of virtual reality, Chalmers (2019) offers the following further definition, explaining that "[i]n the first and narrowest sense",

"a digital object is a bit: a 0 or 1 in a computational system. In the second sense, a digital object is a data structure: a computational object constituted by bits but still individuated computationally. In a third sense, a digital object includes any object wholly grounded in data structures (and perhaps other objects grounded in bits), whether or not it is itself a data structure or individuated computationally. In a fourth sense, a digital object includes any object grounded in data structures (and/or bits) and mental properties. " (Chalmers 2019, p. 456)

So accordingly for Chalmers, virtual objects, that is

"the objects that are contained in virtual worlds and that we (seem to) perceive and interact with when using virtual reality"

such as

"avatars (virtual bodies), virtual buildings, virtual weapons, and virtual treasures" (Chalmers 2017, p. 314; see also Chalmers 2019, p. 454),

are digital objects, which are then again data structures, which are once again fundamentally bits (Chalmers 2019, p. 461). According to Chalmers these objects are "grounded in computational processes which are themselves grounded in physical processes on one or more computers" (Chalmers 2017, p. 317) and "realized in concrete systems, via different voltages in a transistor" (Chalmers 2019, p. 461).
Chalmers distinguishes between the question of grounding and questions of ontology and adds that "physical data structures are especially useful if we are interested not so much in grounding but in the ontological question of what virtual objects are" (Chalmers 2019, p. 466). Thus in ontological terms, virtual objects are in the end (really) physical structures of binary systems on some computer-processing

hardware. He supports this claim with his "argument from perception" (Chalmers 2017, p. 318), in which he claims that

> "1) When using virtual reality, we perceive (only) virtual objects.
>
> 2) The objects we perceive are the causal basis of our perceptual experiences
>
> 3) When using virtual reality, the causal bases of our perceptual experiences are digital objects.
> ———
>
> 4) Virtual objects are digital objects"

At this point, it would probably be intuitive for many users of virtual realities to question the third premise of this argument. How, after all, could digital objects – that is voltages of differing strength – be the basis of my experience of, say, a virtual sunrise since I perceive no such voltages? Chalmers responds that the claim that virtual objects are really digital objects is analogous to the claims that

> "water is H2O, or that lightning is electric discharge. One cannot tell that water is H2O just by looking at it or thinking about it; one needs to know about the underlying processes" (Chalmers 2017, p. 320).

Yet this analogy is quite untenable. First of all, we would be hard pressed to explain how we have reached the conclusion that water is H2O in the first place, if we could not have found out by looking (experimenting) and thinking (theorizing) about it; that instead we had to know about the underlying processes in advance. It is of course true, that I can personally know that water is H2O without looking or thinking, because I have been taught that it is so. But it is actually quite an important distinction that I could, in principle, also have found this out by looking and thinking. This possibility is what distinguishes the virtual–digital relation from the water–H2O relation. I cannot, by looking at and thinking about my digital sunrise, come to know of any makeup of the physical hardware which it is computationally realized on. The possibility of that knowledge transcends what is 'naturally' available within the virtual reality, as I am able to perceive it (for another approach to this issue, see Kofoed-Ottesen 2021; see also Schwitzgebel 2019 for a related but Kant*ian approach). I could of course theorize it, but only in a highly speculative sense. However, from within a virtual reality I do know of this hardware and these digital objects, because I have, so to speak, imported this knowledge into the virtual reality from the non-virtual domain where such knowledge is available. But again the analogy to the theoretical identification that water is H2O is a useful contrast. Lets say, that I have discovered a group of people in my hometown who have never heard of H2O. In principle, I could do experiments and make arguments which would let them too see that water really is made up in that way. That is, by importing this knowledge to a context where it was absent, I can give those persons the tools to find that knowledge for themselves. But no such thing could happen in the virtual-digital case. At most, I suspect that if I tried to explain micro-chips and voltage-alternations to someone within the virtual reality who was not already aware that the sunrise we were both looking at was computer-generated, I would sound like a raving madman – and would have no way to show the correctness of my positions.
As such I don't believe that explaining virtual objects in terms of digital (non-virtual) objects or processes is very helpful in trying to understand the way of being that characterizes virtual objects and the way that they first and foremost present themselves within the virtual worlds.

Chalmers does suppose, that there is a certain phenomenology of virtual perception, which according to him, ensures that sophisticated (as opposed to naive) users of virtual realities will not be 'fooled' into believing and/or perceiving virtual objects to

exist in physical (non-virtual) space, when in fact they exist only in a virtual space. Sophisticated users would rather be acutely aware of the fact that they are interacting with virtual objects, insofar as these are not real themselves, but are real as digital objects (Chalmers 2017, p. 327 and pp. 331-32).

However this intuition of the phenomenology of virtual perception is not very carefully investigated and on the contrary, I believe that a proper investigation of such a phenomenology would result in greatly different outcomes. I believe at least, that there would be very little, if any, difference between our usual perceptions and the way we perceive the virtual objects; put in husserlian terms, the way in which our intentionality 'towards' those objects is characterized. Nor do I believe that we in any meaningful sense necessarily experience the virtual objects to be in some non-physical space. Let us take a straightforward example, from a virtual world in a videogame, such as the most recent addition to the Assassin's Creed series, 'Valhalla' (Ubisoft:Montreal 2020). In it, the player, controlling the main character, Eivor, will quite often have to shoot things at a distance with a bow and arrow. In doing so, focusing on the task at hand, carefully aiming – perhaps trying to move at the same time, or following an already moving target – no concepts of bits, computations or data structures enter my considerations. Only the aiming of the bow and the target. I know when aiming, that I have to draw the bow fully – a fast but shallow draw would fail to hit, since it would not have the necessary momentum to travel the distance. Furthermore, I know intuitively that I have to adjust for the long distance and the drag of gravity, the curvature of the arrows path, so that I must aim above the target's position (kindly helped along by the user-interface crosshairs, which turn from white to red when I have found the right position). One might even imagine, as is the case with many detailed marksman's games, that the game could have also taken strength of wind into account, thus adding yet another physical force to which the shooter must attend. Having for some years in the past been a competitive rifle shooter I can say that being immersed in making sure that Eivor strikes true does not feel much different phenomenologically than being immersed in peering through the crosshairs at a 'real' target board. I believe that part of this problem occurs because Chalmers early on distinguishes between virtual realities and virtual worlds on the grounds that the former is immersive while the latter is not, and claims that "when it comes to ontological issues about virtual worlds, non-immersive and immersive VR raise very similar issues, so it makes sense to drop the immersiveness condition in this domain for a broader analysis" (Chalmers 2017, p. 314). What is problematic about this approach is its disregard for the important phenomenological difference it makes to be immersed (that is, situated within a given virtual world and thus being in a virtual reality proper) and simply engaging with a virtual world, but from an external place.

This position is, I believe, also supported by empirical research such as Aardema et al. (2010) suggesting that users of virtual reality technology experience, albeit brief, disassociation from ordinary reality when coming back from the virtual one. This reaction is not easily explainable if we take it for granted that virtual reality users are aware of the fact that they are engaging with virtual–as–digital objects, since believing that one is interacting with virtual objects which are in fact just ordinary digital objects implies a certain constant anchoring or tethering to the ordinary reality. Building upon the related critique made by Mark Silcox (2019) it might even be argued that we cannot really make sense of the actual experiences people have within virtual realities if we take Chalmer's 'sophisticated' orientation to be the norm.

But of course it should be granted that while sitting with, in my case, the Xbox-controller in hands playing the game, I know that there are no real arrows flying anywhere; that no arrows would continue their trajectory out through the screen and into my couch – or worse! – and that I could not get up from the couch and walk through the screen and into a historical York or London. In this sense I am one of Chalmer's sophisticated users and can recognize the disparity between virtual and non-virtual. However, this is not because I recognize the arrows and archers to be, in reality, just digital objects that deceive me to believe they are arrows and archers. It is

rather, I believe, because I realize the fundamental divide between the place (and corresponding physical space) to which the arrows, archers and Eivor belong and the place to which I myself belong. This divide is very clear in the case of an ordinary, screen based videogame, because the (non)relation between the arrows and my couch for instance determines the arrows as virtual.[1] But as I will argue, this clear distinction fades away when we 'enter' the cyberspace through virtual reality technologies. In this sense, there is something fundamentally different between being present and immersed within a virtual reality and controlling an avatar, such as Eivor, on the screen.

Making the sort of claims that are necessary for establishing a non-virtualist reductivist realism of the virtual - i.e., that virtual objects, as Chalmers put it, are real, insofar as they are (non-virtual) digital objects and (non-virtual) digital objects are real - requires assuming a position which is not available from the perspective within the virtual. It is, in other words, solely from the epistemically privileged position of being (or having knowledge from) outside the virtual, that we can make such claims. Acknowledging this disparity, we must note that in making such claims we make use of facts and relations in our arguments, which do not actually belong to the domain of virtual reality itself, but to that outside of the virtual. Thus when we make claims based on such facts, we are not making claims about the phenomena that is the virtual reality itself.

Chalmers does come close to a consideration of this issue in his discussion of what it means for a virtual rose to be red. For a rose to be red it must "produce reddish experiences in the conditions that are normal for human perceivers" (Chalmers 2017, p. 322). For Chalmers this means that a virtual rose is not really red in this sense, because the virtual rose is really a digital object. As such the rose is really data structures processed on physical hardware, which do not produce a reddish experience. I see no rose-red when looking into the components of my computer where the real substrate of the virtual rose is physically located and thus the virtual rose is not actually red. But, according to Chalmers it is red in a different sense – it is virtually red, because it does in fact produce "reddish experiences in the conditions that are normal for virtual reality" (Chalmers 2017, p. 322 my italics). Here we see that what it means to be red is already relativized to the context of being in or out of the virtual domain. And, as if it were an afterthought, Chalmers adds that

> "Of course if we are actually embedded in a permanent virtual reality, as in The Matrix, then virtual perception will be normal for us, and the virtual roses that normally cause our reddish experiences will be red in the ordinary sense." (Chalmers 2017, p. 323)

I am not convinced that it is necessary to go all the way to a Matrix-like scenario for this to hold. That discussion notwithstanding, my main claim here is that a thorough consideration of the fact, that what it means for the rose to be really red is relative to certain circumstances (such as the degree of immersion into the virtual reality), has to be further explored if we are to properly understand the phenomenon at hand.

What these examples of contemporary theorizations of virtual reality have in common is –to put it shortly– that they fail to consider virtual reality as such (for more on this, see Kofoed-Ottesen 2020). By this is meant that they, from the outset, make the implausible assumption that the virtual can be reduced to and explained by reference to the non-virtual, which makes an actual consideration of virtual reality impossible. To say of virtual reality that it is causally made possible through digital phenomena and physical hardware is no more illuminating of it, than trying to explain complex social phenomena with reference solely to individual psychology or to grasp a work of art solely by reference to the chemical and physical structures of the paint and canvas. As Malpas argues,

"[t]hose elements and the structure as a whole, can be causally explained in terms of the physical properties of certain underlying objects and processes, but understood purely as physical objects and processes, there is no painting and no experience, there is no thought and no place. Indeed while it is a widespread philosophical and scientific tendency to seek to reduce complex structures to more primitive levels of analysis, such reductions typically involve a shift in that which is the focus of explanation." (Malpas 2018, p. 213 emphasis added)

Thus in order to get a clearer understanding of the ontological status of virtual reality we must refocus and pay attention more specifically to it, rather than all manner of circumstances outside of it.

A PHENOMENOLOGICAL APPROACH

Having established the importance of the concept and phenomenon of immersion/ presence in the analysis of virtual reality, we shall take this as our leitmotif as we progress into a consideration of what an approach that contends directly with the virtual as such would look like. So what is immersion?

In a more technical sense when it comes to contemporary scholarship on virtual reality, according to Chalmers, an immersive environment is "one that generates perceptual experience of the environment from a perspective within it, giving the user the sense of 'presence'" (Chalmers 2017, p. 312). Many scholars distinguish between immersion and presence (see for example Slater and Wilbur 1997; Grabarczyk and Pokropski 2016; Skarbez, Brooks, and Whitton 2018), such that immersion is understood solely as the properties of some system that makes possible the experience of presence which, according to Skarbez, Brooks and Whitton is most commonly understood as "something akin to the feeling of "being there" in a virtual place" (Skarbez, Brooks, and Whitton 2018, p. 96). In the following, I use presence and immersion interchangeably to refer to the experience of really being there (as opposed to being where one's physical body is located), a choice which follows also from a methodological consideration to start from the experienced and thus not at first address the enabling properties and conditions which Slater intends by the terms immersion.

Within the history of phenomenology, there is a tradition of using exemplary 'pathological' or breakdown cases in order to gain clearer insights into a phenomenon (consider for example Heidegger's analysis of equipment, boredom and anxiety, as well as Merleau-Ponty's focus on the analysis of pathologies). The advantage of such a methodological approach, which focuses on the analysis of exceptional cases, is that such cases often can bring forth elements of a phenomenon which are not clearly visible in our uncritical everyday relating to it. In this way, in a husserlian frame one might say that such exceptional cases entail also a breakdown of the natural attitude, as discussed for example by Dahl, Falke and Eriksen (2019) in their phenomenological study of so-called broken bodies, in which they argue that "the breakdown opens the phenomenon up for a new phenomenological access. Importantly, it not only opens up the broken state as such, but also opens otherwise neglected dimensions of our bodily constitution" (Dahl, Falke, and Eriksen 2019, pp. 4-5; see also Carel 2021).

Katherine Ward (2020) skillfully lays out how breakdowns are used as a methodological point-of-departure for Heidegger's analysis of not just the concept of being ready-to-hand, where the breakdown is explicitly thematized by Heidegger himself, but also in his important analysis of being-with and the care-structure of Dasein. According to Ward, the usefulness (for Heidegger, but also for a phenomenological methodological approach in general) is, "that when a breakdown occurs, the reference that has broken down becomes expressly available to practical interpretation and is taken as a reference" (Ward 2020, p. 8). This act of taking

something as a reference is what allows us to see what was otherwise hidden by our involvement and distorted by an attempt at a second-order distanced view. This is exemplified in the analysis of Care:

> "[i]n the moment of anxiety, our care fades to the point that even our for-the-sakes-of-which (that ordinarily organize and structure our lives) become insignificant to us. Being a good partner, philosopher, parent, citizen all lose their grip on us. This is a case in which care itself—the mattering of things to us—breaks down and with it so do all our "goings on." " (Ward 2020, p. 12).

Accordingly, the moment of anxiety reveals care insofar as it removes or reduces it – and the sudden lack is what betrays the role that care plays in our ordinary way of being.

This well-established phenomenological methodology of break-analysis is especially apt in the project of characterizing the virtual experience qua immersion, since so-called breaks-in-immersion are already an established 'unit' of measurement within the empirical literature on virtual reality. Applying this approach to our attempt at a phenomenological theory of virtual reality and our current business of explaining the phenomenon of immersion, we thus turn our attention to the occurrence of such breaks, attempting to see how this type of breakdown can illuminate our understanding of virtual reality.

There is quite a rich literature of empirical research on what causes breakdowns, however not surprisingly many of these are based on experiments and experiences with more traditional computer games rather than modern immersive virtual reality environments. However, it seems likely that many of the same immersion-breaking factors repeat across different types of media. Often these causes are related to distractions stemming from outside the virtual domain (where, as Backe argues, attention should be paid to the literary distinction between "the nesting or repetition of a narrative within another [… and …] the breaking of ontological barriers between different fictional worlds or the fictional world and reality" (Backe 2018, p. 6)) or shortcomings of the technology, which disturb the experience by drawing attention to the hardware and processes which make the virtual reality possible. In general, the causes for such breakdowns can often be said to be interactions with non-diegetic elements (see Galloway 2006, p. 7; Zhu 2017, pp. 80-81) such as: intrusive or malfunctioning user interfaces (see Slater and Wilbur 1997, pp. 606-607; Alves, Callado, and Jucá 2020); audiovisual anomalies (see Garau et al. 2008); or cues calling attention to the non-virtual environment (see Nordahl and Korsgaard 2010; Oh, Herrera, and Bailenson 2019).

What these types of breaks seem to have in common is the forceful and disturbing intrusion of phenomena which do not belong within the virtual reality in which one finds oneself to be immersed. This relation, in which, on the one hand, there is some total world or cosmos to which the immersed user experiences themself as belonging, and on the other some extra-cosmological or extra-ontological phenomena which can intrude, seems to suggest a certain sort of fundamental ontological demarcation between that which belongs and that which does not belong to the given place that the virtual reality user is situated in.

One concept, which lends a further degree of support to the idea that immersion involves the existence of a distinctive fundamental boundary between what is within and what is without the virtual domain, is the concept of 'inclusion' found in (Slater and Wilbur 1997). According to Slater and Wilbur, inclusion is a constitutive part of immersion, which "indicates the extent to which physical reality is shut out" (Slater and Wilbur 1997, p. 605). A condition for achieving such inclusion would be to "have the HMD [head-mounted display] completely weightless, so that this aspect of external reality is not perceived by the participant" (Slater and Wilbur 1997, p. 605).

As such the analysis of breaks-in-presence reveals at least one important ontological structural property, namely the boundary between that which belongs and that which does not belong to the virtual. The characteristic of this boundary is of course that the latter category, that which does not belong to the virtual, can however still intrude upon it and thus collapse it entirely.

It may be tempting to see clear parallels between this breakdown and the breakdown in anxiety which was discussed above. After all, Heidegger's analysis of anxiety shows a moment in which the singular Dasein is pulled out of the world and network of meaningful relations in which they were previously embedded. However, as Ward makes clear with her interpretation, the defining feature of anxiety according to Heidegger is that all care loses its meaning entirely, the world as a whole becomes something which does not concern the individual. This is not what happens in the case of a breakdown of immersion. It is not the case that the world as a whole becomes of no concern. It rather becomes set in a new context and thus becomes another object entirely. It loses its character of world-hood, which is substituted with its character of a being that is present-at-hand. This is because the individual-within-the-virtual-world does not stay there in that world as the breakdown of immersion occurs. Rather, the breakdown constitutes a form of retreat to another place, another world, which is the non-virtual, and from this new point of view the virtual world is suddenly re-contituted as a present-at-hand being which can serve some purpose for someone, in order to achieve some project. The concrete content of the referential structure of the ready-to-hand (the structure of with-which, in-which, in-order-to, towards-this and for-the-sake-of-which) is replaced.

It is interesting that a type of appropriation or incorporation is possible in the virtual. In the previously mentioned experiment by Slater and Wilbur, in which subjects were asked to report what type of events caused a break of immersion for them, it was found that

> "when […] a deliberate attempt was made to cause outside interference (making a loud and incongruous noise by dropping a cup and saucer), those who reported the highest sense of presence actually incorporated this noisy event into their VE experience. That is, the source was experienced as if it had occurred from within the environment rather than from external reality" (Slater and Wilbur 1997, pp. 606-607).

As such, subjects with a high degree of immersion did not make the break-down retreat, as described, but rather made the opposite move – to them the sound from the first-order-level of the non-virtual presented itself as belonging to their immediate surroundings of the virtual reality. As Heidegger points out, it requires a more abstract way of addressing a sound to hear it as a 'pure noise'. We first and foremost hear sounds as something (Heidegger 2010, §34). As such the immersed persons actually placed the sound within the virtual context that they themselves belonged to.[2]

Now I have said that the relation between the virtual and the non-virtual is such that the virtual is of a second order to the non-virtual, making the non-virtual more fundamental, in the sense that it is the ontological domain from which there (seemingly) is no further retreat. The question then is whether this means that the virtual is thus simply reducible to this more fundamental domain? To this, the answer is no. On the contrary the second-order nature of the virtual is only possible insofar as it is something in itself, above and beyond the non-virtual. This is clear also in the retreat that occurs in the break of immersion – a retreat which can only be meaningfully understood insofar as there is a change involved.

To conclude, with the phenomenon of immersion and the ontological divide between the world of the virtual reality and that of the non-virtual sketched out through the analysis of break-downs in immersion, I will end the paper by putting this

philosophical consideration in perspective to the concrete concepts and discussions of contemporary (digital) game studies.

CONCEPTUAL RELATION TO CONTEMPORARY GAME STUDIES
First, and perhaps most obviously, the discussion of an ontological delineation that I have presented as a frame to understand the reality of virtual entities and events, has some clear parallels to the discussion and appropriation of Johan Huizinga's concept of the 'magic circle' (Huizinga 1955). With this concept, Huizinga claims exactly that there is a boundary between the game and the real world. It is the structured nature of the game, its rules and regulations, along with the players' adherence to, acceptance and upholding of these rules that grant play this bounded space. This concept has been broadly appropriated (albeit in variously edited forms) by game study researchers (Juul, 2005; Salen & Zimmerman, 2003) but also critiqued by researchers such as Gordon Calleja (Calleja 2018). Calleja argues that Huizinga's concept is flawed, since it is not possible to clearly demarcate play from 'reality', not least because play necessarily happens in that same reality from which it is supposedly separate.

On a similar note, Tyler Blackman (2022) also argues that, based on his interviews with users of the VR game Land's End, that "the virtual worlds of VR are not separate spaces", since the way in which the players interact with them are (co)constituted by their real-life experiences with a multitude of other media, their cultural backgrounds, etc. This conclusion however, seems to run contrary to or at least overreach based on the interview data.

To illustrate this, we can look at two different players in Blackmans interviews, Robert and Franklin.

Robert explains that he experienced the lack of a visible body in the virtual world as a hindrance to his immersion, but that he was able, through active intention, to overtake the attitude that he, in the virtual world, was simply to "think of [him]self as a being with no body who has telekinesis" (Blackman 2022 p. 14). On Blackman's interpretation, this shows that "the connection between his physical body, the virtual world, and his imaginative practice allowed him to experience virtual space differently" and thus "disrupts the notion of a technologically rigid cleavage between the virtual and the real" (Blackman 2022 p. 14). Yet based on the argument presented in this paper, it could be said that Robert's example enforces the idea of a divide between the virtual world (and his existence in it) and the real one. Exactly because Robert's way of achieving (greater) immersion in the game requires him to bracket his knowledge and expectations of his ordinary physical embodiment and adopt the existence of the avatar.

Franklin on the other hand actually explains that he feels as though his "brain is kind of like [on] double duty" due to the experience of being in two worlds and two positions at once. During play, Franklin repeatedly and intentionally lightly kicks the chair he is sitting in, and touches a nearby wall. He explains that he was "entranced by the novelty of kind of being split between the real world and the virtual world" that he "didn't want to upset the illusion by like really kicking the chair and really harshly reminding [him]self" of where he was. Although Blackman does not go into this, it seems as though Franklin was using the small gestures to tether himself to the "real world" and thus ensuring the entrancing experience of dual positioning. As such the action could be interpreted as a way of actively withholding from being too absorbed inside the world of the virtual reality. Thus, rather than being an example of the two being first and foremost overlapping and connected, it is an example of actively engaging a tactic to connect what might otherwise have been disconnected - to remember his physical positioning despite the temptation to let himself be completely immersed in the virtual world.

The concept of a bounded reality in VR experiences found in this paper does not suggest such a clean divide when it comes to game studies. Quite contrary, any game is necessarily related towards a player and outside of very limited game experiences, that player is not a part of the game-world itself. Thus, by their very nature, games counter any stable boundary of in-world immersion. And as Piotr Kubiński argues (see Kubiński 2014), this is not a bad thing; in many cases what Kubiński calls "emersive effects", i.e. effects that pull the player out of immersion and refocuses the experience on the player themself, is part of the enjoyable aspects of playing a game. In other words, the immersive, world-building effect that VR is capable of is not its only capability and certainly should not be understood as normatively superior.

Secondly, the ontological understanding of the virtual realities presented here can better make sense of a group of phenomena within game studies and VR studies, that essentially question which subject is at the center of a gaming or VR experience. For example, Daniel Vella (Vella 2013) argues that understanding the player avatar as an in-game-world representation or extension of the player themselves is imprecise. Rather, he argues, the player becomes the character he is playing, whether it be Mario or Nathan Drake, by overtaking the character's affordances and goals - the character's towards-which, with-which, etc. - in a way that Vella describes as a psychological frame, giving rise to not a player, but a hybrid player-character, or "subjective "I-in-the-gameworld"" (Vella 2015, p. 22) as the subject of the game.

Similarly, Nele Van de Mosselaer has examined how we often "feel emotions from *inside the fictional world* of the videogame" (Mosselaer 2019, p. 194, italics original). According to Mosselaer there are two categories of emotions related to video game experiences, namely those that "originate from a fictional or lusory attitude which brackets the game events from real-life, making the emotions themselves solely relevant within the life of the player-as-a-character" and emotions that are "not felt towards the game *as a game*" (Mosselaer 2019, p. 204) but rather towards the game as a technological artifact, exhibiting disrupting defects or intentionally emmersive effect. These former feelings are real only insofar as they belong to the game-world and in effect only for the immersed player. However, carrying them out beyond the boundary between the virtual and the non-virtual place, they change character and are no longer feelings for the player but for the I-in-the-gameworld.

As such, by understanding the phenomenon of immersion through a phenomenological approach, highlighting the ontological structure that comes to the forefront when examining break-downs of immersion, we can start to sketch out an ontology of virtuality which at once can maintain the distinction between the game-world and the real world, while simultaneously not discounting the reality of the experiences, events and entities of the virtual realm.

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[1] We might look to Husserl's concept of *Bildbewusstsein*, which distinguishes the picture (Bild) seen as a picture and thus belonging to our ordinary reality from the reality which is depicted within the picture. As he claims, with regards to a painting, "[t]he frame is in the visual field. It frames the landscape, the mythological scene, and so on. We look *through the frame,* as if through a window, *into the space of the image*, into *the image's reality*." (Husserl 2006, p. 50 ; quoted in Klevjer 2019, p. 729, emphasis added; see also Backe 2018, p. 6).

[2] Although outside the scope of this paper, I will note that this possibility of placing non-virtual sensations within the virtual is also a key aspect of understanding the embodiment of virtuality.

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