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### Gaming and the Limit of Digital Embodiment

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# Gaming and the limits of digital embodiment

## Introduction

This paper discusses the nature and limits of player embodiment within digital games. We identify a convergence between everyday bodily actions and activity within digital environments, and a trend towards incorporating natural forms of movement into gaming worlds through mimetic control devices. We examine recent literature in the area of immersion and presence in digital gaming; Calleja's (2011) recent Player Involvement Model (PIM) of gaming is discussed and found to rely on a problematic notion of embodiment as 'incorporation'. We go on to further reflect on the nature of player involvement in digital gaming environments by applying insights from Maurice Merleau-Ponty's *Phenomenology of Perception*. It is argued that digital embodiment differs so significantly from primordial embodiment that any idea of total immersion is simply fantasy. We subsequently argue that digital game media nonetheless provide us with unique opportunities for exploring the nature of distinctively human forms of embodiment, and so we need more complete and more reliable phenomenological descriptions of the experiences associated with computer games.

## Towards Whole-Body Interaction

The idea that digital environments could provide complete sensory immersion has long been a 'technofantasy' of science fiction (Ihde, 2010; Gregersen, 2011). However, this remains a regulative ideal and point of orientation for games design, with 3D game worlds becoming ever more convincing, haptic technologies more sophisticated, and control interfaces based on more natural forms of bodily action. Video games have also been reaching out to wider audiences with more people playing them than ever before. Juul (2010:5) suggests that part of this rise in popularity is due to the use of mimetic interfaces (where "the physical activity that the player performs mimics the game activity on screen"). By building upon conventions and activities with which people are already familiar (e.g. swinging a racquet to play tennis) games that adopt mimetic interfaces (e.g. swinging the Nintendo Wiimote to play virtual tennis) are easier to learn how to use since players are already familiar with how the controllers are supposed to work. This reduces the learning curve and lowers the barriers of access to those interested in playing these sorts of games. Similarly, Skalski *et al.*, (2010) argue that controllers with more natural mappings allow for players to easily access mental models of real-world behaviours and thus facilitating engagement within the game.

Jenson and de Castell (2008) suggest that the introduction of novel or bespoke games controllers such as dancemats, motion sensitive controllers and guitar shaped peripherals have contributed to very different forms of game play. This tendency in game design – and this is a trend we also observe in mobile and educational technologies – is twofold. Not only are forms of digital interaction starting to use more (or all) of the body as a control device, but human-computer interaction is increasingly based on natural or mimetic forms of

movement. In addition, forms of haptic feedback (notably vibration) are often used to promote a sense of embodiment within digital environments. As Dourish notes, human-computer interaction has developed through a variety of stages and the latest phase involves a shift from graphical interfaces to more tangible, social and embodied approaches. More specifically, this latest stage “draws on *the way the everyday world works*” and “*the ways we experience the everyday world*” (Dourish, 2001:17).

Since the success of the Nintendo Wii, Microsoft (Kinect) and Sony (PS Move) have also attempted to utilize motion control. Kinect in particular seems to embrace the notion of whole-body interaction by removing the need for a game controller: through an infra-red sensor bar and microphone, Kinect is able to track player movements in real time and respond to specific gestures and spoken commands. It has been claimed that “controller-less immersion has been the Holy Grail of game designers and developers for many years now” (Leyvand *et al.*, 2011:94) though the reviews on sites such as Metacritic indicate that not all games are effective at utilising this type of interaction. For example, *Kinect Star Wars* received a Metascore of 55 (and a user score of 3.6 out of 10) with one reviewer stating “there’s nothing natural about *Kinect Star Wars*. Whether you’re running, fighting, flying, or shooting, the movements range from decent to downright awkward” where “combat is even less fun, with clumsy arm swings that never really feel like you’re truly directing a lightsaber” (Cohen, 2012).

### **Engagement, Immersion, Embodiment**

Human-computer interactions are increasingly using more (or all) of the body as a control device. Game-play is typically described as an engaging activity, and the move towards ‘whole-body’ interactive approaches appears to assume that more ‘embodied’ interactions will lead to more engaging and immersive gaming (and learning) experiences within virtual worlds. For instance, Bianchi-Berthouze, Kim and Patel (2007) investigate the introduction of the latest generation of games consoles which “offer control devices that allow for a more natural type of interaction” (2007: 102). They carried out two studies which examined the effect of body movement within *Guitar Hero*. In the first within groups study, players were asked to play with a classic game pad controller and with a guitar shaped one. In the second study, a between groups design was implemented, where players were either told how to use star power (which requires the player to increase their level of movement by tilting the guitar controller) or they were not given this information. The authors suggest that body movement results in higher engagement and mediates the player’s sense of presence. Specifically they argue the “full-body experience” of playing *Guitar Hero* “facilitates the feeling of presence in the digital environment” and helps to provide a “stronger affective experience” (*ibid.*). It would seem that the trend towards whole-body interaction aims at a more embodied and thus more immersive, engaging and enjoyable game-play experience.

Not all studies demonstrate a relationship between presence and enjoyment, though there does seem to be a link between perceived naturalness of the controller and enjoyment (e.g.

Skalski *et al.*, 2010). Further, precisely what is meant by ‘embodiment’ within digital environments remains unclear (Bayliss, 2007). There is a persistent ambiguity within the literature on virtual realities and games over ‘immersion, engagement and presence’ (McMahan, 2003), since the terms are often used interchangeably (Bayliss, 2007; Calleja, 2007; 2011) further complicating explanations of how these forms of involvement relate to the concept of embodiment. For instance, Brown and Cairns (2004:1298) suggest that players experience involvement on three levels: “engagement; moving on to greater involvement in engrossment; and finally total immersion”. In order for the player to feel like they are inhabiting a different physical location three criteria must be met: namely, (i) engagement (based on attention); (ii) engrossment (requiring emotional investment or ‘stakeholding’); and (iii) immersion (where “total immersion is presence” (*ibid.*, 1299). Meanwhile, McMahan (2003) distinguishes immersion as a term which relates to the diegetic level (i.e. with respect to the game narrative) and engagement to the non-diegetic level (“at the level of gaining points, devising a winning (or at least a spectacular) strategy, and showing off their prowess to other players during the game and afterward, during replay.” (McMahan, 2003:69). She suggests that both contribute to a sense of presence, where she draws upon Lombard and Ditton’s (1997:73) definition of presence as “the perceptual illusion of nonmediation” (see also McMahan, 2003).

Iacovides (2009) has noted that the confusion over the terms such as ‘immersion’ has carried over into the area of games and learning research, as they are rarely defined explicitly. For example, Gee describes games as “action- and goal-directed simulations of embodied experience” (2008:254) suggesting that, during play, the virtual minds and bodies of characters become the player’s surrogate mind and body. Through “taking a projective stance” (where the player projects their own goals onto the character) Gee argues players are able to engage in a form of embodied thinking which is quite similar to the kinds of problem solving and learning people engage in during everyday life. It would seem that games also have scope to serve as simulators which support situated learning. But as Bayliss (2007) notes, experiencing a “highly sophisticated simulation” – for instance when players are “controlling a fictional American soldier taking part in the Normandy invasion... does not equate with them actually storming a beach in north western France”. The digitally ‘embodied’ experience of playing the game differs in obvious ways from the experience of actually taking part in the Normandy invasion. The fictional worlds of games like these are often not attempts to emulate real life, but to re-create shared cinematic, literary or televisual worlds which have no physical correlate. A player who takes on the role of Cole Phelps in *LA Noire* isn’t emulating an experience so much as experiencing a story about a fictional Los Angeles police department in the 1940s; itself a composite of any number of film noir or television shows. Entire game worlds can be fictional; a *Skyrim* player effectively interacts with a complete fantasy world through an ‘embodied’ avatar. Conversely, the avatar controlled by the player may not be recognisably humanoid in form at all (such as the spirit-wolf from the eponymous *Okami*, or, more abstractly, the breath of wind in *Flower*). The extent to which a player can feel embodied in such forms is debatable. Some avatars are evidently more human than others, and manifest different forms of ‘being-in-the-game’. Games allow us a space to be otherwise, to act without consequence and indulge in

behaviours which are unusual for us. There is a general consensus among designers that immersion is achieved through fostering a sense of embodiment. But if embodiment is the right way to conceive (or frame) being ‘in-the-game’ then how might this be promoted? Is it through more natural interfaces / control systems or some other feature? Research in learning technology, for example, suggests that advanced human-computer technology – such as eye-tracking – can contribute to the design of both gaming and learning environments (San Diego & McAndrew, 2009). While the ability to collect data like this is important, such investigations must be tempered with an understanding of the subject’s own conscious experience. If a sense of immersive ‘being’ in a game is rather something that can be promoted by the convincingness of our experience of a digital world, what would be characteristic of such experiences?

### **The ‘Player Involvement Model’ (PIM)**

We have argued that the language of embodiment is often used in unclear or inconsistent ways in gaming research literature. Calleja (2007; 2011) also argues that there remains some confusion of how these terms are used. In particular, the use of the “metaphor of immersion as deep absorption [has become] conflated with a metaphor of immersion as traversable space habitation” (Calleja, 2007:94). As an alternative he presents the Player Involvement Model (PIM), based on qualitative research, which seeks to replace the metaphor of immersion with one of incorporation (Calleja, 2011).

In Calleja’s model, the term incorporation is used signify how the digital environment is made present to the player’s consciousness through a process of internalising the relevant kinaesthetic, ludic, affective, narrative, spatial and shared frames which simultaneously allow the player to exert agency within the digital world and appear present to others within it. Incorporation is defined as “the subjective experience of inhabiting a virtual environment facilitated by the potential to act meaningfully within it while being present to others” (Calleja, 2011:219; Calleja, 2007).<sup>1</sup> This model of involvement emphasises how different forms of engagement can contribute a powerful game-play experiences which involve a combination of deep absorption and the sense of inhabiting a virtual environment. Further, Calleja argues that “incorporation operates on a double axis: the player incorporates (in the sense of assimilation or internalization) at the same time as being incorporated (in the sense of corporeal embodiment) through the avatar in that environment” (Calleja, 2011:211; Calleja, 2007). Drawing upon the experientialist ontology of Lakoff and Johnson (2003), Calleja (2011: 168) states that this process of internalization and experiential restructuring “is compelling precisely because it draws so strongly from everyday life”.

The PIM suggests that the sensation of inhabiting a virtual world is dependent on the player feeling embodied within that world, though it is worth noting that this does not necessarily

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<sup>1</sup> It’s worth noting that the PIM was developed on the basis of data gathered from MMORPGs, perhaps indicating an awareness of intersubjectivity for creating meaning in games. Perhaps only MMORPGs offer the kind of meaning-generating interactions that could reasonably justify the label of intersubjectivity, though this is a claim that we will not examine in any detail in this paper.

mean the experience will be one of ‘deep’ involvement or enjoyment. As Bayliss (2007:5) argues, “though the sense of ‘being there’ may seem to be a direct experience of the game-world for the sufficiently competent player, it is intrinsically mediated by the complex relationship between the player and their locus of manipulation, a relationship based on the distinction between embodiment as a state of being and embodying as an act.” The distinction between “embodiment as a state of being” and “embodying as an act” (adapted from Hirose) is used to frame the various ways in which the player experiences the game world of their avatar through a kind of enacted embodiment. Familiarity with a game world is developed through extending one’s intentionality to the actions of the avatar and appreciating the limits of their agency within the game environment. Thus, Bayliss (2007:5) argues that we should understand embodiment as a form of meaningful enactment which is facilitated by physical actions which mimic the digital actions being portrayed (e.g. accelerate, brake, steer) which improve a sense of immersion within a game.

In Calleja’s work this distinction emerges as the provision of a dual aspect for explaining what he terms ‘incorporation’ as (i) a sense of assimilation of a virtual environment into the conscious experience of the player and (ii) the systematically upheld *embodiment* of that player into a single location within the game world (the avatar) (2011:169). Calleja’s advocacy of the term ‘incorporation’ appeals directly to the language of the lived body, yet any sense of incorporation in the former sense is by proxy. It is *assimilation* rather than incorporation. Calleja’s PIM does not so much solve the problem of digital embodiment, but suspends the issue. The focus of the model is instead on distinguishing a number of discrete elements of player involvement (kinesthetic, spatial, shared, affective, narrative, ludic) and perhaps understanding embodiment as a phenomenon which might arise from some combination of these depending on the game (Calleja, 2011:43-45). This schema is helpful in providing a robust analytic framework with which to understand and describe the experience of gameplay, but does little to show the ways in which such experiences relate to an alternative sense of embodiment or an assimilated environment. While Bayliss refers to this sense of embodiment as a kind of action, Calleja stills relies on the metaphor of spatial and imaginative ‘extension’ into game worlds through the avatar (2011:181). But even if we accept the Baylissian notion of intentionality projected into a digital avatar as a form of embodiment, it remains important to distinguish this from primordial or originary embodiment. There remains a fundamental ontological and phenomenological difference between acting vicariously through an avatar in order to have an approximate experience of their form of embodiment and the way we experience embodiment in our daily lives. While his focus is not so much on embodiment itself, but on modelling the experience of gameplay, Calleja’s notion of ‘incorporation’ as assimilation does not appear to address the philosophical problems provoked by digital embodiment.

It should be noted that we do not mean to imply that Calleja’s treatment of this complex question is in any way superficial. Early on in his book (Calleja, 2011:27) he approaches the problem of the ‘immersive fallacy’ as framed by Salen and Zimmerman (2003:450-453), noting that several writers have conflated the idea of more immersive experiences with more meaningful or more enjoyable forms of game play and advancing the interesting thesis that a schism between technological-psychological understandings of digitally mediated experience

as presence and humanistic understandings of such experiences as immersion may be the root of the problem. Calleja's proposal undoubtedly shows sensitivity to this problem. However, he does not provide a satisfactory solution.

### **The Phenomenology of Embodiment**

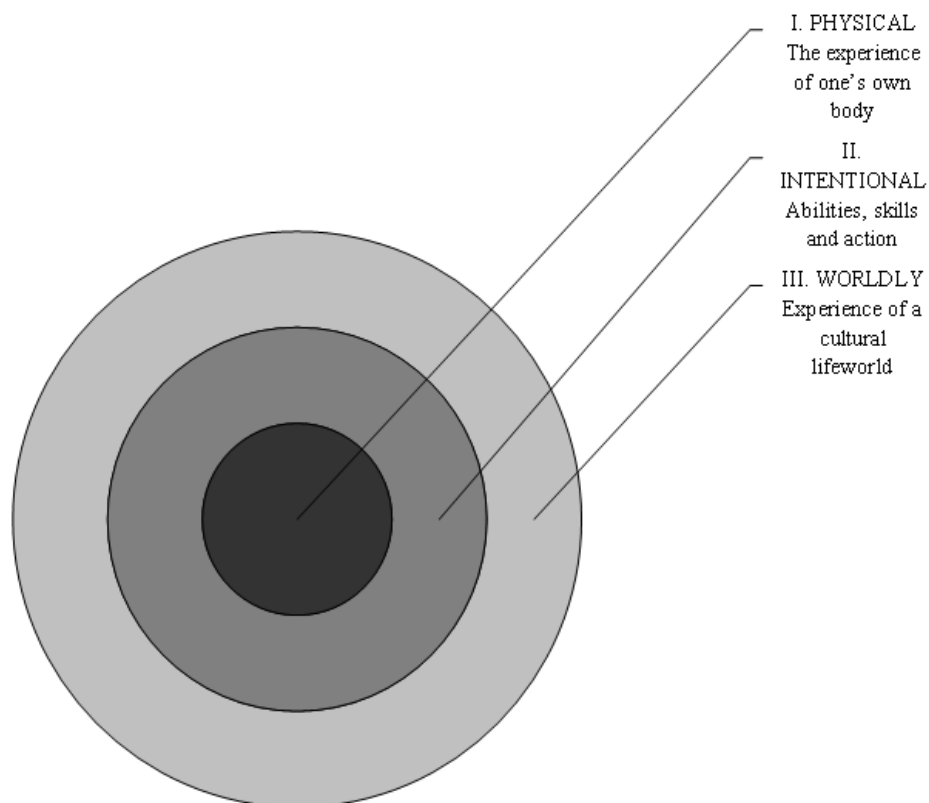
While the PIM recognizes some of the philosophical misconceptions that are found in the discourse around gaming and human-computer interaction (HCI) it's evident that there remains further work to be done to develop the right kind of concepts and language for understanding new forms of digital interaction. In the rest of this paper we will be concerned with the extent to which phenomenology – widely understood as the rational study of conscious experience – can help in this endeavour.

Since the mid-1990s (after a short-lived media interest in virtual reality technologies) specialists in HCI have tried to provide rich and thorough phenomenologies of user embodiment with a view to rendering digital worlds more plausible and immersive (e.g. Murray, 2000). While there are a number of phenomenologists whose work may shed light on the experience of gaming, there are a number of reasons for focusing on Merleau-Ponty in relation to the issue of digital embodiment. Merleau-Ponty's work is also a focal point in Dourish's (2001) influential book on the philosophical basis of computer interaction (where a whole chapter is devoted to discussing the phenomenological tradition). Clark similarly draws on Merleau-Ponty to argue against representationalist paradigms in cognitive science and the philosophy of mind (1997:148). More recently, Crick (2011) has returned to Merleau-Ponty's text in order to propose a phenomenological model of bodies within games based on Sobchak's (2004) account of the phenomenology of the body in film. Merleau-Ponty's analysis is of particular interest with reference to the experience of being 'in the game' because of his emphasis on the centrality of the body and the embodied nature of human experience: *Phenomenology of Perception* attempts a radical re-description of the nature of conscious experience which steers a course between empiricist and 'intellectualist' (Neo-Kantian) positions on the relationship between mind and body (Merleau-Ponty, 1962:28). Merleau-Ponty argues that human subjectivity is embodied, meaning that being a human means being in a world which cannot be reduced to any kind of solipsistic interiority. For Merleau-Ponty, our perceptual relationship to the world – our consciousness – is not a transcendental act, but an interpretation of bodily stimuli. This is expressed in the irreducibility of the *Gestalt*, and the fact that the world enjoys a privileged place in our perception by its very appearance. Thus, our perception of our own being is embodied and there is no 'view from nowhere' (Merleau-Ponty, 1962:60-61). The objects of perception (including one's own body) have an inner horizon in consciousness and an outer horizon in the external world. This 'horizon' is temporal and future-focused (Merleau-Ponty, 1964:21). However, our ability to experience the world results from our form of being-in-the-world [*être au monde*] and specifically from the body, which experiences sensory information and enables us to have a place in "a world of implicit relations and movements" (Merleau-Ponty, 1962:148). Faithful descriptions of experience are, for Merleau-Ponty, vague and often disordered. Nonetheless, the self is *always* embodied: "at every moment living, breathing,

feeling, suffering (being affected), changing and decaying” (Carlisle, 2006:19). Contra Crick (2011) digital avatars are inevitably embodied in ways significantly different to our own form of being. Digital forms of ‘embodiment’ are never primordial.

### **Interfacing Bodies and Game Worlds**

Dreyfus (1996) identifies three different aspects to embodiment in Merleau-Pontian thought, each of which contributes to our understanding of our own experience of embodiment and helps build an intersubjective account of how our bodies are understood by others. The first is physical; the partaking of physical (and distinctively human) form. The second relates to the network of physical abilities and skills we are motivated to develop through our life experiences. The third relates to the background understandings of embodiment we arrive at through being members of cultural lifeworlds with other embodied beings. Each of these aspects is predicated on the preceding features, which we can represent in the following way.



Our contention is that these three aspects of human embodiment – as developed in Merleau-Ponty’s *Phenomenology of Perception* – can help to bring clarity to the complex question of embodiment in digital games. We deal with each of them in turn.



## (I) *Physical*

One of the distinctive things about being a human being is that we cannot touch ourselves or others without becoming aware of our own corporeality, our capacity to *be touched* (Merleau-Ponty, 1968:147). Indeed, the reversibility of touching and being-touched are what distinguishes living objects from inert matter which can only be sensed and not sense. Put another way, the human body can be both the organ of perception and the object that is perceived. This dual-aspect of touching and being-touched [*touchant-touché*] is part of the primordial experience of human subjectivity (Merleau-Ponty, 1964:92) and characteristic of the ‘ontology of the flesh’ more generally construed (Slatman, 2005).

Embodiment is often understood in terms of its opposition to representation: the immaterial mind ‘opposes’ the material body (Ihde, 2010:11-15). The fact that bodies within game worlds cannot conform to this duality is a good illustration of the fundamentally asymmetrical nature of digital embodiment. Consider the example of pain: we never experience the physical pain of a wounded avatar; only a representation of it (whether a diminishing health bar, a shuddering controller, or blood streaking across the screen). Regardless of the particular form of representation (or amelioration) non-digital forms of embodiment are ontologically and epistemologically prior to digital experiences. Rhetoric about digital forms of embodiment often overlooks this. Crick (2011:267) for example overstates his case when he writes that “like our lived phenomenological experience, roaming a virtual game world is a fully embodied, sensuous, carnal activity” on account of an aesthetic convergence between the game body and the cinematic body. We do not relate to bodies in virtual worlds (or in cinema for that matter) in the same way that we relate to our own corporeality. For one thing, we tend not to care too much about dying and we do not experience pain through our avatar: these phenomena are experienced as representation, not as embodied, subjective experience. In this light, the ways in which players are ‘embodied’ within game environments are so unlike our everyday form of embodiment that we might question whether this kind of language is appropriate at all.

## (II) *Intentionality*

To accept the idea that our consciousness can be embodied in digital environments is tacitly to claim that the interfaces which make this possible can be successfully integrated into the experience. We are typically unaware of our clothes, spectacles or false teeth because these kinds of technologies are often in prolonged contact with our bodies. According to Grosz, (1994:80) “anything that comes into contact with the surface of the body and remains there long enough will be incorporated into the body image”. For a convincing and immersive experience, one should be more or less unaware of the way in which it is being mediated. Along these lines, Merleau-Ponty encourages us to ask: how do we perceive the body? How successfully can we incorporate technology into our perception of the body? Merleau-Ponty uses the car as an example of successful polymorphism of this type: a familiar vehicle is car

is an “area of sensitivity” which extends “the scope and active radius of the touch” (Merleau-Ponty, 1962:143).

Mimetic game interfaces are designed to facilitate this sense of polymorphism through incorporation of controllers and avatars into the phenomenological body. The extent to which control devices and game stimuli can effectively become ‘invisible’ forms of amelioration between the subject and a digital game world is the degree to which they can support more immersive gaming experiences. Game control systems should strive to be as ‘invisible’ as possible, phenomenologically speaking, if they are to promote immersion. Technologies and interfaces which involve using more of the body than just the hands – or even do away with controller altogether – to interact with digital worlds do not necessarily promote a sense of ‘embodiment’. In Heideggerian parlance, control devices need to be ‘ready-to-hand’ [*Zuhandenheit*], mediating objects which are their most effective when we become unaware of them as mediating objects (for an overview see Winograd & Flores, 1986). We can understand this as a rationale for ‘whole body’ approaches to human-computer interaction which strive to do away with control devices completely.<sup>2</sup>

### (III) *Worldliness*

Human forms of embodiment as being-in-the-world [*être au monde*] are inevitably bound up with practical context. As social beings, we always find ourselves in a particular cultural and historical context that determines our basic orientation towards the world. Once again following Husserl (1936), Merleau-Ponty argues that to be embodied is to be part of a shared, intersubjective, lifeworld [*Lebenswelt*] which is the source of meaningful activity. Game worlds are not necessarily meaningful in themselves, however. Block puzzle games like *Tetris* or *PuyoPuyo* might present visually coherent representations of space but there’s no intrinsic meaning to be found in destroying blocks.

The recent smash hit *Skyrim* (2011) might seem to be a contender for a game that successfully conveys a meaningful lifeworld. After all, players experience a highly customisable character from a first person perspective who freely roams a detailed and interactive world. Character choices lead to outcomes which are portrayed through convincing visual and audio effects (like damage, being poisoned, etc.).<sup>3</sup> There are hundreds of characters to interact with and an overarching narrative which has been painstakingly crafted. Yet the game has been criticised for lacking any convincing sense of consequences to actions. As Scimea, reflecting on his experiences of exhausting dialogue options with a minor character writes:

I finally realized the problem I was having with *Skyrim*: It felt soulless. I may as well have killed Agnis and taken her stuff, because what did it matter

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<sup>2</sup> Heidegger’s terminology has become established within HCI discourse, though there is a tendency (e.g. Dourish, 2001:139) to understand the concept of being ready-at-hand as an abstract property or state rather than a seamless aspect of conscious experience.

<sup>3</sup> These may work quite well, but there are other proprioceptive aspects of embodied sensory experience which could never conceivably be reproduced within digital environments as we know them: gravity, heat, etc.

whether she was there or not? I suspected that nothing I did would ever matter, and that has been my experience as I've progressed through the game. Skyrim is a huge world drawn with a level of detail that entices us to lose ourselves there, and is filled with things to do, enough to keep us occupied probably for years. But it also feels empty and pointless. (Scimea, 2011)

Some games clearly do aspire to portray meaningful worlds within which the avatar is embodied, with differing degrees of success. *Heavy Rain* and the *Mass Effect* series, for example, emulate aspects of the experience of freedom by presenting detailed worlds with convincing characters and storylines where the paths of action chosen by the protagonist(s) may be morally ambiguous and (crucially) have lasting consequences.

But perhaps it is only through play with other humans that games become meaningful. Consider this excerpt from the *Edge* annual awards which named *Dark Souls* 'Best Online Experience':

*Dark Souls* profoundly understands online play's defining feature: humanity. Though there's an in-game mechanic that shares the name (a typically deft touch, blending concept and lore), the focus is always on others. *Dark Souls*' multiplayer runs alongside its single player, but not always in parallel: asynchronous messages left for you offer hints or tricks, while bloodstains and ghosts flicker in and out of reality. The key is its tightly controlled feature set: with no voicechat and no friends, this lonely world is kept permanently lonely. (Edge, 2011)

Curiously – and perhaps even paradoxically given the way that this title relies on online multiplayer elements – it is a sense of loneliness, alienation or angst in the imperfection or asymmetry of relations with others that appears to afford this title its appeal. A more immersive or convincing sense of embodiment within digital worlds may thus depend on experiencing a convincing, meaningful world within which the player has an elevated sense of choice and responsibility. As Dreyfus (2009:120) argues, virtual environments such as Second Life (and presumably games) do not provide the same experiences as those within the “risky, moody real world”. Worlds that are convincing are also worlds in which we have something at stake. As Heidegger famously argues, human being is fixed and embedded in the world which manifests itself as meaningful through the existential attitude of care or concern [*Sorge*]: there is no such a thing as a human being that has no interests. Thus, it is “only emotional, involved, embodied human beings” (Dreyfus, 2009:47) that have the capacity to behave in authentically human ways.

### **Conclusion: Singing The Body Digital?**

We began this paper by referring to the techno-utopian fantasy of complete embodiment in digital worlds, a vision of digital mediation which is predicated on the possibility that a digital game could be so immersive that there would be no way for the player to know that

they were in a game. We have used Merleau-Ponty's phenomenology of embodiment to suggest that we need to expand the description of embodiment to include a wider sense of being. Game designers interested in promoting embodiment may wish to strive towards producing virtual environments that involve reflexivity at the level of the body, seamless and holistic forms of interaction, and more meaningful game worlds.

While the idea of a *totally* immersive experience is fundamentally fallacious, the drive towards the techno-utopian fantasy of total immersion may make sense in terms of a need to provide authentic experiences that allow for transfer between virtual and real worlds. However, such approaches ultimately miss the point, particularly when it comes to the kind of entertainment provided by gaming. Part of the enjoyment of watching a horror film or playing a soldier in a first person shooter may stem from the very fact that these experiences do indeed differ from what they would be in the "risky, moody real world" where we are much more vulnerable: it is arguably our *lack* of embodiment that forms the basis of the appeal. The distance between our bodies and the activities that occur on screen is important to maintain and attempts to replicate our embodied experiences of the real world are in danger of overlooking this.

This is not to imply that game-play cannot be meaningful in itself, or that it is unable to inspire reflection and creativity. The analysis we have provided rather suggests that photo-realistic graphics and whole body controllers are not the only component of what can make game-play immersive (or enjoyable) and in this we clearly agree with Calleja (2011). Designers should focus more on narratives, consequences and shared interactions if they want to create game-play experiences that are thoroughly engaging and rewarding. In this light, it may be more useful to think about ways in which games can be different to the real-world and the opportunities they afford. Instead of trying to replicate our day to day experience of embodiment, games provide a medium in which we are able to explore and extend our notions of what it means to be a human being that can act in both real and virtual worlds. This will require more complete (and more reliable) phenomenological descriptions of such experiences; more empirical data about the physiology and psychology of immersion; and improved ways of thinking and speaking about the experience of gaming. We hope to have shown that Merleau-Ponty's work provides a useful resource and starting point in such an enterprise.

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