International Journal of Performance Arts and Digital Media, Volume 3 Number 2 & 3.
 Article. English language. doi: 10.1386/padm.3.2&3.123/1

Performing in (virtual) spaces: Embodiment and being in virtual environments

Jacquelyn Ford Morie *University of Southern California*

Abstract

This paper focuses on how the body has been recontextualised in the age of digital technology, especially through the phenomenon of Virtual Reality, and specifically on fully immersive VR environments made as art or performative installations. It discusses the progress\ion in form and function from other digital media or 'cybermedia' to fully immersive virtual environments (VEs). This paper attempts to explicate the specialised and intrinsic qualities of 'Being' in immersive VEs, and how it impacts both the experience of the embodied person in the virtual environment, and our thinking about everyday reality. The unique state of Being in immersive VEs has created a paradigm shift in what humans are now able to experience, and affects how we understand our embodied selves in an increasingly digital world. Because of this, the contributions of visual and performance artists to VE's continued development is key to how we will know and comprehend ourselves in the near and far future as creatures existing in both the physical and the digital domains. The paper draws upon twenty years as a professional Virtual Reality 'maker' who has trained in both Computer Science and in Art, and finds fascinating affinities between these disciplines in the space of the VE where people and performers interact in new embodied modalities.

Keywords

virtual reality
virtual environments
immersive
presence performance
art
embodiment
Being
role play

Part 1. Rethinking the body in the digital age

> The body is the zero point of the world. There. Where paths and spaces come to meet, the body is nowhere. Michel Foucault Utopian Body.
>
> (2006: 233)

A number of late twentieth century theorists, as well as practitioners of digital art, have reconsidered the significance of the body in the digital age. For some, the 'meat shell' – or physical aspect – of the body is no longer relevant. Australian performance artist Stellarc, who accoutres his meat shell with numerous physical and digital devices, has proclaimed his desire to replace all the internal parts of his body with mechanical or electronic substitutes. Hans Moravec, a prominent roboticist at Carnegie Mellon,

promotes the concept of downloading the essence of the human mind into a computer, so one may live forever. However, technology is not infallible. Beyond the fact that most computers have life spans that do not even reach that of a half-grown child, what of long-term maintenance? Will there be an army of servant bodies left behind to tend to the machine-encapsulated brains? Or worse yet, human slaves? Or, will the machines simply be programmed to tend to themselves until the inevitable post-apocalyptic power failure? Then wither the no longer electrically sustained silicon-embedded minds?

I believe, as Erik Davis has stated, that these ideas could be seen as 'symptoms of an arrogant and deadly rift with nature'. Our meat shell is that which connects us to the natural world most directly. To deny it is to break not only with *what* we know but also with *how* we know.

Body as meat can be contrasted with the concept of body as container for information, promoted by Katherine Hayles in *How We Became Posthuman*. As many feminist critics assert, Hayles maintains that body concepts reflect gender differences at their core and that the body is a female concept; disembodiment is a male one. Direct sensory input is messy, the 'wetware' limited and confining (which according to Hayles parallels the state of women in society), whereas the realms of thought and silicon are clean and noble. Yet, Hayles says that today's situation moves us beyond this dichotomy, starting to fuse these ideas. Describing this as the age when we became *posthuman*, she recognizes that the body is an integral part of an 'information/material circuit that includes human and nonhuman components, silicon chips as well as organic tissue, bits of information as well as bits of flesh and bone'. The *virtual body* needs both aspects: 'the ephemerality of information and the solidity of physicality or, depending on one's viewpoint, the solidity of information and the ephemerality of flesh' (Hayles 1996).

Neither has modern science lent much credence to the 'arrogant rift' of Stellarc, Moravec and their similarly minded colleagues. The cognitive sciences, strongly influenced by recent findings from neuroscience, is supporting and justifying a mind/body union, finding extreme interdependencies between our brain's development and our embodied human state. In pointed terms, there would be no mind as we know it without the body that engenders, contains and nurtures it.

This move away from mind as a computer where neurons equate to electronic circuitry, has begun to take hold in philosophy as well. Lakoff and Johnson's foundational work *The Philosophy of Mind* brings this debate to a clear resolution, which echoes the neuroscience findings:

> There is no such thing as a computational person, whose mind is like computer software, able to work on any suitable computer or neurological hardware . . . Real people have embodied minds whose conceptual systems arise from, are shaped by, and are given meaning through living human bodies.
>
> (1999)

Such arguments deflate the concepts of such notable philosophers as Kant ('no autonomous person'), Frege (detached thought not based on mind or body) and Chomsky (language as pure form) and such movements as post-structuralism (no decentred monolithic self, whose meaning is only relevant to a particular milieu).

Phenomenologists, from Husserl to Merleau-Ponty, have also brought the body back into the picture, and their concepts of embodiment have had tremendous influence on diverse areas of thought, from cognitive science to the arts. But only recently, with the bridge of cognitive science adopting empirically derived knowledge about the inner workings of our brains from neuroscience, has there been any means of vetting the philosophical theories.

It seems clear that all prior philosophical schools of thought have been based on *a priori* assumptions, and not empirical data. Cognitive science, a continuum of related disciplines ranging from the more pragmatic computer and neurosciences on one end to psychology and philosophy on the other, now brings a degree of empiricism into philosophical discourse. It has itself gone through an evolution paralleling, in some sense, that of philosophical constructs that have to do with the mind. According to Lakoff and Johnson, the first generation of cognitive science was based on symbolic computational systems, such as computers. It is logical that this phase developed in the 1950s and 60s. They argue that such concepts were in synch with the 'Anglo-American philosophy' of the time, and were informed by the domains of 'early artificial intelligence, information-processing psychology, formal logic, generative linguistics, and early cognitive anthropology'. Moravec was a first generation cognitive scientist. Succeeding generations of cognitive scientists subscribe less and less to the mind-body duality.

When findings from neuroscience about the mind-body connection began to be published, it became evident that many assumptions on which early cognitive science was built could no longer be justified. Chief among those findings was the understanding that our brain and its functioning, structure and ability to reason is based on the actions of the body, and that absent such a body there can be no mind as we know it. Antonio Damasio and other neuroscientists (Edelman, LeDoux and Schacter) have shown how far from the mark the prophets of disembodiment are. The body and what it does, how it experiences the world, is responsible for the complicated interweaving of neuronal connections in our brain, out of which our mind – and perhaps consciousness itself – is constructed. Twenty-first century science has only confirmed that corporeal intelligence translates directly into our mental intelligence.

More evidence from philosophy shows that even our most basic linguistic/mental concepts are built upon metaphors so deeply integrated into our embodied self that they are taken for granted. Phrases such as: life is a *journey*, these two names are *close*, *face* your problems, *grasping* the concept, I *see* what you mean, or *weighed down* by grief, all originate in a lived body experience. The discourse between science and philosophy is

finding mutual benefit, and as Lakoff says, science promises to give us insight into philosophy in three important ways. It can provide conceptual analysis, critical assessment, and a means of constructive philosophical theorizing'.

Part 2. The body emplaced within the virtual

The phenomenological discussion and its focus on the lived experience leads directly into one of the quintessential qualities of virtual environments (VEs). Because our bodies must be emplaced within the virtual space, VEs constitute a distinctive medium of embodiment. VEs engage the body as kinaesthetic input via the specialised interface devices that not only permit but *require* bodily actions to be performed sensorially, kinaesthetically, proprioceptively – within a full 3D spatial, yet virtual construct.

When our perception is mediated by the VR equipment yet seems so real, we must reconsider what does and does not constitute a mediated environment. VR expert and psychologist Jack Loomis has equated this to the unaware state most people have of their everyday embodied existence:

> The perceptual world created by our senses and the nervous system is so functional a representation of the physical world that most people live out their lives without ever suspecting that contact with the physical world is mediated . . .
>
> (1992)

Now that we can experience technologically mediated experiences within virtual environments, the mediated nature of our natural world must be re-examined. VR philosopher Frank Biocca says that our previous complacency has been shattered by the onset of VEs. Yet this state allows us to better understand the basis of immediate experience.

The relationship between the body and experience is direct and immediate, even entwined. Our body becomes the vehicle for sensory experience – that body which has itself been formed *of* experience. The body shapes who we become by compelling our neurons to form their intricate and scintillating patterns of connectivity. Experience affects how we think, feel and understand our place in the external world, and it does this by forming the mind by which we make sense of it.

The body and the space it occupies are part of the full experiential equation. Merleau-Ponty describes it thusly:

> Experience discloses beneath objective space, in which the body eventually finds its place, a primitive spatiality of which experience is merely the outer covering and which merges with the body's very being. To be a body, is to be tied to a certain world. Our body is not primarily *in* space: it is of it.
>
> (2002)

While virtual environment technology still suffers from lack of access by the general public (due to its historical roots in militaristic strongholds and

concomitant high cost) those who have been fortunate to experience compelling virtual environments have been put in touch with something wondrous and expansive. An early, yet pivotal example is the *Placeholder* project, done in the early 1990s by Brenda Laurel, Rachel Strickland and team, which is arguably one of the most embodied virtual experiences ever to be created.

Placeholder directly recalls Donna Haraway's notion of our relationship to other gendered creatures. (Haraway 1985) In *Placeholder* you are embodied, but not as a human being. You take on the persona and characteristics of one of four totemic animals: spider, crow, snake or fish, performing from their point of view, speaking in their voice, seeing with their eyes and even leaving messages in the virtual world for others to find. The human body is thus transformed, or, as Hayles says, 'resurfaced and reconfigured by its interface with the technology'. This reconfiguration, even if not directed at performing other species, is nonetheless necessitated by one's emplacement within the virtual environment, in both the embodied and cognitive sense. The space and the ontological framework of the space we experience is an extremely seductive form of reality.

Part 3. The isochronic structure of emplacement

In immersive environments we are embodied – this is one of their hallmarks – yet, we know little about the body that is experiencing the virtual environment. Any investigation into this dualistic phenomenon will surely raise more questions than it can answer. Where do we position the body that the participant leaves behind in the room? It is the living body, as it exists, breathes and continues working where it is situated, but it is not the lived body, which is experiencing the world within the virtual environment. The VE experient possesses knowledge of two simultaneous bodies. This is true whether there is a virtual body image or not, or whether there is direct or interpreted mappings of navigation and movement.

The act of emplacing one's body within the immersive environment signifies a shift to a dualistic existence in two simultaneous bodies. VR pioneer Marcos Novak (in Palumbo 2000) calls the body the 'threshold between two worlds' and there is much evidence to support this view.

Many VR critics have described how participants enter into the world of the virtual and leave their bodies 'behind'. I believe that participants do not actually leave their bodies behind, even though to a bystander or spectator the physical body may seem to be a form of shed detritus in the room. The body of the participant is synchronously subsumed into the virtual self that enters into the world within the screen, which is created in the mind from what the body experiences. Entering into a territory that is not quite imaginal, and yet not fully based in solid physicality, the self becomes subsumed, bodily, consciously and subconsciously – dancing with the created space-for-becoming.

Ontologically, simultaneous Being within the real and the virtual worlds is a situation humans rarely experience, even if one considers the phenomenal states shamans enter into in performance of their ritual duties. Much

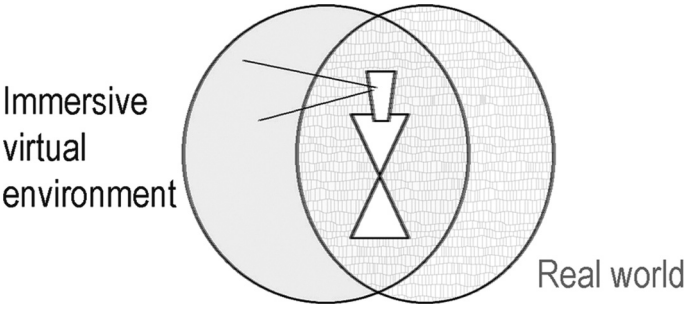

Figure 1: The bifurcated self – existing isochronically in both the real and the virtual worlds.

of the intrinsic nature of Being in an immersive virtual environment underscores this profound phenomenological shift. In a virtual environment, our self exists within a space that in itself does not exist, but that our senses readily believe is there. In our lifetimes, no greater change of Being has taken place than this duality of existence at our command.

The lived body has bifurcated and become two. What does this imply for the lived body? Does it inhabit both spaces equally? Do the isochronal embodiments affect our conscious Being equally? An actor 'bodies forth' (in performance terms) the character he or she is playing in a play or film. Does a VE participant 'body in' to the virtual construction? Are we semi-embodied in a virtual environment, or dually so, ontologically speaking? Are these diacritical states of embodiment, or complementary?

We are inside the virtual yet we are also aware that we are still in the physical world. I believe this is the quandary that makes the concept of *presence*[1] so elusive. At some level we are aware of our dual perceptions, and because of this it takes an extraordinary amount of connection to the virtual experience to overcome, or momentarily forget, this dualistic state of Being. It is more than a simple 'willing suspension of disbelief'. Such a feeling can happen in Csikszentmihalyi's famous state of flow (Csikszentmihalyi 1997), but the conditions that can bring us to it are far from predictable. I believe that while this sense of presence is the ultimate goal of many virtual environments, the experient may also have meaningful experiences whilst still aware of the bifurcated nature of this self-ness (Figure 1).

It is true that we have material bodies and that these bodies 'think' within their embodiment, yet, as Merleau-Ponty explains: 'We actualise separately from the physical body, the body of the anatomists or even the organism of the physiologist, all of which are abstractions, *snapshots taken from the functional body*' (1962). Experiencing the immersive virtual environment, our functional body is within, yet the physical body is not simply playing the role of a snapshot; it remains the context for our functioning.

Kathleen Rogers, a United Kingdom-based artist whose immersive VR works include the series *Sleepless Dreaming*, describes this bodily displacement phenomenon within her work:

1 Presence is a specific term used by virtual reality researchers to indicate the state where one believes that the computer mediated world is real, to the exclusion of the physical world. Much work has gone into trying to find what induces a full state of presence.

> Sleepless Dreaming is composed of computer model houses and interiors that a participant could navigate through to experience the gravitational paradox and the heart of VR. In this work a participant was in effect in two spaces simultaneously. In the real world of the gallery, and moving along a recurrent corridor of rooms navigating through doorways, along walls and into a void.
>
> (2006)

Experiencing a virtual environment provides what Maria Palumbo calls an opening for 'a new interrogation of the world and ourselves, and, consequently, the possibility of imagining other possible kinds of space, other possible ways of being a body-that-becomes-space'.

Part 4. Representation: the imaged forms of embodiment

Once we are in the virtual environment, what form do we take? In immersive VR the physical body itself is shielded from the view by the VR head mounted display. Early VRs at first made do with the simple representation of a disembodied hand, correlated to a physical hand encased in an instrumented glove. Within the virtual space, one saw this representational hand floating out in front of the computed 'eye position'. Moving one's real finger caused a similar motion to occur with the virtual hand. Later the image was expanded to a crude but full body image correlated to the physical body's location in virtual space via a tracking system connected to the head display.

These bodily representations, called *avatars* (a name borrowed from Hindu mythology, where it denotes the incarnation of a spiritual being into bodied form), are more graphically sophisticated today, though not yet to the level of photorealism. The question these visuals raise is not how real they look, but whether they are helpful or distracting to the experient in a VR world. VR practitioners agree there is no single answer to this question. In his foundational article, *The Cyborg's Dilemma* (1997), Frank Biocca discusses evolutionary consequences engendered by the avatar concept and the way we perceive ourselves in a virtual environment. He contends that we have been moving towards ever-more digital representations of our 'self' – a 'progressive embodiment' of which virtual reality is the most advanced and sophisticated example.

Michael Heim, noted philosopher of VR, asks what form the cyber body should take. He questions the range of representation, from a detached hand to a full body, to no image at all: 'should users feel themselves to be headless fields of awareness, similar to phenomenological experience?'

> How are users best immersed in virtual environments? I mean this from a technical-ontological point of view. Should users feel totally immersed? That is, should they forget themselves as they see, hear, and touch the world in much the same way as we deal with the primary phenomenological world? (We cannot see our own heads – just part of our noses – in the phenomenological world.) Or should users be allowed and encouraged to see themselves

as cyberbodies? Should they be able to see themselves over their own shoulders? Should they be aware of the primary bodies as separate entities outside the graphic environment? Should they be able to see other primary bodies interacting with virtual entities? Or should they suspend physical experience? Should we see the primary bodies of others in virtual worlds, or does telepresence mean that we will never be certain of the society we keep, how much of it is illusory or artificial? Should we make up the avatars that represent us or be given various identity options by the software designers?

(1998)

The selection of a body image within virtual environments is not simply an aesthetic choice; it incurs distinct effects on the structure of one's perceptions within the experience, and therefore on the overall qualities of the encounter. Our experience is very much influenced by how we perceive our self, and yet, within most immersive environments, as they exist today, this choice is still made by the VE designer.[2] Neuroscientist Antonio Damasio reminds us how acutely our thought processes are informed by our (real and now virtual) bodies:

> . . . the body as represented in the brain, may constitute the indispensable frame of reference for the neural processes that we experience as the mind; that our very organism rather than some absolute experiential reality is used as the ground reference for the constructions we make of the world around us and for the construction of the ever-present sense of subjectivity that is part and parcel of our experiences; that our most refined thoughts and best actions, our greatest joys and deepest sorrows, use the body as a yardstick.
>
> (1994)

Modern neuroscientists view the body as the primary shaper of neuronal connections constituting our brains, which, in some as yet-to-be-determined way, create our minds and even our human essence. It also contains the grammar of experiencing, rule bound by its sensory apparatus and neural underpinnings, networks and connections. It provides not only our spatial but also our temporal locus, and we may well question how alternate forms of experiential representations in the virtual domain will influence and perhaps change our mental development? Answers to these queries are the domain of future researchers as the numbers of virtual environments reach a critical mass; for now we can simply enumerate the forms of representations and how they are experienced.

The primary modes of embodied expressions in contemporary VEs, delineated by Heim (above) and others, include no avatar, a mirrored self, a partial or full graphical personification and an observer's view of a graphical avatar that represents the self. I will discuss aspects of these as they relate to our ontological nature as emplaced in the immersive environment.

No avatar: The simplest means of representation is no representation at all. This is the first person point of view. The environment appears as though seen through our own eyes. The views in the virtual world are

2 Most avatars in VR, if they exist at all, are not customisable, though the myriad representational possibilities inherent in digital games may exert a strong influence on future decisions about representational form in virtual environments.

computed with the camera lenses situated at the approximate location of each eye (as there is a wide range in the actual physical parameters of each experient). This corresponds to the mental model we have of the self that inhabits the physical world, but in a virtual form within virtual space.

While we are perceptually aware of our physical bodies (seeing the nose in our field of view as Heim mentioned, or even looking down and seeing our laps), not having a representational body is not usually disconcerting. The exception is when we consciously look to see ourselves and don't, for example, when we look down to ensure correct placement of our feet upon a stair, and we see no corresponding virtual foot to place. As Bruce Wilshire explains, '. . . in perception it is only because the body is perceptually engaged with the perceivable world that the world is perceived at all, yet it is only because the body gives way to this world beyond it (*it is not focally perceived itself*) that perception of the world can occur' (Wilshire 1982) (emphasis mine).

Many immersive environments use this mode of (non)representation. Char Davies' worlds fall into this category, as they are specifically designed to take one outside of the ordinary body, even while using aspects of the physical body (i.e. breathing) to navigate the environment. She says her work is meant to '. . . reaffirm the role of the living physical body in immersive virtual space as subjective experiential ground' (Davies 1995). She believes having a body representation would interfere with the connection to the physical body. This type of (non)imaged embodiment can allow one to remain in touch with their inner conception of their own native, imagined self. This is the underlying premise for my own virtual environments, which also use this first-person point of view.

Some VR critics have a very different view of the non-representational form of Being in virtual environments. Writing in the early days of VR, Nell Tenhaaf (1996) calls the human in concert with the VR experience a 'bioapparatus', and argues that the 'absence of representation' in VEs is what allows them to seem unmediated, and produces a 'new order of transcendence'.

The mirrored self: This form presents the participant with a view of himself as captured (typically) by video cameras or other devices that keep track of the body movements of an individual. Few VEs have yet to fully employ the mirrored self, with one prominent exception. Myron Krueger, pioneer of immersivity,[3] believes the human body to be the ultimate interface between the mind and the machine. He insists the body of the participant be unencumbered, and has worked for many years to build interactive media based on this philosophy. In Krueger's installations, the movement and actions of the body alone cause the desired results to occur, by integrating mirrored representations of participants. The body image presented in Kruger's work is typically a single colour, flat field video silhouette of the participant, seen by him (and others) on a screen at the same time as he moves his own body(Krueger 1983). The mirrored image is intuitive, in that we have become accustomed to such representations of self since we first learned to recognise ourselves in a mirror.[4] It is nevertheless a dualistic form, though,

3 Krueger started working in unencumbered full body computer applications in the 1960s before virtual reality was named a concept. He coined his own term for his work – *artificial reality* – and later wrote a book by that name, espousing his ideas. His term never caught on, rather Jaron Lanier's term, *virtual reality*, became the accepted designation for immersive environments.

4 Kreuger's work brings to mind Lacan's concept of the child's first experiences with mirror, and how these encounters help form the image of self. Krueger's work is extremely attractive to children and adults alike, not only for, I suspect, its playful qualities, but also due to the mirror image present during the interactions.

separating the representation from the physical body spatially, but not temporally. Such a representation is isochronic with the physical body.

Graphical personification (partial, whole): When a body image is used, it raises a more ontological question concerning the nature of that image and its correspondence to the experient's own body. Unlike Krueger's video image that was a spatial translation of the 'own body' some VR creators elect to use a spatially coincident graphical avatar for the body representation. In other words, the avatar appears to be in the space occupied by the person's mental construct of where they are in the VE.

Designers are not yet able to create a specialised image for each individual without a great deal of advance planning, and therefore use a generic 3D model. The design of this model is up to the creator of the work who can decide to make it humanoid or not, or limit the representation to a single gender, whereby one could find their female self housed in a male-modelled body.[5]

Third person/observed avatar: In this form of embodied image the participant takes on an embodied image at an experiential locus that is outside their perceptual self. An avatar appears, at some distance out in front of the experient's physical and imaginal locus. It is obviously related and connected to the experient, in that its motions and actions may be controlled by the participant's actions and corresponding decisions. This is what Freud might call the 'observer' or third person view as opposed to the 'field' or self view.

This form of body image is most common in games, where players control an avatar to move through the objectives of the game world, but it is far less common in immersive virtual environments. Rebecca Allen does use this form of representation in her *Bush Soul* series of virtual environments, allowing the participant to inhabit the 3rd person view/body of an intelligent virtual agent. The graphical depiction of this agent is not a human form, but a set of swirling geometric shapes that twirl and spin as the experient directs it, via a force-feedback joystick, across the colourful virtual bush landscape. In fact, however, Allen's design allows the avatar some autonomy. While the experient provides suggestions to the character, ultimately it may not fully follow those directions. The avatar/agent has its own intrinsic behaviour set that can take precedence during the experience (Allen 2000). This situation sets up a phenomenal dichotomy that questions whether I myself, or another controls me. In fact, one of Allen's stated research goals for this series was to investigate the relationship between the avatar and the human.

Shared environments: In shared virtual realities, there is also the question of the representation of others in the environment with the experient. A representation of some form seems mandatory, for absent it, the worlds will appear empty. This poses a larger question: how are forms of self and other determined? Are there guidelines that might govern how we see representations of self and others in shared spaces?

Benedikt maintains that participants should have a body representation. His *Principle of Personal Visibility* (1991: 177–179) actually addresses two

5 This was a state I found myself in recently. In one demo world, I had an avatar representation that was a graphical human figure. When I looked down at my virtual body, however, I found I was a male figure, and a naked one at that!

rules of visibility: that you must project an image within the digital realm, and you must have the right to decide which others in the environment you want to see. (This strikes an odd note in the name of privacy. If I must be visible to everyone, but I can turn off representations of others, then others can turn off my representation. This seems to defeat the purpose of having a representation at all, and in any case it works only for realms of the virtual that are truly shared spaces). Part of his rationale for this is to foster accountability in cyberspace and to nullify voyeurism, but curiously, he suggests a 'small blue sphere' as a minimal presence marker for cyberspace denizens. In spite of a shared space, he argues for a way to be alone, by turning off the representations of others. What if that is done, but others can still see you? What sort of snobbery might they conclude is behind being ignored by that out-of-touch blue ball?

Private, meaningful, immersive worlds are my primary interest here, so I will conclude with a few more thoughts on the subject of self-representation within them. A form and metaphor of my body icon that I cannot control may compete with my own inner representation of self in inhabiting this environment. In such cases, it may be better to have nothing at all. As Davies' work shows, the virtual environment becomes a sacrosanct *enceinte*; a sacred, encompassing space, where mind transcends body even as it references the body, felt organism even in visual absence. This body, as felt phenomenon, is how we know the world, true as much within the virtual as in the real. To have no body icon might even be perceived as an antidote to the commodification of the body in our consumerist, product-saturated world.

Finally, from the phenomenological standpoint, while Merleau-Ponty views the body as 'the common texture of which objects are woven' (1964), he never had to grapple with new forms of immaterial bodies beyond the phenomenal, nor with questions about how we might weave new forms of 'common texture' from them. This is up to us.

Part 5. Role playing and performance within VEs

Role-playing is direct since it engages both the physical and cognitive elements of our psyche. Anyone entering into a virtual world is, by default, playing a role. At the most basic level, he is playing the role of one willing, or unafraid, to enter into a technically mediated environment.

More importantly, the user is also playing the role that the virtual environment imposes on him by the VE. In *Placeholder*, as mentioned, each participant takes on an animal persona such as a snake, bird, spider or fish. To fully enter into the role, they must act like the creature whose form they inhabit. Josephine Anstey's 'Thing' character in her VE work *The Thing Growing* (2000), compels you to play a starring role opposite itself: a strange and fickle creature you have freed from its prison, who is at first grateful and then becomes increasingly demanding.

In any virtual environment that asks the participant to be other than his natural self, he must play along with the role to get the most out of the experience. What happens, however, if the person is at odds with that role? In my VE *DarkCon*, which had a military theme, the mission briefing gave

some participants an aversion to playing the lead role of the scout directed to find information. We found people wanted to able to choose – even in an ersatz discovery mission – to play different parts. One participant wanted to be able to see the world through the eyes of a refugee; others thought it would be more helpful to achieving the mission's goals to be inside the mind of one of the suspected rebels.

Role-playing in virtual environments ties neatly into Brenda Laurels' concept of computers as theatre (Laurel 1991) and relates directly to other performative aspects of virtual environments. The word performance conjures images of the *theater*, which itself comes from the Greek word *theatron*, a place for seeing, not simply in the sense of watching, but also as the deeper meaning to see – to behold, grasp or understand. Post-humanist theorists maintain that interaction with our technologies allows us to gain new understandings of our self. Immersive virtual environments proffer exceptional insights, through expanded concepts of body and identity and understanding of essence, agency and meaning in life.

In real life we put on different personas to perform specific social roles. These are often referred to as masks. Within private, immersive virtual environments, we most often (though not always, depending on the maker's intent) play ourselves. Viewed thus, virtual environments become not so much a mask waiting to be put on, as an enabling methodology, allowing us to cast aside the social masks that everyday conduct requires. Despite some having equated the HMD to a physical mask, it can actually serve in reverse, a mask that removes other masks. Because of this, I view the performance within the virtual environment more as a metaphorical door that leads to an understanding of a private and personal self.

The view available to the observer of a person wearing VR gear is that of the physical body as a text, the body as performer of the virtual experience for the enjoyment of others. This is a very different kind of performance than the first person one from within the virtual environment. Many participants in virtual experiences are not aware they are performing in a dual mode. However, there are few instances where a participant is alone while in the environment; most often others are watching, listening and may themselves be involved with either facilitating or observing. At some level, the participant knows this to be the case. Such knowledge can engender actions that the participant intends to be seen. Yet, if the experience creates deep involvement on cognitive and emotional levels, then the experient may become much less aware of their body's physical performance.

If an experience is convincing and meaningful, the experient primarily performs the text of the experience, and not the reflexive meta-text of herself experiencing the VE. This private performance requires no audience save the performer, observing the inwardly focused experience.

In many forms of new media, the performance aspects have a functional role. Grounding virtual environments in embodied performances gives rise to particular phenomenological issues, some of which may share philosophical territory with other forms of embodied performance, such as ritual, performance art, theatrical or social roles.

Perhaps the most salient example of a private, performative experience is Char Davies' *Osmose*. Davies says the '*Osmose* swallows the participants – suitably swathed in electronic gear – into a sensuous, luminous, and deeply enveloping dreamworld of cloud forests, dark pools and verdant canopies'. (in Erik Davis 1998). Yet *Osmose* is unique in that is promotes both public and private forms of performance. Not only is the experience itself so engaging that it 'swallows' the experient, Davies also allows an external audience to observe the *Osmose* participant behind a screen, as a silhouette engaged in her personal performance. Davies shrewdly imbricates both performative aspects in exhibiting her work, and resolves any speculative conflicts thusly:

> . . . *Osmose* is a powerful example of how technological environments can simulate something like the old animist immersion in the World Soul, organic dreamings that depend, in power and effect, upon the ethereal fire. Besides pointing to a healing use of virtual technologies, *Osmose* also reminds us how intimate we are with electronics, in sight and sound, in body and psyche. (ibid.)

Part 6. Performance, rituals and rites de passage

Performances in general, and VE performative possibilities in particular, can have meaningful and significant effects on those who perform. Victor Turner (1979) cites experimental theatre evangelist Jerzy Grotowski's concept of the theater as a platform for a modern rite of passage, where the stage is done away with, and the spectator becomes a participant in a liminal activity. According to Turner, Grotowski's concept goes so far as to imply the participants in his theatre will discover their essential selves through these ritualistic performances without standard theatrical boundaries.

Unlike Grotowski, noted performance researcher Richard Schechner does not disallow the separate audience within theatre's ritualistic functions. In *Ritual, Play and Performance* (1976), he explains the 'efficacy/ritual – entertainment/theater' as a general form of performance that embraces

> the impulse to be serious and to entertain; to collect meanings and to pass the time; to display symbolic behaviour that actualises 'there and then' and to exist only 'here and now'; to be oneself and to play at being others; to be in a trance and to be conscious; to get results and to fool around; to focus the action on and for a select group sharing a hermetic language, and to broadcast to the largest possible audiences of strangers who buy a ticket.

Virtual environments have much in common with Schechner's form of theatre, but those that are meaningful and private are closer to Grotowski's concept. For now these ritualistic forms of virtual environments are not common (*Osmose* and *Ephémère* excepted), but nonetheless important in what human needs they address.

Phenomenology and semiotics are two ways of looking at a thing. The first embraces the corporeal body; the latter makes of it a sign, even within

its lived state. The symbol and the experience cannot co-exist temporally. In living, in our direct experience, we are unaware of our meaning. It is only when we put on the distancing goggles with their semiotic lenses that we can observe the signs engendered by that experience. The views are complementary, but not congruent. We move back and forth between these modes, experiencing and assimilating, in an endless dialogue that informs who we are, and how we will respond to the next experience.

Ritual action, with its intrinsic, socially construed meanings, may be an exception because it provides an immediate means of signification during the actual living experience, while at the same time, as Robert St. Clair says (1992), it predates and precludes any linguistic retelling of it. Instead we have a multisensory enclosure, a space apart that serves as a respite from the layers and simulacra (in Baudrillard's sense) that confound our day-to-day existence. Immersive virtual environments, imbued with meaning, are opportunities for post ritual formulations, created by the shamanistic efforts of the modern, technologically savvy artist. The VE experience itself *must* precede and inform any narrative retelling of it.

Our intimacy with technology – its pervasiveness – appropriates everything, from social activities to those that press deeply into our private selves. Where is there escape? What respite do we have? Paradoxically, immersive virtual environments may serve as an antidote to this constant flux of technology in our lives. It is hard to be alone in this day and age, and yet, within Char Davis's work, in a museum full of people, and with spectators looking on, I could be alone with, and find myself at last.

In the act of concluding . . .

In setting out the terms of embodiment in virtual spaces, this paper also places the subject of VE next to that of performance practice. It defines the terms: bifurcated body, presence and isochronal embodiments and discusses forms of embodied representation, including avatars, and the mirrored self. The paper notes the primacy of experience that must precede personal self-narrative, and considers the correspondence of virtual environments to rites of passage and post ritual possibilities of virtual liminal states.

Most importantly, this paper argues that there will always be a need for our bodies to develop our brains and, by the mysterious means of consciousness, our minds. The disembodiment of much of our day to day living may push us further into new and unique means of bodily involvement. The 'segmented self' engendered by Hillis' 'polyvocal polyvalency' of our increasingly fractured lives may desire a place of unity, where the only self there is the one that is core to one's consciousness. This argument takes forward my study of immersive experience whilst also contextualising the concepts of self (and particularly embodied 'selves') in relation to virtual environments.

References

Allen, R. (2000), The Bush Soul: Travelling Consciousness in an Unreal World. Available online at http://emergence.design.ucla.edu/. Accessed 7 April 2004.

Anstey, J., Pape, D. and Sandin, D. (2000), The Thing Growing: Autonomous Characters in Virtual Reality Interactive Fiction, *Proceedings of the IEEE Virtual Reality 2000 Conference,* New Brunswick, NJ, pp. 71–78.

Benedikt, M. (1991), 'Cyberspace: Some Proposals', in M. Benedikt (ed.), *First Steps in Cyberspace,* Cambridge, MA: MIT Press.

Biocca, F. (1997), 'The Cyborg's Dilemma: Progressive Embodiment in Virtual Environments', *Journal of Computer-Mediated Communication*, 3: 2.

Csikszentmihalyi, M. (1997), *Finding Flow: the Psychology of Engagement in Everyday Life.* New York, NY: Basic Books, a member of the Perseus Books Group.

Damasio, A.R. (1994), *Descartes' Error: Emotion, Reason and the Human Brain*, New York, NY: G. P. Putnam's Sons.

Davies, C. (1995), 'Osmose: Notes on Being in Immersive Virtual Space,' Colin B., Lone M. and Masoud Y. (eds.), in *Digital Creativity*, Vol. 9, No. 2 (1998), The Netherlands: Swets & Zeitlinger, Lisse, pp. 65–74.

Davis, E. (1998), *Techgnosis: Myth, Magic + Mysticism in the Age of Information,* New York, NY: Three Rivers Press.

Garner, S.B., Jr. (1994), *Bodied Spaces: Phenomenology and Performance in Contemporary Drama*, Ithaca and London: Cornell University Press.

Hansen, M.B.N. (2006), *Bodies in Code: Interfaces with Digital Media*, New York, NY and London, UK: Routledge.

Haraway, D. (1985), A Manifesto for Cyborgs, *Socialist Review* 80: 65–108.

Hayles, N.K. (1996), 'Embodied Virtuality: On How To Put Bodies Back into the Picture, in M.A. Moser and D. MacLeod (eds.), *Immersed in Technology: Art and Virtual Environments,* Cambridge, MA: MIT Press.

Heim, M. (1998), *Virtual Realism*, New York, NY: Oxford University Press.

Krueger, M.W. (1983), *Artificial Reality,* Reading, MA: Addison-Wesley Publishing.

Lakoff, G. and Johnson, M. (1999), *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*, New York, NY: Basic Books.

Laurel, B. (1991), *Computers as Theater*, Reading, MA: Addison-Wesley.

Loomis, J. (1992), 'Distal Attribution and Presence', *Presence: Teleoperators and Virtual Environments*, 1: 1: 113–118.

Merleau-Ponty, M. (1962), *Phenomenology of Perception* (trans. C. Smith), London, UK: Routledge.

——— (2002), *The Structure of Behavior*, 7th Printing, (trans. A.L. Fisher), Pittsburgh, PA: Duquesne University Press (originally published 1942 in French as La Structure de Comportement).

Moravec, H. (1998), *Mind Children: The Future of Robot and Human Intelligence*, Cambridge, MA: Harvard University Press.

Morie, J.F. (1992), Personal Conversation with Stellarc, ISEA 1992, Sydney, Australia.

Palumbo, M.L. (2000), *New Wombs: Electronic Bodies and Architectural Disorders*, Basel, Switzerland: Birkhäuser.

Rogers, K. (2006), From personal website. Available at http://www.kathleenrogers.co.uk/2006/01/sleepless_dreaming_1.htm. Accessed 23 February 2007.

Schechner, R. and Schuman, M. (eds.) (1976), *Ritual, Play and Performance*, New York, NY: Seabury Press.

St. Clair, R.N. (1999a), 'Cultural Wisdom, Communication Theory, and the Metaphor of Resonance', in W.G. Davey (ed.), *Intercultural Communication Studies*, Special Issue on Language and Interculturalism, Vol. 8, No. 1, Institute for Cross-Cultural Research, USA, pp. 79–102.

Tenhaaf, N. (1996), 'Mysteries of the Bioapparatus', in M.A. Moser and D. MacLeod (eds.), *Immersed in Technology: Art and Virtual Environments,* Cambridge, MA: The MIT Press, pp. 51–72.

Turner, V. (1979), 'Frame, Flow and Reflection: Ritual and Drama as Public Liminality', *Japanese Journal of Religious Studies*, 6: 4, pp. 465–499.

Wilshire, B. (1982), *Role Playing and Identity*, Bloomington, IN: Indiana University Press.

Suggested citation

Morie, J.F. (2007), 'Performing in (virtual) spaces: Embodiment and being in virtual environments', *International Journal of Performance Arts and digital Media* 3: 2&3, pp. 123–138, doi: 10.1386/padm.3.2&3.123/1

Contributor details

Jacquelyn Ford Morie is a professional artist and computer scientist, widely known as a passionate VR maven. She is currently a Senior Scientist at USC's Institute for Creative Technologies in Los Angeles, California. She has worked in both animation and visual effects entertainment (Disney, Rhythm & Hues Studios) and has spent two decades developing virtual environments in US government-sponsored research laboratories. She has recently completed her PhD with the SMARTlab, London. Contact: Jacquelyn Ford Morie, Senior Scientist/Project Director, University of Southern California, Institute for Creative Technologies, Los Angeles, CA 90089, USA.
E-mail: morie@ict.usc.edu