

VIRTUAL REALITY AND PERFORMANCE

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This article will set out three things: a description and contextualization of art work I will call virtual reality/performance; a presentation in some detail of a recent manifestation of a virtual reality/performance work; and a perspective on why choreographers and dancers remain largely absent from these developments.

VIRTUAL REALITY/PERFORMANCE WORK

Virtual reality/performance work tends to engage actively with open forms of audience participation and interaction; site-specific responses to space (whether virtual or actual) and the possibilities inherent in discontinuous, gaming, interactive and user/participant-led time frames. Historically, the concept of virtual reality/performance work draws on several genres of art work, i.e., Happenings, performance and live art, participatory art, interactive art, installation art, media and communication art, etc.

The “virtual reality/performance work” invites the audience/viewers/users to participate in or interact with an art work that involves being able to navigate freely “within” a three-dimensional environment created by computer software. This entails the use of sensors and devices to register input from the user/audience member to be integrated with the computer generated 3-D environment. An input device can range from something as simple as the familiar mouse or keyboard to more complex apparatuses that are able to register movement of other parts of the body in space and transmit this information (often position and orientation, but other possibilities are pressure, acceleration, and proximity) to the computer. Common to most virtual reality/performance work is the notion of building a customized input device that becomes a part of the work itself. The computer takes the input information and more or less immediately calculates a perspective within the 3-D environment and renders and displays this as “output” to the user/viewer/audience member via projection devices.

This combination of activities (input, calculation, output) working together may take different forms, and these essentially range from the popularized Head

Mounted Display (developed from ideas pioneered by Ivan Sutherland at the University of Utah in the late 1960s), which uses different left and right eye views to create the illusion of 3-D, to the CAVE. The CAVE (Cave Automatic Virtual Environment, developed in 1992 at the Electronic Visualization Laboratory, University of Illinois) is an immersive 3-D environment that dispenses with the bulky Head Mounted Display.¹ One walks standing up into a 10 by 10 foot room wearing a special pair of active stereo glasses and carrying a mouse “wand” that interacts with the space. There is an input device in the form of a “head tracker” that provides information about the user/audience member’s position in the space. The software synchronizes all the devices and calculates the correct perspective for each wall from the point of view of the user. Four projectors send the computer-generated images onto three walls and the floor.

Everything about these technologies of virtual reality emphasize audience interaction, immersion, or participation over watching from a single vantage point. Thus, they align themselves with the formative cultural movements of the 1950s when interdisciplinary experimentation challenged the borders of conventional arts disciplines and their presentation and sought to break down barriers between performer and audience, maker and viewer. A historically recognized marker of this rupture was the event (untitled) organized by John Cage in the summer of 1952 at Black Mountain College and featuring a radical interdisciplinary juxtaposition of dance, visual art, music/sound, and poetry and text readings. Allan Kaprow’s Happenings of the later 1950s and early 1960s extended this experiment to include “disparate and discontinuous events and spaces” and the notion of events “for performers only”—in other words, participatory performance work.² The anti-establishment ideologies of the period that may have motivated these early pioneers disappeared, but interdisciplinary practices remained. Interdisciplinary art makers and groups continued to work with a growing range of media and communication tools, challenged the traditional locations or sites for performance and further explored the relationship between maker/viewer, performer/audience, producer/user. This range of diverse arts practices not only frames the view of performance I am writing about in this article, but they also aided in the cultural production of precedents for the interactive/participatory and installation approaches that dominate the exploration of Virtual Reality technologies today.

From the early 1990s onward, interdisciplinary artists continued to exploit the growing plenitude of information and communication technologies and tools being created by scientists and engineers in academic and industry laboratories. This has led to more involvement of artists collaborating and working in the laboratories directly with the technologists. In a report to the Rockefeller Foundation published in July 1999, new media historian and consultant Michael Century has written an overview of the development of these sites for hybrid (art/science/technology) innovation.³ He refers to them as *studio-laboratories*, and all five art works I refer to later have been at least partially created in one or more of these sites. It is worth mentioning that the creation, distribution, and display of works created by

collaborations on this scale can often be an international affair, but one that reinforces the view that the cultural landscape of the United States tends to sustain technological advances more readily than the artistic experimentation and development that finds conditions of support more easily in Europe.

The following relatively short list of works falls within the definition of virtual reality/performance work. In chronological order they are Jeffrey Shaw's *The Legible City* (1988), Char Davies's *Osmose* (1994), and Michael Benayoun's *World Skin* (1998).

Jeffrey Shaw is an Australian artist now working in Europe who expanded his practice of creating participatory environments for the active viewer to the exploration of the possibilities of interactive computer technology in the early 1980s. *The Legible City* was an interactive installation that placed a bicycle in front of a computer screen or single screen projection. The bicycle functioned as the input device that allowed the participant/user to navigate through a 3-D city by pedaling. *The Legible City* was based on the actual physical space of a city (Amsterdam and Karlsruhe), but with the buildings replaced with 3-D letters where each "letter's proportions, color and location are derived from the building it replaces."⁴

At the time of making *Osmose*, Char Davies, an artist with a background in visual arts, was based in Montréal. Like *The Legible City*, *Osmose* similarly models the input device on a real-life activity, in this case on the experience of the scuba diver rising and falling underwater while breathing in and out. A vest customized with sensors to detect the movement of the chest enables the user/wearer to move up and down in the virtual world by breathing and right/left, forward/back by tilting. A Head Mounted Display is used to render the 3-D visual experience for the interactive user/participant/viewer (as mentioned in the first section). The sensation is described as one of floating through the twelve virtual worlds—worlds with titles like Forest, Clearing, Leaf, Stream, Pond, and Abyss, "intended as metaphors or sites for the contemplation of a renewed connection with nature."⁵ Another feature of *Osmose* was the attempt to accommodate two audiences, one was the single participant, the "immersant," who was strapped into the input devices, the other was an audience of viewers of the immersant's journey who were supplied with polarized glasses in order to watch a stereoscopic projection of the view of the immersant/participant/user.

World Skin, created in 1998 by Michael Benayoun, makes use of the advanced CAVE technologies described above. In *World Skin*, the viewer/audience/participant is referred to as the "tourist." Benayoun, who has a background in video, computer animation and graphic art, created a 3-D visual landscape "scarred by war-demolished buildings, armed men, tanks and artillery, piles of rubble, the wounded and the maimed."⁶ The CAVE is large enough to take a small group of "tourists" supplied with cameras. Each picture taken removes a portion of the visual scenario and replaces it with a black silhouette. The "picture" is then printed out. Each group of "tourists" is led by the "driver," the only one to have the interactive mouse wand.

A third group of audience/observers/viewers can be accommodated in non-interactive roles as watchers from the back of the CAVE structure, and they can also wear the shutter glasses that will generate a stereoscopic view of the work.

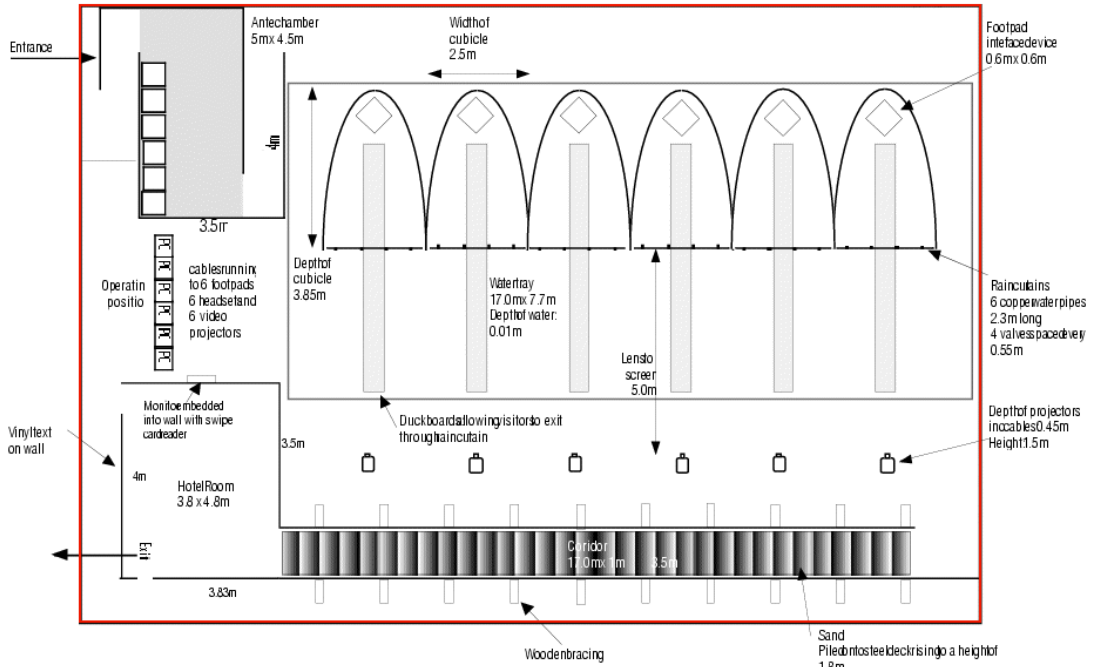
EXTENDING THE POSSIBILITIES—DESERT RAIN

The Mixed Reality Laboratory (MRL) is an interdisciplinary research initiative at the University of Nottingham (UK), bringing together “leading researchers from Computer Science, Engineering and Psychology to research mixed reality—new technologies that merge the physical and digital worlds.”⁷ Projects conducted in the lab combine newly developed or evolving technologies under such headings as “inhabited television,” “immersive user interfaces,” “collaborative virtual environments,” “robot social proxies,” and “traversable mixed reality boundaries.” Some of these projects involve collaboration with artists such as writers and actors giving input into the development process, both creative and experiential, as users. In 1997, the MRL began to collaborate with Blast Theory, a theatre group working in the tradition of “devised theatre” in the UK, on a performance project eventually to be titled *Desert Rain*.⁸ The collaboration also involved eRENA partners ZKM, Karlsruhe, and KTH/Royal Institute of Technology, Stockholm, with commissioning support from the NOW Festival, Nottingham, and the Arts Council of England.⁹ The project was based around the creative implementation of MASSIVE, a multi-user distributed virtual reality system developed at the Mixed Reality Lab in combination with the development of specially designed interface technologies at ZKM. The end result was a large-scale event described variously as a performance, computer game, and installation.

In the collaborators’ conception, *Desert Rain* is organized like a journey, sending six participants on a mission into a virtual world. Each player is zipped into a cubicle and stands on a moveable footpad that controls the journey through this world. Together, they explore motels, deserts, and underground bunkers, communicating with each other through a live audio link. The world itself is projected onto a screen of falling water, creating a “traversable interface” through which performers can visit the players at certain key moments. Players have thirty minutes to find the target, complete the mission, and get to the final room, where others may have a very different idea of what actually happened there.

While utilizing concepts, forms, and processes borrowed from computer games and installation art, *Desert Rain* sustains at its core a clear understanding and manifestation of the processes of performance-making derived from theatre. The roots of the aforementioned “devised theatre” can be traced to that same mixture of artistic avant-gardes of the 1950s and 60s, combined with the UK’s particular brand of alternative theatre that began with the People Show (1965) and continues today with groups such as Forced Entertainment, Reckless Sleepers, Gob Squad, Theatre PUR, Blast Theory, etc. The term “devised theatre” or sometimes the word

EXAMPLE PLAN OF SPACE



BLAST THEORY

Plan for Mixed Reality Laboratory and Blast Theory's *Desert Rain*, 1997.
 Photo: Courtesy MRL.

Jeffrey Shaw's *The Legible City*, 1988. Photo: Courtesy of the artist.



“devising” alone makes reference to a process of making performance through original rehearsal processes that are usually collaborative and inevitably experimental. Some generalizations that may be said of “devised theatre” are that it may avoid the pre-written script as a starting point and might use a multiplicity of materials in a non-hierarchical relationship, i.e., movement, text, objects, electronic media. It adjusts easily to alternative performance sites, and it favors fragmented or non-linear narratives structures. In describing themselves, “devising” groups often find ways to avoid being seen only as theatre makers so as to keep their practice fluid and responsive to different contexts—as Blast Theory does by referring to themselves as “four artists who make live events for theatres, clubs, galleries, and the street”—but nevertheless the conventions of theatre tend to be well understood if only that they may then be subverted.

I attended *Desert Rain* in Bristol, UK, by entering a large warehouse beside the water and waiting in a receiving area where we were given our first set of basic instructions. *Desert Rain* unfolds in six distinct “pedagogical phases,” each carefully scripted in order to give us just enough of these instructions each time to enable us to get through. One set of instructions lies at the core of the experience—that is, how to move in the virtual world. How to move forward and back and, crucially, how to turn. Technically (in the sense of Marcel Mauss’ *Techniques of the Body*), this is accomplished by the same set of skills one might develop to use a skateboard, to surf or ski, by shifting the centre of gravity forward, back, to the right and to the left.¹⁰ Other instructions give information as to the significance of various objects, virtual as well as actual. Others come later from the performers who, for the most part, remain unseen only to be heard giving me personalized instructions over my headset. Instructions are also coming to me from the other participant/audience/team members. Further and final instruction comes in the shape of a performer who materializes through the water screen and ushers me into the final chamber.

“You have 20 minutes”—the game in *Desert Rain* has given me an overall goal, to find my way out of this virtual world within which I am currently “trapped.” This condition of entrapment has already begun forming in my mind as a result of the information received so far, the instructions on the way into these individual cubicles. The imaginary condition is further heightened by the reality of the hooded coat I have been given to wear, the dark, murky, and pixilated quality of the VR imagery being generated by MASSIVE-2, the water on the floor surrounding the navigation footpad I am standing on, and the atmospheric ambient music coming over my headset. A further layering of experience occurs in the purposive construction of a social dynamic between myself and the other five audience members, one that makes it clear it is my choice to either find the exit on my own or with the help of and/or by helping the others in the audience/team. In the end, I play the helpful one and go back to rescue those as the time counts down. I do not escape—I assume I have perished. In the final room, I meet the other members of my team, one or two I have saved, but the hero sensation is fast fading.

If we take a moment to compare the participant/audience/user/viewer strategies of the four works mentioned so far, *Desert Rain* is distinctly different in two ways: 1) six people are immersed *equally* in the experience without assigning one of them the primary role of “driver” or “immersant,” and they can speak directly to each other when close enough in the networked virtual world; and 2) the piece involves the *integration of real-time performers*, not always visible, but who are instrumental in contriving the experience of the participant. Levels of interactivity therefore vary within the work from audience member to audience member, audience member to virtual symbolic entity, and audience member to an “off screen” performer who materializes through the rain curtain when one has completed the journey through the virtual world.

The lead artists in the three projects mentioned earlier, while surely considering themselves to be interdisciplinary artists, nevertheless had backgrounds in creating participatory performance art (Shaw) and in the visual and video arts (Davies and Benayoun). It is useful to consider the different sorts of performance-making practices that Blast Theory, as “devised theatre” practitioners, brought effectively to the collaboration with the Mixed Reality Lab on *Desert Rain*.

ABSENCE OF CHOREOGRAPHERS IN VIRTUAL REALITY

Virtual reality/performance works tend to engage actively with open forms of audience participation and interaction, site-specific responses to space (whether virtual or actual), and the possibilities inherent in discontinuous, gaming, interactive, and user/participant time frames. In conclusion, I want to address the relationship of dance to virtual reality and ask why choreographers, so often on the forefront of experimentations with interactive technologies, seem at present much less involved in making a response to these environments.¹¹

It is rare these days to discover that a choreographer has made an installation or engaged in site-specific work, exploring the “disparate and discontinuous events and spaces” initiated and validated as art-making strategies by the avant garde of the 50s and 60s.¹² In fact, dance was a strong ingredient in the admixture of these experimental movements, but from some point in the mid 1970s, choreographers began to express a clear preference for the coherence of conventional stage space/time. Since the mid to late 80s (with precedents established earlier), some dancers and choreographers have been exploring various interactive computer systems, but their works tend to integrate these systems into presentations in essentially proscenium-like settings and not engage in open and participatory models allowing the audience/user/viewer to cross the border between performance space and spectating space. It is interesting to note that dance seems to have migrated quite comfortably to the space of the screen as demonstrated by the strength and scope of activities producing “dance for the camera” works for film and television that have evolved in the last decade. However, one could also see this as a move towards the

further fixity of space and time offered by the linear film/video medium that is not even open to the energetic fluxuations of live performance no matter how set the choreography.

If these speculations are accurate, creating the best conditions for choreographic responses to virtual reality will require a greater commitment on the part of choreographers as well as the creative technologists to successfully and effectively incorporate dance into these environments. From the technology side, developments in more sophisticated input devices and mixed reality environments should be integrated in an experimental laboratory context with a more sophisticated understanding of what comprises dance and dance-making practices. The difficulties encountered when trying to migrate these practices from the stability of the studio/stage and screen to more open circumstances, can be partly accounted for by considering the ontological difficulty of defining what dance IS as it persistently resists the stabilizing and reifying forces of language. In her introduction to *Choreographing History*, Susan Leigh Foster writes about the “conversation” a trained dancer is able to sustain in rehearsal and performance “that imaginatively invents and then lucidly enunciates their specific corporeal identities.”¹³ This fluency, however, is not one of spoken or written language, but of some other ability to be eloquent and articulate that lies under the surface of the skin in a mesh of neurons, muscles, organs, and bones. Kinesiologist Hubert Godard, who has done extensive work on embodiment, perception, and gesture, suggests that in order to better understand dance we need to bear in mind the “labor of dance,” i.e., the long periods of work in the studio whereby the dance passes into the “deep strata of the non-verbal.”¹⁴

It is this separation from language that makes dance prone as no other art form to losing its contact with the viewer, to stop making sense, and to generate perplexity on the deepest level. These are also possibly some of the reasons why the fixedness of the space/time of the stage and screen continues to attract (and entrap) even the most radical contemporary choreographers. This requirement for what is unchanging, whatever its various reasons for existing, contributes to the lack of choreographic responses to virtual reality. However, given enough support to explore and experiment, there is nothing that should prevent choreographers from breaking free of these contexts (again) and indeed there are signs that these things may be beginning to shift. For choreographers to respond effectively to the possibilities of virtual reality/performance environments, they will need to explore them fully *together with those who are creating the technologies*. This will require more attention to the mechanisms for fostering, funding and facilitation of collaborations that will enable this.

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NOTES

1. For more information on the CAVE visit the website of the Electronic Visualization Laboratory, University of Illinois. <http://www.evl.uic.edu/EVL/VR/systems.shtml>.

2. Kaye, Nick. *site-specific art: performance, place and documentation*. London/New York: Routledge, 2000, 107.

3. Century, Michael. *Pathways to Innovation in Digital Culture*. Centre for Research on Canadian Cultural Industries and Institutions, Next Century Consultants, McGill University. Report supported by the Rockefeller Foundation. July 7, 1999. <http://www.music.mcgill.ca/~mcentury/PI/Pimain.html>.

4. Manovich, Lev. *Navigable Spaces*, 1998. [http://www.manovich.net/under "articles."](http://www.manovich.net/under%20articles)

5. McRobert, Laurie. "Immersive Art and the Essence of Technology," *Explorations: Journal for Adventurous Thought*, Vol. 15, No. 1 (Fall 1996).

6. Quote from Michael Benayoun's website: <http://www.benayoun.com/worldskin.html>.

7. Reynard, Gail, ed. *Mixed Reality Laboratory*. The University of Nottingham, 2000, 3.

8. Blast Theory members are Matt Adams, Ju Row Farr, Nic Tandavanitj, Jamie Iddon. For more information on the company visit the website: <http://www.blasttheory.co.uk/>.

9. For a highly detailed account of the *Desert Rain* project including evaluation of the work by social scientists, download the eRENA report from: <http://www.nada.kth.se/arena/doc/aD7b3.html>.

10. Mauss, Marcel, "Techniques of the Body" (1934) in *Incorporations*, eds. J. Crary and S. Kwinter. New York: Zone Books, 1994, 455–77.

11. In 1994, the Banff Centre for the Arts in Canada organized several projects to explore the emerging possibilities at that time for art in virtual environments. One of these projects, *Dancing with the Virtual Dervish*, involved the contributions of choreographer and dancer Yacov Sharir, who is based at the University of Texas, Austin. Wearing a Head Mounted Display, Sharir interacted with a 3-D computer generated environment created by Marcos Novak. An audience could view Sharir on the stage, and they could watch projected on the screen behind him the environment he was navigating through . . . as he was seeing it. This is similar to the opportunities created in *Osmose* and *World Skin* for a viewing public to watch as someone else navigates through the 3-D space. To read more about the work, see *Immersed in Technology: Art and Virtual Environments*, ed. Mary Anne Moser with Douglas Macleod. London/Cambridge, MA: MIT Press, 1996.

12. Perhaps dance installations are rare, but examples exist. One of these is *Trajets*, co-produced and created by Susan Kozel and Gretchen Schiller with support from the Banff Centre for the Arts. *Trajets* is an installation environment with ten suspended and motorized projection screens that move in response to the visitors' pathways. Images projected onto the screens are of moving bodies. At the time of this writing, this installation has just received support from the Arts Council of England to begin a tour in the United Kingdom. <http://ccii.banff.org/trajets/>.

13. Foster, Susan Leigh, ed. *Choreographing History* (introduction). Indianapolis/Bloomington: University of Indiana Press, 1995, p. 15.

14. Hubert Godard (interviewed by Laurence Louppe), "Singular, Moving Geographies," *Writings on Dance/French Issue* No. 15, 1996, pp. 12–21.
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