

Chapter 14: Design for Cyberspace, Part Two: “Incredible By Design”

The Fairer Sex?

The most affecting works in cyberspace have been created by women. An issue of culture rather than a biological imperative, women have infused the cold, synthetic and unbounded realms of cyberspace with humanity, enclosure, and light. The differences, far larger than “the feminine touch”, show us how much of our own humanity is embodied in the objects create and place around us. While cyberspace will forever remain intrinsically synthetic, it need not remain eternally sharp-edged, unfamiliar and vaguely disorienting. We have enough examples of how to do things right – in large part, because of the work of four women – that cyberspace need no longer suffer from the lack of a human design aesthetic.

This chapter confronts three works widely recognized as landmarks in cyberspace; more than that, it confronts the issues facing the designer in both interface and space, and – as you will see – asserts that these questions require the same answer. In cyberspace, interface and place are the same thing; how we move in cyberspace and where we are in cyberspace can never truly be separate issues.

PLACEHOLDER

In the summer of 1993, Brenda Laurel and Rachel Strickland headed to the Banff Center for the Arts, in Canada’s Rocky Mountains. Laurel – one of the original pioneers of virtual reality, and Strickland – a film maker, sought to address three questions fundamental to virtual worlds. First – how can you create place, or rather, how can you create a synthetic space that feels real? Second – how can that space retain some memory of those who have passed through it? How can the cumulative effects of passage and time leave their imprint on a synthetic space? Finally – how can two people interact in a synthetic space in a meaningful way?

At that time, no one had satisfactorily answered these questions. Everyone believed it possible – but no one had yet done it. Looking at the talents of Laurel and Strickland, we see that their skill sets complemented beautifully; a film maker becomes expert at creating reality from the trapping of props tied together through narrative, character and story; while the technologist knows the limits of the possible, and how to stretch those limits in service of the story.

The “story” of the project, named *PLACEHOLDER*, concerned the exploration three environments loosely modeled on the areas within the Banff National Park. *Hoodoos* world, *Waterfall* world and *Cave* world each represent a natural environment that Laurel and Strickland located on the many hikes they in the hours of discussions during the design phase of the project.

Hoodoos world, named after the pointy spires above the town of Banff, captured the airy heights of the local promontory; Waterfall world captured the incredible beauty of a waterfall and gorge in the heart of the park; and Cave world focused on a subterranean pool and the walls around it. Strickland laboriously photographed and documented each site, producing a mosaic of images which – once texture mapped onto a “frame” – created the basic look of each of the spaces. While visual fidelity to the original spaces never approached their own ideals for the work, each virtual space felt enough like its real-world counterpart to produce a unique feeling of space.





The self has always been difficult to represent in cyberspace; to represent a person with any fidelity requires all of the computers used to make *Toy Story* – and a few more besides. That's not a real-time task, at least, not on this side of the twenty-first century. While we do use *avatars* – incarnations of self in cyberspace – to represent ourselves in environments designed for multiple users, they don't look very much like us. Yet they're still complicated enough to slow down real-time graphics considerable – a very big hit for only a small amount of gain.

The team developed an ingenious solution to the problem; instead of doing their best to remain faithful to the human form, why not depart from it entirely, replacing it with a glyph? – a true self-representation, without any hint of reality. Laurel, a student of the ancient (and lost) culture of the Anasazi Indians of the American southwest, adapted four of their totemic petroglyphs (rock carvings) as self-representations for the users of PLACEHOLDER. The four – Snake, Spider, Fish and Crow – corresponded to the ancient alchemy of Earth, Fire, Water and Air, and upon selecting a representation, the user would also begin to acquire the characteristics of the representation. Moreover, the representation – just a texture map – took very little computer power to render; so it saved that power for the richness and complexity of the virtual environment.





PLACEHOLDER – as “classical” immersive VR – placed users inside of a head-mounted display (HMD), entirely enclosing their experience, and tethered them to a motion-tracking system, so that their movements would have visible effects within the virtual world. However, the different representations moved in different ways; Fish, for example, could move very well in the pool of water in Cave world, but only very poorly anywhere else; Spider could crawl up the walls of the cave; Snake would need to move by slithering on its belly; Crow, amazingly, could fly – if the participants learned to flap their arms. (This adds new meaning to the old joke, “I just flew in from Cleveland – and boy are my arms tired!”) The idea of binding interface to representation – making them inseparable in the mind of the participant – *began* with Placeholder.

One of the more artificial aspects of poorly-designed virtual worlds lies in their inability to reflect changes in them initiated by their participants. Almost like stage sets with everything glued permanently in place, many virtual worlds leave us cold because we can’t leave our own touch behind within them. PLACEHOLDER sought to end that “disembodied” relationship to virtual worlds with the *Voiceholder*. The Voiceholder contained a recording from a participant in PLACEHOLDER, put there to express anything at all – a whim, an emotion, a comment on the experience – could then be played by any other PARTICIPANTS within the space, both at that time and in the future. The Voiceholder made it possible to leave something behind, inside the cyberspace, of the experience of living within it. Voiceholders had four states, identified with icons, including empty:



Listening to a participant:



Full – that is, containing a recording:



And speaking to a participant:



When all the pieces came together at the end of the summer, Laurel and Strickland found they'd created a new virtual reality of natural experience – and noted that people who immersed themselves within it rapidly learned how to “fall into character” with their representations, acting out the story and the space.

The team added a “Voice of the Goddess” for guidance, a director who could give useful information to the participants – helping them to enrich their experience; beyond that, for the first time, two human beings could interact within a naturalistic virtual world, through their totemic avatars, exploring themselves as they explored the space.

DETOUR: Brain Deconstruction Area Ahead

In 1992, Rita Addison wrote these words:

“I have to find my way back to my brain.
But since the accident, it feels just like a black hole.
I'm lost without our connection.
My mind, my best friend is hurt.
I miss you, I know you're in there,
I won't abandon you.”

In 1991, at the top of her career as a photographer, Addison traveled around the world, photographing its natural wonders. Then one day – horribly – it all changed. In an automobile accident, Addison sustained a severe brain injury, which changed her forever. Her recovery took many months, and she remained plagued by problems in concentration and defects in her vision that her doctors could acknowledge, but not treat. She couldn't drive a car, or even use a camera, and became increasingly depressed, trapped in a web of enforced helplessness. Her problem, invisible yet constant, drove her from the company of “able-bodied” individuals, who could neither understand nor empathize with her invisible illness.

I'll show them, she thought, then they'll understand what it's like to be in my head.

But how?

Addison had the good fortune of coming to know Dr. David Seltzer, of the Research Laboratory for Electronics, at the Massachusetts Institute of Technology, who connected Rita with the Electronic Visualization Laboratory (EVL) at the University of Illinois. The scientists at EVL had recently invented something they called the CAVE, a virtual environment closer to Star Trek's *Holodeck* than anything ever before realized, projecting a three-dimensional virtual world onto five of the surfaces of a 10-foot cube – something like a real-world texture map. Inside this world several individuals could find their way through cyberspace, together, without resorting to avatars.

The CAVE seemed a perfect environment to work in – and, because HMDs are very strenuous, even for fully-able individuals – it suited Addison's own needs as well. Over the course of 1993, she labored to create a world that could bring people inside her head. She wanted to warn them, though, before they came in for a peek, so she named the work *DETOUR: Brain Deconstruction Ahead*.

DETOUR opens with a gallery scene; Addison's works, spread out in a regal procession of columns, illustrations hung between them, speak volumes about her aptitude and art.

Passing through this gallery, the tour stops again inside a web of neurons, synapses firing and messages passing from one to another. Then comes a sudden screech of rubber on roadway, a crash, followed by Addison's long, terrifying scream. The fine web of neurons shatters; disconnected, the cells die off, and float in a macabre void – a view of the tomb inside Addison's head.

Now the visitors reenter the gallery area – but this time, they see it through Addison's eyes. Brain injury can cause a whole host of visual defects, such as black holes in the middle of the visual field, images that look like they're floating in water, or fade in and out of clarity. DETOUR takes its visitors through all of these, giving them a taste of life in someone else's head.

The universal acclaim that greeted DETOUR – shown first at SIGGRAPH 1994 – surprised and overwhelmed Addison; she'd done this work for herself, to vent her own frustrations and feelings at being trapped inside her experience; now that she'd shown it to others, she found herself the center of attention. Most significantly, medical researchers began to examine the work, and came to understand her illness in a new light. "We understood these symptoms intellectually," they said to Addison, "but we never knew how it felt to live with them. Now we do."

When Rita Addison brought the world inside her head, she did more than communicate some she couldn't put into words – she created the ground for a bond of empathy between the fully-able and those individuals suffering from maladies almost impossible to understand.

OSMOSE

When PLACEHOLDER programmer John Harrison moved from Banff to Montreal, he did so because artist Char Davies had posed him a challenge. Could he create – inside of

a graphics supercomputer – an evocation of a natural world that had never existed in real space? Davies had spent nearly twenty years as a visual artist, working first in paints and later in hybrid constructions she called “lightboxes”, working to capture a moment of revelation when she “felt the forest inside”. As one of the founders of *SoftImage* – an early 3D tools company – Davies helped to create the graphics revolution in film making, and knew the time had come for a similar revolution in the fine arts.

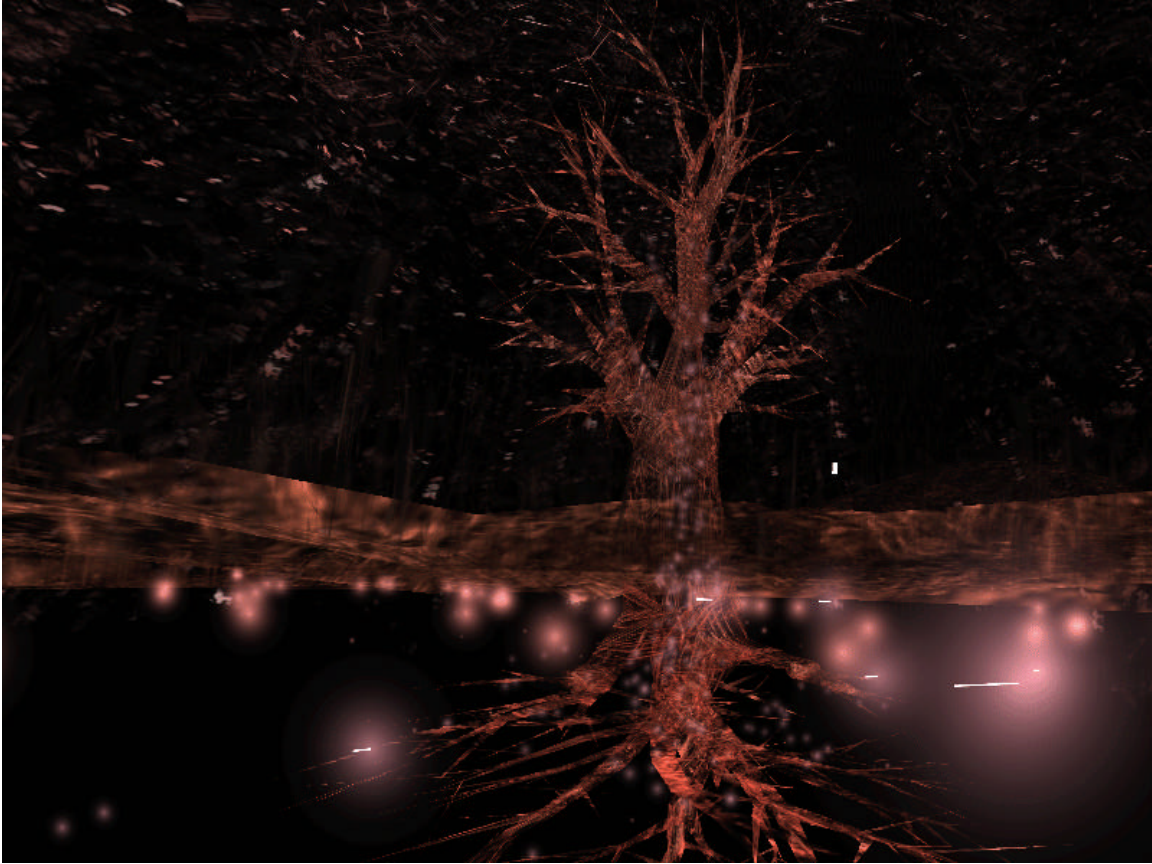
Davies had an agenda: to subvert the hard-edged, too-good-to-be-true styles of simulation – present even in *PLACEHOLDER* and *DETOUR* – with a different aesthetic, one which reveled in the indistinct, the transitional, and the translucent. The space in between, common in the real world, but never explored in simulation became the focal point of the developing collaboration between Harrison, Davies, and modeler Georges Mauro.

To begin, Davies coined a new word to describe an individual immersed in cyberspace; the *immersant* in this newest virtual world would move through it using breath and balance. While this may sound a little odd – especially to those who have not experienced it – the technique represented a simulation of Davies’ experiences SCUBA diving in the Bahamas. Part of the interface apparatus consists of a band around the chest; to move up, you breathe in and expand your lungs; to move down, you exhale. Leaning forward, backward, or to the sides moves you in that direction. It takes only a moment to learn and, as you adapt to the interface, you begin to forget it’s there; this acquiescence to a natural interface – another of Davies’ subversions – lead to the name of the piece – *OSMOSE* – French for osmosis.

The world – or rather, worlds, for 12 different places exist within *OSMOSE* – encompass a forest with a tree as its central figure. This glade marks the center point of *OSMOSE* – all of the other worlds relate to it in some way. Every object in the glade displays a partial translucency; as you move through you see objects in the foreground which constantly evolve in color and form as objects behind them come into and out of view.



08M08+ One Take / 90-11M10+ ©

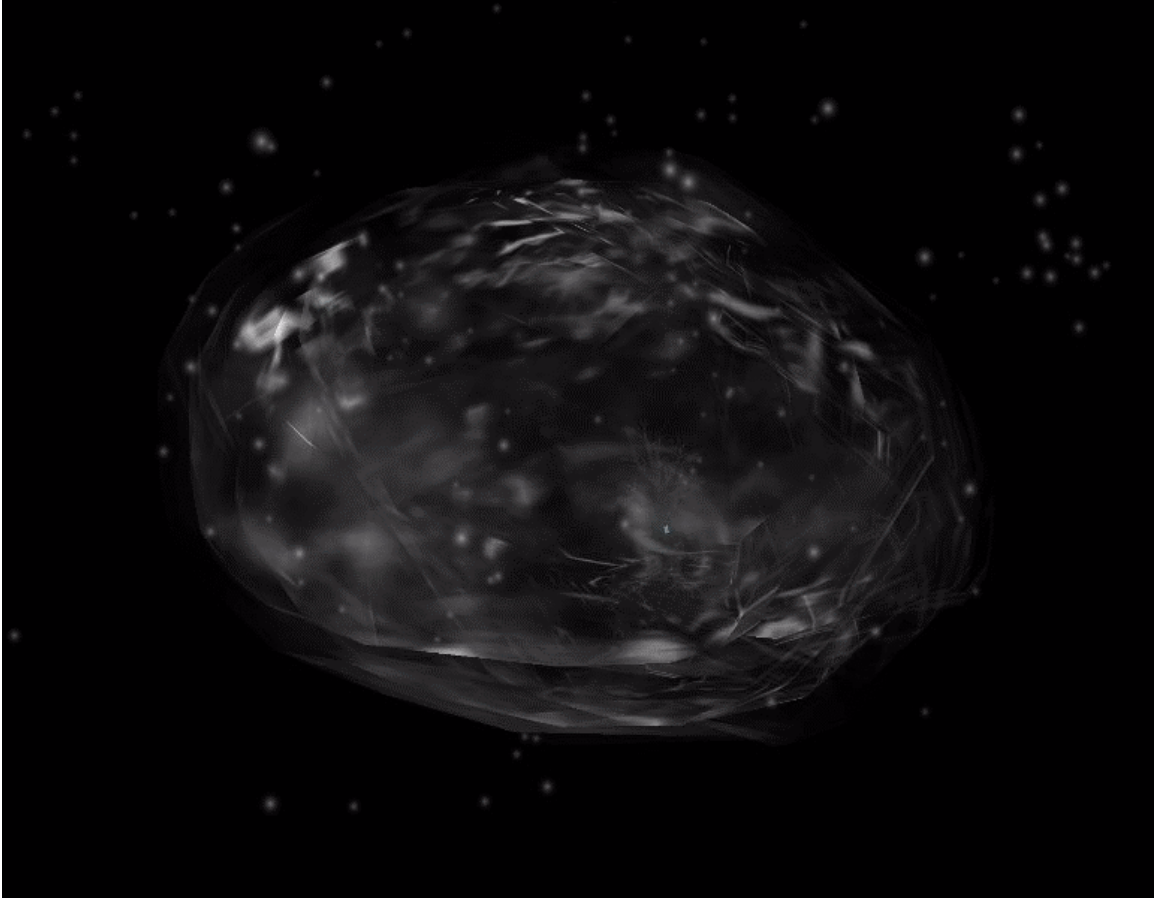


The sound of OSMOSE, ambient and ever-present, consists of two sampled voices, male and female, played through endless transformations of pitch and timbre; it sounds hauntingly familiar without ever being recognizable – another aspect of the in-between.

OSMOSE had to be divided into several worlds because each world approaches the limits of the graphics supercomputer it runs on; Harrison developed transitional portals for Davies, places in OSMOSE where you seamlessly transition from one world into another, in an effect rather like a fade-out/fade-in sequence from a film:

You can explore the glade and the stream that runs through it, as little firefly-like balls of light course through the environment, urging you on toward your next destination, or you can exhale, fall through the earth into the subterranean world, eventually ending up in “code world”, where the 20,000 lines of OSMOSE gently float by you. Or you can float up to the whiteness above, where Davies’ placed fragments of text by philosophers Martin Heidegger and Gaston Bachelard, and poet Rainer Maria Rilke. With your head in the clouds, you can meditate on the big questions.

Finally, you come to the “lifeworld”; it looks much like the central glade, but now enclosed within a crystalline sphere:



This final world came to solve a particular problem Davies' didn't expect she'd encounter; people found OSMOSE so alluring that they left only after a long period of time. She'd expected – and scripted – the experience to last perhaps fifteen or twenty minutes; many immersants would come out after forty minutes and think they'd been immersed for just ten. Davies needed to develop a transition out of OSMOSE; she had begun to plan gallery shows where each immersant would have just twenty minutes to suit up – OSMOSE used an HMD and other position-tracking equipment – learn to fly, explore the worlds, then get back out of the equipment. Bringing the world to a conclusive end seemed the only way to ensure that immersants would ever leave OSMOSE on schedule.

As immersants see the lifeworld, they find themselves pulled out of and away from it, gradually, as the sound fades. After the lifeworld appeared in OSMOSE – in time for its premiere at Montreal's Museum of Contemporary Art – Davies began to hear stories from immersants unlike anything she'd ever imagined. Many – myself included – thought that the gradual exit from the lifeworld felt like a near-death experience; one woman wrote in the guest book that she was “no longer afraid of death”.

While we might look at the work of a Michelangelo or Marc Chagall and find some spiritual comfort, no one had yet ever found this comfort in a work of electronic art.

Somehow OSMOSE had become more than revolution; it had become the archetype of a new type of transcendent art; like the cathedral at Chartes, OSMOSE had become first example of a new kind of bridge between heaven and earth.

What Makes a Design Incredible?

These three works – produced over a period of 24 months – mark a watershed in the history of virtual reality, the threshold between simulation, driven by engineering and devotion to detail, and design, influenced by the intangibles of feeling, character and narrative. These pieces tell stories; tales told not in words, but someplace before words, where the world itself becomes the story. PLACEHOLDER, DETOUR and OSMOSE all recognize a fundamental truth about design in cyberspace; when you create a world, you create point-of-view, a world-view. How you shape that world determines how people will react to it; if you leave a space for them to spread their wings and fly, they will soar; if you invite them inside your body, they will come to understand you; if you help them to dissolve the boundary between themselves and the virtual world, they will transcend both.

Design Principle: Bring the outside in, or the inside out

Although cyberspace can create new worlds, we have a common base of human experience that far surpasses any new world we might seek to create; even the fantasy worlds of science fiction draw heavily on present-day cultural conventions to motivate their characters. When the outside world comes into cyberspace – as with PLACEHOLDER – it can be seen in a new light; the view of the crow becomes incorporated into our being.

Design Principle: Put feeling ahead of seeing.

Any dedication to perfect visual fidelity in design for cyberspace will necessarily lead to frustration and failure; computers, far from fast enough to produce realistic real-time worlds, can, at best, produce only evocations of the real. If we accept this as a basic constraint, we can leverage it to our advantage; PLACEHOLDER uses icons to represent humans; DETOUR consciously sabotages the visual fidelity of the simulation in order to produce the feeling of a brain disorder; OSMOSE uses a fade-dissolve effect to transition between its worlds. In each case the shortcomings of the computer became powerful strengths of the work, because the designer sought to be true to the intent of the work – its tone and feeling – rather than some ideal of realism.

Design Principle: Create Space for Human Being

Each of these works honor the idea that the human is paramount, rather than making the immersant the slave of the machine, they free immersants into new capabilities of doing (PLACEHOLDER), knowing (DETOUR), and being (OSMOSE). The immersant, more than just an observer, becomes integral to the work, completing it. This recognition of the human “spark”, the genesis of all art and religion, creates an environment where the

serendipitous can occur; each of these works proves that, when you dedicate yourself to a design that honors humanity, people will respond, and embrace the work.