

The Feng Shui of Virtual Environments

ABSTRACT

Flow is a subtle but important feature of virtual worlds design. Flow or blockage of flow belongs to the aesthetic dimension of online virtual worlds. The study of flow goes beyond the usual dichotomies of user / tool, subject / object. Examples from the CyberForum series highlight four different aspects of flow in 3-D avatar worlds currently deployed for online learning and conferencing. The implications of flow suggest strategies for enhancing immersion in virtual worlds.

1. Introduction

Flow is a smooth, unimpeded movement through space-time. It is an aesthetic quality of spatial movement and occurs throughout the physical world. As conceived by Feng Shui (“Water and Wind” management), everything in the universe consists of subtle patterns of moving, flowing energy. Feng Shui sees the universe alive with yin-yang pulsations. Without flow, the universe would be dead. On micro and macro levels, energy currents continually balance and counter-balance one another. As a Taoist sage put it, “We may take things at the moment to be solid, but the universe is basically smoke and wind.”

Feng Shui is the art of arrangement, of placing things in such a way as to enhance the flow of energies and to minimize dissipation. Optimal flow for living organisms means that the atmosphere feels like a spring breeze -- neither fast and vehement, nor sluggish and stagnant. The quality of flow causes living beings to either flourish or deteriorate. This paper argues that the art of placement applies to the design of virtual environments just as it applies to the arrangement of the physical world. Because space-time differs from the physical to the virtual, the art of placement is not identical in both realms but the two branches of Feng Shui share much in common. This paper explores four specific ways in which flow applies to the aesthetic of virtual environments.

2. From Substances to Worlds

Studying flow in virtual environments requires an adjustment of thinking to a new way of looking at things. We tend to look for substances, things rather than processes supporting the substances. Software analysis often focuses on the user and the user’s software tools. This subject-object way of looking at interface design downplays the

study of flow. The distinction of “user” and “user’s tools” opens a split between subject and object, user and field of use. To study flow, the basic dichotomy of frontal subject staring at target object must be undercut by the ontology of worlds. The new way of looking is similar to the way in which scientists after Newton revised their approach to studying physical phenomena. Newtonian physicists could not see what we today call fluid dynamics and turbulence theory. It just did not appear on their “radar screens.” (Radar deals with energy fields.) For scientists to visualize and study fields of flow, there had to be an ontological shift. Traditional science, still influenced by Aristotle, focused mainly on substances or on the properties of substantial entities. The new sciences, on the contrary, turned attention from substantial entities toward fields of energy in which substances relate to one another. Theories of relationships and configurations took precedence over theories of substantial entities. The ontological paradigm of physical science had to shift so that new phenomena could come to the fore. The study of flow in virtual environments must likewise turn attention from the user-tools model or the content-delivery model and focus on the interactive context in which the user is immersed.

Philosophy in the 20th century underwent a similar change. The focus shifted from ego-subjects and object substances to the larger fields in which the individual egos and substances could arise. Subject-object philosophies gave way to broader understandings of the contexts in which substantial entities and psychological subjects could arise. The central “problem of world,” as Heidegger formulated it in 1927 (*Being and Time*), began to take precedence over studies of the epistemological subjects and its fixated target objects. The notion of “world” as a “context of relationships” (Heidegger’s *Bewandniszusammenhang*) emphasized the subject’s involvement in constructing networks to connect entities, persons, and concrete projects. World is a construct that opens spaces for event-based interactions and for further constructions. Within the spaces of worlds arise activities that display various patterns of flow. Virtual worlds with their communities and object-building powers portray an existential understanding of reality, which was prepared several decades ago by 20th-century philosophy. Network technology provides a test bed for experimenting with these components of existence.

Another contribution of 20th century philosophy to virtual worlds is the central importance of process. Alfred North Whitehead (1861-1947) spearheaded process philosophy. Whitehead’s *The Concept of Nature* (1920) and *Process and Reality* (1929) placed ontological priority on “actual occasions.” Continuing the philosophy of Leibniz, who invented binary logic in 1666 and a prototype computer, Whitehead saw concrete reality as dynamic process and conceived static entities as abstractions, real only to the extent that static entities can embed themselves into actual occasions. The notion of world as event-based and occasion-centered is important for under-

standing virtual worlds. Where interactivity sharpens the edge of telepresent realities, we locate the “substances” of virtual worlds in event-based interactions. As will be described, the CyberForum@ArtCenter takes process seriously in fashioning worlds as “aesthetic occasions.” The conclusion of this paper will draw further conclusions about the priority of event units over static storage.

This model of software as appropriated environment differs from the tool-user model. The tool-user model describes non-immersive software or immersive software that functions poorly. The difference between the two models parallels early twentieth-century philosophy where the subject-object relationship broke down. One of the strongest criticisms of the subject-object relationship appeared in *Being and Time* (Heidegger, 1927), but other philosophers also attacked the subject-object relationship (Dewey, James, Peirce). The critics attacked subject-object dualism with a holistic notion of “world,” *Umwelt* (“surrounding world”), or Life-World. The critics also attacked the passivity of the epistemological subject that underlay the conventional subject-object model. They noted the special abstract quality of passive observation, and they highlighted the sensory involvement typically used by humans to engage actively and pragmatically in daily processes. Philosophers like Whitehead argued that the atomic structures of the universe are better described by process events than by the substance ontology that underlies the subject-object relationship. Quantum physics suggests that observers become participants in an interactive process that constitutes the reality process (Whitehead). Attacks on the subject-object relationship apply equally well to the user-tool model of interface design. The attacks highlight two positive features: world and event. Both world and event belong to the phenomenon of flow. But before turning to examples of flow, let us look briefly at the reasons why the subject-object relationship remains stubbornly ensconced in the culture of computers.

Computer history since Leibniz conceived the computer / human connection as serving primarily cognitive needs. The material basis of computing was information, which, like numbers, has an abstract, non-material quality. Information, through the universal machine, could absorb everything, perhaps even quality, into the realm of numbers. Even where information is conceived as the rapid transmission of electrons, as in mathematical information theory (Shannon), the computational event remains essentially cognitive and its process essentially rational. The roots of information theory (Russell and Whitehead) go back to Leibniz. For Leibniz, the spatial realm belongs to the “lower” sensory functions, as was held generally by 18th-century Rationalists. The spatial-sensory realm, Rationalists believed, belongs to the affective-qualitative realm, which remains confused and vague in contrast to the numeric measurements of analytical reasoning. Leibniz borrowed a cognitive model from medieval theology where God’s knowledge provided instantaneous access (Heidegger). Leib-

niz's God sees "everything all at once simultaneously." The universe exists on a fundamental level as a body of information that essentially dispenses with - at least in theory - any temporal unfolding. When the computer is regarded in this way as an exclusively informational device, the underlying ideal is to provide all-at-once knowledge without time lag, hesitation, or movement from one point to another. The human affective experiences of dwelling, community, and ritual remain outside the rationalist model, as do the experiences of hope, expectation, hesitation, and surprise. These qualitative experiences belong to finite beings who proceed step-by-step and who develop a spatial sense of where they are in a specific place at a specific time. Where affective-qualitative experience is regarded as secondary or non-essential to information design we see the rationalist ideal still persisting in computer culture.

Spatial awareness originates in early childhood and contains profound affective / qualitative associations. Notions like near / far, higher / lower carry primal qualitative information. This primal information became a highly sophisticated system when elaborated by the ancient Chinese civilization that developed Feng Shui. In fact, humans experience a "flow" of information and this flow has distinctive qualities. Fluid dynamics is a property of space and time. The active design of computer information space (virtual environments) is the design of spatial flow. Ancient civilization developed an art of placement for enhancing and improving the quality of energy flow through space. This art of Feng Shui ("Water & Clouds") redresses the imbalance of cognitive systems theory. Qualitative associations stimulate a meta-informational feel that facilitates navigation through virtual environments.

The past ten years have seen the gradual projection of online 3-D "worlds" into the global network. The projection of human telepresence - whether working with spatial information or socializing in virtual communities - fits the model of "world." Software environments exert an encompassing effect on both the subjects and the objects of activities. This concept of an encompassing horizon or world is the starting point for the aesthetics of virtual environments. It suggests that each single component of the virtual environment influences the overall field of activity in such a way that the whole becomes a play of forces, a mutually concomitant origination through a single dominant atmosphere. The interactivity of individual subjects arises within this environmental field of aesthetic forces.

The notion of atmosphere makes a good starting point for reflecting on the flow of virtual environments. The first-person movement through 3-D space is a natural starting point for studying flow. Most design considerations of virtual-worlds begin with navigation issues and how individual users move from point A to point B in virtual space. Let us look first at flow as the flow of navigation.

3. Navigation and Flow

Terms like “fly-through” or “walk-through” often describe the process of first-person navigation in 3-D software. The terms suggest rapid movement as passage from place to place, sometimes suggesting a feeling of optimal flow. The feeling depends on physical hand-eye coordination and the controls for adjusting dimensional viewpoints as the graphics are updated. Physical coordination can be heightened by high-end virtual reality gear that connects navigation with other organic processes, such as respiration (*OSMOSE* by Char Davies) or the flapping of arms like wings (*Placeholder* by Laurel and Strickland). As the organic process coordinates with the graphics, the sense of immersion in the 3-D scene deepens. Here the flow metaphor encompasses the user’s navigational tools. In a similar way, game software supports joystick, mouse, or keyboard maneuvering through 3-D space and the whole feedback process effects a tunnel-like flow. Navigational flow depends both on objective conditions inscribed in the software and hardware as well as on subjective conditions, such as acquired dexterity and the expectations aroused by pre-conditioning through narrative, documentation, booklets, movies, word-of-mouth, etcetera. Many issues arise for optimizing navigation, such as: avatar self-perception (first or third person), avatar movement speed related to hand speed, and the general viewpoints along the axes allowed by the software. Though these issues are important for virtual environments, our attempt here is to widen the awareness of flow rather than explore issues of navigation. The general feeling of “flow” is the starting point for observing other types of flow because navigational flow is an elementary, first-person experience of flow. We need to look beyond navigation for the deeper layers of flow.

4. Beyond Navigation

A deeper kind of flow in 3-D space is related to navigational flow but it goes beyond user maneuvers. This broader meaning for flow includes the atmospherics of 3-D space as well as the interactive events that charge space with affective qualities and collective meaning. Atmospherics and collective events can create the kind of flow denoted by the terms “spirit of place” and “ritual.” The atmospherics of interactive space relates to the aesthetics and psychological architecture of software. Both atmospherics and ritual flow pertain to navigation but they belong to a broader, deeper, and subtler dimension of experience than to the coordination of user’s body movements with on-screen maneuvers. This deeper dimension of flow appears only after lengthy study and experiment with interactive environments in their many variants. While the deeper dimensions of flow depends on functional navigation and on directly observable phenomena, the study of flow belongs to the qualitative aesthetics of interactive environments. To study this dimension is to enter the realm where

technology and art converge.

Virtual environments attach information to human perception, specifically to the human perception of multi-dimensional spaces. If the attachment is strong, then the human perceiver does not notice the environment as an external “thing” standing over against the perceiver. In other words, a successful virtual environment resembles actual physical environments insofar as the physical environment becomes a background field or surrounding context to support subconscious and conscious activities. “Environment” as a term comes from the notion of “surrounding” (environs) the perceiver rather than standing over against the perceiver as an “object” (Latin: “thrown in front of”). The term “environment” suggests a surrounding backdrop rather than a foreground object. A good virtual environment, therefore, is not an object seen in and for itself but the environment blends into the user’s activities. From the viewpoint of the user, the environment flows smoothly around the uses to which the participant puts it. Instead of the subject-object relationship, the successful virtual environment creates a relationship in which participants swim through information as skilled athletes move through the liquid element of water. The attention of the user is not focused on “this tool out here.” Rather, the attention is wrapped by a fluid medium that calls for participatory involvement. As the user configures and customizes software tools, the tools themselves cease to be “designed tools” and become increasingly “tools for designing.” The subject of knowledge (the user) and the object studied tend to merge through usage and customization. Through deepening involvement, the participant fades out as a “user” or detached tool-wielder and increasingly adapts to the environment as participant. The environment becomes “my own.”

5. Virtual Reality Laboratory

The deeper dimension of flow became apparent during the past few years in experiments by the virtual worlds team at Art Center College of Design in Pasadena, California. The team began building and hosting online events in order to experiment with virtual world design. The team wanted to experiment with large-scale multi-user worlds that already enjoy flourishing communities. The three universes found most congenial for these experiments are: ActiveWorlds (www.activeworlds.com), CyberTown (www.cybertown.com), and Eduverse (www.activeworlds.com/edu). Two of these universes use the ActiveWorlds browser for displaying 3-D avatar worlds (based a subset of Criterion Software’s Renderware), while CyberTown uses a VRML browser (modified by Blaxxun, Inc.). These universes are “fish tank VR” or “worlds in windows.” What fosters community in these 3-D browsers is the ability users have to construct and then share their virtual environment with other avatars (graphic

representations of online visitors).

The two basic types of building in these worlds differ in the amount of skill and time required: additive building and authoring building. Additive building re-configures already-existing models and requires navigation skills and familiarity with the software. Good additive building also requires familiarity with community psychology and a grasp of avatar activities. Authoring building has further requirements, such as skill with 3-D modeling packages like 3-D Studio MAX (Kinetix), Truespace (Caligari), or Blender (NaN). Good authoring also requires basic knowledge of Renderware scripting (RWX format), inverse kinematics, and motion sequencing in LifeForms (Credo Interactive). Textures must be produced and modified in Photoshop and then applied as static textures or as animated frames. The authoring team must create object models, avatars, sounds, sequences, background textures and then compress them for importing into the world. The models are then organized in-world and configured as in additive building. The finished world can then be opened for further additive building or for other more restricted levels of interactive access.

Authoring worlds in these universes can be complex and daunting. The virtual worlds team at Art Center chose to author and host in these universes for two reasons: freedom and community. These universes offer a great deal of freedom with a minimum of interference (more interference in Cybertown than in Activeworlds). Besides freedom, the universes offer opportunities for hosting real-time interactive events accessible anywhere on the globe with a PC and Internet connection. The ease of access means that experiments can host public-access events to test experiences in fully interactive 3-D worlds. Unlike MOOs or MUDs, the designers can engage users in 3-D visual information with direct http links and web cams. Unlike the pseudo 3-D of The Palace, avatars can walk around and interact with objects or animations. Unlike rule-based games like HomeWorld or Quake, authors can enjoy a freedom of concept that opens the interactive tunnel of gaming into broader uses of imagination.

Art Center observations about flow in virtual worlds came after one year of additive building and two years of authoring and hosting events. Additive building began in 1997, and authoring building began in 1998. By the end of 1999, the team began hosting a series of interactive events, which came to be known as CyberForum@ArtCenter. The purpose of CyberForum is to explore virtual worlds as meeting places for the exchange of ideas. The ideas come from books under study by the team, and the invited CyberForum speakers are authors who have written books. Many of the books are about virtual reality and cyberspace theory. The following observations about flow spring from these chat interactions in avatar worlds where an author meets with a panel of five or six readers who ask questions about the ideas in the presence of another twenty or more avatars who also participate in the interactive

chat. While the five or six avatars on the panel arrive prepared for the discussion, the other participating avatars have open invitations to the events via email lists which spread rapidly through the Net. To date, the Forum has conducted seventeen events. Each event was planned weeks in advance, and each event was analyzed for weeks afterwards using chat logs, screen shots, and video captures. Two classes at Art Center revolve around the CyberForum: Virtual Worlds Design and Virtual Worlds Theory, both classes supported by the Digital Media Department. Graduate students in the classes write extensive analyses of the events, and at least one student has done an M.F.A. on virtual worlds.

6. Aspects of Flow

Many aspects of flow affect events in the CyberForum. Issues of flow first appeared when the Forum ran up against stops or blockages in the flow. These blocks became a problem to be solved by the team. Over time, the team found ways to re-establish flow in problem areas, which then confirmed the initial intuition that this or that aspect of virtual environments held important issues of flow. To manage this paper, we will look at four aspects of flow:

- o flow of words with visuals
- o flow of atmospherics
- o flow of group dynamics
- o flow of virtual with physical architecture (avatecture)

First comes the description of the blockage, then follows a strategy we tried for loosening the blockage and re-establishing flow. The strategies may not be the sole solutions for a particular aspect of flow, but each solution seemed to enhance the subsequent CyberForum activities. To illustrate aspects of flow, this paper uses images from actual CyberForum events. The images come from screen grabs that convey only static points in time, which fail to convey the flow of virtual environments. Log files from all CyberForum events exist online (www.mheim.com/cyberforum), and there are also some video files from our worlds and avatar interactions, but this paper will rely on words and images to suggest each aspect of the flow strategy.

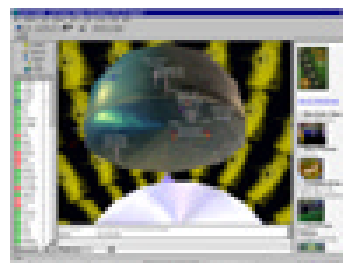
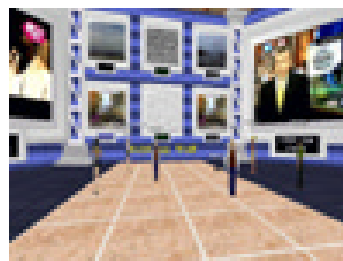
7. Atmospheric Flow

The team first noticed the need to develop flow aesthetics during the online convention “Avatars 1999” in October of that year. “Avatars ‘99” was the first fully online world conference dedicated to avatar worlds, while Avatars 1998 was held partially

in a physical convention center and partially online in avatar worlds. To contribute to Avatars 1999, the team hosted two CyberForum events, one in the Activeworlds browser and one in the Cybertown browser. The CyberForum authors for these events included, respectively, Erik Davis, author of *Techgnosis*, and Margaret Wertheim, author of *The Pearly Gates of Cyberspace*. The Davis event showed the need to develop the aesthetics of flow because of the block that occurred during that event.

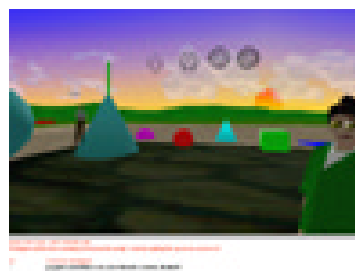
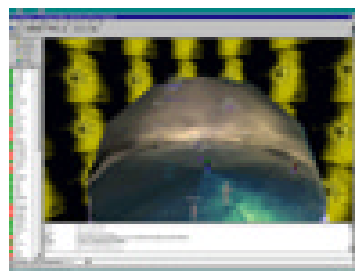
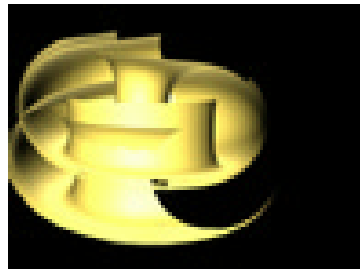
In this case, the flow stopped early in the event. The atmospheric flow broke down just after the meeting began in the convention hall of Avatars '99. The meeting hall was designed very much along the lines of the literalist spatial configuration that simulates real-world surfaces. Most worlds in ActiveWorlds follow the literalist style, implementing gravity, horizon, and places that look like conventional buildings. For example, one schoolhouse in ActiveWorlds has wood-textured chairs and a giant chalkboard which belie the fact that avatars do not use chalk nor do they sit on chairs. The atmosphere of education is presumably invoked by these conventional object references. But do these object-references support the world and its interactive flow? The convention hall was a simulation of a physical convention hall - which might provide familiarity for navigating from point A to point B, but which does not draw on the non-literalist possibilities of the virtual environment.

The convention hall into which the CyberForum took the guest, Erik Davis, failed to create the needed atmosphere. The chat evoked by the convention atmosphere threw a wet blanket on the speaker's fire. [Figure 1] The author did not speak. He remained silent. Ten minutes passed as avatars convened. He was still not talking. The other avatars were chatting chaotically off topic. The master of ceremonies grew uncomfortable and finally asked Erik if he might want to visit another location. The author immediately consented. By this time, the event seemed doomed. After ten minutes in the convention hall, the team invited all participants to join in another world where an area or node exists called "The CyberForum Platform." [Figure 2] The difference was immediate and striking. The author began discussing his book, and the other avatars increasingly concentrated on what he had to say. The Forum developed the atmosphere that has come to typify the CyberForum@ArtCenter: an odd hybrid between a spontaneous party and a formal lecture.



The next Forum was conducted a week later for "Ava-

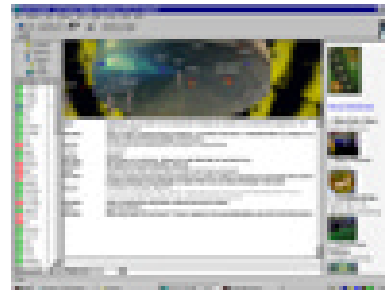
tars 1999” and it took place in a VRML-constructed suburb of CyberTown. A shell-like chamber invited the avatars into an open swirl that spiraled into more intimate areas. Here Margaret Wertheim spoke about Giotto’s mural space and how it offered a premonition of non-realistic cyberspace. [Figure 3] Besides its coloring and soft highlighting (the speaker avatar stands in the brighter area), the Platform has the advantage of scale with intimacy. The entry to the Platform through the Dazzle-Dome [Figure 4] invites entry through its transparent opening, but once inside, avatars are completely surrounded in the closed space. The enclosure enables the exchange to preserve freedom and flight while still funneling attention around the speaker’s avatar. Some spaces do not create enough intimacy to spark discussion. One online class in ActiveWorlds, for instance, used a large open natatorium-like area to host teacher and students. [Figure 5] This space never became a learning place. The teacher spoke to students, but the avatars could never position themselves in such a way as to create comfortable intimacy inside the very spacious atrium. By contrast, a similar class used a literalist “open-air” veranda that gave avatars a judicious amount of spatial intimacy. [Figure 6] A dozen students could interact comfortably with the teacher. The veranda worked especially well as a place where visual aids could magically appear at the behest of the teacher.



The first kind of flow, then, is atmospheric flow. Many factors go into its creation. Perhaps the most important is the need to take into account the degree of realism needed - or not needed - to achieve intimacy. Atmospheric in the virtual world offers freedom for fantasy and a break from the conventions of literalist architecture. In Feng Shui terms, atmospheric management falls under the maxim: “Green dragon high on the left hand, white tiger low on the right.” The configuration of an environment - what feels near and what feels far - can cause energy to flow successfully or to stagnate disastrously.

8. Flow of Words with Visuals

Once the CyberForum team began focusing on flow, certain other blockages appeared. A break in flow became clear as we noticed how words (chat lines) and navigation (avatar movement through the environment) move in opposite directions when viewed from the user perspective in the 3-D browser. The chat lines go left to right, scrolling down the screen, while the avatar movements in the world move up into the 3-D space. [Figure 7] These are opposite directions for the human nervous system: the reader / writer moves attention downwards while the navigator / avatar moves upward, and the movements often occur simultaneously. First-time navigators may not realize what the problem is but they frequently mention the difficulty they have moving and chatting at the same time. Upon analysis, the problem is not so much multi-tasking - something we learn to do all the time with computers - but the attention being split between different sides of the brain. The right brain takes in the whole graphics scene all at once as it unfolds before the avatar while the left-brain takes in discrete alphanumeric words and phrases while absorbing them piecemeal as grammar to be processed. The dual simultaneous brain split creates considerable tension. Nor have is direct voice phone helpful in solving the problem. If voice replaces chat, the fantasy aspect of virtual worlds disappears quickly and the personalities of conventional life return, which eliminates the unique contribution that virtual worlds make to innovation networking. How do we deal then with the apparent warfare between words and pictures, literate communication and immediate visuals?



From its inception, CyberForum aimed to produce “aesthetic occasions” (Whitehead). In virtual worlds, the event or process dominates the fixity of text as well as the stability of images. One aid in dissolving the tension between words and visuals came from the history of rhetorical theory. During the Renaissance, rhetoricians developed a mnemonic technique called “The Memory Palace” [Yates, 1974]. The technique was used by public speakers to remember a long speech. They would remember a number of topics in sequence by imagining a palatial residence through which they could conduct a tour. They imagined each room decorated according to the topic for recall. The speech was conceived as a sequential tour through the rooms of the palace. The imagined spaces imprint the sequence of topics on the speaker’s memory, and the speech itself becomes an event supported by hidden visuals stored in the imagination of the speaker. The visuals in the speaker’s mind may even influence the speech as the room décor introduces a subtext of connotations and associations. This notion of a

classical Memory Palace became a breakthrough for the CyberForum through the idea of reversing the technique and turning it upside down.

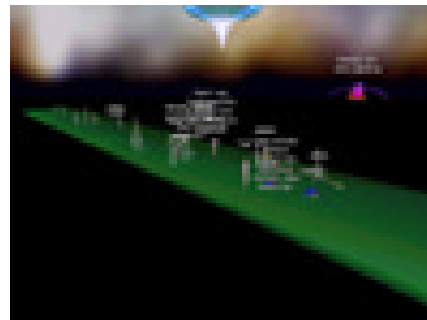
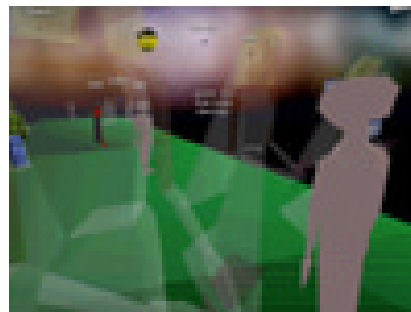
The Reverse Memory Palace (RMP) is a procedure developed by CyberForum@ArtCenter to create better flow between text (chat) and 3-D avatar graphics. RMP creates flow between text chat and visual sequences by yoking text and graphics to a single interactive event. A synergy then develops between text and visuals. The topics of each Forum are supported by interactive events happening in a visual context that vividly supports the topic's meaning. One aspect of RMP is the node or visually vivid place; the second aspect is the interactive performance by the avatars performing in that place. The term "node" designates the place and the term "ritual" designates the avatar performance. The ritual in a node of the virtual world imprints the memory of the topic on the participants discussing the topic. During a one-hour Forum, participants may travel together and perform a ritual in three or four nodes inside a world. Each node imprints a different aspect of the topic under discussion, often according to the bullet-points submitted by the speaker at that Forum. Each node has a visual look to enhance a certain ritual or group interactive performance. The topics of the Forum are idea points as well as "topoi" (Greek "places"). A topic corresponds to the virtual topology. Each Forum production has its distinct topology, and while the choreography of avatar movement cannot be conducted rigidly, the topology offers participants greater enjoyment and understanding through the ritual participation. By all accounts from participants, the ritual events do indeed prove memorable. The purpose of RMP is to create an imprint of a topic through imaginative experiences.

Two examples of RMP nodes come from the Spring 2000 series of the CyberForum@ArtCenter, one with William J. Mitchell (M.I.T. author of *City of Bits*) and one with the VR designer Brenda Laurel (*Placeholder*). Because Mitchell's authorship revolves around the digital transformation of the urban scene, the April 12th CyberForum located one of his discussion points in a node called "Tron." The Tron node proved highly memorable by immersing avatars in structures textured with scanned circuit boards. [Figure 8] The node title refers, of course, to the movie *Tron* (Disney, 1982) but applies textures of technology unknown in 1982, making the node more "realistic." The Tron node brings participants inside the computer in ways that parallel the movie but that also take advantage of an Internet technology only dimly fictionalized before the Internet was widely known and before the advent of avatar worlds. Most striking for the Forum is the fact that Tron is no longer



movie fiction but a real experience on the Internet. The Forum team was thrilled by the reaction of the Dean of Architecture at M.I.T. who said on entering Tron: “Wow!”

Another example of the node as RMP comes from the March 1, 2000 CyberForum with Brenda Laurel (Placeholder, author of *Computers as Theater*). One of Laurel’s discussion points revolved around digital media and memory traces. Laurel’s Placeholder is a high-end VR work that allows visitors, using head-mounted displays, to leave behind messages for future visitors. These placeholders hang in digital space as tiny colored icons which, when clicked, convey a personal message to visitors. The Forum designers followed this theme by locating the event at “Brides” node in ACCD world. The Brides node contains long green slabs supporting a procession of ghostly brides that look like avatars but are not animated. [Figure 9, 10] The bride figures are re-cycled avatars that once served a functional wedding. The wedding took place in ActiveWorlds where the two humans were married, Tomas Landhaus, 27, and Janka Stanhope, 31, who were married on May 8, 1996 at 9 PM (CST) in the multi-user graphical world. The two had first met at Ground Zero in ActiveWorlds, then met later in person and fell in love. [Damer, 1998]. The Brides node in ACCD uses a strong dose of transparency to make the brides appear faded and ephemeral. The node creates a spooky atmosphere where Brenda Laurel talked about gender issues discovered in her work with high-end VR. “In our research,” she said, “we found that women usually described VR as taking their bodies into other spaces while men typically talked about out of body experiences.” Forum participants then shared their own sensations at the moment of existing in “windows VR” with regard to their own genders. The discussion stimulated on-site research, making the virtual world a social laboratory.



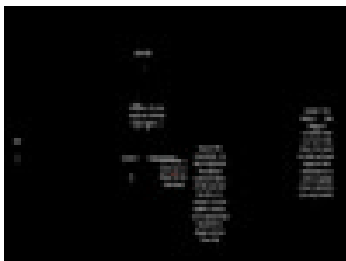
These are only two of the several dozen of nodes created and used by past CyberForums.

9. Flow of Group Dynamics

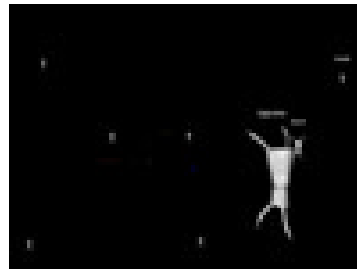
Another aspect of flow familiar to most people and crucial to avatar environments is group dynamics. Individuals making up groups must feel a connection to the other members of the group. Only then do they become a community. The multi-user graphical worlds cannot, Borg-like, assume sociable compliance with the group will. Because online Forums depend on the good will and attention of their remotely connected users, world designers must foster a social flow among participants. Flow has a social dimension. The successful Forum, as mentioned, has a party-like atmosphere, and the participants must at some point share fun.

One solution for social flow is in avatar rituals. Rituals are group performances that can be done with little or no rehearsal and which unite the group in unanimous affirmation of meaning. Rituals create what they signify. In the avatar world, a ritual should require minimal navigation abilities so no participant feels left out. The ritual should create a strong, memorable visual impression. The ritual should encourage banter and social exchange. The ritual should generate topical significance for the Forum discussion. Finally, the ritual should be fun. It should surprise and delight participants as they explore the movements of the ritual.

Two rituals described here are just a few of the many already used in the Forum. The first is the “Plankton Float” which took place on two occasions during the Summer 2000 Forum. The Summer Forum theme was “The Avatar and the Global Brain.” The issues dealt with current theories describing the Internet as an evolutionary mechanism that gradually shapes global consciousness. Two Forum speakers that summer came from the Principia Cybernetica Group. PCP (Principia Cybernetica Program), based in Brussels and Los Alamos, frames theories loosely described as “global brain” theories, and the Forum invited Francis Heylighen and Cliff Joslyn of PCP to speak at separate events. One phrase used in a PCP paper described humans reluctant or unable to get wired as

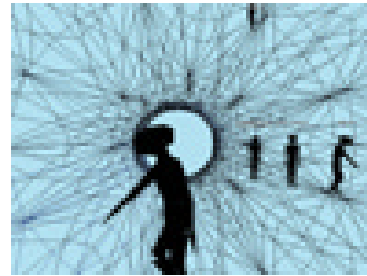


“plankton” for the evolutionary juggernaut. A related ritual used at both events was the “Plankton Float.” For the Plankton Float, participants don awkward avatar shapes with limited functionality and descend to a dark ocean-like pocket of cyberspace decorated with only a few animated bubbles. The plankton-like avatars appear passive and helpless while they bob up and down slowly past one another, remaining within a



small enough area to be visible as an ensemble. Once the bobbing goes smoothly and the plankton effect works, the group discusses the de-humanization implied by the plankton metaphor of evolutionary survival. [Figures 11 & 12]

Another ritual was used during the VLearn 2000 / Avatars 2000 conference October 14-15, 2000. The ritual is called “Avatrapment” and has significance in the general topic of “Avatarue” the conference keynote events produced by CyberForum@ArtCenter. The topic “Avatecture” explores the merger of avatar worlds with physical architecture. The ritual pointed to the danger of becoming trapped in avatar worlds that do not connect to real-world structures or life. The ritual event placed forty participants in a large wire frame cage. As a participant pursues an exit, the cage suddenly pops up in a new form to surround the avatar. The cage design uses warps and visibility limits to achieve its effects. Avatars bounce back and forth as they try to escape, creating an amazing scene to watch. [Figure 13] The cage in itself provides a constantly shifting kaleidoscopic image.



The ritual proved interesting as the group activity for 15-20 minutes. Again, the topic and the ritual facilitate a flow of juices among participants, and the topic idea flows with the visual experience.

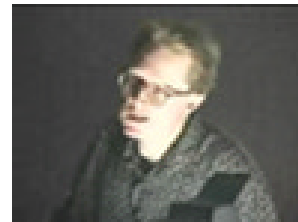
Some rituals prove a conceptual point, and some are simply playful events. This is in keeping with CyberForum philosophy, which is that the functionality of online meetings should always factor playful fun into the equation. This makes sense in connecting remote participants, but it also helps make the event topics memorable. Forum participants, even speakers whose ideas are called into question by the event, often remark that the experience stays with them as a provocation to thought.

10. Flow of Virtual with Physical (Avatecture)

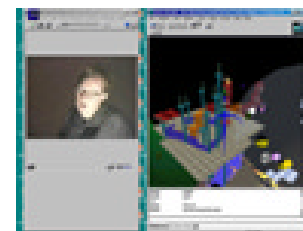
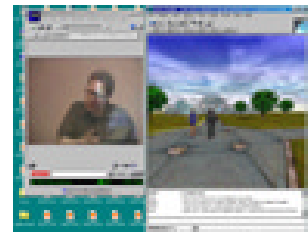
The final aspect of flow discussed in this paper is the interplay of avatar places with physical spaces. This is a topic that deserves the new coinage “avatecture.” Avatecture is the merger of avatar places with physical architectural spaces. The process of avatecture ranges from projection technology to innovative connections of the virtual and the physical. Avatecture is a two-way flow between virtual worlds and physical buildings. “Flow” is a broad term suggesting an enriched environment. Neither the virtual nor the physical swallows each other. The two create a larger synergism. The

avatar becomes an animating feature that injects spirit (Latin anima) into the solid physical structure so as to influence the spirit of its places. This is the meaning of the term avatecture.

Projecting avatar places into physical spaces solves one problem of online broadcasting. CyberForum first came across the problem in collaborating with the UCLA Digital Arts Program in the Fall of 1999. Digital Arts at UCLA broadcasts visiting speakers on the Web via streaming video on the desktop. Excellent camera work for the broadcasts makes the video highly viewable, much like television. This is precisely the problem: the events feel like broadcasting media that are not interactive and that induce passive viewing. From the computer desktop, passivity feels stifling to anyone accustomed to avatar-worlds and eager to ask the speakers questions and chat with others attending the presentation. To enrich the event, the CyberForum team began desktop multitasking by using the UCLA video feed alongside the 3-D avatar world and at the same time projecting the avatar worlds on the walls of the UCLA conference room. On a single desktop, the video could appear in several different ways.



In this way, the passive video stream of one-way performance [Figure 14] changes into the juxtaposed windows of video and avatar worlds. [Figure 15] Realistic video and fantastical avatar world [Figure 16] are juxtaposed. With this technique the team could encounter the UCLA speaker in avatar and simultaneously watch the conference in streaming video. Remote avatars could address questions to the speaker from distributed locations, and during the same exchange in the virtual world, the UCLA projections of the avatar world onto the wall created another loop between virtual and physical. [Figure 17] This event triggered further experiments at Art Center in projecting avatar events onto walls, scrims, and other glass materials. Through additional scripting, the digital artist Tom Mancuso was able to make an installation where physical body movement triggers events in giant avatar projections that in turn loop virtual into physical and vice versa. An outstanding issue explored with these techniques is the issue of photo-realism and its relation to fantasy.



Avatecture has another variation in which avatar worlds project into physical space. This is through the power of avatar ritual performances to parallel and intersect

physical spaces. This second approach first arose in collaboration with architects at the Hollywood architectural firm PUSH (Christophe Cornubert). The collaboration involved designing a 40,000 square-foot theater performance center for Denmark. Suffice it to say that the physical structure is highly configurable, and the building has an online avatar component that endows rooms with significance through performance rituals. Besides establishing an Internet presence, the avatar worlds are focused inside the structure, including a Trimension Reality Room that projects Internet space onto a 24-foot concave screen. Theater becomes participatory through distributed computing. The “spirit of the places” is conjured and re-configured through avatar performances. The pools and eddies in the usage flow of physical spaces are either stirred or concentrated through electronic events.

Avatecture then creates the “smart building” - not in the sense of a domineering, data-gathering Big Brother but in the sense of a building interlaced with human spontaneity. The “smart building” keeps human intelligence in the loop. In conjunction with avatar worlds, human beings affect the building configuration through shaman-like invocations and performance. Too often a theology of the machine omits human beings in favor of automated cybernetic control. By their fantastical nature, avatar rituals inject playful human spontaneity into the ever-changing needs of dwelling in physical structures. The physical spaces are animated and re-animated as needs change. The animation projects the indwelling of human spirit, sharing the original breath that animates. The term avatar originally came from the Sanskrit word meaning “to come down into,” as when the god Krishna takes human form and appears to Arjuna in the Bhagavad-Gita. Avatecture is the human descent into graphical worlds that connect physical structures to global networking and dynamic configurations.

11. Implications of Flow

We have examined several meanings of flow in virtual environments: atmospheric, textual-visual, group dynamism, and physical-virtual architecture. In practice, of course, these flows must themselves flow as one. They must create a single intense event. Flow is about energy fluctuations, and energy has degrees of intensity. The more intense the event, the more immersive is the occasion, and vice versa. Flow must be shaped so it leads to intensity. The intense event cannot be fully captured in a sequential script or in a log file with pictures. Log files are souvenirs of something that has already existed primarily as an occasion. Despite the Western predilection for substances and permanence, the virtual worlds team must accept the passing, changing, flowing nature of actual occasions. By accepting the flow, the virtual worlds team regains the power of actual experiences in a culture that increasingly receives

its realities in pre-packaged formulas. The gain of experiential intensity differs from but does not cancel out the more Apollonian written word with its lengthy books and literate thinking. In fact, CyberForum shows that the book is augmented and complemented by avatar occasions.

One of the implications of flow, then, is that the unit of intelligibility and of value shifts. Instead of the sacred book, the event comes to foreground. Instead of information, the event receives priority. We misconstrue the Internet if we think of it as a vast information library or system of information. The Internet is also a test bed of new life forms like avatars. And avatars come to life through interactive events. The event combines literacy and playful sociality in a series of meaning-conferring events that imprint themselves as memories through their visual strength and topical cogency.

In avatar worlds, aesthetics becomes indistinguishable from environment. Avatar environments are constructed worlds, constructed with varying degrees of critical and aesthetic self-awareness. Ontology here becomes inseparable from aesthetics, which is to say that we exist in avatar worlds according to the choices we make in conjunction with the choices of software designers. Because software is indeed soft, we exist online as fungible, malleable, dynamic forms. We are not simply “interface users” who are given “tools” that exist apart from what we do with them. Nor does the software designer wield complete control over what a virtual world is or can become. Instead, users and tools shape each other to make a holistic totality. Just as we arrange our “desktops” to suit tasks at hand, opening and changing windows, installing or deleting components, combining or moving digital elements of our work, so too virtual worlds fuse participation and creation. Once we grasp the dynamism of the flow between user, software, and programmer, we see another higher order of flow, a meta-condition that is extraordinary creative process evolving within us at this moment in history.

Acknowledgements

Members of the CyberForum team who have contributed over several academic terms to the Forum include: Tobey Crockett, Tom Mancuso, Simon Niedenthal, Matthew Sloly, and Christina Valentine. The team has developed worlds in accd-2 (Activeworlds), ACCD and VWD (Eduverse).

Bruce Damer, Director of the Contact Consortium organized Avatars ‘97, ‘98, ‘99, and 2000, Bonnie DeVarco at the University of California, Santa Cruz, and Margaret Corbit at the Theory Center of Cornell University organized the VLearn 2000 conference.

Selected Bibliography

- Anders, Peter (1998) *Envisioning Cyberspace: Designing 3-D Electronic Spaces*, McGraw-Hill Professional Publishing.
- Benedikt, Michael (1991). "Cyberspace: Some proposals". In Benedikt, M. (Ed.). *Cyberspace: First Steps* (pp. 119-224). Cambridge, MA: MIT Press.
- Coyne, Richard (1998). "Cyberspace and Heidegger's Pragmatics". *Information Technology & People*. Vol. 11, No. 4, pp. 338-350.
- Davies, Char (1998). "Changing Space: Virtual Reality as an arena of embodied being". In Beckmann, John (Ed). *The Virtual Dimension. Architecture, Representation, and Crash Culture* (pp. 145-155). New York: Princeton Architectural Press.
- Heim, Michael (1993). *The Metaphysics of Virtual Reality*. Oxford: Oxford University Press.
- Heim, Michael (1998). *Virtual Realism*. Oxford: Oxford University Press.
- Heim, Michael (1998). "Virtual Reality and the Tea Ceremony." In Beckmann, John (Ed). *The Virtual Dimension. Architecture, Representation, and Crash Culture* (pp. 156-77). New York: Princeton Architectural Press.
- Jakobsson, Mikael and Fors, Anna Croon (2000). "Beyond Use and Design: The Dialectics of Being in Virtual Worlds," presented at "Internet Research 1.0" September 9, 2000 in Kansas City, Missouri. Also available at: <http://www.informatik.umu.se/nlrg/>
- Laurel, Brenda (1993). *Computers as Theatre*. Reading, MA: Addison-Wesley.
- Lunenfeld, Peter (1999). "Unfinished Business". In Lunenfeld, Peter (Ed.). *The DigitalDialectics. New Essays on New Media*. Cambridge, MA: MIT Press.
- Mitchell, William J. (1996). *City of Bits: Space, Place, and the Infobahn*. Cambridge, MA: MIT Press.
- Yates, Frances (1974). *The Art of Memory*. Chicago, University of Chicago Press.