

Creating the Virtual Middle Ground

By Michael Heim

CONTEMPORARY CULTURE EXHIBITS AN INCREASINGLY POLARIZED SPECTRUM OF ATTITUDES TOWARD VIRTUALIZATION. ON ONE SIDE ARE THOSE WHO WANT PHOTOREALISM; ON THE OTHER ARE THOSE WHO SEEK SHEER FANTASY, THESE TWO ATTITUDES APPEAR HEADED FOR A COLLISION AS COMPUTER EVOLUTION UNFOLDS. ONE TASK OF TODAY'S EDUCATOR IS TO PROMOTE A SENSITIVE MIDDLE ROAD THAT STEERS SKILLFULLY BETWEEN SUCH EXTREME ATTITUDES THIS AUTHOR, A LEADING THINKER AT THE COMPUTER-SOCIETY INTERFACE, HAS GIVEN THE NAME "VIRTUAL REALISM" TO HIS STRATEGY FOR BALANCING THE TWO SOCIAL FORCES, AND HIS STUDENTS AT CALIFORNIA'S ART CENTER COLLEGE OF DESIGN ARE PUTTING IT TO THE TEST

In my book *Virtual Realism* (published by Oxford University Press, 1998), I describe five aspects of a strategy designed to promote the acceptance of virtual reality (VR) among members of the computer-using public.

These five aspects—they might even be called imperatives—include (1) clarifying the language of virtual reality; (2) creating a feedback loop between the engineers of virtual reality and the public; (3) observing current shifts in telepresence, that is, how people use technologies to extend their presence via telephone, television, fax, and computers; (4) cultivating premodern somatic awareness through the practice of Tai Chi (see "The Scholar's Sport," page 16); and (5) developing appropriate design models for virtual worlds. The last imperative has occupied my attention over the past year as I teach design students how to build virtual worlds on the Internet.

In 1997, an internal research grant from the Art Center College of Design in Pasadena, California, allowed me to begin exploring the existing means for creating virtual worlds that are both immersive and open to experiment. My discoveries, I believed, would allow me to address the concerns of virtual realism in the area of design. Two new courses in the curriculum of our graduate program emerged from

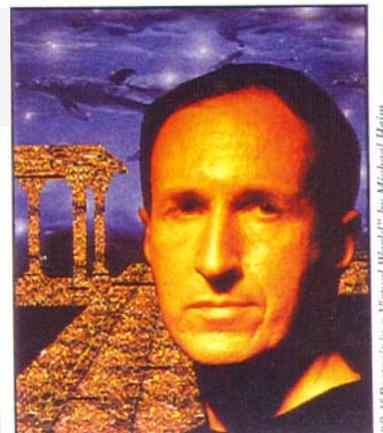
my research, one called Virtual Worlds Design, the other Virtual Worlds Theory.

The latest product of the design class is a virtual space called "accd world," using the initials of the Art Center College of Design. This world is not a finished or complete model of virtual realism, but even in its present incarnation, accd world points out a path that goes down the center line between the extremes of photorealistic representation and cheer fantasy.

PSYCHOLOGICAL IMMERSION

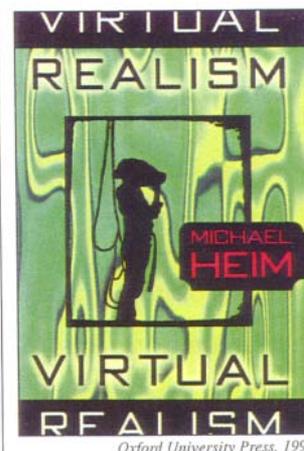
By 2015, our daily lives doubtless will have assimilated the high-end VR that uses immersive head-mounted displays or lightweight goggles. By then, we will daily enter full-surround environments where work and play flourish in electronic landscapes. Today, however, we are experimenting with Internet systems that deliver slow but real-time (synchronous) interactive 3-D worlds to the desktop via modem and telephone lines.

The current "worlds-on-the-desktop" create psychological rather than sensory immersion. In other words, we users participate in these virtual worlds through monitors, keyboards, and mouse buttons, and it is our active building inside these worlds and the recognition of other builders that makes us feel immersed in



"Self-Portrait in a Virtual World" by Michael Heim

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Oxford University Press, 1998

THE SCHOLAR'S SPORT

Today's computer users tend to become victims of the "sitting sickness" for which T'ai Chi is an ancient remedy. That is why author Michael Heim recommends T'ai Chi as one of five aspects in a strategy for promoting the use and acceptance of virtual reality.

In Asia, T'ai Chi has been used for centuries by sedentary workers to enhance their health. There it is known as "the scholar's sport."

Evolution, viewed philosophically, extends and stresses the human organism, and T'ai Chi is a therapy for reintegrating, regrounding, and reconnecting the energy patterns of evolving organisms. It involves both vigorous martial arts movements and soft, smooth stretching movements. Its exercises, including such stances as "rooting" to affirm contact with the earth and "centering" to achieve precise balance with 360-degree orientation, help to deepen the mind-body connection.

the virtual world. These worlds are the psychological predecessors of full sensory immersive VR.

Virtual worlds seek to engage our dwelling rather than our passive contemplation. Instead of working like broadcast media, these worlds invite user participation and customization. By identifying with an avatar (an animated token of one's self) and actively navigating through a 3-D environment, the user becomes part of virtual events. Through active building, users achieve psychological immersion, which is why one software universe—that is, a collection of worlds based on the same set of programs—is called "Active Worlds."

Active Worlds is the trademark of the Circle of Fire Studio and is accessible on the Internet at www.activeworlds.com. A 3-D browser can be downloaded free from this Web site. Visitors may use the browser to enter virtual worlds, where they can fly, chat, and build. Full citizenship in Active Worlds costs a yearly registration fee of US\$20.

SETTING THE SPECS

To effect psychological immersion, a VR program must meet the following specifications: the 3-D graphics of the online world must run smoothly over a modem; the world must provide avatars for user identity and real-time chat; and the objects in the world must allow interactive participation rather than passive viewing. Such requirements rule out, in my mind, VRML (Virtual Reality Modeling Language) or VRML-based worlds. To date, VRML is just too *clunky* and slow.

To meet psychological requirements, I have chosen the Active Worlds universe, which employs *RenderWare* as its underlying script. The Active Worlds (AW) *RenderWare* universe permits the full panoply of resources needed for psychological immersion:

- World backgrounds for atmosphere
- Embedded sounds in regions or in objects
- Interactive objects to build or modify
- Avatars to represent users in real time with chat capability
- Animated sequences that convey body gestures through the avatars.

AW is still rudimentary and limited, I admit, but it is constantly improving. All in all, it seems to me the best 3-D experience on the Internet today, and it signals the dawn of a larger transformation by which the Internet evolves into a three-dimensional, multiuser, participatory universe.

THE ACCD WORLD

Our experimental *accd* world is one of nearly 200 evolving virtual worlds in the AW universe. These 200 worlds receive hundreds of visitors every day, and many of the visitors are building inside the worlds by using objects already found there.

In addition to these additive builders, there are also authoring builders, who do not depend on pre-given objects or avatars but who create objects and avatars for a world. In most cases, the authoring builders consist of teams rather than individuals. These authorial teams create and host the worlds, which then attract visitors and accommodate additive builders.

Our *accd* world is authored and hosted by a team of students at Art Center College of Design. One distinctive feature of *accd* world is its central location on the spectrum between *photorealism* and fantasy. Most virtual worlds in AW are based on *real* world topology. Many attempt to represent flat land, mountains on a single horizon, and a planetary topology as recognizable as Earth or Mars.

By contrast, *accd* world has no single flat land but only local regions of gravity. It contains layers of development up and down the vertical y-axis, spread out in discrete regions. Instead of a single geography, *accd* world contains many disconnected but related areas of construction. This construction mode parallels the principles of virtual realism. (See "Contrasting Virtual Worlds," pages 18-19.)

A BALANCING ACT

Virtual worlds do not re-present the primary world. Inside a virtual world, we need not foster the illusion that we are in a re-presented natural world. Worlds are not realistic in the sense of photorealism. Each virtual world is a functional whole intended to parallel, not re-present or absorb, the primary world we inhabit.

Treating artificial worlds as distractions from the real world is just as off-balance as wanting to dissolve the primary world into cyberspace. Realism in virtuality should seek neither *photo-realistic* illusions nor representations. Realism, in the sense of virtual realism, means a pragmatic functioning in which work and play generate new kinds of entities.

VR transubstantiates but does not imitate life. VR technology is about entering worlds and environments, and worlds arise from humans adapting things through pragmatic functioning. Virtual realism arises from habitation, livability, and dwelling much more than from any calculating realism that strives to get every detail "correct." Not correctness but function establishes the genuineness of a world. The social transition to cyberspace is, therefore, as important as any computer engineering research.

A virtual world can achieve a functional isomorphism with the primary world, but it does not do so by re-presenting the

primary world. The virtual world needs only to foster a similar livability. It must have a home space for orientation, means of transport through virtual space, ways to store information, and tools for interacting with fellow avatars.

Most important, the virtual world must use the right amount of fantasy to make the world attractive and “virtual” (having less gravity than primary being). The virtual world must have that “something extra” that transforms routine activities through fun and playfulness. A touch of whimsy can be compatible with efficiency and accomplishment, especially where users can choose the degree of playfulness in the world’s teleology.

FANTASY AND FUNCTION

At its current stage of development, **accd** world does not yet offer visitors the full pragmatic dwelling for which it eventually aims. The present **accd** world seeks the right note of balance between fantasy and representational (**naïve**) realism. In coming months, **accd** world aims to offer online tools for building art objects as well as opportunities for criticism by professional artists and art school faculty. These activities will support greater habitation, livability, and dwelling.

The current avatars in **accd** world mix fantasy with function. Two major kinds of avatars—humanoid and winged—populate **accd** world. The winged avatars, including giant colorful birds and exotic flying insects, work well in the open spaces of the world. Because **accd** world contains discrete regions of construction in vertical layers, the flying avatars provide the thrill of navigating unhindered through wide-open virtual spaces.

Flying avatars such as **Neckbird** and the Insect series also display deformations that distinguish their anatomy from **common**-sense forms. The noticeable deformations distinguish **accd** world avatars from the typical prosaic avatars seen in AW humanoids.

Our **Chairboy** anatomy, for instance, comes attached to a large chair, making him permanently sedentary. Our **Greenman** avatar wears clothing that does not match. Deliberate deformations play with the prose of virtual identity.

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THE CURRENT STRUGGLE

In the accompanying article “Contrasting Virtual Worlds” (page 18), I illustrate, to a limited extent, two contrasting strategies for the design of virtual worlds. They show the current struggle for the right metaphors to shape cyberspace.

The right metaphors, I suggest, are those that strike a balance. The balance arises between the need to extend ourselves more deeply into 3-D computer space and, at the same time, to ground ourselves more deeply in primary reality. We cannot achieve such harmony by seeking to replicate the primary world in **cyber**-space; nor do we achieve it by substituting a pointless fantasy for the real world. Harmony arises from attention to both tendencies—to both the realist and the idealist within us.

I hope and believe that **accd** world will take us a tiny step further down the pragmatic path of virtual realism. The journey to virtuality launches us onto an open field. Which way we choose to travel makes a big difference. The route of virtual realism is not an easy one. Nor can it be traveled once and for all. It is a continual balancing act, one that has already begun and that requires ongoing attention. ◀

By 2015, our daily lives doubtless will have assimilated the high-end VR that uses immersive head-mounted displays or lightweight goggles. By then, we will daily enter full-surround environments where work and play flourish in electronic landscapes.

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CONTRASTING VIRTUAL WORLDS

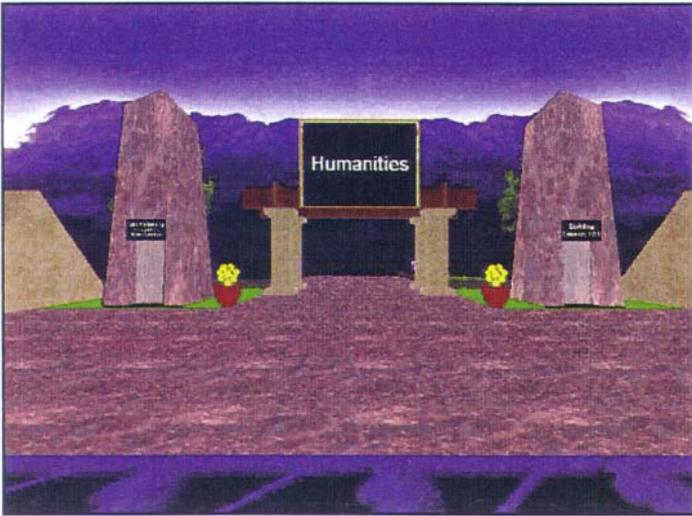


Figure 1: Entrance to AlphaU



Figure 2: Entrance to AWSchool

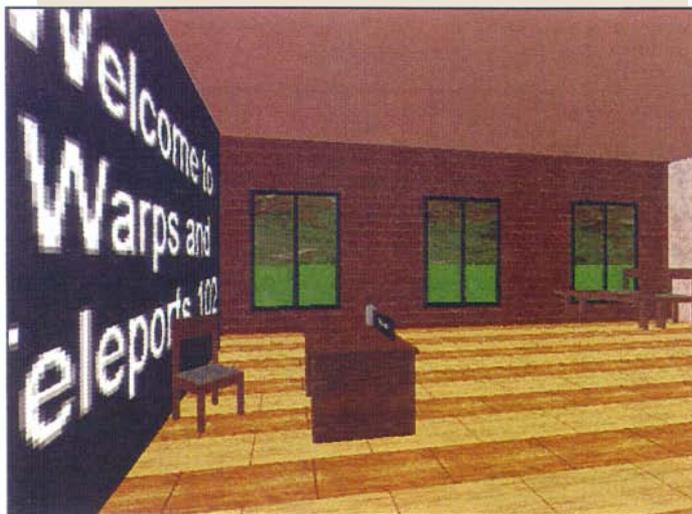


Figure 3: Inside AWSchool

The best way to clarify the styles of virtual realism may be to contrast the Art Center College of Design's *accd* world with two other virtual worlds that purport to create a "learning environment": *AWSchool* and *AlphaU*.

The contrast is illustrated by images captured from the three worlds (Figures 1-6). While captured images may help illustrate the contrast of the three worlds, a full contrast comes into focus only for persons who actually enter the virtual worlds and engage them through real-time interactivity.

In live presentations, I sometimes add to these illustrations some movies captured directly from the moving screens of *AW*. Used in this way, the movies translate first-person free navigation into a series of passive, linear, cinema-like sequences. Like all linear media, the cinema brings its viewers into a mode of passive viewing. Passive viewing characterizes all broadcast media, while the most characteristic feature of the new media is their inaccessibility to passive contemplation. Truly interactive experience requires at least 20 minutes of direct, 360-degree navigation, which is usually sufficient to induce a certain degree of psychological immersion. Cinema cannot substitute for interactive experience. Movies and illustrations can provide only a clue about the design style of virtual realism.

Transformation is the theme of the six illustrations I have taken from videos to convey the issues of designing for virtual realism. One postulate of virtual realism is that whatever goes online undergoes transformation. The real can no more be reproduced online than it can be replaced by fantasy. Reality is transformed by entering the virtual. Virtual worlds need not suggest a replacement of the primary world; nor should they be so fantastical as to derange common sense. As I explain in the main article, virtual world design should attain a harmony between photorealism and fantasy.

Consider Figure 1, which shows the entrance to *AlphaU*. When we look at the design strategy of *AlphaU*, we see an ontological nostalgia for the physical 3-D world. *AlphaU* attempts to represent the 3-D gravity found in the primary world, including the adornments of flowerpots and the geometry of academic monumentality. Despite the nostalgia, however, a closer inspection reveals that the "pillars" of this academic monument are not the Ionic columns they appear to be but are in fact "teleport" booths. Teleport booths are ubiquitous in *AW*: their design was probably inspired by the Tardis telephone booth of television's "Dr. Who." Teleport booths allow avatars to "warp" instantaneously to another destination in virtual space. These "pillars" in *AlphaU* demonstrate that virtual worlds transform even where they try to re-present.

Still more nostalgic are the various signs at the entrance of *AlphaU*. Figure 1 shows the sign for the Humanities Division, which signals one of the departments of academic disciplines divided according to the current university curriculum. Where once the academy sprang from the psychological "faculties" of the human mind, the virtual world here irrelevantly mirrors the departments of the primary world campus—a dubious legacy for Web-based education.

A similar nostalgia for campus architecture appears in the samples from *AWSchool*. Figure 2 shows the *AWSchool* main building, which is, again, laid out as if it were red brick and monumental stone. The ephemeral, flickering virtual school seeks to replicate the solid structures of uppercase Education!

Moving inside *AWSchool*, we find even more representational absurdity. In Figure 3, we see the wooden chair, desks, and

blackboards of the conventional schoolroom. What more do we need? Virtual chalk?

Neither AWSchool nor AlphaU finds the middle ground of virtual realism. These worlds lean toward the apparent security of a realism that actually threatens to stifle everything virtual by burdening it with pointless replication.

In the Art Center's accd world there is far less reality replication (Figures 4-6). The challenge for accd world is, on the contrary, to develop pragmatic functionality.

This virtual world, in its current stage of development, leans toward fantasy, as can be seen in the first view at ground zero (the entrance portal of a virtual world), which shows several ghostlike silhouettes strewn across the virtual landscape (Figure 4). These are indeed ghosts. They are remnants of avatars. If you look closely, you can see that these models are former avatars recycled to become semitransparent statues. With their wispy veils and long gowns, they resemble bride statues, or faded brides. And they are in fact modified bride avatar.

The original models on which the accd bride statues are based, come from the first Internet-hosted wedding ever held inside a multi-user graphical virtual world. On May 8, 1996, history was made when Tomas Landhaus, 27, and Janka Stanhope, 31, were married in real life inside AW. Tomas and Janka came dressed in avatars specially designed for the occasion. After the AW ceremony, the real-life groom drove from San Antonio, Texas, to Tacoma, Washington, to kiss his bride. In 1998, the designers of accd world borrowed the bride avatar and fashioned out of it a poetic fantasy to stand statue-like at the gates of accd world. The faded avatar models thus are relics of relics of real presence.

In the background of Figure 4, you can see the fantasy architecture developed by accd world builders. The rainbow architecture projects exotic lines and colors. Turrets and sacred flames top the buildings. The horizon blurs the flat-earth plane by repeating an abstract pattern.

Figure 5 shows a different section of exotic architecture. And from this perspective you can see the horizontal plane give way to a deeper layer. Another floor of the building appears through the ground plane. From this view you can see the multilayered design strategy, but you cannot see the many Islands of tiered development that extend throughout various sections of accd world. Sometimes the ground plane exists for miles and miles of virtual space. At other times the ground plane vanishes into black virtual space as far as the eye can see. The architecture shown in Figure 5 will one day become part of the gallery space used later to display artwork by visitors.

Figure 6 shows another section of accd world. The huge slabs of white and blue rectangular panels float like Mondrianesque abstractions in virtual space. The avatar birds of accd world, Tweak and Squawk, flit thrillingly through these spaces

-Michael Heim



Figure 4: Entrance to accd world

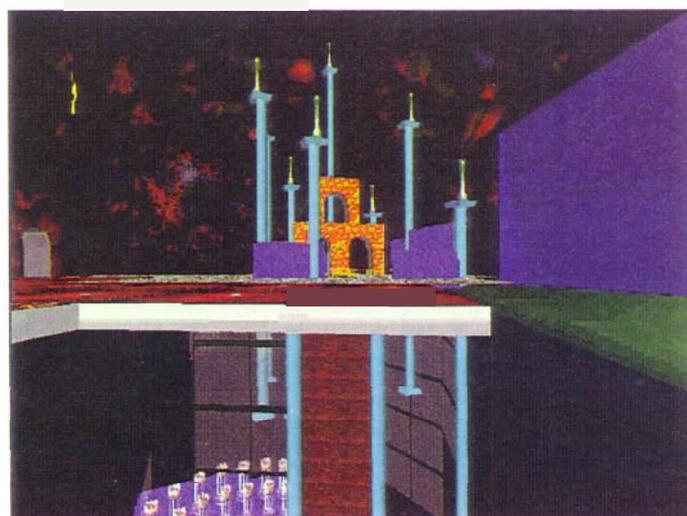


Figure 5: Exotic architecture of accd world

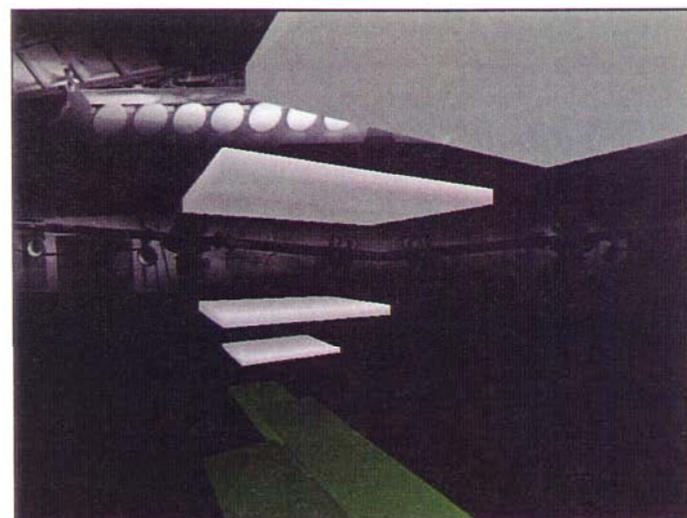


Figure 6: Another section of accd world

Since this article was written, AlphaU has changed its name to Active Worlds University and AWSchool has rearranged some of its buildings. Active Worlds University is run by volunteer instructors who charge no fees for their classes in online building. Its Web page can be found at www.awcommunity.org/awu/. AWSchool was built by the American Builders Guild and is hosted by the Circle of 5. The Circle's Web page can be found at www.gineric.com/alphaworld/homepage/aws.htm.