

*Abstract: "Virtual Realism"*

Contemporary culture exhibits an increasingly polarized spectrum of attitudes toward virtualization. On one side are [network idealists](#), who dream of uploading everything local and physical to global networks. On the other side are [naive realists](#) -- from the [Unabomber](#) to a host of neo-Luddite critics, who reject computers. These two social forces appear headed for a collision as computer evolution unfolds.

[Virtual Realism](#) is a strategy for balancing these two forces. Virtual Realism includes several imperatives:

- [Clarify the language of virtual reality](#)
- [Create a feedback loop between engineers and public](#)
- [Observe current shifts in telepresence \(technalysis\)](#)
- [Cultivate pre-modern \(somatic\) body awareness \(Tai Chi\)](#)
- [Develop appropriate design models for virtual worlds](#)

This last component will be the focus of the presentation. The presentation will demonstrate models of online worlds designed according to virtual realism, and then a [contrast](#) will be made with more naively realistic worlds. The models come from the author's recent work with graduate students at the Art Center College of Design in Pasadena, California.

This paper (no footnotes) is available with full-color illustrations on the Internet at <http://www.mheim.com/rio>

# Virtual Realism

By Michael Heim

## *Introduction*

Contemporary life bristles with attitudes toward virtualization. As computers emerge in all areas of life, some critics attack virtual reality as an extension of shallow television. Others hail global networks as the advent of new communities that transform economics and social life. In my book *Virtual Realism*, I analyze the spectrum of attitudes from "Naïve Realism" to "Network Idealism" and I suggest a pragmatic balance called "Virtual Realism." For the purposes of this paper, I will sketch the opposing attitudes in simple terms: first, the Teilhardian optimism of network idealists, and then the naïve realism of the Luddite critics sometimes associated with the Unabomber. I then condense the strategy of virtual realism into four main points while highlighting the design strategy based on its principles. The design strategy offers guidelines for constructing online, 3-D, real-time virtual worlds that harmonize conflicting attitudes. The presentation concludes by showing video samples of current online virtual world

construction done by graduate students at the Art Center College of Design in Pasadena, California, where I teach Virtual Worlds Theory and Virtual Worlds Design.

### *Network Idealists*

The idealist sees planet Earth converging. Computer networks foster virtual communities that cut across geographies and time zones. Virtual communities seem to heal isolated people locked in metal boxes on urban freeways. Through computer networks, the population can socialize while shopping, learning, and business are only a mouse click away. The telephone and the television seem to have been mere beginnings of a more powerful, multi-sensory, interactive telepresence. “Virtual communities” recall McLuhan’s “global village” and Teilhard’s “Omega Point.”

Network idealists advance a philosophy of convergence. The convergence ranges from the auto-poetic systems of *Principia Cybernetica* to the political activism of the *Electronic Freedom Foundation*. One way to grasp the idealist roots of this philosophy is to consider the Teilhardian thought current underlying mid-twentieth-century thinking. At the heart of network idealism pulses a thought most clearly articulated by the French Jesuit paleontologist, Pierre Teilhard de Chardin.

Teilhard de Chardin envisioned the convergence of human beings into a single massive “noosphere” or “mind sphere.”<sup>1</sup> This giant network would surround Earth to control the planet’s resources and shepherd a world unified by Love. Teilhard’s catholic vision ranged from evolutionary physics to world religion. (His views received more suspicion than support from Vatican orthodoxy.) He saw in the physical world an inner drive for all substances to converge into increasingly complex units. Material atoms merge to create higher-level units. Matter eventually converges to form organisms. The convergence of organic life in turn produces higher-level complexities. The most complex units establish a new qualitative dimension where consciousness emerges. On the conscious level, the mind — and then the networking of minds — gives birth to a new stage of spirit. As in Hegel’s nineteenth-century philosophy, Teilhard sees expanding spirit as the inner meaning or cosmic purpose of the preceding evolution. Convergence toward greater complexity, even on the sub-atomic level, exemplifies the Love principle (agapic rather than erotic). Only later, with the dawn of intelligence, does Love come into full self-awareness. For Teilhard, this is the Christ principle guiding the universe. “In the beginning was the Logos.” Only at its culminating point does history reveal its full meaning as the mental sphere assumes dominance. Teilhardians see ultimate convergence as the Omega or End-Point of time, the equivalent of the Final Coming of Christ.

Teilhard, like Karl Marx before him, inherited evolutionary dynamics from Hegel, the father of German Idealism. Hegel applied the Christian notion of Divine Providence to the recorded events of civilized history in order to show a rational progression. Hegel’s elaborate encyclopedias and multi-volume histories of Western civilization affirm a hidden evolutionary will driving purposely towards a single culmination. The fulfillment of history, according to

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<sup>1</sup> See *The Future of Man* by Pierre Teilhard de Chardin, transl. Norman Denny, (New York: Harper & Row, 1964), and also *The Phenomenon of Man*, transl. Bernard Wall, (New York: Harper & Row, 1965, c1959).

Hegel, is a spiritual unity harmonized in diversity, a oneness which subsequent interpreters describe as a “classless society” (Marx) or as “social progress” (the American Hegelians).<sup>2</sup>

Hegel saw a divine Idea unfold in the material world of historical events — even to the point of squeezing all recorded history into a Procrustean logic of progress. The motor that powered the movement of history was a series of internal civil wars, each bringing the entire society a little closer to perfection. The culmination of all revolutions, for Hegel, produced Western constitutional democracies where the individual and the individual’s rights are recognized by the social collective. Just what this heavenly harmony looks like in practice appeared differently to the various proponents of Hegelian idealism. While Marx’s advocates dressed in the worker’s garb of political economy or in revolutionary guerrilla fatigues, Teilhard’s vision blended synthetic physics with Christian communitarianism. It is especially the communitarianism that attracts network idealists.

Connecting the communitarian impulse with the cult of technology may seem incongruous at first glance, but we must not forget that the organized, enduring community is itself a co-product of agricultural technology, of the development of machines. For millennia, machines functioned as stand-alone tools under supervision of a single human operator -- the hoe, the plow. With larger-scale projects and manufacturing, machines increasingly functioned in an ensemble -- the mill, the boatyard. The shift from machinery of isolated work tools to larger systems becomes one of the defining characteristics of the industrial era, with railroads, fuel distribution, and highway systems being obvious examples. The interconnection of one machine to another extended into the sphere of human society and cultural production with networks: first radio, then television, and now computers. The contemporary convergence of all three media has created a situation in which a vast variety of machines plug into seemingly limitless networks, all with the computer as the control switch.

The network idealist builds collective bee-hives. The world-wide networks that cover the planet create a global bee-hive where civilization shakes off individual controls and electronic life steps out on its own. The idealist sees the next century as an enormous communitarian buzz. In that networked world, information circulates freely through the planetary nervous system, and intellectual property vanishes as a concept. Individuals give and take freely. Compensation is automated for the heavenly, disembodied life. Electronic angels distribute credit. Private territory and material possessions no longer divide people. The battle of the books recedes through digital mediation, and proprietary ideas give way to voluntary barter. Cooperative intelligence vanquishes private minds. Extropian idealists (who define themselves as the enemies

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<sup>2</sup> William Torrey Harris (1835-1909) was the American philosopher and Hegel translator who in 1873 established the first public-school kindergartens in the United States, later serving as U.S. commissioner of education from 1889–1906. Hegelians in St. Louis and in Ohio took seriously Hegel’s view that the Absolute Spirit (citizenship under a free constitution) had emigrated from Europe to America. These social reformers rejected Marx’s revolutionary violence while promoting public-spirited projects like national parks, public libraries, and the 1904 International Exhibition that invoked “the Spirit of St. Louis.” See William H. Goetzmann (ed.), *The American Hegelians: An Intellectual Episode in the History of Western America* (New York: Knopf, 1973); Loyd David Easton (ed.), *Hegel's First American Followers: The Ohio Hegelians* (Athens, Ohio: Ohio University Press, 1966); and Paul Russell Anderson’s *Platonism in the Midwest* (New York: Columbia University Press, 1963). To understand the break between the Hegelians and Karl Marx, see Harold Mah’s *The End of Philosophy and the Origin of "Ideology": Karl Marx and the Crisis of the Young Hegelians*, (Berkeley: University of California Press, 1987). Classic Hegelian idealism differs in its historical depth and breadth from the network idealism described in this paper. But that is another story in itself.

of entropy) encourage their members to entrust their deceased bodies to cryonic storage until scientists one day either revive the repaired body or upload the brain-encased mind into silicon chips. The Teilhardian Internet is optimism gone ballistic.

### *Naïve Realists*

Realists remain unimpressed. They are uneasy with the idealists who celebrate electronic collectives. I know people in rural communities who hear wishful thinking in the phrase “virtual community.” It sticks in their throat. For many, real community means a difficult, never-resolved struggle. It is a sharing that cannot be virtual because its reality arises from the public places that people share physically -- not the artificial configurations you choose but the spaces that fate allots, complete with the idiosyncrasies of local weather and a mixed bag of family, friends, and neighbors. For many, the “as-if community” lacks the rough interdependence of life shared. And here is where the naive realist draws the line. The direct, unmediated spaces we perceive with our senses create the places where we mature physically, morally, and socially. Even if modern life shrinks public spaces by building freeways, and even if the “collective mind” still offers much interaction among individuals through computers, the traditional meeting places still foster social bonds built on patience and on the trust of time spent together. Here is the bottom line for realists.

No surprise, then, for realists when they hear that the Internet Liberation Front is bringing down the Internet’s Pipeline for six hours, when Anti-Semitic hate groups pop up on Prodigy, when *Wired* magazine gets letter-bombed, or when Neo-Nazis work their way into the German Thule Network. The utopian *communitas* exists as an imagined community, as the Mystical Body. Real community exists, on the contrary, where people throw their lot together and stand in face-to-face ethical proximity. Computer hardware may eventually allow us to transport our cyberbodies, but we are just learning to appreciate the tradeoffs between primary and virtual identities. Put the New Jerusalem on hold until we phone security!

The naive realist feels fearful about virtual reality. There is fear of abandoning local community values as we move into a cyberspace of global communities. There is fear of diminishing physical closeness and mutual interdependence as electronic networks mediate more and more activities. There is fear of crushing the spirit by replacing bodily movement with smart objects and robotic machines. There is fear of losing the autonomy of our private bodies as we depend increasingly on chip-based implants. There is fear of compromising integrity of mind as we habitually plug into networks. There is fear that our own human regenerative process is slipping away as genetics transmutes organic life into manageable strings of information. There is fear of the sweeping changes in the workplace and in public life as we have known it. There is fear of the empty human absence that comes with increased telepresence. There is fear that the same power elite who formerly “moved atoms” as they pursued a science without conscience will now “move bits” that govern the computerized world.

The critics of fear often assume a philosophy of “naïve realism.” Naïve realists take reality for what is experienced immediately. Reality, they assert, is the physical phenomena we perceive with our bodily senses, what we see directly with our eyes, smell with our noses, hear with our ears, taste with our tongues, and touch with our skin. From the standpoint of this empirically perceived sensuous world, the computer system is at best a tool, at worst a mirage

distracting us from the real world. The elaborate data systems we are developing exist outside our primary sensory world. The systems do not belong to reality but constitute instead, in the eyes of the naïve realist, a suppression of reality. The suppression comes through “the media,” which is seen to function as vast, hegemonic corporate structures that systematically collect, edit, and broadcast packaged experience. The media infiltrate and distort non-mediated experience, compromising and confounding the immediacy of experience. Computers accelerate the process of data gathering, and threaten further, in the eyes of the naïve realist, what little remains of pure, immediate experience. The naïve realist believes that genuine, natural experience is as endangered as clean air and unpolluted water. The naïve realist aligns computers with the corporate polluters who dump on the terrain of unmediated experience.

The supposed purity of immediate experience was defended by the New England Transcendentalists in nineteenth-century America. Thinkers like Henry David Thoreau, backed by the publicity skills of Ralph Waldo Emerson, proclaimed a return to pure, unmediated experience.<sup>3</sup> Thoreau left city life to spend weeks in a rustic cabin in the woods at Walden Pond near Concord, Massachusetts so he could “confront the essential facts of life.” Far from the social and industrial hubbub, Thoreau spent two years contemplating the evils of railroads and industrialization. Although railroad tracks and freeways now circumscribe Walden Pond, many contemporary critics, like Wendell Berry, seek to revive the Thoreauvian back-to-nature ethic and take up the cause represented by his Walden retreat.<sup>4</sup>

In the eyes of the naïve realist, computer networks add unnecessary frills to the real world while draining blood from real life. The mountains, rivers, and great planet beneath our feet existed long before computers, and the naïve realist sees in the computer an alien intruder defiling God’s pristine earth. The computer, say the naïve realists, should remain a carefully guarded tool, if indeed we allow computers to exist at all. The computer is a subordinate device that tends to withdraw us from the primary world. We can and should, if the computer enervates us, pull the plug or even destroy the computer.

By voicing such fears, the naïve realist sounds alarms that many people have come to connect with the Unabomber.

### *Unabomber Manifesto*

The Unabomber is an important figure for understanding naïve realism.<sup>5</sup> The Unabomber’s extremism cannot be understood in isolation from the one-sided commercial euphoria that sells millions of computers each year. The Unabomber’s attack on computers became clear to the public in September, 1995 when the *Washington Post* published a 56-page,

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<sup>3</sup>Thoreau spent two years on the shore of Walden Pond (1845-1847). His essays on the topic appear in his book *Walden* (1854).

<sup>4</sup> See Wendell Berry, *A Continuous Harmony: Essays Cultural and Agricultural* (New York: Harcourt Brace Jovanovich, 1970).

<sup>5</sup> The name “Unabomber” came from the Federal Bureau of Investigation code for “university - airlines bomber,” since the majority of the twenty-three bomb targets were people who worked at universities or traveled the airlines. In 1998, Theodore J. Kaczynski, a Montana recluse who once taught mathematics at the University of California, Berkeley, admitted culpability for the Unabomber crimes.

35,000-word manifesto on “Industrial Society and Its Future.”<sup>6</sup> Under the pressure of bomb threats against airline passengers, the newspaper carried the *Unabomber Manifesto* in its morning edition. By evening on the East Coast, you could not find a single copy of the *Post* with its 8-page manifesto insert. The next day, however, the 200-kilobyte text of the manifesto turned up on the Internet. It appeared on a World-Wide Web site sponsored by the Federal Bureau of Investigation. The Unabomber had his own “home page,” illustrated with wanted posters and maps pinpointing the series of explosions he had caused, all in a high-tech, Web format.

Search the *Unabomber Manifesto* and you find the word “computer” mentioned frequently in conjunction with “control” and “technology.” The serial bomber blames technology, especially computers, for a variety of societal ills: the invasion of privacy, genetic engineering, and “environmental degradation through excessive economic growth.” The *Unabomber Manifesto* borrows heavily from an older school of social critics who follow the French writer Jacques Ellul. The book by Ellul, *Technological Society*, a bible in the 1960s, demonized an all-pervasive technology monster lurking beneath the “technological-industrial system.”<sup>7</sup> Ellul took a snapshot of technology in the 1960s, and he then projected and expanded that single frozen moment in time onto a future where he envisioned widespread social destruction. Ellul’s approach -- what economists call “linear trend extrapolation” -- takes into account neither social evolution nor economic transformation. Ellul did not include the possibility that economies of scale would arise to redistribute technological power, allowing individuals, for instance, to run personal computers from home and publish content on an equal footing with large corporations.

The dark future portrayed by Ellul appears throughout the *Unabomber Manifesto*, but the Unabomber goes further by linking the technology threat explicitly to computers. The killer critic sees computers as instruments of control to oppress human beings either by putting them out of work or by altering how they work. The *Manifesto* states:

It is certain that technology is creating for human beings a new physical and social environment radically different from the spectrum of environments to which natural selection has adapted the human race physically and psychologically. If man does not adjust to this new environment by being artificially re-engineered, then he will be adapted to it through a long and painful process of natural selection. The former is far more likely than the latter.<sup>8</sup>

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<sup>6</sup> The Unabomber Manifesto appeared in the *Washington Post* on September 19, 1995. To browse the many variants of the Unabomber Manifesto, the reader can begin at the Yahoo Internet site (<http://www.yahoo.com>) and look under “Society and Culture.” Then click on “Crimes” and “Homicides,” then on “Serial Killers,” under which is “Unabomber” and “Unabomber Manifesto.” Along the way, the reader will also find many satirical and not-so-satirical Web sites devoted to the myth of the Unabomber.

<sup>7</sup> See Jacques Ellul, *The Technological Society*, transl. John Wilkinson, (New York: Vintage, 1967, c1964).

<sup>8</sup> *Unabomber's Manifesto*, “Industrial Society and its Future,” paragraph 178. The paragraph numbering I use belongs to the CoE/Bono version, revision 2, which corrects most, if not all, of the known errors in the *Washington Post* version, including the omission of paragraph 116. The CoE/Bono version is on the Web in a hypertext version at <http://www.envirolink.org/orgs/coe/resources/fc/unabetoc.html>. A search via Yahoo will turn up several other versions.

The dilemma outlined by the Unabomber can be found in other extremist critics. Many share the Unabomber's views without harboring his pathological desperation. The no-win dilemma they see is either to permit evolution to wreck millions of lives or to use technology to forcibly re-engineer the population. Laissez-faire evolution or artificial engineering seem the sole options: Either manipulate humans to fit technology, or watch technology bulldoze the population until all that remains is a techno-humanoid species of mutants. The Ellul school of criticism posits a monolithic steamroller "technology" that flattens every activity, and the Ellulian view allows only a static fit between technology and society. This school of thought sometimes puts a national face on the alien technology monster, calling it "Americanization."<sup>9</sup>

Naïve realism and network idealism are two sides of the same coin. The computer's impact on culture and the economy turned from a celebration into a backlash against cyberspace. A cultural pendulum swings back and forth, both feeding off and being fed to a sensation-hungry media.<sup>10</sup> The media grabs onto hype and overstatement, culled from marketers and true believers. When the media assesses the techno-culture, a trend climbs in six months from obscurity to one of the Five Big Things -- complete with magazine covers, front page coverage in newspapers, and those few minutes on television which now constitute the ultimate in mass appeal. After the build-up, the backlash begins. The process is as follows: (1) simplify an issue; (2) exaggerate what was simplified; (3) attack the inadequacies of the simplification. Cyberspace was no exception, and the reverse swing against cyberspace was inevitable.

The backlash is not simply the product of a fevered media economy. It taps into people's real attitudes towards an ever more technologized culture. This runs from those who are frustrated by the frequent need to upgrade software to those who experience "future shock" as a personal, existential jolt. While futurologists Alvin and Heidi Toffler preach "global trends" from an economist's overview, the individual suffers painful personal changes in the work and marketplaces. Waves of future shock may intrigue forward-looking policy makers, but those same swells look scary to someone scanning the horizon from a plastic board adrift in the Ocean. The big picture of evolutionary trends often overwhelms and silences the personal pain of living people. Those people will eventually find their voices in a backlash against the confident soothsayers in business suits.

A streak of the Unabomber's Luddite passion weaves through the cyberspace backlash. The titles of several books published in the past few years give a glimpse of the breadth of the backlash. The books include: *Resisting the Virtual*; *Rebels Against the Future: The Luddites and Their War on the Industrial Revolution*; *Media Virus*; *Data Trash*; *Silicon Snake Oil: Second Thoughts on the Information Highway*; *The Age of Missing Information*; *The Gutenberg Elegies*; *War of the Worlds: Cyberspace and the High-Tech Assault on Reality*; and *The Future Does Not Compute*.<sup>11</sup> Obviously, these books show infinitely more grace than the Unabomber's crude,

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<sup>9</sup> See Mark Poster's discussion of Baudrillard in Chapter 6 of *Poster's The Second Media Age* (Cambridge, MA: Blackwell, 1995), pp. 95-117.

<sup>10</sup> I am using the term "media" here as a shorthand for an admittedly vast segment of society often at odds with each other, and sometimes even with themselves.

<sup>11</sup> James Brook and Iain Boal, *Resisting the Virtual Life* (San Francisco: City Lights Books, 1995); Kirkpatrick Sale, *Rebels Against the Future: The Luddites and Their War on the Industrial Revolution* (Reading, Massachusetts: Addison-Wesley, 1995); Douglas Rushkoff, *Media Virus* (New York: Ballantine Books, 1994); Arthur Kroker and Michael W. Weinstein, *Data Trash* (New York: St. Martin's Press, 1994); Clifford Stoll, *Silicon Snake Oil: Second Thoughts on the Information Highway* (New York: Doubleday, 1995); Bill McKibben, *The Age*

coercive manifestos. But they all reject, to varying degrees, the movement of life into electronic environments.

Some American critics have embraced the title “neo-Luddite.” Kirkpatrick Sales, for instance, felt compelled to distance himself from the *Unabomber Manifesto* because he in fact uses many of the same arguments to reject technology and he shares with the Unabomber some common critical sources like Ellul. While agreeing in principle with what the Unabomber says, critics like Sales wish to maintain distance from terrorist practices. Such critics grew in numbers during the early 1990s when information technology extended into every area of life, spawning a multimedia industry and virtual reality companies.

### *Virtual Realism: A Pragmatic Balance*

Naive realism and network idealism belong together in the cyberspace continuum. They are binary brothers. One launches forth with unreserved optimism; the other lashes back with a plea to ground ourselves outside technology in primary reality. Hegel would have appreciated their mutual opposition while betting on an eventual synthesis. Unfortunately, no synthesis is in sight. A collision is more likely. Even if we were to subscribe to an idealist synthesis, we would only subsume individual pain under collective social forces.

We need instead to treat the conflict as an existential matter. Rather than conjure a solution with a wave of dialectic, I suggest we look toward a pragmatic balance. We need to find within ourselves both the Unabomber and the Teilhardian technologist, and rather than allow them to argue in the abstract, we need to have them work together, side-by-side in our current evolution. There is a delicate balance that sways between the idealism of unstoppable Progress and the Luddite resistance to virtual life. The Luddite falls out of sync with the powerful affirmative human energies promoting rationality for three centuries and now blossoming into the next century. But the idealist slips into the progress of tools without content, of productivity without satisfaction, of ethereal connections without corporeal discipline. Both inclinations -- naive realism and futurist idealism -- belong to our destiny. We are each part Unabomber, part Teilhardian.

Between these two extremes swings the tight rope of virtual realism. This long thin rope stretches across the chasm of change and permits no return. Indifferent standstill is even more dangerous. The challenge is not to end the oscillation between realism and idealism but to find the path that goes through them. It is not a synthesis in the Hegelian sense of a result achieved through logic. Rather, virtual realism is an existential process of criticism, practice, and conscious communication. Virtual realism produces an uneasy balance: to balance the idealist's enthusiasm for computerized life with the need to ground ourselves more deeply in the felt earth affirmed by the realist as our primary reality.

How do we cultivate virtual realism in ourselves? The answer is not a simple one, nor one to which we can subscribe once and for all and then put away in a convenient box of ready

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*of Missing Information* (New York: Plume, 1992); Sven Birkerts, *The Gutenberg Elegies* (Boston: Faber & Faber, 1994); Mark Slouka, *War of the Worlds: Cyberspace and the High-Tech Assault on Reality* (New York: Basic Books, 1995); Stephen L. Talbott, *The Future Does Not Compute: Transcending the Machines in Our Midst* (Sebastopol, California: O'Reilly & Associates, 1995).



answers. For the sake of this paper, though, I will condense some main tasks of virtual realism as outlined in my book of that title:<sup>12</sup>

1. Clarify the language of virtual reality.
2. Create a feedback loop between engineers and public
3. Observe current shifts in telepresence (*technanalysis*)
4. Cultivate pre-modern (somatic) body awareness (Tai Chi)
5. Develop appropriate design models for virtual worlds

Let me devote a paragraph to each of these five points and then I will dwell on the last point, which will introduce the computer video portion of this presentation.

1. **Clarify the language of virtual reality.** Fiction writers like William Gibson and Neil Stephenson were useful in the early stage of cyberspace development, but they wrote without actually experiencing VR technology. Their fiction was fine for stoking imaginations. Now, however, we are in the early phase of actual experiments. Fiction and commercial advertising distort the meaning of virtual reality, conceiving it as a nebulous state-of-mind or attenuating its meaning so much as to lose the essential features of VR: immersion, interactivity, and information intensity. Each of these features has a specific technical description, and VR is first and foremost a technology, not simply a subjective state of mind or a metaphor for whatever goes into computers. Keeping a close watch on the language we use supports the next point.

2. **Create a feedback loop between engineers and public.** In a democratic society, lay citizens can influence technical systems. It is not easy for citizens to participate in the evolution of technology, but it is possible. I have seen this happen myself in the early 1990s as VR technology became the focus of national conferences in the United States. The path of virtual realism requires bridges spanning an informed population and a socially alert community of engineers. One of the important outgrowths of this loop is InfoEcology, the use of virtual reality to enhance environmental cleanup. (See Chapter 5 in *Virtual Realism*.)

3. **Observe and describe in detail current shifts in telepresence (*technanalysis*).** Art works and interactive art installations indicate how technology shifts the pragmatic landscape of work and play. A phenomenology of daily computer usage can help us gauge changes in tempo and reality scope. Tempo and reality scope belong to the ontological shift introduced by virtual reality. The user phenomenology of specific practices – what I call “*technanalysis*” -- contributes to the cautious pathway of virtual realism. One example of *technanalysis* I offer is *Electric Language*,<sup>13</sup> which analyzes the shift of reading and writing from print to electronic text.

4. **Cultivate pre-modern (somatic) body awareness (*Tai Chi*).** Because high-end VR telepresence (with head-mounted displays and CAVE environments) signals dangers like AWS (Alternate World Syndrome) and other psycho-somatic disorders, we need to promote the retrieval of pre-modern dimensions of bodily awareness. Help for this effort can be found, among other places, in the Asian view of mind / body as a harmony to be cultivated rather than a duality to be exploited. Computerization needs to go

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<sup>12</sup> See Michael Heim, *Virtual Realism* (Oxford University Press, 1998).

<sup>13</sup> See Michael Heim, *Electric Language: A Philosophical Study of Word Processing* (Yale University Press, 1987). A reprint edition with new introduction and a preface by David Gelernter is scheduled to appear in 1999.

hand-in-hand with sensitivity to the subtle energetic components of human experience. Taoist martial arts and practices provide key examples of integration that help balance computer culture.

**5. Develop appropriate design models for virtual worlds.** This strategic point parallels the strategy for appropriate language (number one above). The design goal of virtual realism is to form a middle path between shocking with the new (“future shock”) and denouncing computers as a distraction. The design of virtual realism avoids environments of complete fantasy that remain unrelated to pragmatic purposes. It also eschews the attempt to re-present the primary world. We can no more escape the primary world through virtual worlds than we can upload reality to the computer.

This last point can help make virtual realism intuitive. We can better understand virtual realism when we view it as a style of virtual worlds design. Over the past year, my research in virtual worlds design has developed a non-representative but (potentially) pragmatic design for virtual worlds. My classes in Virtual Worlds Design and Virtual Worlds Theory in the graduate school at the Art Center College of Design in Pasadena, California, have produced samples of world building that convey the style of virtual realism as I conceive it.

### *Design Principles for Virtual Realism*

By the year 2015, our daily lives will doubtless have assimilated high-end Virtual Reality with its immersive head-mounted displays or light-weight goggles. By then we will also enter full-surround environments where work and play migrate to electronic landscapes. Today, however, we are experimenting with Internet systems that deliver slow but real-time (synchronous), interactive 3-D worlds to the desktop. These current “worlds-through-the-window” create psychological rather than sensory immersion. In other words, we 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 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 is called “Active Worlds.” To effect psychological immersion, the 3-D graphics of the online world must run smoothly over a modem; the worlds 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 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 ontology 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; and animated sequences that convey bodily gestures through the avatars. Admittedly, AW is rudimentary and limited, but it is constantly improving. AW seems to me the best 3-D experience on the Internet,

and it signals the dawn of a larger transformation by which the Internet evolves into a three-dimensional, multi-user, participatory universe.

Our experimental world is one of nearly two hundred evolving virtual worlds in the AW universe. Each of the two hundred worlds receives hundreds of visitors every day, and many of the visitors build by using objects already inside the worlds. Besides these additive builders, there are also authoring builders, who do not depend on pre-given objects or avatars but who create the 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 (hence the name “accd world”).

A distinguishing characteristic of accd world is its central location on the spectrum between photo-realism 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 Y-axis, spread out in discrete regions. Instead of a single geography, accd world contains many disconnected but related areas of construction.

The construction mode parallels the principles of virtual realism. Virtual worlds do not re-present the primary world. In virtual worlds we need not believe we are in a re-presented natural world. Worlds are not realistic in the sense of photo-realism. 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 fashion 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 so not 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. At its current stage of development, accd world does not yet offer visitors the full pragmatic dwelling for which it eventually aims, but at 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 latter 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 like 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. The *Chairboy* anatomy, for instance, comes attached to a large chair, making him permanently sedentary. The *Greenman* avatar wears clothing that does not match. Deliberate deformations play with the prose of virtual identity.

### *Contrasting World Designs*

To clarify the style of virtual realism, I conclude by contrasting accd world with two other virtual worlds that purport to create a “learning environment”: AW School and AlphaU. My contrast is illustrated by images captured from the three worlds. While captured images may help illuminate the contrast of the three worlds, a full contrast comes into focus only for people who actually enter the virtual worlds and engage them through real-time interactivity.

Besides six illustrations, I will also show movies captured directly from the moving screens of AW. As such, 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 twenty minutes of direct, 360-degree navigation, which is usually sufficient to induce a certain degree of psychological immersion. Cinema cannot substitute for interactive experience. What I show here, nevertheless, provides some clues about what I mean by the design style of virtual realism.

The movies show selections from live online navigations captured from different perspectives and using different viewpoints. Users can switch between two main viewpoints. With the third-person viewpoint, the user sees the navigating avatar as if from a “god’s eye view.” The first-person viewpoint shows the world at the eye level at the avatar (though you cannot see the tip of your avatar’s nose). The user chooses between these viewpoints depending on the activity. When in a chat situation, users often adopt the third-person viewpoint so the social distances between the avatars can appear. When in a world- or object-oriented situation, as when building or exploring, users often adopt the first-person viewpoint so the objects at hand can appear more directly. The user determines which viewpoint to use from moment to moment, and either of the two viewpoints occurs only in a particular user’s window on the world. In other words, two users might choose not only different perspectives on things but also different viewpoints on themselves. These choices do not appear in the movies except as *ex post facto* decisions.

Because virtual worlds occur in real-time on the Internet and because they run on simple, off-the-shelf personal computers, they deliver a relatively slow frame rate of between two to five frames per second, usually through a 28k- or 56k-bps modem. The resultant images appear crude and choppy as video, especially compared to the broadcast media to which we are all so

accustomed. Cinema and television use 30 or more frames per second. The virtual worlds' meager frame rate corresponds to low-end hardware and to the Internet's current connectivity. To offset these limitations, virtual worlds contain relatively simple models made of a minimal number of polygons so that they will run smoothly. (The simplicity of their structure should not be confused with the ease of their production. The models are inherently difficult to create and mount.) The virtual objects consequently appear blocky and cartoon-like, especially to someone viewing them passively as movies. In their native interactive environment, these virtual worlds can be highly engaging. As the underlying technology improves, higher resolution models will soon become available.

One of the postulates 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 fantastic as to terrify common sense. Virtual world design should aim at a harmony between photo-realism and fantasy.

Transformation is the theme of the six figures I have taken from videos to convey the issues of designing for virtual realism. 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 re-present 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 at all Ionic columns but are in fact "teleport" booths. Teleport booths are ubiquitous in AW and 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 AW School. *Figure 2* shows the AW School 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 AW School, 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 AlphaU nor AW School 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.

There is far less reality replication in accd world. The challenge for accd world – seen in *Figures 4* and *5* – is, on the contrary, to develop pragmatic functionality. In its current stage of development, accd world leans toward fantasy, as can be seen in the first view at Ground Zero (the entrance portal of a virtual world).

Ground Zero (*Figure 4*) of accd world shows several ghost-like silhouettes strewn across the virtual landscape. 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 semi-transparent statues. With their wispy veils and long gowns, they resemble bride statues, or faded brides. And they are in fact modified bride avatars. 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, at 9 p.m. Central Standard Time, 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 3,100 miles from San Antonio, Texas to Tacoma, Washington to kiss his bride.<sup>14</sup> 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 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 multi-layered 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 made by visitors.

*Figure 6* shows an entirely different section of accd world. This section contains huge slabs of rectangular panels. The white and blue panels float like Mondrianesque abstractions in virtual space. The avatar birds of accd world -- Tweak and Squawk – flit thrillingly through these spaces.

## Conclusion

These six figures 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 do not achieve such harmony by seeking to replicate the primary world in cyberspace, nor do we achieve harmony by substituting a pointless fantasy for the real world. Harmony arises from attention to both tendencies within – to the realist and the idealist in us. I would like to believe that accd world takes a tiny step down the pragmatic path of virtual realism.

The computer video I bring provides a cinematic tour of these worlds in all their differences. The best tour, however, comes from entering the worlds live, in real time on a

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<sup>14</sup> For details, see Bruce Damer's *Avatars!* (San Francisco: Peachpit Press, 1998). pp. 133-34.

computer. If you wish, my avatar and I would be happy to take you on a tour of AW and especially of accd world.

The journey to virtuality launches us onto an open field. Whichever 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.

Thank you for joining me this far on the journey.

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