

## **As Real As What? The Stakes in Virtual Reality**

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Good Morning. This is perhaps an unusual presentation in the context of a Showcase of New Technologies. It represents the kind of co-operative research that is an example of one of the key themes of this conference, the aim to bring the sectors of culture -- represented by the Banff Centre for the Arts -- and technology -- represented by Alias Research Inc -- into close connection. However, this talk is not, because it cannot yet be, a "showcase" of the new virtual reality technologies, but rather an outline of our joint approach towards them, based on our extrapolations from the state of current prototypical systems.

First, let us define some terms: several are used, more less interchangeably, to describe a similar kind of immersive experience in simulated audiovisual environments: Virtual Reality, Artificial Reality, Virtual Worlds. All are dependent on the same technologies, that is, computer-generated interactive environments which convey to the participant a sense of presence in alternate surroundings through colour stereoscopic presentation of the virtual scene to the eyes, the tracking of position and gesture of limbs to permit direct interaction with the virtual surroundings, and by locating the participant precisely in a 3-dimensional sound space. A more general term, Cyberspace, coined and made infamous by novelist William Gibson, is increasingly used to describe shared public or corporate data-realms made possible by this manner of interfaces and output devices.

As the slightly cynical tone of our title might suggest, when we say "as real as what?", we are drawing attention to one among many curious facets of the current virtual reality phenomenon, namely the huge gap between the claims made by its proponents and the present capability of the technology. In short, we cannot avoid the fact that already, in the few short years since the early prototypical systems were launched as commercial products, a cult of virtual reality has been born, complete with hucksters and hype-masters heralding the arrival of yet another new age of personal empowerment through media, consciousness-expansion, and all the rest, with which we are sure you are all quite familiar by now. Why this came about is very interesting in the context of a conference that aims to examine the inter-penetrations of culture and technology today, and we will touch on some of these later in this presentation.

The other issue which our title is meant to interrogate is the raging debate about the relation between the simulated "reality" of cyberspace, and natural reality. Again, we can't possibly summarize these issues in the time available, other than to signal the fact that in this field, we are already in the midst of a very unusual admixture between technology and culture: for it is no exaggeration to say that it is now at least in part through a series of dense and intelligently-imagined cultural representations -- principally, literary descriptions of cyberspace -- that the technical issues for the design of cyberspace are being debated. These artistic conceptions for cyberspace project a dystopian world of urban blight and decay, over which is layered an aggressively violent and intensely stimulating cyberspace world available to the senses through computers. The point is that these artistic conceptions actually force us to pay attention in the present to how we perceive the disorienting technological and political changes around us -- the borderless, transnational world of runaway change, of unstable jobs and

production, of homogenized mass culture which are enabled by reprogrammable cybernetic machinery. Thus, as the actual programming (or, as some have even termed it, colonization) of virtual worlds begins, it is without the earlier modernist myths that equated technical and social progress. To the contrary: if the images conjured by VR and cyberspace have touched a raw cultural nerve, it is because they are at the same time technologically exciting *and* politically or socially problematical. In fact, we begin this cycle of development with very few answers about practical uses, and perhaps even less of an idea about how or whether it might turn into a medium of artistic expression. But we can recognize the significance of certain of its key potentials, based on our general experience with information technologies. Three of these are notable here:

- immersion - the participant is surrounded by a rich and convincing, albeit artificial environment;
- interaction - the objects or agents that co-exist with the participant in the virtual world are not static or pre-programmed, but react to the actions and manipulation of the participant in a way that is experienced as natural and intuitive;
- multiple participants - the ability to relate to representations of other individuals within the virtual world, which provides the potential for both reciprocity and collaboration (facets which are only now starting to be incorporated into the technical possibilities of the existing mass electronic media such as interactive TV).

### The Technology

We are now going to turn to a survey of the technical state of the art. What you are looking at is a scene from the Virtual Lobby research project from the

University of North Carolina, showing what is considered the standard VR rig, in which eyephones, a glove, and in this case, also a treadmill, are used by the participant. You will see that of the three principles just listed, only immersion is at work fully; interaction less so, and multiple participants not at all.

Besides architectural walkthroughs, other applications that are being researched and developed include city planning, virtual travel, communications (mention on-line cyberspaces, in infant form, that exist in computer networks such as Usenet or Habitat), telecommuting, conferences and meetings, disabilities, molecular modelling, flight and driving simulation, surgical simulation, and arts and entertainment.

As a further measure of what is possible today, let's look at current application of computer graphics in design and animation. The ALIAS design system is a set of software applications that allow designers to create animated, three-dimensional geometric models of objects and places- to create, in virtual form, consumer products, architectural spaces, and animation for film and video. Alias' clients use this software on a day-to-day production basis, to produce, in addition other forms of output, rendered images that are almost indistinguishable from photographs.

As a further example of what we would like to be able to achieve with virtual reality, let's look at another video. This is a short animation created by Alias as part of our sponsorship last year of the Festival of Festivals in Toronto. The animation is a fly through of the Elgin Theatre in Toronto. Imagine as you watch this that you can interactively control where the camera goes.

Two further observations on this animation are in order. The first is that in the past, creators have used a range of pictorial conventions, of which the kind of photorealism which you just saw is only one. The second observation is that this level of animation is not yet possible in real time. In fact, each frame of the animation took 1 to 3 hours of computing on a high-end workstation. So we have a big gap between what many designers want, and what interactive systems can deliver. And while computers keep getting faster, the desire for high quality visual output is insatiable, and virtual reality systems will always be challenged to keep up with the demand.

### The Theoretical Issues

The visioning of cyberspace is presently occurring intensively in the traditional technical forums for computer science, but also among sociologists, writers, architects, political theorists, and some artists. It is a field that attracts extraordinarily diverse interest, and among the most promising of the forums for this kind of interdisciplinary investigation is the annual International Conference on Cyberspace. The third of these sessions is scheduled to take place here in Montreal in the spring of 1992. This is a meeting initially organized by Michael Benedikt, an architect, and it is unusual in that it assumes that the enabling means to, and navigation in cyberspace will exist, and so focuses mainly on the human/social aspects of cyberspace conceived of as an independent realm.

Widely divergent values and visions are held by the contributors to the Cyberspace conferences, and the differences are closely reflective of broader issues in the general society, such as the politics of gender, race and class. There are currently major concerns by some thinkers that this technology will continue to develop as an exclusive white, male-dominated domain, and that its design

will therefore be unable to accommodate the concerns of women and minorities, in particular. More generally, the association of all this technology with its military and aerospace origins and uses continues to act as some kind of fatal disqualification for its serious consideration in other uses. Central to these debates are concerns about the control over, access to, and cost of future experience in cyberspace. On a more ethereal plane, the transcendental claims for cyberspace as a kind of electronically-generated Noösphere à la Teilhard de Chardin, a fusion of humankind through the net, are strongly contested by those who argue for Cyberspace as a place to promote individual differences and separateness. And finally, there remain deep questions, concern, and frustration on the part of many women, as well as many artists, about the overstated claims (mainly from the cult of cyberspace) for empowerment and enhanced creativity.

The distrust of artists to work with new informing or cybernetic media is, in my view, actually a dark sub-theme that we may find running throughout this conference; where it is evident, as is certainly the case with some artists' suspicions about VR, it is hardly surprising, given the fact that almost none have had any opportunity to work with the tools. Furthermore, the relative theoretical sophistication of artists today has made it a commonplace to reject the so-called neutrality of technology; rather, tools are widely seen now as inscribing in their very form, various social and political assumptions that went into their initial design by scientists or engineers. This concern often is expressed by artists as dislike or even sometimes revulsion toward new technology, on the basis that their creative work will be appropriated or distorted by a complex machine beyond their ability to control or understand; and it is a concern that we have tried to take into account in our approach towards artistic research at The Banff Centre.

For while we recognize the validity of artist's concerns about being taken for a swindle, we think they are countered by a parallel historical tendency of greater moment. This is the tendency for artists to anticipate through conceptual innovations in existing media, the technical innovations that come about in subsequent generations. In a way this might be seen as the reciprocal to McLuhan's well-known 'rear-view mirror' principle, which observes the way mainstream use of new media starts by recapitulating the content of previous ones. The converse, i.e., artists anticipating new technical developments, was observed by the German critic Walter Benjamin, in relation to film and photography in the 1920's; he observed that Cubism, Dada and Futurism had created expressions of simultaneity and multiple perspective for which technical means of realization arrived later, in montage and juxtaposition made possible by the technology of film. Two other examples illustrate the same point: the 19th century *Gesamtkunstwerke*, or total work of art, of Richard Wagner, which introduced the concept of a precise and unified control over image and sound that in the 20th century became the essence of synchronized sound film; and the invention of "sound colour" composition by early modern composers such as Schoenberg well before the arrival of the analog and digital synthesizers that now allow for a much more detailed control of sound's physical properties. And finally, to bring the argument back to interactive media, the concept of the "Open Work" (following its chief theorist, Umberto Eco) or "cybernetic" artwork has been around since the early 20th century, in the work of artists such as Joyce, Duchamp, and Cage; it is clear now that the artistic processes pioneered by some of these creators -- non-linearity, variable form, multiple perspective -- are processes that are not only realizable through interactive software, but further, seem to suggest the most fitting creative uses for it.

The point of this excursion into aesthetics is that while there may be real suspicion on the part of artists about the technologies of control in virtual reality systems, a good number are well primed, from the conceptual standpoint, to take real creative advantage of the technology **as long as they can approach it as a true artistic milieu.** What in fact is required to effectively place a new or recently emerged technology into the hands of artists?

This is not necessarily a simple question. Cost is prohibitive at the early stage of any new technologies, so it is difficult for artists to gain independent access. Furthermore, there are institutional blockages: corporations can't afford the luxury of subsidizing artists directly; scientific research establishments generally are unable to accommodate the culture of artistic experimentation; and arts educational institutions are also hard pressed to integrate this kind of activity into their core mandate, especially with current fiscal restraint. Complicating this further is the fact that mere access to sophisticated new software and hardware tools is not enough. Rare is the artist who possesses the skill set needed to program them, so that increasingly what is required is a new kind of hybrid facilitator, the creative technologist who is gifted with both the technical skills and the artistic sensibility to serve as a high-level tool builder for artists. We must recognize such tool-makers, involved to the point of co-creation, in the new ecology of art in cyberspace, just as much, from the other side, we must realize that the observer is ever more an active interpretant, or interactor in what we have called the open artwork of the future.

Taking account of all these factors, The Banff Centre for the Arts has formulated a program in Media Arts which is designed to provide the necessary conditions

for mature artists to work in a creative environment, with support, in the exploration of emerging technologies. We have sought partners widely, in both the academic and corporate world, and especially in the case of Alias Research, and the University of Alberta, have found organizations which agree with our premisses and are interested in bringing their expertise to bear on co-operative projects. [Support has also been provided by the Canadian Institute for Research on Cultural Enterprises (CIRCE)]. Beginning this Summer, and continuing through the Fall we will host a series of artists residencies designed to allow artists to explore the technologies of virtual reality, both on the basic level of orientation and exposure, and on the next level of production. Some 25 artists from Canada, the U.S., Europe and Asia will participate in the project this year; subject to funding, we will seek to continue this kind of activity in 1992 as well.

We have already mentioned the way in which artists have refused to accept the doctrine of neutrality regarding technology -- that tools are indifferent to the purposes or creative intent brought to them. It seems a necessity, at least in the introductory stage, to challenge the assumptions of technology designers, especially where these assumptions might be gender-biased (just think of the joystick or Powerglove if you need reminding that all the metaphors and images around these tools are those of "boys toys"). The philosophical issues that we think require research by artists are indeed profound: Questions about representation, abstraction and identity; Photo-realism -- how much reality is enough? Industrial or corporate applications may have an insatiable need for visual resolution, but what bandwidth is sufficient for plausible interaction in a virtual world? How to signify a tree? with leaves and shading, or just an icon? Personal representation? How important are other senses? What do we lose by

not being there? Which of the laws of time and space do we replicate? Does virtual reality need gravity?

These questions, it should be clear, are not technical, but are of the kind that require the invite best critical thinking in a wide variety of fields. The approach we have outlined may suggest a new stage of self-consciousness in our understanding of the development of media, one which allows technological development to seriously be informed by cultural values. If so -- and our efforts are based on the assumption that this is an imperative -- we may have a chance to avoid the bleak images of future cyberspaces that have been prophesied by today's artists.

Thank you.