

Putting a Human Face on Cyberspace: Designing Avatars and the Virtual Worlds They Live In

Organizer

Bruce Damer (Contact Consortium)

Panelists

Steve DiPaola (OnLive! Technologies)
Joannis Paniaras (University of Art and Design)
Kirk Parsons (Black Sun Interactive)
Bernie Roel (University of Waterloo)
Moses Ma (Internet Game Inc.)

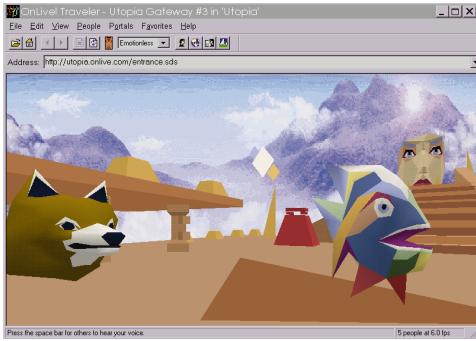


Figure 1: User avatars in conversation in the voice supported OnLive Traveler virtual world, August 1996

The Emergence of a New Design Medium

Who do you want to be today? As thousands of Internet users begin new lives as 'avatars' in virtual worlds, a new design industry is being born. SIGGRAPH 1996 had several panels, BOFs, exhibits, and discussions on VRML, character animation and multi user virtual communities. These forums introduced the medium we term "avatar cyberspace" to the SIGGRAPH community. Since SIGGRAPH, conferences such as Virtual Humans, Earth to Avatars 96, World Movers, and VRML 97 began to flesh out some of the major issues in designing for avatar worlds. In addition, avatar standards efforts such as Living Worlds, Universal Avatars and Open Community have been initiated.

Avatars and the worlds they live in comprise a vast new design medium attracting a wide range of professionals including: anthropologists, 3D and multimedia designers, character animators, musicians, voice and facial expression specialists, performance artists, architects, business workgroup and workflow experts, and educators involved in distance learning.

The Discussants

We have assembled a group of experts to discuss the technologies underlying avatars, design tools and approaches to build avatars and the worlds they live in, and the psychological relationship of users to their avatars.

Bruce Damer: Bruce Damer is co-director of the Contact Consortium, the world's leading forum on avatar virtual worlds. Bruce speaks and writes extensively on new Internet frontiers and is completing a book on avatar worlds.

Steve DiPaola: Steve DiPaola leads a team of artists, architects, UI designers and musicians in designing and developing 3D Avatars and virtual spaces at OnLive! Technologies the creators of

the Traveler voice-supported virtual world.

Moses Ma: Moses Ma is an Internet and computer gaming visionary and was the originator of the Universal Avatars specification with IBM. He recently became co-author of the Open Community VRML multi-user specification proposal with Mitsubishi Electronics.

Ioannis Paniaras: Ioannis Paniaras is completing graduate research at the Media Lab of the University of Art and Design Helsinki UIAH. Ioannis is studying virtual communities and avatar fashion trends and their influence on social life in Cyberspace.

Kirk Parsons: Kirk Parsons is a developer of avatar authoring software and has served as a chief avatar technologist for a number of companies including Black Sun Interactive.

Bernie Roehl: Bernie Roehl is a software developer based at the University of Waterloo in Ontario, Canada. Bernie has written several books and dozens of articles on virtual worlds and currently chairs the Virtual Humans Architecture Group.

Issue Areas



Figure 2: Avatar wedding in AlphaWorld, May 8, 1996

The design of multi-user graphical virtual environments is one of the most challenging new areas in computer science and consumer on-line services. Supporting tens of thousands of users in simultaneous communication in a shared virtual environment, within which they can build their own spaces and shape their own faces might seem like an impossible task. Yet, a dozen such environments are running today, hosting over 350,000 users dialing in from home PCs.

The number one question asked by users entering these virtual environments is: how can I design my own "avatar" (their virtual embodiment)? The success or failure of these environments in

research or commercial settings can hinge on avatar design issues. Basic design decisions often involve trade-offs: in the basic technology choices (2D versus 3D, polygonal versus photorealistic), in the methods of communication (text versus voice, gesture versus facial animation) and in the use of standards (VRML versus proprietary 3D, IRC versus custom communication backbones). The most difficult design criteria to pin down are aesthetic: what makes one person 'like' or 'identify' with their avatar can be often very personal and subjective.

The panelists will focus on design approaches for avatars within the emergent 'avatar cyberspace'. Some panelists will give an overview of the underlying technologies of avatars, some will describe their experiences designing and using avatar virtual worlds and others will address aesthetic and psychological issues surrounding avatars.

We encourage you to download and try some of these virtual worlds. There is a comprehensive gateway to the medium of Avatar Cyberspace at <http://www.digitalspace.com/avatars>. Additional information on projects and debates within Avatar Cyberspace can be found at the Contact Consortium home page at: <http://www.ccon.org>.

Summaries of the Individual Presenters

Bruce Damer, Panel Moderator

What the moderator will contribute to the panel

In my task as moderator, I will guide the panelists through the major themes and provide a continuity to the work done over the past year, making sense of the trends and technologies for the audience. I also plan to act to discipline panelists to stay focused on the issues of avatar design (as this topic area is so broadly connected to other interesting subjects).

The moderator's viewpoint on the panel topic

I feel that the panel topic will emerge into a whole discipline of design, emerging from the synthesis of many different fields. To take a cue from Nicholas Negroponte, the question we face is no longer: "are you being digital?" but is now "what is your digital being?"



Figure 3: Avatars meeting in street scenes in OZ Virtual, March 1997

The Panelists

Steve DiPaola

What Steve will contribute to the panel

I will speak about design approaches which rely heavily on techniques to make users feel that they are really interacting in the virtual space: 3D attenuated voice and sound, 3D navigation,

an immersive first person U.I., individualized 3D head avatars with emotions and lip sync, 3D space design. I will then cover how well Onlive has transposed this experience to consumer based

PC platforms connected to the Internet at dial-up speeds. During the panel, I will connect live to a virtual world allowing panelists to query users and ask for themselves how effective the design approaches are.

The panelist's viewpoint on the panel topic

The design approach to avatar cyberspace that I bring is born of experience trying to emulate natural social paradigms and provide immersion in a 3D visual and sound landscapes. Three more-detailed examples of design choices we have made might spark interest and debate within the panel and the audience:

- * *Does community come from communication?* I hold that the structural process of a community and socialization, real or virtual is communication and that the most natural human form of communication is verbal. Therefore, 3D spatial multi-participant voice with distance attenuation, and stereo positioning is the best tool for the development of virtual cocktail parties and virtual communities alike. Other panelists or the audience may choose to challenge this view based on their experience in text-based virtual community.
- * *You are your avatar, but can we use just heads?* A fundamental goal of avatar cyberspace is to bind the Real Person at their computer ~with~ the Virtual Avatar in cyberspace. Given the finite CPU/polygon/bandwidth resources, we need to invest in the most natural form of socialization first: face to face. I posit that the body (hand gestures, body language) is secondary for human communication and can be added later. Would anyone care to challenge this?
- * *Major Design Issue: physically based spiral of infinite betterment* Given the natural emulation goal, one might assume that the design choice is to strive to make things more and more realistic, this is not so. A major truth in computer graphics and simulation (and well known for facial modeling) is the more realistic you make something, the more open to criticism it is for not being realistic enough. So we emulate natural paradigms just enough to achieve recognition of familiarity. Is 'just good enough for all practical purposes' just good enough?

Moses Ma

What Moses will contribute to the panel

I will contribute my background and experience in attempting to develop and promote a standard set of formats, protocols and design methodologies for avatars. Until now, avatars have been system and browser dependent, which meant that an avatar created for one virtual world wasn't necessarily compatible with other worlds. A number of people in the VRML business have put together a proposal, called Universal Avatars, which details a way to standardize what avatars are and do.

By using this proposed standard, avatars will be able to move from one world to another, keeping the same appearance and behavior. This means that users will be able to recognize other users' avatars that they met in other worlds. And their avatars will have individualized automatic actions, moods, and even pets.

And they'll be able to tell how their friends, from around the world, are feeling today, just by the look on their avatar's faces.

The latest draft of our proposal now deals with a variety of issues, which begin with 3D models and behaviors, but now ventures forth to discuss other important issues, such as persistent identity, interworld communications, database concerns, and support for additional emerging standards such T-120, H-323 and Versit. We believe that this is an early basis for an emerging "operating system" for socialization.

The panelist's viewpoint on the panel topic

Clearly, it would be useful to have a standardized avatar representation for the purpose of visiting all virtual worlds with a user's preferred avatar representation and openly tendered identity profile. This has many benefits, including the reduction of the workload on the user, the standardization of global search for other people through their public avatar presentation, and the ability to create new business opportunities for VR vendors. The Universal Avatar system, if adopted, could have a fundamental impact on the design of avatars in the medium of virtual worlds on the Internet.

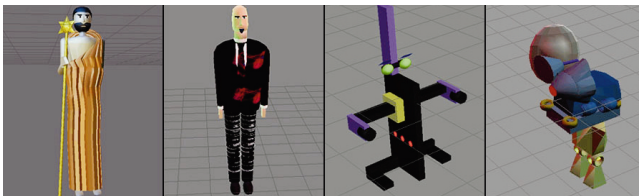


Figure 4: Various avatars designed by Ioannis Paniaras

Ioannis Paniaras

What Ioannis will contribute to the panel

As an artist, designer, and researcher in CMC (computer mediated communication) I will focus on issues related with the aesthetics, the design, the visual management of the avatar, its identity and the community of avatars and their cultural manifestations through a design perspective. I will pose the following provocative questions to the panel:

- * What is a virtual persona and how does one design for and manage a virtual persona?
- * How do the aesthetics and the visual appearance of an avatar can contribute to a didactic state of virtual life and communication in the virtual community?
- * How does the design of the avatar influences the identity and the perception of the self in real life?
- * What is an ideal interface for human contact?

I will also demonstrate some design examples of avatars with articulation and expressions.

The panelist's viewpoint on the panel topic

This medium is not understood well but has demonstrated the power to defragment the solid identity [the modern notion of the identity] and sustain the emergence of a plethora of virtual identities. Avatars are part of the visual and behavioral grammar of the emerging cultures in virtual communities, and by analyzing the design structure of the avatar we help understand the

direction we might heading in human contact. I would like to ask the audience think about new visions for avatar mediated communication which originate in knowledge of human behavior.

Kirk Parsons

What Kirk will contribute to the panel

I will focus on avatar representation issues, including avatar animation. My presentation will be done from a technical perspective, with the goal being to relate the key technical trade-offs to avatar authoring possibilities. This presentation will be complementary with Ioannis' in that he will be focusing on top level artistic issues, while I'll focus on how the underlying technology affects an artist's choices in the design process.

- * Expressiveness in avatars - how is it achieved
- * Suspension of Disbelief
- * Morph based animations
- * Keyframe animations
- * Real-time motion technologies
- * Artificial Intelligence and Avatars

The panelist's viewpoint on the panel topic

I believe that any designer of avatars must have a solid understanding of underlying technologies, not only to enable them to function within narrow bandwidth constraints, but also to create effective and aesthetically pleasing designs. The use of photorealism to reduce polygon count, texture mapping and morphing to create facial expression and other 'tricks' must be in the designer's grab bag of techniques.

Bernie Roehl

What Bernie will contribute to the panel

What I will contribute to the panel is a strong background in the technology of virtual reality, as well as insight into the activities of various groups (Living Worlds and the Virtual Humans Architecture Group) which are relevant to our efforts at avatar standards definition and avatar design. I feel it's important that we acknowledge the need to create expressive and communicative avatars within the constraints imposed by bandwidth, latency and rendering performance.

The panelist's viewpoint on the panel topic

My viewpoint on the panel is that it should attempt to identify and prioritize the most important issues related to avatars, as a first step towards dealing with those issues. My own personal feeling is that the key issues are:

- * defining standards that enable the creation of interoperable avatars
- * creating tools that allow users to create their own avatars
- * provide avatars with as much expressive power as possible, using voice and gesture and facial expressions
- * find effective methods for integrating speech, expression and movement
- * issues surrounding identity and the ownership of one's virtual self