3D Avatars and Collaborative Virtual Environments

Koon-Ying Raymond Li
e-Promote Pty. Ltd., Australia

James Sofra
Monash University, Australia

Mark Power
Monash University, Australia

INTRODUCTION

With the exponential growth in desktop computing power and advancements in Web-based technologies over the past decade, the virtual community is now a reality. The latest derivative of the virtual community, made possible by 3D avatars, is called the collaborative virtual environment (CVE). These CVEs often provide "fantasy-themed online worlds" for participants to socially interact. Instead of placing emphasis on team-playing, the sharing of information, and collaborative activities, a CVE focuses on social presence and communication processes. Unlike virtual environments which allow participants to discuss what is going on in the real world, the participants' experiences of the virtual world provided by the CVE are often the main topics for discussion. These CVEs, just like their real counterparts, have their own issues and problems. This article will analyze the potential benefits of avatars, helping to build virtual communities and explore the possible issues that are associated with the CVE.

A virtual community (VC) is a computer-mediated communication environment that exhibits characteristics of a community. Unlike the physical community, the participants in a virtual community are not confined to a well-defined physical location or to having distinctive characteristics. Members of most VCs (for example, the Final Fantasy game community or a newborn baby support group) are often bounded only by a common interest.

A VC can be a simple message board with limited or no visual identifiers for its users to utilize when posting and sharing their text messages with others. Conversely, it can also be a sophisticated 3D environment with interactive objects and fully detailed human-oid character animations. The ARPANET, created in 1978 by the U.S. Department of Defense's Advanced Research Projects Agency, is often said to be the first virtual community (Rheingold, 2000). Other significant landmarks in the evolution of VCs, as noted by Lu (2006), are: Multi-User Domain/Dungeon (MUD) (1979), Internet Relay Chat (IRC) (1988), America On-Line (AOL) (1989), Doom (online games) (1993), ICQ (instant messaging) (1996), Everquest (Massively Multi-player Online Role-Playing Game (MMORPG)) (1999), and Friendster (social networks) (2003). While the earlier VCs emphasized team-playing, the sharing of information, and collaborative activities, the latest ones (the social networks) focus on social presence and communication processes (Kushner, 2004).

These social networks may be referred to as collaborative virtual environments (Brown & Bell, 2004). They provide a "fantasy-themed online world" for participants to socially interact and collaborate. There is also a distinctive difference between the two types of VCs in terms of the contents of their discussion: the earlier VCs provide an online media to allow participants to discuss what is going on in the real world, while the inhabitants' experiences within the virtual world are the main topics for conversations in a CVE.

Anonymity of its members is one of the important features of VCs. Avatars are often employed by their members to identify each other. The word 'avatar' comes from ancient Sanskrit and means "a manifestation of the divine in human form or reincarnation" (Parrinder, 1982). In other words, it is the earthly manifestation of God. The term 'avatar' is now used to describe a person's alter ego in a virtual world. Avatars, such as those used in an online chat environment like ICQ, are 2D image based. The users in these environ-

ments select a name or a 2D image so other members may identify them.

Avatars can also be 3D. With 3D avatars, users can project a certain amount of their own personality through the appearance of the avatars chosen to represent them, while remaining anonymous. A majority of the current 3D avatars are humanoid in form and many allow for gestures and facial expressions.

This article focuses only on 3D avatars and their 3D virtual worlds. The benefits of 3D avatars helping to build virtual communities will be explored and the associated issues, particularly those relating to CVE, will be analyzed and discussed.

3D AVATARS AND THE VIRTUAL WORLD

Users can use their 3D avatars' appearance to project their chosen personalities and characteristics to others within a virtual world (see Figure 1) and, at the same time, can maintain their chosen degree of anonymity. Anonymity helps open communication channels, encourages users to voice more freely, and removes social cues. As such, avatars can help to promote the better sharing of information. With the freedom of choice in both representation and anonymity, users will acquire a more comfortable version of themselves, which would help them to increase their levels of confidence in dealing with others. According to Brown and Bell (2004), anonymity encourages interactions between strangers which do not happen in the real world. Avatars can also be used to help businesses and large corporations conduct successful meetings (Exodus,

Figure 1. Avatar's eyelashes shape and fingernail color can be customized (Source: www.There.com)


2003). Avatars, including the text- and 2D-based types, can help to remove human inequalities, such as racism and sexism, as well as biases against mental deficiencies and handicaps (Castronova, 2004). Victims who are troubled by "issues of secrecy, hyper vigilance, sexuality and intimacy" can now gain comfort from other virtual world inhabitants and online therapists. Victims, having been physically or sexually abused, who feel ashamed to discuss their situations, can use their avatars to enter the virtual world to commence treatment (Fenichel et al., 2002).

In text-based chat virtual environments, meanings are sometimes lost due to lack of supporting cues such as body language and facial expression. Emoticons, such as smileys (😲 😄), can help to partially solve this issue. 3D avatars in humanoid form can now provide gestures, postures, body languages, as well as facial expressions. Gestures include handshakes, nodes, and even dancing with joy. According to Brown and Bell (2004), "emotional communication enhances communication." 3D avatars can help to express emotions through facial expressions and gestures, thus enhancing the communication process. They help to provide a better environment for collaborative activities.

In text-based virtual communication, posted messages are often not specific for a particular participant. Conversations within a 3D avatar world, however, can be targeted at a particular audience, similar to what is happening in the real world. 3D avatars' gestures and gazes can assist in the communication process within a crowded virtual room and identify who is currently engaged in a conversation. It also helps to identify those who are in private communication and thus allows conversations to remain undisturbed (Salem & Earle, 2000).

Besides being more aesthetically appealing to users, 3D avatars can be more engaging as the users can have a choice in their perspective: a *first-* or *third-person* view of the virtual world. These avatars not only represent the presence of their users in a virtual space, but also display the users' orientations and locations (Salem & Earle, 2000). The users can now interact with other objects or avatars within the virtual world similar to what is happening in the real world. Some 3D virtual worlds are now enhanced with 3D sound (with distance attenuation and stereo positioning) to provide feedback as to the spatial positioning of other participants and elements within the virtual world. As such, 3D avatars do not only have the potential to assist
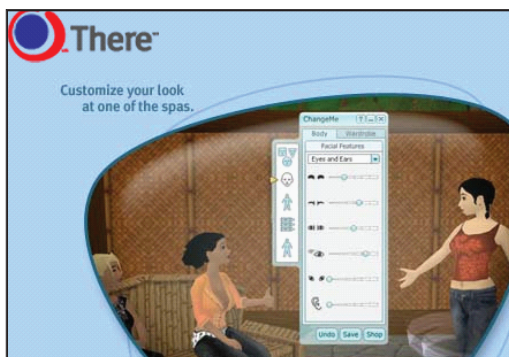
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