ReLIVE : Towards a communicative, supportive and 'enjoyable' Virtual Environment

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Introduction :

We have launched the ReLIVE project with the aim of delivering a communicative, supportive and 'enjoyable' virtual environment (VE). This is a multidisciplinary project involving the design of avatars, the development of a virtual environment and the definition of prevailing interaction principles to be involved. The design of the avatars that will be populating our VE focuses on delivering expressive avatars capable of emotion and personality rendering. While for the virtual environment we are looking into visual and audio features as well as the development of choreography to control the behaviour of the environment's avatars. We are at the same time creating a narrative as a social etiquette which will be the 'rule of the land' in the environment.
As part of the ReLIVE project, we are undergoing the development of an interface device to be used as a gateway to the system, a virtual environment rich with artefacts and a population of avatars, and finally a pet robot, the projection into the real world of the VE. Although the two other parts of the project are important we will focus in this paper on the development of the virtual environment and the population of avatars.

Initial principles :

The avatars are the embodiments in the VE of both the participants who can then see each others as well as see the environment agents. Looking at current environments there is two trends in avatars design namely avatars with a humanoid shape at different level of realism and animal, abstract or free shape avatars. Since our objective is to facilitate human to human communication, we have chosen to concentrate on the development of humanoid avatars. Our design of the avatars is inspired from the masks of Commedia dell'Arte which are rich in emotions and will be easily understood by the environment participants. Essentially we are driven in the design of the avatars by two aims. Initially to create an avatar that can be perceived as the representation of other participants, and also to facilitate the communication between participants by means of emotional and expressive avatars. Choosing highly realistic avatars would have required the delivery of sophisticated behaviours and complex choreography (e.g. Set of movements to express some emotions). Further to this initial tests have indicated the high level of expectations users have when presented with a realistic avatar.
An example a face of a realistic avatar is shown in Figure (1) this face has strong features and can express emotions, however every effort to render a realistic face have still left the avatar expressions ambiguous in some cases.

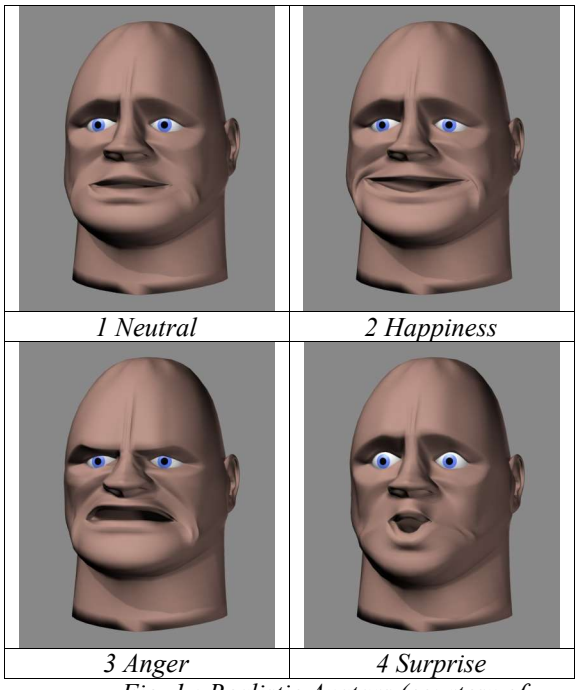


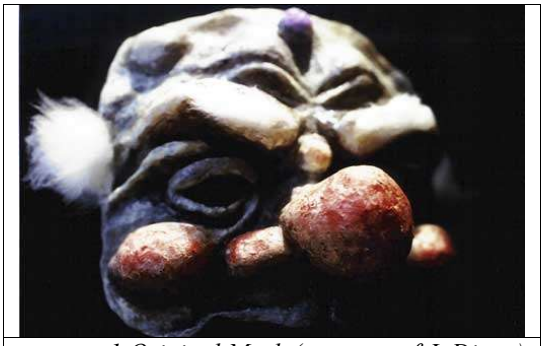
Fig. 1 : Realistic Avatars (courtesy of Y.Chapriot)

One can see that the neutral expression could be mistaken for sadness, and happiness for

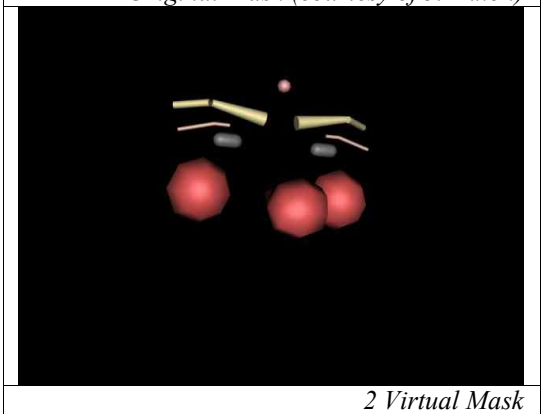
nonchalance. Our conclusion is that the rendering of emotions in a natural fashion will be very difficult to achieve and indeed impossible in the case of current online VEs (e.g. blaxxun, active world…).
We thereafter explored other ways of expressing emotions, and we find inspiration in the world of theatre.

Commedia dell'Arte :

Commedia dell'Arte was of particular interest for several reasons. Essentially the masks worn by the actors, the comprehensive set of movements to express different emotions and state of mind, and most importantly the fact that Commedia is essentially a improvisation theatre where the actors continuously add to and adapt the plot.
Commedia's masks are interesting in many ways to our work as they provide caricaturised faces which can be rendered using simple elements as illustrated in Fig 2.1. The masks have also the particularity of reinforcing the most communicative features of the face, the overall shape, the shape and relative size of the nose, the forehead, the cheeks and the eyebrow. The mouth is often left uncovered.



1 Original Mask (courtesy of J. Dixon)



2 Virtual Mask

Figure 2 : Commedia Mask: Il Dottore

Avatar's Behaviours :

The behaviour of Commedia actors is highly structured and defined, the result is what looks like exaggerated movement of the characters on the stage. From our point of view this is very useful as it is a expression and emotion rich set of gestures and postures that can be used by the participants of the VEs. The choreography we are proposing for the avatars of ReLIVE is a set of hand gestures, facial expressions, body postures and also Commedia dell'Arte 'gestures', such a vocabulary will deliver a communication rich visual language.

Depending on the situation, for example casual meetings, work discussion or games, we have also outlined the synopsis of a short piece of theatre which we can translate into social etiquette in the VE. The synopsis is based on traditional Commedia characters, masks and storylines.
Such a narrative or' interactive theatre play' is in fact a scenario of the experience the participants will have in the environment. For example how the greeting of the participant(s) is achieved, how the encounter in the VE is done and what 'atmosphere' is set up for the 'venue'.

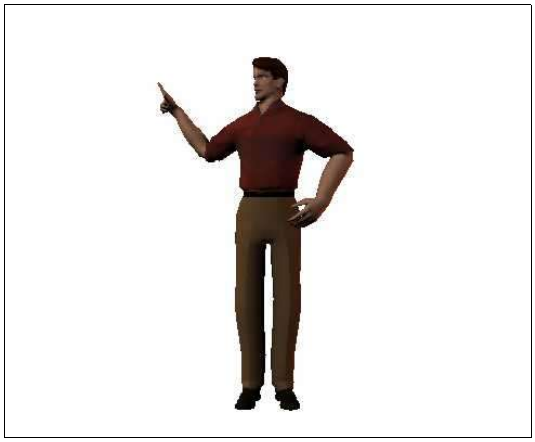


Figure 3 : A Commedia dell'Arte posture (Attention.

The Virtual Environment Experience :

A virtual environment is an interactive online three-dimensional visual space, which should not be about mimicking realism. It should be about delivering a communicative, supportive and 'enjoyable' environment. To do so we are relying on several elements to support the roles of the avatars, namely Dynamic interface objects, artefacts, atmosphere and the design of the environment.

Dynamic interface objects such as morphing 3D icons, widgets and teleports are used to facilitate the interaction within the VE, for example to assist during the navigation through the environment.

Figure 4 : 3D Icon

A set of artefacts distributed in the environment, produced by a fine artist involved in this project. We are developing some 'furniture' to deliver specific functions (a kiosk for help) as well as some 'construction' to give special clues to the participants.

Atmosphere, audio and lighting effects controlled within the VE. We hope to have these parameters finely tuned to the narrative of the space.

Finally, the actual design of the environment is done following architecture and landscape principles, in terms of spaces, organisation and dimensions. Particularly to this point, Commedia suggest a set of 'décor' which we can inspire ourselves from when designing the VE. There is however a balance to find between design a theatre set and delivering a VE with a wide variety of applications.

Conclusion

Through this work we have created a multidisciplinary team involving a computing engineer, a 3D animation specialist, a designer, a fine artist and a theatre producer. With such a mixture of expertise we are delivering a comprehensive set of enhancements to current VEs, as well as exploring new adventures in the design of successful environments. Specifically, to deliver a communicative environment we propose to make the 'meeting' of avatars a straight forward process facilitated by a responsive environment which adapt to the current activities. We are also hoping to deliver highly communicative avatars, which will deliver an interesting and useful environment as well as enrich the 'conversation' and communication between participants. Such a supportive VE will facilitate co-operative work. We aim to deliver an enjoyable VE by providing the participants with an experiences rich environment.

Acknowledgments

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