Virtual mirror

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Avatars are progressively being used more frequently by humans as part of their online communication. In the present paper we explore the multi-faceted possibilities of emotional expressions generated by avatars, which look like their owners. First real user experiences were a success as the users were highly motivated to interact with the system.

Avatars, Emotional User Interfaces, Embodied Conversational Agent (ECA).

1. INTRODUCTION

The increasing popularity of virtual worlds like Second Life and World of Warcraft has transformed our vision of avatars, the synthetic bodies which represent us in these worlds. Avatars are progressively being used more frequently by humans as part of their online communication [6,7]. 'The Virtual Messenger' is designed to allow two spatially separated people to meet up "virtually" through their avatars [2]. Recent progress in 3D techniques allows people to create their own avatar using photographic images [3,5]. Nowadays people are able to create a type of interface feature such as an Embodied Conversational Agent (ECA) which performs facial gestures and body movements, and which has been programmed to play out emotions. An ECA is a realistic virtual human that possesses the ability to engage in conversation with a human. [1]. This new form of human-computer interaction represents a particular challenge for design research because of the emergent technologies with which they are endowed and because of the fact that users' responses to these artefacts is currently unknown. [9]. In the present paper we explore the multi-faceted possibilities of emotional expressions generated by an avatar that looks like his owner. Our aim is to discover if there is a minimal set of displays required to elicit a response and if the receivers understand these displays.

2. CHARACTERISTICS OF THE 'VIRTUAL MIRROR'.

The 'Virtual Mirror' is a communication tool that allows people to email an avatar which looks like

the sender. This avatar enables its owner to send positive emotional messages to their contacts. The emotional displays of the avatar aim to empathize with the recipient in a particular situation. For example if the sender wants to congratulate someone for a happy event like an anniversary or a promotion, or if the user wants to express sorrow or regret concerning an unhappy or discouraging event. A neutral message could be sent to confirm an event in which the sender and recipient are involved like a meeting. These expressions of affect are based on the Russell's circumplex model of emotions [10]. Four emotional states were chosen including: happy, sad, astonished, and neutral. For technical reasons in this first version users only have access to 3 types of emotional state for their avatars: to congratulate; to encourage and to confirm a meeting with their recipients.

Crazytalk v6 PRO[4] was chosen in order to create the avatars for the users. Some studies suggested that the mismatch between the different modalities of synthetic emotions creates user discomfort [11]. Therefore despite being able to use the software to take text and generate the speech used by the avatar, we decided to record the voice of testers and integrate this in our interface.

Three scenarios were created

- The user wishes 'Happy birthday' to his contact
- The user says 'Don't worry' to his contact
- The user wants to confirm a meeting by saying 'See you at five o'clock'

Furthermore users could personalize the speech of the avatar with text. The interface of the sent

message and the interface of the receive message is presented in Figure 1.

Figure 1: The interface of the virtual mirror: sent and received

2.1 Experimental Evaluation

Ten people: 8 males and 2 females tested their 'Virtual Mirror'. The experiment allowed us to investigate whether people associated themselves with their emotional avatars and if people who received these messages felt empathy with the avatar as a messenger of the sender.

2.1.1. Results

Firstly the qualitative exploratory work revealed that people felt slightly uncomfortable with their 'synthetic face mirror', the first time they met, particularly when displaying emotions. Users considered the shape of the mouth, eyes and eyebrows as crucial to expressing the emotion that the avatar was displaying. Recipients had big expectations concerning the avatar transmitted by the sender. They all recognised the sender from the composed image of the avatar. The goal of the displayed emotion, whether it was: to congratulate, to comfort or to confirm, was successful for 9 out of 10 people.

3. FUTURE WORK

In order to discover the reasons underlying the discomfort expressed by users, we intend to isolate and classify different elements of the facial expression. We particularly want to investigate the relationship between the position and shape of the eyebrows, eyes, nose and mouth, as elements of the facial expressions displaying emotions. The next step is to run quantitative test online. Our aim is to discover if there is a minimum set of display elements required to elicit a response, if these

displays are understood by the receivers, and if any effects similar to the 'uncannyvalley' exist [8].

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