Subtle Expressivity for Characters and Robots

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SUBTLE EXPRESSIVITY

Humans, both consciously and unconsciously, use subtle expressions to indirectly communicate their emotions and intentions through variations of the gaze direction, pitch of speech and gesture speed. Humans also perceive changes in the internal states of others from subtle changes in their expressivities while interacting with them. Subtle expressivity plays the supporting part to the leading role of explicit expressivity, such as contents of speech or category of facial expressions. However, subtle expressivity plays an important role to gently regulate the relationship among the participants of an continuous interaction.

These subtle expressivities are little focused on in the design of interactive media in the context of software products and computers. Only in the area of computer games in which pre-designed animated characters are used, the full potential of subtle expressivity is fully understood and used.

Although the general interest of the human-computer interaction research community in life-likeness and personality as a goal of software design is growing for reducing cognitive load [1,2], we are far from having coherent understanding of what subtle expressivity actually is and how products and processes can address it. We might question whether designing for subtle expressivity will result in gentle emotional effects on people and whether the processes and topics involved differ in any significant way from designing for believability or personality.

CHALLENGES FOR SUBTLE EXPRESSIVITY

As a result of the rapid progress of technology, computers have become interactive partners rather than useful tools for people. In the past ten years, the CHI community had a strong interest in studying the believability, life-likeness and personality generation for interactive media, such as animated characters and communication robots.

Most studies, however, focus on explicit expressions using non-verbal information including facial expression [3], nod and glance [4,5] or para-linguistic features including speech style [6] or voice tone [7,8]. These expressions are designed to produce consistent emotions and intensions. So far, the subtle expressivity is only of peripheral interest compared to the interest in explicit expressivity.

One reason might be that it is even hard in human-human interaction to observe and define subjectively the subtle expressivities. Even if people misinterpreted a subtle expression of their communication partner, they still continue to interact and try to interpret further expressions.

The possibly best-known real world example for subtle expressivity is the facial expressions of the Mona Lisa (see Figure 1). Various interpretations of her smile are available and thoroughly discussed. The discussion can even be extended by including the expressions that her observers make in face-to-face contact.
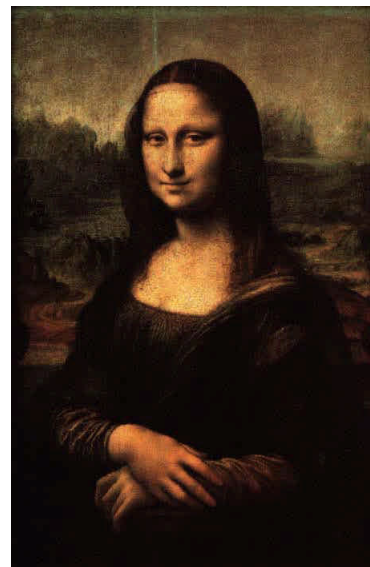

Figure 1: Mona Lisa by Leonardo Da Vinci.

Unfortunately, there is no clear tradition in either cognitive psychology or emotion psychology about the human abilities in using subtle expressivity in their various communication channels. Many researchers focus on deciding and categorizing unique emotional codes for explicit expressivity, such as an angry face, an OK sign or a happy voice.

IMPORTANCE OF SUBTLE EXPRESSIVITY

Conventional computer systems are constructed to help and assist with the user's work. However, recent applications

are extending their focus to the area of entertainment and amusement. Electric toys and entertainment robots may soon invade our everyday lives. Subtle expressivity is a key requirement for the social acceptance of these types of characters and robots. The growing interest of researchers and designers may turn subtle expressivity into an major issues for future interactive technology for both the office and the home.

The concepts and theories of subtle expressions are also required for products designers and developers. However, as mentioned the above section, they are not clarified in detail. If these concepts are arranged clearly, researchers and designers are going to be pioneers by creating useful guidelines for the development of interactive technology.

The measuring or evaluation methods for subtle expressivity are necessary for researchers and designers to support the development of these guidelines and to clearly identify the gentle effects of subtle expressivity. The proposal of new measuring methods beyond usability will also have an impact on cognitive science and psychology.

GOAL OF THE WORKSHOP

The workshop aims to provide a forum to discuss emerging issues in the design of subtle expressivities and its applications. Furthermore, we want to identify major issues involved in the interaction of subtle expressions and their effect on the user and discuss the role of cognitive science and psychology in the use of subtle expressions in the design of embodied characters.

We plan to cover the following topics:

Concepts, theories or guidelines: Conceptual contribution for design of subtle expressions including psychological theory or software quality models.

Implementation methods: Case study for software/hardware products using subtle expressivity.

Measuring methods: Evaluation contribution of gentle effects of subtle expressions.

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