

Creative Approaches to Emotional Expression Animation

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Abstract

In facial expression research, it is well established that certain emotional expressions are universally recognized. Studies into observer perception of expressions have built upon this research by highlighting the importance of particular facial regions, actions, and movements to the recognition of emotions. In many studies, the stimuli for such studies have been generated through posing by non-experts or performances by trained actors. However, character animators are required to craft recognizable, believable emotional facial expressions as a part of their profession. In this poster, the authors discuss some of the creative processes employed in their research into emotional expressions, and how practice-led research into expression animation might offer a new perspective on the generation of believable emotional expressions.

Keywords: Emotion and Personality, Facial Animation

1 EMOTIONAL EXPRESSION ANIMATION

Emotional facial expressions have been examined in great detail. Early research into human perception of expressions has led to the identification of universal expressions, which in turn has informed artistic training and practice. However, while the drive to create more authentic and accurate representations of facial expressions has a strong foothold in computer science and psychology research, the practice of character animation can afford an added insight into how expressions are generated and perceived. Expressions can be carefully modified and varied to determine their effectiveness in conveying a desired emotional state of a character.

Early Disney animation made use of skilled artists who developed a range of procedures, techniques, and principles which can be applied to produce effective character animations [3]. For animators, an effective animation is not only one that the audience can read easily, but also one that they will find believable. It seems straight forward enough to create an expression animation that an audience will recognize as ‘happiness’, yet subtle cues within that animation can shatter audience suspension of disbelief.

Animation principles which imply the application of caricature (such as exaggeration or anticipation) can make characters seem more lifelike. It can be argued that the overriding principle in character animation is that effective character animation is the creative *imitation* - rather than the strict *replication* - of life.

Emotional Avatars is an interdisciplinary research project which draws upon the knowledge of animation, computer arts, and psychology research. The aim of the project is to investigate the generation and perception of emotional expression animation to determine whether the nuances of emotional facial expression can be choreographed more effectively [2]. This poster examines the practice-led research methods utilized by the project members.

2 GENERATING AND EVALUATING ANIMATION

Animations were produced that covered the six universal expressions at three levels of emotional intensity. The eighteen animations were created and refined by the lead author. Reference materials were drawn from prominent studies of facial expressions and from video footage of acted and naturalistic expressions [1]. For the most part, however, the animation was produced iteratively through the application of artistic judgment calls. The animator

initially blocked out the basic animations before making adjustments to sequence, timing and duration. This resulted in a visual log of animation production, both in terms of iterations of animation and sketchbook development.

Throughout the course of the project, the animator focused on enhancing the believability of the expressions by employing core animation principles. For example, the expression of surprise was manipulated through the application of *anticipation* – that is, a preliminary action which sets up a major action. Before the eyes opened fully at the peak of the surprise expression (the major action), a blink was used so that the audience would anticipate this event (preliminary action). Instead of replicating life, a creative imitation of life was used to enhance the recognition and believability of the expression.

Through evaluation of the animation process, it was possible to determine which spatial-temporal attributes the animator felt were most appropriate for the emotion being animated. Adjustments to features and timing are clear from both the development of animation and the sketchbooks. However, this process is highly subjective when only one animator is involved. To gauge the opinion of other animators and a wider audience, the animations were shown to colleagues in the latter stages of development and displayed at an exhibition upon completion.

3 REVIEW AND EXPOSITION OF ANIMATION

To assess the quality of the animation, videos of the expressions were reviewed by the project team. A review procedure was developed which required the team to analyze the animations in subtle detail. The reviewers interrogated the quality of the animation using five primary measures (identification of emotion, emotional clarity, emotional intensity, sincerity, and authenticity) applied to several factors (facial regions, expression onset, expression apex, expression offset, expression duration, and feature timing). The opinions and comments of the reviewers were added to the review document, which was later used to generate the final iterations of the expression animations.

The finished animations were initially incorporated into a controlled experiment which looked to measure observer perception of expressions [2]. While the output from this experiment provided crucial feedback for the animators, the feedback was limited and did not provide in-depth critique from observers. In order to gather detailed responses from observers, an exposition of the animation was designed.

Unlike a standard exhibition of work, the animation exposition was designed to gather qualitative data from visitors through interaction and visitor contribution. Previously, subjective criticism by the animator reflecting in practice and peer criticism from expert colleagues informed the production of animation. By exposing the work to a wider audience and encouraging contributions, the exposition effectively represented a third level of observer criticism. Visitors to the exposition were able to contribute in a number of ways, including; voting for and ranking animations using a ballot box, interacting with an animated avatar, leaving detailed comments in visitor books, creating sketches of facial expression on the wall, and conversing with the animator.

4 CONCLUSION

Scientific research into expression movement and perception will enhance the authenticity of animated characters. However, some of the most believable animated characters are those which are created and refined iteratively by skilled and knowledgeable artists. Further research into how artists produce such performances could improve our understanding of what makes an animated expression recognizable and, perhaps more importantly, believable.

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