Multi-Modal Affective Computing Technology Design the Interaction between Computers and Human of Intelligent Tutoring Systems

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ABSTRACT

In this paper, the authors are using emotion recognition in two ways: facial expression recognition and emotion recognition from text. Through this dual-mode operation, not only can strengthen the effects of recognition, but also increase the types of emotion recognition to handle the learning situation smoothly. Through the training of image processing to identify facial expression, the emotion from text is identifying by emotional keywords, syntax, semantics and calculus with logic. The system identifies learners’ emotions and learning situations by analyzing, choosing the appropriate instructional strategies and curriculum content, and through agents to communicate between user and system, so that learners can get a well learning. This study uses triangular system evaluation methods, observation, questionnaires and interviews. Experimental design to the subjects by the level of awareness on art and non-art to explore the traditional teaching, affective tutoring system and no emotional factors learning course website these three kinds of ways to get results, analysis and evaluate the data.

KEYWORDS


INTRODUCTION

Baker et al. (2009) has pointed out that cognitive emotion situations and learning environments are interactive, especially through the teaching system to determine the learner’s emotions automatically and give an appropriate response in the past are incomplete, so these are potential and direction of research. In emotion recognition, because facial expressions are the most direct signals, we can observe each other through facial expressions. In conversation through the application and awareness of words
also can get the current mood. After getting emotion, adapting learner’s emotions and judge that how to feedback to learners can improve learning effectiveness. In contrast to previous studies, although shown that the use of emotion can help to learn to improve learners’ motivation of learning, weather to enhance learning effectiveness still has doubts.

The digital art is constructed through a bit of storage, transmission, existence, evolution, and in the process created in the system, organization and network systems. Interactive, fictitiousness, wisdom, uncertainty, more variability and randomness can produce a self-evolution of reproductive characteristics. How to through the application of new technologies and the integration of digital artistic content, show the artist’s imagination, to experience more by communicates, it will be important issue to the future of art. Therefore, in order for students be able to stand on today’s trend of the times, digital art education curriculum is planned to be worthy of development direction. At the same time, view the current teaching design of intelligent tutoring system, for the development of more comprehensive teaching content and teaching objectives clear and general discipline-based, non-spindle of course, there is still potential for development programs and space. Collingwood (1938) believe that artistic activity is the performance of a human emotional experience, so digital art course requires personal subjective, highly emotional as a base in order to cause learning even further creation. Therefore, need more emotional style to help learning. In art teaching, most of traditional teachings are one teacher face to many learners. It may ignore the feelings of each user easily. Therefore, the researchers will develop courses in digital art tutoring system for the spindle, discussing and exploring, hoping to improve the motivation and learning effect of digital art. (Lin, Chen, Sun, & Tsai, 2012; Lin, Hsieh, Loh, & Wang, 2012).

This study hopes to add affective computing into intelligent tutoring system (Intelligent Tutoring Systems, ITS). In identify of learners’ emotions with image processing, affective computing, semantic computing to improve the recognition rate, to get the real demand and information. Positive emotions can help thinking and problem solving, in contract to negative emotions. (Eyharabide, Amandi, Courgeon, Clavel, & Zakaria, 2011) Therefore, if we can realize that the students’ emotions and give them appropriate feedbacks to adjust the teaching content must help to learning. The study of Sarrafzadeh et al. (2008) and Mao et al. (2009) are used virtual agents for communication between the system and the learner, the virtual agents have mass emotions is a well influence on learning motivation. (Johnson et al., 2000), so the creation of a virtual agent to accompany is needed. This study design through the use of multi-mode, including the interface module, teaching modules, emotion recognition module, curriculum database. There are successfully increased learner motivations, thereby increasing effectiveness of learning.

LITERATURE REVIEW

Emotion Recognition

To use multiple forms of identification to identity, not only able to increase the types of emotions can help increase recognition accuracy, Ren (2009) via, identify emotions to let the system get emotional and give feedbacks through text, voice, facial as the input signal. Gunes (2007) identify emotions through facial gestures and postures. Facial recognition only needs webcam as a input, semantic recognition only keyboard and mouse as inputs, low cost and high convenience to go detect with parallel input into the computer, so this study use face recognition and text recognition as emotional recognition method.

Facial Emotion Recognition

Ekman et al. (1971) based on the face and facial features, definition six kinds of facial expressions: joy, anger, sadness, surprise, disgust and fear. TF Cootes et al in 1992 proposed Active Shape Model (Active Shape Model, ASM), training the same type of object images to establish the active shape
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