

Emotive Tour Guide System

Mei Yii Lim, Ruth Aylett, Christian Martyn Jones
School of Mathematical and Computer Sciences
Heriot-Watt University
Edinburgh, EH14 4AS, Scotland
{myl, ruth, cmj}@macs.hw.ac.uk

Abstract

The Emotive Tour Guide System is a mobile context-aware and spatial-aware system, including an intelligent emotional guide with personality, offering the user with an affective multimodal interaction interface.

Keywords: context-aware, emotion, personality, affective interaction

1. INTRODUCTION

The Emotive Tour Guide System is proposed to address the frustration that usually occurs in interacting with an emotionless computerised system. This research differs from the previous work [1, 2, 3, 4, 5, 6] by the creation of an affective multimodal interaction interface. This supersedes the idea that a guide can only recite facts about places or events. Instead we wish to provide an 'intelligent emotional guide with personality'. It includes an Emergent Emotion Model which can affect the way the guide reacts to the user during interaction. The hypothesis here is that an emotional agent with personality can make interaction more realistic and natural as well as present the user with a more engaging and memorable visit by holding attention and helping comprehension of new information.

2. THE SYSTEM

The Emotive Tour Guide System consists of two emotional agents each possessing a contrasting personality. These guides present users with different versions of the same story about an event or place allowing them to understand an event more deeply, a learning strategy targeted by the UK National Curriculum for History [7]. A multi-sensory system, including a speech synthesis system and a Global Positioning System will be integrated into the PDA using wireless communication. Before a tour starts, the guide will first extract information from the user and plan a route based on this information. On route to the destination the guide will draw the users attention to landmarks, and applying a story-telling technique will links the memory and interests of the guide as well as the visitor to the spatial location. The user interacts using the graphical user interface and receives responses by means of text, graphics and audio. A server performs the processing and holds the guides emotional memory and memory about facts and sends the information to the PDA on demand. FIGURE 1 gives an illustration of the system architecture.

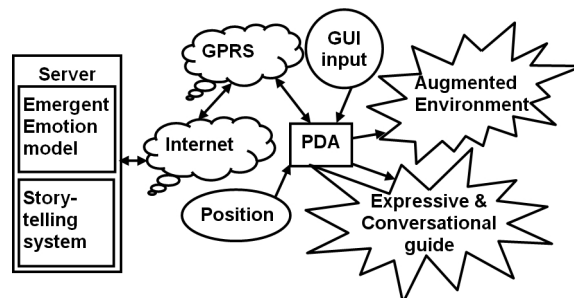


FIGURE 1: The Overall System Architecture

3. EMERGENT EMOTION MODELS

The Emergent Emotion model is a novel element of this research. It is designed based on the Psi model [8] that provides a framework for agents focusing on emotional modulation of perception, action-selection, planning and memory access. Emotions are not explicitly defined but emerge from modulation of information processing and action selection. The agent perceives the environment continuously and generates intentions based on acquired information and user needs. These intentions are stored in memory of intentions together with the agents level of competence (capability of coping with problems) and level of uncertainty (predictability of the environment). Next, the agent selects an intention and decides autonomously whether to gather more information, to perform planning or to execute an existing plan, based on some modulators values: arousal (rate of processing), resolution level (carefulness of behaviour) and selection threshold (how easy is it for other motive to take over). The weight of the modulators affects the way the guide tackles interaction. Personality emerges by changing these values. Responses from the user can affect the guides emotional state and form the basis for assumption about his/her interest. If the user adopts the guides perspective by agreeing, the agent will provide a more detailed explanation about the subjects or related subjects. On the other hand, if they show no interest or disagree, the guide will present the subject without much elaboration. This way, the guide personalises the information presentation based on the users interest.

4. CHALLENGES AND FUTURE WORK

The biggest challenge of this research is retaining high user attention and generating a long-term memory. Next, is determining the relevant set of emotions. Of interest is the how well we must match the agents appearance and its behavioural. In addition, appropriate ontologies must be established for the agent memories, the world model and the user model. The system must also take into account the special interests of each user to automatically propose an appropriate presentation of fact and story. Technically, accuracy of GPS tracking needs consideration so that the guide is spatially responsive. The limited resources of the PDA requires for us to expressing emotions using other visual techniques rather than using facial animation. In terms of scene augmentation, a synchrony between the different senses of enhancements is vital.

The development of the proposed system is undertaken in an iterative and rapid prototyping manner. The current focus is on the Emergent Emotion Model. Next, all the mobile components will be integrated and the final system will include the Emergent Emotion Model, the narrative system and the multiple modalities for interaction. User evaluations will be carried out throughout and on completion of the development phase to test the validity of the hypothesis.

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