Exploring Behavioural Styles in Human-ECA Interaction

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ABSTRACT

We propose a system that computes the behaviour of a listening agent. Such an agent, developed within the Sensitive Artificial Listening Agent project, must exhibit varied behaviour. The verbal and non verbal communication depends not only on the agent's mental state towards the interaction (*e.g.*, if it agrees or not with the speaker) but also on the agent's characteristics such as its emotional traits and its behaviour style. Our system computes the behaviour of the listening agent in real-time.

INTRODUCTION

A big challenge that must be faced in the design of virtual agents is the issue of credibility, not only in the agent's aspect but also in its behaviour. Users tend to react as if in a real human-human interaction when the virtual agent behaves in a natural human manner (Nass *et al.*, 1994; Reeves & Nass, 1996. The work presented in this paper focuses on the listener's behaviour and is set within the Sensitive Artificial Listening Agent (SAL) project, which is part of the EU STREP SEMAINE project (http://www.semaine-project.eu). This project aims to build an autonomous talking head able to exhibit appropriate behaviour when it plays the role of the listener in a conversation with a user. Four characters, with diRerent emotional styles, invite the user to chat trying to induce her/him in a particular emotional state. Within SAL, we aim to build a real-time Embodied Conversational Agents (ECAs) able to automatically generate those verbal and non verbal signals that a human interlocutor displays during an interaction. These signals, called backchannels, provide information about the listener's mental state towards the speaker's speech (*e.g.*, if s/he believes or not what the speaker is saying). In our system backchannel signals are emitted not only according to the agent's mental state towards the interaction but also its behaviour tendencies, that is the particular way of producing non verbal signals that characterizes the agent. In our work the behaviour tendencies are defined by the preference the agent has in using each available communicative modality (head, gaze, face, gesture and torso) and a set of parameters that affect the qualities of the agent's behaviour (*e.g.* wide *vs.* narrow gestures). We call the behaviour tendencies the agent's baseline. The proposed work incorporates a pre-existing system for the generation of distinctive behaviour in ECAs (Mancini & Pelachaud, 2007; Mancini & Pelachaud, 2008). The result is a system capable of computing the verbal and non-verbal behaviours that the agent, in the role of the listener, has to perform on the basis of both its baseline and its mental state.

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