IGI PUBLISHING ITJ 5127
701 E. Chocolate Avenue, Hershey PA 17033-1240, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.igi-global.com

This paper appears in the publication, International Journal of Agent Technologies and Systems, Volume 1, Issue 3
edited by **Goran Trajkovski © 2009, IGI Global**

Towards Learning 'Self' and Emotional Knowledge in Social and Cultural Human-Agent Interactions

Wan Ching Ho, University of Hertfordshire, UK

Kerstin Dautenhahn, University of Hertfordshire, UK

Meiyii Lim, Heriot-Watt University, UK

Sibylle Enz, Otto-Friedrich-Universitaet Bamberg, Germany

Carsten Zoll, Otto-Friedrich-Universitaet Bamberg, Germany

Scott Watson, University of Hertfordshire, UK

ABSTRACT

This article presents research towards the development of a virtual learning environment (VLE) inhabited by intelligent virtual agents (IVAs) and modelling a scenario of inter-cultural interactions. The ultimate aim of this VLE is to allow users to reflect upon and learn about intercultural communication and collaboration. Rather than predefining the interactions among the virtual agents and scripting the possible interactions afforded by this environment, we pursue a bottom-up approach whereby inter-cultural communication emerges from interactions with and among autonomous agents and the user(s). The intelligent virtual agents that are inhabiting this environment are expected to be able to broaden their knowledge about the world and other agents, which may be of different cultural backgrounds, through interactions. This work is part of a collaborative effort within a European research project called eCIRCUS. Specifically, this article focuses on our continuing research concerned with emotional knowledge learning in autobiographic social agents. [Article copies are available for purchase from InfoSci-on-Demand.com]

Keywords: *Cultural Differences; Human-Machine Systems; Knowledge Utilization; Social Learning; Storyboards*

INTRODUCTION

In addition to the popular utilisation of social agent simulations in areas such as education and academic research, nowadays immersive online virtual worlds allow social agents to be further enhanced through highly frequent inter-

actions with human users. For example, Second Life (Linden Research, 2005), as a well-known and quickly evolving virtual society, has attracted millions of users to experience a new kind of social interaction in a virtual space. Powerful PCs, fast broadband connections and advanced 3D graphics offer users this alternative online reality. Interestingly, users' social activity in such a virtual society involves high levels of cultural and emotional learning, as many real cases demonstrate that are reported by Ananthaswamny (2007). How well can we expect intelligent virtual agents (IVAs) to be able to cope with interactions similar to those that human users experience in a comparable social context?

To answer this question, one of the primary goals from our research project eCIRCUS (2006) "Education through Characters with emotional-Intelligence and Role-playing Capabilities that Understand Social interaction" is to promote intercultural empathy. Cross-cultural conflicts have been the source of violent acts in many countries worldwide, including conflicts involving people who come to live in a different country. This background forms a strong motivation for our goal to develop a virtual learning environment (VLE) that supports intercultural learning and fosters intercultural empathy skills for its users. Through developing an educational role-play game named ORIENT with character-based emergent narrative (Aylett et al, 2005), we aim to establish a fun way to educate boys and girls at the age of thirteen to fourteen years in the UK and Germany. The learning outcomes will be designed specifically for children native to the host countries and will be used by the entire school class.

Not surprisingly, in virtual worlds like Second Life or other popular online games, the large international user population and the freedom given to individuals to openly "live" in the environment introduce a certain level of difficulty in intercultural communication. Naturally most users can handle problems emerging from cultural differences – without much effort they can understand both verbal and non-verbal expressions from other characters, which may be either non-player characters (NPCs) or avatars controlled by other users who may be from different backgrounds[1]. To achieve the same level of social and cultural understanding, IVAs are expected to have an *interdependent* (rather than *independent*) "self" – being more attentive to themselves and sensitive to others[2] (Markus & Kitayama, 1991). Consequently, they need to have the ability to be aware of cultural differences and to learn from others. Therefore, we argue that IVAs will benefit from a type of memory which records events that are meaningful to the agent personally and also allows them to extend their knowledge about others' cultural expressions.

Like human beings, these agents should also respond to a stimulus situation with mediation by cognitive processing at several different stages. As