Chapter 18
Towards Culturally–Aware Virtual Agent Systems

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ABSTRACT

Globalization leads to an increase in intercultural encounters with a risk of misunderstandings due to different patterns of behavior and understanding. Learning applications have been proposed that employ virtual agents as their primary tool. Through their embodiment, learning can be done in a game-like environment in a more interesting way than for example learning with a textbook. The authors support the idea that virtual agents are a great opportunity for teaching cultural awareness. Realizing this, the concept of culture needs to be translated into computational models and the advantages of different systems using virtual agents need to be considered. Therefore, the authors reflect in this chapter on how virtual agents can help to learn about culture, scan definitions of culture from the social sciences, give an overview on how multiagent systems developed over time and classify the state of the art that integrates culture in multiagent systems. In addition, an approach of simulating culture-specific behavior using such a multiagent system is introduced and future trends in enculturating virtual agent systems are outlined.

INTRODUCTION

In the not so distant past, everyday conversations were generally held between people from the same geographical region who shared a common ground in social norms and expectations. Experiencing different cultures was only possible for a very small group of people that ventured out into the unknown, often ill-prepared with knowledge about other cultures. Due to globalization, a larger group of people is able to get in touch with other cultures nowadays. Through modern communication devices such as the Internet or teleconferencing systems, communication across different cultures is possible, even without traveling. As a result, communication is much easier on the one hand, but

on the other, miscommunication comes into play. Large geographical distances, different upbringing and education evoke a lack of common ground in social knowledge, which cannot be taken as granted any more. In (Hofstede, 1991), the patterns of thinking that drive an individual are described as the "software of the mind" that is a product of the social environment that one grew up in and one's own life experience. Besides globalization, immigration leads to an increased contact to people with different cultural backgrounds (Ting-Toomey, 1999). Thus, different cultural believes, values and communication styles meet each other in one and the same country. Language as main medium of communication is the most obvious barrier of intercultural communication. But even when communication partners speak the same language, misunderstandings can arise through cultural differences, such as differences in nonverbal behavior or different perceptions of behaviors.

Moreover these misunderstanding are often not recognized as such. If communication partners e.g. take for granted a common ground of social knowledge, they might interpret each other's behaviors in their own culture-specific way. Assuming that this interpretation is correct, behaviors might be decoded wrongly but stay unrecognized. Even worse than being overlooked, the interlocutor might assume that the behavioral misconduct was done on purpose and thus, one could be offended. In this way, people might be confronted with being refused without knowing the reason for it, which in turn can lead to frustration.

Following Hofstede (1991), the authors state that being aware of the fact that some behaviors are interpreted differently across cultures is the first step to avoid inter-cultural misunderstandings and with it, to learn intercultural communication.

In (Hofstede, 1991), the acquisition of inter-cultural communication abilities is explained in three steps:

(1) **Awareness:** The first step of gaining intercultural competence is being aware of culture-related differences in behavior. The most noticeable part of this step is not only to know about differences, but to accept the fact that there is no better or worse way of interacting - that it is just different. Consequently, individuals need to learn that one's own behavior routines are not superior to others.

(2) **Knowledge:** Gaining knowledge is the next logical step. This implies learning about the target culture's symbols and rituals. This does not necessarily include that one shares the values of a culture, but at least has an idea on where these values differ from one's owns.

(3) **Skills:** Hofstede states that the steps of Awareness and Knowledge are sufficient to avoid most of the obvious misunderstandings in cross-cultural communication. The third step of gaining skills in intercultural communication however needs more practice. This includes recognizing the symbols and heroes of the other culture and practicing their rituals.

The authors think that multiagent systems are a powerful medium in gaining intercultural competencies and that they can be used in all three learning steps described above in the following way:

(1) **Awareness:** The first step on the way to inter-cultural understanding can be simply achieved by observing virtual agents that show a certain culture-specific behavior. A trainee can for example be confronted with a group of characters without any prior information about the culture he or she is interacting with.

(2) **Knowledge:** Gaining knowledge about another culture can be done by observing virtual agents, too. However, additional information

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