

Can Culture Translate to the Virtual World?

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Abstract. The United States consists of a diverse population of ethnic groups. Catering health care to such a culturally diverse population can be difficult for health care professionals. Culture plays a complex role in the development of health and human service delivery programs. Cultural Competence has emerged as an important issue to improve quality and eradicate racial/ethnic disparities in health care. The Nursing Standards of proficiency for nursing education emphasize that nurses should be able to acknowledge patients cultural practices and take cultural influences into account when providing nursing care. A major challenge facing the nursing profession is educating and assisting nurses in providing culturally relevant care. To tackle this issue we have created virtual humans that will represent different cultures. These virtual humans will serve as educational tool that allow nurses to understand and handle patients from different cultures. Our first culturally-specific virtual human is a young Indian girl. In this paper we will discuss the architecture to create a culturally specific virtual patient.

Keywords: Culture, Cultural Competence, Transcultural Nursing, Virtual Humans.

1 Introduction

The 2000 census revealed that 29.4% of the United States population represents a variety of ethnic backgrounds. The main ethnic groups identified are: Hispanic, African American, Native American or American Indian, Asian, Native American or other Pacific Islander [14]. It has been projected that by the year 2050, the minority population will surpass the majority population [15]. With such a diverse population arises the issue of multiculturalism or what is commonly known as cultural diversity.

Cultural differences are one of the main contributors of disparities in the health care industry with respect to the quality of services provided. Research indicates significant existence of racial and ethnic disparities in access to health care service [13]. The 'Healthy People 2020' initiative, launched by the U.S Department of Health and Human Services, has emphasized the need to eradicate these disparities and thereby improve the health of all groups [8]. Therefore, it has become necessary to provide "culturally competent" medical care to improve the quality of the health care industry [5].

To provide culturally relevant care, it is necessary to acknowledge patients' cultural practices and take their cultural influences into account. A major challenge in

the health care industry is to educate and prepare future nurses with skills in transcultural nursing. This paper discusses the use of virtual humans as patients to teach cultural competence to nursing students.

2 Understanding Culture and Cultural Competence

According to Chamberlain, 2005 culture means “the values, norms and traditions that affect how individuals of a particular group perceive, think, interact, behave and make judgments about their world” [3]. Understanding culture helps us to understand how people see their world and interpret their environment. Culture also influences how people seek health care and how they respond towards health care providers [11]. Nurses must possess the ability and knowledge to communicate and to understand health behaviors influenced by culture. Having this ability and knowledge can eliminate barriers caused by race and ethnicity to provide culturally competent care.

Cultural Competence is the ability to interact effectively with people from different cultural backgrounds [4]. To be culturally competent the nurse needs to understand his/her world views and those of the patients and integrate this knowledge while communicating with the patients. Nurses need to learn how to ask sensitive questions while showing respect for different cultural beliefs [2][10]. Along with cultural sensitivity, it is also necessary to develop a transdisciplinary, transcultural model that must be taught at the basic level of nursing education [7].

3 Agent Architecture

To create a culturally-specific virtual patient we are utilizing the FATiMA (FearNot Affective Mind Architecture), agent architecture. This architecture creates believable agents where emotions and personality play a central role [1]. We extended FATiMA to allow for the cultural adaption of the agents (see Fig. 1). The cultural aspects are set through the Hofstede cultural dimension values for the culture of the character; culturally specific symbols; culturally specific goals and needs, and the rituals of the culture [9].

Agents perceive the outside world based on their sensors. The perceived events are then passed through symbol translation. Different cultures perceive events differently based on their symbols. The symbol translation captures the specificities of communication in the agent’s culture. For example, shaking one’s head in India means ‘yes’ as opposed to the US interpretation of ‘no’. Once the event has been identified by the agent, the appraisal process is triggered. In the appraisal process the situations are interpreted to enable valence reaction. The appraisal process consists of two main components:

1. Motivational System: Calculates the desirability of an event towards the agent depending upon the agent’s needs and drives. If an event is perceived to be positive for the agent’s needs, the desirability of the event is high, and vice-versa.
2. Cultural Dimensions: They are psychological dimensions, or value constructs, which can be used to describe a specific culture. Cultural dimensions capture the social norms of the culture that the agent is part of. We have considered Geert

Hofstede’s cultural dimensions for India [9]. Geert Hofstede's research gives us insights into other cultures so that we can be more effective when interacting with people in other countries. Hofstede’s cultural dimensions are- Power Distance Index (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance Index (UAI), and Long-term Orientation (LTO).

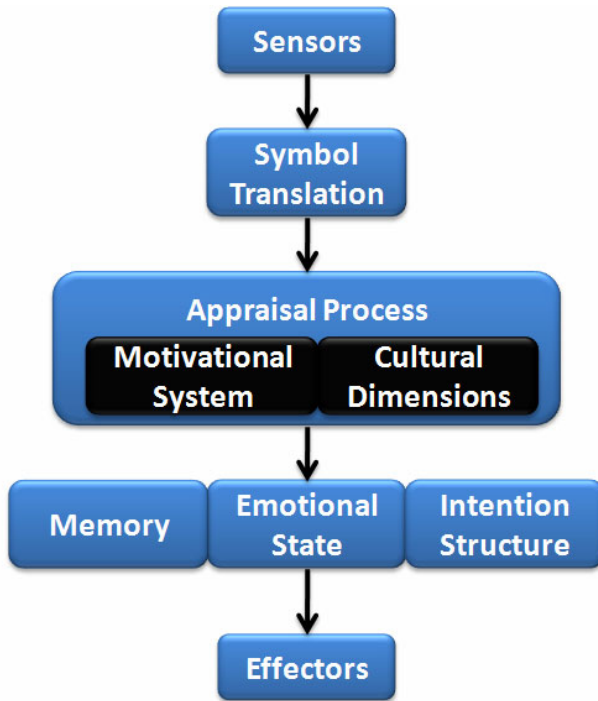


Fig. 1. Culturally-modified FATiMA

The appraisal component then activates an emotion producing an update in the agent’s memory and starts the deliberation process. The emotional state of the agent is determined by the OCC model of emotions defined by Ortony, Clore and Collins [12]. The deliberation process consists of the intention structure, which determines the agents- goals, intentions and plans. Once the action is chosen, symbol translation is invoked, and the agent translates the action taking into account its symbols, before the action is performed by its actuators.

4 Methods

In collaboration with the nursing department of University of North Carolina at Charlotte (UNCC), a life-sized virtual patient belonging to the Indian culture is being developed. The Indian culture was chosen due the large population of Indian students and families in the UNC system. The virtual patient is a 24-year old Indian girl, Sita.

The initial test case will involve Sita visiting a clinic due to an outbreak of Tuberculosis (TB) in one of her classes. In India, the population is immunized against TB. Any subsequent screening for TB results in a positive result due to the presence of the antibodies in the blood. Sita, during her preliminary visit to the clinic has presented with a positive result on the TB screening test. Sita is at the clinic for her subsequent visit. The nursing students will interact with a life-size projection of Sita. The goal of the students is to receive answers to their list of required questions, with some of the questions eliciting negative desirability based on the cultural dimensions of young, Indian females.

Sita's personality is based on Digman's Five Factor Model (FFM) [6] with her emotions governed by the OCC model of emotions [12]. The students interact with Sita on a one-on-one basis. Our goal is to design Sita such that she reacts to the student based upon the questions asked, how the questions are posed and the student's body language during the interaction. The interaction will be video recorded and analyzed by a faculty member. The faculty member is able to annotate the recording as they evaluate the student's performance. The annotated video will then used by the student as a study tool.

5 Future Work

We plan to create a common framework that will help in development of autonomous virtual humans belonging to different cultural/ethnic groups. Using this framework next we plan to create a Hispanic patient (due to high Hispanic population in Charlotte). Also we are investigating using Virtual Humans to improve customer service in other industries e.g. banking, education.

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