

# **CULTURAL INTELLIGENCE ASSISTANCE FOR CROSS-CULTURE UNDERSTANDING AND ACTION RECOMMENDATION**

Xiaohui Cui, Songhua Xu and Thomas E. Potok

Applied Software Engineering Research Group, Computational Science and Engineering Division, Oak Ridge National Laboratory, Oak Ridge, TN, USA

## **ABSTRACT**

When traveling or working in a culturally diverse environment, it is demanding for a new comer to quickly notice, understand, and adapt to different culture norms to avoid cultural misunderstanding, and further to establish friendship with the local people. The main challenges include both correctly understanding the intent behind behaviors from people with a different cultural background, and effectively adjusting one's own behaviors to a local cultural setting to express one's intention without ambiguity. Quality cross-cultural assistance can help us accurately recognize the true purpose behind behaviors of a person from a different cultural background, and also advise us to act properly in a new cultural setting. In this project, we aim at providing an advanced cultural intelligence assistance tool, implemented as a mobile application, to facilitate individual users to understand behaviors, norms, and conventions in a new culture, as well as to change their behaviors appropriately in the new cultural environment.

## **PRIMARY TRACK**

Application of Social Cultural Methods, Models, and Tools (MMT)

## **SECONDARY TRACK**

Cultural Training

## **DESCRIPTION**

Globalization introduces us into continuous contact with people from a wide spectrum of culture at an unprecedented breadth and depth (Tomlinson 1999). As a result, to fight the global battle on terrorism, increasing number of US diplomats and military forces are dispatched all over the world, where they need to constantly interact with local people in their native culture. Successful adaptation to a new culture is also critical for US military forces participating in international peace keeping and nation rebuilding activities on foreign lands, to gain supportive collaboration from allies and native people (Wiley 2008). On the other end, failing to overcome cultural gap can significantly slow down or hinder the establishment of friendly, productive relationships in a foreign culture working environment. Cultural ignorance may also lead to adversary actions, or even result in cultural conflicts, in which case the cost of cultural misunderstanding can grow extremely expensive. Inappropriately observing and respecting cultural difference may further lead to prejudices, discrimination, racism, and other significant consequences.

In recent years, cross cultural understanding and awareness have been gradually recognized as an important part of military operations. However, cultural trainings provided to soldiers tend to be simplistic, typically delivered as a list of do's and don'ts without providing much in-depth understanding (Wunderle 2006). With nearly 8 years trial and error experience in Afghanistan

and Iraq, US military forces have gradually acquired the most necessary knowledge and expertise to face cultural challenges in the two oversea battle fields. However, it is likely the geopolitical environment of the world will shift when the next global security threat occurs, which will call for expertises, such as languages and cultural understanding capabilities. in a very different region of the world. Apparently, trial and error is not an affordable approach each time when we need to work in a new cultural environment; unfortunately, today's US military forces lack an effective assistance tool, which can quickly provide information and recommendation when our military personnel step into a new culture circumstance.

In this proof of concept project, we aim at developing a cultural intelligence assistance tool as a mobile intelligent system, to facilitate individual users to understand behaviors, norms, and conventions in a new culture, as well as to adaptive their behaviors appropriately in the unfamiliar culture. Our system will recommend to end users key controversies between customs of a local culture in a user's current place and those of the user's home culture, emphasizing behaviors that may cause misinterpretations or culturally stirred conflicts. Our system will also recommend to users how to express their intents in a suitable way that fits into the local culture. As shown in Figure 1, the system is available for war fighters either as a standalone mobile computing device or in the form of an application running on smart phones. Our system delivers cultural intelligence information through the location aware push technique. Overall, our system aims at providing real-time socio-cultural awareness and expert assistance on cultural intelligence, to help military personnel and travelers aptly adjust themselves in a new cultural environment for smooth and successful mission execution.



**Figure 1: A Mobile Dynamic Social Cultural Awareness & Recommender System**

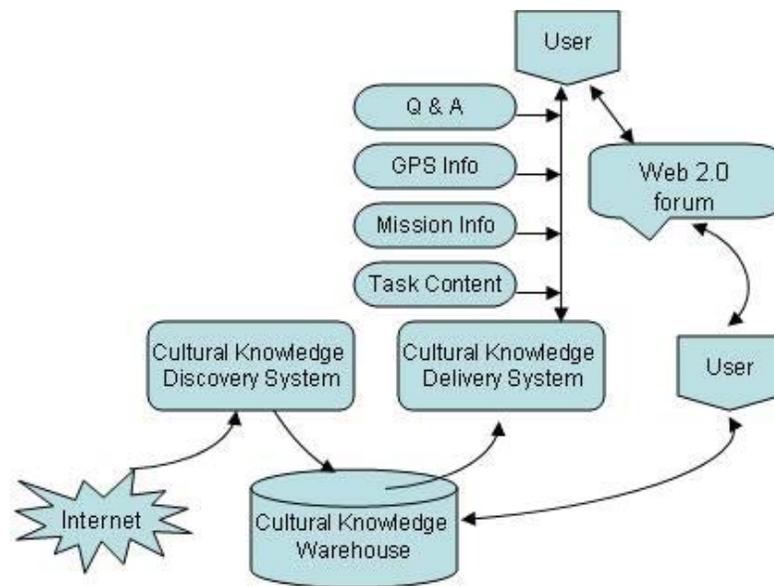
Our culture intelligence assistant system consists of two key sub-system modules. Figure 2 shows the architecture of our system:

- Sub-system I: Culturally dependent knowledge discovery system, whose objective is to establish a culturally dependent knowledge warehouse (CKW);
- Sub-system II: Geographically location sensitive, context aware information delivery and recommender system for culturally dependent knowledge, whose objective is to deliver the most relevant and useful culturally dependent knowledge to an end user, according to the user's geographic location and his or her current task context..

Through sub-system I, our system autonomously curates culturally dependent knowledge through crawling information from both traditional webpages, and Web 2.0 contents such as

online forums, email-lists, messages in public chatting rooms, and blogs. Given all the web crawling results, our system then performs a semi-supervised learning based approach (Deák, Bartlett et al. 2007) to identify culturally related information and further to organize them into a CKW warehouse. In the CKW, we represent each piece of culturally dependent knowledge as a triplet, which takes the form of (information, primary cultural background, secondary cultural background), where the component “primary cultural background” contains the following fields--race, ethnicity, gender, geographic region of origin, time, educational achievement, religious beliefs, age cohort, health status; and the component “secondary cultural background” contains the following fields--socioeconomic status, varieties of "challenges" and "ableness", various types of life experience, family structure, sexual orientation, level of mobility (both physical and geographic), level of acculturation to majority norms.

The sub-system II is responsible for intelligently disseminating culturally dependent knowledge according to the geographic location of an end user. Besides recommending most pertinent cultural knowledge to a user, our system also allows users to post questions, in which case our system will generate automatic answers to the questions, as powered by the background cultural knowledge warehouse. Our system will also allow end users to directly communicate with human experts or other users through a custom cultural information exchange Web 2.0 platform, to get in-person consulting regarding most difficult cultural questions or circumstances that deserve human attention and professional response. Our system is also capable of acquiring culturally dependent knowledge available in non-English languages through machine translation technologies. Essentially, our system will perform a multilingual web crawling and then apply statistic machine translation to convert the crawled pages into their English counterparts for natural language understanding and knowledge extraction.



**Figure 2: Architecture of our Cultural Intelligence Assistance System**

In summary, our proof of concept cultural intelligence assistance system intends to demonstrate the concept of proactively searching, collecting, integrating, and organizing culturally dependent knowledge from a wide spectrum of versatile online sources into a comprehensive, unified culturally dependent knowledge warehouse (CKW). Due to the web

crawling and mining feature of our system, it can acquire a most comprehensive set of culturally dependent knowledge on a real-time basis. In addition to the large-scale cultural knowledge discovery function of the system, our system is also unique in its personalized way to deliver culturally dependent knowledge to end users in a location sensitive and context aware fashion.

## **ACKNOWLEDGEMENTS**

This paper has been authored by employees of UT-Battelle, LLC, under contract DE-AC05-00OR22725 with the U.S. Department of Energy. Accordingly, the United States Government retains and the publisher, by accepting the article for publication, acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.

## **BIOGRAPHY**

Dr. Xiaohui Cui is the scientist staff of the Computational Sciences & Engineering Division, Oak Ridge National Laboratory of Department of Energy and the adjunct associate professor of University of Louisville in Kentucky. His research interests include agent based modeling and simulation, social computing, swarm intelligence, GIS and transportation, emergent behavior, complex system, high performance computing, and information retrieval. His research programs have been supported by Office of Navy Research, Department of Homeland Security, Department of Energy and Lockheed Martin Company. He was reported by MSNBC, New Scientist etc. In 2008 and 2009, he received the Department of Energy Outstanding Mentor Award and the Significant Event Award.

## **REFERENCES**

- [1] Deák, G., M. Bartlett, et al. (2007). "New trends in cognitive science: Integrative approaches to learning and development " *Neurocomputing* 70(13): 8
- [2] Tomlinson, J. (1999). *Globalization and culture*. Chicago, University of Chicago Press.
- [3] Wiley, C. (2008). *Could Lessons Learned in Somalia Be Beneficial to Africa Command (AFRICOM)?* Quantico, VA Marine Corps Command and Staff College
- [4] Wunderle, W. (2006). *Through the Lens of Cultural Awareness: a primer for US Armed Forces deploying to Arab and Middle Eastern countries*. Ft. Leavenworth, Combat Studies Institute.