

Traveller:

An Interactive Cultural Training System controlled by User-Defined Body Gestures



Felix Kistler¹, Elisabeth André¹, Samuel Mascarenhas², André Silva², Ana Paiva², Nick Degens³, Gert Jan Hofstede³, Eva Krumhuber⁴, Aavid Kappas⁴, and Ruth Aylett⁵

- Experience-based role play with virtual agents
- Educate young adults (18-25) in cultural sensitivity
 - *Affective Goal*: making users aware that their rules for interpretation of appropriate behavior might be incorrect
 - *Cognitive Goal*: making users understand general differences in cultures
- *Story*: Users adopt the role of a character that has not traveled too much for most of his life. The scenario starts at the café of the character's grandmother, in which he receives a letter from his deceased grandfather. In this letter, the grandfather, who liked to travel the world, promises the grandson a "lost treasure" that he should find in a journey through different countries. In each country the grandson has to interact with locals in so-called critical incidents to progress. To be successful, the users have to select the correct interaction options depending on the agents' simulated synthetic culture. The journey leads to three different countries with each having about three different scenes.

- *FAtiMA* agent architecture [1] with a *Social Importance Dynamics* model and *culturally - adaptive behavior* [2]:

- Virtual characters simulate different *synthetic cultures* defined in three Hofstede dimensions [3]: *power distance*, *individualism vs. collectivism*, and *masculinity vs. femininity*
- Characters assign the user a different *SI-level* depending on his or her chosen actions
- Depending on the *SI-level* the characters adapt their behavior and synthesize emotions



- Process for creating *user-defined gestures* [4] adapted for *full body gestures* [5]: 

- 22 Users run through the first three scenes of the story that included ten in-game actions
- Interaction is disabled, but the users spontaneously invent 251 body gestures when the system displays possible actions in text fields
- Gesture candidates are chosen according to the agreement between the users

- Gesture candidates integrated with the *FUBI* framework [6] 

- Gestures defined in *XML* and visualized as symbols
- Symbols on the screen represent interaction options
- Need to be performed as visualized to select an option
- *Static images* = postures that should be hold shortly
- *Animations/Arrows* = motions that need to be mimicked



- Interactive storytelling environment created in *Unity3D* (<http://unity3d.com>)

- Two in-game action types:

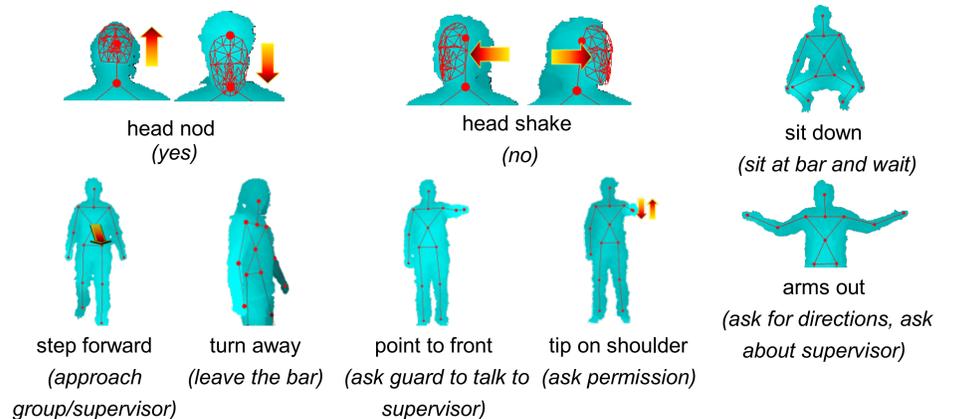
a) *Navigation*



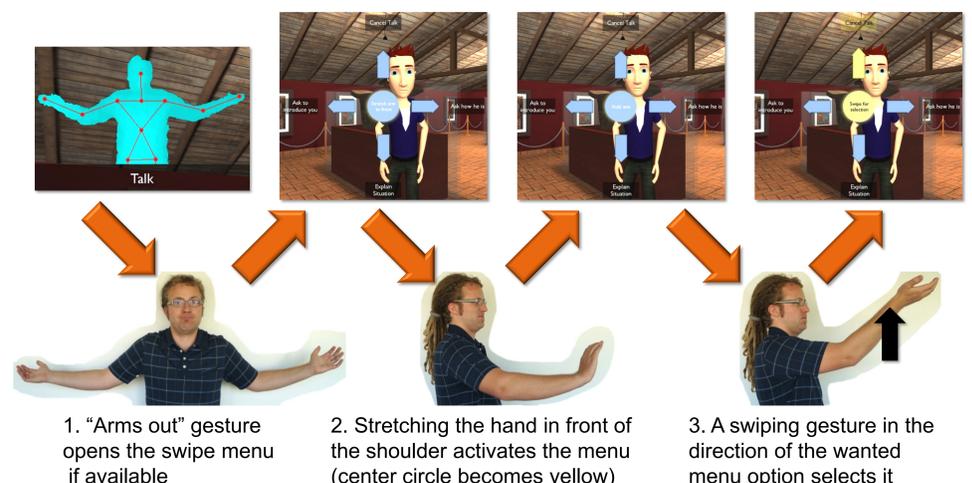
b) *Dialogue*

1) Yes
2) No
3) Maybe

- Implemented gesture candidates and related in-game actions (in brackets)



- *Swipe menu* for more complex dialogue actions



References:

- [1] J. Dias, S. Mascarenhas, and A. Paiva. Fatima modular: Towards an agent architecture with a generic appraisal framework. In Proc. of the Int. Workshop on Standards for Emotion Modeling, 2011.
- [2] S. Mascarenhas, R. Prada, A. Paiva, N. Degens, and G. J. Hofstede. Can i ask you a favour? - a relational model of socio-cultural behaviour. In Proc. AAMAS 2013. Springer Berlin / Heidelberg.
- [3] G. Hofstede, G. J. Hofstede, and M. Minkov. Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival. McGraw-Hill, New York, 2010.
- [4] J. O. Wobbrock, M. R. Morris, and A. D. Wilson. User-defined gestures for surface computing. In Proc. CHI 2009. ACM New York.
- [5] F. Kistler and E. André. User-defined body gestures for an interactive storytelling scenario. In Proc. INTERACT 2013.
- [6] F. Kistler, B. Endrass, I. Damian, C. Dang, and E. André. Natural interaction with culturally adaptive virtual characters. Journal on Multimodal User Interfaces, 2012.