

Informing the Design of Deictic Behaviors of a Web Agent with Spoken and Sign Language Video Data

Jean-Claude Martin, Jean-Paul Sansonnet, Annelies Braffort, and Cyril Verrecchia

¹ LIMSI-CNRS, BP 133 F-91403 Orsay cedex, France
{martin, jps, annelies.braffort, cyril.verrecchia}@limsi.fr

Keywords: deictic gestures, web virtual agents, multimodal corpus.

Deixis refers to linguistic features that relate utterances to the circumstances of space and time in which they occur. Pointing gestures are regarded as indicating an object, a location or a direction, which is discovered by projecting a straight line from the furthest point of the body part that has been extended outward, into the space that extends beyond the speaker [1]. Pointing show complex relations between multiple modalities such as gaze, hand, torso orientation and language [2]. The form of pointing adopted provides information about how the speaker wishes the object being indicated to be regarded [1]. Few virtual agents endowed with deictic capabilities [3-5] have been designed from experimental data collected with the target application. Furthermore, few studies have compared deixis in speaking and signing users [6]. In this paper we focus on the specification of deictic behaviors to be displayed by speaking and signing web agents during a presentation task. A video corpus was collected in the context of the target application in order to study the deictic behaviors in both vocal and signed languages. We also describe the DIVA web agents that we use for web based presentations.

1 Collecting Video Data about Spoken and Signed Deictics

In order to compare spoken and signed deictic on the same application, one speaking subject and one signing subject were videotaped by 2 cameras while presenting a schema displayed on the wall (Fig. 1). They were asked questions eliciting deictic behaviors such as “Show me the teams of the department”. Preliminary analyses of the collected data revealed that simple deictics show some similarities between speaking and signing subjects. Yet, some differences are observed for complex deictics, such as the use of the dominated hand for the signing subject.

2 Deictic Behaviors in the DIVA Web Agents

The collected data can be used to specify deictic behaviors in web based presentation agents. DIVA stands for DOM Integrated Virtual Agents. DIVA agents are integrated with the DOM (Document Object Model) tree structure of web pages. The objectives are: 1) an open programming framework for easy development of new experimental

agents in web-based applications; 2) a DOM-integrated software architecture making it easy for the DIVA agents to access the inner structure of the applications/services.

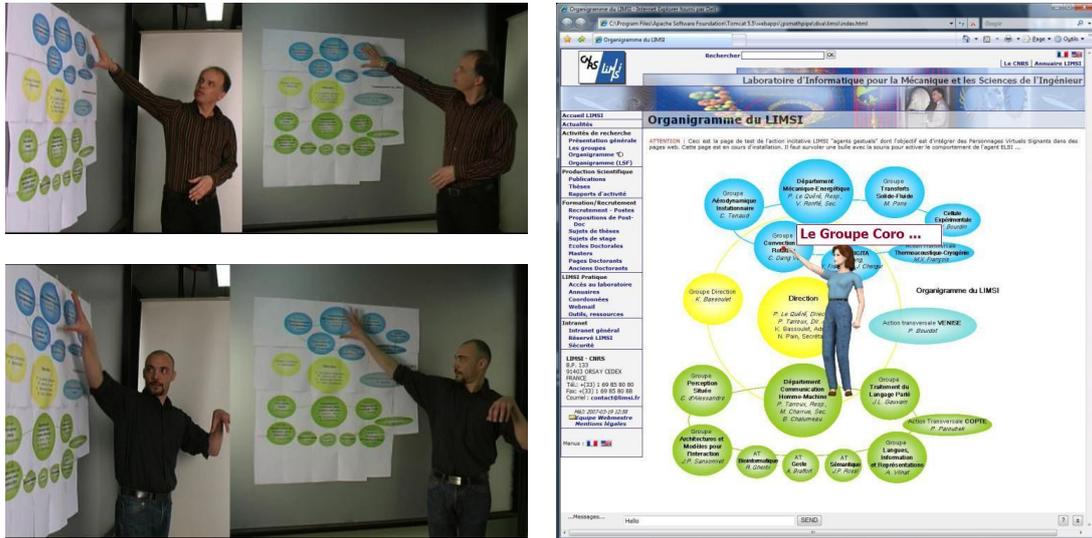


Fig. 1. Left: spoken and signed deictics during a presentation. Right: a DIVA agent is performing a deictic gesture towards an object of the DOM structure.

Future work includes the formal annotation and analyses of the collected data, the implementation and evaluation of the observed relations between modalities.

References

- [1] Kendon, A. *Gesture : Visible Action as Utterance*. Cambridge University Press, 2004.
- [2] Kita, S. *Pointing. Where Language, Culture, and Cognition Meet*. Lawrence Erlbaum Associates, London, 2003.
- [3] Lester, J. C., Towns, S. G., Callaway, C. B., Voerman, J. L. and P., F. *Deictic and emotive communication in animated pedagogical agents*. *Embodied Conversational Agents*. The MIT Press, p 123-154, 2000.
- [4] Noma, T., Zhao, L. and Badler, N. *Design of a Virtual Human Presenter*. *IEEE Journal of Computer Graphics and Applications*, 20, 4 (2000), 79-85.
- [5] Rist, T., André, E. and Müller, J. *Adding animated presentation agents to the interface*. ACM Press, Orlando, Florida, United States, 1997.
- [6] Cuxac, C. *The Expression of Spatial Relations and the Spatialization of Semantic Relations in French Sign Language*. *Language Diversity and Cognitive Representations*. Benjamins : Amsterdam, 123-142, 1999.