

Multimodality for face-to-face interaction between an embodied conversational agent and a human partner: experimental software platform

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The research work aims at developing multimodal systems enabling an embodied conversational agent and a human partner to engage into a situated face-to-face conversation notably involving objects of the environment. These interactive multimodal systems involve numerous software sensors and actuators such as recognizing/synthesizing speech, facial expressions, gaze or gestures of the interlocutors. The environment in which this interaction occurs should also be analyzed so that to maintain or attract attention towards objects of interest in the dialog. Perception-action loops of these multimodal systems should finally take into account the mutual conditioning of the cognitive states of the interlocutors as well as the psychophysical, linguistic and social dimensions of these multimodal turns.



In this context and due to the complexity of the signal and information processing to implement, the objective of this work is first to conceive and implement a wizard-of-Oz software platform for exploring the conception space by simulating parts of this interactive system by a human accomplice while other parts are taken in charge by automatic behavior. The first objective of the work is to study the impact of this faked versus automatic behavior on the interactions in terms of cognitive load, subject's satisfaction or task performance. The final objective is of course to progressively substitute to human intelligence and comprehension of the scene an autonomous context-sensitive and context-aware interactive system.

The software platform should warrant real-time processing of perceived and generated multimodal events and should provide the wizard-of-Oz with tools that are adequate and intuitive for controlling the part of the simulated behavior of the system.

This thesis will be conducted in the framework of the OpenInterface european project (FP6-IST-35182 on multimodal interaction) and the ANR project Amorces (human-robot collaboration for manipulating objects).

Expected results

Experimental:

- Prototype of the Wizard-of-Oz platform
- Recordings of multimodal conversations between an embodied conversational agent and a human partner using the prototype

Theoretical :

- Taxonomy of Wizard-of-Oz platforms
- Design of real-time Wizard-of-Oz platforms
- Highly modular software model of multimodal systems
- Multi-layered model of face-to-face conversation

Keywords

Interaction model, multimodality, multimodal dialog, interaction engineering, software architecture, Wizard-of-Oz platform

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