Universität Bielefeld

AG Angewandte Computerlinguistik
Dialogue Systems Group (DSG)
Faculty of Linguistics and Literary Studies, Prof. Dr. David Schlangen

The "AG Angewandte CL" develops and applies computational methods for the study of text and speech. A particular focus, organised within the "Dialogue Systems Group", is on studying natural and artificial systems that can engage in (mostly) verbal interaction. In our empirical work, we look at human-human interactions, both task-oriented dialogues as well as more conversational ones. We record such interactions in our lab, where we have facilities for making high-quality audio and video recordings, as well as capturing body motion and tracking facial parameters including eye gaze.

The empirical work motivates our modeling efforts, where again we're interested in two – ideally complementary – things: a) purely explanatory models, which may be implemented in simulations or functional system in 'toy domains', or may exist just "on paper", and b) practical systems, where the focus is more on building a useful computer interface than on staying true to the original, i.e. the human.

Topics of Interest

- Interaction Management. How do participants in a conversation coordinate their behaviour (taking turns at speaking, laughing synchronously, etc.), and how do they coordinate their understanding of what was said? How can what we learn about this be applied to artificial conversational agents?
- Incremental and Situated Processing. How does processing (interpretation and generation) of language work *online*, i.e. concurrently to the input stream, situated in time and space? Have developed toolkit for building incremental conversational systems: *http://inpro.tk*
- Natural Language Understanding. How can we mean more than we say? How can the inherent uncertainty of understanding best be modelled?
- Non-verbal Communication. What is the interplay between verbal and non-verbal communicative signals?

The Multimodal Interaction Lab

The mintLab provides the environment for research and teaching activities of the "Phonetics & Phonology Group" (Prof. Petra Wagner) and the "Applied Computational Linguistics / Dialogue Systems Group" (Prof. David Schlangen). The projects in the lab are centered around the recording and analysis of multi-modal conversational data.

The lab offers the following types of sensors for recordings:
- high-quality video and audio recording with multiple cameras and microphones
- motion capture, both marker-less and, for high-precision, with markers
- eye tracking, based on external stereo camera
- physiological sensors such as breathing belt

Data streams are integrated into a virtual reality environment for visualization and analysis.
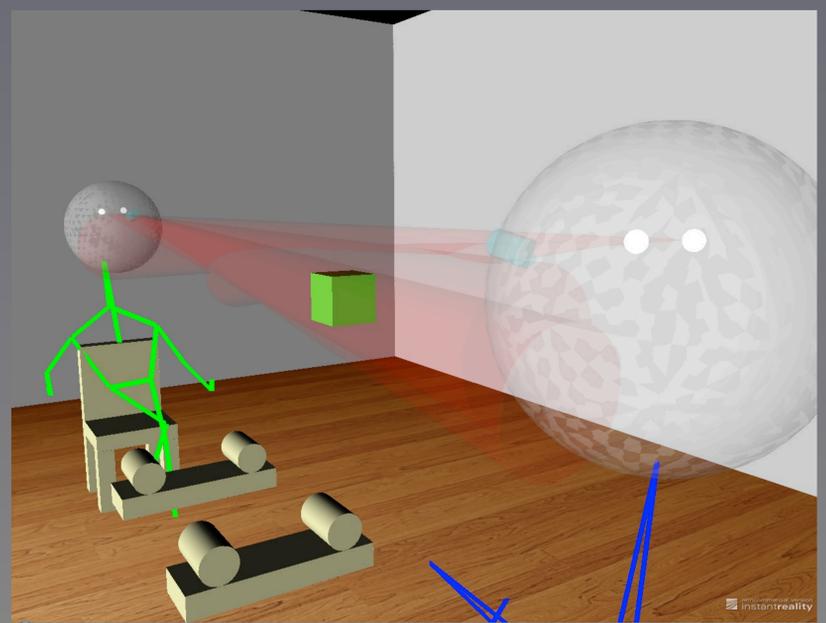
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