

Augmented iconicity

Visualizing and analyzing gestures with motion-capture technology

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In multimodal interaction research, motion-capture technology (MoCap) has proven to be a powerful tool to investigate furtive gestures and head movements in minute detail. Precise 3-D numerical data corresponding to finger/hand configurations and movements are tracked on a millimeter and millisecond scale. Visualizing otherwise invisible motion traces allows for new insights into the dynamic gestalt properties of communicative movements. The kinetic data streams further lend themselves to statistical analyses and pattern recognition, which opens up new avenues for gesture and sign language research.

This talk presents MoCap studies recently carried out in the Natural Media Lab (HumTec, RWTH Aachen). One focus is on qualitative analyses of iconic gestures whose iconicity was augmented through visualizing and freezing their motion trajectories. Affording graphic information, MoCap plots of gestures describing paintings revealed additional qualities, e.g., regarding underlying image schemas (Mittelberg 2013, 2014). MoCap was further used to visualize gestural diagrams representing travel itineraries dialogue partners drew into the air (Schüller & Mittelberg in press).

The second focus concerns quantitative approaches that involve normalizing numeric gesture data to aggregate movements across subjects. This allowed us to visualize the speakers' individual use of gesture space via heat maps (Priesters & Mittelberg 2013) or to find patterns in head gestures across speakers (Brenger & Mittelberg 2015). Gesture signatures of selected movement types further served as input for an algorithm searching the data set for similar trajectories, which afforded automated retrieval of all the tokens of a given gesture type (Beecks et al. 2016; Schüller et al. 2017).

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