

# Information technology for active perception

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In this talk we will present an overview of our objectives and current results related to gaze-based communication. Our goal is to integrate gaze into visual communication systems by measuring and guiding eye movements [1]. This requires (i) investigating and modelling how eye movements are determined by the visual input, and (ii) new technological developments for better eye tracking and fast gaze-contingent graphics. So far we have shown on an extensive data set that with natural videos a rather limited set of about 5-15 locations is sufficient to predict saccades. Simple nonlinear feature extraction can come close to predicting the set of candidate locations (our predictor is half as good as an ideal predictor based on the experimental data). Furthermore, gaze-contingent stimulation and foveation have been shown to significantly influence the eye movements without producing any consciously perceived pop-out effects; in most cases the stimulation goes unnoticed. Regarding the technological development, we will demonstrate gaze-contingent spatio-temporal foveation, remote single-camera eye tracking, and eye tracking integrated into head-mounted displays.

A poster on our ideas and objectives will also be presented.

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[1] <http://www.inb.uni-luebeck.de/Itap/>