

Cross-species differences in the perception of dynamic facial expressions.

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Abstract

In primates facial expressions represent an important channel to communicate emotions. Human and monkey expressions of the same emotion can be quite different. How efficiently can we learn to recognize facial expressions of another primate species, and can we understand human facial movements even if it is linked to faces of another species? **METHODS:** To clarify these questions, exploiting state-of-the-art technology in computer animation, we have developed a highly realistic model of a dynamically moving monkey head, which is animated by monkey and human motion capture data. The model is based on a monkey MRI scan, adding relevant surface structures, like skin and fur. Animation is based on a ribbon structure that mimics the monkey and human facial muscle system. In addition, we developed a corresponding realistic human head avatar model. Using a hierarchical generative Bayesian models (combining GP-LVMs and GPDMs), we are able to interpolate continuously between the facial movements representing emotional expressions in humans and monkeys. We validated the accuracy of the generated movements exploiting a ‘Turing test’ that contrasts generated and original captured motion. We investigate the categorization of two different emotions (anger and fear) with respect to human- and monkey-specific movements, presenting these movements on human and as well as monkey avatars. **RESULTS:** Preliminary results suggest that the generated motion is highly accurate and indistinguishable from the original motion-captured motion. Participants are able to recognize human expressions presented on a monkey avatar. The exact dependence of emotion categorization on motion and the avatar type (human or monkey) is presently being studied. This implies that human-specific facial motion can be recognized even when it is presented on the face of another primate species.

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