Recognition and Categorization of Objects and Faces

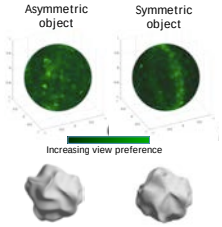
Psychophysics, Virtual Reality, Eye-tracking and Neuroimaging

MAX-PLANCK-GESELLSCHAFT

MPI FOR BIOLOGICAL CYBERNETICS

Lewis Chuang

How do humans move objects to retrieve features for object learning?



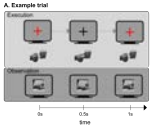
Active observers prefer to view objects along their axis of symmetry (when present).

- Roles of head and eye movements in unrestrained viewing conditions

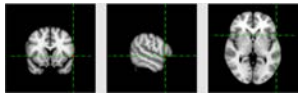
Stephan de la Rosa

Locating mirror neurons in the human brain using fMRI adaptation

Using fMRI adaptation, we found the first evidence for Mirror Neurons (MNs) in BA 44/45, the area considered the strongest candidate for MNs in humans.



We used stimuli that resembled those of monkey studies.



5 voxels in BA 44/45 showed all 3 necessary characteristics of MNs : motor and visual sensitivity, stronger sensitivity for object directed movements, and motor-visual adaptation.

Kathrin Kaulard

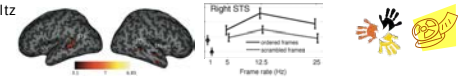
Categorization of facial expressions is influenced by dynamic information

Categorizing emotional and conversational expressions using both static and dynamic stimuli revealed that dynamic information allows better disambiguation, particularly for conversational expressions.

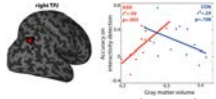
- Neural correlates of dynamic facial expressions
- Embodiment of facial expressions using TMS
- EEG brain dynamics during processing of facial expressions
- Age-related differences in processing of facial expressions

Johannes Schultz

Neural representations of facial motion and moving objects



Superior temporal sulcus is particularly sensitive to meaningful facial motion.

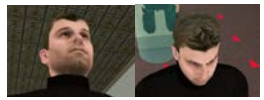


TPJ gray matter volume reduction in autism correlates with reduced detection of social interactivity.

- Representation of face species
- Representation of face expressions
- Human mirror system
- Grid cells and navigation

Isabelle Bülthoff

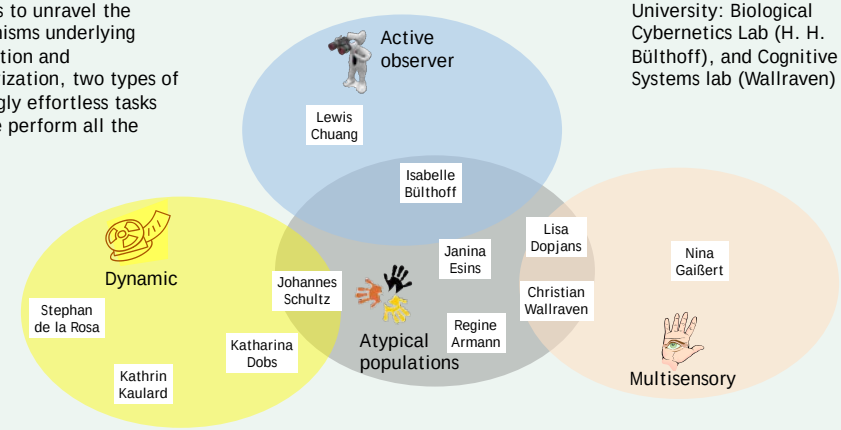
Face recognition using full-bodied avatars in a virtual environment



The pitch of learned viewpoints influences face recognition even when observers actively view sitting and standing avatars.

- Interplay between sex and identity recognition in familiar faces.
- Role of body size for face recognition
- What gives a face its ethnicity?
- Investigating the other-race effect in different face recognition tasks

The goal of the RECCAT group is to unravel the mechanisms underlying recognition and categorization, two types of seemingly effortless tasks that we we perform all the time.

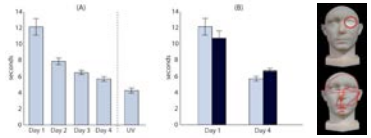


Collaborations with Korea University: Biological Cybernetics Lab (H. H. Bülthoff), and Cognitive Systems lab (Wallraven)

Christian Wallraven

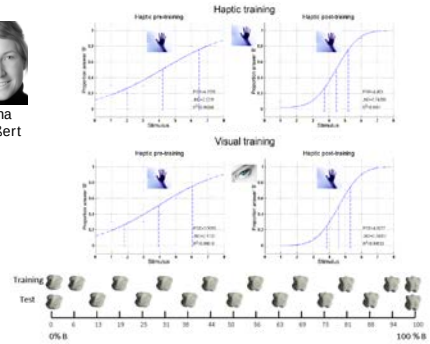
Lisa Dopjans

Multisensory object processing: objects and faces



Training of serial exploration of face masks is highly efficient and may even lead to an inversion effect. Graphs: RT from restricted (Day 1-4) and unrestricted viewing (UV). RT show an inversion cost for inverted faces on Day 4, but not on Day 1.

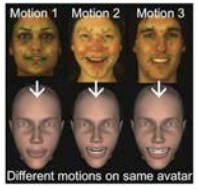
Nina Gaißert



Visual training improves haptic shape categorization of complex, novel 3D objects as much as haptic training does (and vice versa).

Katharina Dobs

The role of idiosyncratic facial motion in person recognition

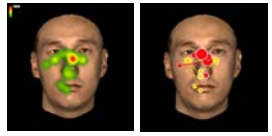


- Studying the knowledge about correlations between facial components
- Measuring the sensitivity to approximations of biological motion

We found that the participants' task and the kind of motion influence the effect of facial motion on person recognition. To this end, we use motion retargeting to dissociate facial motion from facial form.

Regine Armann

Cultural differences in eye movements when viewing faces

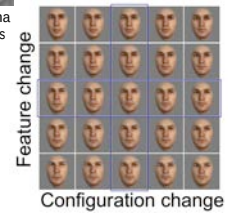


Comparing how Seoul and Tübingen participants look at faces when they judge face characteristics like trustworthiness or likeability.

- Neural representations of male and female face identities studied with fMRI adaptation
- Probing the representation of own- and other-race face identities in face-space using high-level face adaptation

Janina Esins

Heterogeneity in face blindness



- Development of a natural and parametrically controllable face stimulus set
- Comparing face recognition in Prosopagnosia and the Other Race effect
- Investigating the influence of a special diet on Prosopagnosia

Investigating the diversity of impairments in a large group of congenital prosopagnosics. For example, comparing the sensitivity to feature and configuration changes in faces.