6th Summer School

IRTG/CREATE – The Brain in Action

Sporthotel Grünberg
June 26 – July 02, 2022

Program of the IRTG Summer School 2022

Venue: Sporthotel Grünberg, Am Tannenkopf 1, 35305 Grünberg,
Tel: +49 6401 8020

June 26, 2022 *Sunday*	until 17:30	***Arrival***
	18:00 – 19:00	***Dinner***
	19:00 – 19:15	***Opening Address by Katja Fiehler and Frank Bremmer***
		Session chair: Moritz Schubert
		Keynote Lecture
	19:15 – 20:45	**Niko Troje**, York U, Canada *'Deictic consistency and the development of a new telecommunication platform'*
June 27, 2022 *Monday*	07:30 – 09:00	***Breakfast***
		Session chair: Laura Mikula
	09:00 – 09:30	**Elef Schellen**, Gießen U, Germany '*Neural markers of object size in early visual areas as evoked by moving stimuli*'
	09:30 – 10:00	**Pitigoi Isabell**, Queen´s U, Canada '*Age, gender, and task modulation of eye blink behaviour in humans*'
	10:00 – 10:30	**Pierre-Pascal Forster**, Gießen U, Germany '*What can we learn from self-environment interactions in virtual reality?*'
	10:30 – 11:00	***Coffee/Tea Break***
		Session chair: Frieder Hartmann
	11:00 – 11:30	**Brandon Caie**, Queen´s U, Canada '*Predictive Gating of Evidence Accumulation*'
	11:30 – 12:00	**Lucie Preißler**, Gießen U, Germany '*Emotion perception from human body movements in children*'
	12:30 – 14:30	***Lunchbreak and Mentoring Meetings***
	15:00 – 18:00	**IRTG-Team Building**
	18:30 – 20:00	***Dinner***
	20:00 – 21:00	***Meeting of the Joint Directorate***
June 28, 2022 *Tuesday*	07:30 – 09:00	***Breakfast***
		Session chair Lucie Preißler
	09:00 – 09:30	**Kevin Hartung**, Marburg U, Germany '*Find the fish! Advantage from contextual cueing in foraging tasks with eye tracking*'
	09:30 – 10:00	**Laura Mikula**, York U, Canada '*Adaptation to Pong bounce perturbations is quick and independent from wall tilt*'
	10:00 – 10:30	**Ilja Wagner**, Marburg U, Germany

		'*Interaction of dynamic error signals in saccade adaptation*'
	10:30 – 11:00	***Coffee/Tea Break***
		Session chair: Raphael Gastrock
	11:00 – 11:30	**Edward Ody**, Marburg U, Germany
		Influence of self-initiated, cued and involuntary movements on the perception of visual action consequences'
	11:30 – 12:00	**Jennifer Ruttle**, York U, Canada
		'*Does "learning to learn" happen in visuomotor adaptation?*'
	12:30 – 14:30	***Lunchbreak and Mentoring Meetings***
	14:30 – 15:00	Session chair: Ambika Bansal
		Sadra Fathkhani, Marburg U, Germany
		'*Encoding of 3D space in the macaque Ventral Intra Parietal (VIP)*'
	15:00 – 15:30	**Kathrin Pabst**, Marburg U, Germany
		'*Modeling the sky compass in the desert locust brain*'
	15:30 – 16:00	**Hongyi Guo**, Northwestern U, Canada
		'*Effect of Binocular Disparity on Flow Parsing*'
	16:00 – 16:30	***Coffee/Tea Break***
		Session chair: Johannes Keck
	16:30 – 17:00	**Nedim Göktepe,** Marburg U, Germany
		'*Saccadic suppression of displacement for visuohaptic stimuli*'
	17:00 – 17:30	**Raphael Gastrock**, York U, Canada
		'*Behavioral mechanisms that distinguish de novo learning from motor adaptation*'
	18:30 – 20:00	**Dinner**
June 29, 2022 *Wednesday*	07:30 – 09:00	***Breakfast***
		Session chair: Renate Reisenegger
	09:00 – 09:30	**Mahboubeh Habibi**, Marburg U, Germany
		'*Eye tracking identifies biomarkers in α-synucleinopathies versus progressive supranuclear palsy*'
	09:30 – 10:00	**Matt Laporte**, Queen´s U, Canada
		'*Optimal control of bimanual reaching by neutral networks*'
	10:00 – 10:30	**Leonhard Gerharz**, Gießen U, Germany
		'*Gaze deployment during aging in predictive and unpredictive environments*'
	10:30 – 11:00	***Coffee/Tea Break***
		Session chair: John Kim
	11:00 – 11:30	**Ambika Bansal**, York U, Canada
		'*Estimating travel distance differs depending on the direction, but not speed of self-motion*'
	11:30 – 12:00	**Frieder Hartmann**, Gießen U, Germany
		'*Measuring complex interactions between hands and objects during visually-guided multi-digit grasping*'
	12:30 – 14:00	***Lunchbreak and Mentoring Meetings***
		Session chair: Katja Fiehler & Frank Bremmer
	14:00 – 14:40	**TAM Session, Mareike Grotheer**, Marburg U, Germany
		'Human brain adaptations that support math and reading skills'

	14:40 – 15:20	**TAM Session, Ben de Haas**, Gießen JLU, Germany *'I Spy with my little eye - adventures in individual perception'*
	15:20 – 16:00	**TAM Session, Constantin Rothkopf** 'Towards a computational account of natural sequential behavior'
	16:00 – 16:30	***Coffee/Tea Break***
	16:30– 17:10	***TAM Session,* Katja Dörschner**, Gießen JLU, Germany *'Material Perception'*
	17:10 – 17:50	***TAM Session, Hamidreza Jamalabadi***, Marburg U, Germany 'Control theory in psychiatry: brain, symptoms, and behavior'
	17:50 – 18:30	***TAM Session,* Daniel Kaiser**, Gießen JLU, Germany *'Predictability and Prediction in Natural Vision*'
	18:30 – 22:00	***Dinner, IRTG 1901 Alumni and TAM Meeting***
June 30, 2022 *Thursday*	07:30 – 09:00	***Breakfast***
		Session chair: Sadra Fathkhani
	09:00 – 09:30	**Moritz Schubert,** Marburg U, Germany '*Extending the Bayesian Causal Inference of Body Ownership Modell Across Time*'
	09:30 – 10:00	**John Kim**, Toronto U, Canada '*Perception of spatial orientation using allocentric and egocentric references*'
	10:00 – 10:30	**Renate Reisenegger**, Marburg U, Germany '*Neurophysiological correlates of self-motion processing and navigation*'
	10:30 – 11:00	***Coffee/Tea Break***
		Session chair: Mahboubeh Habibi
	11:00 – 11.30	**Shanaa Modchalingam**, York U, Canada '*Effects of visual cues in an immersive environment on adaptation to internal and external errors*'
	11:30 – 12:00	**Elena Führer,** Gießen U, Germany '*Neural correlates of tactile suppression throughout reaching movements*'
	12:30 – 14:00	***Lunchbreak and Mentoring Meetings***
		Session chair: Hongyi Guo
	14:00 – 14:30	**Ben Cuthbert,** Queen´s U, Canada '*Exploring LIP-FEF dynamics during delayed saccades*'
	14:30 – 15:00	**Christina Schmitter**, Marburg U, Germany '*Neural correlates of sensorimotor and inter-sensory temporal recalibration: tDCS and fMRI results*
	15:00 – 15:30	**Johannes Keck**, Gießen U, Germany *'Neuralcorrelates of perceiving emotional body language in social interactions'*
	15:30 – 16:00	***Coffee/Tea Break***
		Session chair: Edward Ody
	16:00 – 17:30	***Keynote Lecture*** **Laurence Harris**, York U, Canada

	17:30 – 18:30	***Farewell Get-Together***
	18:30 – 20:00	***Dinner, Departure of German PIs***
July 1, 2022 *Friday*	07:30 – 09:00	***Breakfast***
	09:00 – 10:00	***Departure Canadian PIs***
	10:00 – 11:00	***Soft Skill Course "Time and Self-Management" Group 1***
	11:00 – 11:30	***Coffee/Tea Break***
	11:30 – 12:30	***Soft Skill Course "Time and Self-Management" Group 1***
	12:30 – 13:30	**Lunch**
	14:00 – 14:30	***Soft Skill Course "Time and Self-Management" Group 1***
	15:30 – 16:00	***Coffee/Tea Break***
	16:00 – 18:00	***Soft Skill Course "Time and Self-Management" Group 1***
	18:30 – 20:00	***Dinner***
July 2, 2022 *Saturday*	07:30 – 09:00	***Breakfast***
	10:00 – 11:00	***Soft Skill Course "Time and Self-Management" Group 2***
	11:00 – 11:30	***Coffee/Tea Break***
	11:30 – 12:30	***Soft Skill Course "Time and Self-Management" Group 2***
	12:30 – 13:30	**Lunch**
	14:00 – 14:30	***Soft Skill Course "Time and Self-Management" Group 2***
	15:30 – 16:00	***Coffee/Tea Break***
	16:00 – 18:00	***Soft Skill Course "Time and Self-Management" Group 2***
	18:30 – 20:00	***Dinner***

Abstracts: Key Note Speakers

Deictic consistency and the development of a new telecommunication platform

Nico Troje
Centre for Vision Research, Dept. of Biology, York University, Canada

I will start my presentation with reasoning about pictures and picture perception. What are pictures and what exactly distinguish them from the real things they are depicting? Once we identified these differences, I will introduce a tool, the Alberti Frame, that allows us to directly compare the perception of real things and their pictures under conditions that control for all differences individually. I will particularly focus on the roles that binocular disparity and motion parallax play in that context, and I will show that these two depth cues play very different roles in providing depth and sense of place to the visual experience.

In the second half of the talk, I will introduce you to an application that directly results from the research presented in the first part. I will demonstrate a new computer-mediated teleconferencing platform that, in contrast to systems such as Skype or Zoom, enables users to establish natural, dynamic eye contact. I will discuss the implications of that system and will conclude by talking about our plans to turn it into a new line of research on the dynamics of visual communication.

The sixth (or first) sense on planet Earth

Laurence Harris
Centre for Vision Research, York University, Toronto, Canada

The vestibular system (the sixth sense, really the first sense) has been largely overlooked. It was only recognized as an independent sense in 1914 when Robert Bárány won a Nobel prize for his demonstrating it. But actually the vestibular sense was the first sense to evolve and is fundamental to all aspects of perception; it may even be implicated in the emergence of consciousness. The vestibular system is exquisitely sensitive to accelerations of the head, including the constant and mysterious acceleration of gravity. In this talk I will describe some of the vestibular system's properties, functions and interactions with other senses. We can experimentally manipulate the relationship between vestibular and other senses using virtual reality and we can alter gravity's value using a centrifuge, but to truly reveal gravity's role we need to cancel it in low Earth orbit. Changing orientation relative to gravity or cancelling it altogether, affects your perception of how far away things are. It also affects how much visual motion is needed to perceive that you have traveled through a particular travel distance. These results will be discussed in terms of their practical consequences and the multisensory processes involved.

Abstracts

Presenting authors (underlined) are listed in alphabetical order

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Estimating travel distance differs depending on the direction, but not speed of self-motion

Ambika Bansal, Denise Henriques
Centre for Vision Research at York University, Canada

Although estimating travel distance is essential to our ability to move and navigate through the world, our distance estimates can be imprecise and inaccurate. When moving to the location of a previously seen target, the further the intended target distance, the more people tend to undershoot its location (Redlick et al., 2001). This phenomenon has been modelled as resulting from a leaky spatial integrator, meaning that these mis-estimations occur because (1) the integration "leaks" the further you move, and (2) there is a gain factor involved in transforming visual motion to travel distance (Lappe et al., 2007). The model has only been tested using forward translational movements, and postulates that perceived travel distance results from integration over distance and is independent of travel speed. Speed effects would imply integration over time as well as space. To test this, we measured participants' (n=15) perceived travel distance over a range of speeds (1, 3, 5 m/s) and distances in four different directions (up, down, forward, backward). Results show no effect of speed on either the gains or "leakage" (alphas). In terms of the effect of direction on gain, backward differed significantly from down (p=0.01), and up (p<0.001). In terms of the alphas, backwards differed significantly from forward (p<0.001), down (p=0.01), and up (p=0.004), and forward also differed significantly from down (p<0.05). These findings show that when making these distance estimates, we are likely integrating over space and not time, which means that Lappe's leaky spatial integrator model does not to be expanded to include a speed term. The effects of direction shows that transforming visual motion into travel distance differs depending on the direction of movement, and that the Lappe model can be applied to movement in these directions as well.

Predictive Gating of Evidence Accumulation

Brandon Caie, Gunnar Blohm
Queen's University, Kingston, Canada

We make predictions about the future by finding patterns in the past; these predictions are combined with sensory information when making decisions. Biophysical models of the decision-making suggest that the accumulation of sensory information is gated, acting as a brake on the onset of the decision process. Previously, it has been assumed that a feedforward processing of sensory information is gated, so the role of predictive feedback prior to the accumulation of decision evidence is unclear. Here, we cast gated evidence accumulation as a prediction problem, wherein an estimate of the timing of future sensory information is combined with current sensory information to control the onset of evidence accumulation. We tested our model on reaction times in a free choice saccade task, where participants directed eye movements as fast as possible to either of two asynchronously presented choice targets. We observed a strategy in which participants balanced reacting to targets with predicting when they would occur, resulting in anticipatory responses. Analysing reaction time distributions according to choice sequences revealed that this trade-off was shaped by the outcome of the previous trial (despite randomized statistics), and the delay between trials. Fitting a gated accumulator to reaction time data showed that previous-trial dependencies in an anticipatory process triggering decision evidence accumulation was necessary to explain the joint effect of trial history and inter-trial delay time. Together, this suggests that evidence accumulation is disinhibited by combining feedforward sensory processing with predictive feedback of its timing.

Exploring LIP-FEF dynamics during delayed saccades

Ben Cuthbert, Gunnar Bloom
Queen's University, Kingston, Canada

Despite its importance for everyday behaviour, the neural mechanisms underlying working memory remain unclear. While some single-neuron recordings in monkeys correlate with working memory performance, it has proven difficult to connect these data with existing computational models that include thousands of neurons. Here, I propose leveraging recent advances in machine learning to re-analyze existing data and bridge this gap. We will develop a flexible cortical network model by training an artificial recurrent neural network (RNN) to perform a memory task originally completed by monkeys. Individual units of the RNN will be validated with single-neuron data, and the population-level dynamics of the RNN will be compared to mechanisms proposed by existing network models.

Encoding of 3D space in the macaque ventral intraparietal area (VIP)

Sadra Fathkhani [1, 2], Baptiste Caziot [1, 2], Frank Bremmer [1, 2]
[1]*Neurophysics,* [1]*Philipps-Universität Marburg, Germany*
[2]*Center for Mind, Brain and Behavior, Universities of Marburg and Giessen, Germany*

Perceiving depth is one of the key features in our everyday life. When we are stationary, to grasp an object, we have to know the exact 3D position of that object. During self-motion, locating objects in our environment is crucial for our movement planning in order to avoid hitting possible obstacles or interact with them. During vision, each eye obtains an image of the world from a slightly different viewing angle. The difference between these two images is called *binocular disparity*. Binocular disparities provide distance information relative to the current plane of fixation in 3D space (version and vergence). Yet, it is still unclear if, and how disparity signals are integrated with eye-position signals to recover ego-centric distance.

To investigate this question, we recorded single-unit activity of 147 neurons from two awake macaque monkeys in the ventral intraparietal area (area VIP). Random dot stimuli were presented stereoscopically on a projection screen and consisted of a 800 ms fixation period, followed by a 2 second movement of the stimulus on a circular pathway. For each trial a fixation target was presented at a straight-ahead position at eye-level at one of three egocentric distances, inducing three

vergence angles (-2°, 0° or +2° relative to the screen) and the random dots had one of 7 possible disparities relative to the screen (-3° to +3°).
We found that most recorded neurons were jointly tuned to motion direction and disparity. In agreement with previous results, preferred direction of VIP neurons was independent of stimulus disparity. Furthermore, we found that a meaningful fraction of neurons were also tuned to vergence, both during fixation without further visual stimulation, and during motion stimulation. We conclude that area VIP has, in principle, all signals available necessary for computing depth (disparity scaled by vergence) and ego-centric distance. We are currently investigating whether these signals can be decoded from population activity.

What can we learn from self-environment interactions in virtual reality?

Pierre-Pascal Forster, Katja Fiehler
Experimental Psychology, Justus-Liebig-University Gießen, Gießen, Germany

Our sensory organs are tuned to action possibilities. Whether observing other people, looking for a ripe apple on a tree, or listening to the sound of an approaching car when crossing a street; we readily perceive affordances provided by our environment. To make use of those interaction possibilities, it is important to encode a spatial map of our environment. In other words, we need a spatial reference frame of ourselves in the environment surrounding us. Embodiment and presence are processes which can help us to create such a reference frame by dividing space between body and environment. We might perceive ourselves at the origin of this reference frame, and encode objects either relative to the self or other objects. Here, I would like to present recent findings on embodiment and presence, and expand these by insights from an ongoing project on spatial coding.
Overall, we demonstrate that a reduced visual paradigm is able to replicate the allocentric weight effect observed by Klinghammer et al. (2015). Additionally, this effect seems to be present when the target and landmarks are encoded together (study 1), as opposed to separately (study 2). Interestingly, these findings suggest that perceptual grouping of a target and surrounding landmarks influence whether allocentric information is used when reaching.

Neural correlates of tactile suppression throughout reaching movements

Elena Führer, Katja Fiehler
Experimental Psychology, Justus-Liebig-University Gießen, Gießen, Germany

The predictive suppression of tactile perception in the context of voluntary movements is a well-established phenomenon in behavioural experiments, yet the neural underpinnings are still debated. EEG-studies show a reduction of early somatosensory evoked (SEP) components during movement compared to rest, likely reflecting cortical processing in motor areas. In contrast, later

SEP-components are enhanced during movement. First, we aim to investigate how these behavioural and neural effects correlate by quantifying tactile suppression during a reaching movement using both psychophysical measures and SEPs. Second, we plan to examine how tactile suppression is modulated throughout the time course of a reaching movement. Behavioural findings indicate a down-regulation of tactile suppression as processing sensory feedback gains importance at critical points during the movement. Combining psychophysical measures and SEPs will give insight into the processing stage at which such a modulation of sensory processing during the movement occurs.

Behavioral mechanisms that distinguish de novo learning from motor adaptation

Raphael Gastrock, Denise Henriques
Centre for Vision Research at York University, Canada

When people encounter movement errors, they process these errors to correct for subsequent movements. Such error processing contributes to learning when we are either adapting well-known movements or acquiring new motor skills (de novo learning). Previous studies have compared these two types of motor learning, however, several aspects of de novo learning, including its retention and generalization, still warrant investigation. Here, participants completed an online version of the mirror reversal task, a paradigm that captures de novo learning mechanisms, across two sessions. In session 1 (N = 63), participants reached to three targets located in the upper-right quadrant of the workspace (5, 45, 85 degrees in polar coordinates), with the mirror located along the vertical midline axis. Although targets farther from the mirror axis produced larger errors, we found that asymptotic learning did not differ across target locations. Moreover, we observed quick progression in learning and no reach aftereffects, which are persistent deviations in reaches after perturbation removal and are indicative that adaptation has occurred. Interestingly, participants make faster and shorter movements towards the 5 degree target, while taking the longest amount of time and path to reach the 45 degree target. Participants returned for a second session (N = 48; days apart: M = 4.77, SD = 2.52), and showed retention of learning upon re-experiencing the perturbation. They then reached for corresponding target locations within the lower-right and upper-left quadrants of the workspace, followed by reaches using their opposite and untrained hand. We observed almost complete and near immediate generalization of learning to targets across the workspace and the opposite hand. Taken together, these results provide further behavioral mechanisms that distinguish de novo learning from adaptation.

Gaze deployment during aging in predictive and unpredictive environments

Leonard Gerharz, Eli Brenner & Dimitris Voudouris, Katja Fiehler
Experimental Psychology, Justus-Liebig-University Gießen, Gießen, Germany

When interacting with the environment, humans typically shift their gaze to positions of interest before executing body movements. With increasing age, both motor execution and sensory sampling are compromised. Older adults may compensate for their compromised vision by relying more on prediction or by increasing visual sampling by looking around more. To investigate such age-related compensation, younger (18-35 years) and older (>55 years) healthy adults fixated a cross on a screen, and upon its disappearance searched and reached for a visual target presented at one of two possible target positions. Contrast sensitivity for both groups was measured by a psychophysical forced-choice experiment.
The target position was either random (50/50), biased (80/20), or predictable (100/0), in different blocks of trials. We expected saccades to the target to be earlier (including predictive saccades) when it was possible to predict where the target would be, and overall, more saccades before fixating the target during search in less predictable conditions. If older adults rely more on predictive strategies, the difference in saccade latency should be more pronounced for this age group. If they rely more on active sampling, they should perform more saccades during the search period of less-probable conditions. Preliminary results confirm that saccades to the target had shorter latencies when the target position was predictable, but they were generally longer in older adults. Participants made more saccades when the target position was less predictable. This was more pronounced in older adults. Thus, aging appears to primarily result in increased visual sampling.

Keywords:
aging, prediction, action, gaze deployment, peripheral vision

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Saccadic suppression of displacement for visuohaptic stimuli

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[2] *Allgemeine Psychologie, Justus-Liebig-Universität Giessen, Giessen*

[3]*Center for Mind, Brain and Behavior, Philipps-Universität Marburg, Marburg, Germany*

The detection of object displacement is greatly reduced during saccadic eye movements. One explanation is that the visual system assumes a stable environment during saccades to counteract the distortion of retinal motion generated by the eye movements. Another explanation suggest that the visual system holds on to both pre- and post-saccadic information and separates them if there is a strong discrepancy. When a brief blank period is introduced just before the displacement, detection performance becomes comparable to performance without saccades. In both theories blanking

provides compelling evidence to the visual system about object displacement. In the current study, we tested whether haptic cues in visuohaptic objects are taken as evidence for external motion. To this end, we tested visual displacement detection performance in three conditions. In all conditions, a peripheral object was displaced by different step sizes during saccades. In two visual-only conditions, the displacement occurred either during the saccade or after a 300 ms blank period. The visuohaptic condition had additional haptic stimulation with congruent or incongruent displacement. The blanking significantly improved the detection performance. However, haptic stimulation did not improve or bias the detection performance compared to the visual-only condition. Our results suggest that haptic information does not reduce saccadic suppression of displacement.

Effect of Binocular Disparity on Flow Parsing

Hongyi Guo[1], Rob Allison
[1]*Center for Vision Research, York University, Toronto*

During locomotion, optic flow provides important information for detection, estimation and navigation. On the other hand, binocular disparity, which carries compelling depth information, can potentially aid optic flow parsing. We explored the effect of binocular disparity on observers' ability to detect and discriminate object motion during simulated locomotion with two experiments. In each experiment, twelve participants were recruited and tested on our wide-field stereoscopic environment (WISE). In the first experiment, the stimulus consisted of four spherical targets hovering in a pillar hallway presented under stereoscopic, synoptic (binocular but without disparity), and monocular viewing conditions. In each trial, one of the four targets moved either in depth (approaching or receding) or a frontal parallel direction (contracting or expanding). Participants detected the moving target during a simulated forward walking locomotion in a 4-alternative forced choice task. Adaptive staircases were adopted to obtain the thresholds of the target motion speed in each viewing condition. The results showed that when stationary, binocular summation contributed more to motion detection, but when moving, binocular disparity contributed more. In the second experiment, a target was presented each time in the same scene. Participants discriminated between forward and backward target motions in a 2-alternative forced choice task. There were three main findings. Firstly, binocular disparity had a significant effect on the discrimination bias, but binocular summation does not. Secondly, there was an enormous difference on discrimination bias between stationary and moving trials, but there was no significant difference between the absolute values of bias for forward and backward motion. This showed that the presence of locomotion affects flow parsing much more than reversing the locomotion direction. Thirdly, the mean bias resulted in the direction of the target staying approximately constant with respect to the pillars, potentially revealing the strategy being used.

Eye tracking identifies biomarkers in α-synucleinopathies versus progressive supranuclear palsy

Mahboubeh Habibi,[1,2] Brian J White,[2] Donald C Brien,[2] Brian C Coe, [1] Annette Janzen [1,] Wolfgang H. Oertel,[1†] and Douglas P. Munoz [2,3†]

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Objectives

This study 1) describes and compares saccade and pupil abnormalities in patients with manifest alpha-synucleinopathies (αSYN: Parkinson's disease (PD), Multiple System Atrophy (MSA)) and a tauopathy (progressive supranuclear palsy (PSP)); 2) determines whether patients with rapid-eye-movement sleep behaviour disorder (RBD), a prodromal stage of αSYN, already have abnormal responses that may indicate a risk for developing PD or MSA.

Methods

Ninety (46 RBD, 27 PD, 17 MSA) patients with an aSYN, 10 PSP patients, and 132 healthy age-matched controls (CTRL) were examined with a 10-minute video-based eye-tracking task (Free Viewing). Participants were free to look anywhere on the screen while saccade and pupil behaviours were measured.

Results

PD, MSA, and PSP spent more time fixating the centre of the screen than CTRL. All patient groups made fewer macro-saccades (>2° amplitude) with smaller amplitude than CTRL. Saccade frequency was greater in RBD than in other patients. Following clip change, saccades were temporarily suppressed, then rebounded at a slower pace than CTRL in all patient groups. RBD had distinct, although discrete saccade abnormalities that were more marked in PD, MSA, and even more in PSP. The vertical saccade rate was reduced in all patients and decreased most in PSP. Clip changes produced large increases or decreases in screen luminance requiring pupil constriction or dilation, respectively. PSP elicited smaller pupil constriction/dilation responses than CTRL, while MSA elicited the opposite.

Conclusion

RBD patients already have discrete but less pronounced saccade abnormalities than PD and MSA patients. Vertical gaze palsy and altered pupil control differentiate PSP from αSYN.

Measuring complex interactions between hands and objects during visually-guided multi-digit grasping

Frieder Hartmann [1], Guido Maiello[1], Constantin A. Rothkopf [3] and Roland Fleming[1,2]

[1] Department of Experimental Psychology, Justus Liebig University Giessen

[2] Centre for Mind, Brain and Behaviour (CMBB), University of Marburg and Justus Liebig University Giessen

[3] Institute of Psychology & Centre for Cognitive Science, Technical University of Darmstadt

When we grasp an object, we need to adjust our hand pose to the object's shape and select appropriate surface contact regions for our hand to establish a stable grip. How we select contact points has previously been studied by projecting markers attached to the fingertips onto the object. However, this approach does not allow measuring complex interactions between the hand and the object, e.g., when extended regions of the finger or palm are in contact with the object's surface. Here, we propose a workflow to estimate full contact regions from marker-based tracking data. Participants reach and grasp real objects while the 3D positions of markers attached to both the objects and selected locations on the back of the hand are being tracked. From the hand markers, we then derive hand joint poses and positions, and use a state-of-the-art hand mesh reconstruction algorithm to generate a mesh model of the participant's hand in the current pose and position. Using 3D printed objects realized from object meshes allows us to co-register hand and object meshes, and to estimate contact regions from intersections between meshes. We validate the approach by comparing the reconstructed hand meshes with video data synchronized to the motion capture. Finally, we provide proof-of-concept demonstrations of some of the kinds of studies into visually-guided grasping that can be realized using our approach.

Find the fish! Advantage from contextual cueing in foraging tasks with eye tracking

Kevin Hartung, Anna Schuboe

Cognitive Neuroscience of Perception and Action, Philipps-University Marburg, Marburg, Germany

Regularities and patterns in natural environments could give us advantages in pending tasks. Studies on contextual cueing show repeated distractor locations could guide attention to the associated target position, resulting in better performance compared to novel trials. This is even true when observers do not become aware of the manipulation of the arrangement. The present study transfers this concept to a foraging task, where multiple instances of a target could appear. Participants were asked to collect as many target instances as possible in an efficient way. The target was a moving cartoonish fish, the distractors three different kind of fishes. The fishes were swimming around stationary, cartoonish coral in differently colored background displays. We assumed that repeatedly presented constellations of corals, background and fishes would result in a contextual cueing effect, so that the participants can collect the targets faster in repeated compared to novel patches.

After online experiments provided d no evidence for an advantage for context repetitions, we performed a similar study in our lab to collect eye tracking data in addition. The more controlled

environment and the eye tracking data provide a better understanding of the learning process during the task.

Neural correlates of perceiving emotional body language in social interactions

Johannes Keck, Jörn Munzert
[1] *Department of Sports, Justus Liebig University Giessen*

Objective

As members of social species, the ability to recognize emotional states from body movements (Emotional Body Language, EBL) is strongly developed in humans. Yet the extent to which the brain connects external visual information such as EBL to internal subjective impressions such as positive or negative valence remains largely unknown. The goal of the study is to (I) identify human brain regions associated with emotional valence perception from EBL as well as to assess (II) whether subjective valence ratings (i.e. the perceived emotional intensity of a stimulus) influence activation magnitude and lastly (III) which brain areas reveal a distinctive pattern corresponding to respective valence impressions and thus suggesting a distinct coding of unique valence experience.

Method

In the present study a set of validated point light displays portraying emotional scenes (positive vs negative) vs their scrambled version was used. Participants determined the subjective valence of these scenes, while their brain activity was measured with functional magnetic resonance imaging (fMRI).

Results

Preliminary whole brain analyses revealed increased neural activation to emotional interactions regardless of positive or negative valence compared to scrambled stimuli in brain regions which are involved in action-observation (inferior parietal lobe, IPL) and mentalizing (lateral occipital cortex, LOC).

Discussion

Based on previous finding, we expect a clear separation of positive and negative valence in a priori defined regions of interest such as extra striate body area (EBA), premotor cortex (PMC), IPL, temporo-parietal junction (TPJ). We further expect a clear separation of valence presenting a representational dissimilarity with positive and negative valence on opposite ends of the continuum.

Perception of spatial orientation using allocentric and egocentric references

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People use a combination of allocentric (relative to external references or landmarks) and egocentric (relative to one's own body) representations when coding their surroundings. In this study, participants wore virtual reality headset and judged whether the virtual room (identical to the real room they were sitting in) was rotated (N = 20) – Pitch, Roll, and Yaw – or translated (N = 20) – up/down, left/right, and forward/backward – using either allocentric or egocentric reference frame. In allocentric tasks, participants compared the virtual room to the real room. In egocentric tasks, they compared the virtual room to their own body, i.e., sitting upright in the center of the room on a chair. The results revealed that participants were most sensitive in detecting room rotation in Roll, followed by Yaw, and worst in Pitch (average thresholds were 0.73°, 2.35°, and 3.41° respectively). For translation, people are more sensitive to the room being shifted in the left/right and up/down directions compared to being shifted in the forward/backward direction (average thresholds were 0.15m, 0.05m and 0.05m respectively). No significant differences were found in the thresholds between the allocentric or egocentric tasks, suggesting people may be equally good at using either reference frame when detecting room misalignment.

Optimal control of bimanual reaching by neutral networks

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In a popular view, motor control is largely contralateral: the functions of motor regions in one cortical hemisphere are specific to the control of muscles on the opposite side of the body. Then, why has ipsilateral activity of primary motor cortex (M1) been observed during single-arm reaches? Ecologically-relevant behaviours often involve multiple parts on both sides of the body's midline. For example, I may reach in two distinct directions with my two arms, while avoiding collisions with myself. Such movements presumably require coordination of control across the midline of the brain. We propose that the observed ipsilateral activity during unimanual reaching trials will emerge in an artificial neural network with bilateral symmetry (i.e. artificial "hemispheres"), trained on a mixed unimanual and bimanual reaching task, with the possibility of collisions in the bimanual case. However, a similar network trained only on a mixture of (left or right) unimanual reaches should not show ipsilateral activity. We expect the trained networks to also reproduce single-unit tunings and population dynamics observed in M1 during similar reaching tasks in monkeys.

Adaptation to Pong bounce perturbations is quick and independent from wall tilt

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The human motor system can adapt to unexpected perturbations during ongoing movements. Except for target jump studies, most of the research focused on adaptation to perturbations applied to the hand, such as force field or visuomotor rotation. But less is known about how we adapt to perturbations affecting objects that we interact with. For instance, do participants take into consideration visual cues in the environment to reduce their errors and correct subsequent motor commands? To investigate this question, we used an online version of the pong game in which participants intercepted a ball using a paddle controlled by their cursor. We manipulated the post-bounce ball trajectory to be congruent or not with the orientation of the bouncing wall. The "trained tilt" group (n = 34) adapted to the congruent condition while the "trained horizontal" group (n = 36) adapted to the incongruent condition. If visual cues are effectively used by participants, the "trained tilt" group should exhibit faster and/or more complete adaptation than the "trained horizontal" group. Our results showed that the perturbation significantly decreased the interception success rate. Both groups showed typical markers of motor adaptation: large initial errors upon perturbation introduction, followed by rapid error reduction and aftereffects (errors in the opposite direction) when the perturbation was removed. However, we did not observe significant differences in interception success rates or errors between the "trained tilt" and "trained horizontal" groups. Our findings suggest that participants quickly adapted to the dynamics of the pong ball although the tilt of the bouncing surface did not contribute to their performance. Furthermore, this experiment provides evidence that adaptation to external perturbations applied to a moving object is possible in online settings. These results encourage further research on motor adaptation using more naturalistic stimuli and gamified tasks, in real-world or virtual reality environments.

Effects of visual cues in an immersive environment on adaptation to internal and external errors

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When performing motor tasks, we improve performance by modifying future movements to correct for observed errors. The assigned source of the errors can affect many aspects of adaptation including its generalizability and the updating of internal models. Adaptation to errors assigned to internal sources (e.g., our arm) is often specific to the arm and is poorly generalized when acting with a different effector. Adaptation to errors assigned to external sources (e.g., the environment) on the other hand, is agnostic to the effector being used but may be specific to the environment. Since the cause of an error is often ambiguous, sensory cues can be used to estimate the likely source of the error. We developed a task in which motor errors could be assigned to internal or external sources. Participants made arm movements to roll a ball toward targets in a head-mounted virtual reality environment. We induced errors by either modifying the mapping between the arm movement and the initial movement of the ball, or by applying a change in the ball path only after the release of the ball. Additionally, we used informative visual cues to signal changes in the environment to increase external error attribution. Pilot data show visual cues can facilitate the assignment of errors

to external sources. The visual cues can be dynamics of the ball movement or global environmental changes. External error attribution can in turn allow for rapid switching between motor memories.
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Influence of self-initiated, cued and involuntary movements on the perception of visual action Consequences

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Efference copy-based forward model mechanisms may help us to distinguish between self- and externally-generated sensory consequences. Previous studies have shown that neural activity (for example ERPs) and perception (for example, perceived intensity) associated with self-initiated sensory consequences are reduced (sensory suppression). Furthermore, involuntary movements (produced by TMS, nerve stimulation or a passive movement device that moves the finger using an electromagnet) do not produce attenuated responses, suggesting that movement planning is necessary to produce sensory suppression. Self-initiated and externally cued movements also differ in pre-movement neural activity and in the time course of processing within the supplementary motor area. However, it is unclear whether the prediction of sensory consequences also differs between these two movement types. The purpose of this study was to investigate neural and behavioural responses to visual stimuli triggered by self-initiated and externally-cued movements. Participants performed self-initiated (active), externally-cued (cued) or involuntary (passive) movements. Participants made *active* (the movement couldn't be made until 700ms after a tone cue to ensure a self-initiated movement) or *cued* movements (as quickly as possible after the cue). Movements could also be *passive* (the finger was pulled down by an electromagnet). The movements triggered two successively presented grey discs and participants were asked to indicate which of the discs appeared to be brighter? We measured ERPs and subjective perception of brightness. There was a significant main effect of action type on amplitude of the N1-P2 complex. Post hoc tests revealed that the N1-P2 peak to peak amplitude was lower in the active condition than the passive condition. However, the amplitude in the cued condition did not significantly differ from either active or passive. Subjective intensity perception did not significantly differ between the three movement types. The results reinforce the idea that movement planning is necessary to produce neural (N1-P2) suppression. However, we found no evidence that externally cueing movements modulates subsequent stimulus processing.

Modeling the Sky Compass in the Desert Locust Brain

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Navigation relying on a a sense of heading direction is a phylogenetically widespread cognitive ability. Insects are great model organisms for its study as their comparably simple brains produce efficient strategies to navigate in complex environments. In the central complex of the insect brain, multimodal cues are fused into a compass-like head direction representation. Based on the proposed connectivity of columnar neurons in the central complex of the desert locust, we designed a computational model to examine how these neurons could maintain a stable representation of heading direction and how a shift of the compass could be induced by motion signals when the animal turns. We show that a circuit that differs from previous models of the insect central complex regarding its excitation-inhibition balance can achieve a stable heading estimate, too. In line with the insect and vertebrate literature, our model requires a multiplicative motion input effect to shift the compass signal, implemented via a direction-dependent modulation of the synaptic weights in our model.

Age, gender, and task modulation of eye blink behaviour in humans

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Spontaneous blinking of the eyes is a crucial physiological behaviour allowing for corneal lubrication and ocular protection. However, it tends to occur at a higher rate than necessary for these purposes alone, suggesting that additional cognitive, social, or environmental factors may be involved. It has been shown that blinks occur at implicit breakpoints in a task and are sensitive to internal mental states related to attention and cognitive demand. Here, our objective is to characterize eye blink behaviour in healthy controls performing two tasks: a structured interleaved pro- and anti-saccade task and an unstructured video-viewing task. We collected video-based eye tracking data from 608 participants spanning the ages of 5-93 years (390 female, 218 male) on these tasks, and analyzed blink timing and duration. We found differences in blink behaviour between age groups, with blink rate increasing from childhood to adulthood. Female blink rate was higher in those of reproductive age, suggesting a strong hormonal modulation. Additionally, blink behaviour was highly organized within both structured and unstructured tasks, occurring at times with minimal task demands. Participants suppressed eye blinks more often on anti-saccade trials than pro-saccade trials, consistent with stronger inhibitory control on anti-saccade trials. These findings suggest that blink behaviour can contribute to the identification of non-invasive biomarkers related to cognition, memory, and motor ability, which have important implications for early disease diagnosis.

Emotion perception from human body movements in children

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Body movements, similar to faces and speech, convey emotions. Even infants are able to recognize emotions from action kinematics of single persons (Addabbo et al., 2019). However, very few studies have investigated the role of social interactions in emotion perception from body movements in childhood. Perceiving such interpersonal emotional information is important for the understanding of social intentions and social behavior.
This study aims to find out how preschoolers and adults perceive happy and angry actions from human kinematics. Therefore, we tested 5-year-old children and adults with point-light displays (PLD) of emotional body movements (happy, angry) presented as pairs (dyads) and as single actors (monads). Participants were asked to categorize the PLD as happy or angry via button press. Furthermore, we quantified kinematic and postural intra- as well as interpersonal features in the PLDs using SAMI toolbox (Zabicki & Keck, 2021) and analyzed the extent to which they are related to the participant's judgments.
Our results showed higher emotion recognition accuracies for interactive dyads compared to monads in both children and adults, as expected. Interestingly, children showed higher recognition accuracies for happy compared to angry monads (positivity bias), whereas adults showed higher recognition accuracies for angry compared to happy monads (negativity bias). SAMI analyses revealed that emotion perception in monads was driven by similar intrapersonal PLD features in children and adults, mainly by limb contraction and vertical movement. Emotion perception from dyads was driven by a variety of interpersonal features, mainly by interpersonal distance, the synchronization of accelerations, the time spent in the personal space of the counterpart. Thus, although children and adults differ in their ability to categorize happiness and anger from emotional body movements in monads, they use similar intrapersonal PLD features for emotion recognition.

Neurophysiological correlates of self-motion processing and navigation

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Navigation through the environment is a task that humans and other animals carry out daily. This behavior can be studied in a variety of sensory modalities. For example, on one hand, the processing of optic flow (visual self-motion stimuli) has been related to a visual cortical network in macaques and in humans. On the other hand, several studies have shown evidence for the hippocampal formation, to be involved in giving rise to a cognitive map: a representation of the spatial environment to support locating oneself and the guidance of future navigational action. Notably, these two different systems have been studied separately so far, and little is known about the interactions between the hippocampal formation and visual cortical regions during self-motion and path integration.
Our first aim is to bridge the gap in understanding of the functional relationship between the neural self-motion- and the spatial navigation-network by studying the interaction between the hippocampal formation and visual cortical regions during path integration. To this end, I currently record

intracranial EEG from presurgical epileptic patients solving a behavioral task, in which they have to reproduce a previously seen self-displacement. We hypothesize to find a neural correlate of subjective distance estimation.
Second, we aim to explore if and how eye movements, or the lack of them, affect the processing of self-motion information. To this end, I have started to test healthy human participants in a distance discrimination task, during which they either have to fixate a central target, or are allowed to make free eye-movements. We hypothesize that performance is more accurate in case eye movements are allowed.
In my presentation, I will present first results from both studies.

Does "learning to learn" happen in visuomotor adaptation?

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People can quickly adapt their movements to various perturbations, which is usually attributed to explicit components. However, it is unknown how quickly implicit components of learning emerge, as this has never been measured directly but has merely been inferred as the residual aspect of explicit learning. Here, we will discuss a series of experiments where we directly measure implicit components of learning, like reach aftereffects and changes in estimates of hand location, following every single training trial when reaching with a 30° visuomotor rotation. In stark contrast to the assumption that the implicit stage of learning is slow, we find that these direct measures of implicit learning asymptote almost immediately. In our first study, reach aftereffects and changes in hand localization hit their usual maximum magnitude within respectively three and one training trials. In our second study we test if and by how much this rapid implicit measure of learning can be slowed. We test both terminal cursor feedback as well as the absence of movement during training ("passive exposure"), so that there are no sensory prediction errors guiding adaptation. But hand localization shifts still saturate within 3-4 trials. Even in our third study, where we change the perturbation size and direction every 12 trials, we see immediate changes in reported hand location. In short, while updated estimates of hand position and reach aftereffects do not reflect explicit strategies to counter a perturbation, they change very quickly and robustly. Our results also challenge the untested assumption that the time course of implicit learning can merely be inferred from that of explicit learning. These two processes likely occur simultaneously and mostly independently.

Neural markers of object size in early visual areas as evoked by moving stimuli

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Neural activity in early visual areas codes, among other things, for object size. Due to the retinotopic nature of these areas, excitation of neurons here is proportional to excitation of the retina. Previous research found that not only retinal size, but perceived size of objects contributes to early visual activity. In an attempt to study early visual activity in response to object size in more dynamic environments, a series of experiments was conducted by the author combining virtual reality and steady state visually evoked potential (SSVEP) EEG recordings. These experiments involved stimuli moving and changing size during trials. Resulting data was inconclusive and sometimes counterintuitive. For one, early visual areas seemed to correspond not just to physical and retinal size, but to distance to the stimulus as well. Possible reasons for this are methodological, i.e. the inherent constraints of virtual reality technology and EEG data quality, though it cannot be ruled out that early visual areas do indeed process more information than previously thought. In order to remove the methodological constraints of previous experiments, we constructed a moving monitor setup. This allows us to record EEG data while participants observe stimuli that move towards and away from them in a controlled manner. The present study describes EEG markers of early visual area activity when observing objects in motion, moving towards or away from an observer.

Neural correlates of sensorimotor and inter-sensory temporal recalibration: tDCS and fMRI results

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The characteristic temporal relationship between actions and their sensory outcomes allows us to distinguish self- from externally generated sensory events. However, the complex sensory environment can cause transient delays between action and outcome calling for flexible recalibration of predicted sensorimotor timing. Since the neural underpinnings of sensorimotor temporal recalibration are largely unknown, we used (1) cerebellar transcranial direct current stimulation (ctDCS) to directly investigate the involvement of the cerebellum and (2) fMRI to further examine the neural correlates of this process.
In adaptation phases, participants were exposed to constant delays of 150ms between actively or passively generated button presses and visual or auditory sensory outcomes. Recalibration was assessed unimodally or cross-modally in a subsequent test phase during which variable delays (0-417ms) between button press and visual or auditory outcome had to be detected.
This procedure was applied (1) while receiving either anodal, cathodal, dual-hemisphere or sham ctDCS (2) or while lying in an MRI scanner.
Results of the tDCS experiment indicated that after anodal ctDCS and visual adaptation, a temporal recalibration effect occurred in the auditory modality while it was absent in vision. As the adaptation modality was visual, effects in audition suggest that recalibration occurred on a supra-modal level. In active conditions, i.e., in a sensorimotor context, facilitation of recalibration occurred at the delay level closest to the adaptation delay, suggesting a precise cerebellar-dependent temporal recalibration mechanism. In passive conditions, i.e., in a purely inter-sensory context, facilitation of recalibration was overall stronger and tuned to larger delays.
For the fMRI experiment we expect a continuous reduction of prediction error responses in the cerebellum over the course of temporal recalibration specifically for active movement conditions. We further expect BOLD suppression in sensory cortices (i.e., reduced activation for processing predictable actively generated outcomes vs. passively presented stimuli) to increase over the course of

the recalibration process due to increasing predictability of the delayed action-outcomes. This pattern of results is expected to occur also in a cross-modal context where the outcome modality differs between adaptation and test phases indicating supra-modal action-outcome processing.

Extending the Bayesian Causal Inference of Body Ownership Modell Across Time

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Bayesian Causal Inference (BCI) models multisensory perception as inference about two causal structures: either the sensory data stems from several separate causes or from a common cause. If the sensory evidence supports a common cause, the multimodal sensory input is integrated into a single percept. BCI has been applied to the rubber hand illusion, in which the subject integrates tactile stimulation with seen brush strokes on a rubber hand and experiences said hand as their own. Among other applications, a model of body ownership is relevant for virtual reality design, especially for strengthening avatar embodiment. In previous work, we have criticized the applied BCI model for its extraordinarily wide priors. Here we investigate whether the priors can be narrowed by increasing the sensory evidence. We try to accomplish this by extending the model across time. Preliminary results look encouraging, but further research, especially psychophysical experiments to inform the parameter choices, is needed.

Interaction of dynamic error signals in saccade adaptation

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Saccade accuracy is maintained by a learning mechanism called saccade adaptation. Previous studies used singular stimuli and found that erroneous saccades are only corrected when feedback about their accuracy is available shortly after movement offset (e.g., Bahcall & Kowler, 2000). However, naturalistic environments can be filled with many dynamic objects and saccade adaptation has to use the right object at the right time to maintain saccade accuracy in an ever-changing
world. Although a previous study showed that delayed feedback, available only long after saccade offset, can drive saccade adaptation if it is task-relevant (Wagner et al., 2021), it is currently unknown how delayed feedback from relevant stimuli interacts with conflicting feedback signals from temporarily proximate irrelevant stimuli.
We instructed participants to make a vertical saccade towards an unfilled circle. Inside the circle, two squares were shown for 150 ms each, successively at opposite locations: The first square appeared upon saccade detection and the second square appeared 200 ms after the offset of the first square. Participants were instructed that they either have to discriminate which side of the first (discriminate-first-condition) or the second square (discriminate-secondcondition)

had a gap.
We observed saccade adaptation towards the first square in the discriminate-first-condition. However, no adaptation to either square was observed in the discriminate-second-condition; instead, primary saccades were directed to the center of the circle and additional secondary saccades were used to bring gaze close to the location of the second square. Importantly, this was not due to the oculomotor system ignoring delayed feedback: Saccade adaptation was observed in a control condition, where only the second square was shown.
We conclude that saccade adaptation can suppress signals from irrelevant stimuli. However, delayed postsaccadic accuracy feedback is not obligatory used for saccade adaptation if multiple, temporally proximate error signals are available around saccade offset.

Predictive Gating of Evidence Accumulation

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The prevalence of screen-based communication makes it important to understand how a person's gaze is perceived when viewed on screen. A better understanding of screen-based gaze perception would facilitate the enhancement of communication tools, thus increasing communication efficiency.Motion parallax is an important depth cue that enables participants to perceive objects more accurately in real and virtual worlds. The presence of motion parallax provides context to directional cues such as hand gestures or eye gaze. This study aims to examine whether the addition of simulated motion parallax increases participants' sensitivity to the gaze direction of faces on a screen. By using motion capture technology to track a user's head location, we control a virtual camera whose movement in a virtual environment corresponds with the user's own motions. This allows the image on the screen to be dynamically rendered based on their position. The study examines two conditions: one uses head tracking to simulate the view onto a 3D head behind a window framed by the computer screen. In the other condition we present static images of the same head on the screen. In the Window condition the avatar's head and eye gaze are set to varying angles and users are asked to move themselves into the line of sight of the avatar. Once they reach a location at which they perceive eye contact their head location is recorded. The angular difference between the participant's head location and their expected position is then analyzed. In the static condition, the avatar's total gaze (head gaze plus eye gaze) is shown at angles between -11° and 11° deg around the fronto-parallel view, and participants indicated whether they perceived the head looking to their left or right. Both datasets are modelled by normal distributions such that means (accuracy) and variance (precision) of eye gaze perception can be assessed and compared. In the static condition, participants had an average mean of 0.87° and an average standard deviation of 6.2°. In the motion parallax condition, the average mean was 3.5° and the average standard deviation was 3.1°. The difference between the standard deviations in the two conditions was found to be statistically significant (p=0.02).

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Time and Self Management

An exclusive workshop for IRTG (1901) The Brain in Action – BrainAct

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Date: July 1, 2022, 9:00 am–5 pm, or July 2, 2022, 9:00 am–5 pm
Venue: Sporthotel Grünberg, Am Tannenkopf 1, 35305 Grünberg
Trainer: Dr. Julia F. Späth, www.fit4trust.com

The objective of this one-day workshop is to optimize your personal time and self-management during the PhD period. The overall focus lies on the improvement of your current scientific work situation. Working in science often implies a conflict in allocating time between own research and the involvement in other projects. In addition, there is currently more than ever before the need to cope with uncertainty in your time schedule and delays in information exchange. Good time and self-management enables you to stay flexible and to actively react to unforeseen events.

In the workshop you will reflect on strengths and weaknesses of your personal work habits, including the issue of procrastination. In various tutorials you will gain insight into techniques and best practices of time and self-management, e. g. how to focus on priorities, how to gain free space, and how to use your personal power peaks. We will discuss daily disturbances in your current working environments and develop respective counteraction procedures to enable the efficient achievement of your personal goals.

The workshop aims at sharing experiences and best practices in the group of participants. You will be inspired to test out and discuss new approaches for your personal time and self-management.

Intended learning outcomes
You will be able to

- improve your time and self-management by applying strategies and techniques,
- identify priorities and organize your tasks accordingly,
- develop strategies to counteract disturbances,
- define your personal power peaks, and to use them in planning your activities on a daily and weekly basis.

Target group
Both workshops will be held in English and can be attended by a maximum of 10 participants. This is an exclusive workshop for members of the IRTG The Brain in Action – BrainAct.

The trainer
Dr. Julia F. Späth studied business education at the Johannes Gutenberg University Mainz and wrote her PhD thesis on the interdisciplinary topic of "Trust in Organisations". She founded Fit4Trust Consulting in 2008 to lead projects for organizational and human resources development. Julia is coaching scientists, project teams, and executives in the fields of self management and decision making.

Softskill course 'Time and Self Management' group assignment

(Softskillcourse will take place in *Grünberger Zimmer*)

Group one, Juli 1st

Bansal, Ambica
Cuthbert, Ben
Forster, Pierre Pascal
Gerharz, Leonard
Göktepe, Nedim
Modchalingam, Shanaathanan
Pabst, Katrin
Pitigoi, Isabell
Preißler, Lucie
Reisenegger, Renate
Ruttle, Jennifer
Schmitter, Christina
Schubert, Moritz
Wagner, Ilja

Group two, Juli 2nd

Caie, Brandon
Fathkhani, Sadra
Führer, Elena
Gastrock, Raphael
Guo, Hongyi
Habibi, Mahboubeh
Hartmann, Frieder
Hartung Kevin
Keck, Johannes
Kim, John
Laporte, Matt
Mikula, Laura
Ody, Edward
Schellen, Elef
Vembukumar, Viswajit