

# Symposia

# Symposia

Several thematic symposia will highlight the methodological and technical state of the art in important domains. These sessions are of interest to a broad range of conference delegates.

The conference contains the following symposia:

- Improving Sports Performance
- Large and Small Scale Physiological Recordings in Behavioural Context
- Measuring Surgical Behavior
- Monitoring of Social Interactions and Initial Signs of Conflicts in Isolated Groups during Long-Term Missions
- The Significance of Voluntary Exploration to Monitor Emotional Behavior of Rodents
- Unveiling Affective Signals

## SYMPOSIUM

### Improving Sports Performance

Date: Wednesday, August 25  
Time: 10:00-12:10  
Location: Planck  
Chairs: Patricia de Cocq (Wageningen University, The Netherlands) and  
Carolien Munsters (NHB Deurne, The Netherlands)

In top class sports, performances of athletes are very close. Small improvements in technique can make the difference between winners and losers. A combination of behavioral analysis and physiological data can play a key role in improving sports performance and developing innovative training tools. It is a challenge to incorporate modern measuring equipment into the daily training of athletes. The measurements should not disturb the athlete and coach and in the same time should record all data necessary. Measurement equipment should therefore be small, wireless and user friendly. Several sports face this challenge.

#### Program

- 10:00 Performance monitoring in equine sports.  
Patricia de Cocq (Wageningen University, The Netherlands) and  
Carolien Munsters (Utrecht University, The Netherlands).
- 10:20 Methodological approach to evaluate interactive behavior's in Team games: an  
example in Handball.  
João Prudente (University of Madeira),  
Júlio Garganta (University of Porto, Portugal) and  
M.Teresa Anguera (University of Barcelona, Spain).
- 10:40 *Coffee break*
- 11:10 The use of video for improving swim start performance.  
Sander Schreven and Roald van der Vliet (Innosport, The Netherlands).
- 11:30 The measurement of the visual search behavior in sport. Can it be a new  
avenue into talent identification and development?  
Geert Savelsbergh (Institute Move VU University, The Netherlands).
- 11:50 Better performance in Marathon running .  
Cees van Bladel (Sports and Technology, The Netherlands).
- 12:10 *End of session*

## SYMPOSIUM

### Large and Small Scale Physiological Recordings in Behavioural Context

Date: Friday, August 27

Time: 10:00-15:40

Location: Einstein

Chairs: Gernot Riedel and Bettina Platt (University of Aberdeen, United Kingdom)

Coordinated rhythmic activity of neural populations gives rise to oscillatory local field potentials and large scale electroencephalograms at a broad range of frequencies. Synchronous rhythms are likely to reflect relevant information and frequency shifts may underlie experience- or behaviour-dependent functional interactions between neuronal assemblies. While the most common mode of synchronisation may be established through the local cohesive discharge of neighbouring cells or neurones with direct synaptic contacts, global synchronisation may also take place to establish widespread assemblies of disparate neural populations. To detect and analyse such global and local electrophysiological traits is one of the current challenges in basic and translational neuroscience.

This aim is made even more difficult when attempting to correlate electrophysiological data with stage- or task-related behaviour or even cognitive processes. It requires cohesive and linked recordings of physiological, spatial and behavioural responses synchronised and time-stamped in real time. Once aligned in the spatio-temporal domain, analysis needs to implement novel sorting strategies for correlational analysis applying linear and/or non-linear algorithms.

In this symposium, we seek to review some methodical progress focussing on large scale (global EEG) as compared to small scale (single unit) recordings in clearly defined behavioural paradigms in rodents. Speakers are selected because they utilise different technical products for physiological measurements (using cable, transmitter or microchip) and video-observation software of differing specification. We seek to generate intense discussion highlighting both the advantages but also the limits of each system and intend to foster a more intense interaction between manufacturer and scientist for product enhancement.

#### Program

- 10:00 Epidural EEG recording using microchips in behavioural context.  
Bettina Platt, Andrea Pano, Amar Jyoti and Gernot Riedel (University of Aberdeen, Scotland).

- 10:20 Timed behaviors in mice.  
Valter Tucci and Glenda Lassi (Italian Institute of Technology, Italy) and Patrick M. Nolan (Mammalian Genetics Unit, Harwell, United Kingdom).
- 10:40 *Coffee break*
- 11:10 Route finding in a complex maze in wild-type and CA1 NR-1 KO mice: hippocampal local field potentials, single units and relationship with behaviour.  
Francesco Battaglia (SILS - Center for Neuroscience, Amsterdam, The Netherlands).
- 11:30 Use of Behavioral Outcome to Assess Cognitive State.  
Robert Hampson (Wake Forest University School of Medicine, USA).
- 11:50 Simultaneous Measurement of Brain Activity, Physiology & Behavior in Large Animals.  
Nadine Reefmann (Agroscope Reckenholz-Tänikon Research Station, Switzerland), Thomas Muehleemann and Martin Wolf (ETH and University Zürich, Switzerland), Beat Wechsler and Lorenz Gyga (Federal Veterinary Office, Switzerland).
- 12:10 Platform for ambulatory assessment of psycho-physiological signals and online data capture.  
Jürgen Stumpp and Panagiota Anastasopoulou (Karlsruhe Institute of Technology, Germany).
- 12:30 *Lunch break*
- 14:00 Experimental Design for Sternocleidomastoid Muscle Stress Measurement .  
Chee Fai Tan, Wei Chen and Matthias Rauterberg (Technical University of Eindhoven, The Netherlands).
- 14:20 Peripheral Arterial Tone as an index of ANS trade-off.  
Stas Krupenia (Thales Research and Technology, The Netherlands), Eldad Yechiam and Maya Arad (Israel Institute of Technology, Israel).
- 14:40 Using EEG Recordings to Examine the Relationships between Sustained Attention and Types of Background Music in Individuals with ADHD.  
Chelsea Liang Ru Chew (Nanyang Technological University, Singapore).
- 15:00 Psychophysiological data collection in an organizational setting: studying interaction between the manager and subordinate during performance review discussion.  
Mikko Salminen, Pentti Henttonen and Niklas Ravaja (Center for Knowledge and Innovation Research, Finland) and Mikael Saarinen (Sensitiva Inc, Finland).

- 15:20 Extracellular Multi Unit Recording in Fear Conditioning in Mice Using a Telemetry Approach in an Automated Home Cage (DualCage) Environment.  
René F. Jansen, Anton W. Pieneman and Andries Ter Maat, (VU University Amsterdam, The Netherlands),  
Oliver Stiedl and Manfred Gahr (Max Planck Institute for Ornithology, Germany).
- 15:40 *End of session*

## SYMPOSIUM

### Measuring Surgical Behavior

Date: Friday, August 27

Time: 10:00-12:30

Location: Zernike

Chair: Gabriëlle J.M. Tuijthof (Delft University of Technology, The Netherlands)

Medical technology is evolving quickly. This is also true in the operating theatre, where the introduction of minimally invasive surgery has brought many benefits for the patient: less morbidity, and quicker recovery. Despite these advances in technology, patient safety cannot be guaranteed for 100%.

This symposium aims to give an overview of different methods as developed by researchers in the surgical field. They will all discuss their own efforts to meet the challenge of measuring surgical behaviour. Finally, we can point out a direction towards a future ultimate registration tool.

#### Program

- 10:00 Teaching arthroscopy: analysis of verbal communication in the operating room.  
Gabriëlle Tuijthof (Delft University of Technology / Academic Medical Centre, The Netherlands),  
Alexander Vos, Inger Sierevelt, Mattias Schafroth and Gino Kerkhoffs (Academic Medical Centre, The Netherlands).
- 10:20 Methods for Automatic Statistical Modeling of Surgical Workflow.  
Tobias Blum, Nassir Navab and Hubertus Feußner (Technische Universität München, Germany).
- 10:40 *Coffee break*
- 11:10 In-vivo measuring surgical workflow activities in the OR.  
Loubna Bouarfa (Delft University of Technology, The Netherlands),  
Laurents P. S. Stassen (Academic Hospital Maastricht, The Netherlands),  
Pieter. P. Jonker & Jenny Dankelman (Delft University of Technology).

- 11:30 Learning curve assessment and identification of surgical pitfalls of a new hip prosthesis using time-action analysis.  
Jakob van Oldenrijk & Elisa Rijk (Academic Medical Center Amsterdam, The Netherlands),  
Wouter Runne (Onze Lieve Vrouwe Gasthuis Amsterdam, The Netherlands) and  
Cees van Egmond (Isala Klinieken Zwolle, The Netherlands).
- 11:50 Haptic Feedback Provides Objective Assessment of Surgical Skills.  
G. Chami (General Hospital, Scunthorpe, United Kingdom).
- 12:10 Methods for Objective Assessment of Arthroscopic Skills.  
N. Howells (University of Oxford, Oxford, United Kingdom).
- 12:30 *End of session*

## SYMPOSIUM

### Monitoring of Social Interactions and Initial Signs of Conflicts in Isolated Groups during Long-Term Missions

Date: Friday, August 27

Time: 14:00-15:40

Location: Zernike

Chairs: Roman Gorbunov and Emilia Barakova (Technical University of Eindhoven, The Netherlands) and  
Karl Tuyls (Maastricht University, The Netherlands)

Success of long-term missions performed by a small group of people in extreme environment critically depends on psychological states of crew members as well as on interpersonal relations within a crew. To predict and prevent conflicts within a crew it is important to develop different techniques for monitoring psychological state of group members and overall social state of the group. Monitoring of different aspects of nonverbal behaviors as well as behavior of crew members during on-line games are demonstrated to be promising approaches to the problem of measuring human behavior within a group.

#### Program

- 14:00 PSPA - Test for the Study of Individual Values and Mutual Perception in Small Groups .  
Vadim Gushin and Alla Vinokhodova (State Research Center – Institute for Biomedical Problems RAS, Russia).
- 14:20 Electronic partners that diagnose, guide and mediate space crew's social, cognitive and affective processes.  
Jurriaan van Diggelen, Mark Neerincx, and Nanja Smets (TNO, The Netherlands)  
Mikael Wolff (ESA-ESTEC, The Netherlands) and  
Leo Breebaart (S&T, The Netherlands).
- 14:40 Automatic Mental Health Assistant: Monitoring and Measuring Nonverbal Behavior of the Crew During Long-Term Missions.  
Natalia Voynarovskaya, Roman Gorbunov, Emilia Barakova and  
Matthias Rauterberg (Technical University of Eindhoven, The Netherlands).
- 15:20 *End of session*

## SYMPOSIUM

### The Significance of Voluntary Exploration to Monitor Emotional Behavior of Rodents

Date: Thursday, August 26

Time: 10:00-12:30

Location: Curie

Chair: Oliver Stiedl (VU University Amsterdam, The Netherlands)

In this symposium we will provide examples from research approaches in rodents demonstrating the importance of voluntary choice and decision-making under baseline stress-free conditions for emotional behavior. These novel approaches allow for substantially improved interpretation of performance changes as opposed to currently used standardized behavior tests. Emotion cannot be measured directly but instead has to be inferred indirectly from behavioral and concomitant physiological (e.g. neural, autonomic) adjustments. Standard anxiety tests and fear learning tasks are characterized by human interference that affect emotional behavior and may bias the experimental outcome. This is particularly relevant for tests that depend on locomotor activity-derived measures as index of fear and anxiety. In response to this dilemma, we will discuss current methodological pitfalls and provide insights into our concepts and used methodological approaches including choice behavior with multiple measures extending to aspects of the organization of behavior (actualgenese: the moment-to-moment dynamics of behavior). Thus, human interference is largely excluded in these experiments while the duration of experiments is extended to several days. These novel approaches follow the main features of natural exploratory behavior starting out from a safe home base and driven by the motivation to investigate novel areas. The motivation for exploration is generally the drive to find resources or reproductive needs while facing the risk of the unknown e.g. potential predators. Exploration implies novelty detection and thus a discrimination from what is known and what is new. The distinction between exploration and cognition is not sharp. The same can be said for the distinction between for instance anxiety and exploration. Thus, home cage observations that involve the activation of different motivational systems are an appropriate setting for assessing the integration of different motivational systems.

## Program

- 10:00 Fear Conditioning in an Automated Home Cage (DualCage) Environment.  
Oliver Stiedl Anton W. Pieneman and René F. Jansen (VU University, Amsterdam, The Netherlands),  
Christian Gutzen and Stephan Schwarzer (Biobserve, Germany).
- 10:20 Spontaneous behavior in the home cage: a new test environment for measuring neuropathic pain.  
Berry Spruijt, Raymond C. de Heer and Johanneke E. van der Harst (Delta Phenomics, The Netherlands).
- 10:40 *Coffee break*
- 11:10 An automated maze for studying working memory and decision-making in rodents.  
Jeansok Kim (University of Washington, USA).
- 11:30 Genetic Dissection of Motor Activity Levels and Avoidance Behavior in The Home Cage; Translational Phenotypes for Mood Disorders.  
Martien Kas and Annetrude (J.G.) de Mooij-van Malsen (UMC Utrecht, The Netherlands) and  
Berend Olivier (Utrecht University, The Netherlands).
- 11:50 Understanding Exploratory Behavior Step by Step.  
Ilan Golani, Ehud Fonio and Yoav Benjamini (Tel Aviv University, Israel)
- 12:10 *End of session*

## SYMPOSIUM

### Unveiling affective signals

Date: Friday, August 27

Time: 11:10-15:40

Location: Lorentz-Zeeman

Chairs: Egon L. van den Broek. (University of Twente / Radboud University Medical Center Nijmegen, The Netherlands),  
Anton Nijholt (University of Twente, The Netherlands) and  
Joyce H.D.M. Westerink (Philips Research, The Netherlands)

The ability to process and, subsequently, understand affective signals is the core of emotional intelligence and empathy. However, more than a decade of research in affective computing has shown that it is hard to develop computational models of this process. We pose that the solution for this problem lays in a better understanding of how to process these affective signals. This article introduces a symposium that brought together various approaches towards unveiling affective signals. As such, it is envisioned to be a springboard for affective computing.

#### Program

10:00

10:20

11:10 Unveiling Affective Signals.  
Egon L. van den Broek and Anton Nijholt (University of Twente, The Netherlands),  
Joyce H.D.M. Westerink (Philips Research, The Netherlands).

11:30 Measuring affective and social signals in vocal interaction.  
Khiet P. Truong (University of Twente, The Netherlands).

11:50 Facial EMG as a tool for inferring affective states.  
Anton van Boxtel. (Tilburg University, The Netherlands).

12:10 Motor, Emotional and Cognitive Empathic Abilities in Children with Autism and Conduct Disorder.  
Danielle M.A. Bons, Floor E. Scheepers, Nanda N.J. Rommelse, and Jan K. Buitelaar  
(University Centre Nijmegen, The Netherlands).

12:30 *Lunch break*

14:00 Mimicry as a Tool for Understanding the Emotions of Others.  
Marielle Stel & Kees van den Bos (University of Utrecht, The Netherlands).

- 14:20 Social Signal Processing: Understanding Nonverbal Communication in Social Interactions.  
Alessandro Vinciarelli and Fabio Valente (Idiap Research Institute, Switzerland).
- 14:40 Automatic Measurement of Affect in Dimensional and Continuous Spaces: Why, What, and How?  
Hatice Gunes and Maja Pantic (Imperial College London, U.K.).
- 15:00 Relative Affective Blindsight for Fearful Bodily Expressions.  
Bernard M.C. Stienen and Beatrice de Gelder (Tilburg University, The Netherlands).
- 15:20
- 15:40 *End of session*