

First PACE Thematic Workshop "Making a sense of a rich world: multimodal integration in complex environments"

Marseille
27-29 January 2016

Event concept

The issue of how humans form coherent, valid, and robust percept by processing sensory stimuli (delayed and corrupted by noise) from various modalities is a central question in cognitive science, behavioural science, and neuroscience. The goal of this workshop will be to provide insights on how this challenging problem is solved by the brain. Speakers that will attend this workshop will present various approaches to address the issue of multi-sensory integration (MSI), and multi-modal integration, not only for perception but also for action.

The first session **Theoretical approaches for MSI** will focus on identifying the key problems inherent to MSI, and present the main approaches currently employed to address those problems.

Examples on how multiple sources of information, sometimes redundant, sometimes conflicting, are flexibly combined to allow coherent percept of the body and/or the environment will be discussed in the second session, **MSI for perception**.

A **keynote speech** by Dora Angelaki will close the first day of the training.

The third session **MSI for action** will address the issue of how accurate movements can be achieved despite noise and delays in sensory information.

Finally, the session **MSI across the lifespan** will focus on changes and/or deficits in children, elderly and patients.

This session will be followed by a **visit of INT** institute and labs.

An informal **poster session** at the end of the second day will offer to the ESRs the opportunity to present their research project, which of course will still be at an early stage, and to discuss opportunities for secondments with PACE PIs.

During first **hands-on** sessions, essential **Psychophysical methods** will be discussed and the students will be introduced to the widely used open source statistical **software R**.

During the second hands-on session, the associated partner BKIN will provide a 1/2-day training on the programming of the **KINARM Exoskeleton Lab** (2 KINARM Exoskeleton robots for the upper limbs coupled with 2D virtual/augmented reality display) produced by BKIN to manipulate proprioceptive and visual sensory inputs.

A **PACE internal meeting** will close the workshop, allowing network members to debrief and plan future steps of the project.



Sessions on 27-28 January will take place at INT - Salle Henri Gastaut, floor -1

Day 1 – Wednesday 27 January 2016	
10:00	Theoretical approaches for MSI – part I <ul style="list-style-type: none"> Alexandre Pouget (University of Geneva) <i>Neural basis of multisensory integration.</i> Pascal Mamassian, CNRS Director of Research, Head of CNRS LSP Unit <i>Bayesians inference, noise and correlation</i>
11:30	Coffee break
12:00	Theoretical approaches for MSI – part II <ul style="list-style-type: none"> Robert J Van Beers, PhD, MOVE Research Institute Amsterdam, VU University Amsterdam <i>Roles of cue precision and cue accuracy in multisensory integration</i> Guillaume Masson, INT Director, CNRS <i>Fixational saccades and visual scenes: noise or sensory information ?</i>
13:30	Lunch break
15:00	MSI for perception <ul style="list-style-type: none"> Marc Ernst, Research Group Leader, Max Planck Institute <i>Getting in Touch with Multisensory Integration</i> Manuel Vidal, Researcher, CNRS-INT <i>When did I hear that flash? Timing audiovisual events: from perception to (re)action</i> Jeroen Smeets, VU University Amsterdam <i>The inconsistencies that arise from sensory integration.</i>
17:15	Coffee break
17:45 18:45	Keynote lecture <ul style="list-style-type: none"> Dora Angelaki, Chairman/Professor, Department of Neuroscience, Baylor College of Medicine <i>Visuo-vestibular integration for self-motion perception</i>
19:00	End of first day

Day 2 – Thursday 28 January 2016	
9:30	MSI for action – part I <ul style="list-style-type: none"> Sam Sober, Assistant Professor, Department of Biology, Emory University <i>Flexible strategies for sensory integration during motor planning</i> Andrew Welchman, Wellcome Trust Senior Research Fellow, Cambridge University <i>Seeing depth: computations and cortical networks</i>
11:00	Coffee break

11:30	<p>MSI for action – part II</p> <ul style="list-style-type: none"> Joan López-Moliner, Institute of Neurosciences, University of Barcelona <i>Temporal error signals in interception</i> Guillaume Masson / Anna Montagnini, CNRS-INT <i>Dynamic integration of different sources of motion information for eye-tracking.</i>
13:00	Lunch break
14:30	<p>MSI across life span – part I</p> <ul style="list-style-type: none"> Opher Donchin, Senior Lecturer, Ben Gurion University of the Negev <i>The cerebellar role in correcting reach errors: hierarchical processing or multi-sensory integration</i> Monica Gori, Researcher, Italian Institute of Technology <i>The development of multi-sensory integration in children</i>
16:00	Coffee break
16:30	<p>MSI across life span – part II</p> <ul style="list-style-type: none"> Meir Plotnik, PhD Sheba Medical Centre <i>Multisensory integration for Gait coordination</i> Petra Siemonsma, Medior Research Scientist, Netherlands Organisation for Applied Scientific Research (TNO) <i>Multisensory integration and aging</i>

Hands-on-session open to PACE network members and PhD Program students (limited places)

Day 3 – Friday 29 January 2016	
9:00 R+1	<p>Hands-on: Psychophysics and R introductory course – part I</p> <p>Gabriel Baud-Bovy, Team Leader, Italian Institute of Technology <i>Psychophysical methods : methods to compute sensory thresholds and to build psychophysical scales and statistical computing using R (open source software)</i></p>
10:30	Coffee break
11:00 R+1	<p>Hands-on: Psychophysics and R introductory course – part II</p> <p>Gabriel Baud-Bovy, Team Leader, Italian Institute of Technology</p>
12:30	Lunch break
14:00 R+1	<p>Hands-on: Technical skills</p> <p>Video conference with Duncan McLean, Senior Software Developer, BKIN Technologies Ltd. <i>Harnessing the power of KINARM Labs for conducting experiments in Multi-Sensory Integration: An introduction to programming custom tasks for KINARM Labs</i></p>
16:00	Coffee break
16:30 R+1	PACE partners meeting (PACE network only)
19:00	End of TW1