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ESF Research Conferences

A Programme of the European Science Foundation



ESF-EMBO Symposium on Three Dimensional Sensory and Motor Space

Probabilistic Mechanisms of Learning and
Development in Sensorimotor Systems

Sant Feliu de Guixols (near Barcelona), Spain, 8-13 October 2005

Chair: **Daniel Wolpert** (University of Cambridge, UK)
Vice-Chair: **Jeroen Smeets** (Erasmus MC, NL)

With support from the *Generalitat de Catalunya*



Final Programme

On line at: <http://www.esf.org/conferences/lc05110>

Saturday 8 October

Late afternoon / early evening	Registration at the hotel reception and ESF desk
19.30	Welcome drink
20.00	Dinner

Sunday 9 October

08.30	Conference Opening
Session 1: Vision	
09.00	Pascal Mamassian (CNRS, Paris, FR) <i>Bayesian inference for three-dimensional perception</i>
09.40	Discussion
09.50	Sérgio Nascimento (University of Minho, Braga, PT) <i>Chromatic properties of natural scenes</i>
10.30	Discussion

- 10.40** **Coffee break**
- 11.10 **Tom Trocianko** (University of Bristol, Bristol, UK)
The ecology of colour
- 11.50 Discussion
- 12.00 **Paul Hibbard** (University of St Andrews, UK)
Binocular energy responses to natural images
- 12.30 Discussion
- 12.45 Signature of the Agreement between ESF and the Generalitat de Catalunya
- 13.00 **Lunch**
- 16.30** **Coffee break**
- Session 2: **Statistics and action**
- 17.00 **Stephen Scott** (Queen's University, CA)
A potential link between the statistics of action, sensorimotor associations in primary motor cortex and motor learning
- 17.40 Discussion
- 17.50 **Daniel Wolpert** (University of Cambridge, UK)
Movement drift is the result of optimal sensory combination
- 18.30 Discussion
- 20.00** **Dinner**
- 21.30 Poster session

Monday 10 October

Session 3: **Multisensory and sensorimotor integration**

- 09.00 **Marc Ernst** (Max-Planck Institute for Biological Cybernetics, DE)
A Bayesian view on multimodal integration
- 09.40 Discussion
- 09.50 **Philip Sabes** (UCSF, San Francisco, US)
Sensory integration during motor planning
- 10.30 Discussion
- 10.40** **Coffee break**
- 11.10 **Sophie Deneve** (CNRS, Bron, FR)
Neural basis for Bayesian sensorimotor integration and motor control

- 11.50 Discussion
- 12.00 **Laurence Harris** (York University, CA)
A three-stage mechanism for simultaneity constancy
- 12.30 Discussion
- 13.00 Lunch**
- 16.30 Coffee break**

Session 4: **Predictive mechanisms**

- 17.00 **Randy Flanagan** (Queen's University, CA)
Predictive mechanisms in object manipulation tasks
- 17.40 Discussion
- 17.50 **Kathleen Cullen** (McGill University, Montreal, CA)
Distinguishing between self-generated and passively applied head movements: cancellation of reafference in the vestibular nuclei
- 18.30 Discussion
- 19.30 Dinner**
- 21.00 Poster session

Tuesday 11 October

Session 5: **Perception**

- 09.00 **Shigeru Kitazawa** (Juntendo University, Tokyo, JP)
Where tactile signals are ordered in time
- 09.40 Discussion
- 09.50 **Christoph Kayser** (Max-Planck Inst. for Biological Cybernetics, DE)
Auditory Scene Analysis - does touch help?
- 10.30 Discussion
- 10.40 Coffee break**
- 11.10 **David Knill** (University of Rochester, US)
Learning the statistics of scenes for 3D visual perception
- 11.50 Discussion
- 12.00 **Martin Banks** (Max-Planck Institute for Biological Cybernetics, DE)
Why do pictures viewed from the wrong place look right?
- 12.30 Discussion
- 13.00 Lunch**

- 14.00** **Half-day excursion**
- 19.30** **Aperitif and Conference Dinner**

Wednesday 12 October

Session 6: **Sensorimotor variation and control**

- 09.00 **Robert van Beers** (Erasmus MC, Rotterdam, NL)
Role of motor noise in planning of saccadic eye movements
- 09.40 Discussion
- 09.50 **Reza Shadmehr** (Johns Hopkins University, Baltimore, US)
*Motor adaptation, passage of time, and sleep:
a Bayesian approach to motor memory consolidation*
- 10.30 Discussion
- 10.40** **Coffee break**
- 11.10 **Jeroen Smeets** (Erasmus MC, Rotterdam, NL)
How we deal with variability in dart-throwing
- 11.50 Discussion
- 12.00 **Stephen Lisberger** (University of California, San Francisco, US)
Searching for the source of sensori-motor variation
- 12.30 Discussion
- 13.00** **Lunch**
- 16.30** **Coffee break**

Session 7: **Decision processes**

- 17.00 **John Krakauer** (Columbia University, US)
Savings and interference depend on the History of effector use
- 17.40 Discussion
- 17.50 **Julia Trommershäuser** (Giessen University, DE)
Movement planning and decision making
- 18.30 Discussion
- 19.30** **Dinner**
- 21.00 General discussion about future developments in this field

Session 8: **Learning**

- 09.00 **Emanuel Todorov** (UCSD, San Diego, US)
From task parameters to motor synergies: A hierarchical framework for approximately-optimal control of redundant manipulators
- 09.40 Discussion
- 09.50 **Maarten Frens** (Erasmus MC, Rotterdam, NL)
Cracking the Complex Spike Code
- 10.30 Discussion
- 10.40 Coffee break**
- 11.10 **Peter König** (University of Osnabrück, Osnabrück, DE)
Beyond sensory substitution: Learning the sixth sense
- 11.50 Discussion
- 12.00 **Hermann Mueller** (Saarland University, DE)
Hit the target!- How to handle stochastic influences in goal directed throwing
- 12.30 Discussion
- 13.00 Lunch and departure