



The Sixth Computational Motor Control Workshop at Ben-Gurion University of the Negev

June 15-17, 2010, W. A. Minkoff Senate Hall, BGU Marcus Family Campus, Beer-Sheva, Israel

Website: <http://www.bgu.ac.il/cmaw>

Department of Biomedical Engineering and
the Zlotowski Center for Neuroscience at Ben-Gurion University of the Negev

Program

Tuesday, June 15 Welcome Dinner



Wednesday, June 16

- 8:20-8:50 Registration, poster placement and coffee
8:50-9:00 Greetings – **Dr. Opher Donchin**, head of the organizing committee, BGU
9:00-9:10 Opening remarks – **Motti Herskowitz**, Vice-president and Dean for Research and Development

Cerebellar learning

Chairperson: Dr. Opher Donchin, BGU

- 9:10-9:40 **Prof. Stephen G. Lisberger** – UCSF, San Francisco, USA
Variation, signal, and noise in the neural circuit for smooth pursuit eye movements
- 9:40-10:10 **Dr. Opher Donchin** – BGU
Models and data in understanding cerebellar function
- 10:10-10:40 **Prof. Matti Mintz** – Tel Aviv University, Tel Aviv, Israel
Reciprocal communication between cerebellum and amygdala in motor learning
- 10:40-10:50 Discussion
- 10:50-11:30 **Posters and coffee**

Computational models

Chairperson: Prof. Ron Meir, Technion, Haifa, Israel

- 11:30-12:00 **Prof. Naftali Tishby** – Hebrew University, Jerusalem, Israel
Information Reinforcement-Learning
- 12:00-12:30 **Dr. Sigal Berman** – BGU
Geometric algebra and analysis of human arm movements
- 12:30-12:40 Discussion
- 12:40-14:40 **Posters and lunch**

Organizing principles of behavior

Chairperson: Prof. Gideon Inbar, Technion, Haifa, Israel

- 14:40-15:10 **Prof. Robert Scheidt** – Marquette University, Milwaukee, USA
Reorganization of coordination among redundant control signals during adaptation to rotation and scaling distortions of a newly learned sensorimotor transformation
- 15:10-15:40 **Prof. Natalia Dounskaia** – Arizona State University, Tempe, USA
Hierarchical control of bimanual movements revealed by arm dominance challenges the muscle homology principle
- 15:40-16:10 **Dr. Steve Chase** – Carnegie-Melon University, Pittsburgh, USA
Visuomotor adaptation observed through a brain-computer interface
- 16:10-16:20 Discussion
- 16:20-16:30 **SenseGraphics, NAN Instruments, and Alpha Omega Engineering**
Best poster and Travel Awards
- 16:30-17:00 **Posters and coffee**

Simulated and natural motor control

Chairperson: Prof. Ferdinando Mussa-Ivaldi, Northwestern University, Chicago, USA

- 17:00-17:30 **Prof. Gerald Loeb** – University of Southern California, Los Angeles, USA
Spinal-like regulator simplifies control of multiple degree-of-freedom limbs
- 17:30-18:00 **Prof. Etienne Burdet** – Imperial College, London, UK
Robots can learn to control haptic interactions as humans do
- 18:00-18:30 **Dr. Amir Karniel** – BGU
A Turing-Like Handshake test for Motor Intelligence: CMCW-VII 2011 Tournament announcement
- 18:30-18:40 Discussion
- 20:30 **Dinner and discussion**

Thursday, June 17, 9:00-17:00, Desert hike Guide – Eitan Krovovski

Invitation Letter and Call for Posters

Dear Colleagues,

In what has now become a tradition, we wish to invite you to participate in the sixth annual **Ben-Gurion University Workshop on Computational Motor Control** on **June 16, 2010**, in the W. A. Minkoff Senate Hall at Ben-Gurion University of the Negev, Beer-Sheva, Israel. The following information is also available on our website:

<http://www.bgu.ac.il/cmchw>

Thank you for your attention,
Opher Donchin and Amir Karniel
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Winter in the Negev

Overview: The nervous system analyses sensory information and orchestrates motor commands. In so doing, it faces challenges that it shares with many artificially engineered systems. In the spirit of the classic field of cybernetics, the field of computational motor control makes scientific and technological progress simultaneously by exploring the differences between artificial control theory and biological motor control. Computational motor control is a multidisciplinary research program in which mathematics, engineering, biology, medicine and the cognitive neurosciences all play important roles. This workshop will bring together world leaders in the field of computational motor control including Israeli researchers and distinguished guests. The goal will be to learn about the current state of the field and to identify the directions that will provide the medical and scientific breakthroughs of the next decades.

Call for Posters: The posters will be available throughout the day near the lecture hall to facilitate fruitful discussions. Please submit a one-page abstract of up to 400 words by May 16 through the website or by email to cmchw@bgu.ac.il with the subject heading "CMCW registration form". An email should clearly contain your name and affiliation. Notification of acceptance and abstract books will be mailed out on May 20. In addition, all accepted abstracts will appear on our website prior to the conference. Poster's should have a maximum width of 90 cm and a maximum height of 120 cm.

Best Poster Award: The award committee will choose the best poster(s) which will be announced at the end of the day. The Best Poster Award Committee: **Sandro Mussa-Ivaldi**, Northwestern University, **Gerald Loeb**, University of Southern California; **Gideon Inbar**, Technion, **Amir Karniel**, Ben-Gurion University; and **Miriam Zacksenhouse**, Technion. **To be considered for the best poster award**, authors must submit a file with their poster to the Best Poster Award Committee by June 4, 2010. The poster can be submitted in PDF, TIFF, or Power Point formats by e-mail to cmchw@bgu.ac.il. Please use the subject heading "CMCW best poster submission" and include in the text of the message the name of the main author.

Travel Award: In special cases we will also consider a travel award to partially cover the expenses of international researchers/students. The criteria for the travel award will be: (i) The scientific quality of the proposed poster and its relevance to the topic of the workshop (ii) An interest in pursuing a PhD, post doc or faculty position at Ben-Gurion University. Those interested in receiving a travel award should submit an abstract for the poster they will submit and a short description of their circumstances by April 20 by e-mail to cmchw@bgu.ac.il with the subject heading "CMCW travel award."

Dinners: We will have a festive welcome dinner on the evening of June 15, before the workshop. Speakers and chairmen will be guests of the workshop at the dinner. For others wishing to join us, the dinner will be subsidized and will cost no more than 100 NIS per person. We will also have a more modest dinner and discussion in the evening following the workshop.

Tour to the Negev: On Thursday, June 17, we plan a trip to the Negev. Cost per-person will be no more than 150 NIS (approx. \$40), registration and payment (cash only) to the trip will be done during the morning of June 16 at the workshop registration desk. Price includes the cost of lunch.

Registration: Please register before May 20. Registration is mandatory but free. Space may be limited, so please register early. Please register on our website or by email to cmchw@bgu.ac.il with the subject heading "CMCW registration form". Please indicate in your registration whether you are interested in participating in the welcome dinner, the discussion dinner or the desert hike.

Sponsors:

- The President, Ben-Gurion University
- The Zlotowski Center for Neuroscience, BGU
- The Rector, Ben-Gurion University
- The Dean of the Faculty of Health Sciences
- The Dean of the Faculty of Engineering



The desert in motion