



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

June 7, 2006, W. A. Minkoff Senate Hall, BGU Marcus Family Campus, Beer-Sheva, Israel

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

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

Program

- 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 – **Prof. Rivka Carmi**, BGU president

The Nature of Movement

Chairperson: Prof. Gideon Inbar, EE, Technion

- 9:10-9:40 **Prof. Emilio Bizzi** - McGovern Institute for Brain Research, Massachusetts Institute of Technology
Keynote speaker under the auspices of the Kreitman Foundation Distinguished Visitors Program
Learning and consolidation of motor tasks
- 9:40-10:10 **Dr. Benny Hochner** - Department of Neurobiology, Hebrew University, Jerusalem
Motor control of goal directed movements in the flexible arms of the octopus
- 10:10-10:40 **Prof. Jerry Loeb** - Department of Biomedical Engineering, University of Southern California
Biomimetic integration of sensorimotor neural prostheses
- 10:40-10:50 Discussion
- 10:50-11:30 Posters and coffee

Perception and Action

Chairperson: Prof. David Golomb - Physiology&BME, BGU

- 11:30-12:00 **Prof. Anatol Feldman** - Department of Biomedical Engineering, University of Montreal
The referent body configuration and principle of minimal interaction: solutions to redundancy problems in motor control
- 12:00-12:30 **Dr. Tzvi Ganel** - Department of Behavioral Sciences, BGU
Hemisphere and skill determine vulnerability to visual illusions during grasping
- 12:30-13:00 **Dr. Mark Wessinger** - Department of Psychology, University of Nevada, Reno
Modal and amodal processing is task- and modality-specific
- 13:00-13:10 Discussion
- 13:10-14:30 Poster and lunch



Representation

Chairperson: Dr. Opher Donchin, BME, BGU

- 14:30-15:00 **Prof. Sandro Mussa-Ivaldi** - Northwestern U. and the Rehabilitation Institute of Chicago
The adaptive representation of time and space
- 15:00-15:30 **Dr. Dana Cohen** - Gonda Brain Research Center, Bar-Ilan University
Spike timing during typical movements
- 15:30-16:00 **Prof. Haim Sompolinsky** - Racah Institute of Physics, Hebrew University
Motor trajectories: a dynamical-systems perspective
- 16:00-16:10 Discussion
- 16:10-16:30 "Stretching" break

Coding

Chairperson: Prof. Tamar Flash, Weizmann Institute

- 16:30-17:00 **Prof. Moshe Abeles** - Gonda Brain Research Center, Bar-Ilan University
What is coded in neurons of the motor cortex?
- 17:00-17:30 **Prof. Maarten Frens** - Department of Neuroscience, Erasmus University
Cracking the complex spike code
- 17:30-17:40 Discussion;
The Alpha Omega and the SenseGraphics Awards for the best posters.
NanInstruments Travel Award.
- 17:40-18:30 Buffet dinner

Motor Adaptation

Chairperson: Dr. Amir Karniel, BME, BGU

- 18:30-19:00 **Dr. Jim Patton** - BME, Northwestern U. and the Rehabilitation Institute of Chicago
Exploiting the natural capacity to adapt for motor teaching and rehabilitation
- 19:00-19:30 **Dr. Robert Scheidt** - BME, Marquette University
Independent control of trajectory and final equilibrium position predicts asymmetric transfer of learning and systematic extent errors in reaching
- 19:30-20:00 **Prof. Claude Ghez** - Department of Neurology, Columbia University
Separate early and late updating mechanisms assure accuracy of trajectory and final position in reaching
- 20:00-20:10 Discussion

Invitation Letter and Call for Posters

Dear Colleagues,

Following the success of the first workshop we wish to invite you to participate in the second annual Ben-Gurion University workshop on computational motor control on June 7, 2006, 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>

1. Overview
2. Call for Posters
3. Best Poster Award
4. Tour to the Negev
5. Registration
6. Sponsors
7. Advisory committee

Thank you for your attention,

Opher Donchin and Amir Karniel donchin@bgu.ac.il; akarniel@bgu.ac.il



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 500 words by May 15 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. All the accepted abstracts will appear on the website prior to the workshop.

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:

- Amir Karniel, Ben-Gurion University
- Dana Cohen, Bar-Ilan University
- David Golomb, Ben-Gurion University
- Gideon Inbar, Technion – Israel Institute of Technology

Tour to the Negev: On Thursday June 8th we plan a trip to Ein Ovdad area, cost per-person will be 150NIS (approx. \$35), registration and payment (cash only) to the trip will be done during the morning of June 7 at the workshop registration desk.

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".

Sponsors:

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

Advisory Committee:

- Opher Donchin, Ben-Gurion University
- Amir Karniel, Ben-Gurion University
- Rich Ivry, Berkeley
- Stephen Schall, University of Southern California
- Dana Cohen, Bar-Ilan University
- Tamar Flash, Weizmann Institute



The desert in motion