

# TRANSLATIONAL AND COMPUTATIONAL MOTOR CONTROL (TCMC) 2013 In Collaboration with the American Society of Neurorehabilitation

November 8, 2013

Hard Rock Hotel, San Deigo – Room: The Edge

Morning Session (Translational): 8:30 AM – 11:45 PM & 1:00 PM – 1:45 PM

Afternoon Session (Computational): 1:45 PM – 6:45 PM

## TRANSLATIONAL SESSION

- 8:30 AM Robert Wagenaar Memorial Lecture: Understanding Dynamics of Motor Recovery Following Stroke. Gert Kwakkel, Ph.D. Chair Neurorehabilitation, VU University Medical Center, Amsterdam, The Netherlands
- 9:15 AM Targeted exercises to increase cortical influence over spinal reflexes. Harel, N., Pena, S., Morin, K., Asselin, P. and Spugen, A.
- 9:35 AM Electrical stimulation of motor cortex in the uninjured hemisphere after chronic unilateral injury promotes recovery of skilled locomotion through ipsilateral control. Carmel, J., Hiroki, K. and Martin, J.
- 9:55 AM Motor control is impaired in both the affected and the unaffected arm after stroke and shows a limited time window of recovery. Cortés, J.C., Goldsmith, J., Harran, M., Kim, N., Xu, J., Luft, A., Celnik, P., Krakauer, J.W. and Kitago, T.
- 10:15 AM ❖ *Coffee Break and Translational Poster Session*
- 10:45 AM Motor costs in Parkinson's disease. Salimpur, Y., Shadmehr, R. and Mari, Z.
- 11:05 AM Assessing the role of neuromuscular components using a tendon-driven robotic plant controlled by neuromorphic hardware. Niu, C.M., Rocamora, J., Valero-Cuevas, F. and Sanger, T.
- 11:25 AM Neural and decoder adaptation in BMI reduces interference from native motor networks. Orsborn, A. and Carmena, J.
- 11:45 PM ❖ *Lunch Break*
- 1:00 PM Outstanding Neurorehabilitation Clinician Award Lecture: Leveraging Motor Learning Mechanisms for Rehabilitation. Amy J Bastian, Ph.D., P.T. Kennedy Krieger Institute, The Johns Hopkins School of Medicine, Baltimore, MD

## **COMPUTATIONAL SESSION**

- 1:45 PM Action cost biases the perceptual decision making, only when the cost is implicit. Hagura, N., Diedrichsen, J. and Haggard, P.
- 2:07 PM Neural Dynamics of Reaching Following Incorrect or Absent Motor Preparation. Ames, K.C., Ryu, S. and Shenoy, K.
- 2:29 PM Neural correlates of adaptation to dynamic and kinematic perturbations in dorsal premotor cortex. Perich, M. and Miller, L.
- 2:50 PM ❖ *Coffee Break and Computational Poster Session – Part 1*
- 3:10 PM Savings is restricted to the temporally labile component of motor adaptation. Hadjiosif, A. and Smith, M.A.
- 3:32 PM Savings Upon Re-Aiming in Visuomotor Adaptation. Morehead, R., Crossley, M. and Ivry, R.
- 3:54 PM Learning from error: history of past errors dictates sensitivity to error. Herzfeld, D., Vaswani, P., Marko, M. and Shadmehr, R.
- 4:16 PM Multilayer controllers can learn from random feedback weights. Lillicrap, T.P., Cownden, D., Akerman, C.J. and Tweed, D.B.
- 4:40 PM ❖ *Coffee Break and Computational Poster Session – Part 2*
- 5:00 PM Internal coordinate representations for motor adaptation and interference reduction. Franklin, D.W., Yeo, S.-H., Batchelor, A.V. and Wolpert, D.M.
- 5:22 PM Neural correlates of motor memory with multiple time scales in sensorimotor adaptation. Kim, S., Ogawa, K., Lv, J., Schweighofer, N. and Imamizu, H.
- 5:44 PM Bayesian cue combination model of intentional binding. Ma, J., Chen, L., Kording, K. and Wei, K.
- 6:05 PM Invited Speaker: Synthesis of Complex Movements with Optimal Control. Emo Todorov, University of Washington.

### **POSTER PRESENTATIONS: Morning Session (10:30 AM – 11:00 AM)**

- P1. Proficient BMI Control Enabled by Closed-Loop Adaptation of an Optimal Feedback-Controlled Point Process Decoder. Shanechi M, Orsborn A, Gowda S & Carmena, J.
- P2. Does long-term exposure to skiing enhance dynamical leg control in old age? Lawrence E, Posch M, Meimer F, Dilitz S, Stern V, Werner I & Valero-Cuevas F.
- P3. The evolution of fine muscle control for dexterous manipulation in humans is surprisingly incomplete Valero-Cuevas F & Bumann R.
- P4. The role of inter-segmental dynamics during catching in typically developing children and children with Developmental Coordination Disorder. Asmussen M, Przysucha E & Dounskaia N.
- P5. Improvements in joint kinematics recorded during therapy sessions are not reflected in more traditional pre- and post-therapy functional assessments. McNulty P, Trinh T, Lee P & Shiner C.
- P6. Development of Virtual Games with Functional Electrical Stimulation for Post-Stroke Hemiplegia. Fu M, Knutson J & Chae J.
- P7. Bilateral priming accelerates recovery of upper limb function after stroke: A randomized controlled trial. Byblow W, Stinear C, Petoe M & Barber A.
- P8. Deficits of sensorimotor control and their impact on limb stabilization post-stroke: a case series. Mrotek L, Stoeckmann T, Bengtson M, Ghez C & Scheidt R.
- P9. Perturbation motor corrections correlate with features of reaching and are independent of proprioceptive impairments post-stroke. Bourke TC, Bagg SD, Dukelow SP, Norman KE & Scott SH.
- P10. Intermuscular coherence across the affected and unaffected hands during a grasp-and-lift task post stroke. Bilaloglu S, Aluru V & Raghavan, P.

### **POSTER PRESENTATIONS: Afternoon Session (2:50 PM – 3:10 PM & 4:40 PM – 5:00 PM)**

- P11. The neural representation of likelihood uncertainty in the motor system. Dekleva BM, Wanda PA, Kording KP & Miller LE.
- P12. Immediate decay onset in fixed and variable environments. Brennan AE & Smith MA.
- P13. Population dynamics in both premotor and motor cortical ensembles reflect changes in limb biomechanics. Suminski A, Mardoum P, Lillicrap T & Hatsopoulos N.
- P14. Shortening the reaction time prevents expression of 'fast' learning during motor adaptation. Haith A & Krakauer J.
- P15. The influence of threat on movement and economic decision making under risk. O'Brien M & Ahmed A.
- P16. Feedback responses enforce trajectory control when required by the goal of the ongoing task. Cluff T & Scott SH.
- P17. Interpreting reach adaptation in the actor-critic framework. Khan R & Thoroughman K.
- P18. In search of a common mechanism for motor savings: Experience-dependent changes in learning parameters during locomotor adaptation. Mawase F, Shmuelof L, Bar-Haim S & Karneil A.
- P19. When to dwell and when to move: finding comfort in variability. Cos I, Girard B & Guigon E.
- P20. A computational model for motor and social effects on joint force production. Abe M & Watanabe K.
- P21. Optimality under fire: Dissociating learning from Bayesian integration. Acerbi L, Hart BM, Behbahani FM & Peters MA (Best Poster: CoSMo Summer School).