

特別講演

題目 : Modeling and Control of Human Neuromuscular Dynamics toward Advanced Neuroprosthetics

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- ・日時 : 2014年8月5日(火) 10:00-11:00
- ・場所 : 首都大学東京 日野キャンパス 1号館 会議室 2, 3
- ・参加費 : 無料(事前申込みは不要です)
- ・言語 : 日本語(ただし, スライドは英語です)

概要 : One of the challenging issues in computational rehabilitation is that there is a large variety of patient situations depending on the type of neurological disorder. To improve the performance of motor neuroprosthetics beyond the current limited use of such system, subject-specific modelling would be essential. In addition, human characteristics are basically time variant, for instance, neuromuscular dynamics may vary according to muscle fatigue. In order to correspond to time-varying characteristics, we believe that robust bio-signal processing and model-based control which can manage the nonlinearity and time variance of the system, would bring break-through and new modality in rehabilitation.

A new control strategy, EMG-Feedback Predictive Control (EFPC), is proposed to adaptively control stimulation pattern compensating to time-varying muscle state changes. This presentation will also introduce some recent results regarding volumetric muscle modelling and human posture measurement.

略歴 : He received the B.S. degree in mechano-aerospace engineering from Tokyo Institute of Technology in 1999. M.S. and Ph.D. degrees from University of Tokyo, graduate school of engineering in 2001 and 2005 respectively. He was an assistant professor at Jikei University School of Medicine, Research Center for Medical Sciences from 2001 to 2006, and a postdoctoral fellow at INRIA France, DEMAR project from 2007. Since 2008, he has been a tenured researcher with INRIA and LIRMM at University of Montpellier, Computational Medicine and Neurosciences, DEMAR project. His research interests include modeling and control of neuromuscular dynamics and motor learning in rehabilitation. He received Best Paper Award from Journal of Japanese Society for Computer-aided Surgery and CAS Young Investigator Award, Gold Prize from Hitachi Medical Systems. He is a senior member of Engineering in Medicine and Biology Society, IEEE. He serves as the editorial board member for medical robotics section of the International Journal of Advanced Robotic Systems, and co-chair of IEEE RAS Technical Committee on Human Movement Understanding.

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