

WORKSHOP CO-CHAIRS

Michael H. Smith,
University of California Berkeley, USA
m.h.smith@ieee.org

Seong-Whan Lee,
Department of Brain and Cognitive
Engineering, Korea University, Korea
swlee@image.korea.ac.kr

Vinod A Prasad,
Nanyang Technological University,
Singapore
ASVinod@ntu.edu.sg

Ricardo Chavarriaga Lozano,
Ecole Polytechnique Fédérale de
Lausanne, Switzerland
ricardo.chavarriaga@epfl.ch

INVITED SPEAKERS (partial list)

Jose Carmena
Vice Chair, IEEE Brain initiative
University of California Berkeley, USA

José del R. Millán
Ecole Polytechnique Fédérale de
Lausanne, Switzerland

Paul Sajda
Chair, IEEE Brain initiative
Columbia University, USA

PANELS

Important Topics in Designing
and Building Real World BMI
Control Systems: What is New?

How Research and Methodologies
in Systems, Human-Machine
Systems, and Cybernetics can
be applied to BMI Control Systems

What Have We Learned, Where
Do We Go From Here?"

TUTORIALS

Brain-Computer Interface Systems -
Overview, Design Challenges and
Current State of the Art

New Research and Industrial
Applications in BMI Systems

<http://www.smc2016.org>



IEEE SMC 2016's 6th **Workshop on Brain-Machine Interfaces Systems** will be held October 9-12, 2016 in Budapest as part of the program of **SMC 2016** - the flagship annual conference of the IEEE Systems, Man, and Cybernetics Society. This workshop is organized by the *IEEE SMC Technical Committee on Brain-Machine Interfaces Systems* and is technically co-sponsored by the *IEEE Brain Initiative* and the *IEEE Engineering in Medicine and Biology Society*. Participation is free to all registered SMC2016 attendees. The theme of this year's workshop, which involves the integration of Systems, Human-Machine Systems, and Cybernetics, is:

New Research Opportunities and Industrial Applications in BMI Systems Arising from the IEEE Brain Initiative

Brain-Machine Interfaces (BMI) systems offer the possibility of a new generation of multidisciplinary technologies that allow users to directly control devices via the nervous system. Successful realization of such approaches encompass several challenges including seamless interaction of the human and the machine, robust systems to chronically measure brain activity, reliable decoding of the (neural) control signals, and efficient means to provide information back to the user. Development of robust BMI systems suitable for chronic, independent use demands special efforts for developing adaptive intelligent algorithms and low-power wearable invasive or non-invasive recording techniques.

The goal of this workshop is to facilitate the interaction and intellectual exchange between all researchers, developers and consumers of this technology. This international forum is a unique opportunity for reporting the latest advances, innovations, and applications in these fields. Also of interest will be the report and evaluation of complete systems considering aspects such as multidimensional performance metrics reflecting decoding accuracy, task performance, human factors, decoding algorithms, feedback, etc. These topics represent both challenges to the field and a tremendous opportunity for collaborative and multidisciplinary research, involving not only peers with expertise in the field of BMI, but also expertise in systems engineering, human-machine systems, cybernetics, and/or other disciplines.

Like the SMC's previous workshops, the focus is on practical applications of BMI theory and methodologies leading to tangible systems, products, and service technologies. As such, all submitted papers should include a section on how their topic can translate into practical applications. At the core of BMI systems is the coordination of sensing, computation, communication, control, and actuation of dynamic systems. Collaboration between experts from many research areas within SMC and from other related technical communities is needed to further progress the creation of reliable real-world BMI systems with significant and lasting impact on people and society. Advances in IEEE SMC's fields of interest as they relate to BMI are expected to empower future research and development to achieve this goal. This workshop will be of special interest to those experts in the topics listed below who are interested in learning how their research areas can be applied to solving of various research problems necessary for the development of real-world invasive and non-invasive BMI systems. Besides presentations of accepted papers, this 4 day workshop will feature tutorials, panels, discussions with the audience, and a number of prominent invited speakers from industry and academia.

Systems Science and Engineering:

Discrete Event Systems and Petri Nets
Distributed Intelligent Systems
Industrial Applications
Intelligent Control Systems
Medical Mechatronics
Robotic and Autonomous Systems
Self-Organized & Multiagent Sensor Systems
System of Systems Engineering
System Modeling and Control
Neuroscience Systems

Human-Machine Systems:

Adjustable Autonomy
Assistive Technology
Brain-Machine Interface Systems Architectures
Haptics and Teleoperation
Human Centered Design
Human-Computer Interaction
Human-Machine System Design
Human-Robot Interaction
Kansei (sense/emotion) Engineering
Smart Prosthetic/Orthotic Technology
Teleoperators
Virtual and Augmented Reality Systems

Cybernetics:

Awareness Computing
Biometrics and Bioinformatics
Computational Life Science
Data & Information Fusion
Intelligent Multimedia Comm.
Knowledge Acq. in Intelligent Systems
Knowledge-based Systems
Machine Learning
Machine Vision & Image Processing
Medical Informatics
Natural Language Processing
Pattern Recognition
Soft Computing

Important Dates

April 15, 2016: Deadline for submission of full-length papers
May 25, 2016: Acceptance/Rejection notifications
July 09, 2016: Final camera-ready papers due

If you would like to organize a session for the BMI workshop, please contact Michael H. Smith (m.h.smith@ieee.org).