

WORKSHOP ORGANIZERS

Michael H. Smith, Chair
University of California Berkeley, USA

Seong-Whan Lee, Co-Chair
Korea University, Korea

Vinod A Prasad, Co-Chair
NTU, Singapore

Ricardo Chavarriaga Lozano, Co-Chair
EPFL, Switzerland

Ljiljana Trajković, Technical Program
Chair, SFU, Canada

SMC 2016 KEYNOTE ON BMI

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

BMI WORKSHOP KEYNOTES

Commercialization of Technology
Featuring Founders Behind Innovative
Companies Worth Over \$5 Billion

INVITED SPEAKERS

Andrew Laine
President, EMB Society,
Columbia University, 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 Systems:
What is New?

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

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



IEEE SMC 2016's 6th **Workshop on Brain-Machine Interface Systems** will be held October 9-12, 2016 in Budapest as part of **SMC 2016** - the flagship annual conference of the IEEE Systems, Man, and Cybernetics Society. The workshop, organized by the *IEEE SMC Technical Committee on Brain-Machine Interface Systems*, will also host the *IEEE Brain Initiative Annual Meeting*. The workshop is technically co-sponsored by the *IEEE Brain Initiative*, *IEEE Consumer Electronic Society*, *IEEE Computational Intelligence Society*, *IEEE Engineering in Medicine and Biology Society*, *IEEE Magnetics Society*, *IEEE Society on Social Implications of Technology*, *IEEE Solid-State Circuits Society*, and the *IEEE Standards Association*. Participation is free to all registered SMC 2016 attendees.

The theme of this year's workshop, involving the integration of concepts from Systems, Human-Machine Systems, and Cybernetics at large, 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 the 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, and feedback. 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.

As previous SMC 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. The workshop is of special interest to experts in topics related to Systems, Human-Machine Systems, and Cybernetics at large who are interested in learning how their research areas can be applied to solving various research problems necessary for the development of real-world invasive and non-invasive BMI systems.

The four-day workshop features tutorials, panels, discussions with the audience, a number of prominent invited speakers from industry and academia, and presentations of accepted papers.

A highlight of the workshop is a session on *Commercialization of Technology*, titled "Moving Research Out of the Lab Into the Real World: How Science and Technology Become Commercialized" with speakers Reese Jones, Founder Farallon, Netopia, BMUG; Jack McCauley, Co-founder Oculus; Joel Libove, Founder Furaxa, Ultraview; Stephen Pieraldi, Founder Fail Pro, 2BClear; Stuart M. Dambrot, Founder Critical Thought Media; and Bernt R. Wahl, Founder Factice, Datahunt, Dynamic Software.

The *IEEE Brain Initiative Best Paper Award* will be given to the best paper at this workshop, and five IEEE Brain Initiative student travel grants will be awarded. All papers will be eligible for the *SMC Franklin V. Taylor Memorial Award* and the *SMC Best Student Paper Award*.

Important Dates

April 15, 2016: Deadline for submission of full-length papers

May 25, 2016: Acceptance/Rejection notifications

July 09, 2016: Final papers due

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