

# WORKSHOP ON BRAIN-MACHINE INTERFACE SYSTEMS

IEEE SMC 2019

October 6-9, Bari, Italy

## BMI WORKSHOP COMMITTEE

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## BMI WORKSHOP KEYNOTE SPEAKERS

Maria Chiara Carrozza, Biorobotics Institute,  
Scuola Superiore Sant'Anna, Italy

Febo Cincotti, Sapienza Univ. Rome, Italy

## PANELS

AI and neurotech: hype or hope?

What's next for neurotechnologies and how  
are industry and industry-academia  
partnerships paving the way?

## TUTORIALS

How to run BMI systems effectively

## BRAIN HACKATHON

### Chair

Christoph Guger, g.tec, Austria

### Co-Chairs

Tiago H. Falk, INRS-EMT, Canada  
Tim Mullen, Intheon, USA  
Rossella Spataro, Univ. of Palermo, Italy  
Daniela de Venuto, Politecnico di Bari, Italy

## CALL FOR PAPERS AND ABSTRACTS

The IEEE SMC 9th Workshop on Brain-Machine Interface (BMI) Systems will be held on October 6-9, 2019 in Bari, Italy as part of SMC 2019, the flagship annual conference of the IEEE Systems, Man, and Cybernetics Society. The goal of the Workshop is to provide a forum for researchers to present research results, facilitate the interaction and intellectual exchange between researchers, developers and consumers of BMI technology. The four-day Workshop will feature a series of **tutorials, panels, student events, a hands-on demonstration session, prominent invited industry and academic speakers,** and presented **contributed papers**. Several **Student Travel Awards** and a **Best Student Paper Award** have been sponsored by the IEEE Brain Initiative. Moreover, this is the fourth year that the Workshop hosts a BR41N.IO **Brain-Computer Interface Hackathon**, with \$3000 in prizes to be won. Learn more about the IEEE SMC2019 BCI Hackathon projects and teams, how to form/join one, and how to register at <https://www.br41n.io/Bari-2019>.

The BMI Workshop is organized by the **IEEE SMC Technical Committee on Brain-Machine Interface Systems**. Participation is free to all registered SMC 2019 attendees. The theme of this year's Workshop is:

### *From Assistive Technologies to Affective Computing: What's Next for Neurotechnologies?*

BMIs were originally conceptualized as an assistive technology allowing locked-in individuals to communicate via P300 spellers. Over the years, innovative applications have emerged, including the control of exoskeletons to improve locomotion or spinal cord stimulation neurotechnologies that enable voluntary control of walking in individuals with spinal cord injury. Alternate paradigms (SSVEPs, ErrP) have also been perfected to improve communications for non-verbal individuals and new applications in affective computing and human factors have emerged. What will the future bring? BMIs are being integrated into virtual reality headsets, headphones, and eyeglasses; being used to diagnose disease; speed up rehabilitation; and for human performance enhancement. With advances in sensors and machine intelligence, what is next for BMIs?

## Call for Papers and Abstracts

We invite contributions reporting the latest advances, innovations and applications in the field of BMI. Full length papers (4-6 pages, +2 at a fee) and late-breaking research abstracts (1-2 pages) may be submitted to any of the 13 Special Sessions as well as the general BMI track on any BMI or BMI-related and neurotechnology topic:

1. **BCIs for immersive environments: augmented reality, virtual reality and more.** *Chairs: Felix Putze, Dean Krusienski, and Sergi Bermúdez i Badia*
2. **Real-world applications of BCI systems.** *Chairs: Alexander Heilinger, Christoph Guger, and Ivan Volosyak*
3. **Brain connectivity and neuronal system identification: theory and applications to brain state decoding.** *Chairs: Tim Mullen and Stefan Haufe*
4. **Multimodal machine Interfaces for "in-the-wild" experiments.** *Chairs: Mark Parent and Tiago H. Falk*
5. **Neurorehabilitation applications of brain-machine interfaces.** *Chairs: Ning Jiang and Yiwen Wang*
6. **Brain-inspired cognitive systems.** *Chairs: Yingxu Wang and Henry Leung*
7. **Neuroadaptive technologies and passive BCIs.** *Chairs: Thorsten Zander, Laurens Krol, and Tim Mullen*
8. **Recent advances in SSVEP based BCI systems.** *Chair: Ivan Volosyak*
9. **Deep learning and transfer learning for brain-machine interfacing.** *Chairs: Tim Mullen, Dongrui Wu, Yufei Huang, and Christian Kothe*
10. **Neurotechnologies in the clinic: tools, technologies and applications.** *Chairs: Tiago H. Falk, Francisco Fraga, and Claudio Babiloni*
11. **BMIs enabled by shared control: principles and applications.** *Chairs: Luca Tonin and Serafeim Perdikis*
12. **Mobile brain-body imaging.** *Chairs: Tim Mullen, Christian Kothe, and Tzzy-Ping Jung*
13. **Exploiting cognitive processes for BMIs.** *Chairs: Iñaki Iturrate and Ricardo Chavarriaga*

## Important Dates

Full-length (4-6 page, +2 pages at a fee) Paper submission due: April 19, 2019

Late-Breaking Research Abstract (1-2 pages) submission due: May 12, 2019

Notification of paper/abstract acceptance: June 7, 2019

Final manuscript/abstract due: July 7, 2019

**Papers:** Full-length papers are to be submitted electronically at <http://conf.papercept.net/conferences/scripts/start.pl>. Late-breaking abstracts should be submitted via email to [falk@emt.inrs.ca](mailto:falk@emt.inrs.ca). **Only accepted and presented full-length papers will appear in the conference proceedings and in IEEExplore.**

[http://musaelab.ca/bmi19/smc2019\\_bmi.html](http://musaelab.ca/bmi19/smc2019_bmi.html)

