

Workshop on Brain-Machine Interface Systems

IEEE SMC 2018

IEEE INTERNATIONAL CONFERENCE ON SYSTEMS, MAN, AND CYBERNETICS

Miyazaki, JAPAN, Oct 7-10, 2018



CALL FOR PAPERS AND SPECIAL SESSIONS

2018 Workshop on Brain-Machine Interface Systems and Meeting of Current and Emerging Brain Initiatives from Around the World

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Margaret Thompson, UW, USA

Media

Sarah Breinbauer, br41n.io, Austria

Technical Editor

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BRAIN INITIATIVES MEETING

James Jefferies, President, IEEE
Michael H. Smith, UC Berkeley, USA
Global Current & Emerging Brain Initiatives

BMI WORKSHOP INVITED SPEAKERS

Andrzej Cichocki, Skoltech, Russia
Mitsuo Kawato, ATR, Japan

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

Merging Minds and Machines: Integrating BMI with AI, VR, and AR – Hype or Hope

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

TUTORIALS

BMI systems - overview, applications and research challenges

Designing BMIs for ALS and other users with motor and cognitive disabilities

BRAIN HACKATHON COMMITTEE

Chair

Christoph Guger, g.tec, Austria

Co-Chairs

Tiago H. Falk, INRS-EMT, Canada
Kyousuke Kamada, Asahikawa Univ Japan
Tim Mullen, Intheon, USA

Chairs, Hackathon Student Competition

Kojiro Matsushita, Gifu Univ., Japan
Takeshi Ogawa, ATR, Japan

The IEEE SMC 2018 8th **Workshop on Brain-Machine Interface Systems** (BMI) will be held on October 7-10, 2018 in Miyazaki, Japan as part of the program of SMC 2018 – the flagship annual conference of the IEEE Systems, Man, and Cybernetics Society.

The BMI workshop is organized by the **IEEE SMC Technical Committee on Brain-Machine Interface Systems** and is technically co-sponsored by the IEEE Brain Initiative. Participation is free to all registered SMC 2018 attendees. The theme of this year's workshop is:

International Brain Initiative: Bringing Together Disciplines and Countries

Brain Initiative researchers around the world recognize their work is so complex that—despite public and private sector resources—no single initiative or institution can fully address the challenge they face: *To better understand the brain*. This complexity involves exploration involving a number of disciplines (and their interplay), and in particular within the fields of systems engineering, human factors analysis, and cybernetics. As such, to develop the next-generation neurotechnological systems envisioned today, researchers across different fields and countries will need to come together and join forces. Advances seen in neuroimaging, artificial intelligence, virtual/augmented reality, human-machine interaction, cloud computing, and nanotechnology suggest we are at a prime time for such interdisciplinary exploration.

Meeting of Global Current and Emerging Brain Initiatives

The IEEE President, **James Jefferies**, will host a special meeting of global Brain Initiative leaders from Japan, China, US, Israel, Korea, Australia, New Zealand, Europe, Canada, and IEEE working on large-scale multi-year brain projects. **The purpose of this meeting is to continue the creation of an International Brain Initiative**, and to continue the engagement of various stakeholders to ensure the success of such an endeavor. Topics to be discussed include the status of all Brain Initiatives, future collaboration and cooperation, funding opportunities for joint proposals, commercialization, neuroethics, standardization, joint research, and data sharing.

Call for Papers and Special Sessions

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 and other neurotechnologies. We invite contributions reporting the latest advances, innovations, and applications in these fields, including the integration of AI, VR, AR, and BMI, affective BMIs, hybrid BMIs, deep learning for BMIs, BMI-controlled robots, neurorehabilitation, and other related neurotechnologies. These and other 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 and other neurotechnologies, but also those with expertise in systems engineering, human-machine systems, cybernetics, neuroscience, medicine, robotics, amongst other disciplines. The four-day workshop will feature, besides the meeting of the **global brain initiatives, tutorials, panels, a brain-computer interface hackathon**, prominent **invited industry/academia speakers**, and presented **contributed papers**.

This is the third year the IEEE SMC BMI Workshop hosts a **Brain-Computer Interface Hackathon** with over \$4,000 in prizes. The BCI Hackathon is a brainstorming and collaborative marathon designed to rapidly produce fully functional BCI prototypes. The Hackathon will take place on October 7-8 and provides an environment for innovation and entrepreneurship. Learn more about the IEEE SMC2018 BCI Hackathon projects and teams, how to form/join one, and how to register at br41n.io/Miyazaki-2018.

Important Dates

Special Sessions proposal due: February 23, 2018
Approval of Special Session proposals: March 16, 2018
Paper submission due: March 31, 2018
Notification of acceptance: June 1, 2018
Author registration deadline: July 10, 2018
Camera-ready deadline: July 20, 2018
Conference dates: October 7-10, 2018

Papers: Prospective authors are invited to submit full-length papers electronically through the conference website. Papers should be concise, but contain sufficient detail and references to allow critical review.

Note: Accepted papers not physically presented at SMC 2018 are excluded from IEEE proceedings.