



Special Session on

Brain-Computer Interfaces and Cognitive Computation in Intelligent Systems

Special session code: **7579m**

<https://sites.google.com/view/smc-bmi-workshop2024/information-for-authors/approved-special-sessions>
<https://www.ieeesmc2024.org/#/special-sessions>

Paper submission deadline: **8 April 2024**

Submission link: <https://conf.papercept.net/conferences/scripts/start.pl>

Submission guidelines: <https://www.ieeesmc2024.org/#/call-for-paper>

Abstract: A Brain-Computer Interface (BCI) is a computer-based system that captures Electroencephalography (EEG) signals, processes them, and translates them into commands that are transmitted to an output device for the execution of a desired action. Thanks to their affordable cost and non-invasive nature, BCIs offer unparalleled capabilities for controlling various devices.

The BCI paradigm seamlessly aligns with Cognitive Computation and Intelligent Systems, including human-machine systems (HMS), cognitive IoT, Edge, Healthcare, and wearable computing applications. Leveraging Artificial Intelligence (AI) techniques, these systems can predict human cognitive-related outcomes.

However, in everyday activities, the interaction between BCIs and AI is limited. The lack of systematic approaches hampers the development of methods, applications, and services that can seamlessly integrate with people's daily activities. This integration is crucial for predicting future actions and adapting behavior according to individuals' intentions.

The primary objective of this special session is to bring together researchers and practitioners to present cutting-edge research results that support the advancement of BCI-based systems and Cognitive Computation methods and approaches in the context of novel Intelligent Systems. The focus will be on introducing innovative methodologies for integrating AI algorithms and Cognitive computation methods with BCI technologies and Intelligent Systems across various applications, such as HMS, IoT, Healthcare, Cyber-Physical-Social Systems. By doing so, the integration facilitates the ability to predict specific outcomes and offer corresponding explanations, all within the framework of explainable AI methodologies and optimal human-centered AI.

Topics include, but are not limited to:

- Brain-Computer Interfaces (BCI) in Intelligent Systems
- BCI for people's daily routine systems
- Machine Learning (ML) for BCI Systems
- Cognitive Computation models for BCI systems and Intelligent Systems
- Explainable Artificial Intelligence (XAI) in Intelligent Systems
- EEG signal analysis and applications
- User studies on BCI and AI usages
- Neuroergonomics
- Human-AI teaming
- Next generation Human-Machine Systems
- BCI for Robotics
- Cognitive Robotics

Special session organizers

Giuseppe D'Aniello, University of Salerno, Italy.
gidaniello@unisa.it

Domenico Lofù, Polytechnic University of Bari, Italy.
domenico.lofu@poliba.it

Elvira Brattico, Aarhus University, Denmark.
elvira.brattico@clin.au.dk

Tiago Falk, University of Quebec, Canada.
tiago.falk@inrs.ca

Angela Lombardi, Polytechnic University of Bari, Italy.
angela.lombardi@poliba.it

Hasan Ayaz, Drexel University, USA.
ha45@drexel.edu