The 2th International Workshop on Brain-specific Computing via Advanced AI Techniques (BCAIT 2025)

November 11-13, 2025, Bari, Italy (Both online and offline modes)

Traditional applications of machine learning or deep learning often directly apply generic models to neuroimaging data or make superficial structural adaptations. We highlight a paradigm shift: designing brain-intrinsic architectures, which fundamentally capture the brain's organizational principles. Further, we examine how emerging computational technologies (e.g., quantum computing, large language models, spiking neural networks, and graph neural networks) can overcome the high-dimensional challenges of brain data (e.g., EEG/fMRI/fNIRS) to transform diagnosis for various brain diseases. In addition, knowledge-driven AI methods for brain science are another key area of interest for this workshop. These approaches provide effective solutions for mitigating the limitations posed by small sample sizes and improving model interpretability and robustness. Multimodal fusion for brain diseases provides a pivotal lens for deciphering pathological mechanisms. By integrating multimodal brain-related data (e.g., electronic health records, imaging data, and electrophysiological time-series signals) and empowered by the aforementioned technologies, we investigate pathways to augment clinical decision-making. These advances catalyze transformative real-world applications including: early neuro-degenerative detection, personalized neuromodulation, inpatient risk stratification, automated seizure diagnostics, stroke rehabilitation targeting, etc., directly supporting precision neurology.

The BCAIT 2025 Workshop, co-located with the 2025 International Conference on Brain Informatics, will be held on November 11-13 in Bari, Italy. Our goal is to consolidate recent advances in brain-specific computing paradigms and foster interdisciplinary dialogue on: architectures embedding neurobiological principles, emerging computational technologies for brain-related data, knowledge-infused AI for clinical reliability. We invite researchers and scientists to submit their high-quality and original works in this workshop.

Topics of Interest

Research topics of interest include, but not limited to:

- Brain data-characteristic oriented deep learning

- emerging computational techniques assisted brain data processing
- knowledge-driven few-shot neuroimaging
- explainable neuro-AI
- brain-inspired neuromorphic computing
- neuro-encoding model interpretability
- Multimodal brain information fusion
- AI-driven neurorehabilitation targeting

Submission and Publication

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Similar to the main conference, there are 2 types of paper submissions that are possible:

Type Ⅰ: Full Paper Submissions. 9-12 pages are strongly encouraged for the regular papers including figures and references in Springer LNCS Proceedings format. All full-length papers accepted will be published by Springer as a volume of the series of LNCS/LNAI.

Type Ⅱ: Abstract Submissions. Abstracts have a word limit of 1500 words. Experimental research is particularly welcome. Accepted abstract submissions will be included in the conference program and will be published as a single, collective proceedings volume. However, it will NOT be included in the conference proceedings to be published by Springer.

All papers will be peer-reviewed and accepted based on originality, significance of contribution, technical merit, and presentation quality. If the submission gets accepted, the authors will submit a revised ("camera-ready") version that takes into account this feedback.

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