Deep Learning for Neuro-heuristic Brain Analysis is a workshop at the 33rd International Conference on Artificial Neural Networks (ICANN 2024), which will be held in Lugano-Viganello, Switzerland, September 17 - September 20, 2024.

Call for papers

Deep learning algorithms, with their capacity to identify non-linear patterns and relationships within vast datasets, have revolutionized our ability to decipher the complexities of the human brain and are thus being increasingly used in contemporary neuroscience research. Indeed, the intricate nature of neural processes calls for the use of advanced analytical tools, and deep learning provides a novel framework for extracting meaningful insights from neuroscientific data. Moreover, this trend has recently encouraged the adoption of Graph Neural Networks (GNNs) to analyze and understand how the pattern of connectivity in biological neural systems might account for human brain function and behavior. Indeed, the brain graph is a natural fit for GNN models, since they can preserve graph topological properties while learning to perform a given task.

This workshop aims to explore the integration of deep learning techniques with neuro-heuristic approaches for the advanced analysis of brain data, with a particular focus on discussing how deep learning can be used to enhance our understanding of the brain as a complex self-organizing system, how its topological properties drive the interplay between sensory processing, sensorimotor integration, and cognition, and how these properties are affected by brain diseases.

The primary goal will be to encourage discussion about the potential and the limitations of novel application of deep learning techniques in the analysis of brain data and explore the transformative impact of deep learning for tackling challenging questions in neuroscience research.

This workshop focuses on the broad spectrum of application of deep learning techniques in the analysis of brain data. Theoretical and methodological papers are welcome from any of the following areas, including but not limited to:

- Deep learning for Neuroimaging Analysis
- Deep learning for Functional Magnetic Resonance Imaging (fMRI) data analysis
- Deep learning in functional near-infrared spectroscopy (fNIRS)
- Deep learning models for Brain Signal Analysis
- Electroencephalography (EEG) data analysis using Deep Learning
- Deep learning for Brain Connectivity and Network Analysis
- Functional brain connectivity analysis using Deep Learning
- Structural brain connectivity analysis Deep Learning
- Deep Learning for graph theoretical analysis of brain networks.
- Deep learning for early detection and diagnosis of neurological disorders
- Deep learning model for brain activity classification
- Deep learning models for predicting cognitive states based on brain data
- Brain Age Estimation using deep learning models

Paper Submission

For paper submission, please proceed to our submission submission instructions outlined on the conference webpage. When submitting a paper make sure to select the correct track "**Workshop: Deep Learning for Neuro-heuristic Brain Analysis**" from the list of category. Accepted papers will be published in the conference proceedings.

- Go to the ICANN 2024 submission system and click on "Submit now".
- You will be redirected to equinOCS. Log into the system.
- Insert details of your paper and select the category "**Workshop: Deep Learning for Neuro-heuristic Brain Analysis**"
- Click on "Register Paper". Good Luck!!

Important Dates

Paper Submissions: March 15 2024
Paper Acceptance Notifications: May 15 2024
Deadline for rebuttal: May 31 2024
Final notification of Acceptance or Rejection after Rebuttal: June 10 2024
Conference: September 17 - September 20, 2024

Conference and Venue

The ICANN 2024 features three conference tracks, namely AI and Machine Learning, Bio-Inspired Computing, and the Applications Track, making it a unique forum to bring together researchers across a wide range of disciplines related to Artificial Intelligence and Neural Networks.

The conference will take place at the campus of the University of Southern Switzerland and the University of Applied Sciences and Arts of Southern Switzerland, Via la Santa 1, 6962 Lugano-Viganello, Switzerland.

Session Organisers

- Alessandro Villa (University of Lausanne)
- Alessandra Lintas (University of Lausanne)
- Luca Pasa (University of Padua)
- Nicolò Navarin (University of Padua)
- Alberto Testolin (University of Padua)
- Marco Zorzi (University of Padua)
- Alessandro Sperduti (University of Padua)

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