

Network Neuroscience

Thematic Session within VipIMAGE 2019

VII ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Porto, Portugal, 16-18 October 2019

www.fe.up.pt/vipimage

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Description

The human brain is one of the most complex system existing in nature. The emergence of cognitive and physiological phenomena is the outcome of a complex series of interactions that occur hierarchically. Hence, explaining cognition is not possible just by taking into account the single parts the brain is composed of, but a comprehensive view of the collective behaviors of its constituents and the interactions with its environment should be considered to study the global system behavior. A network formulation simplifies the analysis of a complex system by providing mathematical tools able to capture different aspects of its organization in a compact manner.

Graph theoretical methods have been extensively applied to many neuroimaging datasets in order to describe the topological properties of both functional and structural brain networks. Although these methods have become a gold standard for analysing the complex behavior of the human brain, several important issues related to the identification of the networks, their temporal evolution and new complex metrics for their topological description need to be further explored in order to provide a general and comprehensive analysis framework. Indeed, the human brain is a highly flexible dynamic system: executing both complex and simple functions requires the ongoing reconfiguration of the connections among the general- and specific-domain subsystems.

Topics of interest include (but are not restricted to):

- Brain Connectivity from Images
- Applying machine learning to high-dimensional brain connectivity features
- Models of neuronal system dynamics, behavior, and cognition
- Diagnostic Imaging based on system neuroscience
- Exploiting structural-functional relationships in brain connectivity
- Computational neuroscience
- Computational Intelligence
- Neural Networks and Applications
- Machine Learning in neuroscience

Publications

The **proceedings book** will be **published by Springer** under the book series "[Lecture Notes in Computational Vision and Biomechanics](#)" and **indexed by Elsevier Scopus**.

A **special issue** of the Taylor & Francis international journal "[Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization](#)", indexed in Clarivate Analytics Emerging Sources, Elsevier Scopus and dblp, **will be published**. All authors of works presented in VipIMAGE 2019 will be invited to submit an extended version to the special issue.

Important dates

- **Submission of extended abstracts: May 31, 2019** (final deadline)
- Final Papers (non-mandatory): July 15, 2019

Organizers

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