

CALL FOR PAPERS

IEEE Signal Processing Society

IEEE Journal on Selected Topics in Signal Processing

Special Issue on **Advanced Signal Processing in Brain Networks**

Aims and Scope

Network models of the brain have become an important tool of modern neurosciences to study fundamental organizational principles of brain structure & function. Their connectivity is captured by the so-called *connectome*, the complete set of structural and functional links of the network. There is still an important need for advancing current methodology; e.g., going towards increasing large-scale models; incorporating multimodal information in multiplex graph models; dealing with dynamical aspects of network models; and matching data-driven and theoretical models.

These challenges form multiple opportunities to develop and adapt emerging signal processing theories and methods at the interface of graph theory, machine learning, applied statistics, simulation, and so on, to play a key role in the analysis and modeling and to bring our understanding of brain networks to the next level for key applications in cognitive and clinical neurosciences, including brain-computer interfaces.

Topics of Interest include (but are not limited to):

- Multi-layer/multiplex networks
- Various types of brain data including (f)MRI, M/EEG, NIRS, ECoG/multi-electrode arrays, genomics, ...
- Novel subspace decompositions (e.g., tensor models, sparsity-driven regularization, low-rank properties)
- Multiscale decompositions (e.g., graph wavelets)
- Advanced statistical inference (e.g., two-step procedures, Riemannian statistics)
- Machine learning (e.g., graph kernels, structured penalties, deep neural networks)
- Dynamical systems and simulation approaches
- Time delay techniques for brain networks
- Big data methods for brain networks (e.g., approximate inference, distributed computing on graphs)
- Dynamical graphical models (e.g., Bayesian non-parametrics, structure learning)
- Clustering (e.g., overlapping/fuzzy communities)

Important Dates:

Manuscript submission due: ~~November 1, 2015~~ **November 15, 2015**

First review completed: January 15, 2016

Revised manuscript due: February 28, 2016

Second review completed: April 15, 2016

Final manuscript due: June 1, 2016

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