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Call for Papers
IEEE Signal Processing Society
IEEE SIGNAL PROCESSING MAGAZINE

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Special Issue on Graph Signal Processing: Foundations and Emerging Directions

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As modern data is getting more heterogeneous and intricate, identifying and leveraging its intrinsic structure and geometry emerges as a crucial task. The postulation of parsimonious models for the available information and the existing interdependencies is critical not only to understand the data at hand, but also to define effective compression, reconstruction, and inference architectures to process the available information. Graph signal processing (GSP) has approached this problem by modeling the structure of the data using a graph and, then, viewing the available information as a signal defined on top of it. A plethora of graph signals exists, with examples ranging from neurological activity patterns defined on top of brain networks to the spread of epidemics over social networks. Most early GSP efforts assumed that the underlying network was known, and then analyzed how the graph's algebraic and spectral characteristics impact the properties of the graph signals of interest. More recently, the focus has been on setups where the graph is implicit and must be learned from the data itself. While the theoretical and practical success achieved by GSP in the last years has been noticeable, many issues remain open, with, e.g., robust, nonlinear, or higher-dimensional GSP being at their infancy.

This Special Issue aims at introducing recent GSP advances, identifying some of its emerging directions, and presenting relevant practical problems that can be successfully addressed using GSP tools. The overall goal is to provide an overview of the current state of GSP, making it accessible to a broader audience who will ultimately contribute to shape the future of the field.

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

- Theoretical foundations for GSP: Advanced models for graphs, graph signals and graph filters
- Nonlinear GSP
- Beyond graph models: Hyper-based and tensor-based GSP
- Statistical and robust GSP
- Graph topology inference, including directed graphs and applications to causality
- Machine learning for graph signals and geometric data
- Applications of SP over directed graphs to causal inference
- Deep learning architectures for graph signals and geometric data
- Algorithmic advances, distributed computations and large-scale graphs
- Bioengineering, neuroscience and bioinformatics using GSP-tools
- Communication, power, and transportation networks using GSP-tools
- Finance, economics, and social networks using GSP-tools
- Speech, image and video processing using GSP-tools

Submission Process

The Special Issue seeks to offer broad coverage of the field including most recent developments in both theory and applications. Submissions of comprehensive overviews are strongly encouraged, as well as papers dealing with new and emerging applications provided that are accessible for a broad audience. White papers are required, and full articles are invited based on the review of white papers. Submissions will be reviewed according to the IEEE Signal Processing Magazine guidelines, and should not have been published or under review elsewhere

Manuscripts should be submitted online at http://mc.manuscriptcentral.com/sps-ieee using the Manuscript Central interface, see http://www.signalprocessingsociety.org/publications/periodicals/spm/ for guidelines and information.

Important Dates

White papers (4 pages) due: October 21, 2019	Revised manuscripts due: June 7, 2020
Invitation notification: November 28, 2019	Final acceptance notification: July 7, 2020
Manuscripts due: February 22, 2020	Final manuscripts due: August 1, 2020
Review results and decision notification: May 1, 2020	Publication due: **November 1, 2020**

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