Proceedings of the IEEE

May 2018 / VOL. 106 / NO. 5

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SPECIAL ISSUE

SPECIAL ISSUE ON APPLICATIONS OF GRAPH THEORY

Edited by T. Adali and A. Ortega

787 Topology Identification and Learning Over Graphs: Accounting for Nonlinearities and Dynamics
By G. B. Giannakis, Y. Shen, and G. V. Karanikolas
|INVITED PAPER| This article focuses on the problem of learning graphs from data, in particular, to capture the nonlinear and dynamic dependencies.

808 Graph Signal Processing: Overview, Challenges, and Applications
By A. Ortega, P. Frossard, J. Kovačević , J. M. F. Moura, and P. Vandergheynst
|INVITED PAPER| This article presents methods to process data associated to graphs (graph signals) extending techniques (transforms, sampling, and others) that are used for conventional signals.

829 Graph Anomaly Detection Based on Steiner Connectivity and Density
By J. Cadena, F. Chen, and A. Vullikanti
|INVITED PAPER| This article focuses on the important problem of anomaly detection in dynamic networks that evolve over time.

846 Applications of Community Detection Techniques to Brain Graphs: Algorithmic Considerations and Implications for Neural Function
By J. O. Garcia, A. Ashourvan, S. F. Muldoon, J. M. Vettel, and D. S. Bassett
|INVITED PAPER| The article studies "small-world" properties at a distributed level, studying how modularity can be detected and maximized, presenting the utility of these approaches in uncovering behaviorally-relevant structure in neuroimaging data.

868 A Graph Signal Processing Perspective on Functional Brain Imaging
By W. Huang, T. A. W. Bolton, J. D. Medaglia, D. S. Bassett, A. Ribeiro, and D. Van De Ville
|INVITED PAPER| This article addresses how the signal processing view on brain graphs can provide additional insights into brain network analysis.

886 Application of Graph Theory to Assess Static and Dynamic Brain Connectivity: Approaches for Building Brain Graphs
By Q. Yu, Y. Du, J. Chen, J. Sui, T. Adali, G. D. Pearlson, and V. D. Calhoun
|INVITED PAPER| This article reviews the approaches proposed to date for building graphs to summarize brain connectivity and presents their comparative review.

907 Graph Spectral Image Processing
By G. Cheung, E. Magli, Y. Tanaka, and M. K. Ng
|INVITED PAPER| This article shows how graph-based approaches can complement existing image processing methods.

931 Graph-Theoretic Analysis of Power Systems
By T. Ishizaki, A. Chakrabortty, and J.-I. Imura
|INVITED PAPER| This article provides a comprehensive overview of the applications of graph theory in power system modeling, dynamics, coherency, and control.

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DEPARTMENTS

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By J. Baillieul, G. Grenier, and G. Setti

784 SCANNING THE ISSUE
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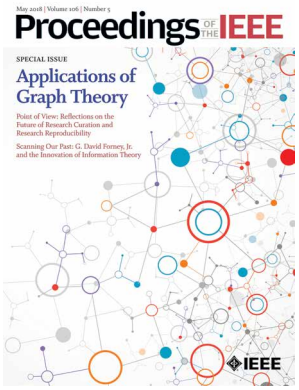
1006 SCANNING OUR PAST
From Theory to Practice: G. David Forney, Jr. and the Innovation of Information Theory
By A. B. Magoun

1010 FUTURE SPECIAL ISSUE/SPECIAL SECTIONS



On the Cover: The month's cover image is an artist's rendition of a graphical network, which beautifully captures the essence of this special issue.

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953 Network Topology and Communication–Computation Tradeoffs in Decentralized Optimization

By A. Nedić, A. Olshevsky, and M. G. Rabbat

|INVITED PAPER| This article considers scenarios where a distributed computation has to be accomplished through the cooperation of multiple physically distributed nodes, with applications in the context of sensor networks, cooperating robots, among others.

977 Electrical Networks and Algebraic Graph Theory: Models, Properties, and Applications

By F. Dörfler, J. W. Simpson-Porco, and F. Bullo

|INVITED PAPER| This article provides an overview of the connections of algebraic graph theory and the design and analysis of electric circuits, from integrated circuits to large distribution grids.

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