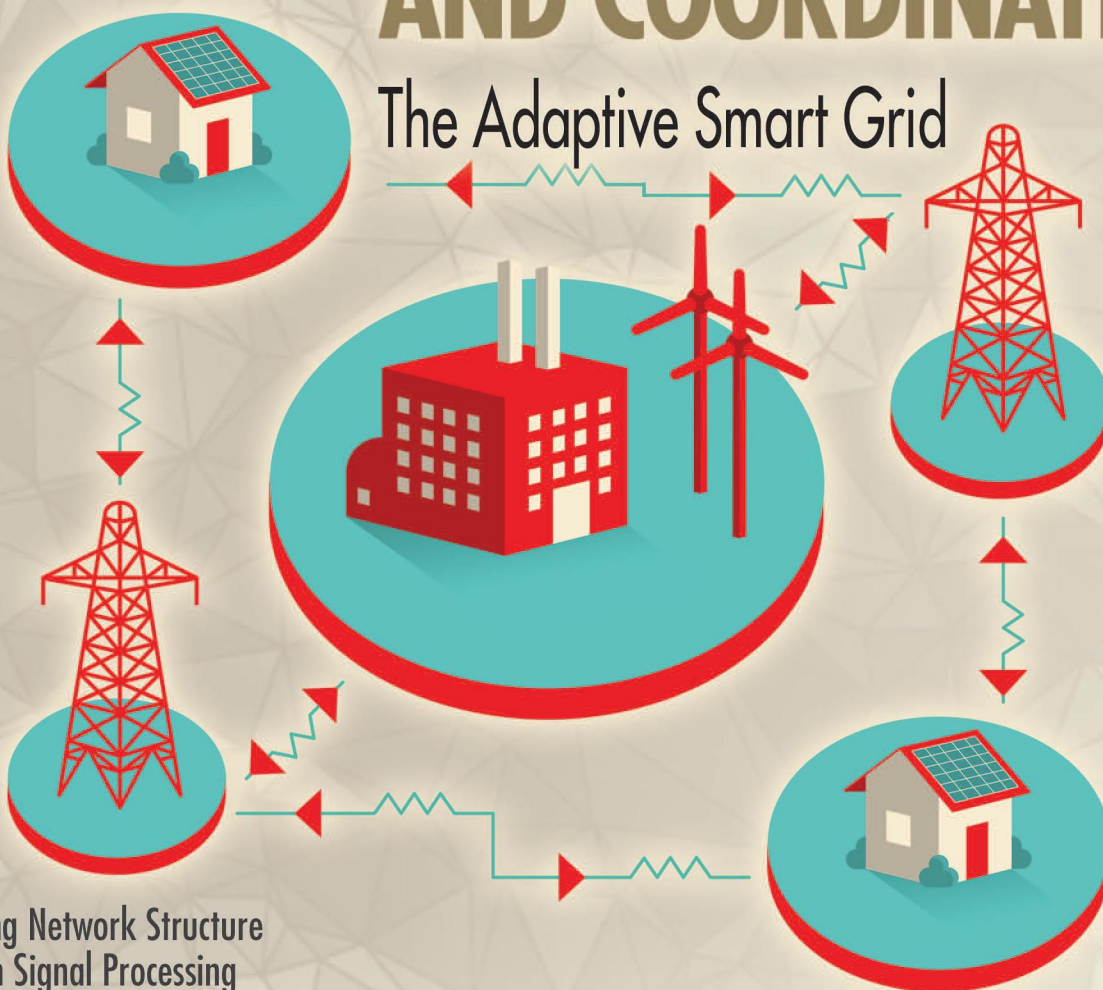


IEEE Signal Processing MAGAZINE

Volume 36 | Number 3 | May 2019

INTELLIGENT SIGNAL PROCESSING AND COORDINATION



The Adaptive Smart Grid

Identifying Network Structure
via Graph Signal Processing

Learning Graphs From Data

Count Time-Series Analysis

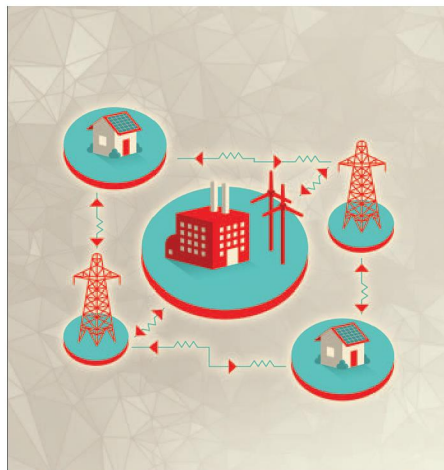
Reproducible Research: Best Practices
and Potential Misuse

Contents

Volume 36 | Number 3 | May 2019

FEATURES

- 16** **CONNECTING THE DOTS**
Gonzalo Mateos, Santiago Segarra,
Antonio G. Marques,
and Alejandro Ribeiro
- 44** **LEARNING GRAPHS
FROM DATA**
Xiaowen Dong, Dorina Thanou,
Michael Rabbat,
and Pascal Frossard
- 64** **COUNT TIME-SERIES ANALYSIS**
Dimitris Manolakis, Nicholas
Bosowski, and Vinay K. Ingle
- 82** **INTELLIGENT SIGNAL PROCESSING
AND COORDINATION FOR THE
ADAPTIVE SMART GRID**
Pirathayini Srikantha
and Deepa Kundur



ON THE COVER

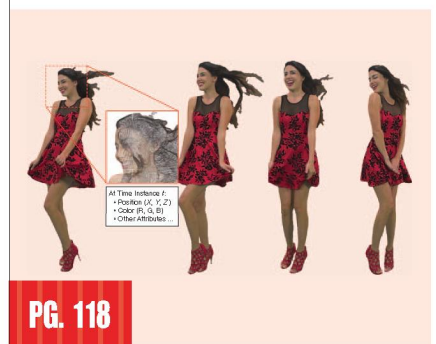
Four exciting feature articles are included in this issue of *IEEE Signal Processing Magazine*. Topics include identifying network structure via graph signal processing (SP), solutions to the problem of graph learning, state-of-the-art developments for modeling count time series in an SP framework, and intelligent SP and coordination for the adaptive smart grid. Enjoy the issue!

COVER IMAGE: @ISTOCKPHOTO.COM/9AMSTOCK
BACKGROUND: IMAGE LICENSED BY INGRAM PUBLISHING

- 103** **Conference Highlights**
Images of the Athenian Sun
*Nikos Nikolaidis, Nikolaos V. Boulgouris,
Lisimachos Paul Kondi,
Christophoros Nikou,
and Konstantinos N. Plataniotis*
- 106** **Perspectives**
Reproducible Research: Best Practices
and Potential Misuse
Emil Björnson
- 110** **Lecture Notes**
A Data Analytics Perspective of Power
Grid Analysis—Part 2: Teaching Old
Power Systems New Tricks
*Sithan Kanna, Ahmad Moniri,
Yili Xia, Anthony G. Constantinides,
and Danilo P. Mandic*
- 118** **Standards in a Nutshell**
Video-Based Point-Cloud-Compression
Standard in MPEG: From Evidence
Collection to Committee Draft
*Evee S. Jang, Marius Preda,
Khaled Mammou, Alexis M. Tourapis,
Jungsun Kim, Danilo B. Graziosi,
Sungryeul Rhyu, and Madhukar Budagavi*
- 128** **In the Spotlight**
Spotlight on the Multimedia Signal
Processing Technical Committee
*Marta Mrak, Enrico Magli,
and Frédéric Dufaux*

COLUMNS

- 9** **Reader's Choice**
Top Downloads in IEEE Xplore
- 12** **Special Reports**
Signal Processing Advances Consumer
Electronics
John Edwards



IEEE SIGNAL PROCESSING MAGAZINE (ISSN 1053-5888) (ISPREG) is published bimonthly by the Institute of Electrical and Electronics Engineers, Inc., 3 Park Avenue, 17th Floor, New York, NY 10016-5997 USA (+1 212 419 7900). Responsibility for the contents rests upon the authors and not the IEEE, the Society, or its members. Annual member subscriptions included in Society fee. Nonmember subscriptions available upon request. **Individual copies:** IEEE Members US\$20.00 (first copy only), nonmembers US\$241.00 per copy. Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limits of U.S. Copyright Law for private use of patrons: 1) those post-1977 articles that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923 USA; 2) pre-1978 articles without fee. Instructors are permitted to photocopy isolated articles for noncommercial classroom use without fee. **For all other copying, reprint, or republication permission,** write to IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854 USA. Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All rights reserved. Periodicals postage paid at New York, NY, and at additional mailing offices. **Postmaster:** Send address changes to IEEE Signal Processing Magazine, IEEE, 445 Hoes Lane, Piscataway, NJ 08854 USA. Canadian GST #125634188 **Printed in the U.S.A.**

Digital Object Identifier 10.1109/MSP.2019.2899081

- 3 From the Editor**
Going Toward 6G
Robert W. Heath, Jr.
- 6 President's Message**
People's Needs or People's Greed
Ali H. Sayed
- 124 Dates Ahead**
- 127 Humor**
Machine-Learning Class
Robert W. Heath, Jr. and Nuria González-Prelcic



©ISTOCKPHOTO.COM/BUZZER

GlobalSIP 2019 will be held in beautiful Ottawa, Ontario, Canada from 11 to 14 November 2019.

EDITOR-IN-CHIEF

Robert W. Heath, Jr.—The University of Texas at Austin, U.S.A.

AREA EDITORS

Feature Articles

Matthew McKay—Hong Kong University of Science and Technology, Hong Kong SAR of China

Special Issues

Namrata Vaswani—Iowa State University, U.S.A.

Columns and Forum

Roberto Togneri—The University of Western Australia

e-Newsletter

Ervin Sejdic—University of Pittsburgh, U.S.A.

Social Media and Outreach

Tiago Henrique Falk—INRS, Canada

Special Initiatives

Andres Kwasinski—Rochester Institute of Technology, U.S.A.

EDITORIAL BOARD

Daniel Bliss—Arizona State University, U.S.A.
 Danijela Cabric—University of California, U.S.A.
 Volkan Cevher—École polytechnique fédérale de Lausanne, Switzerland
 Mrityunjay Chakraborty—Indian Institute of Technology, Kharagpur, India
 George Chrisikos—Qualcomm, Inc., U.S.A.
 Elza Erkip—New York University, U.S.A.
 Alfonso Farina—Leonardo S.p.A., Italy
 Clem Karl—Boston University, U.S.A.
 C.-C. Jay Kuo—University of Southern California, U.S.A.

Erik Larsson—Linköping University, Sweden
 David Love—Purdue University, U.S.A.
 Maria G. Martini—Kingston University, U.K.
 Helen Meng—City University of Hong Kong, Hong Kong SAR of China
 Meinard Mueller—Friedrich-Alexander Universität Erlangen-Nürnberg, Germany
 Phillip A. Regalia—U.S. National Science Foundation
 Alejandro Ribeiro—University of Pennsylvania, U.S.A.
 Douglas O'Shaughnessy—INRS Université de Recherche, Canada
 Osvaldo Simeone—Kings College London, U.K.
 Milica Stojanovic—Northeastern University, U.S.A.
 Ananthram Swami, Army Research Labs, U.S.A.
 Jong Chul Ye—KAIST, South Korea
 Qing Zhao—Cornell University, U.S.A.
 Josiane Zerubia—INRIA Sophia-Antipolis Méditerranée, France

ASSOCIATE EDITORS—COLUMNS AND FORUM

Ivan Bajic—Simon Fraser University, Canada
 Balázs Bank—Budapest University of Technology and Economics, Hungary
 Panayiotis (Panos) Georgiou—University of Southern California, U.S.A.

Hana Godrich—Rutgers University, U.S.A.
 Rodrigo Capobianco Guido—São Paulo State University, Brazil
 Yuan-Hao Huang—National Tsing Hua University, Taiwan
 Euee Seon Jang—Hanyang University, Republic of Korea
 Vishal Patel—Rutgers University, U.S.A.
 Christian Ritz—University of Wollongong, Australia
 Changshui Zhang—Tsinghua University, China
 H. Vicky Zhao—Tsinghua University, China

ASSOCIATE EDITORS—e-NEWSLETTER

Nesreen Ahmed—Intel, U.S.A.
 Behnaz Ghorrani—Florida Atlantic University, U.S.A.
 Yang Li—Harbin Institute of Technology, China
 Alessio Medda—Georgia Tech Research Institute, U.S.A.
 Irena Orovic—University of Montenegro, Podgorica
 Sarah Ostadabbas—Northeastern University, U.S.A.
 Ronen Talmon—Technion, Israel

ASSOCIATE EDITOR—SOCIAL MEDIA/OUTREACH

Guijin Wang—Tsinghua University, China

IEEE SIGNAL PROCESSING SOCIETY

Ali H. Sayed—President
 Ahmed Tewfik—President-Elect
 Fernando Pereira—Vice President, Conferences
 Nikos D. Sidiropoulos—Vice President, Membership
 Sergio Theodoridis—Vice President, Publications
 Walter Kellerman—Vice President, Technical Directions

IEEE SIGNAL PROCESSING SOCIETY STAFF

William Colacchio—Senior Manager, Publications and Education Strategy and Services
 Rebecca Wollman—Publications Administrator

IEEE PERIODICALS MAGAZINES DEPARTMENT

Jessica Welsh, *Managing Editor*
 Geraldine Krolin-Taylor, *Senior Managing Editor*
 Janet Dudar, *Senior Art Director*
 Gail A. Schnitzer, *Associate Art Director*
 Theresa L. Smith, *Production Coordinator*
 Mark David, *Director, Business Development - Media & Advertising*
 Felicia Spagnoli, *Advertising Production Manager*
 Peter M. Tuohy, *Production Director*
 Kevin Lisankie, *Editorial Services Director*
 Dawn M. Melley, *Staff Director, Publishing Operations*

Digital Object Identifier 10.1109/MSP.2019.2904429

SCOPE: *IEEE Signal Processing Magazine* publishes tutorial-style articles on signal processing research and applications as well as columns and forums on issues of interest. Its coverage ranges from fundamental principles to practical implementation, reflecting the multidimensional facets of interests and concerns of the community. Its mission is to bring up-to-date, emerging and active technical developments, issues, and events to the research, educational, and professional communities. It is also the main Society communication platform addressing important issues concerning all members.



IEEE prohibits discrimination, harassment, and bullying.
 For more information, visit
<http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.