CSS Publications Activities

**Vice-President**

THOMAS PARISINI *Imperial College London and University of Trieste*

http://www.ieeecss.org/publications/css-publications

**Journal Editors**

IEEE Transactions on Automatic Control

ALESSANDRO ASTOLFII *Imperial College London and University of Rome “Tor Vergata”*

http://www.ieeecss.org/publications/tac

IEEE Transactions on Control Systems Technology

ANDREA SERRANI *Ohio State University*

http://www.ieeecss.org/publications/tcst

IEEE Transactions on Control of Network Systems

IOANNIS PASCHALIDIS *Boston University*

JEFF SHAMMA *Deputy Editor-in-Chief King Abdullah University of Science and Technology*

http://www.ieeecss.org/publications/transactions-control-network-systems

IEEE Control Systems Magazine

JONATHAN HOW *Massachusetts Institute of Technology*

http://www.ieeecss.org/publications/csm

IEEE Control Systems Letters

MARIA ELENA VALCHER *University of Padua*

http://ieee-cssletters.dei.unipd.it/index.php

**Electronics Editor**

E-letter on Systems, Control and Signal Processing

JIANGHAI HU *Purdue University*

http://www.ieeecss.org/publications/e-letter/e-letter

*Submission and editorial instructions can be found on each publication’s homepage*

For subscription to the monthly E-Letter, please visit:

http://www.ieeecss.org/newsletter/subscriptions
REGULAR PAPERS

Approximate Best-Response Dynamics in Random Interference Games .................................................. I. Bistritz and A. Leshem 1549
Performance Bounds on Spatial Coverage Tasks by Stochastic Robotic Swarms .................................................. F. Zhang, A. L. Bertozzi, K. Elamvazhuthi, and S. Berman 1563
Stabilizing Stochastic Predictive Control Under Bernoulli Dropouts .......................................................... P. K. Mishra, D. Chatterjee, and D. E. Quevedo 1579
Observability of Finite Labeled Transition Systems ................................................................................. K. Zhang, T. Liu, and D. Cheng 1591
An Adaptive-Observer-Based Robust Estimator of Multi-sinusoidal Signals .................................................... B. Chen, G. Pin, W. M. Ng, S. Y. Hui, and T. Parisini 1618
On Weight-Prioritized Multitask Control of Humanoid Robots ............................................................................ K. Bouyarmane and A. Kheddar 1632
Optimal Denial-of-Service Attack Scheduling With Energy Constraint Over Packet-Dropping Networks ........................................................................................................................................... J. Qin, M. Li, L. Shi, and X. Yu 1648
Almost Global Consensus on the $n$-Sphere .................................................................................................. J. Markdahl, J. Thunberg, and J. Gonçalves 1664
Proximate Time-Optimal Control of a Harmonic Oscillator .............................................................................. R. A. Braker and L. Y. Pao 1676
Characterizations of Input-to-State Stability for Infinite-Dimensional Systems .............................................. A. Mironchenko and F. Wirth 1692
Stabilization of Networked Control Systems Under Clock Offsets and Quantization ............................................. K. Okano, M. Wakaiki, G. Yang, and J. P. Hespanha 1708
Uniform Value for Some Nonexpansive Optimal Control Problems With General Evaluations ......................... X. Li 1724

TECHNICAL NOTES

Formation-Preserving Properties of Cooperative Kinematic Agents With or Without External Influence of Target Attraction .................................................................................................................. W. Li 1737
Asynchronous Implementation of Distributed Coordination Algorithms: Conditions Using Partially Scrambling and Essentially Cyclic Matrices .................................................................................. Y. Chen, W. Xia, M. Cao, and J. Liu 1745

(Contents Continued on Back Cover)
Distributed Nonsmooth Optimization With Coupled Inequality Constraints via Modified Lagrangian Function ................................................................. S. Liang, X. Zeng, and Y. Hong 1753
Importance Splitting for Finite-Time Rare Event Simulation ............................................. G. Jiang and M. C. Fu 1760
Worst-Case Prediction Performance Analysis of the Kalman Filter ...................................... S. Yasini and K. Pelckmans 1768
Constrained Consensus in Continuous-Time Multiagent Systems Under Weighted Graph ........ Z. Zhou and X. Wang 1776
Robust Consensus Analysis and Design Under Relative State Constraints or Uncertainties ................................................................. D. H. Nguyen, T. Narikiyo, and M. Kawanishi 1784
Synchronization of Coupled Dynamical Systems: Tolerance to Weak Connectivity and Arbitrarily Bounded Time-Varying Delays ................................................................. Z. Meng, T. Yang, G. Li, W. Ren, and D. Wu 1791
Finite Horizon Tracking Control of Boolean Control Networks ........................................... Z. Zhang, T. Leifeld, and P. Zhang 1798
Reduced-Order Internal Models in the Frequency Domain .................................................... P. Laakkonen and L. Paunonen 1806
Input-to-State Stabilizing Control for Cyber-Physical Systems With Multiple Transmission Channels Under Denial of Service ................................................................. A.-Y. Lu and G.-H. Yang 1813
Extremum Cycle Times in Time Interval Models ............................................................... P. Declerck 1821
Verification of Prognosability for Labeled Petri Nets ............................................................ X. Yin 1828
Compositional Abstraction and Safety Synthesis Using Overlapping Symbolic Models ................................................................. P.-J. Meyer, A. Girard, and E. Witrant 1835
Toward Event-Triggered Extended State Observer ............................................................... Y. Huang, J. Wang, D. Shi, and L. Shi 1842
Data-Driven Coordinated Attack Policy Design Based on Adaptive $L_2$-Gain Optimal Theory ........ L. An and G.-H. Yang 1850
A Pulse-Based Integrated Communication and Control Design for Decentralized Collective Motion Coordination ................................................................. H. Gao and Y. Wang 1858
32 Control Theory for Synthetic Biology
Recent advances in system characterization, control design, and controller implementation for synthetic biology
VICTORIA HSIAO, ANANDH SWAMINATHAN, and RICHARD M. MURRAY

63 Data-Driven Sparse Sensor Placement for Reconstruction
Demonstrating the benefits of exploiting known patterns
KRITHIKA MANOHAR, BINGNI W. BRUNTON, J. NATHAN KUTZ, and STEVEN L. BRUNTON

87 Feedback Control Engineering for Cooperative Community Development
Tools for financial management advice for low-income individuals
HUGO GONZALEZ VILLASANTI, LUIS FELIPE GIRALDO, and KEVIN M. PASSINO

3 FROM THE EDITOR
Ethically Aligned Design

5 ABOUT THIS ISSUE
Control Theory for Synthetic Biology

9 PRESIDENT’S MESSAGE
On the Tools of Our Trade

12 25 YEARS AGO

14 TECHNICAL ACTIVITIES
Technical Committee on Smart Grids
Technical Committee on Nonlinear Systems and Control

20 PEOPLE IN CONTROL
Ali Mesbah
Guillaume Mercère
Jakob Stoustrup
Qing-Chang Zhong
Sam Coogan
102 FOCUS ON EDUCATION
An Introduction to Nonlinear Robust Control for Unmanned Quadrotor Aircraft

122 BOOKSHELF
Book Announcements

125 CONFERENCE REPORTS
The 21st International Conference on Systems Theory, Control and Computing (ICSTCC 2017)
The 56th IEEE Conference on Decision and Control (CDC)

134 CONFERENCE CALENDAR

135 CSS BUSINESS
Minutes of the IEEE Control Systems Society Board of Governors Meeting

144 ON THE LIGHTER SIDE
The Local Optimization Yokel

MISSION STATEMENT AND SCOPE: As the official means of communication for the IEEE Control Systems Society, IEEE Control Systems Magazine publishes interesting, useful, and informative material on all aspects of control system technology for the benefit of control educators, practitioners, and researchers. With this mission statement in mind, IEEE Control Systems Magazine encourages submissions, both feature articles and columns, on all aspects of control system technology.

SUBMISSION OF MANUSCRIPTS: A feature article typically provides an in-depth treatment of either an application of control technology, a tutorial on some area of control theory, or an innovation in control education.

IEEE Control Systems Magazine publishes a variety of columns. “Applications of Control” columns are industrially oriented summaries of innovations in control technology; “Focus on Education” typically describes some aspect of education such as novel control experiments. “Lecture Notes” can be theoretical in nature as long as they have clear tutorial value and intent. See recent issues for examples of these and other types of columns. Authors are encouraged to contact the editor-in-chief about the suitability of potential columns.

A detailed Author’s Guide, a sample formatted manuscript, and LATEX template can be found at http://www.ieeecss.org/publications/css/submissions. The specifications in this Guide should be followed by all submissions.

All manuscripts should be submitted electronically to the IEEE Control Systems Magazine website, https://css.paperplaza.net/conferences/scripts/start.pl, with inquiries on appropriateness of content emailed to jhow@mit.edu.

SPECIAL ISSUES: IEEE Control Systems Magazine encourages proposals for special issues. Proposers are encouraged to contact the editor-in-chief to discuss potential topics.

BOOKS AND CONFERENCES: Submit information about recently published books to the associate editor for book reviews. Submit information about past and future conferences to the corresponding editor for conferences.

ADVERTISING: IEEE Control Systems Magazine accepts advertising for educational products, books, software, conferences, employment, and control-related technology. For information about advertising, contact Mark David, m.david@ieee.org, +1 732 465 6473.

IEEE CONTROL SYSTEMS MAGAZINE is published bimonthly by The Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, New York, NY 10016-5997, U.S.A. +1 212 419 7900. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society, or its members. The magazine is a membership benefit of the IEEE Control Systems Society, and subscriptions are US$4.00 per member per year (included in Society fee). Replacement copies for members are available for US$23.00 (one copy only). Nonmembers can purchase individual copies for US$108.00. Nonmember subscription prices are available on request. Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limits of the 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 01929, U.S.A.; and 2) pre-1978 articles without fee. For other copying, reprint, or republication permission, write to: Copyrights and Permissions Department, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854-U.S.A. Copyright © 2018 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 Control Systems Magazine, IEEE, 445 Hoes Lane, Piscataway, NJ 08854 U.S.A. Canadian GST #125634188 Printed in U.S.A.
American Control Conference

JUNE 27-29, 2018
MILWAUKEE, WISCONSIN, USA
ACC 2018
http://acc2018.a2c2.org/
Important Dates

Paper Submissions Open: November 1, 2017

Invited Session Proposals Due: January 15, 2018 (PASSED)

Contributed and Invited Papers Due: January 15, 2018 (PASSED)

Acceptance Notice: April 23, 2018

Final Submissions Due: May 21, 2018 (PASSED)

CONFERENCE ON TECHNOLOGY AND APPLICATIONS

AUGUST 21-24, 2018
Copenhagen, Denmark

CCTA 2018 will be held at the Scandic Hotel Copenhagen Scandic Copenhagen is located in central Copenhagen, with views of one of the three lakes and the city, and close to the Tivoli Gardens and the pedestrian street, Strøget. With its leafy parklands and canal side living, Copenhagen is a green and liveable city to visit. Summer jazz and street food markets fill the city during summer months, and there is never far to a sandy beach or harbour bar.

http://ccta2018.ieeecss.org/
DECEMBER 17-19, 2018
MIAMI, FLORIDA, USA
Conference on Decision and Control

Important Dates

Invited Session Proposals Due:
March 10, 2018 (Passed)

Paper Submissions Due:
March 20, 2018 (Passed)

Workshop Proposals Due:
May 1, 2018 (Passed)

Paper and Workshop Decision Notification:
Mid-July 2018

https://cdc2018.ieeecss.org