CSS Publications Activities

**Vice-President**

IOANNIS PASCHALIDIS *Boston University*
http://ieeecss.org/publications

**Journal Editors**

IEEE Transactions on Automatic Control

ALESSANDRO ASTOLFI *Imperial College London and University of Rome “Tor Vergata”*
http://ieeecss.org/publication/transactions-automatic-control

IEEE Transactions on Control Systems Technology

ANDREA SERRANI *Ohio State University*
http://ieeecss.org/publication/transactions-control-systems-technology

IEEE Transactions on Control of Network Systems

JEFF SHAMMA *University of Illinois at Urbana-Champaign*
ANNA SCAGLIONE Deputy Editor-in-Chief *Arizona State University*
http://ieeecss.org/publication/transactions-control-network-systems

IEEE Control Systems Letters

MARIA ELENA VALCHER *University of Padua*
http://ieeecss.org/publication/control-systems-letters

IEEE Control Systems Magazine

RODOLPHE SEPULCHRE *University of Cambridge*
http://ieeecss.org/publication/ieee-control-systems-magazine

IEEE Open Journal of Control Systems

SONIA MARTINEZ *University of California, San Diego*
http://ieeecss.org/publication/open-journal-control-systems

**Electronics Editors**

CSS State-Space Forum
FABIO PASQUALETTI *University of California, Riverside*
ANKUSH CHAKRABARTY *Mitsubishi Electric Research Laboratories*
https://state-space.ieeecss.org

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

A Small-Gain Theory for Abstract Systems on Topological Spaces ......................................................... M. Bin and T. Parisini 4494

Abstraction of Continuous-Time Systems Based on Feedback Controllers and Mixed Monotonicity .......... V. Sinyakov and A. Girard 4508

Feedback Nash Equilibria in Differential Games With Impulse Control .................................................. U. Sadana, P. V. Reddy, and G. Zaccour 4523

On the Exact Convergence to Nash Equilibrium in Hypomonotone Regimes Under Full and Partial-Decision Information .................................................. D. Gadjov and L. Pavel 4539

Homothetic Tube Model Predictive Control for Nonlinear Systems ......................................................... S. V. Raković, L. Dai, and Y. Xia 4554

Analysis of Theoretical and Numerical Properties of Sequential Convex Programming for Continuous-Time Optimal Control ......................................................... R. Bonalli, T. Lew, and M. Pavone 4570


A Deterministic Least Squares Approach for Simultaneous Input and State Estimation ......................... G. Gakis and M. C. Smith 4602

Combining Prior Knowledge and Data for Robust Controller Design .................................................... J. Berberich, C. W. Scherer, and F. Allgöwer 4618

Decentralized False-Data Injection Attacks Against State Omniscience: Existence and Security Analysis .... T.-Y. Zhang, D. Ye, and Y. Shi 4634

Decentralized Composite Optimization in Stochastic Networks: A Dual Averaging Approach With Linear Convergence ................................................................. C. Liu, Z. Zhou, J. Fei, Y. Zhang, and Y. Shi 4650

Decentralized Linear Quadratic Systems With Major and Minor Agents and Non-Gaussian Noise ............... M. Afshari and A. Mahajan 4666

Inner Approximating Robust Reach-Avoid Sets for Discrete-Time Polynomial Dynamical Systems ........ C. Zhao, S. Zhang, L. Wang, and B. Xue 4682

Nonlinear Two-Time-Scale Stochastic Approximation: Convergence and Finite-Time Performance ........ T. T. Doan 4695

Lyapunov Characterizations of Exponential Mean Square Input-to-State Stability for Discrete-Time Markovian Switching Nonlinear Systems ......................................................... A. Impicciatore, P. Pepe, and A. D’Innocenzo 4706

Data-Driven Resilient Predictive Control Under Denial-of-Service ......................................................... W. Liu, J. Sun, G. Wang, F. Bullo, and J. Chen 4722

The Implicit Maximal Positively Invariant Set ......................................................................................... S. V. Raković and S. Zhang 4738

Secure Your Intention: On Notions of Pre-Opacity in Discrete-Event Systems ........................................ S. Yang and X. Yin 4754

Convergence Analysis of Dual Decomposition Algorithm in Distributed Optimization: Asynchrony and Inexactness ......................................................................................... Y. Su, Z. Wang, M. Cao, M. Jia, and F. Liu 4767

On Structural Rank and Resilience of Sparsity Patterns ........................................................................... M.-A. Belabbas, X. Chen, and D. Zelazo 4783

Gradient-Tracking-Based Distributed Optimization With Guaranteed Optimality Under Noisy Information Sharing ........................................................................................................ Y. Wang and T. Başar 4796

(Contents Continued on Page 4493)
Distributed Optimization Over Dependent Random Networks ........................................ A. Aghajan and B. Touri 4812
Joint Coefficient and Solution Estimation for the 1-D Wave Equation: An Observer-Based Solution to Inverse Problems ................................................................. C. Kitsos, M. Bajodek, and L. Baudouin 4827
On the Sample Complexity of Decentralized Linear Quadratic Regulator With Partially Nested Information Structure ................................................................. L. Ye, H. Zhu, and V. Gupta 4841
On-the-Fly Control of Unknown Systems: From Side Information to Performance Guarantees Through Reachability ......................................................... F. Djeumou, A. P. Vinod, E. Goubault, S. Putot, and U. Topcu 4857
Robust Adaptive Dynamic Event-Triggered Control of Switched Nonlinear Systems ................................................................. L. Long, F. Wang, and Z. Chen 4873

TECHNICAL NOTES
Direct Data-Driven Control of Linear Time-Varying Systems ........................................ B. Nortmann and T. Mylvaganam 4888
Cautious Bayesian MPC: Regret Analysis and Bounds on the Number of Unsafe Learning Episodes ................................................................. K. P. Wabersich and M. N. Zeilinger 4896
Efficient Sampling Policy for Selecting a Subset With the Best ................................ G. Zhang, B. Chen, Q.-S. Jia, and Y. Peng 4904
Data-Driven Minimum Entropy Control for Stochastic Nonlinear Systems Using the Cumulant-Generating Function ................................................................. Q. Zhang, J. Zhang, and H. Wang 4912
Stabilization in Distribution of Hybrid Systems by Intermittent Noise .......................... W. Mao, J. Hu, and X. Mao 4919
On Stochastic Stabilization via Nonsmooth Control Lyapunov Functions ........................ P. Osinenko, G. Yaremenko, and G. Malaniya 4925
Fixed-Time Convergent Distributed Observer Design of Linear Systems: A Kernel-Based Approach ................................................................. P. Ge, P. Li, B. Chen, and F. Teng 4932
Stability of Nonlinear Impulsive Systems: Self-Triggered Comparison System Approach ................................................................. X. Li, Y. Wang, and S. Song 4940
Finite-Time Distributed Average Tracking for Multiagent Optimization With Bounded Inputs ................................................................. X. Shi, G. Wen, J. Cao, and X. Yu 4948
Delayed and Switched Deployment of Second-Order Agents on a Line Segment: Delays and Switches Do Not Matter ................................................................. A. Aleksandrov, A. Fradkov, and A. Semenov 4956
Explicit Solutions and Stability Properties of Homogeneous Polynomial Dynamical Systems ................................................................. C. Chen 4962
On the Existence of Invariantly Differentiable Functionals for Globally Exponentially Stable Time-Delay Systems ................................................................. S. Talebi, M. Ataei, and P. Pepe 4970
On the Design of Regularized Explicit Predictive Controllers From Input–Output Data ................................................................. V. Breschi, A. Sassella, and S. Formentin 4977
Best Effort Workload Disparity Minimization in Multi-Agent Systems With Capacity Constraints ................................................................. G. Olivera, T. Charalambous, L. Faramondi, R. Setoja, and A. Gasparri 4998
New Versions of Gradient Temporal-Difference Learning ........................................... D. Lee, H.-D. Lim, J. Park, and O. Choi 5006
Stabilizability of Linear Dynamical Systems Using Sparse Control Inputs ................. C. Sriram, G. Joseph, and C. R. Murthy 5014
Consensus Tracking of Singular Multiagent Systems via Sliding-Mode Approach ........ X. Liu, Y. Xie, F. Li, and W. Gui 5022
Fixed-Time Stable Proximal Dynamical System for Solving MVIPs .............................. K. Garg, M. Baramvall, R. Gupta, and M. Benosman 5029
Global Feedback Regulation for a Class of Uncertain Nonlinear Systems via Integral Control: A Gain Control Technique ................................................................. X. Zhang, X. Chen, and C. Wen 5037
Fixed-Time Lyapunov Criteria of Stochastic Nonlinear Systems and Its Generalization ................................................................. H. Min, S. Shi, S. Xu, J. Guo, and Z. Zhang 5052
Nonfragile-Observer-Based Integral Sliding Mode Control for a Class of Uncertain Switched Hyperbolic Systems ................................................................. Y. Kao, X. Liu, M. Song, L. Zhao, and Q. Zhang 5059
Aizerman Conjectures for a Class of Multivariate Positive Systems ............................ R. Drummond, C. Guiver, and M. C. Turner 5073

(Contents Continued from Front Cover)

(Contents Continued on Back Cover)
A Minimum Principle for Affine-Convex Control Problems With Nonregular Mixed Constraints

J. A. Becerril, K. L. Cortez, and M. do R. de Pinho 5081

A Terminal Set Feasibility Governor for Linear Model Predictive Control

T. Skibik, D. Liao-McPherson, and M. M. Nicotra 5089

Predictive Feedback Control for Inventory Systems Subject to Delays and Constraints

B. B. Farraa, R. Abbou, and J. J. Loiseau 5096

Constrained Receding Horizon Output Estimation of Linear Distributed Parameter Systems

J. Xie, J.-P. Humaloja, C. R. Koch, and S. Dubljevic 5103

LQG Differential Stackelberg Game Under Nested Observation Information Patterns

Z. Li, D. Marelli, M. Fu, and H. Zhang 5111

Fully Distributed Algorithm for Resource Allocation Over Unbalanced Directed Networks Without Global Lipschitz Condition

J. Zhang, L. Liu, X. Wang, and H. Ji 5119

Regression Filtration With Resetting to Provide Exponential Convergence of MRAC for Plants With Jump Change of Unknown Parameters

A. Glushchenko, V. Petrov, and K. Lastochkin 5127

Structural Estimation of Partially Observable Markov Decision Processes

Y. Chang, A. Garcia, Z. Wang, and L. Sun 5135

Distributed Event-Triggered Control of Networked Strict-Feedback Systems via Intermittent State Feedback

L. Sun, X. Huang, and Y. Song 5142

Adaptive Output Feedback Control of Nonlinear Systems: A Dynamic-Gain Scaling Approach

X. Jia, S. Xu, and S. Zhou 5150

A Robustness Analysis to Structured Channel Tampering Over Secure-by-Design Consensus Networks, M. Fabris and D. Zelazo


Optimal Markov Policies for Finite-Horizon Constrained MDPs With Combined Additive and Multiplicative Utilities, U. M. Kumar, V. Kavitha, S. P. Bhat and N. Hemachandra

Data-Based Control Design for Output-Error Linear Discrete-Time Systems With Probabilistic Stability Guarantees, W. D’Amico, A. Bisoffi and M. Farina

Edit Mechanism Synthesis for Opacity Enforcement Under Uncertain Observations, W. Duan, R. Liu, M. P. Fanti, C. N. Hadjicostis and Z. Li

Counter-Example Guided Inductive Synthesis of Control Lyapunov Functions for Uncertain Systems, D. Masti, F. Fabiani, G. Gnecco and A. Bemporad

Differentially Private Algorithms for Synthetic Power System Datasets, V. Dvorkin and A. Botterud

Optimal Control of Distributed Ensembles With Application to Bloch Equations, R. Chertovskih, N. Pogodaev, M. Staritsyn and A. P. Aguiar

Structural Conditions for Chattering Avoidance in Implicitly Discretized Sliding Mode Differentiators, R. Seeber and S. Koch

Secure State Estimation Under Actuator and Sensor Attacks Using Sliding Mode Observers, T. Keijzer, R. M. G. Ferrari and H. Sandberg

Parameterized Barrier Functions to Guarantee Safety Under Uncertainty, A. Alan, T. G. Molnar, A. D. Ames and G. Orosz


Privacy-Informed Consensus-Based Secondary Control in Cyber-Physical DC Microgrids, M. S. Sadabadi

Robust Control of Discrete-Time Systems With Coefficient Matrices Given by Polytopic Martingales, T. Kitahiro, Y. Hosoe and T. Hagiwara

Multi-Agent Dynamic Scheduling With a Posteriori Path Tracking and Collision Avoidance Using Model Predictive Control, J. Bertoncini, V. Nikitina and M. Gerds
A Matching Principle for Power Transfer in Stochastic Thermodynamics, O. M. Miangolarra, A. Taghvaei and T. T. Georgiou .................................................. pp. 2107-2112


Safety-Critical Control for Systems With Impulsive Actuators and Dwell Time Constraints, J. Breeden and D. Panagou ........................................................................ pp. 2119-2124

Overlapping Fusion Estimation for Discrete Time-Varying Interconnected Systems, Y. Zhang, B. Chen and L. Yu ........................................................................................................ pp. 2125-2130

Beyond Nyquist in Frequency Response Function Identification: Applied to Slow-Sampled Systems, M. van Haren, L. Mirkin, L. Blanken and T. Oomen ................................................................. pp. 2131-2136


Fusion of Distance Measurements Between Agents With Unknown Correlations, C. Cros, P. -O. Amblard, C. Prieur and J. -F. Da Rocha ........................................................................ pp. 2143-2148

Imitation and Transfer Learning for LQG Control, T. Guo, A. A. A. Makdah, V. Krishnan and F. Pasqualetti........................................................................................................ pp. 2149-2154


Rollout-Based Charging Strategy for Electric Trucks With Hours-of-Service Regulations, T. Bai, Y. Li, K. H. Johannson and J. Mårtensson ........................................................................... pp. 2167-2172

Markov Chain Monte Carlo for Gaussian: A Linear Control Perspective, B. Yuan, J. Fan, Y. Wang, M. Tao and Y. Chen ........................................................................................................... pp. 2173-2178

Novel Control Approaches Based on Projection Dynamics, Z. Fu, C. Cenedese, M. Cucuzzella, Y. Kawano, W. Yu and J. M. A. Scherpen ........................................................................................................ pp. 2179-2184

Consensus Control Based on Privacy-Preserving Two-Party Relationship Test Protocol, H. Wang, D. Li, Z. Guan, Y. Liu and J. Liu ........................................................................................................ pp. 2185-2190

Differentially Flat Learning-Based Model Predictive Control Using a Stability, State, and Input Constraining Safety Filter, A. W. Hall, M. Greeff and A. P. Schoellig ........................................................................ pp. 2191-2196

Tracking MPC Tuning in Continuous Time: A First-Order Approximation of Economic MPC, M. Facchino, A. Bemporad and M. Zanon ........................................................................................................ pp. 2197-2202

Combinatorial Optimization Approach to Client Scheduling for Federated Learning, T. Omori and K. Kashima ........................................................................................................... pp. 2203-2208

System Identification and Control Using Quadratic Neural Networks, L. Rodrigues and S. Givigi .............................................................................................................................. pp. 2209-2214


Connectivity-Preserving Formation Tracking for Multiple Double Integrators by a Self-Tuning Adaptive Distributed Observer, Z. Pan and B. M. Chen ................................................................ pp. 2221-2226

Quantum Pontryagin Neural Networks in Gamkrelidze Form Subjected to the Purity of Quantum Channels, N. Binandeh Dehaghani, A. P. Aguiar and R. Wisniewski ................................................................ pp. 2227-2232


Robust Admittance Control With Complementary Passivity, J. Xu, X. Chen, Y. Tan and W. Zou ................................................................................................................................. pp. 2239-2244


Biomolecular Control Circuit With Inherent Bi-Stability Is Applicable for Automatic Detection of Gut Infection, Y. Huang and M. N. Mayalu ........................................................................................................ pp. 2251-2256
Robust Constraint-Following Control for Uncertain Mechanical Systems With Generalized Udwadia-Kalaba Approach, Z. Zhu et al. ................................................................................................................................................................................................................. pp. 2263-2268
State Aggregation for Distributed Value Iteration in Dynamic Programming, N. Vertovec and K. Margellos ......................................................................................................................................................................................................................... pp. 2269-2274
On the Benefit of Nonlinear Control for Robust Logarithmic Growth: Coin Flipping Games as a Demonstration Case, A. V. Proskurnikov and B. R. Barmish ......................................................................................................................................................................................................................... pp. 2275-2280
Robust Microphase Separation Through Chemical Reaction Networks, F. Blanchini, E. Franco, G. Giordano and D. Osmanović ......................................................................................................................................................................................................................... pp. 2281-2286
Interconnection Schemes in Modeling and Control, P. Borja, J. Ferguson and A. van der Schaft ......................................................................................................................................................................................................................... pp. 2287-2292
Data-Driven Output-Feedback Control for Unknown Switched Linear Systems, K. Hu and T. Liu ......................................................................................................................................................................................................................... pp. 2299-2304
Data-Driven Robust Backward Reachable Sets for Set-Theoretic Model Predictive Control, M. Attar and W. Lucia ......................................................................................................................................................................................................................... pp. 2305-2310
Certified Control Oriented Learning: A Robust Predictor-Based Approach, R. Singh and M. Sznaier ......................................................................................................................................................................................................................... pp. 2311-2316
Hybrid Dynamical Control for Discharging Rate Consensus in AC-Bus Microgrids, M. C. Merchán-Riveros and C. Albea ......................................................................................................................................................................................................................... pp. 2323-2328
Distributionally Robust Differential Dynamic Programming With Wasserstein Distance, A. Hakobyan and I. Yang ......................................................................................................................................................................................................................... pp. 2329-2334
42 Microscale 2D Particle Position Control
The individual and group cases
ION MATEI, MAKSYM ZHENIROVSKYY, JOHAN DE KLEER, and ANNE PLOCHOWIETZ

63 The REEF Autonomous Vehicles Laboratory
A collaboration hub expediting flight capabilities for the U.S. department of defense and academic research
MICHAEL ANDERSON, J. HUMBERTO RAMOS, BENJAMIN DICKINSON, KEVIN BRINK, and PRASHANT GANESH
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.

IEEE Control Systems 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 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—ISSN 1066-033X (ISSAD7) is published bimonthly by The Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, New York, NY 10016, 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. To order individual copies for members and nonmembers, please e-mail the IEEE Contact Center at contactcenter@ieee.org. Member and nonmember subscription prices 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 01923, 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 © 2023 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, IEEE, 445 Hoes Lane, Piscataway, NJ 08854 U.S.A. Canadian GST #125634188

Printed in U.S.A
Conference on
Control Technology and Applications
CCTA 2023
August 23–25, Bridgetown, Barbados

Paper Submission Opens:
November 4, 2022

Paper Submission Due:
January 31, 2023 (Passed)

Decision Notification:
April 21, 2023

Registration Opens:
Middle of May, 2023

Final Submissions:
Middle of June, 2023 (Passed)

https://ieeeeccta.org/
Conference on Decision and Control

CDC 2023

December 13–15, Singapore

Initial Paper to L-CSS with CDC option
March 17, 2023 (Passed)
Invited Session Proposals
March 24, 2023 (Passed)
Initial Paper Submission
March 31, 2023 (Passed)
Workshop Proposals
May 15, 2023 (Passed)
Decision Notification
Mid-July, 2023
Final Submission
September 10, 2023

https://cdc2023.ieeecss.org/
American Control Conference
ACC 2024

July 8–12, Toronto, Canada

L-CSS option Submission
September 08, 2023

ACC Manuscript Submission
September 22, 2023

Acceptance/Rejection Notice
January 22, 2024

Final Manuscript Submission
March 13, 2024

https://acc2024.a2c2.org/
Conference on Control Technology and Applications

CCTA 2024

August 21–23, Newcastle upon Tyne, UK

Paper Submission Opens
November 01, 2023

Tutorial Session Proposals Due
February 01, 2024

Paper Submission Due
February 05, 2024

Invited Session Proposals Due
March 01, 2024

Decision Notification
April 08, 2024

Registration Opens
May 01, 2024

Final Camera-Ready Submission
June 15, 2024

https://ccta2024.ieeecss.org/