

# E-LETTER ON SYSTEMS, CONTROL, & SIGNAL PROCESSING ISSUE 390, FEBRUARY 2021

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Welcome to Issue 390 of the CSS E-letter available [here](#).

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The next E-Letter will be mailed out at the beginning of March 2021.

## Contents

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### 1. IEEE CSS Headlines

- 1.1 Become a CSS Member
- 1.2 Follow the CSS Social Media Accounts
- 1.3 CSS Technically Cosponsored Events
- 1.4 CSS Publications Content Digest
- 1.5 IEEE Transactions on Automatic Control
- 1.6 IEEE CSS Technical Committee on Intelligent Control
- 1.7 The 60th IEEE Conference on Decision and Control, Austin, USA
- 1.8 CFP: IEEE Trans. on Automatic Control Special Issue on Learning/Control
- 1.9 CFP: IEEE Trans. on Ctrl. of Network Sys. Special Issue on Smart Networks
- 1.10 Roadmap 2030: Call for Vision Statement for Control for Societal Challenges
- 1.11 IEEE CSS Outreach Fund Solicitation

### 2. Miscellaneous

- 2.1 Spring School on Data-driven Model Learning for Dynamic Systems
- 2.2 European PhD Award on Systems and Control
- 2.3 Autonomous Drone Racing Competition
- 2.4 EMGR 5.9 Released: EMpirical GRamian Framework
- 2.5 Virtual Seminar Series on Games, Decisions and Networks

### 3. Books

- 3.1 Distributionally Robust Learning
- 3.2 Hybrid Feedback Control

#### **4. Journals**

- 4.1 Systems & Control Letters
- 4.2 Journal of Dynamical and Control Systems
- 4.3 Evolutions Equations and Control Theory
- 4.4 Asian Journal of Control
- 4.5 IET Control Theory & Applications
- 4.6 International Journal of Control
- 4.7 International Journal of Control, Automation, and Systems
- 4.8 European Journal of Control
- 4.9 Automatica
- 4.10 Applied and Computational Mathematics an International Journal
- 4.11 Journal of Pure and Applied Mathematics
- 4.12 Control Engineering Practice
- 4.13 Journal of Process Control
- 4.14 ISA Transactions
- 4.15 Nonlinear Analysis: Hybrid Systems
- 4.16 Journal of the Franklin Institute
- 4.17 CFP: Dynamic Games and Applications for Modeling/Control of Epidemics
- 4.18 CFP: International Journal of Robust and Nonlinear Control
- 4.19 CFP: Nonlinear Analysis: Hybrid Systems

#### **5. Conferences and Workshops**

- 5.1 The 60th IEEE Conference on Decision and Control, USA
- 5.2 Roadmap 2030: Vision Statements for Control for Societal Challenges, Virtual
- 5.3 IFAC Workshop on Time Delay Systems, China
- 5.4 Mediterranean Conference on Control and Automation, Italy
- 5.5 International Conference on Unmanned Aircraft Systems, Greece
- 5.6 World Congress: Math Problems in Engineering and Sciences, Czech Republic
- 5.7 IFAC Conference on Modeling and Control of Nonlinear Systems, Online
- 5.8 Workshop on Computation-Aware Algorithmic Design for CPS, Virtual
- 5.9 International Conference on Methods in Automation and Robotics, Poland
- 5.10 International Conference on System Theory and Control, Romania
- 5.11 International Conference on Event-Based Control and Communication, Virtual
- 5.12 Learning in Control: Satellite to CPS Week 2021, Virtual
- 5.13 International Conference on Control, Automation and Systems, Korea
- 5.14 Modeling, Estimation and Control Conference, USA

#### **6. Positions**

- 6.1 PhD: Marie Curie PhD Positions, EU
- 6.2 PhD: KU Leuven, Belgium
- 6.3 PhD: University of Lorraine, France
- 6.4 PhD: North Carolina A&T State University, USA
- 6.5 PhD: University of Lorraine, France
- 6.6 PhD: Maynooth University, Ireland
- 6.7 PhD: Delft University of Technology, The Netherlands
- 6.8 PhD: Luleå University of Technology, Sweden
- 6.9 PhD: Delft University of Technology, The Netherlands

- 6.10 PhD: University of Lille, France
- 6.11 PhD: Lund University, Sweden
- 6.12 PhD: Arizona State University, USA
- 6.13 PhD: University of Kentucky, USA
- 6.14 Postdoc: University of Kentucky, USA
- 6.15 Postdoc: Arizona State University, USA
- 6.16 Postdoc: Maynooth University, Ireland
- 6.17 Postdoc: The University of Colorado Boulder, USA
- 6.18 Postdoc: Rice University, USA
- 6.19 Postdoc: Washington University in St. Louis, USA
- 6.20 Postdoc: University of Utah, USA
- 6.21 Faculty: University of Waterloo, Canada
- 6.22 Faculty: Maynooth University, Ireland
- 6.23 Faculty: University of Florida, USA
- 6.24 Faculty: Technical University of Denmark, Denmark
- 6.25 Faculty: KU Leuven, Belgium
- 6.26 Faculty: KU Leuven, Belgium
- 6.27 Faculty: University of Maryland, USA

## 1 IEEE CSS Headlines

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### 1.1. Become a CSS Member

Contributed by: Ahmad Taha, [ahmad.taha@utsa.edu](mailto:ahmad.taha@utsa.edu)

Become a CSS Member by visiting the following link <https://bit.ly/2ZBWCCs>.

[Back to the contents](#)

### 1.2. Follow the CSS Social Media Accounts

Contributed by: Ahmad Taha and Ankush Chakrabarty [ahmad.taha@utsa.edu](mailto:ahmad.taha@utsa.edu), [chakrabarty@merl.com](mailto:chakrabarty@merl.com)

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[Back to the contents](#)

### 1.3. CSS Technically Cosponsored Events

Contributed by: Luca Zaccarian, CSS AE Conferences, [zaccarian@laas.fr](mailto:zaccarian@laas.fr)

The following items have been recently included in the list of events technically cosponsored by the IEEE Control Systems Society:

- 2021 19th International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt 2021). Philadelphia (PA), USA. October 18-21, 2021. <http://www.wi-opt.org/index.html>

- 2021 25th International Conference on System Theory, Control and Computing (ICSTCC 2021). Iași, Romania. October 20-23, 2021. <https://icstcc2021.ac.tuiasi.ro/>

- 2021 33rd Chinese Control and Decision Conference (CCDC 2021). Kunming, China. May 22-24, 2021. <http://www.ccdc.neu.edu.cn/>

- 29th Mediterranean Conference on Control and Automation (MED 2021). Brindisi, Italy. June 22-25, 2021. <http://www.med2021.poliba.it/>

- 25th International Conference on Methods and Models in Automation and Robotics (MMAR 2020). Miedzyzdroje, Poland. August 23-26, 2021. <http://www.mmar.edu.pl>

For a full listing of CSS technically cosponsored conferences, please visit

<http://ieeecss.org/conferences/technically-co-sponsored>

and for a list of the upcoming and past CSS main conferences please visit

<http://ieeecss.org/conferences/financially-sponsored>

[Back to the contents](#)

#### 1.4. CSS Publications Content Digest

Contributed by: Kaiwen Chen, [kaiwen.chen16@imperial.ac.uk](mailto:kaiwen.chen16@imperial.ac.uk)

The IEEE Control Systems Society Publications Content Digest is a novel and convenient guide that helps readers keep track of the latest published articles.

The CSS Publications Content Digest, available at

<http://ieeecss.org/publications-content-digest>

provides lists of current tables of contents of the periodicals sponsored by the Control Systems Society.

Each issue offers readers a rapid means to survey and access the latest peer-reviewed papers of the IEEE Control Systems Society. We also include links to the Society's sponsored Conferences to give readers a preview of upcoming meetings.

[Back to the contents](#)

#### 1.5. IEEE Transactions on Automatic Control

Contributed by: Alessandro Astolfi, [ieeetac@imperial.ac.uk](mailto:ieeetac@imperial.ac.uk)

IEEE Transactions on Automatic Control

Volume 66 (2021), Issue 1 (January)

##### Papers:

- Push-Pull Gradient Methods for Distributed Optimization in Networks Shi Pu, Wei Shi, Jinming Xu, Angelia Nedich, p. 1
- Formal and Efficient Synthesis for Continuous-Time Linear Stochastic Hybrid Processes Luca Laurenti, Morteza Lahijanian, Alessandro Abate, Luca Cardelli, Marta Kwiatkowska, p. 17
- Modeling collective behaviors: A moment-based approach Silun Zhang, Axel Ringh, Xiaoming Hu, Johan Karlsson, p. 33
- Approximate Supermodularity of Kalman Filter Sensor Selection Luiz Fernando de Oliveira Chamon, George J. Pappas, Alejandro Ribeiro, p. 49
- Homothetic tube-based robust Economic MPC with integrated Moving Horizon Estimation ZIHANG DONG, David Angeli, p. 64
- Parsimonious Bayesian Filtering in Markov Jump Systems with Applications to Networked Control Alexandre Mesquita, p. 76
- Forward Invariance of Sets for Hybrid Dynamical Systems (Part II) Jun Chai, Ricardo G. Sanfelice, p. 89
- Feedback Stabilization of a Class of Diagonal Infinite-Dimensional Systems with Delay Boundary Control Hugo Lhachemi, Christophe Prieur, p. 105
- On Passivity, Reinforcement Learning and Higher-Order Learning in Multi-Agent Finite Games Bolin Gao, Lacro Pavel, p. 121
- Distributed Economic Dispatch for Energy Internet Based on Multi-Agent Consensus Control Wushun Chen, Tao Li, p. 137
- Finite Blocklength Entropy-Achieving Coding for Linear System Stabilization Yirui Cong, Xiangyun Zhou, Rodney A. Kennedy, p. 153
- Asynchronous Gradient-Push Mahmoud Assran, Michael Rabbat, p. 168
- Practical Synchronization in Networks of Nonlinear Heterogeneous Agents with Application to Power Systems Dhruvajit Chowdhury, Hassan K. Khalil, p. 184

- Randomized Greedy Sensor Selection: Leveraging Weak Submodularity Abolfazl Hashemi, Mahsa Ghasemi, Haris Vikalo, Ufuk Topcu, p. 199
- Systematic Design of Robust Event-Triggered State and Output Feedback Controllers for Uncertain Non-holonomic Systems Pengpeng Zhang, Tengfei Liu, Zhong-Ping Jiang, p. 213
- Remote State Estimation in the Presence of an Active Eavesdropper Kemi Ding, Xiaoqiang Ren, Alex S. Leong, Daniel E. Quevedo, Ling Shi, p. 229
- Optimal control of systems subject to input-dependent hydraulic delays Charles-Henri Clerget, Nicolas Petit, p. 245

### Technical Notes and Correspondence:

- An Augmented Lagrangian for Optimal Control of DAE Systems: Algorithm and Properties Marco Aurèlio Schmitz de Aguiar, Eduardo Camponogara, Bjarne A. Foss, p. 261
- Exponential stabilization of a star-shaped thermoelastic network system based on the extended state observer with time-varying gains Lei Wang, Zhiqiang Gao, Xuesong Zhou, Zhongjie Han, p. 267
- Boundary delayed observer-controller design for reaction-diffusion systems Rami Katz, Emilia Fridman, Anton Selivanov, p. 275
- Over- and Under-Approximating Reachable Sets for Perturbed Delay Differential Equations Bai Xue, Qi-uye Wang, Shenghua Feng, Naijun Zhan, p. 283
- Global Convergence for Replicator Dynamics of Repeated Snowdrift Games Pouria Ramazi, Ming Cao, p. 291
- Temporal Parallelization of Bayesian Smoothers S. Sarkka and A. F. Garcia-Fernandez, p. 299
- Predictor based output-feedback control of linear stochastic systems with large I/O delays Filippo Cacace, Alfredo Germani, Costanzo Manes, Marco Papi, p. 307
- On Practical Stability Preservation under Fast Sampling and Accurate Quantization of Feedbacks for Non-linear Time-Delay Systems Mario Di Ferdinando, Pierdomenico Pepe, Alessandro Borri, p. 314
- Distributed Optimal Control for Linear Multi-Agent Systems on General Digraphs Zhuo Zhang, Weisheng Yan, Huiping Li, p. 322
- Efficient Implementation of Rate Constraints for Nonlinear Optimal Control Yuanbo Nie, Eric C. Kerrigan, p. 329
- New Results on the Characterization of Strictly Positive Real Matrix Transfer Functions Mojtaba Hakimi-Moghaddam, Augusto Ferrante, p. 335
- On realizability of specific biquadratic impedances as three-reactive seven-element series-parallel networks for inerter-based mechanical control Kai Wang, Michael Z. Q. Chen, p. 340
- State Consensus for Discrete-time Multi-agent Systems over Time-varying Graphs Ji-Lie Zhang, Xiang Chen, Guoxiang Gu, p. 346
- H2 Performance of Series-Parallel Networks: A Compositional Perspective Mathias Hudoba de Badyn, Mehran Mesbahi, p. 354
- Input-to-state stability of impulsive delay systems with multiple impulses Peng Li, Xiaodi Li, Jianquan Lu, p. 362
- A Rendezvous Strategy with R2 Reachability for Kinematic Agents Souradip De, Soumya Ranjan Sahoo, Pankaj Wahi, p. 369
- Linear-Quadratic Time-Inconsistent Mean-Field Type Stackelberg Differential Games: Time-Consistent Open-Loop Solutions Jun Moon, Hyun Jong Yang, p. 375

- Optimizing prediction dynamics with saturated inputs for robust model predictive control Hoai-Nam Nguyen, p. 383
- A Unifying Framework for Strong Structural Controllability Jiajia Jia, Henk J. van Waarde, Harry L. Trentelman, M. Kanat Camlibel, p. 391
- Discrete-time  $k$ -positive linear systems Rola Al-Seidi, Michael Margaliot, Juergen Garloff, p. 399
- New tests for the stability of 2D Roesser models Olivier Bachelier, Thomas Cluzeau, Driss Mehdi, Nima Yeganefar, p. 406
- On the Equivalence of Youla, System-level and Input-output Parameterizations Yang Zheng, Luca Furieri, Antonis Papachristodoulou, Na Li, Maryam Kamgarpour, p. 413
- Event-Triggered Stabilization of a Class of Nonlinear Time-Delay Systems Pengpeng Zhang, Tengfei Liu, Zhong-Ping Jiang, p. 421
- Contraction Analysis of Nonlinear DAE Systems Hung D. Nguyen, Thanh Long Vu, Jean-Jacques Slotine, Konstantin Turitsyn, p. 429
- Lyapunov-Krasovskii characterizations of stability notions for switching retarded systems Ihab Haidar, Pierdomenico Pepe, p. 437
- Model-based dynamic event-triggered control for systems with uncertainty: a hybrid system approach Kun-Zhi Liu, Andrew R. Teel, Xi-Ming Sun, Xue-Fang Wang, p. 444
- Event-based Formation Control for Multi-agent Systems Under DoS attacks Yang Tang, Dandan Zhang, Peng Shi, Wenbing Zhang, Feng Qian, p. 452
- Networked Control under DoS Attacks: Trade-offs between Resilience and Data Rate Shuai Feng, Ahmet Cetinkaya, Hideaki Ishii, Pietro Tesi, Claudio De Persis, p. 460
- Interval estimation for uncertain systems via polynomial chaos expansions Weixin Han, Zhenhua Wang, Yi Shen, Bin Xu, p. 468
- Correction to "Satisficing in Multi-Armed Bandit Problems" Paul Reverdy, Vaibhav Srivastava, Naomi Ehrlich Leonard, p. 476

[Back to the contents](#)

## 1.6. IEEE CSS Technical Committee on Intelligent Control

Contributed by: Tansel Yucelen, [yucelen@usf.edu](mailto:yucelen@usf.edu)

Becoming a Member of the IEEE CSS Technical Committee on Intelligent Control

I am writing this message as the Chair of the IEEE Control System Society (CSS) Technical Committee on Intelligent Control (TCIC). Here is our mission statement:

*To foster a community of members who advance the science and technology and provide forums for the theoretical and practical considerations of intelligent control techniques and their application to devices and systems.*

Please visit the TCIC webpage

<http://intelligent-control.ieeecss.org/intelligent-homeforfurtherdetails>.

Since our TCIC has the opportunity to bridge multiple disciplines ranging from electrical, mechanical, and aerospace engineering to computer science, we are looking for new members and student members that can contribute to intelligent control techniques and their applications (e.g., space systems, robotics, manufacturing systems, automotive systems, automated highway systems, aircraft, spacecraft, underwater vehicles,

land vehicles, process control, consumer products, and healthcare).

If you are interested to be a member or a student member, please send me (1) your name, (2) your position, (3) your affiliation, and (4) your CV. (Note that you need to be a member or a student member of the IEEE and CSS.)

Tansel Yucelen, Ph.D., IEEE TCIC Chair ([yucelen@usf.edu](mailto:yucelen@usf.edu))

[Back to the contents](#)

### **1.7. The 60th IEEE Conference on Decision and Control, Austin, USA**

Contributed by: Sergio Galeani, [sergio.galeani@uniroma2.it](mailto:sergio.galeani@uniroma2.it)

The 60th IEEE conference on Decision and Control will be held Monday through Wednesday, December 13-15, 2021 at the Fairmont Hotel, Austin, Texas, USA. The conference will be preceded by workshops on Sunday, December 12, 2021.

The CDC is recognized as the premier scientific and engineering conference dedicated to the advancement of the theory and practice of systems and control. The CDC annually brings together an international community of researchers and practitioners in the field of automatic control to discuss new research results, perspectives on future developments, and innovative applications relevant to decision making, systems and control, and related areas.

The 60th CDC will feature contributed and invited papers, as well as workshops and tutorial sessions. It is hosted by the IEEE Control Systems Society (CSS) in cooperation with the Society for Industrial and Applied Mathematics (SIAM), the Japanese Society for Instrument and Control Engineers (SICE), and the European Control Association (EUCA).

The conference will take place in the Fairmont Hotel in Austin, Texas. Austin is known as the “Live Music Capital of the World” and is the home to the University of Texas at Austin as well as the Texas State Capital. The city features many high-tech companies and start-ups and is renown for its vibrant food and and culture scenes. As Austin’s unofficial slogan is “Keep Austin Weird”, the 60th CDC has embraced this aspect of the host city and has incorporated a number of non-traditional elements in the program.

**IMPORTANT NOTICE:** The working assumption for now is that CDC’21 will be an in-person event and we are proceeding with the plans for the conference under that assumption.

At the same time, we are looking at ways in which partial conference attendance could be possible virtually as well for those unable or unwilling to travel. And, of course, as this is a highly uncertain, dynamically evolving system, the plans may have to be revisited as we get closer to the conference dates.

Don’t miss future updates on CDC2021! Follow us on Twitter: [#IEEECDC2021](#)

[Back to the contents](#)



## 1.8. CFP: IEEE Trans. on Automatic Control Special Issue on Learning/Control

Contributed by: George J. Pappas, [pappasg@seas.upenn.edu](mailto:pappasg@seas.upenn.edu)

IEEE Transactions on Automatic Control

Special Issue on Learning and Control

Deadline: May 1, 2021

Special Issue Scope: Over the past two decades, advances in computing and communications have resulted in the creation, transmission and storage of data from all sectors of society. Over the next decade, the biggest generator of data is expected to be Internet-of-Things devices which sense and control the physical world. This explosion of data requires a rapprochement of areas such as machine learning, control theory, and optimization. The availability and scale of data, both temporal and spatial, brings a wonderful opportunity for our community to both advance the theory of control systems in a more data-driven fashion, as well as have a broader industrial and societal impact.

There are various challenges on the interface between the control community and the machine learning community. The aim of this special issue is to bring together some of the significant developments on the interface between machine learning, dynamics, and control systems. Our special issue welcomes both regular papers and technical notes on topics that include but are not limited to:

- Foundations of learning of dynamics models
- System identification
- Episodic learning, online learning, and adaptive control
- Optimization for machine learning
- Data-driven optimization for dynamical systems
- Distributed learning over distributed systems
- Reinforcement learning for physical systems
- Safe reinforcement learning and safe adaptive control
- Statistical learning for dynamical and control systems
- Bridging model-based and learning-based dynamical and control systems
- Robustness of data-driven and learning-based control systems
- Physics-constrained learning
- Physical learning in dynamical and control systems applications in robotics, autonomy, transportation systems, cognitive systems, neuroscience, etc.

Special Issue Guest Editors

- Anuradha Annaswamy, MIT [aanna@mit.edu](mailto:aanna@mit.edu)
- Manfred Morari, University of Pennsylvania [morari@seas.upenn.edu](mailto:morari@seas.upenn.edu)
- George J. Pappas, University of Pennsylvania [pappasg@seas.upenn.edu](mailto:pappasg@seas.upenn.edu)
- Claire Tomlin, UC Berkeley [tomlin@eecs.berkeley.edu](mailto:tomlin@eecs.berkeley.edu)
- Rene Vidal, Johns Hopkins University [rvidal@jhu.edu](mailto:rvidal@jhu.edu)
- Melanie Zellinger, ETH Zurich [mzeilinger@ethz.ch](mailto:mzeilinger@ethz.ch)

Special Issue Schedule

- Submission Site Opens March 1, 2021
- Paper Submission Deadline May 15, 2021
- Author Notification November 1, 2021
- Final Manuscript Submissions January 1, 2022
- Special Issue Publication Summer 2022 (tentative)

More information:

<http://ieeecss.org/publication/transactions-automatic-control/special-issues>

\*Note: The Paperplaza submission link given below will allow submission to this special issue after March 1, 2021. When submitting the paper, the system will prompt the user to select submission to the special issue.

[Back to the contents](#)

### **1.9. CFP: IEEE Trans. on Ctrl. of Network Sys. Special Issue on Smart Networks**

Contributed by: Michela Robba, [michela.robba@unige.it](mailto:michela.robba@unige.it)

Deadline Extension: Special Issue of IEEE Transactions on Control of Network Systems on Smart city-networks

Scope: In recent years, there is a growing interest on sustainable and smart cities in which advanced technologies for data collection and elaboration are being developed together with technologies for mitigating greenhouse gas emissions reduction (such as renewables, electric vehicles, high efficiency production plants, etc.). Cities need more efficient water, transportation, and energy systems to address various challenges including a growing population, environmental and economical sustainability, and resiliency to natural disasters and/or unpredicted events. The focus of this special issue is to assemble new advances in the study of smart city-networks. Network control methods that enable optimization and resiliency constitute one example. The use of data-driven techniques, including many that are based on machine learning, is another. Graph-theoretic and game-theoretic solutions that help understand these networks and interface between these networks are essential. Tradeoffs regarding problems with smart city-networks (such as resiliency and privacy, performance and computational complexity of various algorithms, etc.) need to be suitably characterized.

Challenges precipitated due to large amounts of data and the scale of these networks need to be addressed. Both theoretical and practical explorations of this topic are necessary. Specific topics include (but not limited to):

- Distributed control and optimization for smart city networks (traffic, transportation, water, energy, telecommunication, gas, smart grids, supply chains and production systems, etc.)
- Fault detection and state estimation of water, transportation and energy networks
- Machine learning-based control and optimization for smart city's networks
- Optimal control of smart city networks
- Control, optimization, and communication interconnected Smart city networks.
- Resiliency and privacy of smart city networks

- Issues related to big-data and their connection to analysis and synthesis of efficient networks
- Cyber-physical security and cyber-physical human systems of large-scale networks
- Applications to real smart city networks (water, energy, transportation, traffic, energy communities, etc.)
- Applications to interconnected smart city networks (e.g., power grid and electric mobility, water networks and district heating, energy communities including smart buildings and distributed generation, integration with the ICT network, etc.)

#### Important Dates

- Paper submission deadline: March 1, 2021
- Completion of the first round review: July 2021
- Completion of the second round review: December 2021
- Final submission due: April 2022
- Tentative publication date: June 2022

#### Guest Editors

- Michela Robba, Associate Professor, Department of Informatics, Bioengineering, Robotics and Systems Engineering, University of Genoa, Genoa, Italy
- Giulio Ferro, Assistant Researcher, PhD, Department of Informatics, Bioengineering, Robotics and Systems Engineering, University of Genoa, Genoa, Italy
- Rong Su, Associate Professor, School of Electrical and Electronic Engineering, Nanyang Technological University (NTU), Singapore
- Anuradha Annaswamy, Senior Research Scientist, Department of Mechanical Eng., Director, Active-adaptive Control Laboratory, Massachusetts Institute of Technology (MIT), Cambridge, MA
- Christos Cassandras, Professor, Head, Division of Systems Engineering, Center for Information and Systems Engineering (CISE), Boston University, Boston, MA
- Karl Johansson, Professor, School of Electrical Engineering and Computer Science, KTH Royal Institute of Technology, Stockholm, Sweden

[Back to the contents](#)

#### **1.10. Roadmap 2030: Call for Vision Statement for Control for Societal Challenges**

Contributed by: Anuradha Annaswamy, [aanna@mit.edu](mailto:aanna@mit.edu)

Open Call for Vision Statement for Control for Societal-Scale Challenges: Roadmap 2030

Virtual Workshop, June 4-5, 2021

Physical Workshop, Stockholm, June 2022

Organizers: A.M. Annaswamy, K. H. Johansson, and G.J. Pappas

The IEEE Control Systems Society would like to develop a scientific roadmap for the future of our discipline, Control for Societal-Scale Challenges: Roadmap 2030. The objectives of the roadmap are to lay out new societal areas where our discipline can have impact over the next decade, propose novel scientific challenges that the community should pursue, and investigate workforce education and training curricula in order to address these challenges. Our plan is also to ensure that the roadmap has a broad scope including new technological drivers, new infrastructures for control systems, and legal, organizational and regulatory

factors that are prevalent in societal-scale systems.

In support of this effort, we will conduct a workshop in two parts, the first during June 4-5, 2021, in a virtual format, and the second during June 2022 in Stockholm, in an in-person format. The workshop discussions will be centered around six identified themes, with elements of real-time decision making, machine learning, autonomy, data-driven and physics-driven approaches, security and privacy, and big-data pervading all six themes. Short descriptions of all theme abstracts can be found in the appendix.

We would like to invite the broader control community to submit vision statements towards this roadmap, describing your personal view about the future of the discipline. Your written input can address any of the following issues: (a) Novel or existing domains where control systems can have a critical role, (b) scientific challenges or exciting scientific directions for the future, (c) innovative ideas about workforce development and control systems curriculum, (d) organizational, regulatory, economic or infrastructure challenges or drivers that we should be considering in the future, and (e) anything else you think is critical for the future of our discipline. Please note that all inputs should be forward looking, broad, and thematically linked to the objectives of the roadmap. We are not looking for specific approaches, technical solutions, or results, but rather future directions that our community should be exploring to solve grand societal challenges.

We would like your vision statement to be in the form of an abstract, not exceeding 300 words, and either in a doc or pdf format. All statements will be reviewed by the theme leaders (see appendix), and some may be chosen for presentation at the workshops, or invited for further articulation in the roadmap. Selected submissions will be included the final roadmap report, which will be posted on the IEEE CSS homepage and related websites.

Please email your abstracts to any of the three organizers listed above (aanna@Mit.edu, kallej@kth.se, pappasg@seas.upenn.edu) no later than March 1, 2021.

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## Appendix

Panel 1: Decision making with real-time and distributed data (Leads: Anders Rantzer and Na Li)

Recent radical evolution in distributed sensing, computation, communication, and actuation has revolutionized the way systems operate and fostered the emergence of real-time decision making with large and distributed data. Examples cut across a broad spectrum of engineering and societal fields such as energy systems, transportation systems, Internet, sensor networks, social networks, epidemics and many others. In most of applications, established models from one or more disciplines need to be combined with blackbox models built from data. A good example is in autonomous driving, where the existing extensive experience of control technology such as ABS braking, cruise control and ESP systems for vehicle stabilization needs to be combined with machine learning methods to analyse traffic situations and human behavior. To do this in a safe and robust manner, it is essential to understand how learning algorithms for sequential decision-making can interact with continuous physics based dynamics. Similarly, in power systems, well established control solutions are increasingly being combined with learning algorithms correlating consumer behavior with weather forecasts, to minimize costs and optimize efficiency. This panel will focus on the challenges related to learning in a real-time setting in combination with distributed data, with a focus on challenges

that common to a variety of aforementioned applications. Examples include 1) how to develop physics-aided learning methods that exploit both the known-physics, historical data, and real-time data? 2) how to develop scalable solutions which could handle the large size of the system and the large amount of data generated from different locations? 3) how to balance the tradeoff between solution efficiency, computation speed, and communication quality for real-time operation by prioritizing the information and tasks? 4) how to ensure system safety while providing enough flexibility and robustness for running the system under various (nonstationary or even adversarial) environment?

Panel 2: Safety-critical autonomous systems with ML (Leads: Claire Tomlin and Angela Schoellig)

Advances in machine learning have accelerated the introduction of autonomy in our everyday lives. However, ensuring that these autonomous systems act safely is an immense challenge. Today, when self-driving vehicles, or collaborative robots, operate in real-world uncertain environments, it is impossible to guarantee safety at all times. The key challenge stems from the uncertainty of the environment itself, and the inability to predict all possible situations that could confront the system. Machine learning, and its potential ability to generalize, may be a solution. For example, a learning-based perception system for a self-driving vehicle, must be able to generalize beyond the scenes that it has observed in training. Yet today, these algorithms are producing solutions that are not easy to understand, are brittle to faults and possible cyber-attacks. The purpose of this Panel is to explore the scope of safe autonomy, to present the challenges, and to explore current research developments which help us move towards a solution.

Panel 3: Resilient infrastructure-systems with AI and IoT (Leads: Dan Work and Carlos Canudas de Wit)

Monitoring and control for large-scale critical infrastructure systems is accelerated by low cost sensing, communication, computation, and actuation technologies that underpin the internet of things. Enabled by the large volumes of data produced by these systems, a new generation of mobility, energy, water, and health networks are increasingly adopting artificial intelligence-enabled components that further increase the richness of these systems. As the scale and complexity of these systems continues to grow, so do the challenges to provide robustness and resilience. For example, attacks on the cyber infrastructure can lead to cascading failures that dramatically degrade or cripple the physical systems. Allowing pervasive sensing and guaranteeing privacy remains open in many application domains. This panel will establish the challenges to enable monitoring and control for infrastructure systems that are smart, resilient, secure, and privacy preserving.

Panel 4: Control in Human-automation, Health, and Networked Systems (Leads: Sandra Hirche and Aaron Ames)

Control has the unique ability to transform society across a spectrum of application domains that can positively impact quality of life. In many of these domains the interaction between the human and the automation system plays an important role and requires an in-depth understanding for the development of novel control technologies. This panel is devoted to future directions in control for human-automation systems, that can positively address societal-scale challenges at multiple levels, from direct physiological interaction, to human collaborations with robotic and autonomous systems, to networked population-wide interactions.

At the direct interaction level, the goal is to understand interactions with the human body and its processes, from neurocontrol to physiological control mechanisms. This can directly infuse control theory to positively improve human function, mitigate against disease, and augment performance. There is ever increasing interaction with humans and control systems via robotic and autonomous systems, and understanding this has important ramifications to everything from robotic assistive devices to ever increasing autonomous features in automotive systems. Finally, at the human population level, control can inform and drive the evolution of systems from local community to global scales. This includes traffic management, power and general infrastructure systems, economics and epidemics.

In all application domains and all levels of interaction, key challenges from a control theory perspective include understanding safety and uncertainty in the context of human decision making. Safety considerations are central due to the direct interactions with humans. Exploring notions of safety from a theoretic and dynamic point of view, and characterizations thereof, will be essential in deploying theoretic solutions into real-world applications. These notions of safety, and guarantees obtained via control theory more generally, will involve human models that may be difficult to ascertain. As such, methods that are robust to uncertainty will need to be developed—these likely could include data-driven approaches for mitigating this uncertainty that learn and adapt.

Panel 5: Systems and Control Opportunities for Climate Change Mitigation and Adaptation (Leads: Pramod Khargonekar and Tariq Samad) There is international consensus that global warming and the resulting climate change represent an extremely important grand challenge for the next several decades. Experts in the field of systems and control can make valuable contributions to several key strategies for climate change mitigation and adaptation. Indeed, because of the large scope of this topic, this panel will only address a subset of possible directions. In fact, two topics will be of primary focus, although these are broad enough to incorporate numerous opportunities for impact.

The first is energy system decarbonization. In general, we will emphasize “system-level” aspects—large-scale renewable generation from diverse sources; integration of renewables and storage in transmission and distribution networks; microgrid optimization and control; and energy markets for products and services.

The second broad topic is adaptation to climate change: How can the control community contribute to ensuring a habitable planet if, as seems highly likely now, mitigation efforts are, at best, only partially successful? Adverse impacts will be manifold—including increasing frequencies of storms, dramatic sea-level rise, droughts and flooding, and deterioration of agricultural lands and yields. However, we will target a general problem that we believe the controls community is ideally suited to take a leadership role in: What novel methodologies can be developed for facilitating strategic decision making under deep uncertainty?

Our objective for the panel is to develop a set of recommendations for the controls community, its leadership, and funding agencies. These recommendations will include promising new opportunities for research, collaborations with other fields, new R&D programs at national and international levels, workshops and other events, and publications for motivating and promoting the role of control science and engineering in the defining grand challenge for the future of humanity and its ecosystem.

Panel 6: Education and Training (Leads: Christos Cassandras and Joao Hespanha)

The panel's scope is designed to cover the following five areas:

- 1) Academic curriculum: Design the ideal undergraduate curriculum for Systems and Control over the next decade in terms of (i) material covered, (ii) blend of theory/applications, (iii) blend of paper-pencil exercises/simulation/experiments. Identify explicit changes with respect to a typical current curriculum: What should be eliminated/downplayed? What should be added?
- 2) Outreach: Identify opportunities (and create them if possible) to incorporate Systems and Control concepts in pre-college education. Specifically identify concepts, ideas, or grand challenges that can provide inspirational value to pre-college students.
- 3) Driving Areas: Identify the technical areas that should drive Systems and Control education. Differentiate between areas based on principles which transcend technological and societal changes and new areas that need to be introduced to Systems and Control education.
- 4) Industry: Explore the role that academic institutions could/should have in Industry training, as well as the role that Industry should have in academic education. Find ways to improve the interaction between universities and industry, in the educational and training context. Explore the role that internships or apprenticeships can play in bringing students closer to real industrial application problems.
- 5) Building bridges with other science/engineering fields: It has often been said that control is a "hidden technology" one that "enables" other technologies but does not stand out by itself. Discuss the accuracy (or not) of this statement. If the statement is true, explore how to best incorporate systems and control into a college curriculum (e.g., what department does it belong to?) If the statement is not true, find new ways to change this perception through education or outreach.

[Back to the contents](#)

#### 1.11. IEEE CSS Outreach Fund Solicitation

Contributed by: Oscar González, [ogonzale@odu.edu](mailto:ogonzale@odu.edu)

The IEEE Control Systems Society (CSS) Outreach Fund provides grants for projects that will benefit CSS members and the control community in general. Since its inception in 2011, the Fund has funded more than 78 grants on behalf of a diverse group of CSS member-led activities.

The CSS Outreach Task Force is pleased to announce that the window for proposal submission for its 2021 spring solicitation will be held from **March 22 to April 16 2021**. IEEE CSS Outreach Fund Solicitation The maximum amount that can be requested for an Outreach project is **USD\$20K**.

Because of the time needed for grant approval and processing, a CSS member with an institutional affiliation interested in pursuing an Outreach-funded project starting in 2022 should apply during this solicitation.

Information regarding the program, which includes proposal requirements descriptions, a list of current and past funded projects, and a 2017 informative 10-minute video overview is found at:

<http://ieeecss.org/activities/control-systems-society-outreach-fund>

The CSS Outreach Fund is also featured in an article appearing in the August 2019 issue of the IEEE Control Systems Magazine:

<https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8764655>

Inquiries, notices of intent, and requests for application materials need to be made directly to Oscar González, Outreach Task Force Chair, at [ogonzale@odu.edu](mailto:ogonzale@odu.edu)

[Back to the contents](#)



## 2 Miscellaneous

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### 2.1. Spring School on Data-driven Model Learning for Dynamic Systems

Contributed by: Guillaume Mercère, [guillaume.mercere@univ-poitiers.fr](mailto:guillaume.mercere@univ-poitiers.fr)

2021 Spring School on Data-driven Model Learning for Dynamic Systems

Virtual Edition, 6-9 April 2021

Due to the coronavirus pandemic, the fourth edition of the doctoral school in data-based modeling (system identification) will be organized in a fully virtual fashion. This school (sponsored by the GDR MACS) consists of a series of lectures and of exercise sessions aiming at covering the fundamentals of data-driven modeling approaches as well as more advanced topics. The course is eligible for scientific doctoral modules. The school is thus mainly aimed at an audience of PhD students, but is also open to any other persons interested in the topic of data-based modeling.

The 2021-edition will have the honour to welcome Professor Van den Hof (TU Eindhoven, Pays-Bas) that will present a one-day course entitled: *Dynamic Network Identification*.

More information on this doctoral school (registration fees, ...) can be found at the following link:

<https://spring-id-2021.sciencesconf.org/>

The deadline for registration is 31 January 2021.

[Back to the contents](#)

### 2.2. European PhD Award on Systems and Control

Contributed by: Luca Greco, [luca.greco@centralesupelec.fr](mailto:luca.greco@centralesupelec.fr)

2020 European PhD Award on Systems and Control

The European PhD Award is given annually in recognition of the best PhD thesis in Europe, in the field of Systems and Control, and it is sponsored by EECI <http://www.eeci-igsc.eu>. The aim is to encourage high-quality works among young researchers in their initial research period. Since 2018, the awardee(s) of this Prize are invited to contribute (vision, review or research tutorial type paper) to Annual Review in Control, in a new category of papers of this IFAC Journal, dedicated to Young Research Talents.

As every year, we would like to solicit the participation of young researchers that have recently obtained their PhD degree to the selection process. To be eligible for the award, the thesis must be in English and have been defended in a European University between 15/07/2019 and 14/07/2020. The main scientific contributions have to be related with analysis of involved dynamical systems, development of the control and estimation theory, or their applications to cutting-edge real-world problems. The selection is based on a peer-reviewing process with the Scientific Committee approval.

The prize consists of a certificate and a cash award of 1000 €. It will be delivered during the ECC21 Congress.

Deadline for application: \*28th February 2021\*

Former recipients can be found on the webpage:

<http://eeci2.l2s.supelec.fr/sites/eeci2.l2s.supelec.fr/files/winners.pdf>

To apply, please consult the award webpage:

[http://eeci2.l2s.supelec.fr/PhD\\_Award](http://eeci2.l2s.supelec.fr/PhD_Award)

Please forward this message also to whom it may concern in your Department or to your colleagues.

Best regards,  
Denis Efimov,  
Luca Greco

[Back to the contents](#)

### 2.3. Autonomous Drone Racing Competition

Contributed by: Andriy Sarabakha, [andriy.sarabakha@tum.de](mailto:andriy.sarabakha@tum.de)

Autonomous Drone Racing at FUZZ-IEEE 2021

Dear Colleagues,

We are pleased to announce the autonomous drone racing competition for benchmarking fuzzy logic controllers.

This competition will be held at the 2021 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2021) in Luxembourg. The goal of the competition is to validate various fuzzy logic controllers in a challenging scenario: autonomous drone racing. We strongly encourage student participation. For more details, please visit

[https://sarabakha.info/fuzz\\_ieee\\_2021\\_competition.php](https://sarabakha.info/fuzz_ieee_2021_competition.php)

We look forward to your participation in this exciting event,  
Andriy Sarabakha and Erdal Kayacan,  
Organization Committee

[Back to the contents](#)

### 2.4. EMGR 5.9 Released: EMpirical GRamian Framework

Contributed by: Christian Himpe, [himpe@mpi-magdeburg.mpg.de](mailto:himpe@mpi-magdeburg.mpg.de)

emgr – EMpirical GRamian Framework, version 5.9 has been released.

emgr computes empirical system Gramians, which provide insight into nonlinear input-output systems of the form:

$$\dot{x} = f(x, u, p, t), y = g(x, u, p, t).$$

in terms of:

Reachability,  
Observability,  
Minimality,  
Identifiability.

emgr is an open-source project compatible with MATLAB/Octave and Python/NumPy. Further info at: <https://gramian.de> and <https://github.com/gramian/emgr>

[Back to the contents](#)

## 2.5. Virtual Seminar Series on Games, Decisions and Networks

Contributed by: Francesca Parise, [fp264@cornell.edu](mailto:fp264@cornell.edu)

Virtual Seminar Series on “Games, Decisions and Networks”

Advisory Board: Asu Ozdaglar (MIT), Christos Papadimitriou (Columbia), Drew Fudenberg (MIT), Eva Tardos (Cornell), Matthew O. Jackson (Stanford), Ramesh Johari (Stanford), and Tamer Başar (UIUC).

Organizing Committee: Yang Cai (Yale), Ozan Candogan (Chicago), Nika Haghtalab (Berkeley), Francesca Parise (Cornell), Muhammed Sayin (MIT), Kaiqing Zhang (UIUC)

We are pleased to announce the start on a new virtual seminar series on “Games, Decisions, and Networks”. The series aims at bringing together researchers working on foundations and applications of game theory, decision theory, and networks from control, computer science, economics and operation research.

Upcoming speakers include:

- Constantinos Daskalakis (MIT)
  - Aaron Roth (Upenn)
  - Rakesh Vohra (Upenn)
  - Sanjeev Goyal (Cambridge)
  - Aislinn Bohren (Upenn)
  - Jason Marden (UCSB)
- and more to be added!

The seminars will tentatively be biweekly on Fridays starting from Jan 22nd. Please feel free to join our Google Group/Mailing List (<https://groups.google.com/u/2/g/games-decisions-networks-seminar>).

For any additional information and links to attend the talks, please visit the seminar webpage: <https://sites.google.com/view/gamesdecisionsnetworks>.

For any info you can contact us at: [gamesdecisionsnetworksseminar@gmail.com](mailto:gamesdecisionsnetworksseminar@gmail.com), and at twitter: @Games\_Seminar.

[Back to the contents](#)

## 3 Books

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### 3.1. Distributionally Robust Learning

Contributed by: Mike Casey, [mike.casey@nowpublishers.com](mailto:mike.casey@nowpublishers.com)

Title: Distributionally Robust Learning

Authors: Ruidi Chen and Ioannis Ch. Paschalidis

Suggested Citation: Ruidi Chen and Ioannis Ch. Paschalidis (2020), "Distributionally Robust Learning", Foundations and Trends® in Optimization: Vol. 4: No. 1-2, pp 1-243.

<http://dx.doi.org/10.1561/2400000002>

Subscribers to Foundations and Trends in Optimization can access this monograph at:

<https://nowpublishers.com/article/Details/SYS-026>

Print copies can be purchased by list members for \$40 including regular shipping using the discount code: 103112

<https://nowpublishers.com/Order/BuyBook?isbn=978-1-68083-772-8>

Description: Many of the modern techniques to solve supervised learning problems suffer from a lack of interpretability and analyzability that do not give rise to rigorous mathematical results. This monograph develops a comprehensive statistical learning framework that uses Distributionally Robust Optimization (DRO) under the Wasserstein metric to ensure robustness to perturbations in the data.

The authors introduce the reader to the fundamental properties of the Wasserstein metric and the DRO formulation, before explaining the theory in detail and its application. They cover a series of learning problems, including (i) distributionally robust linear regression; (ii) distributionally robust regression with group structure in the predictors; (iii) distributionally robust multi-output regression and multiclass classification; (iv) optimal decision making that combines distributionally robust regression with nearest-neighbor estimation; (v) distributionally robust semi-supervised learning; (vi) distributionally robust reinforcement learning. Throughout the monograph, the authors use applications in medicine and health care to illustrate the theoretical ideas in practice. They include numerical experiments and case studies using synthetic and real data.

Distributionally Robust Learning provides a detailed insight into a technique that has gained a lot of recent interest in developing robust supervised learning solutions that are founded in sound mathematical principles. It will be enlightening for researchers, practitioners and students working on the optimization of machine learning systems.

#### Table of Contents:

1. Introduction
2. The Wasserstein Metric
3. Solving the Wasserstein DRO Problem
4. Distributionally Robust Linear Regression

5. Distributionally Robust Grouped Variable Selection
  6. Distributionally Robust Multi-Output Learning
  7. Optimal Decision Making via Regression Informed K-NN
  8. Advanced Topics in Distributionally Robust Learning
  9. Discussion and Conclusions
- Acknowledgments  
References

[Back to the contents](#)

### 3.2. Hybrid Feedback Control

Contributed by: Leslie Nangle, [Leslie.Nangle@press.princeton.edu](mailto:Leslie.Nangle@press.princeton.edu)

Hybrid Feedback Control  
by Ricardo G. Sanfelice

Hybrid control systems exhibit both discrete changes, or jumps, and continuous changes, or flow. An example of a hybrid control system is the automatic control of the temperature in a room: the temperature changes continuously, but the control algorithm toggles the heater on or off intermittently, triggering a discrete jump within the algorithm. Hybrid control systems feature widely across disciplines, including biology, computer science, and engineering, and examples range from the control of cellular responses to self-driving cars. Although classical control theory provides powerful tools for analyzing systems that exhibit either flow or jumps, it is ill-equipped to handle hybrid control systems.

In Hybrid Feedback Control, Ricardo Sanfelice presents a self-contained introduction to hybrid control systems and develops new tools for their analysis and design. Hybrid behavior can occur in one or more subsystems of a feedback system, and Sanfelice offers a unified control theory framework, filling an important gap in the control theory literature. In addition to the theoretical framework, he includes a plethora of examples and exercises, a Matlab toolbox (as well as two open-source versions), and an insightful overview at the beginning of each chapter.

Relevant to dynamical systems theory, applied mathematics, and computer science, Hybrid Feedback Control will be useful to students and researchers working on hybrid systems, cyber-physical systems, control, and automation.

Ricardo G. Sanfelice is professor of electrical and computer engineering at the University of California, Santa Cruz. He is the coauthor of Hybrid Dynamical Systems (Princeton).

Enter discount code P239 on the PUP website at <http://press.princeton.edu> to receive 30% off through December 31, 2021. Your discount will be applied when the order is processed. \*Shipping charges and local import fees apply\*

<https://press.princeton.edu/books/hardcover/9780691180229/hybrid-feedback-control>

Praise for the book:

"Hybrid Feedback Control delves into the design of hybrid controllers and how they can solve a wide variety of control problems. This book helpfully features a large number of detailed examples that look at real physical systems, and a useful Matlab toolbox."—Daniel Liberzon, University of Illinois at Urbana-Champaign

"Hybrid systems and control design have many applications in fields ranging from mechanical engineering and computer science to biology. This well-organized book provides convincing examples of hybrid controllers that offer desired closed-loop system responses where traditional control techniques do not work."—Sergey Nersesov, Villanova University

"The subject of this book, the theory of hybrid systems and control, is timely, relevant, and important. I am not aware of any competing books that address this topic with the same level of detail."—Alessandro Astolfi, Imperial College London

ISBN 9780691180229

424 pages

7 x 10 inches

2021 copyright

Price: \$75.00 / £62.00

[Back to the contents](#)

## 4 Journals

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### 4.1. Systems & Control Letters

Contributed by: Lusia Veksler, [lveksler@ucsd.edu](mailto:lveksler@ucsd.edu)

Systems & Control Letters

Volumes 145–147, November 2020, December 2020, and January 2021

#### Papers:

- On structural invariants in the energy-based in-domain control of infinite-dimensional port-Hamiltonian systems, Tobias Malzer, Hubert Rams, Markus Schöberl, Article 104778
- Exact observability conditions for Hilbert space dynamical systems connected with Riesz basis of divided differences, G.M. Sklyar, J. Woźniak, M. Firkowski, Article 104782
- Design of global smooth implicit control Lyapunov function for multiple-integrator system with input constraint, Yuh Yamashita, Naoto Adachi, Ryo Nonaka, Koichi Kobayashi, Article 104776
- An upper bound on the dimension of minimal positive realizations for discrete time systems, Luca Benvenuti, Article 104779
- Detectability of Boolean networks with disturbance inputs, Biao Wang, Jun-e Feng, Article 104783
- Adaptive set-point regulation of linear  $n + 1$  hyperbolic systems with uncertain affine boundary condition using collocated sensing and control, Haavard Holta, Ole Morten Aamo, Article 104777
- Higher-order tracking properties of nonlinear adaptive control systems, Liyan Wen, Gang Tao, Ge Song, Article 104781
- On reducible state variables of logical control networks, Haitao Li, Wenhui Dou, Article 104798
- Comparison theorem for viability kernels via conic preorders, Michel De Lara, Pedro Gajardo, Diego Vicencio, Article 104799
- Data-based stabilization of unknown bilinear systems with guaranteed basin of attraction, Andrea Bisoffi, Claudio De Persis, Pietro Tesi, Article 104788
- K-memory-embedded insertion mechanism for opacity enforcement, Rongjian Liu, Liujuan Mei, Jianquan Lu, Article 104785
- Existence of decentralized controllers for vehicle platoons: On the role of spacing policies and available measurements, Paul Wijnbergen, Bart Besselink, Article 104796
- Minimizing control volatility for nonlinear systems with smooth piecewise-quadratic input signals, Ryan Loxton, Qun Lin, Fabrizio Padula, Lorenzo Ntogramatzidis, Article 104797
- Leader-following almost output consensus for linear multi-agent systems with disturbance-affected unstable zero dynamics, Tingyang Meng, Zongli Lin, Article 104787
- Dwell-time based stability analysis and control of LPV systems with piecewise constant parameters and delay, Muhammad Zakwan, Saeed Ahmed, Article 104805
- Sparse source identification of linear diffusion–advection equations by adjoint methods Azahar Monge, Enrique Zuazua, Article 104801
- Generalized weak rigidity: Theory, and local and global convergence of formations, Seong-Ho Kwon, Hyo-Sung Ahn, Article 104800
- Optimal output estimation for infinite-dimensional systems with disturbances, Kirsten A. Morris, Article 104803

- Longtime behavior of a class of stochastic tumor-immune systems, T.D. Tuong, N.N. Nguyen, G. Yin, Article 104806
- Formation control for agents modeled with extended unicycle dynamics that includes orientation kinematics on  $SO(3)$  and speed constraints, Christopher Heintz, Jesse B. Hoagg, Article 104784
- Adaptive synchronization of heterogeneous multi-agent systems: A free observer approach, Miguel F. Arevalo-Castiblanco, Duvan Tellez-Castro, Jorge Sofrony, Eduardo Mojica-Nava, Article 104804
- ISS-like estimates for nonlinear parabolic PDEs with variable coefficients on higher dimensional domains, Jun Zheng, Guchuan Zhu, Article 104808
- Hybrid boundary stabilization of linear first-order hyperbolic PDEs despite almost quantized measurements and control input, Nikolaos Bekiaris-Liberis, Article 104809
- Robustification of nonlinear control systems vis-à-vis actuator dynamics: An immersion and invariance approach, Romeo Ortega, Bowen Yi, Jose Guadalupe Romero, Article 104811
- A stochastic maximum principle for partially observed stochastic control systems with delay, Shuaiqi Zhang, Xun Li, Jie Xiong, Article 104812
- On the fixed-time stabilization of input delay systems using act-and-wait control, Wim Michiels, Bin Zhou, Article 104807
- Orbital Stabilization of Underactuated Systems using Virtual Holonomic Constraints and Impulse Controlled Poincaré Maps, Nilay Kant, Ranjan Mukherjee, Article 104813
- Boundary feedback stabilization of quasilinear hyperbolic systems with partially dissipative structure, Ke Wang, Zhiqiang Wang, Wancong Yao, Article 104815
- Local R-linear convergence of ADMM-based algorithm for  $\ell_1$ -norm minimization with linear and box constraints, Mitsuru Toyoda, Mirai Tanaka, Article 104824
- Fully distributed time-varying formation tracking control of linear multi-agent systems with input delay and disturbances, Wei Jiang, Chunyan Wang, Yunhe Meng, Article 104814
- Generating series for networks of Chen–Fliess series, W. Steven Gray, Kurusch Ebrahimi-Fard, Article 104827
- Passive linear continuous-time systems: Characterization through structure, Izchak Lewkowicz, Article 104816
- Well-posedness and exponential stability of boundary control systems with dynamic boundary conditions, Abed Boulouz, Hamid Bounit, Said Hadd, Article 104825
- On the existence of a common Lyapunov function for a family of nonlinear positive systems, Alexander Aleksandrov, Article 104832
- Stabilization and optimal control of discrete-time systems with multiplicative noise and multiple input delays, Lin Li, Huanshui Zhang, Yu Wang, Article 104833
- Stabilization of bilateral teleoperators with asymmetric stochastic delay, Francesco Cordoni, Luca Di Persio, Riccardo Muradore, Article 104828
- Stability radii of differential–algebraic equations with respect to stochastic perturbations, Do Duc Thuan, Nguyen Hong Son, Cao Thanh Tinh, Article 104834
- Completely distributed formation control for networked quadrotors under switching communication topologies, Hao Liu, Yanhu Wang, Jianxiang Xi, Article 104841
- Inventory control of a class of logistic networks, Berna Bou Farraa, Rosa Abbou, Jean Jacques Loiseau, Article 104845
- Node and network resistance to bribery in multi-agent systems, Guilherme Ramos, Daniel Silvestre, Carlos Silvestre, Article 104842



- Generalized value iteration for discounted optimal control with stability analysis, Mingming Ha, Ding Wang, Derong Liu, Article 104847
- L2-incremental gain stability of linear systems with nonlinear Lipschitz actuator, Mohsen Ghodrat, Horacio J. Marquez, Article 104846
- Dissipativity learning control (DLC): Theoretical foundations of input–output data-driven model-free control, Wentao Tang, Prodromos Daoutidis, Article 104831
- Structured identification for network reconstruction of RC-models, Gabriele Calzavara, Luca Consolini, Juxhino Kavaja, Article 104849

### **Special Issue on Recent Advances on Infinite Dimensional Systems - Dedicated to Ruth F. Curtain**

- Output feedback stabilization for 1-D wave equation with variable coefficients and non-collocated observation, Xiao-Hui Wu, Hongyinping Feng, Bao-Zhu Guo, Article 104780
- Minimax sliding mode control design for linear evolution equations with noisy measurements and uncertain inputs, Sergiy Zhuk, Orest V. Iftime, Jonathan P. Epperlein, Andrey Polyakov, Article 104830
- Optimal linear–quadratic control of asymptotically stabilizable systems using approximations, Hans Zwart, Kirsten A. Morris, Orest V. Iftime, Article 104802

[Back to the contents](#)

## **4.2. Journal of Dynamical and Control Systems**

Contributed by: Yuri Sachkov, [yusachkov@gmail.com](mailto:yusachkov@gmail.com)

Journal of Dynamical and Control Systems

<https://www.springer.com/journal/10883>

Volume 27, Issue 1

### **Papers:**

- Dynamical Decomposition of Bilinear Control Systems Subject to Symmetries Domenico D’Alessandro, Jonas T. Hartwig
- Approximate Controllability of a Class of Semilinear Coupled Degenerate Systems Fengdan Xu, Qian Zhou, Yuanyuan Nie
- A New Carleman Inequality for a Heat Equation in Presence of Singularities and Controllability Consequences D. Sadali, M. S. Moulay
- Piecewise-Smooth Slow–Fast Systems Paulo R. Silva, Jaime R. Moraes
- Essential Boundedness and Singularity in Optimal Control Javier F. Rosenblueth, Gerardo Sánchez Licea
- Smooth Invariant Manifolds for Differential Equations with Infinite Delay Lokesh Singh, Dharendra Bahuguna
- Front-like Entire Solutions for a Lotka–Volterra Weak Competition System with Nonlocal Dispersal Qian Zhang, Guo-Bao Zhang
- Optimal Distributed Control for a Model of Homogeneous Incompressible Two-Phase Flows Fang Li, Bo You
- Limit Cycles Bifurcating from an Invisible Fold–Fold in Planar Piecewise Hamiltonian Systems Denis Carvalho Braga, Alexander Fernandes da Fonseca, Luiz Fernando Gonçalves, Luis Fernando Mello

**Correction:**

- Correction to: On Spectral Curves and Complexified Boundaries of the Phase-Lock Areas in a Model of Josephson Junction A. A. Glutsyuk, I. V Netay

[Back to the contents](#)

**4.3. Evolutions Equations and Control Theory**

Contributed by: Irena Lasiecka, [lasiecka@memphis.edu](mailto:lasiecka@memphis.edu)

Evolutions Equations and Control Theory (EECT)

Volume 10, number 1, March 2021

**Papers:**

<https://www.aimsclences.org/journal/A0000-0000/2021/10/1>

[Back to the contents](#)

**4.4. Asian Journal of Control**

Contributed by: Li-Chen Fu, [lichen@ntu.edu.tw](mailto:lichen@ntu.edu.tw)

Asian Journal of Control

Early View Papers

<https://onlinelibrary.wiley.com/toc/19346093/0/0>

Vol. 23, No. 1 January, 2021

<https://onlinelibrary.wiley.com/toc/19346093/2021/23/1>

**Special Issue Papers:**

1. Paper Title: Editorial for SPECIAL ISSUE ON "Control and Automation Trends addressing theoretical and applicative aspects at ICCAD'19"

Authors: Hassen Fourati, Hassene Seddik

2. Paper Title: Autonomous Smart Robot for Path Predicting and Finding in Maze Based On Fuzzy and Neuro-Fuzzy Approaches

Authors: Batti, Habiba; Ben Jabeur, Chiraz; Seddik, Hassene

3. Paper Title: Application of Grey System Theory to Phosphorite Sinter Process: From Modeling to Control

Authors: Fourati, Hassen; Toktassynova, Nigina; Suleimenov, Batyrbek

4. Paper Title: Design of A Pid Optimized Neural Networks and A Pd Fuzzy Logic Controllers for A Two-Wheeled Mobile Robot

Authors: Ben Jabeur, Chiraz; Seddik, Hassene

5. Paper Title: Observer-Based Model Reference Control of Takagi-Sugeno-Lipschitz Systems Affected by Disturbances Using Quadratic Boundedness

Authors: Puig, Vicenc; Yang, Ruicong; Rotondo, Damiano

6. Paper Title: Data-Based Design of Robust Fault Detection and Isolation Residuals Via Lasso Optimization and Bayesian Filtering

Authors: Cascianelli, Silvia; Costante, Gabriele; Crocetti, Francesco; Ricci, Elisa; Valigi, Paolo; Fravolini, Mario

7. Paper Title: Control Strategies for Ventilation Networks in Small-Scale Mines Using an Experimental Benchmark

Authors: Rodriguez, Oscar; Novella Rodriguez, David; Witrant, Emmanuel; Franco, Edinson

8. Paper Title: Continuous Simultaneous Stabilization of Single-Input Nonlinear Stochastic Systems

Authors: Oumoun, Mohamed; Iggidr, Abderrahman; Souza, Max

9. Paper Title: Model Predictive Control for Continuous Lactide Ring-Opening Polymerization Processes

Authors: Afsi, Nawel; Othman, Sami; Bakir, Toufik; Costa, Liborio Ivano; Sakly, Anis; Sheibat-Othman, Nida

10. Paper Title: Vision-Based Control Architecture for Human-Robot Hand-Over Applications

Authors: Scimmi, Leonardo; Melchiorre, Matteo; Mauro, Stefano; Pastorelli, Stefano

### Regular Papers:

1. Paper Title: Identification for Wiener-Hammerstein Systems Under Quantized Inputs and Quantized Output Observations

Authors: Jin Guo and Yanlong Zhao

2. Paper Title: Economic Model Predictive Control for The Operation Optimization of Water Distribution Networks with Risks

Authors: Shaoyuan Li, Yuan Zhang, Yi Zheng and Yuanyuan Zou

3. Paper Title: Back-Stepping Stabilization of Fractional-Order Triangular System with Applications to Chaotic Systems

Authors: Chenchen Peng and Weihai Zhang

4. Paper Title: Virtual Control with Hard Constraints

Authors: Al-Hajjar, Ali; Swei, Sean; Zhu, Guoming

5. Paper Title: Markov Games with Unknown Random State-Actions-Dependent Discount Factors: Empirical Estimation

Authors: J. Adolfo Minjarez-Sosa, David Gonzalez-Sanchez and Fernando Luque-Vasquez

6. Paper Title: Robust Output-Based Controller Design for Enlarging the Region of Attraction of Input Saturated Linear Systems

Authors: Ivan de Jesus Salgado Ramos, Manuel Mera and Isaac Chairez

7. Paper Title: Single-Channel Predefined-Time Synchronisation of Chaotic Systems

Authors: Munoz Vazquez, Aldo Jonathan; Sanchez Torres, Juan Diego; Anguiano-Gijon, Carlos Alberto

8. Paper Title: Sliding Mode Control of Uncertain Fractional Order Systems: A Reaching Phase Free Approach

Authors: Thach Dinh, Shyam Kamal, Rahul Sharma, Harikrishnan M S and Bijan Bandyopadhyay

9. Paper Title: Adaptive Steering- Based Hdtc Algorithm for Pmsm

Authors: Ali Adam and Amr Elnady

10. Paper Title: Hierarchical Inversion-Based Output Tracking Control for Uncertain Autonomous Underwater Vehicles Using Extended Kalman Filter

Authors: Hsiu-Ming Wu and Mansour Karkoub

11. Paper Title: Optimal Control of Forward-Backward Stochastic Jump-Diffusion Differential Systems with Observation Noises: Stochastic Maximum Principle

Authors: Qingxin Meng, Meijiao Wang and Qihong Shi

12. Paper Title: Nonlinear Model Order Reduction with Low Rank Tensor Approximation

Authors: Yao-Lin Jiang, Junman Yang and Kang-Li Xu

13. Paper Title: Controlling The Multi-Plant Networked System with External Perturbations Via Adaptive Model-Based Event-Triggered Strategy  
Authors: Jianwen Feng, Pan Yang, Xinchu Fu, Chen Xu and Jingyi Wang
14. Paper Title: A Two-Stage Searching Method for Continuous Time-Delay Systems Identification  
Authors: Meng Bai, Minhua Li and Yingjun Lyu
15. Paper Title: Output-Feedback-Based Sliding Mode Control for Networked Control Systems Subject to Packet Loss and Quantization  
Authors: Yugang Niu and Jiarui Li
16. Paper Title: Fixed-Time Synchronization for Complex-Valued Bam Neural Networks with Time Delays  
Authors: Ziyi Zhang, Runan Guo, Xiaoping Liu, Maiying Zhong, Chong Lin and Bing Chen
17. Paper Title: Augmented TP Model Transformation-Based Parallel Distributed Compensation Control Design  
Authors: Guoliang Zhao and Wang Degang
18. Paper Title: Adaptive Fault-Tolerant Control of an Axially Moving System with Time-Varying Constraints  
Authors: Wei He and Xinling Yue
19. Paper Title: Integrated Design of Robust Fault Estimation and Fault-Tolerant Control Against Simultaneous Actuator and Sensor Faults  
Authors: Huaguang Zhang, Yunfei Mu, Kun Zhang and He Ren
20. Paper Title: Fault Estimation for Aero-Engine LPV Systems Based On LFT  
Authors: Yanhua Ma, Rui Wang and Min Liu
21. Paper Title: Adaptive Gains to Super-Twisting Technique for Sliding Mode Design  
Authors: Xiaogang Xiong, Shanhai Jin and Shyam Kamal
22. Paper Title: Numerical Methods for The Minimal Non-Negative Solution of the Non-Symmetric Coupled Algebraic Riccati Equation  
Authors: Juan Zhang and Fangyuan Tan
23. Paper Title: A Pure Neural Network Controller for Double-Pendulum Crane Anti-Sway Control: Based On Lyapunov Stability Theory  
Authors: QingRong Chen, Wenming Cheng, Lingchong Gao and Johannes Fottner
24. Paper Title: Distributed Accelerating of Quantized Second-Order Consensus with Bounded Input  
Authors: Hajar Atrianfar, Alireza Ahmadi and Farzaneh Abdollahi
25. Paper Title: Hybrid Control of Synchronization of Fractional Order Nonlinear Systems  
Authors: Milad Mohadeszadeh and Naser Pariz
26. Paper Title: An H-Infinity Non-Fragile Observer-Based Adaptive Sliding Mode Controller Design for Uncertain Fractional-Order Nonlinear Systems with Time Delay and Input Nonlinearity  
Authors: Vahid Johari Majd, Majid Parvizian and Khosro Khandani
27. Paper Title: Adaptive Predictive Path Following Control Based On Least Squares Support Vector Machines for Underactuated Autonomous Vessels  
Authors: Chenguang Liu, Huarong Zheng, Rudy Negenborn, Xiumin Chu and Shuo Xie
28. Paper Title: Output Feedback Stabilization of Cascaded Ode-Wave Equations with Time Delay in Observation  
Authors: Jun-Min Wang and Aye Aye Than
29. Paper Title: Robust Detection of Intermittent Multiplicative Sensor Fault  
Authors: Donghua Zhou, Junfeng Zhang, Panagiotis D Christofides, Xiao He, Yinghong Zhao and Zhihao Zhang

30. Paper Title: Fault Tolerant Control for A Class of Nonlinear System with Actuator Faults  
Authors: Liling Ma, Lushan Zhou, Yuan Huang, Wang Junzheng and Dawei Shi
31. Paper Title: Fault Tolerant Control for Joint Structure in Pems High Speed Maglev Train  
Authors: Zhiqiang Wang, Zhiqiang Long and Xiaolong Li
32. Paper Title: Observer-Based Compensation Control of Servo Systems with Backlash  
Authors: Guofa Sun, Jingbo Zhao and Qiang Chen
33. Paper Title: Performance-Based Near-Optimal Vibration Control for Nonlinear Offshore Platforms with Delayed Input  
Authors: Shi-Yuan Han, Xiao-Fang Zhong, Yue-Hui Chen, Jin Zhou and Gong-You Tang
34. Paper Title: Modelling and Simulation of Nabla Fractional Order Systems Using Vector Fitting Method  
Authors: Yong Wang, Yiheng Wei, Jiachang Wang and Peter W Tse
35. Paper Title: Dynamic Analysis of a Novel Time-Lag Four-Dimensional Fractional-Order Financial System  
Authors: Zhe Zhang, Jing Zhang, Yong Cheng, Feng Liu and Can Ding
36. Paper Title: Guaranteeing Performance for Uncertain Nonlinear Systems with Bounded State Constraint and Mismatching Condition  
Authors: Jinquan Xu, Hao Fang, Ye-Hwa Chen, Hong Guo and Xiaofeng Ding
37. Paper Title: Study On Vehicle Active Suspension System Control Method Based On Homogeneous Domination Approach  
Authors: Qing-Hua Meng, Chih-Chiang Chen, Pan Wang, Zong-Yao Sun and Bingji Li

#### **Brief Papers:**

1. Paper Title: Model Reduction Based On Limited-Time Interval Impulse Response Gramians  
Authors: Deepak Kumar, Ahmad Jazlan and Victor Sreeram
2. Paper Title: Stabilization of Uncertain Fractional Order System with Time-Varying Delay Using BMI Approach  
Authors: Hua-Cheng Zhou, Binbin He, Chun-Hai Kou and YangQuan Chen
3. Paper Title: Local Stabilization of Semilinear Parabolic System by Boundary Control  
Authors: Yuanchao Si and Chengkang Xie
4. Paper Title: Node-To-Node Consensus of Multi-Agent Networks with Event-Triggered Control and Packet Losses  
Authors: Aihua Hu, Ling Li and Haiyun Gao

[Back to the contents](#)

#### **4.5. IET Control Theory & Applications**

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IET Control Theory & Applications

Volume 15, February 2021

<https://ietresearch.onlinelibrary.wiley.com/toc/17518652/2021/15/3>

#### **Research Papers:**

- Nikou, Alexandros, Verginis, Christos K., Heshmati-alamdari, Shahab, Dimarogonas, Dimos V., A robust non-linear MPC framework for control of underwater vehicle manipulator systems under high-level task, <https://doi.org/10.1049/cth2.12045>
- Zhao, Tianyi, Duan, Guangren, Interconnection structure preservation design for a type of port-controlled hamiltonian systems—A parametric approach, <https://doi.org/10.1049/cth2.12046>
- Subramaniyam, Ramasamy, Joo, Young Hoon, Memory-based ISMC design of DFIG-based wind turbine model via T-S fuzzy approach, <https://doi.org/10.1049/cth2.12047AB>
- Li, Xiehuan, Ye, Dan, Membership-function-dependent security control for networked T-S fuzzy-model-based systems against DoS attacks, <https://doi.org/10.1049/cth2.12048>
- Yang, Ning, Chen, Dongyan, Hu, Jun, Quantised control of delayed Markovian jump systems with partly known transition probabilities, <https://doi.org/10.1049/cth2.12049>
- Ashraf, Muhammad Ammar, Aljaz, Salman, Zou, Yao, Hamayun, Mirza Tariq, An integral sliding mode fault tolerant control for a class of non-linear Lipschitz systems, <https://doi.org/10.1049/cth2.12050>
- Du, Shengli, Zhao, Xudong, Qiao, Junfei, Zong, Guangdeng, Guaranteed cost stabilization control of discrete-time switched systems, <https://doi.org/10.1049/cth2.12051>
- Esmaeilani, Leili, Ghaisari, Jafar Bagherzadeh, Mohammad Ali
- Hammerstein–Wiener identification of industrial plants: A pressure control valve case study, <https://doi.org/10.1049/cth2.12052>
- Hernández-González, O., Ramírez-Rasgado, F., Astorga-Zaragoza, C. M., Guerrero-Sánchez, M. E., Valencia-Palomo, G., Rodríguez-Mata, A. E., Observer for non-linear systems with sampled measurements: Application to the friction factor estimation of a pipeline, <https://doi.org/10.1049/cth2.12053>
- Lu, Junjie, She, Zhikun, Liao, Fucheng, Necessary and sufficient conditions for stabilisability of discrete-time time-varying switched systems, <https://doi.org/10.1049/cth2.12054>
- Sakthivel, Rathinasamy, Harshavarthini, Shanmugam, Tatar, Nasser-Eddine, Disturbance estimation based tracking control for periodic piecewise time-varying delay systems, <https://doi.org/10.1049/cth2.12055>
- El-Hawwary, Mohamed I., Hierarchic distributed stabilization of a class of three-dimensional formations for underactuated agents, <https://doi.org/10.1049/cth2.12057>

[Back to the contents](#)

#### 4.6. International Journal of Control

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International Journal of Control

Volume 94, Issue 2, 2021

<http://www.tandfonline.com/toc/tcon20/current>

#### Papers:

- PID control of robot manipulators actuated by BLDC motors, Victor M. Hernández-Guzmán & Jorge Orrante-Sakanassi, pages: 267-276
- Adaptive multi-dimensional Taylor network tracking control for a class of nonlinear systems, Yu-Qun Han, Shan-Liang Zhu, Shu-Guo Yang & Lei Chu, pages: 277-285
- Multiple Lyapunov function-based longitudinal maneuver control of air-breathing hypersonic vehicles, Hao An, Qianqian Wu, Hongwei Xia & Changhong Wang, pages: 286-299

- Enhanced operation of wastewater treatment plant using state estimation-based fault detection strategies, Imen Baklouti, Majdi Mansouri, Ahmed Ben Hamida, Hazem Numan Nounou & Mohamed Nounou, pages: 300-311
- An optimal indirect control of underwater vehicle, E. Paifelman, G. Pepe & A. Carcaterra, pages: 312-326
- Fault diagnosis in linear systems via sliding mode observers, A. N. Zhirabok, A. E. Shumsky & A. V. Zuev, pages: 327-335
- Relationship between backward and forward linear-quadratic mean-field-game with terminal constraint and optimal asset allocation for insurers and pension funds, Kai Du, Jianhui Huang & Zhen Wu, pages: 336-350
- A modelling and predictive control approach to linear two-stage inverted pendulum based on RBF-ARX model, Xiaoying Tian, Hui Peng, Xiaoyong Zeng, Feng Zhou, Wenquan Xu & Xiaoyan Peng, pages: 351-369
- An adaptive observer for a class of nonlinear systems with a high-gain approach. Application to the twin-rotor system, Habib Dimassi, Salim Hadj Said, Antonio Loria & Faouzi M'Sahli, pages: 370-381
- Pole placement parameterisation for full-state feedback with minimal dimensionality and range, Kamal Mammadov, pages: 382-389
- LPV system identification for control using the local approach, X. Bombois, D. Ghosh, G. Scorletti & J. Huillery, pages: 390-410
- Twisting sliding mode extremum seeking control without steady-state oscillation, Zongru He, Songlin Chen, Zhengyi Sun, Libin Wang & Kema Ma, pages: 411-421
- Input-to-state stability analysis for homogeneous hybrid systems with bounded time-varying delays, Yan He, Xi-Ming Sun, Jun Liu & Yuhu Wu, pages: 422-432
- Optimal robust state-feedback control of nonlinear systems: minimal time to target, Jacob Hammer, pages: 433-451
- Stabilisation of a linearised Cahn–Hilliard system for phase separation by proportional boundary feedbacks, Pierluigi Colli, Gianni Gilardi & Ionut Munteanu, pages: 452-460
- Decentralised adaptive synchronisation of a class of discrete-time and nonlinearly parametrised coupled multi-agent systems, Xinghong Zhang, Hongbin Ma & Chao Zhang, pages: 461-475
- Semi-globally practical finite-time stability for uncertain nonlinear systems based on dynamic surface control, Yang Liu, Xiaoping Liu, Yuanwei Jing & Ziyi Zhang, pages: 476-485
- Adaptive high order sliding mode controller/observer based terminal sliding mode for MIMO uncertain nonlinear system, Rim Hendel, Farid Khaber & Najib Essounbouli, pages: 486-506
- Consensus-based formation control for nonholonomic vehicles with parallel desired formations, Xiaodong He & Zhiyong Geng, pages: 507-520
- Global exponential stability of positive periodic solutions for a class of multiple species Gilpin-Ayala system with infinite distributed time delays, Kaihong Zhao, pages: 521-533
- Relaxation in nonconvex optimal control problems governed by evolution inclusions with the difference of two Clarke's subdifferentials, Yi-rong Jiang, Nan-jing Huang, Qiong-fen Zhang & Chang-chun Shang, pages: 534-547
- Output regulation for stochastic delay systems under asynchronous switching with dissipativity, Cui-Li Jin, Li-Li Li, Rui Wang & Qing-Guo Wang, pages: 548-557

[Back to the contents](#)

#### 4.7. International Journal of Control, Automation, and Systems

Contributed by: Keum-Shik Hong, [journal@ijcas.com](mailto:journal@ijcas.com)

International Journal of Control, Automation, and Systems

Vol. 19, No. 2, February 2021

##### Papers:

- Backward Reachability Analysis for Nonlinear Dynamical Systems via Pseudospectral Method Myoung Hoon Lee and Jun Moon\* pp.575-586
- Open Loop Robust Equilibria in Uncertain Discrete Time Games Fernando Guerrero Velez, Manuel Jimenez Lizarraga\*, and Celeste Rodriguez Carreon pp.587-595
- New Robust Stability Criteria for Lur'e Systems with Time-varying Delays and Sector-bounded Nonlinearities Wenyong Duan, Yan Li, Jian Chen, and Baozhu Du\* pp.596-606
- Stabilization of Enforced Positive Switched Linear Systems with Bounded Controls Jinjin Liu pp.607-617
- Reliable H-Infinity Control on Stochastic Delayed Markovian Jump System with Asynchronous Jumped Actuator Failure Wenpin Luo, Jun Yang\*, and Xinzhi Liu pp.618-631
- Sampled-data Based Dissipativity Control of T-S Fuzzy Markovian Jump Systems under Actuator Saturation with Incomplete Transition Rates Tianshu Xu, Jianwei Xia\*, Xiaona Song, Zhen Wang, and Huasheng Zhang pp.632-645
- Asynchronous Control for Positive Markov Jump Systems Kai Yin, Dedong Yang\*, Jiao Liu, and Hongchao Li pp.646-654
- Observer-based Finite-time Control of Stochastic Non-strict-feedback Nonlinear Systems Yan Zhang and Fang Wang\* pp.655-665
- Input-to-state Stability of Impulsive Stochastic Nonlinear Systems Driven by G-Brownian Motion Lijun Pan\* and Jinde Cao\* pp.666-675
- Fractional-order Sliding Mode Constraint Control for Manipulator Systems Using Grey Wolf and Whale Optimization Algorithms Seong-Ik Han pp.676-686
- An Adaptive Neural Sliding Mode Control with ESO for Uncertain Nonlinear Systems Jianhui Wang\*, Peisen Zhu, Biaotao He, Guiyang Deng, Chunliang Zhang\*, and Xing Huang pp.687-697
- Generic Adaptive Sliding Mode Control for a Quadrotor UAV System Subject to Severe Parametric Uncertainties and Fully Unknown External Disturbance Tianpeng Huang, Deqing Huang\*, Zhikai Wang, Xi Dai, and Awais Shah pp.698-711
- Improved Function Augmented Sliding Mode Control of Uncertain Nonlinear Systems with Preassigned Settling Time Guangbin Cai, Xinyu Li, Mingzhe Hou\*, Guangren Duan, and Fei Han pp.712-721
- Immersion and Invariance-based Sliding Mode Attitude Control of Tilt Tri-rotor UAV in Helicopter Mode Li Yu, Guang He\*, Shulong Zhao, Xiangke Wang, and Lincheng Shen pp.722-735
- Robust Distributed Cooperative Controller for DC Microgrids with Heterogeneous Sources Juwon Lee and Juhoon Back\* pp.736-744
- Frequency Criterion of Robust Modality for the Class of Linear Systems with Time-delays Ilya Aleksandrovich Rybin\* and Vasiliy Grigorievich Rubanov pp.745-752
- Back-stepping Robust Control for Flexible Air-breathing Hypersonic Vehicle via a-filter-based Uncertainty and Disturbance Estimator Yuhua Yang, Xingling Shao\*, Yi Shi, and Wendong Zhang pp.753-766
- Chattering-free Fault-tolerant Attitude Control with Fast Fixed-time Convergence for Flexible Spacecraft Seyed Majid Esmaeilzadeh\*, Mehdi Golestani, and Saleh Mobayen pp.767-776



- Robust Optimal PID type ILC for Linear Batch Process Furqan Memon and Cheng Shao\* pp.777-787
- Robust Boundary Vibration Control of Uncertain Flexible Robot Manipulator with Spatiotemporally-varying Disturbance and Boundary Disturbance Mohamed Ahmed Eshag, Lei Ma\*, Yongkui Sun, and Kai Zhang pp.788-798
- Robust Actuator Fault Reconstruction for Takagi-Sugeno Fuzzy Systems with Time-varying Delays via a Synthesized Learning and Luenberger Observer Qingxian Jia\*, Lina Wu, and Huayi Li pp.799-809
- The Decoupled Active/Reactive Power Predictive Control of Quasi-Zsource Inverter for Distributed Generations Dazhong Ma, Ke Cheng, Rui Wang, Sen Lin, and Xiangpeng Xie\* pp.810-822
- Distributed Cooperative Path Planning for Tracking Ground Moving Target by Multiple Fixed-wing UAVs via DMPC-GVD in Urban Environment Chaofang Hu\*, Zhuo Meng, Ge Qu, Hyo-Sang Shin, and Antonios Tsourdos pp.823-836
- Distributed Fixed-time Formation-containment Control for Multiple Euler-Lagrange Systems with Directed Graphs Menghu Hua, Huafeng Ding\*, Xiang-Yu Yao, and Xinxin Zhang pp.837-849
- Model-based, Distributed, and Cooperative Control of Planar Serial-link Manipulators S. Soumya and K. R. Guruprasad\* pp.850-863
- Adaptive Interconnection and Damping Assignment Passivity Based Control for Underactuated Mechanical Systems Mutaz Ryalat\*, Dina Shona Laila, and Hisham ElMoaqet pp.864-877
- Pinning Synchronization of Complex Dynamical Networks on Time Scales Fang-Di Kong\* and Jian-Ping Sun pp.878-888
- Adaptive Finite Time Control for Wearable Exoskeletons Based on Ultra-local Model and Radial Basis Function Neural Network Jianjun Sun, Jie Wang\*, Peng Yang, Yan Zhang, and Lingling Chen pp.889-899
- Adaptive Actuator Fault Compensation and Disturbance Rejection Scheme for Spacecraft Zhen Li and Xin Chen\* pp.900-909
- Design Robust Self-tuning FPIDF Controller for AVR System Khaled Eltag\* and Baoyong Zhang pp.910-920
- Adaptive Control with Quantized Inputs Processed by Lipschitz Logarithmic Quantizer Guanghao Zhang, Xin Huo\*, Jinkun Liu, and Kemao Ma pp.921-930
- Adaptive State-space Control of Under-actuated Systems Using Error-magnitude Dependent Self-tuning of Cost Weighting-factors Omer Saleem\* and Khalid Mahmood-ul-Hasan pp.931-941
- Adaptive Parameter Identification for Nonlinear Sandwich Systems with Hysteresis Nonlinearity Based Guaranteed Performance Linwei Li, Huanlong Zhang\*, Fengxian Wang, and Xuemei Ren pp.942-952
- Collision-free Autonomous Navigation of a Small UAV Using Low-cost Sensors in GPS-denied Environments Wonkeun Youn, Hayoon Ko, Hyungsik Choi, Inho Choi, Joong-Hwan Baek, and Hyun Myung\* pp.953-968
- Model-dependent Scheduling and H-infinity Control Co-design for Networked Control Systems Shunli Zhao\* and Yuehui Ji pp.969-979
- Fault Diagnosis and Fault Tolerant Control for Manipulator with Actuator Multiplicative Fault Yawei Wu and Lina Yao\* pp.980-987
- Passivity-based Voltage Controller for Tidal Energy Conversion System with Permanent Magnet Synchronous Generator Youcef Belkhier\* and Abdelyazid Achour pp.988-998
- Dynamic H-Infinity Feedback Boundary Control for a Class of Parabolic Systems with a Spatially Varying Diffusivity Yanjiu Zhou\*, Baotong Cui, and Xuyang Lou pp.999-1012
- Improving Response Performance of Quadrant-detector-navigated Unmanned Underwater Vehicle in Underwater Docking Operations Olamide Akinyele, Jae Weon Choi\*, and Chang Ho Yu pp.1013-1025
- Spoofing Signal Generation Based on Manipulation of Code Delay and Doppler Frequency of Authentic GPS Signal Seong-Hun Seo, Gyu-In Jee\*, and Byung-Hyun Lee pp.1026-1040

- A Highly Integrated Automatic Fiber Optical Gyroscope Sensing Coil Winding System Shuang-Chao Ge\*, Rui-Feng Yang, and Chen-Xia Guo pp.1041-1053
- A Series-elastic Robot for Back-pain Rehabilitation ElHussein Shata, Kim-Doang Nguyen\*, Praneel Acharya, and Jeffrey Doom pp.1054-1064
- Nonlinear Sliding Mode Tracking Control of Underactuated Tower Cranes Zhuoqing Liu, Ning Sun\*, Yiming Wu, Xin Xin, and Yongchun Fang pp.1065-1077
- Robust Adaptive Terminal Sliding Mode Control of an Omnidirectional Mobile Robot for Aircraft Skin Inspection Xingkai Feng and Congqing Wang\* pp.1078-1088
- Velocity Control of an Omnidirectional Wheeled Mobile Robot Using Computed Voltage Control with Visual Feedback: Experimental Results Armando Saenz\*, Victor Santibanez, Eusebio Bugarin, Alejandro Dzul, Hector Rios, and Jorge Villalobos-Chin pp.1089-1102
- Deep Convolutional Neural Network Architectures for Tonal Frequency Identification in a Lofargram Jihun Park\* and Dae-Jin Jung pp.1103-1112
- Interval Type-2 Fuzzy Logic PID Controller Based on Differential Evolution with Better and Nearest Option for Hydraulic Serial Elastic Actuator Haozhen Dong, Xinyu Li, Pi Shen, Liang Gao\*, and Haorang Zhong pp.1113-1132
- Application of Fuzzy Moving Sliding Surface Approach for Container Cranes Quang Hieu Ngo\*, Ngo Phong Nguyen, Quoc Bao Truong, and Gyoung-Hahn Kim pp.1133-1138
- Adaptive Reinforcement Learning Strategy with Sliding Mode Control for Unknown and Disturbed Wheeled Inverted Pendulum Phuong Nam Dao\* and Yen-Chen Liu pp.1139-1150
- On Robust Approximate Feedback Linearization: Control with Two Gain-scaling Factors Sang-Young Oh and Ho-Lim Choi\* pp.1151-1157

[Back to the contents](#)

#### 4.8. European Journal of Control

Contributed by: Kay Tancock, [k.tancock@elsevier.com](mailto:k.tancock@elsevier.com)

European Journal of Control

Vol 57, January 2021

#### Papers:

- Junyao Xie, Charles Robert Koch, Stevan Dubljevic, Discrete-time model-based output regulation of fluid flow systems, pg.1-13
- Kobe De Becker, Koen Michiels, Stein Knoors, Steffen Waldherr, Observer and controller design for a methane bioconversion process, pg.14-32
- Karima Tebani, Said Amari, Min-Plus realizable control design for partially observable timed event graphs under marking constraints, pg.33-40
- Georges Bastin, Jean-Michel Coron, Amaury Hayat, Feedforward boundary control of 2x2 nonlinear hyperbolic systems with application to Saint-Venant equations, pg.41-53
- Nadia Djeghali, Maamar Bettayeb, Said Djennoune, Sliding mode active disturbance rejection control for uncertain nonlinear fractional-order systems, pg.54-67
- Tingting Xu, Henghui Zhu, Ioannis Ch. Paschalidis, Learning parametric policies and transition probability models of markov decision processes from data, pg.68-75

- Carlos Aguilar-Ibanez, Belem Saldivar, Manuel Jimenez Lizarraga, Eloisa Garcia-Canseco, Ruben Garrido, Parametric uncertain second-order linear system output- adaptive stabilization: An integral and MRCA based approach, pg.76-81
- Ameneh Nejati, Sadegh Soudjani, Majid Zamani, Compositional abstraction-based synthesis for continuous-time stochastic hybrid systems, pg. 82-94
- RaviTeja Gundeti, Shana Moothedath, Prasanna Chaporkar, Feedback Robustness in Structured Closed-loop System, pg.95-108
- Viktor Bezborodov, Luca Di Persio, Riccardo Muradore, Stabilization of planar non-Markovian switched linear systems with unbounded random delays, pg.109-118
- Ziqiang Lu, Yuanguo Zhu, Qinqin Xu, Asymptotic stability of fractional neutral stochastic systems with variable delays, pg.119-124
- Assia Daid, Eric Busvelle, Mohamed Aidene, On the convergence of the unscented Kalman filter, pg.125-134
- S. Kanakalakshmi, R. Sakthivel, S.A. Karthick, A. Leelamani, A. Parivallal, Finite-time decentralized event-triggering non-fragile control for fuzzy neural networks with cyber-attack and energy constraints, pg.135-146
- Chaima Zammali, Jérémy Van Gorp, Zhenhua Wang, Tarek Raïssi, Sensor fault detection for switched systems using interval observer with L-Infinity performance, pg.147- 156
- Sergio Galeani, Corrado Possieri, Mario Sassano, Steady-state, harmonic response and moments of linear systems with periodic jumps, pg.157-162
- György Lipták, Katalin M. Hangos, Gábor Szederkényi, Stabilizing feedback design for time delayed polynomial systems using kinetic realizations,pg.163-171
- Jianping Guo, Application of a novel adaptive sliding mode control method to the load frequency control, pg.172-178
- Hassène Gritli, Safya Belghith, LMI-based synthesis of a robust saturated controller for an underactuated mechanical system subject to motion constraints, pg.179- 193
- Seyed-Mostafa Almodarresi, Marzieh Kamali, Emmanuel Nuño, Romeo Ortega, Farid Sheikholeslam, Consensus in networks of uncertain euler-lagrange agents using adaptive gravity compensation, pg.194-204
- Xing Gu, Rogemar Mamon, Thibaut Duprey, Heng Xiong, Online estimation for a predictive analytics platform with a financial-stability-analysis application, pg.205-221
- Mehdi Golestani, Seyed Majid Esmaeilzadeh, Saleh Mobayen, Fixed-time control for high-precision attitude stabilization of flexible spacecraft, pg.222-231
- Gandikota Gurumurthy, Dushmanta Kumar Das, Terminal sliding mode disturbance observer based adaptive super twisting sliding mode controller design for a class of nonlinear systems, pg.232-241
- Ali Parsa, Alireza Farhadi, New coding scheme for the state estimation and reference tracking of nonlinear dynamic systems over the packet erasure channel (IoT): Applications in tele-operation of autonomous vehicles, pg.242-252
- Xiaofeng Zhang, Weijun Hu, Caisheng Wei, Tao Xu, Nonlinear disturbance observer based adaptive super-twisting sliding mode control for generic hypersonic vehicles with coupled multisource disturbances, pg.253-262
- Yuliang Bai, James D. Biggs, Zichen Zhang, Yibo Ding, Adaptive fault-tolerant control for longitudinal motion of supercavitating vehicles, pg.263-272
- Rie B. Larsen, Bilge Atasoy, Rudy R. Negenborn, Model predictive control for simultaneous planning of container and vehicle routes, pg.273-283

- M. Ouzahra, Finite-time control for the bilinear heat equation, pg.284-293
- Andrzej Nowakowski, Control of blowup and approximate optimality conditions for the wave equations, pg.294-301

[Back to the contents](#)

#### 4.9. Automatica

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Automatica

Volume 123, January 2021

##### Regular Papers:

- Guanpu Chen, Yang Ming, Yiguang Hong, Peng Yi, Distributed algorithm for  $\epsilon$ -generalized Nash equilibria with uncertain coupled constraints
- Yinghong Zhao, Xiao He, Junfeng Zhang, Hongquan Ji, Michael G. Pecht, Detection of intermittent faults based on an optimally weighted moving average T2 control chart with stationary observations
- Hao Yu, Jun Shang, Tongwen Chen, On stochastic and deterministic event-based state estimation
- Jian Hou, Zhiyun Lin, Mengfan Xiang, Mingyue Jiang, Random grouping based resilient beamforming
- Thiago B. Burghi, Maarten Schoukens, Rodolphe Sepulchre, Feedback identification of conductance-based models
- Robert A.E. Zidek, Ilya V. Kolmanovsky, Alberto Bemporad, Model predictive control for drift counteraction of stochastic constrained linear systems
- Lu Zhang, Xu-Guang Li, Zhi-Zhong Mao, Jun-Xiu Chen, Gao-Xia Fan, Some new algebraic and geometric analysis for local stability crossing curves
- Courtney A. Rouse, Christian A. Cousin, Brendon C. Allen, Warren E. Dixon, Shared control for switched motorized FES-cycling on a split-crank cycle accounting for muscle control input saturation
- Pio Ong, Jorge Cortés, Opportunistic robot control for interactive multiobjective optimization under human performance limitations
- Alessandro Duca, Bilinear quantum systems on compact graphs: Well-posedness and global exact controllability
- Wei Xiao, Christos G. Cassandras, Decentralized optimal merging control for Connected and Automated Vehicles with safety constraint guarantees
- David Umsonst, Henrik Sandberg, On the confidentiality of controller states under sensor attacks
- Tianliang Zhang, Feiqi Deng, Weihai Zhang, Robust H-Infinity filtering for nonlinear discrete-time stochastic systems
- Xusheng Luo, Miroslav Pajic, Michael M. Zavlanos, An optimal graph-search method for secure state estimation
- Songlin Zhuang, Xinghu Yu, Jianbin Qiu, Yang Shi, Huijun Gao, Meta-sequence-dependent H-Infinity filtering for switched linear systems under persistent dwell-time constraint
- Agnieszka Wiszniewska-Matyskiel, Rajani Singh, Necessity of the terminal condition in the infinite horizon dynamic optimization problems with unbounded payoff
- Henk J. van Waarde, Pietro Tesi, M. Kanat Camlibel, Topology identification of heterogeneous networks: Identifiability and reconstruction

- Bin Hu, Stochastic stability analysis for Vehicular Networked Systems with State-dependent bursty fading channels: A self-triggered approach
- Pepijn Bastiaan Cox, Roland Tóth, Linear parameter-varying subspace identification: A unified framework
- Eyal Weiss, Michael Margaliot, A generalization of linear positive systems with applications to nonlinear systems: Invariant sets and the Poincaré–Bendixson property
- Filipe C. Pedrosa, João C. Nereu, João B.R. do Val, When control and state variations increase uncertainty: Modeling and stochastic control in discrete time
- Tarek Ahmed-Ali, Iasson Karafyllis, Fouad Giri, Sampled-data observers for delay systems and hyperbolic PDE–ODE loops
- Nicolò Robuschi, Clemens Zeile, Sebastian Sager, Francesco Braghin, Multiphase mixed-integer nonlinear optimal control of hybrid electric vehicles
- Philip E. Paré, Ji Liu, Carolyn L. Beck, Angelia Nedić, Tamer Başar, Multi-competitive viruses over time-varying networks with mutations and human awareness
- Rui Fu, Amirhossein Taghvaei, Yongxin Chen, Tryphon T. Georgiou, Maximal power output of a stochastic thermodynamic engine
- Jorge I. Poveda, Na Li, Robust hybrid zero-order optimization algorithms with acceleration via averaging in time
- Yiding Ji, Xiang Yin, Stéphane Lafortune, Optimal supervisory control with mean payoff objectives and under partial observation
- Vivek Natarajan, Compensating PDE actuator and sensor dynamics using Sylvester equation

### **Brief Papers:**

- Tanagorn Jennawasin, David Banjerdpongchai, Iterative LMI approach to robust static output feedback control of uncertain polynomial systems with bounded actuators
- Filippo Cacace, Massimiliano d’Angelo, Alfredo Germani, LTV stochastic systems stabilization with large and variable input delay
- Saverio Messineo, A nonlinear control strategy for robust tracking under exogenous vibrations for in-line nano-metrology
- Yu Zhao, Yuan Zhou, Yongfang Liu, Guanghui Wen, Panfeng Huang, Fixed-time bipartite synchronization with a pre-appointed settling time over directed cooperative– antagonistic networks
- Frédéric Mazenc, Michael Malisoff, Miroslav Krstic, Stability and observer designs using new variants of Halanay’s inequality
- Photios A. Stavrou, Mikael Skoglund, LQG control and linear policies for noisy communication links with synchronized side information at the decoder
- Christos K. Verginis, Dimos V. Dimarogonas, Adaptive robot navigation with collision avoidance subject to 2nd-order uncertain dynamics
- Mathieu Pouliquen, Eric Pigeon, Olivier Gehan, Abdelhak Goudjil, Romain Auber, Impulse response identification from input/output binary measurements
- Nak-seung P. Hyun, Rebecca McGill, Robert J. Wood, Scott Kuindersma, A new control framework for flapping-wing vehicles based on 3D pendulum dynamics
- Abdeljalil Benabdelhadi, Fouad Giri, Tarek Ahmed-Ali, Miroslav Krstic, Fatima-Zahra Chaoui, Adaptive observer design for wave PDEs with nonlinear dynamics and parameter uncertainty

- Wen Kang, Lucie Baudouin, Emilia Fridman, Event-triggered control of Korteweg–de Vries equation under averaged measurements
- Sepideh Hassan-Moghaddam, Mihailo R. Jovanović, Proximal gradient flow and Douglas–Rachford splitting dynamics: Global exponential stability via integral quadratic constraints
- Joachim Deutscher, Jakob Gabriel, A backstepping approach to output regulation for coupled linear wave–ODE systems
- Shaunak D. Bopardikar, A randomized approach to sensor placement with observability assurance
- Hongjiu Yang, Hai Zhao, Yuanqing Xia, Jinhui Zhang, Nonlinear MPC with time-varying terminal cost for tracking unreachable periodic references
- Jiazheng Wang, Xiaoqiang Ren, Subhrakanti Dey, Ling Shi, Remote state estimation with usage-dependent Markovian packet losses
- Kai Schenk, Marc Wissing, Jan Lunze, Trajectory tracking in networks of linear systems
- Jaime A. Moreno, Gildas Besançon, On multi-valued observers for a class of single-valued systems
- Sen Kuang, Xiaoke Guan, Daoyi Dong, Finite-time stabilization control of quantum systems
- Yang Zhu, Emilia Fridman, Sub-predictors for network-based control under uncertain large delays
- Erliang Zhang, Rik Pintelon, Identification of dynamic errors-in-variables systems with quasi-stationary input and colored noise
- Muhammad Saeed Aslam, Peng Shi, Cheng-Chew Lim, Self-adapting variable step size strategies for active noise control systems with acoustic feedback
- Yifu Zhang, Jorge Cortés, Model predictive control for transient frequency regulation of power networks
- Fei Chen, Xiaozheng Chen, Linying Xiang, Wei Ren, Distributed economic dispatch via a predictive scheme: Heterogeneous delays and privacy preservation
- Hugo Lhachemi, Christophe Prieur, Robert Shorten, Robustness of constant-delay predictor feedback for in-domain stabilization of reaction–diffusion PDEs with time- and spatially-varying input delays
- Florence Josse, Emmanuel Bernuau, Emmanuel Moulay, Patrick Coirault, Robustness of sampled-data homogeneous systems
- Salah Laghrouche, Mohamed Harmouche, Yacine Chitour, Hussein Obeid, Leonid M. Fridman, Barrier function-based adaptive higher order sliding mode controllers
- Di Zhao, Sei Zhen Khong, Li Qiu, Stabilization of cascaded two-port networked systems with simultaneous nonlinear uncertainties
- Rami Katz, Emilia Fridman, Delayed finite-dimensional observer-based control of 1-D parabolic PDEs
- K.D. Do, Bounded and inverse optimal formation stabilization of second-order agents
- Zuogong Yue, Johan Thunberg, Wei Pan, Lennart Ljung, Jorge Gonçalves, Dynamic network reconstruction from heterogeneous datasets

[Back to the contents](#)

#### **4.10. Applied and Computational Mathematics an International Journal**

Contributed by: Fikret Aliev, [chief\\_ed@acmij.az](mailto:chief_ed@acmij.az)

Applied and Computational Mathematics an International Journal

[www.acmij.az](http://www.acmij.az)

Vol.20, No.1, February 2021

**Special Issue on Fuzzy logic and its application to modeling epidemics: Coronavirus and beyond:**

## Papers:

- Preface: Oscar Castillo, Zakia Hammouch, Abdon Atangana, Cruz Vargas De León, Karam Allali
- A study on the spread of COVID-19 in Brazil in crisp and fuzzy environment via a mathematical model  
S. Melliani, A. El Allaoui, L.S. Chadli, S. Mondal
- Algorithms for screening travelers during COVID-19 outbreak using probabilistic dual hesitant values based on bipartite graph theory  
Harish Garg, Gagandeep Kaur
- Analyzing a novel coronavirus model (COVID-19) in the sense of Caputo-Fabrizio fractional operator  
Mustafa Ali Dokuyucu, Ercan Celik
- Modeling the optimal interventions to curtail the cluster based COVID-19 pandemic in India: efficacy of prevention measures  
Tanvi, Rajiv Aggarwal, Ashutosh Rajput
- Forecasting of the Istanbul stock exchange (ISE) return with a golden ratio model in the epidemic of COVID-19  
O. Oztunc Kaymak, Y. Kaymak, N. Ozdemir
- Application of similarity measure in pattern recognition of COVID-19 spread and its effects in Pakistan  
Muhammad Saeed, Asad Mehmood, Thabet Abdeljawad, Muhammad Haris Saeed, Muhammad Asim
- An adaptive neuro fuzzy modelling and prediction system for diagnosis of COVID-19  
Aditya Khamparia, Rajat Jain, Poonam Rani, Deepak Gupta, Ashish Khanna, Oscar Castillo
- A stochastic mathematical model for COVID-19 according to different age groups  
A. Babaei, H. Jafari, S. Banihashemi, M. Ahmadi
- A fuzzy-based strategy to suppress the novel coronavirus (2019-nCoV) massive outbreak  
Tie-Hong Zhao, Oscar Castillo, Hadi Jahanshahi, Abdullahi Yusuf, Madini O. Allassafi, Fawaz E. Alsaadi, Yu-Ming Chu
- A fractional multi-order model to predict the COVID-19 outbreak in Morocco  
Abdelouahed Alla Hamou, Elhoussine Azrou, Zakia Hammouch, Abdelilah Lamrani Alaoui

[Back to the contents](#)

## 4.11. Journal of Pure and Applied Mathematics

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TWMS Journal of Pure and Applied Mathematics

Vol. 12, No.1, 2021

ISSN 2076-2585

## Papers:

“Fuzzy Sets in Dealing with Imprecision and Uncertainty: Past and Future“

Dedicated to the memory of Lotfi A. Zadeh

Lead Guest editor: Prof. Irina Perfilieva

Guest Editors: Prof. Didier Dubois, Prof. Etienne E. Kerre, Prof. Witold Perdycz

1. L.A. Zadeh, the visionary in Explainable Artificial Intelligence  
Bernadette Bouchon-Meunier , Marie-Jeanne-Lesot and Christophe Marsala
2. Zadeh's Vision, Modern Physics, and the Future of Computing  
Vladik Kreinovich and Olga Kosheleva
3. Managing uncertainty and fuzziness through a generalized conditional plausibility model  
Giulianella Coletti and Barbara Vantaggi
4. On robustness of measures of dispersion for fuzzy data  
Przemyslaw Grzegorzewski
5. Mathematical Analysis of Fuzzy-valued Functions  
Luciano Stefanini, M. Arana-Jimenez, M., L. Guerra, L. Sorini,
6. Multi-adjoint algebras as general structures in fuzzy set theory  
Jesus Medina
7. Uniform Convergence of Generalized Probability Mixtures that Represent Combined Fuzzy Systems'  
Bart Kosko
8. Manifestation of fuzzy topology in some fuzzy mathematical structures  
Alexandr Sostak
9. How visions of Zadeh led to formation of new models of natural language  
Vilem Novak
10. Fuzzy Set Theory in games  
Rudolf Kruse, Alex Dockhorn
11. Mathematical morphology and spatial reasoning: Fuzzy and bipolar setting  
Isabelle Bloch
12. Circular Intuitionistic Fuzzy TOPSIS Method with Vagueness of Membership Functions: Supplier Selection Application  
Cengiz Kahraman, Nurşah Alkan

[Back to the contents](#)

#### **4.12. Control Engineering Practice**

Contributed by: Kay Tancock, [k.tancock@elsevier.com](mailto:k.tancock@elsevier.com)

Control Engineering Practice

Volume 107, February 2021

#### **Virtual Special Section on Emerging Leaders in CEP:**

- Qingyuan Liu, Chao Shang, Dexian Huang, Efficient low-order system identification from low-quality step response data with rank-constrained optimization

#### **Regular Papers:**

- Edgar A. Martínez, Héctor Ríos, Manuel Mera, Robust tracking control design for Unicycle Mobile Robots with input saturation

- Xing-Chen ShangGuan, Yong He, Chuan-Ke Zhang, Li Jin, Joseph William Spencer, Switching system-based load frequency control for multi-area power system resilient to denial-of-service attacks



- E.J. Pérez-Pérez, F.R. López-Estrada, G. Valencia-Palomo, L. Torres, J.D. Mina-Antonio, Leak diagnosis in pipelines using a combined artificial neural network approach
- Jiawei Li, Lu Lu, Leidi Zhao, Cong Wang, Junhui Li, An integrated approach for robotic Sit-To-Stand assistance: Control framework design and human intention recognition
- Seyed Ali Mohamad Dehghan, Hamid Reza Koofigar, Hamid Sadeghian, Mohsen Ekramian, Observer-based adaptive force–position control for nonlinear bilateral teleoperation with time delay
- Fernando Martínez-García, Ghada Badawy, Masoud Kheradmandi, Douglas G. Down, Adaptive Predictive Control of a data center cooling unit
- Yaru Yang, Stevan Dubljevic, Shaoyuan Li, Economic model predictive control for transport-reaction systems with target profiles
- Thiago V. Costa, Rafael R. Sencio, Luís Cláudio Oliveira-Lopes, Flávio V. Silva, Fault-tolerant control by means of moving horizon virtual actuators: Concepts and experimental investigation
- H. Sira-Ramírez, E.W. Zurita-Bustamante, On the equivalence between ADRC and Flat Filter based controllers: A frequency domain approach
- Mohamed Fnadi, Wenqian Du, Frédéric Plumet, Faïz Benamar, Constrained Model Predictive Control for dynamic path tracking of a bi-steerable rover on slippery grounds
- Gianfranco Gagliardi, Daniele Mari, Francesco Tedesco, Alessandro Casavola, An Air-to-Fuel ratio estimation strategy for turbocharged spark-ignition engines based on sparse binary HEGO sensor measures and hybrid linear observers
- J.J. Marquez, A. Zafra-Cabeza, Carlos Bordons, Miguel A. Ridaio, A fault detection and reconfiguration approach for MPC-based energy management in an experimental microgrid
- Dheeraj B. Gosala, Harikrishnan Raghukumar, Cody M. Allen, Gregory M. Shaver, Timothy P. Lutz, Model-based design of dynamic firing patterns for supervisory control of diesel engine vibration
- Juan Li, Cong Wang, Weidong Zhang, Changgang Lu, A novel multi-leak sensor deployment strategy in water distribution networks based on the LSDR-JMI method
- Chuanfang Zhang, Kaixiang Peng, Jie Dong, A lifecycle operating performance assessment framework for hot strip mill process based on robust kernel canonical variable analysis
- Alexandre Janot, Patrick M. Wensing, Sequential semidefinite optimization for physically and statistically consistent robot identification
- Qing Chen, Youqing Wang, Key-performance-indicator-related state monitoring based on kernel canonical correlation analysis
- George Gkizas, Optimal robust control of a Cascaded DC–DC boost converter
- Rafal Madonski, Krzysztof Łakomy, Momir Stankovic, Sally Shao, Shihua Li, Robust converter-fed motor control based on active rejection of multiple disturbances
- Jinmu Lai, Xin Yin, Xianggen Yin, Lin Jiang, Fractional order harmonic disturbance observer control for three-phase LCL-type inverter
- Ping Li, Xiaohong Jiao, Yang Li, Adaptive real-time energy management control strategy based on fuzzy inference system for plug-in hybrid electric vehicles
- Kay-Uwe Henning, Simon Speidel, Frieder Gottmann, Oliver Sawodny, Integrated lateral dynamics control concept for over-actuated vehicles with state and parameter estimation and experimental validation

**Virtual Special Section on Machine Learning and Advanced Data Analytics in Control Engineering Practice; Edited by Aditya Tulsyan, Manabu Kano, Margret Bauer and Zhiqiang Ge.**

- Jiusi Zhang, Yuchen Jiang, Hao Luo, Shen Yin, Prediction of material removal rate in chemical mechanical polishing via residual convolutional neural network

#### **Virtual Special Section on Marine Vehicles Control:**

- Henglai Wei, Qi Sun, Jicheng Chen, Yang Shi, Robust distributed model predictive platooning control for heterogeneous autonomous surface vehicles

- Chang-Duo Liang, Ming-Feng Ge, Zhi-Wei Liu, Guang Ling, Feng Liu, Predefined-time formation tracking control of networked marine surface vehicles

[Back to the contents](#)

#### **4.13. Journal of Process Control**

Contributed by: Kay Tancock, [k.tancock@elsevier.com](mailto:k.tancock@elsevier.com)

Journal of Process Control

Volume 97, January 2021

#### **Regular Articles:**

- Arvind Ravi, Niket S. Kaisare, Two-layered dynamic control for simultaneous set-point tracking and improved economic performance, pg.17-25

- Viviane Botelho, Jorge Otávio Trierweiler, Marcelo Farenzena, MPC model monitoring and diagnosis for non-square systems, pg.26-44

- Ryan J. McCloy, Ruigang Wang, Jie Bao, Differential dissipativity based distributed MPC for flexible operation of nonlinear plantwide systems, pg.45-58

- Zhenxiang Feng, Yonggang Li, Bei Sun, Chunhua Yang, Zhisheng Chen, A trend-based event-triggering fuzzy controller for the stabilizing control of a large-scale zinc roaster, pg.59-71

- Dinesh Krishnamoorthy, A distributed feedback-based online process optimization framework for optimal resource sharing, pg.72-83

- Ma. Aracelia Alcorta Garcia, Sonia Gpe. Anguiano Rostro, Gerardo Maximiliano Mendez, Facundo Cortes Martinez, Yosefat Nava Aleman, Hybrid H<sub>2</sub>/H-∞ sub-optimal - stochastic risk-sensitive control for polynomial systems of first degree, pg. 84-91

- Yunjian Hu, Jie Sun, Wen Peng, Dianhua Zhang, pg.Nash equilibrium-based distributed predictive control strategy for thickness and tension control on tandem cold rolling system, pg.92-102

#### **Review Articles:**

- H. Safaeipour, M. Forouzanfar, A. Casavola, A survey and classification of incipient fault diagnosis approaches, pg.1-16

[Back to the contents](#)

#### 4.14. ISA Transactions

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ISA Transactions

Volume 108, February 2021

##### Research Articles:

- Haibo Zhou, Chaolong Zhang, Shuaixia Tan, Yu Dai, Ji'an Duan, Design of the footprints of uncertainty for a class of typical interval type-2 fuzzy PI and PD controllers, pg.1-9
- Jinbo Wu, Yifei Hu, Yuxian Huang, Indirect adaptive robust control of nonstrict feedback nonlinear systems by a fuzzy approximation strategy, pg.10-17
- M.R. Zamani, Z. Rahmani, B. Rezaie, A novel model predictive control for a piecewise affine class of hybrid system with repetitive disturbance, pg.18-34
- Jiao-Jun Zhang, Adaptive multi-dimensional Taylor network dynamic surface control for a class of strict-feedback uncertain nonlinear systems with unmodeled dynamics and output constraint, pg.35-47
- Junfeng Zhang, Miao Li, Tarek Raissi, Reliable control for positive switched systems with random nonlinearities, pg.48-57
- Min Ding, Hao Zhou, Hua Xie, Min Wu, Ryuichi Yokoyama, A time series model based on hybrid-kernel least-squares support vector machine for short-term wind power forecasting, pg.58-68
- Meiliu Li, Jinhua She, Chuan-Ke Zhang, Zhen-Tao Liu, Yasuhiro Ohyama, Active disturbance rejection for time-varying state-delay systems based on equivalent-input- disturbance approach, pg.69-77
- Marcelo M. Morato, Julio E. Normey-Rico, A novel unified method for time-varying dead-time compensation, pg.78-95
- Uğur Demiroğlu, Bilal Şenol, Frequency frame approach on tuning FOPI controller for TOPTD thermal processes, pg.96-105
- Ming-Qing Zhang, Xiong-Lin Luo, Modified canonical variate analysis based on dynamic kernel decomposition for dynamic nonlinear process quality monitoring, pg.106-120
- Nan-Nan Zhao, Xin-Yu Ouyang, Li-Bing Wu, Feng-Rui Shi, Event-triggered adaptive prescribed performance control of uncertain nonlinear systems with unknown control directions, pg.121-130
- Yunchang Huang, Jianhui Wang, Fang Wang, Biaotao He, Event-triggered adaptive finite-time tracking control for full state constraints nonlinear systems with parameter uncertainties and given transient performance, pg.131-143
- Jianfang Jiao, Weiting Zhen, Guang Wang, Yinsong Wang, KPLS-KSER based approach for quality-related monitoring of nonlinear process, pg.144-153
- Yifan Liu, Housheng Su, Some necessary and sufficient conditions for containment of second-order multi-agent systems with intermittent sampled data, pg.154-163
- Jian Yang, Hongjin Zhang, Hongjun Chu, Weidong Zhang, Output event triggered consensus control of nonlinear multi-agent systems with relative state constraints, pg.164-177
- Teng-Fei Ding, Ming-Feng Ge, Cai-Hua Xiong, Ju H. Park, Min Li, Second-order bipartite consensus for networked robotic systems with quantized-data interactions and time-varying transmission delays, pg.178-187
- Qie Liu, Yingming Tian, Yi Chai, Min Liu, Li Sun, Design of unscented Kalman filter based on the adjustments of the number and placements of the sampling points, pg.188-195

- Suman Yadav, Richa Yadav, Ashwni Kumar, Manjeet Kumar, A novel approach for optimal design of digital FIR filter using grasshopper optimization algorithm, pg.196- 206
- Pedro Balaguer, Asier Ibeas, Optimal averaging time for improving observer accuracy of stochastic dynamical systems, pg.207-219
- Zhong Wang, Yan Li, State-dependent indirect pseudospectral method for nonlinear optimal control problems, pg.220-229
- Samira Zare, Moosa Ayati, Simultaneous fault diagnosis of wind turbine using multichannel convolutional neural networks, pg.230-239
- Rajeev Kumar, Rajveer Singh, Haroon Ashfaq, Sudhir Kumar Singh, Manoj Badoni, Power system stability enhancement by damping and control of Sub-synchronous torsional oscillations using Whale optimization algorithm based Type-2 wind turbines, pg.240-256
- M. Elsis, M. Soliman, Optimal design of robust resilient automatic voltage regulators, pg.257-268
- Manikandan Vazhara Malayil, Masilamani Vedhanayagam, A novel image scaling based reversible watermarking scheme for secure medical image transmission, pg.269-281

#### **Practice Articles:**

- Yuanlong Xie, Xiaolong Zhang, Wei Meng, Shiqi Zheng, Shuting Wang, Coupled fractional-order sliding mode control and obstacle avoidance of a four-wheeled steerable mobile robot, pg.282-294
- Junwei Wang, Xiyuan Chen, Ping Yang, Adaptive H-infinite kalman filter based on multiple fading factors and its application in unmanned underwater vehicle, pg.295- 304
- Jin Zhang, Zhaohui Tang, Yongfang Xie, Mingxi Ai, Weihua Gui, Data-driven adaptive modeling method for industrial processes and its application in flotation reagent control, pg.305-316
- Yuanbo Xu, Fan Fan, Xiangkui Jiang, A fast iterative filtering decomposition and symmetric difference analytic energy operator for bearing fault extraction, pg.317-332
- Hang Wang, Min-jun Peng, Zhuang Miao, Yong-kuo Liu, Chengming Hao, Remaining useful life prediction techniques for electric valves based on convolution auto encoder and long short term memory, pg.333-342
- Shuzhi Dong, Guangrui Wen, Zihao Lei, Zhifen Zhang, Transfer learning for bearing performance degradation assessment based on deep hierarchical features, pg.343- 355
- Yun Gao, Xiaoyang Liu, Haizhou Huang, Jiawei Xiang, A hybrid of FEM simulations and generative adversarial networks to classify faults in rotor-bearing systems, pg.356-366
- Zhihua Chen, Shoukun Wang, Junzheng Wang, Kang Xu, Jinge Si, Control strategy of stable walking for a hexapod wheel-legged robot, pg.367-380
- Brahim Brahmi, Mark Driscoll, Ibrahim K. El Bojairami, Maarouf Saad, Abdelkrim Brahmi, Novel adaptive impedance control for exoskeleton robot for rehabilitation using a nonlinear time-delay disturbance observer, pg.381-392
- Chao Ma, Jun Yang, Jianyun Chen, Chao Zhou, Path following identification of unmanned aerial vehicles for navigation spoofing and its application, pg.393-405

[Back to the contents](#)

#### 4.15. Nonlinear Analysis: Hybrid Systems

Contributed by: Kay Tancock, [k.tancock@elsevier.com](mailto:k.tancock@elsevier.com)

Nonlinear Analysis: Hybrid Systems

Volume 39, February 2021

##### Regular Papers:

- Paweł Klimasara, Michael C. Mackey, Andrzej Tomski, Marta Tyran-Kamińska, Randomly switching evolution equations
- Ayyoub Ait Ladel, Abdellah Benzaouia, Rachid Outbib, Mustapha Ouladsine, El Mostafa El Adel, Robust fault tolerant control of continuous-time switched systems: An LMI approach
- Qiang Xi, Xinzhi Liu, Finite-time stability and controller design for a class of hybrid dynamical systems with deviating argument
- Prakash Mani, Rakkiyappan Rajan, Young Hoon Joo, Integral sliding mode control for T-S fuzzy descriptor systems
- Hao Liu, Zhujun Wang, Sampled-data-based consensus of multi-agent systems under asynchronous denial-of-service attacks
- Aiqing Wu, Surong You, Wei Mao, Xuerong Mao, Liangjian Hu, On exponential stability of hybrid neutral stochastic differential delay equations with different structures
- Zhenyue Wang, Lijun Gao, Huiying Liu, Stability and stabilization of impulsive switched system with inappropriate impulsive switching signals under asynchronous switching
- Zhilong He, Chuandong Li, Zhengran Cao, Hongfei Li, Stability of nonlinear variable-time impulsive differential systems with delayed impulses
- Carolina Albea-Sánchez, Hybrid dynamical control based on consensus algorithms for current sharing in DC-bus microgrids
- Lars Lindemann, Dimos V. Dimarogonas, Funnel control for fully actuated systems under a fragment of signal temporal logic specifications
- Kun-Zhi Liu, Xi-Ming Sun, Andrew R. Teel, Jun Liu, Stability analysis for networked control systems with sampling, transmission protocols and input delays
- Chenhong Zhu, Xiaodi Li, Jinde Cao, Finite-time H-Infinity dynamic output feedback control for nonlinear impulsive switched systems
- Deqiang Zeng, Ruimei Zhang, Ju H. Park, Shouming Zhong, Guo-Cheng Wu, Reliable stability and stabilizability for complex-valued memristive neural networks with actuator failures and aperiodic event-triggered sampled-data control
- Zhuoyu Li, Dan Ma, Jun Zhao, Dynamic event-triggered L-Infinity control for switched affine systems with sampled-data switching
- Haoxiang Ma, Mou Chen, Hao Yang, Qingxian Wu, Mohammed Chadli, Switched safe tracking control design for unmanned autonomous helicopter with disturbances
- A.S. Matveev, M.S. Nikolaev, Hybrid control for tracking environmental level sets by nonholonomic robots in maze-like environments
- Bin Liu, Bo Xu, Zhijie Sun, Incremental stability and contraction via impulsive control for continuous-time dynamical systems
- Wenping Cao, Quanxin Zhu, Razumikhin-type theorem for pth exponential stability of impulsive stochastic functional differential equations based on vector Lyapunov function

- Feng Shu, Junyong Zhai, Adaptive output feedback stabilization for switched p-normal nonlinear systems with unknown homogeneous growth rate
- Alexey Zhirabok, Alexander Zuev, Vladimir Filaretov, Alexey Shumsky, Fault identification in nonlinear hybrid systems
- Vipin Kumar, Muslim Malik, Mohamed Djemai, Results on abstract integro hybrid evolution system with impulses on time scales
- Alan Tapia, Denis Efimov, Miguel Bernal, Leonid Fridman, Andrey Polyakov, A polytopic strategy for improved non-asymptotic robust control via implicit Lyapunov functions
- Guangjun Shen, Ruidong Xiao, Xiuwei Yin, Jinhong Zhang, Stabilization for hybrid stochastic systems by aperiodically intermittent control
- Yan Liu, Ming Wang, Dianhui Chu, Huan Su, Feedback control based on discrete-time state observations on synchronization of stochastic impulsive coupled systems
- S. Arora, Manil T. Mohan, J. Dabas, Approximate controllability of the non-autonomous impulsive evolution equation with state-dependent delay in Banach spaces
- Abolfazl Lavaei, Sadegh Soudjani, Majid Zamani, Compositional abstraction-based synthesis of general MDPs via approximate probabilistic relations
- Corentin Briat, Hybrid L-Infinity  $\times$  L-Infinity-performance analysis and control of linear time-varying impulsive and switched positive systems

[Back to the contents](#)

#### 4.16. Journal of the Franklin Institute

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Journal of the Franklin Institute

Vol 358, Issue 1

January 2021

#### Security and Privacy in CPS:

- Yi Yang, Sixin Wang, Meilin Wen, Wei Xu, Reliability modeling and evaluation of cyber-physical system (CPS) considering communication failures, pg.1-16
- Tian-Yu Zhang, Dan Ye, A novel adaptive cooperative attack design against cyber-physical systems via mixed H-Infinity/H- index, pg.17-34
- Qinxue Li, Shanbin Li, Bugong Xu, Yonggui Liu, Data-driven attacks and data recovery with noise on state estimation of smart grid, pg.35-55
- Bin Xie, Chen Peng, Minjing Yang, Xiaobing Kong, Tengfei Zhang, A novel trust-based false data detection method for power systems under false data injection attacks, pg.56-73
- Zhixiong Zhong, Yanzheng Zhu, Chih-Min Lin, Tao Huang, A fuzzy control framework for interconnected nonlinear power networks under TDS attack: Estimation and compensation, pg.74-88
- Hui Ge, Dong Yue, Xiangpeng Xie, Song Deng, Chunxia Dou, A unified modeling of multi-sources cyber-attacks with uncertainties for CPS security control, pg.89-113
- Bingyu Wang, Qiuye Sun, Renke Han, Dazhong Ma, Consensus-based secondary frequency control under denial-of-service attacks of distributed generations for microgrids, pg.114-130
- Tao Wen, Quanbo Ge, Xinan Lyu, Lei Chen, Baigen Cai, A cost-effective wireless network migration planning method supporting high-security enabled railway data communication systems, pg.131-150

- Weiwei Tu, Jiuxiang Dong, Ding Zhai, Optimal  $\epsilon$ -stealthy attack in cyber-physical systems, pg.151-171
- Yasin Yilmaz, Suleyman Uludag, Timely detection and mitigation of IoT-based cyberattacks in the smart grid, pg.172-192
- Kai Fan, Wei Jiang, Qi Luo, Hui Li, Yintang Yang, Cloud-based RFID mutual authentication scheme for efficient privacy preserving in IoV, pg.193-209
- Cynthia Vargas Martinez, Birgit Vogel-Heuser, A Host Intrusion Detection System architecture for embedded industrial devices, pg.210-236
- Fangyuan Hou, Jian Sun, Performance degradation of stealthy attacks against sensor measurements in vector systems, pg.237-250

### **Control Systems:**

- Hui Gao, Kaibo Shi, Hongbin Zhang, A novel event-triggered strategy for networked switched control systems, pg. 251-267
- Ruicheng Ma, Hongrui Zhang, Shengzhi Zhao, Exponential stabilization of switched linear systems subject to actuator saturation with stabilizable and unstabilizable subsystems, pg. 268-295
- Chao Ai, Wei Gao, Lijuan Chen, Jiawei Guo, Andrew Plummer, Bivariate grid-connection speed control of hydraulic wind turbines, pg.296-320
- Chuang Li, Xuebo Yang, Neural networks-based command filtering control for a table-mount experimental helicopter, pg. 321-338
- Caifen Fu, Wen Tan, Analysis and tuning of reduced-order active disturbance rejection control, pg. 339-362
- I.M. Boiko, N.V. Kuznetsov, R.N. Mokaev, E.D. Akimova, On asymmetric periodic solutions in relay feedback systems, pg.363-383
- Wenyong Mu, Fang Qiu, Bo Zhuang, Ligang Chen, Optimal actuator switching synthesis of observer-based event-triggered state feedback control for distributed parameter systems, pg.384-399
- Yong-Chao Liu, Salah Laghrouche, Abdoul N'Diaye, Maurizio Cirrincione, Hermite neural network-based second-order sliding-mode control of synchronous reluctance motor drive systems, pg.400-427
- Huijiao Wang, Bing Xue, Anke Xue, Leader-following consensus control for semi-Markov jump multi-agent systems: An adaptive event-triggered scheme, pg.428-447
- Feng Dai, Bin Liu, Optimal control problem for a general reaction-diffusion tumor-immune system with chemotherapy, pg.448-473
- Kotaro Hashikura, Jad Musaddiq Bin Jaafar, Akira Kojima, Md Abdus Samad Kamal, Kou Yamada, LQ preview state feedback with output regulation constraint, pg.474- 493
- Haotian Wang, Yanqian Wang, Guangming Zhuang, Asynchronous H-Infinity controller design for neutral singular Markov jump systems under dynamic event-triggered schemes, pg.494-515
- Hongxia Zhang, Xinzhi Liu, Wei Xu, Threshold dynamics and pulse control of a stochastic ecosystem with switching parameters, pg.516-532
- Jeng-Tze Huang, Global neuro-adaptive control of nonstrict-feedback systems with unknown control directions and multiple time delays, pg.533-554
- Dongwon Kim, Jinhoh Lee, Robust control of a system with a pneumatic spring, pg.555-574
- Zeinab Echreshavi, Mokhtar Shasadeghi, Mohammad Hassan Asemanni, H-Infinity dynamic observer-based fuzzy integral sliding mode control with input magnitude and rate constraints, pg.575-605
- Fei Chu, Xiang Cheng, Chuang Peng, Runda Jia, Qinglai Wei, A process transfer model-based optimal compensation control strategy for batch process using just-in-time learning and trust region method, pg.606-632

- Jiawei Wu, Ling Huang, Global stabilization of linear systems subject to input saturation and time delays, pg.633-649
- Jing Zhao, Zhixiong Zhong, Chih-Min Lin, Hak-Keung Lam, H-Infinity tracking control for nonlinear multivariable systems using wavelet-type TSK fuzzy brain emotional learning with particle swarm optimization, pg.650-673
- Vipin Kumar, Mohamed Djemai, Michael Defoort, Muslim Malik, Finite-time stability and stabilization results for switched impulsive dynamical systems on time scales, pg.674-698
- Mien Van, Dariusz Ceglarek, Robust fault tolerant control of robot manipulators with global fixed-time convergence, pg.699-722
- Yufeng Tian, Zhanshan Wang, Bounded real lemma and H-Infinity control for singular Markovian jump systems with mode-dependent derivative-term coefficient, pg.723- 736
- Dario Giuseppe Lui, Alberto Petrillo, Stefania Santini, Distributed model reference adaptive containment control of heterogeneous multi-agent systems with unknown uncertainties and directed topologies, pg.737-756
- Yanzhou Li, Yuanqing Wu, Shenghuang He, Network-based leader-following formation control of second-order autonomous unmanned systems,pg.757-775
- Nicoleta Aldea, Piotr Kopacz, Generalized loxodromes with application to time-optimal navigation in arbitrary wind, pg.776-799
- Mohamed Yagoubi, Redouane Chaibi, A nonsmooth Newton method for the design of state feedback stabilizers under structure constraints, pg.800-813
- Zhouchao Wei, Amin Yousefpour, Hadi Jahanshahi, Uğur Erkin Kocamaz, Irene Moroz, Hopf bifurcation and synchronization of a five-dimensional self-exciting homopolar disc dynamo using a new fuzzy disturbance-observer-based terminal sliding mode control, pg.814-833
- Zhenzhen Chen, Jian Yang, Xiju Zong, Leader-follower synchronization controller design for a network of boundary-controlled wave PDEs with structured time-varying perturbations and general disturbances, pg. 834-855
- G. Rohith, Fractional power rate reaching law for augmented sliding mode performance, pg.856-876

### **Complex Networks and Dynamic Systems:**

- Suriguga Mongolian, Yonggui Kao, Changhong Wang, Hongwei Xia, Robust mean square stability of delayed stochastic generalized uncertain impulsive reaction- diffusion neural networks, pg.877-894
- Jia Jia, Zhigang Zeng, Fei Wang, Pinning synchronization of fractional-order memristor-based neural networks with multiple time-varying delays via static or dynamic coupling, pg.895-933
- Boumediène Chentouf, Sabeur Mansouri, On the exponential stabilization of a flexible structure with dynamic delayed boundary conditions via one boundary control only, pg.934-962
- Danhong Chen, Yunfei Peng, Energy analysis of a class of state-dependent switched systems with all unstable subsystems, pg.963-979
- Huiyuan Li, Jian-an Fang, Xiaofan Li, Tingwen Huang, Impulse-based coupling synchronization of multiple discrete-time memristor-based neural networks with stochastic perturbations and mixed delays, pg.980-1001
- Xifen Wu, Haibo Bao, Jinde Cao, Finite-time inter-layer projective synchronization of Caputo fractional-order two-layer networks by sliding mode control, pg.1002-1020
- Yang Li, Ningyun Lu, Jiantao Shi, Bin Jiang, A quantitative causal diagram based optimal sensor allocation strategy considering the propagation of fault risk, pg.1021- 1043



- Nguyen Huu Sau, Dinh Cong Huong, Mai Viet Thuan, New results on reachable sets bounding for delayed positive singular systems with bounded disturbances, pg.1044-1069
- William M. Kuhnert, Paulo J. Paupitz Gonçalves, Diego F. Ledezma-Ramirez, Michael J. Brennan, Inerter-like devices used for vibration isolation: A historical perspective, pg.1070-1086
- Bo Song, Ya Zhang, Ju H. Park, Zhichun Yang, Delay-dependent stability analysis of stochastic time-delay systems involving Poisson process, pg.1087-1102

### **Signal Processing and Communication:**

- Xin Chen, Shunyi Zhao, Fei Liu, Robust identification of linear ARX models with recursive EM algorithm based on Student's t-distribution, pg.1103-1121
- Jiao Li, Fanlin Jia, Xiao He, On fault detection of discrete-time switched systems via designing time-varying residual generators, pg.1122-1135
- Xinpeng Liu, Xianqiang Yang, Miao Yu, Identification of switched FIR systems with random missing outputs: A variational Bayesian approach, pg.1136-1151
- David Henry, Theories for design and analysis of robust H-Infinity/H- fault detectors, pg.1152-1183

**Vol 358, Issue 2**

**January 2021**

### **Control Systems:**

- Xiaozheng Jin, Jizhou Yu, Jiahu Qin, Wei Xing Zheng, Jing Chi, Adaptive perturbation rejection control and driving voltage circuit designs of wheeled mobile robots, pg.1185-1213
- Weiwei Yang, Jiejunyi Liang, Jue Yang, Paul D. Walker, Nong Zhang, Corresponding drivability control and energy control strategy in uninterrupted multi-speed mining trucks, pg.1214-1239
- Yuan-Guang Zheng, Ying-Ying Zhang, Stabilization of periodic oscillations with transient delayed feedback control, pg.1240-1251
- Xinyang Tian, Qinhuang Xu, Qiang Zhan, An analytical inverse kinematics solution with joint limits avoidance of 7-DOF anthropomorphic manipulators without offset, pg.1252-1272
- Jung-Min Yang, Dong-Eun Lee, Seong Woo Kwak, Model matching inclusion for input/state asynchronous sequential machines with constraint on the length of control input sequences, pg.1273-1290
- Mengling Li, Feiqi Deng, Xiaofeng Zheng, Jinnan Luo, Mean-square stability of stochastic system with Markov jump and Lévy noise via adaptive control, pg.1291-1307
- Mauro Cappelli, Bernardino Castillo-Toledo, Stefano Di Gennaro, Nonlinear Control of pressurized water reactors with uncertainties estimation via high order sliding mode, pg.1308-1326
- Rui Mu, Airong Wei, Haitao Li, Lu Yue, Leader-following consensus for multi-agent systems with actuator faults via adaptive event-triggered control, pg.1327-1349
- Xiao Cai, Jun Wang, Shouming Zhong, Kaibo Shi, Yiqian Tang, Fuzzy quantized sampled-data control for extended dissipative analysis of T-S fuzzy system and its application to WPGs, pg.1350-1375
- Charles Aguiar, Daniel Leite, Daniel Pereira, Goran Andonovski, Igor Škrjanc, Nonlinear modeling and robust LMI fuzzy control of overhead crane systems, pg.1376- 1402
- Jung-Min Yang, Dong-Eun Lee, Robust corrective control against a class of actuator attacks in input/state asynchronous sequential machines, pg.1403-1421

- Luis Ibarra, Antonio Rosales, Pedro Ponce, Arturo Molina, Adaptive SMC based on the dynamic containment of the sliding variable, pg.1422-1447
- Ahmed Rehan, Igor Boiko, Yahya Zweiri, Optimal non-parametric tuning of PID controllers based on classification of shapes of oscillations in modified relay feedback test, pg.1448-1474
- Liping Zhang, Guoshan Zhang, Optimal output regulation for heterogeneous descriptor multi-agent systems, pg.1475-1498
- Jiace Yuan, Ming Zhu, Xiao Guo, Wenjie Lou, Finite-time trajectory tracking control for a stratospheric airship with full-state constraint and disturbances, pg.1499-1528
- Yuanyuan Ju, Guifang Cheng, Zhishuai Ding, Stochastic H-Infinity finite-time control for linear neutral semi-Markovian jumping systems under event-triggering scheme, pg.1529-1552
- Sung Hyun Kim, Nonquadratic stabilization conditions for nonhomogeneous Markovian jump fuzzy systems with higher-level operation modes, pg.1553-1577
- Jian Wang, He He, Jiafeng Yu, Stabilization of continuous linear scalar systems with network-induced delay using quantized and lossy observations, pg.1578-1598

#### **Complex Networks and Dynamic Systems:**

- Xiaotao Zhou, Lulu Li, Xiao-Wen Zhao, Pinning synchronization of delayed complex networks under self-triggered control, pg.1599-1618

#### **Signal Processing and Communication:**

- Ying Liu, Youqing Wang, Actuator and sensor fault estimation for discrete-time switched T-S fuzzy systems with time delay, pg.1619-1634
- Zhengquan Chen, Lu Han, Yandong Hou, Robust fault estimation and isolation for a descriptor LPV system with disturbance, pg.1635-1655
- Yun Feng, Yaonan Wang, Jun-Wei Wang, Han-Xiong Li, Abnormal spatio-temporal source estimation for a linear unstable parabolic distributed parameter system: An adaptive PDE observer perspective, pg.1656-1672
- Ke Li, Shunyi Zhao, Choon Ki Ahn, Fei Liu, State estimation for jump markov nonlinear systems of unknown measurement data covariance, pg.1673-1691

#### **Corrigendum:**

- Majid Ghorbani, Mahsan Tavakoli-Kakhki, Ali Akbar Estarami, Corrigendum to “Robust FOPID stabilization of retarded type fractional order plants with interval uncertainties and interval time delay” [Journal of the Franklin Institute Volume 356, Issue 16, 2019, Pages 9302–9329], pg.1692

[Back to the contents](#)

#### 4.17. CFP: Dynamic Games and Applications for Modeling/Control of Epidemics

Contributed by: Eitan Altman, [Eitan.Altman@inria.fr](mailto:Eitan.Altman@inria.fr)

Dynamic Games and Applications—Call for Papers

Special Issue on Dynamic Games for Modeling and Control of Epidemics

Guest Editors:

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The recent COVID-19 pandemic has caused a significant social and economic disruption in today's connected world. There is an imminent need to understand and control the spreading of the disease over networks. Dynamic games provide a natural framework to model and analyze the individual incentives and their social interactions over large networks. Sophisticated models such as evolutionary games and mean-field games have enabled the understanding of the emerging population-level phenomena and effective control mechanisms. Connecting dynamic games and epidemic models offers a scientific foundation for rigorous and quantitative analysis and design of screening, containment, and mitigation strategies for large-scale dynamic and network systems. This cross-disciplinary approach will not only address the current challenges with COVID-19 but also shed light on related problems of computer viruses and misinformation in networks. In 2021, Dynamic Games and Applications will publish a special issue on the subject, emphasizing new game-theoretic models and rigorous analysis approaches for epidemics and network systems. The special issue welcomes submissions from theoreticians as well as applied researchers, and it is important to note that papers submitted should have epidemics as the centerpiece. Within that framework, some selected topics (among others) of special interest are:

- Evolutionary games for epidemic modeling
- Integration of game theory and mathematical modelling of infectious disease
- Differential games for decentralized control of epidemics
- Design of treatment, vaccination, and quarantining strategies
- Mean-field game approach to epidemic control
- Multi-agent reinforcement learning methods for epidemics
- Epidemic model-order reduction and identification
- Coupled information and disease spreading
- Competitive virus spreading
- Cooperative control of epidemic models
- Empirical and experimental studies
- Applications of epidemic modeling and games to communication networks, social networks, biological networks, etc.

Submission Deadline: April 15, 2021

Publication Date: December 2021

We encourage early submissions, and the submissions will be processed as soon as they are received. Papers that still require major revision after the second round will not be accepted for the special issue and will be treated as submissions to a regular issue. The accepted papers will appear online in advance of the

production of the full special issue.

For submission instructions, please visit:

<http://www.springer.com/mathematics/applications/journal/13235>

[Back to the contents](#)

#### **4.18. CFP: International Journal of Robust and Nonlinear Control**

Contributed by: Giulia Giordano, [giulia.giordano@unitn.it](mailto:giulia.giordano@unitn.it)

IJRNC Special Issue: Control-Theoretic Approaches for Systems in the Life Sciences

The International Journal of Robust and Nonlinear Control invites submissions for a special issue on “Control-Theoretic Approaches for Systems in the Life Sciences”, handled by the Guest Editors: Giulia Giordano, Declan Bates, Pasquale Palumbo, Philip E. Paré, Daniel E. Rivera, Steffen Waldherr.

Specific topics of interest include, but are not limited to:

- systems biology and synthetic biology: modelling, analysis, control and design of biochemical and biological systems at all scales;
- analysis and management of ecological networks;
- epidemiological systems: dynamics and suppression of contagion;
- biomedical systems, including disease management and the design and analysis of novel treatments.

Both papers with novel theoretical approaches and papers that advance theoretical contributions with meaningful applications are welcome.

Key dates:

- First Submission Deadline: April 30, 2021
- Notification of First Round Decision: June 30, 2021
- Revised Paper Submission Deadline: August 31, 2021
- Notification of Final Decision: October 31, 2021
- Final Paper Submission Deadline: November 30, 2021
- Publication of Issue: Early 2022

The Call for Papers can be found here:

<https://bit.ly/3owcleJ>

[Back to the contents](#)

#### **4.19. CFP: Nonlinear Analysis: Hybrid Systems**

Contributed by: Kai Cai, [kai.cai@eng.osaka-cu.ac.jp](mailto:kai.cai@eng.osaka-cu.ac.jp)

Special Issue: “Security, Privacy and Safety of Cyber-Physical Systems”

Guest Editors: Kai Cai, Osaka City University ([kai.cai@eng.osaka-cu.ac.jp](mailto:kai.cai@eng.osaka-cu.ac.jp))

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Cyber-physical systems are engineered systems that are built from and depend upon the synergy of computational and physical components. They are pervasive in today's technological society. Cyber-physical systems usually involve complex interactions of continuous dynamics with discrete logic, referred to as "hybrid" behavior. The development of controller design and verification algorithms for such complex systems are crucial and challenging tasks, due in particular to the theoretical difficulties of analyzing hybrid behavior and to the computational challenges associated with the synthesis of hybrid controllers.

Ever-increasing demands for safety, privacy, security and certification of cyber-physical systems put stringent constraints on their analysis and design, and necessitate the use of formal model-based approaches. In recent years, we have witnessed a substantial increase in the use of formal techniques for the verification and design of privacy-sensitive, safety-critical cyber-physical systems.

The main objective of this special issue to gather recently developed novel approaches devoted to analysis and enforcement of security, privacy and safety of cyber-physical systems using formal techniques. We seek submissions including but not limited to the following topics:

- Security and privacy analysis of cyber-physical systems, including opacity, differential privacy, noninterference and other related notions
- Fault diagnosis, intrusion detection, and attack mitigation of cyber-physical systems
- Supervisory control for safety of discrete-event systems
- Formal methods and reactive synthesis for safety of cyber-physical systems
- Data-driven verification and synthesis of cyber-physical systems
- Distributed approaches for large scale cyber-physical systems and hybrid systems
- Algorithms and tools for verification and synthesis of safety-critical systems
- Applications in security and/or safety of manufacturing systems, transportation systems, energy systems, robotic networks, telecommunications, and computer networks.

Submission Information:

- Deadline (no further extension): February 14, 2021
- Website: <https://www.editorialmanager.com/NAHS/default.asp>
- Article type (identifier of this special issue): VSI: Security

[Back to the contents](#)

## 5 Conferences and Workshops

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### 5.1. The 60th IEEE Conference on Decision and Control, USA

Contributed by: Sergio Galeani, [sergio.galeani@uniroma2.it](mailto:sergio.galeani@uniroma2.it)

The 60th IEEE conference on Decision and Control will be held Monday through Wednesday, December 13-15, 2021 at the Fairmont Hotel, Austin, Texas, USA. The conference will be preceded by workshops on Sunday, December 12, 2021.

The CDC is recognized as the premier scientific and engineering conference dedicated to the advancement of the theory and practice of systems and control. The CDC annually brings together an international community of researchers and practitioners in the field of automatic control to discuss new research results, perspectives on future developments, and innovative applications relevant to decision making, systems and control, and related areas.

The 60th CDC will feature contributed and invited papers, as well as workshops and tutorial sessions. It is hosted by the IEEE Control Systems Society (CSS) in cooperation with the Society for Industrial and Applied Mathematics (SIAM), the Japanese Society for Instrument and Control Engineers (SICE), and the European Control Association (EUCA).

The conference will take place in the Fairmont Hotel in Austin, Texas. Austin is known as the “Live Music Capital of the World” and is the home to the University of Texas at Austin as well as the Texas State Capital. The city features many high-tech companies and start-ups and is renown for its vibrant food and culture scenes. As Austin’s unofficial slogan is “Keep Austin Weird”, the 60th CDC has embraced this aspect of the host city and has incorporated a number of non-traditional elements in the program.

**IMPORTANT NOTICE:** The working assumption for now is that CDC’21 will be an in-person event and we are proceeding with the plans for the conference under that assumption.

At the same time, we are looking at ways in which partial conference attendance could be possible virtually as well for those unable or unwilling to travel. And, of course, as this is a highly uncertain, dynamically evolving system, the plans may have to be revisited as we get closer to the conference dates.

Don’t miss future updates on CDC2021! Follow us on Twitter: [#IEEECDC2021](https://twitter.com/IEEECDC2021)

[Back to the contents](#)

### 5.2. Roadmap 2030: Vision Statements for Control for Societal Challenges, Virtual

Contributed by: Anuradha Annaswamy, [aanna@mit.edu](mailto:aanna@mit.edu)

Open Call for Vision Statement for Control for Societal-Scale Challenges: Roadmap 2030

Virtual Workshop, June 4-5, 2021

Physical Workshop, Stockholm, June 2022

Organizers: A.M. Annaswamy, K. H. Johansson, and G.J. Pappas

The IEEE Control Systems Society would like to develop a scientific roadmap for the future of our discipline, *Control for Societal-Scale Challenges: Roadmap 2030*. The objectives of the roadmap are to lay out new societal areas where our discipline can have impact over the next decade, propose novel scientific challenges that the community should pursue, and investigate workforce education and training curricula in order to address these challenges. Our plan is also to ensure that the roadmap has a broad scope including new technological drivers, new infrastructures for control systems, and legal, organizational and regulatory factors that are prevalent in societal-scale systems.

In support of this effort, we will conduct a workshop in two parts, the first during June 4-5, 2021, in a virtual format, and the second during June 2022 in Stockholm, in an in-person format. The workshop discussions will be centered around six identified themes, with elements of real-time decision making, machine learning, autonomy, data-driven and physics-driven approaches, security and privacy, and big-data pervading all six themes. Short descriptions of all theme abstracts can be found in the appendix.

We would like to invite the broader control community to submit vision statements towards this roadmap, describing your personal view about the future of the discipline. Your written input can address any of the following issues: (a) Novel or existing domains where control systems can have a critical role, (b) scientific challenges or exciting scientific directions for the future, (c) innovative ideas about workforce development and control systems curriculum, (d) organizational, regulatory, economic or infrastructure challenges or drivers that we should be considering in the future, and (e) anything else you think is critical for the future of our discipline. Please note that all inputs should be forward looking, broad, and thematically linked to the objectives of the roadmap. We are not looking for specific approaches, technical solutions, or results, but rather future directions that our community should be exploring to solve grand societal challenges.

We would like your vision statement to be in the form of an abstract, not exceeding 300 words, and either in a doc or pdf format. All statements will be reviewed by the theme leaders (see appendix), and some may be chosen for presentation at the workshops, or invited for further articulation in the roadmap. Selected submissions will be included the final roadmap report, which will be posted on the IEEE CSS homepage and related websites.

Please email your abstracts to any of the three organizers listed above (aanna@mit.edu, kallej@kth.se, pappasg@seas.upenn.edu) no later than March 1, 2021.

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## Appendix

Panel 1: Decision making with real-time and distributed data (Leads: Anders Rantzer and Na Li)

Recent radical evolution in distributed sensing, computation, communication, and actuation has revolutionized the way systems operate and fostered the emergence of real-time decision making with large and distributed data. Examples cut across a broad spectrum of engineering and societal fields such as energy systems, transportation systems, Internet, sensor networks, social networks, epidemics and many others. In most of applications, established models from one or more disciplines need to be combined with blackbox models built from data. A good example is in autonomous driving, where the existing extensive experience of control technology such as ABS braking, cruise control and ESP systems for vehicle stabilization needs to

be combined with machine learning methods to analyse traffic situations and human behavior. To do this in a safe and robust manner, it is essential to understand how learning algorithms for sequential decision-making can interact with continuous physics based dynamics. Similarly, in power systems, well established control solutions are increasingly being combined with learning algorithms correlating consumer behavior with weather forecasts, to minimize costs and optimize efficiency. This panel will focus on the challenges related to learning in a real-time setting in combination with distributed data, with a focus on challenges that common to a variety of aforementioned applications. Examples include 1) how to develop physics-aided learning methods that exploit both the known-physics, historical data, and real-time data? 2) how to develop scalable solutions which could handle the large size of the system and the large amount of data generated from different locations? 3) how to balance the tradeoff between solution efficiency, computation speed, and communication quality for real-time operation by prioritizing the information and tasks? 4) how to ensure system safety while providing enough flexibility and robustness for running the system under various (nonstationary or even adversarial) environment?

Panel 2: Safety-critical autonomous systems with ML (Leads: Claire Tomlin and Angela Schoellig)

Advances in machine learning have accelerated the introduction of autonomy in our everyday lives. However, ensuring that these autonomous systems act safely is an immense challenge. Today, when self-driving vehicles, or collaborative robots, operate in real-world uncertain environments, it is impossible to guarantee safety at all times. The key challenge stems from the uncertainty of the environment itself, and the inability to predict all possible situations that could confront the system. Machine learning, and its potential ability to generalize, may be a solution. For example, a learning-based perception system for a self-driving vehicle, must be able to generalize beyond the scenes that it has observed in training. Yet today, these algorithms are producing solutions that are not easy to understand, are brittle to faults and possible cyber-attacks. The purpose of this Panel is to explore the scope of safe autonomy, to present the challenges, and to explore current research developments which help us move towards a solution.

Panel 3: Resilient infrastructure-systems with AI and IoT (Leads: Dan Work and Carlos Canudas de Wit)

Monitoring and control for large-scale critical infrastructure systems is accelerated by low cost sensing, communication, computation, and actuation technologies that underpin the internet of things. Enabled by the large volumes of data produced by these systems, a new generation of mobility, energy, water, and health networks are increasingly adopting artificial intelligence-enabled components that further increase the richness of these systems. As the scale and complexity of these systems continues to grow, so do the challenges to provide robustness and resilience. For example, attacks on the cyber infrastructure can lead to cascading failures that dramatically degrade or cripple the physical systems. Allowing pervasive sensing and guaranteeing privacy remains open in many application domains. This panel will establish the challenges to enable monitoring and control for infrastructure systems that are smart, resilient, secure, and privacy preserving.

Panel 4: Control in Human-automation, Health, and Networked Systems (Leads: Sandra Hirche and Aaron Ames)

Control has the unique ability to transform society across a spectrum of application domains that can positively impact quality of life. In many of these domains the interaction between the human and the au-



tomation system plays an important role and requires an in-depth understanding for the development of novel control technologies. This panel is devoted to future directions in control for human-automation systems, that can positively address societal-scale challenges at multiple levels, from direct physiological interaction, to human collaborations with robotic and autonomous systems, to networked population-wide interactions.

At the direct interaction level, the goal is to understand interactions with the human body and its processes, from neurocontrol to physiological control mechanisms. This can directly infuse control theory to positively improve human function, mitigate against disease, and augment performance. There is ever increasing interaction with humans and control systems via robotic and autonomous systems, and understanding this has important ramifications to everything from robotic assistive devices to ever increasing autonomous features in automotive systems. Finally, at the human population level, control can inform and drive the evolution of systems from local community to global scales. This includes traffic management, power and general infrastructure systems, economics and epidemics.

In all application domains and all levels of interaction, key challenges from a control theory perspective include understanding safety and uncertainty in the context of human decision making. Safety considerations are central due to the direction interactions with humans. Exploring notions of safety from a theoretic and dynamic point of view, and characterizations thereof, will be essential in deploying theoretic solutions into real-world applications. These notions of safety, and guarantees obtained via control theory more generally, will involve human models that may be difficult to ascertain. As such, methods that are robust to uncertainty will need to be developed—these likely could include data-driven approaches for mitigating this uncertainty that learn and adapt.

Panel 5: Systems and Control Opportunities for Climate Change Mitigation and Adaptation (Leads: Pramod Khargonekar and Tariq Samad) There is international consensus that global warming and the resulting climate change represent an extremely important grand challenge for the next several decades. Experts in the field of systems and control can make valuable contributions to several key strategies for climate change mitigation and adaptation. Indeed, because of the large scope of this topic, this panel will only address a subset of possible directions. In fact, two topics will be of primary focus, although these are broad enough to incorporate numerous opportunities for impact.

The first is energy system decarbonization. In general, we will emphasize “system-level” aspects—large-scale renewable generation from diverse sources; integration of renewables and storage in transmission and distribution networks; microgrid optimization and control; and energy markets for products and services.

The second broad topic is adaptation to climate change: How can the control community contribute to ensuring a habitable planet if, as seems highly likely now, mitigation efforts are, at best, only partially successful? Adverse impacts will be manifold—including increasing frequencies of storms, dramatic sea-level rise, droughts and flooding, and deterioration of agricultural lands and yields. However, we will target a general problem that we believe the controls community is ideally suited to take a leadership role in: What novel methodologies can be developed for facilitating strategic decision making under deep uncertainty?

Our objective for the panel is to develop a set of recommendations for the controls community, its leadership, and funding agencies. These recommendations will include promising new opportunities for re-

search, collaborations with other fields, new R&D programs at national and international levels, workshops and other events, and publications for motivating and promoting the role of control science and engineering in the defining grand challenge for the future of humanity and its ecosystem.

Panel 6: Education and Training (Leads: Christos Cassandras and Joao Hespanha)

The panel's scope is designed to cover the following five areas:

1) Academic curriculum: Design the ideal undergraduate curriculum for Systems and Control over the next decade in terms of (i) material covered, (ii) blend of theory/applications, (iii) blend of paper-pencil exercises/simulation/experiments. Identify explicit changes with respect to a typical current curriculum: What should be eliminated/downplayed? What should be added?

2) Outreach: Identify opportunities (and create them if possible) to incorporate Systems and Control concepts in pre-college education. Specifically identify concepts, ideas, or grand challenges that can provide inspirational value to pre-college students.

3) Driving Areas: Identify the technical areas that should drive Systems and Control education. Differentiate between areas based on principles which transcend technological and societal changes and new areas that need to be introduced to Systems and Control education.

4) Industry: Explore the role that academic institutions could/should have in Industry training, as well as the role that Industry should have in academic education. Find ways to improve the interaction between universities and industry, in the educational and training context. Explore the role that internships or apprenticeships can play in bringing students closer to real industrial application problems.

5) Building bridges with other science/engineering fields: It has often been said that control is a "hidden technology" one that "enables" other technologies but does not stand out by itself. Discuss the accuracy (or not) of this statement. If the statement is true, explore how to best incorporate systems and control into a college curriculum (e.g., what department does it belong to?) If the statement is not true, find new ways to change this perception through education or outreach.

[Back to the contents](#)

### 5.3. IFAC Workshop on Time Delay Systems, China

Contributed by: Jie Chen, [jichen@cityu.edu.hk](mailto:jichen@cityu.edu.hk)

16th IFAC Workshop on Time Delay Systems (TDS 2021)

The 16th IFAC Workshop on Time Delay Systems (TDS 2021), which continues the long-time successes of the workshop series since 1998 and seeks to meet the growing interest of the international scientific community in systems with time delays, will be held in Guangzhou, China on September 29-October 1, 2021. The TDS 2021 technical program will include contributed and invited papers, as well as tutorial sessions and workshops, focusing on theoretical advances and technological applications of systems and control related to time delay systems. This focus includes but is not limited to modelling and identification, analysis, filtering and estimation, stability and stabilization, safety, structural properties, robustness, approximation techniques and numerical methods, data-driven and machine-learning methods, control schemes and ap-

plication in process control, vibration control, networked systems, autonomous agents, communications, bio-engineering, economics and other fields. Particularly welcomed is the latest progress in emerging problem areas such as cyber-physical systems, cloud-based control, and in emerging applications such as smart grid, biomedical systems, intelligent transportation, intelligent manufacturing and automation.

Situated at the heart of the thriving Pearl River Delta and in close proximity to Hong Kong and Macao, Guangzhou is the third largest city in the Mainland China that boasts a unique southern China culture blended with its fast-developing modern metropolitan ambience. The city, readily accessible from the world's major airports, is known for many of its attractions and promises to offer most unforgettable cultural, sightseeing, dining, and entertainment experiences.

TDS 2021 recognizes excellent student contributions by presenting a Best Student Paper Award for a paper whose primary author and presenter is a student.

The workshop homesite is <https://www.tds2021.ee.cityu.edu.hk/>, with the link <https://www.tds2021.ee.cityu.edu.hk/pdf/CFP-TDS2021.pdf> to Call for Papers.

[Back to the contents](#)

#### **5.4. Mediterranean Conference on Control and Automation, Italy**

Contributed by: Mariagrazia Dotoli, [mariagrazia.dotoli@poliba.it](mailto:mariagrazia.dotoli@poliba.it)

29th Mediterranean Conference on Control and Automation (MED 2021). Bari, Italy. June 22-25, 2021, <http://www.med2021.poliba.it/>

Dear Colleague,

We apologize if you receive multiple copies of this email.

Please be informed that the Organizing Committee of 29th Mediterranean Conference on Control and Automation - MED 2021 – ([www.med2021.poliba.it](http://www.med2021.poliba.it)) [22-25 June 2021- Bari, Italy] has extended the submission date of the invited session proposal to 14th January 2021, which is the very final deadline.

The paper submissions are open and are possible by 15th January 2021, this date will be susceptible to extension too.

The safety and health of all colleagues, awaited participants, and guests is a top priority for MED 2021 Organizing Committee, therefore, we are constantly and closely following the pandemic situation, as well the recommendations of health authorities.

With the aim of facilitating participation in the conference, the MED2021 will be held as a hybrid conference allowing registrants the choice to participate physically or to connect remotely.

Hopefully, the pandemic situation will be much better in June 2021 and international travel will be restored. However, due to the significant uncertainty worldwide at this time, MED 2021 provides a priori the option of online participation, which will allow everybody to participate even if their home country has travel restrictions. Online participation will have reduced registration fees.

We strongly encourage you, your teammates and colleagues to submit papers to this outstanding Conference and present your results in person or on-line.

Topics of the conference:

The general conference topic is Smart Cities and Smart Systems.

Submissions and Publications (<http://med2021.poliba.it/wordpress/submission-and-publications/>):

- Accepted Regular and Invited Session Regular papers that are being presented at the MED2021 will be published in the proceedings of the event and will be available in IEEE Explore and indexed in Scopus.
- Proposals for invited sessions, tutorials/workshops, as well as papers should be submitted via PaperCept: <https://controls.papercept.net/conferences/scripts/start.pl>
- Note that the conference allows for the submission of novel/cutting edge ideas with potential, however, not yet fully developed, in the form of Invited Session Presentation Only and Presentation Only papers, which will be presented at the conference but will not be published in the conference proceedings.
- Invited session proposals can include Invited Session Presentation Only papers.

Important dates:

- Invited Session proposal – EXTENDED: 14 January 2021
- Submission of Regular, Presentation Only, Invited Session Regular, Invited Session Presentation Only papers – 15 January 2021 (SUSCEPTIBLE OF EXTENSION)
- Notification of acceptance/rejection of papers – 18 March 2021
- Final submission - 15 April 2021

For any further information, please visit the conference website [www.med2021.poliba.it](http://www.med2021.poliba.it), or contact us by email at [med2021@poliba.it](mailto:med2021@poliba.it)

Yours sincerely,

Prof. Mariagrazia Dotoli, General Chair of MED2021

Prof. Laura Giarré, General Co-Chair of MED2021

Prof. Elisa Franco and Prof. Laura Giarré, Program Chairs of the MED2021

Prof. Alessandra Parisio and Prof. Laura Menini, Publication and Publicity Chairs of the MED2021

Dr. Graziana Cavone, Local Arrangements Chair of the MED2021

[Back to the contents](#)

#### **5.5. International Conference on Unmanned Aircraft Systems, Greece**

Contributed by: Youmin Zhang, [Youmin.Zhang@concordia.ca](mailto:Youmin.Zhang@concordia.ca)

Call-for-Papers: 2021 International Conference on Unmanned Aircraft Systems (ICUAS'21), Athens, Greece, June 15-18, 2021 ([www.uasconferences.com/2021\\_icuas/](http://www.uasconferences.com/2021_icuas/))

On behalf of the Organizing Committee and the ICUAS Association, it is our pleasure to invite you to contribute to and participate in the 2021 International Conference on Unmanned Aircraft Systems, ICUAS'21,

which will be held, again, in Athens, Greece. The conference venue is the luxurious Divani Caravel Hotel, <http://divanicaravelhotel.com>. This decision was reached by ‘popular demand’ as most registered participants in ICUAS’20 were not able to travel to Greece due to COVID-19. Athens is a metropolitan/cosmopolitan city, the capital of Greece, the birthplace of Democracy, and the home to the world-renowned Acropolis and Parthenon – a city where visitors can walk safely and enjoy the rich, almost 5,000-year-old history it has to offer.

The major themes of ICUAS ’21 are: AI and autonomy for UAS/RPAS, UAS/RPAS design for safety, reliability and resilience, unmanned – manned swarms, aerial manipulation, and technology standards, all contributing to building high-confidence systems. National and international organizations, agencies, industry and authorities work towards defining roadmaps of UAS/RPAS expectations, technical requirements and standards that are prerequisite to their full utilization. The next generation of UAS/RPAS will be used for a wide spectrum of civilian and public domain applications. Challenges to be overcome include the topics of interest listed below. Innovative solutions to these challenges will pave the way towards full integration of UAS/RPAS with manned aviation and into the national airspace.

ICUAS ’21 aims to bring together different groups of qualified representatives worldwide, funding agencies, industry and academia, to discuss the current state of unmanned aviation advances, and the roadmap to their full utilization in civilian and public domains. Special emphasis will be given to research opportunities, and to ‘what comes next’ in terms of the essential technologies that need to be utilized to advance the state-of-the-art.

Conference topics include (but not limited to):

- . Airspace Control . Integration . See/Sense-Detect-and-Avoid Systems
- . Airspace Management . Interoperability . Security
- . Airworthiness . Levels of Safety . Sensor Fusion
- . Autonomy. Manned/Unmanned Aviation . Smart Sensors
- . Biologically Inspired UAS . Micro- and Mini- UAS . Standardization
- . Certification . Networked UAS . Technology Challenges
- . Control Architectures . Payloads. Training
- . Energy Efficient UAS . Path Planning and Navigation . UAS Applications
- . Environmental Issues . Regulations . UAS Communications
- . Fail-Safe Systems . Reliability of UAS . UAS Testbeds
- . Frequency Management . Risk Analysis . UAS Transportation Management (UTM)

Through keynote addresses, round table discussions and presentations, it is expected that the outcome of the Conference will be a clear understanding of what industry, civilian, national/international authorities need, and what are the crucial next steps that need to be completed before UAS/RPAS are utilized in everyday life applications.

IMPORTANT DATES (Please check the latest information at <http://www.uasconferences.com>)

February 15, 2021: Full Papers/ Invited Papers/Tutorial Proposals Due

April 15, 2021: Acceptance/Rejection Notification

May 10, 2021: Upload Final, Camera Ready Papers; Early Registration Deadline

PAPER SUBMISSION: Paper format should follow IEEE guidelines, and electronic submission will be handled through PaperCept - details are available on the conference web site. Submitted papers should be classified as Contributed or Invited Session (max. 10 pages), or Poster (max. 6 pages) papers. Accepted, contributed and invited session papers only, will be allowed up to two additional pages for a charge of \$100 per additional page. Poster papers should be aimed at novel and cutting-edge ideas with potential, however, not yet fully developed.

Invited Sessions: Proposals must be submitted and uploaded electronically. A Summary Statement describing the motivation and relevance of the proposed session, paper titles and author names must be uploaded electronically by due date. Authors must also submit full versions of invited papers electronically, marked as Invited Session Paper.

Workshops/Tutorials: Proposals for workshops/tutorials should contain title, the list of speakers, and extended summaries (2000 words) of their presentations. Proposals must be sent by e-mail to the Tutorial/Workshop Chair by due date.

Welcome and look forward to receiving your contributions and attendance to the ICUAS'21! For detailed information please see [www.uasconferences.com](http://www.uasconferences.com).

#### ICUAS ASSOCIATION LIAISON CHAIR

Kimon P. Valavanis, Univ. of Denver, [kimon.valavanis@du.edu](mailto:kimon.valavanis@du.edu)

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Nikos Tsourveloudis, Technical U of Crete

#### PROGRAM CHAIRS

Andrea Monteriu, Univ. Pol. delle Marche

Matko Orsag, University of Zagreb

[Back to the contents](#)

### 5.6. World Congress: Math Problems in Engineering and Sciences, Czech Republic

Contributed by: Seenith, [seenithi@gmail.com](mailto:seenithi@gmail.com)

World Congress: Mathematical Problems in Engineering, Aerospace, and Sciences

When: Date: June 22-25, 2021

Where: Location: Czech Technical University in Prague, Prague, Czech Republic

Website: <http://www.icnpaa.com>

<http://www.icnpaa.com/index.php/icnpaa/ICNPAA2020>

ICNPAA's AIM: Mathematical Problems in Engineering, Aerospace, and Science have stimulated cooperation among scientists from a variety of disciplines. Developments in computer technology have additionally allowed for solutions to mathematical problems. This international forum will extend scholarly cooperation and collaboration, encouraging the dissemination of ideas and information. The conference will have a pool of active researchers, with a proper balance between academia and industry, as well as between senior and junior researchers, including graduate students and post-doctoral fellows. It is anticipated that such a balance will provide both senior and junior researchers an opportunity to interact and to have a wider picture of recent advances in their respective fields. The conference, especially, enables the setting up of new interdisciplinary research directions among its participants by establishing links with world-renowned researchers, making possible joint international projects that will no doubt bring about fresh and innovative ideas and technologies in engineering, aerospace, and sciences.

Co-Sponsored by: AIAA: American Institute of Aeronautics and Astronautics IFIP: International Federation of Information Processing CTU: Czech Technical University in Prague, Prague, Czech Republic

The proceedings will be published by the American Institute of Physics. AIP Conference Proceedings are indexed in:

- Astrophysics Data System(ADS)
- Chemical Abstracts Service (CAS)
- Crossref
- EBSCO Publishing
- Electronic Library Information Navigator (ELIN), Sweden
- Elsevier – SCOPUS
- International Atomic Energy Agency (IAEA)
- Thomson Reuters (ISI)

[Back to the contents](#)

### **5.7. IFAC Conference on Modeling and Control of Nonlinear Systems, Online**

Contributed by: Hiroshi Ito, [hiroshi@ces.kyutech.ac.jp](mailto:hiroshi@ces.kyutech.ac.jp)

IFAC Conference on Modelling, Identification and Control of Nonlinear Systems, Online

MICNON 2021 Call-for-Papers: The Third IFAC Conference on Modelling Identification and Control of Nonlinear Systems (MICNON 2021) will be held online during September 15-17, 2021. MICNON 2021 will be accompanied by a pre-conference day of tutorial workshops. Due to situations related to COVID-19, it will be held in a fully online format. Updated information is available always at <http://micnon2021.org/>

Pre-conference tutorial workshops : September 14, 2021

Conference dates : September 15-17, 2021

Deadline for invited session proposal : February 8, 2021

Deadline for paper submission : February 15, 2021

Deadline for tutorial workshop proposal : February 15, 2021

The scope of the conference will range from theoretical aspects to practical applications of nonlinear systems theory, including control, analysis, modelling, and identification of nonlinear systems and related fields. Accepted papers that have been presented at an IFAC meeting will be published in the proceedings of the event using the diamond open access IFAC-PapersOnLine series hosted on ScienceDirect.

Topics (not limited to)

- \* Modeling and identification of nonlinear systems
- \* Control of nonlinear systems
- \* Stability and complex dynamics
- \* Networked nonlinear systems
- \* Stochastic control systems
- \* Control of networks
- \* Control with limited information
- \* Nonlinear systems with time delay
- \* Disturbance rejection
- \* Switching control
- \* Adaptive control and signal processing for nonlinear systems and other related topics

International Program Committee

Chair : Kenji Fujimoto (Kyoto University, Japan)

Co-Chair: Alessandro Astolfi (Imperial College London, University of Rome Tor Vergata)

Co-Chair for Industrial Relationship: Martin Guay (Queen's University)

National Organizing Committee

General Chair : Hiroshi Ito (Kyushu Institute of Technology)

Vice Chair from industry: Daisuke Akasaka (MathWorks Japan)

Editor : Yuh Yamashita (Hokkaido University)

IFAC Main Sponsoring Technical Committee

TC 2.3 Non-Linear Control Systems

IFAC Co-Sponsoring Technical Committees

TC 1.1 Modelling, Identification and Signal Processing

TC 1.2 Adaptive and Learning Systems

TC 2.1 Control Design

TC 6.1 Chemical Process Control

TC 8.4 Biosystems and Bioprocesses

TC 9.4 Control Education

[Back to the contents](#)



## 5.8. Workshop on Computation-Aware Algorithmic Design for CPS, Virtual

Contributed by: Abhishek Halder, [ahalder@ucsc.edu](mailto:ahalder@ucsc.edu)

Workshop on Computation-Aware Algorithmic Design for Cyber-Physical Systems

This is a satellite workshop of the 2021 CPS-IoT week. The goal of this workshop is to lay out the foundations of computation-aware algorithmic design of cyber-physical systems by bringing together experts (both practitioners and researchers) in cyber-physical systems and key areas in hardware design, real-time systems, optimization, control, safety, and verification.

Workshop website: <https://www.hyconsys.com/CAADCPS2021>

We solicit regular papers (max 6 pages) and extended abstracts (max 2 pages). Paper submission must be performed via the EasyChair system: <https://easychair.org/conferences/?conf=caadcps2021>

Regular papers must describe original work, be written and presented in English, and must not substantially overlap with papers that have been published or that are under submission. Submitted papers will be judged on the basis of significance, relevance, correctness, originality, and clarity. They should clearly identify what has been accomplished and why it is significant.

Regular paper and extended abstracts submissions should be in ACM conference template. All accepted papers will be posted on the workshop's website and included in the ACM Digital Library.

Submission deadline: February 10, 2021

(submission link: <https://easychair.org/conferences/?conf=caadcps2021>)

Notification: March 10, 2021

Final version: April 10, 2021

Workshop date: May 18, 2021

CFP: <https://easychair.org/cfp/caadcps2021>

Organizers: Murat Arcak, Abhishek Halder, Heiner Litz, Linh Phan, Ricardo Sanfelice, Majid Zamani

[Back to the contents](#)

## 5.9. International Conference on Methods in Automation and Robotics, Poland

Contributed by: Pawel Dworak, [pawel.dworak@zut.edu.pl](mailto:pawel.dworak@zut.edu.pl)

25th International Conference on Methods and Models in Automation and Robotics

23-26 August 2021

Amber Baltic Hotel, Miedzyzdroje, Poland

It is our great pleasure to invite You to participate in the 25th International Conference on Methods and Models in Automation and Robotics, MMAR 2021 to be held in Miedzyzdroje, Poland, from August 23th to August 26th, 2021.

The Conference will be a good opportunity for highlighting the new results and directions of Automatic Control theory, technology and applications. As such, it mainly will concentrate on the following key points:

- emphasis on invited lectures including plenaries,
- industry participation promotion,
- attract young people to study and work in the field.

The participants of the 25th International MMAR Conference will have the opportunity to take part in the wide spectrum of categories for technical presentations, including plenary lectures, regular papers of both lecture and poster session types, and panel discussion. We look forward to seeing our old and new friends in Poland. You are kindly invited to participate in the 25th International MMAR Conference in Miedzydroje, Poland.

Topics of interest include, but are not limited to:

- Identification, modelling and simulation
- Signal processing
- Control and systems theory
- Robotics
- Intelligent systems and methods
- Control systems

The proceedings of the conference will be submitted for review and approval for inclusion in the IEEE Xplore® Digital Library and will be submitted for inclusion in the Conference Proceedings Citation Index - Science (ISI Web of Science).

Key Dates (Please check the latest information at [www.mmar.edu.pl](http://www.mmar.edu.pl))

- March 5, 2021 - Paper submission
- May 17, 2021 - Notification of acceptance
- June 21, 2021 - Registration
- June 21, 2021 - Camera-ready paper submission

For more information see <http://www.mmar.edu.pl>

[Back to the contents](#)

#### **5.10. International Conference on System Theory and Control, Romania**

Contributed by: Mihaela-Hanako Matcovschi, [mhanako@ac.tuiasi.ro](mailto:mhanako@ac.tuiasi.ro)

Call for Papers: ICSTCC 2021 - 25th International Conference on System Theory, Control and Computing  
October 20-23, 2021, Iași, Romania  
<https://icstcc2021.ac.tuiasi.ro/>

The 25-th International Conference on System Theory, Control and Computing ICSTCC 2021 aims at bringing together under a unique forum, scientists from academia and industry to discuss the state of the art and the new trends in system theory, control and computer engineering, and to present recent research results

and prospects for development in this rapidly evolving area.

The conference will be held in this format for the 12th time, joining four previous different scientific meetings organized separately by four faculties specializing in Control and Computing from Romania. Starting from 2011, benefiting from the technical co-sponsorship of IEEE Control Systems Society, the Proceedings of every edition have been included in IEEE Xplore Digital Library. The Proceedings of the 2013 and 2015-2019 editions are indexed in Clarivate Analytics Web of Science.

The conference will be held in Iasi, which is the second largest city in Romania. Located in the historical region of Moldavia, Iasi has traditionally been one of the leading centers of Romanian social, cultural, academic and artistic life. Home to the oldest Romanian university and to the first engineering school, Iasi is one of the most important education and research centers of the country.

ICSTCC 2021 will feature several kinds of presentations, including invited talks, contributed papers, special sessions and contributions from industry, a seminar for young researchers and PhD students and a meeting dedicated to Women in Engineering, Research and Development. The outcome of ICSTCC 2021 is hoped to be an inclusive event, a comprehensive view of some leading research areas: control, robotics, computers, electrical and electronic engineering. The topics of the conference are available here.

Invited Speakers:

- Eduard Gröller – Austria
- Ioana Banicescu – USA
- Marc Gatti – France
- Maria Prandini – Italy
- Robain De Keyser – Belgium

Important Deadlines:

- April 30, 2021: Submission of proposals for invited sessions
- April 30, 2021: Initial submission of papers
- June 15, 2021: Notification of acceptance for papers
- July 15, 2021: Final camera ready manuscript and registration payment for at least one of the authors
- October 20-23, 2021: Conference

We look forward to receiving your contribution to ICSTCC 2021 and to welcome you in Iasi.

Mihail Voicu, Professor Emeritus Dr. Eng.  
Member of the Romanian Academy  
General Chair of ICSTCC 2021  
"Gheorghe Asachi" Technical University of Iasi  
Faculty of Automatic Control and Computer Engineering

[Back to the contents](#)

### 5.11. International Conference on Event-Based Control and Communication, Virtual

Contributed by: Anton V. Proskurnikov, [anton.p.1982@ieee.org](mailto:anton.p.1982@ieee.org)

International Conference on Event-Based Control, Communication and Signal Processing (Virtual)

Call for Papers: 7th International (Virtual) Conference on Event-Based Control, Communication and Signal Processing (EBCCSP 2021). <http://www.ebccsp2021.org>

On behalf of the Organizing Committee, we are pleased to invite you to contribute research papers and proposal for invited sessions to the 7th International Conference on Event-Based Control, Communication and Signal Processing, which will be held virtually on 22-25 June 2021. The aim of the EBCCSP conference series is to provide a platform for the research communities that work in diverse application areas of the event-based paradigm to exchange new research results and ideas to explore synergies and foster scientific advancement.

The main topic submission areas are event-Based Control and Systems, event-based communication and computing, event-based signal processing and discrete-event systems. Topics include but are not limited to:

- Event-based and self-triggered control,
- Continuous and periodic event-triggered control,
- Hybrid systems,
- Event-based control over networks,
- Decentralized and distributed event-triggered control,
- Event-based state estimation,
- Control systems with Lebesgue sampling,
- Lyapunov sampling for event-driven controllers,
- Event-based intermittent control,
- Generalized predictive event-triggered control,
- Flexible event-based and time-triggered protocols and architectures,
- Complex events detection,
- Event-based wireless sensor and control systems,
- Event-triggered and self-triggered real-time task scheduling,
- Intelligent sampling,
- Intelligent event-driven sensors,
- Event-driven signal processing and data acquisition,
- Event-driven analog-to-digital conversion techniques,
- Event-driven adaptive filters.

For more detailed information, please visit the conference website <http://www.ebccsp2021.org>

#### IMPORTANT DATES

Proposals for special sessions: February 15, 2021

Regular paper submission : March 28, 2021

Submission of Work-in-Progress: April 11, 2021

Acceptance notification: May 3,2021

## COMMITTEES

### General Chairs

Miguel Díaz-Cacho Medina, University of Vigo, Spain

Marek Miskowicz, AGH Univ. of Science & Technology, Poland

### Program Committee Chairs

Brigitte Bidegaray-Fesquet, Laboratoire Jean Kuntzmann, France

Anton Proskurnikov, Polytechnic University of Turin, Italy

### Work-in-Progress Chairs

Alexander Medvedev, Uppsala University, Sweden

Saeed Mian Qaisar, Effat University, Kingdom of Saudi Arabia

[Back to the contents](#)

## 5.12. Learning in Control: Satellite to CPS Week 2021, Virtual

Contributed by: Manuela Luminita Bujorianu, [mbujorianu@gmail.com](mailto:mbujorianu@gmail.com)

LEAC (LEARNING IN CONTROL) satellite to CPS Week 2021

The venue gathers leading experts to present cutting edge results within the data-driven design of control systems.

Inquiries about the nature and structure of concepts, data- vs. model-based knowledge, have become central in CPS research. It is not surprising that the philosophical rivals, empiricism and rationalism have been battling for many hundred years. Despite advances in machine learning and success stories in social and mass media, learning is still very challenging. This workshop is a consequence of the transition of the CPS community from the model-based to data-based methods. From the position of having only a few high quality sensors to the case where data is omnipresent, but often of varying quality. We strive to learn the machines and infrastructures, to work autonomously, work together and collaborate with people. We need new paradigms for the theory and practice of CPS. This workshop is the first step of joining research forces in formalizing and subsequently solving learning, safety assessment and verification problems.

CFP: We are inviting you to submit your work in progress on the topics related to the following areas and their applications:

- Reinforcement learning for CPS
- Machine learning techniques for CPS
- Modelling of human behavior and sociotechnical systems
- Safety verification and computation

Submissions:

Please send up to 4 pages short papers

Submission Deadline: Feb 22, 2021

Weblink to LEAC and submissions:

<https://www.es.aau.dk/sections-labs/Automation-and-Control/Project+sites/swift/leac/>

Chairs

Rafal Wisniewski (University of Aalborg) raf@es.aau.dk

Manuela-Luminita Bujorianu (University of Strathclyde) luminita.bujorianu@strath.ac.uk

[Back to the contents](#)

### 5.13. International Conference on Control, Automation and Systems, Korea

Contributed by: Zee Yeon Lee, [conference@icross.org](mailto:conference@icross.org)

2021 21st International Conference on Control, Automation and Systems (ICCAS)

2021, October 12-15, 2021 Ramada Plaza, Jeju, Korea

<http://2021.iccas.org>

We would be honored to invite you at the “The 21st International Conference on Control, Automation and Systems (ICCAS 2021)” on October 12 15, 2021 at Ramada Plaza in Jeju, Korea. Jeju is a very beautiful and relaxing island, and selected as the World Natural Heritage.

ICCAS 2021 is an annual international conference being hosted for the last 20 years by the Institute of Control, Robotics and Systems, Our goal is to provide a challenging forum for researchers and industry practitioners to share their original research results and practical development experiences on new challenges and emerging issues in control, automation, robotics and systems.

#### IMPORTANT DATES

- May 31, 2021 : Submission of Organized Session Proposals
- June 7, 2021 : Submission of Full Papers
- July 28, 2021 : Notification of Acceptance
- August 25, 2021 : Submission of Final Camera-ready Papers

#### PAPER SUBMISSION:

The conference invites three types of submission: “Regular Paper”, “Research Poster Paper”, and “Organized (Invited) Session/Mini-symposium Paper”.

Indexed in: IEEE Xplore, EI compendex, and SCOPUS

Topics (not limited to)

- Control Theory and Applications
- Robotics and Mechatronics
- Machine Learning and Big Data
- Information and Network Theories
- Autonomous Vehicle Systems
- Human-Robot Interactions
- Process Control Systems

- Machine Vision and Perception
- Bio & Ecological Systems
- Control Devices and Instruments
- Artificial Intelligent Systems
- Cyber Physical Systems
- Guidance, Navigation, and Control
- Sensors and Actuators
- Human Augmented Robots
- Industrial Applications of Control
- Smart Manufacturing System
- Civil and Urban Control Systems

We look forward to welcoming you at ICCAS 2021.

General Chair: Do Yong Lee (KAIST, Korea)

General Co-Chair: Seul Jung (Chungnam National University, Korea)

Program Co-Chairs: Hyun Myung (KAIST, Korea), H. Jin Kim (Seoul National University)

Organized by Institute of Control, Robotics and Systems (ICROS)

More information on ICCAS 2021 is available at <http://2021.iccas.org>.

[Back to the contents](#)

#### **5.14. Modeling, Estimation and Control Conference, USA**

Contributed by: Huazhen Fang, [fang@ku.edu](mailto:fang@ku.edu)

##### 2021 Modeling, Estimation and Control Conference

The inaugural Modeling, Estimation and Control Conference (MECC 2021), sponsored by the American Automatic Control Council (AACC) and co-sponsored by the International Federation of Automatic Control (IFAC), will be held October 24-27, Sunday-Wednesday, 2021, online and at University of Texas at Austin, Texas, United States. On behalf of the MECC 2021 Organizing Committee, AACC, and IFAC, we cordially invite you to participate in the conference and enjoy a unique opportunity to network with colleagues online and/or in Austin, Texas, United States.

MECC 2021 aims to serve the scientific and engineering communities with interests in the modeling, estimation, and control of cross-disciplinary mechanical systems; to provide a platform for the dissemination and discussion of the state of the art in relevant research areas; and to create opportunities for networking with colleagues. The conference features conference awards, contributed sessions, invited sessions, workshops, special sessions, plenary talks, keynote speeches, student programs, as well as committee meetings, industry programs, and social functions.

MECC 2021 invites (1) manuscripts that report original research on all aspects of modeling, estimation, and control; and (2) proposals for invited, special, and tutorial sessions, and workshops on emerging topics. Exhibits from both industries and research labs are welcome.

All accepted papers must be presented online or on-site at the conference by an author of the paper. Online access to conference papers will be given to all registered attendees at the start of the conference. MECC 2021 conference proceedings will be published via IFAC-PapersOnLine which is open access and indexed in EI, Scopus, Web of Science, and INSPEC. Registration discounts will be offered to all members of AACCC, IFAC, and their member societies such as AIAA, AIChE, APS, ASCE, ASME, IEEE, ISA, SCS, and SIAM.

For more detailed information, please check the conference website: <https://mecc2021.a2c2.org>.

General Chair: Junmin Wang, The University of Texas, Austin

Program Chair: Hosam Fathy, University of Maryland

[Back to the contents](#)



## 6 Positions

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### 6.1. PhD: Marie Curie PhD Positions, EU

Contributed by: Daniele Bernardini, [daniele.bernardini@odys.it](mailto:daniele.bernardini@odys.it)

15 Marie Curie PhD positions - cutting edge research in embedded learning and optimization at top EU universities and companies.

15 Marie Curie PhD positions are currently open at top European research universities and companies. These are unique opportunities to start an international career, carry out advanced training and research in the field of learning and optimization for industrial control systems, and grow personally and professionally. Please see the specific PhD projects, supervisors, candidate profiles, and application deadlines at <https://elo-x.eu/>.

The PhDs will be hosted at Univ. Freiburg (DE), KU Leuven (BE), Politecnico di Milano (IT), EPFL (CH), ETH (CH), Polytechnic Univ. of Bucharest (RO), Siemens Industrial SW solutions (BE), Bosch (DE), ODYS (IT), Atlas Copco (BE), Tool-temp (CH). The positions pertain to project ELO-X, "Embedded Learning and Optimization for the neXt generation of smart industrial control systems". ELO-X is a Marie Curie Innovative Training Network (ITN) funded by the European Commission Horizon 2020 program.

With 15 doctoral researchers working at 6 research universities and 5 international companies from 5 European countries, and further 4 partner organizations in China, Japan and the US, ELO-X will accelerate research and development in embedded learning and optimization, delivering new methods and applications. ELO-X will train skilled researchers able to further advance research and technology transfer of embedded learning and decision-making solutions to industry, reinforcing the EU technological leadership in strategic industrial fields such as transportation, energy, infrastructures, and manufacturing. Marie Skłodowska-Curie PhDs are prestigious international positions funded by the European Commission. Remuneration is very generous, in line with Marie Curie PhD Fellowships, and can change based on mobility and family status.

The following eligibility conditions apply to all positions:

- Mobility: candidates must not have resided or carried out their main activity (work, studies, etc.) in the country of the host institution for more than 12 months in the 3 years immediately prior to recruitment under the ELO-X project.
- Qualifications and research experience: candidates must be in the first 4 years of their research career after the master degree was awarded.

For the details of each position and the application procedure, please see <https://elo-x.eu/>.

[Back to the contents](#)

### 6.2. PhD: KU Leuven, Belgium

Contributed by: Wim Michiels, [Wim.Michiels@cs.kuleuven.be](mailto:Wim.Michiels@cs.kuleuven.be)

PhD position on "Control oriented analysis of linear periodic delay-differential algebraic systems"

Delay-differential algebraic equations (DDAEs) naturally appear in mathematical models for dynamical systems. A systematic description of the components of the system and their interconnections leads to a combination of differential equations and algebraic constraints, while the delays model the inherent time-lags in the interconnections. The analysis of systems described by DDAEs is challenging due to the interplay between the implicit system description and the infinite-dimensional dynamics. At the same time, the literature is very limited and scattered over different domains.

The project aims at the construction of an overarching mathematical framework for the analysis of linear time-invariant and time-periodic DDAEs. First, the basic theory will be addressed, contributing to stability and Floquet theory, and to perturbation theory. Second, analysis methods and computational tools will be constructed to assess and optimize the robustness of the stationary solution.

Distinct features in the methodology are the role of duality, in a system theoretic sense, and connections with nonlinear eigenvalue problems. In order to reach the objectives, the theories of differential equations, matrix distance problems, algebraic decision problems, and robust control approaches will be integrated.

The ideal candidate has a Master degree in mathematics (pure, applied, computational), mathematical engineering, or control engineering (with a strong interest in systems and control theory). Applicants whose mother tongue is not English, must present an official language test report.

We offer fully funded PhD position in an international context for four years at the Numerical Analysis and Applied Mathematics (NUMA) section of KU Leuven, a top European university and hub for interdisciplinary research in the fields of Applied Mathematics and Systems & Control.

More information, and application instructions can be found at  
<https://www.kuleuven.be/personeel/jobsite/jobs/56124430>

[Back to the contents](#)

### **6.3. PhD: University of Lorraine, France**

Contributed by: Jerome Loheac, [jerome.loheac@univ-lorraine.fr](mailto:jerome.loheac@univ-lorraine.fr)

Subject title: Stabilization and controllability of Stefan's problem;

Keywords: Control, Stabilization, Heat equation, Stefan's Problem, Constrained state;

PhD directors: Jerome Loheac and Takeo Takahashi;

Workplaces: Institut Elie Cartan de Lorraine and Centre de Recherche en Automatique de Nancy;

Start of the PhD thesis: October 2021.

In this subject, we will focus on the controllability and stabilization problem of the fusion interface of a solid. This problem can be modeled by Stefan's equations. These equations involve two heat equations coupled at the melting point. This is a non-linear problem involving free boundary.

This subject requires both automatic and applied mathematics skills. In addition to basic knowledge of automatics, notions on partial differential equations will be desirable. In addition, numerical experiments will be requested. It will therefore be necessary to have elementary notions in numerical approximation as well as to master some numerical calculation software.

Detailed subject available at:

<https://mycore.core-cloud.net/index.php/s/CsW500B2TFnELcU>

[Back to the contents](#)

#### **6.4. PhD: North Carolina A&T State University, USA**

Contributed by: Ioannis Raptis, [iraptis@ncat.edu](mailto:iraptis@ncat.edu)

##### Ph.D. Positions-Motion Planning and Control of Multi-Robot Systems

Applications are invited for several Ph.D. positions in Motion Planning and Control of Multi-Robot Systems. The positions are with the Department of Electrical and Computer Engineering at North Carolina A&T State University, and the students will work under the supervision of Dr. Ioannis Raptis.

The research aims to establish a theoretical and computational framework for the design of motion coordination algorithms for fleets of mobile robots that operate in confined spaces. Applications include traffic management in autonomous intersections, urban aerial mobility, and warehouse automation. The research has analytical, computational, and experimental components. The derived algorithms will be validated using actual aerial and ground mobile robots.

Students from all majors relevant to control systems, computer science or engineering, and applied mathematics are encouraged to apply. Preference will be given to candidates with a strong and demonstrated background in at least one of the following topical areas: control theory, discrete mathematics and algorithms, transportation, and programming.

The assistantships include a tuition waiver and a graduate student stipend. Review of submissions will begin immediately. Interested students are strongly encouraged to apply early, as the hire of successful candidates will take place on a first-come-first-served basis. The start date is August 2021.

##### Qualifications:

- M.S. degree in mechanical engineering, electrical and computer engineering, aerospace engineering, mathematics, computer science, or a closely related area.
- Excellent mathematical background preferably in control theory, linear algebra, discrete mathematics, and heuristic algorithms.
- Demonstrated programming experience and experience with embedded systems.
- Good programming skills in MATLAB/SIMULINK.
- Very good English communication skills (written and oral).
- Ability and motivation to conduct independent research.

To Apply: Please email, as a single .pdf document, the following items to [iraptis@ncat.edu](mailto:iraptis@ncat.edu): (i) a cover letter (clearly indicating expected start date, relevant experience, and motivation); (ii) detailed Curriculum Vita; (iii) copies of unofficial transcripts; (iv) GRE and TOEFL (for international students) scores—note that these standardized tests are mandatory; and (v) copies of relevant publications (if any). Note that only interested candidates will be considered and contacted who clearly show to their cover letter (or application email)

how their background and research interests align with the position. Shortlisted applicants will be directed to apply to the Department of Electrical and Computer Engineering at North Carolina A&T State University.

[Back to the contents](#)

### 6.5. PhD: University of Lorraine, France

Contributed by: Jean-Christophe Ponsart, [jean-christophe.ponsart@univ-lorraine.fr](mailto:jean-christophe.ponsart@univ-lorraine.fr)

A PhD position in Fault diagnosis and fault-tolerant control of LPV systems in Research Center for Automatic Control of Nancy (CRAN - [www.cran.univ-lorraine.fr/anglais/](http://www.cran.univ-lorraine.fr/anglais/)), University of Lorraine (France) is opened from October 2021 (<https://bit.ly/2XThiTK>).

Application: Applicants shall have a Master's degree in systems and controls, applied Math or a related discipline.

Please email your application to Pr JC Ponsart ([jean-christophe.ponsart@univ-lorraine.fr](mailto:jean-christophe.ponsart@univ-lorraine.fr)) and Dr B. Marx ([benoit.marx@univ-lorraine.fr](mailto:benoit.marx@univ-lorraine.fr)).

The application should include your detailed CV, a brief statement of research experience and interests, a list of publications, copies of testamurs and diploma supplements, as well as grades and rankings from the candidate, dissertations and/or internship reports and/or publications from the candidate, the names of one to three references with eventually a recommendation letter, and a scan of your passport.

Context: Fault diagnosis and fault tolerant control (FTC) are key issues. Indeed, fault diagnosis allows to detect, locate and possibly quantify one or more malfunctions in a process. The fault tolerant control relies on the results provided by the diagnosis to ensure a certain level of performance despite the occurrence of fault(s) [Blanke, 2006]. While these tools have been developed in the linear framework for several decades, the current challenge remains their extension to the nonlinear framework, which is necessary for an accurate description of complex processes. In this perspective, the use of linear parameter varying systems (LPV) [Briat, 2015, Marx, 2019], or polytopic or TS systems [Takagi, 1985] is an interesting and generic tool for representing a large class of nonlinear systems by a structure close to the linear case or defined by a set of linear submodels [Lendek, 2010, Tanaka, 2001]. This representation facilitates the performance analysis and the synthesis of control, observation and diagnostic modules using, for example, optimization under linear matrix inequality constraints (LMI).

Expected researches: The cause and nature of the faults affecting the process to be diagnosed and/or controlled have a significant influence on the diagnosis or FTC techniques to be used. According to [Pasqualetti, 2013], faults can be caused - among other things - by accidental or malicious corruptions of measures taking the form of unknown entries replacing the transmitted data or by transmission defects (missing data, saturations [Bezzaoucha, 2016], dead zones, etc). From the modeling point of view, two main classes of faults can be distinguished : additive and parametric. Among the latter, a particular care should be taken with input saturations that prevent the calculated control input from being applied to the system [Tarbouriech, 2011]. Several works have already been done in this direction [Bezzaoucha, 2016], but some obstacles still remain (restrictive assumptions, pessimism of the results, etc.) and limit their applications. A more accurate description of the saturation phenomena in a polytopic form should make it possible to remove some of these locks. Constraints on state variables should also be included to take into account the validity do-

main of the polytopic rewriting of the original nonlinear model [Nguyen, 2015]. In the context of diagnosis and tolerance to additive faults, an interesting research direction would be to avoid the exclusive use of observer-based structures. Indeed, the observer is synthesized by minimizing the fault influence on the estimation error, and then the residue generator is constructed to be as sensitive as possible to faults, precisely from this estimation error. It would therefore be interesting to consider alternative structures for the diagnostic modules based on the available input and output signals of the system. Among the possible structures, the use of coprime factorization should be considered for the diagnosis and FTC of nonlinear systems. This technique was used in the linear framework for diagnosis [Frank, 1994] and for FTC [Zhou, 2001], but its extension to the non-linear framework remains open.

To summarize, after a preliminary bibliographical work, the following paths could be explored by the PhD student:

- polytopic modelling of transmission faults phenomena, such as saturation and/or dead zones, allowing them to be taken into account in the system model, and may be allowing the estimation of their parameters [Bezzaoucha, 2016] ;
- Observer-based diagnosis for nonlinear systems based on polytopic / LPV models [Lopez Estrada, 2014, Lopez Estrada, 2019] ;
- the extension of the coprime factorization-based diagnosis to nonlinear systems represented by polytopic models / LPV
- the extension of the obtained results to descriptor polytopic LPV models [Estrada Manzo, 2015, Lopez Estrada, 2014].

Keywords: Fault diagnosis, fault tolerant control and nonlinear systems.

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[Back to the contents](#)

#### **6.6. PhD: Maynooth University, Ireland**

Contributed by: Carrie Anne Barry, [CarrieAnne.Barry@mu.ie](mailto:CarrieAnne.Barry@mu.ie)

PhD (funded): Centre for Ocean Energy Research, Maynooth University Ireland

PhD Position (4 year studentship €18k [tax free] p.a. + fees)

The Centre for Ocean Energy Research (COER) at Maynooth University, Ireland has a further opportunity for well-qualified applicants interested in undertaking a funded PhD.

The successful candidate will be involved in a PhD project to develop a small-scale wave powered data buoy. The primary focus of this project is the development of a reliable, efficient and cost-effective power source for marine sensing, based on data buoy movement due to incident waves. Secondary aspects include the integration of the sensor and data transmission systems within the framework of a holistic system that achieves optimal design compromise between power provision, usage, data transmission rates and stability as a sensor platform.

The project will include hydrodynamic modelling, PTO modelling, control system design, optimisation sensor design, data transmission system design, simulation and experimental testing, information dissemination and public engagement.

This project will involve collaboration with Dundalk IT (IRL), Techworks Marine (IRL), Monterey Bay Aquarium Research Institute (USA), and Resolute Marine (USA). 2 to 3 months of every year will be spent in PLOCAN (Oceanic Platform of the Canary Islands, Spain).

Funding has been provided by the Marine Institute's Eoin Sweeney Scholarship. In addition to a tax-free stipend of €18,000, PhD fees are fully covered. The project also provides generous funding for equipment,

materials and travel (conferences, courses, secondment, etc) and is tenable for a 4-year structured PhD.

Applicants should be well qualified to bachelor's or master's degree level in one of the following areas: mechanical/mechatronic engineering, electronic engineering, control engineering. Exceptional students in applied maths or hydrodynamics may be considered.

The project will be supervised by Prof. John Ringwood, who was the recipient of the 2019 Maynooth University Research Supervision Award. Further information on COER is available at: <http://www.eeng.nuim.ie/coer/>.

To apply, send a full CV, along with the contact details of 3 referees, to [coer@mu.ie](mailto:coer@mu.ie). Informal enquiries may be made to Carrie Anne Barry ([CarrieAnne.Barry@mu.ie](mailto:CarrieAnne.Barry@mu.ie)).

[Back to the contents](#)

### **6.7. PhD: Delft University of Technology, The Netherlands**

Contributed by: Riccardo Ferrari, [r.ferrari@tudelft.nl](mailto:r.ferrari@tudelft.nl)

#### PhD in Sparse Data Driven Methods for Prognosis of Electric Vehicles

The Delft Center for Systems and Control, at Delft University of Technology (The Netherlands), has one position open for a PhD in "Sparse Data Driven Methods for Prognosis of Electric Vehicles"

The position is in collaboration with Volvo AB and will be hosted in Dr. Riccardo Ferrari's group.

The introduction of next generation heavy electric vehicles, such as electric trucks, is seen as an important contribution to worldwide efforts to curb greenhouse gases emission levels. Still, to deliver their promised performances, such novel electric vehicles should be robust to faults and be designed to optimize their maintenance.

While advanced diagnosis and prognosis algorithms that are suitable for fleets of complex vehicles are model-based, their design, tuning and validation require considerable amounts of data. Large and densely populated data sets, unfortunately, may not always be available, especially during the design phase of such vehicles. The challenge of tuning and validating diagnosis and prognosis algorithms using datasets that are sparse over time and over the vehicles' population is precisely the motivation for this PhD opening.

The successful candidate will carry out research as part of the project "SPARSITY: using data from sparse measurements for predictive maintenance", which is an academic-industrial collaboration between Dr. Ferrari's group at Delft Center for Systems and Control (TU Delft, The Netherlands) and Volvo Group, a world-leading automotive company headquartered in Gothenburg (Sweden).

Research topics will include, but will not be limited to:

- adapting state-of-the-art system identification algorithms to use sparse datasets;
- uncertainty quantification and propagation in complex nonlinear systems;
- probabilistic methods for diagnosis and prognosis thresholds design and validation;
- sensitivity analysis of diagnosis and prognosis performances with respect to data sparsity.

The resulting methodologies and algorithms will be tested against real use cases provided by Volvo, where the candidates may spend a secondment period.

Requirements: We are looking for a strong and motivated applicant holding, or close to holding, a M.Sc. degree in a field related to the project, such as:

- Systems & Control
- Applied Mathematics
- Mechanical engineering
- Electrical or Electronics engineering
- Vehicle engineering
- Aerospace Engineering

A good command of the English language is required. Candidates with a background in fault diagnosis/prognosis, automotive electric powertrains or probabilistic methods such as Polynomial Chaos Expansion or Gaussian Process Regression are especially encouraged to apply.

Application procedure: Please apply before 15 February 2021 via <https://www.tudelft.nl/over-tu-delft/werken-bij-tu-delft/vacatures/details/?jobId=1793> and upload the following:

- motivation letter (up to one page)
- curriculum vitae;
- list of publications, including citation count;
- research statement (up to three pages);
- transcripts of all exams taken and obtained degrees (in English);
- names and contact information of two academic references (e.g. project/thesis supervisors);
- up to 3 research-oriented documents (e.g. thesis, conference/journal publication)

A pre-employment screening can be part of the selection procedure. You can apply online. We will not process applications sent by email and/or post.

[Back to the contents](#)

## 6.8. PhD: Luleå University of Technology, Sweden

Contributed by: George Nikolakopoulos, [geonik@ltu.se](mailto:geonik@ltu.se)

Two PhD students in Robotics and Artificial intelligence

The Robotics and Artificial Intelligence (RAI) ([www.ltu.se/robotics](http://www.ltu.se/robotics)) subject at the department of Computer Science and Electrical and Space Engineering at Luleå University of Technology, Sweden is now looking for two PhD students contributing to our growing activities.

The RAI team is conducting fundamental research in all the aspects of robotics with a specific focus on aerial, space and softrobotics. The vision of RAI is aiming in closing the gap from theory to real life, while the team has a strong expertise in field robotics. Specific application areas of focus are robotics for mines, aerial inspection of aging infrastructure, multi-robotic search and rescue, multi sensorial fusion and multi-robot coordination, including multirobot perception, decentralization and mission execution.



The RAI team has a strong European participation in multiple R&D&I projects, while RAI is also participating in the DARPA SUB-T challenge with the CoSTAR Team lead by NASA/JPL (<https://costar.jpl.nasa.gov/>) and has an R&D research agenda with HONDA Research Institute in Japan (<https://www.jp.honda-ri.com/en/>).

Research topics: The PhD candidates will be working in the field of aerial robotics and their activities will be linked with European R&D Projects and the SubT challenge in the general field of multi-vehicle collaborative perception and exploration of unknown and non-structured areas (Tunnels, Urban and Caves).

The research topic is in Robotics and Artificial Intelligence. More specifically, the position will involve dense research activities in the area of designing, experimenting and theoretical control development in the area of UAVs. The specific two research topics include:

- Research Topic #1 AI and Motion planning Robotics

- Reinforcement learning for collaborative multi robot team deployment
- Advanced AI for mission planner for team of hybrid robots
- Deep learning for localization
- Multi sensor fusion framework
- Motion planning for dynamic and uncertain environments
- Multi-Robot global/local motion planning
- Exploration of unknown and unstructured environments
- Proactive & Reactive Obstacle Avoidance
- Robot interaction and collaboration between different types of robots

- Research Topic #2 Perception based Robotics

- Collaborative vision for robotics
- Collaborative Mapping and Exploration
- Simultaneous localization, path planning and exploration
- Multi-Modal Mapping
- Multi Session Mapping
- Multi robot cooperative object detection
- Real-time perception systems for guidance and control

For applications please follow this link:

<https://www.ltu.se/ltu/Lediga-jobb/Lediga-jobb-1.107417?l=en>

Job Reference: 61-2021

Kind Regards,

George Nikolakopoulos

Professor and Chair for Robotics and Artificial Intelligence

Robotics Team: <https://www.ltu.se/robotics>

CoSTAR Team: <https://costar.jpl.nasa.gov/>

ARTEMIS Scientific Council Member - <https://artemis-ia.eu/>

SPIRE Task Force Member - <https://www.spire2030.eu/>  
Web: [www.gnikolak.com](http://www.gnikolak.com)  
Department of Computer Science, Electrical and Space Engineering  
Luleå University of Technology  
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Twitter: [geonikolak](https://twitter.com/geonikolak)

[Back to the contents](#)

### 6.9. PhD: Delft University of Technology, The Netherlands

Contributed by: Laura Ferranti, [l.ferranti@tudelft.nl](mailto:l.ferranti@tudelft.nl)

PhD Position in Private and Secure Robot Coordination at Delft University of Technology

Autonomous robots (such as cars, vessels, and drones) will be widespread in our daily lives, aiming at reducing pollution while improving traffic efficiency and safety. While these technologies have the potential to revolutionize our urban mobility, societal concerns in terms of safety, security, and privacy can overshadow their benefits. The goal of this PhD position is to design a cooperation framework to allow autonomous robots to safely navigate without revealing private information and while dealing with faults and attacks. We will employ tools for secure multi-party computation, multi-variant execution, and distributed numerical optimization to design this novel cooperation framework.

Experiments on real autonomous robots (e.g., ground robots) will demonstrate the effectiveness of the proposed design.

In this project, as a PhD candidate, you will investigate how to design a coordination algorithm for mobile robots that: (1) deals with the robots sharing private information in real time; (2) is resilient to faults and attacks.

Requirements: You have a MSc degree in Computer Science, Applied Mathematics, Robotics, Systems and Control, or a related field. You have strong analytical skills and must be able to work at the intersection of several research domains. Good programming skills and experience with programming languages such as Python and C++ are of foremost importance. Excellent command of the English language is required, as well as excellent communication skills. Candidates with a strong track record in privacy-preserving algorithms, cyber-physical systems security, numerical optimization, or robotics are especially encouraged to apply. Experience with applied cryptography is a strong plus.

Additional information: For more information about this vacancy, visit the vacancy website at the following link:

<https://www.tudelft.nl/over-tu-delft/werken-bij-tu-delft/vacatures/details?jobId=1879&jobTitle=PhD%20Position%20Private%20and%20Secure%20Robot%20Coordination>

[Back to the contents](#)

#### **6.10. PhD: University of Lille, France**

Contributed by: Thierry Floquet, [thierry.floquet@ec-lille.fr](mailto:thierry.floquet@ec-lille.fr)

PhD positions at University of Lille, France

Two PhD positions starting October 2021 in nonlinear control and observation are available at CRIStAL Laboratory at University of Lille, France.

Further information can be found at:

<https://www.cristal.univ-lille.fr/profil/tfloquet#page1>

[Back to the contents](#)

#### **6.11. PhD: Lund University, Sweden**

Contributed by: Anton Cervin, [anton@control.lth.se](mailto:anton@control.lth.se)

PhD: Lund University, Sweden

The Department of Automatic Control at Lund University, Sweden, announces a doctoral student position with focus on cloud.

The research will be performed within the ELLIIT-funded project "Robust and Secure Control over the Cloud", in collaboration with Linköping University. The goal is to utilize the cloud for advanced real-time control computations (i.e., online optimization, particle filtering, or machine learning) while guaranteeing a robust and secure control loop. The project contains both theory development and implementation in cloud systems. We are seeking a candidate with an MSc degree and a strong background in mathematics, control theory, and with an interest in computer systems and programming.

A doctoral studentship at Lund University is a fixed-term employment of a maximum of 5 years (including 20% teaching). A doctoral student will receive a competitive monthly salary of 31 200 SEK with a yearly raise.

For more information and application, see

<https://lu.varbi.com/what:job/jobID:375680/?lang=en>

[Back to the contents](#)

#### **6.12. PhD: Arizona State University, USA**

Contributed by: Daniel E. Rivera, [daniel.rivera@asu.edu](mailto:daniel.rivera@asu.edu)

Open PhD positions at Arizona State University

A number of PhD assistantships are available in the Control Systems Engineering Laboratory at Arizona State University for research in novel uses of system identification, model predictive control, and ancillary systems methodologies applied to modeling and optimization of mHealth interventions for physical activity. These are funded from three US National Institute of Health (NIH) grants: U01CA229445 "Operational-

izing behavioral theory for mHealth: dynamics, context, and personalization,” R01LM013107 “SCH: Control systems engineering for counteracting notification fatigue: an examination of health behavior change,” and R01CA244777 “Optimizing Individualized and Adaptive mHealth interventions via control systems engineering methods.”

Candidates need to be admitted to the PhD programs at Arizona State in either chemical or electrical engineering, and will be working in a highly interdisciplinary environment involving psychologists, behavioral scientists, engineers, and computer scientists.

Inquiries (which should be accompanied by statements of interest and a summary of the candidate’s background in control systems and ancillary fields) should be addressed to Professor Daniel E. Rivera, Program Director, Control Systems Engineering Laboratory, at [daniel.rivera@asu.edu](mailto:daniel.rivera@asu.edu).

[Back to the contents](#)

### **6.13. PhD: University of Kentucky, USA**

Contributed by: Xu Jin, [xu.jin@uky.edu](mailto:xu.jin@uky.edu)

Ph.D. Positions in intelligent control at the University of Kentucky

Ph.D. openings are available in the Department of Mechanical Engineering at the University of Kentucky, Lexington, KY, in Dr. Xu Jin’s group on the topics of intelligent control. We look for excellent students in one or more of the following areas:

1. Adaptive control
2. Iterative learning control
3. Nonlinear systems and control
4. Vision-based control
5. Ground vehicles
6. Quadrotors
7. Robot manipulation systems
8. Multiagent/interconnected/networked/cyber-physical systems

More research details can be found on Dr. Xu Jin’s website:

<https://www.engr.uky.edu/directory/jin-xu>

and the external links included.

The positions include stipend, health care, and tuition support. The offers are valid for two years, and renewable for additional years based on performance of the students. Qualifications: The applicants **MUST ALREADY HAVE**, or will soon have the GRE and TOEFL test scores (if applicable) meeting the departmental minimum requirement.

How to apply: Applications should be emailed to Dr. Xu Jin at [xu.jin@uky.edu](mailto:xu.jin@uky.edu) as soon as possible. Please include a full CV (including GRE and TOEFL scores if applicable), PDFs of relevant publications, and names of at least three references. Upon initial email discussions, those who are encouraged to apply should then apply to the department as soon as possible, and indicate my name (Dr. Xu Jin) in the application package.

Visiting Ph.D. students and scholars are also very welcomed for self-funded research visit for 6-24 months.

\* Short note about the department and the city: Mechanical Engineering is the largest department in the College of Engineering with 35 tenured and tenure-track faculty members, over 1,000 undergraduate students, and over 120 graduate students. The department also has state-of-the-art computational facilities, research labs, and classrooms, including UAV, ground robot, and air table satellite testing facilities. The city of Lexington is ranked #3 Best City to Raise a Family, #4 City with Best Tech Career Potential, # 8 City with the Lowest Living Cost, # 21 Best Places to Live in America, and # 31 Most Educated Cities in America. Located in the heart of the Bluegrass Region, Lexington is known as the “Horse Capital of the World”.

[Back to the contents](#)

#### **6.14. Postdoc: University of Kentucky, USA**

Contributed by: Xu Jin, [xu.jin@uky.edu](mailto:xu.jin@uky.edu)

Postdoc Position in intelligent autonomous vehicle control at the University of Kentucky

One Postdoc position is available in the Department of Mechanical Engineering at the University of Kentucky, Lexington, KY, in Dr. Xu Jin’s group on the topics of intelligent autonomous vehicle control. The ideal candidate should already have (or will soon have) a Ph.D. degree in an electrical/mechanical/automation/vehicle engineering program, and should have a strong standing in the following areas:

1. Good English writing, speaking, listening, and reading skills
2. Solid theoretical foundation in adaptive control and/or iterative learning control, or other intelligent control methods
3. Solid theoretical foundation in nonlinear and multiagent systems and control
4. Solid practical skills in camera/vision-based analysis and control
5. Experimental skills with ground robots/vehicles (wheeled and/or unicycle-type robots/vehicles, such as Quanser Qbot /QCar)
6. Computer-aided design skills
7. Significant programming skills, both software and hardware

The Postdoc offer is valid for one year, and renewable for another year based on performance. Package will include stipend (salary), benefits, health care coverage, research travel, etc. The starting time can be negotiable, ideally between August and December of 2021.

More research details regarding Dr. Xu Jin’s areas can be found on the website:

<https://www.engr.uky.edu/directory/jin-xu>

and the external links included.

How to apply: Applications should be emailed to Dr. Xu Jin at [xu.jin@uky.edu](mailto:xu.jin@uky.edu) as soon as possible. Please include a full CV, PDFs of relevant publications, transcripts, and names of at least three references. Upon initial email discussions, those who are encouraged to apply will receive further instructions.

\* Short note about the department and the city: Mechanical Engineering is the largest department in the College of Engineering with 35 tenured and tenure-track faculty members, over 1,000 undergraduate stu-

dents, and over 120 graduate students. The department also has state-of-the-art computational facilities, research labs, and classrooms, including UAV, ground robot, and air table satellite testing facilities. The city of Lexington is ranked #3 Best City to Raise a Family, #4 City with Best Tech Career Potential, # 8 City with the Lowest Living Cost, # 21 Best Places to Live in America, and # 31 Most Educated Cities in America. Located in the heart of the Bluegrass Region, Lexington is also known as the “Horse Capital of the World”.

[Back to the contents](#)

#### **6.15. Postdoc: Arizona State University, USA**

Contributed by: Daniel E. Rivera, [daniel.rivera@asu.edu](mailto:daniel.rivera@asu.edu)

Open postdoctoral position at Arizona State University

We are seeking applicants for an open postdoctoral position in the Control Systems Engineering Laboratory at Arizona State University for projects related to the use of system identification, model predictive control, and related technologies for modeling and optimizing mHealth behavioral interventions, with an emphasis on interventions to promote physical activity. The funding sources are three US National Institute of Health (NIH) grants (noted in the entry on PhD positions at ASU in this issue of the e-letter).

Qualified applicants will have an earned doctorate in chemical, electrical, mechanical engineering or related field, and show evidence (through dissertation work and publications) of being able to contribute to areas of relevance to these projects at a high level of proficiency. Preference will be given to applicants who wish to use the postdoctoral position as a means to develop credentials for an academic career.

The position is available immediately for one year, but may be renewed for a second year based on performance and continued availability of funds.

Candidates should submit, via email to Prof. Daniel E. Rivera ([daniel.rivera@asu.edu](mailto:daniel.rivera@asu.edu)), the following: 1) a curriculum vitae, including educational background and a list of publications, 2) two publications representing the applicant’s research work, and 3) contact information for two references.

[Back to the contents](#)

#### **6.16. Postdoc: Maynooth University, Ireland**

Contributed by: Carrie Anne Barry, [CarrieAnne.Barry@mu.ie](mailto:CarrieAnne.Barry@mu.ie)

Postdoc (X2): Maynooth University, Centre for Ocean Energy Research (COER), Ireland

Two postdoctoral positions (36M and 12M) are now available in the Centre for Ocean Energy Research in Maynooth University’s Electronic Engineering Department on a strategic U.S.-Ireland R&D Partnership: Control Co-Design of Heterogeneous Arrays of Wave Energy Converters.

Funded by Science Foundation and the National Science Foundation (US), the focus of the roles will be on the development of numerical optimisation-based control strategies for the linear and nonlinear models of Wave Energy Converter (WEC) arrays. The overall approach will rely on suitably adapting and extending existing frameworks based on direct transcription and other techniques such as networked model predictive control to the setting of multi-objective optimal control for WEC arrays.

The posts present significant opportunities for career development, in relation to sourcing of independent research funding, research management and supervision; mentoring in these aspects will be provided. The project exists within a wider COER group of 16 researchers and has international academic collaborators, including Iowa State University and Queens University Belfast.

The ideal candidate will have:

- A PhD in engineering, mathematics or closely related discipline
- At least 2 years' postdoctoral experience
- Some record of scholarly publication
- Familiarity with the MATLAB/Simulink software suite
- Excellent analytic and programming skills

Highly desirable:

- Some experience in wave energy systems
- Experience in developing numerical methods for optimal control
- Experience in the design and analysis of networked control systems
- Experience with numerical optimisation algorithms and model-predictive control
- Experience in multi-objective optimisation

More information on the positions can be found in the full job description <https://bit.ly/3sCHuAo>

COER is an active international research centre involved in fundamental and applied research. COER has a wide range of national and international collaborators and a staff complement consisting of academic staff, postdoctoral researchers, research students and interns, all of which have a strong international dimension. There are also frequent international visitors to the centre. Further information is available at <http://www.eenge.nuim.ie/coer/>

- Informal inquiries may be made by email to [CarrieAnne.Barry@mu.ie](mailto:CarrieAnne.Barry@mu.ie)
- Only shortlisted candidates will be invited to attend for interview.
- Appointments will be approved by the President based on the report of the selection board.
- It is anticipated that interviews will be held during the week of the 21st February 2021.
- The appointment will commence on 1st May 2021.

Salary: Senior Postdoctoral Researcher: €45,942 per annum

Appointment will be made in accordance with the Department of Finance pay guidelines. \*New entrants to the public sector will be appointed on the first point of the Postdoctoral Researcher pay scale.

Closing Date: 23:30hrs (local Irish time) on Sunday, 14th February 2021.

Please note all applications must be made via our Online Recruitment Portal at the following link:  
<https://www.maynoothuniversity.ie/human-resources/vacancies>

Applications must be submitted by the closing date and time specified above. Any applications which are still in progress at the closing time on the specified closing date will be canceled automatically by the system. Late applications will not be accepted.

[Back to the contents](#)

### **6.17. Postdoc: The University of Colorado Boulder, USA**

Contributed by: Lucy Pao, [pao@colorado.edu](mailto:pao@colorado.edu)

Post-doctoral position opening in control, co-design, and optimization of wind turbines The Pao Research Group in the Electrical, Computer, & Energy Engineering (ECEE) Department at the University of Colorado Boulder (CU Boulder) is seeking an outstanding PostDoctoral Researcher! The successful candidate will work on the development and validation of controllers as well as the co-design and optimization for multi-megawatt wind turbines, with possible extension of the ideas to other application areas such as atomic force microscopy.

Our currently funded projects include those on the topics of control design as well as co-design and optimization for a 25-megawatt downwind (fixed-bottom) turbine and a 10-megawatt wind turbine on a lightweight floating platform. We also have a pending proposal on control design as well as co-design and optimization for atomic force microscopy.

The successful postdoc will be expected to work on two of our funded projects, where the postdoc will have some choice on the particular projects on which they will work. Since most of our projects are joint with the US National Renewable Energy Laboratory (NREL), it is expected that at least one project that the postdoc works on will be joint with NREL and thus the applicant must meet requirements to gain site access at NREL. Familiarity with issues related to the control, design, and simulation of wind turbines and/or floating structures and with NREL-developed software tools for evaluating wind turbine control algorithms will be beneficial, as will leadership and mentoring skills.

The University of Colorado Boulder is an Equal Opportunity employer and is committed to building a culturally diverse community of faculty, staff, and students dedicated to contributing to an inclusive campus environment.

The start date for this position is anticipated to be as early as May 1, 2021 and preferably no later than September 1, 2021. The initial appointment will be for 12 months, and can potentially be renewed for an additional 12 months.

The University of Colorado offers excellent benefits, including medical, dental, retirement, paid time off, tuition benefit and ECO Pass. The University of Colorado Boulder is one of the largest employers in Boulder County and offers an inspiring higher education environment.

For further details regarding the position and to apply, please visit:

<https://jobs.colorado.edu/jobs/JobDetail/?jobId=28061>

Completed applications received by February 15, 2021 will receive full consideration. Applications will be accepted until the position is filled. Application materials will not be accepted via email. For consideration, applications must be submitted through the above website.

[Back to the contents](#)



### 6.18. Postdoc: Rice University, USA

Contributed by: Lydia Kavraki, [kavraki@rice.edu](mailto:kavraki@rice.edu)

Postdoctoral position at Rice University - Analysis Techniques for DNNs

A postdoctoral researcher is sought for a two-year position in computer science at Rice University to work with Professors Lydia Kavraki and Moshe Vardi on analysis techniques for deep neural networks (DNNs).

The impressive capabilities of deep neural networks have inspired system developers to use them in safety-critical cyber-physical control systems, such as autonomous vehicles and air traffic collision avoidance systems. For such applications it is imperative that the correctness of DNN systems be verified. Furthermore, it is desirable that such system be resistant to perturbations introduced by an adversary, or by inadvertent data corruption from system noise, domain shift, or broken sensors. Several recent incidents have underscored the need to better understand DNNs, and verify both their safety and security.

This project aims at developing techniques for analysis of DNNs by combining methods from formal methods, cyber-physical systems, and robotics. We are seeking candidates who have demonstrated ability to lead and/or work collaboratively in teams comprised of individuals of diverse backgrounds, skills, and perspectives.

**BACKGROUND:** Applicants must hold a Ph.D. in Computer Science, Electrical & Computer Engineering, Robotics, or a related field. Required skills include excellent analytical skills, excellent software engineering skills, and excellent writing skills. Candidates with current expertise at the intersection of formal methods and robotics/cyber-physical systems will be given priority. This position is particularly suited for candidates who want to follow a career in academia.

**ABOUT RICE UNIVERSITY:** As a leading research university with a distinctive commitment to education, Rice University (<https://www.rice.edu>) aspires to path breaking research, unsurpassed teaching, and contributions to the betterment of our world. It seeks to fulfill this mission by cultivating a diverse community of learning and discovery that produces leaders across the spectrum of human endeavor. The George R. Brown School of Engineering ranks among the top 20 of undergraduate engineering programs (US News & World Report) and is strongly committed to nurturing the aspirations of faculty, staff and students in an inclusive environment. Rice University is an Equal Opportunity Employer with commitment to diversity at all levels and considers for employment qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national or ethnic origin, genetic information, disability, or protected veteran status. Rice University, a Tier 1 Research University, is located in the vibrant urban setting of Houston, TX, the fourth largest city in the U.S. Rice is ranked #16 in National Universities in the 2021 by "US News Best Colleges" and #1 for Quality of Life in the Princeton Review's 2021 edition of "The Best 382 Colleges."

Interested applicants should contact Professor Lydia Kavraki ([kavraki@rice.edu](mailto:kavraki@rice.edu)) and Professor Moshe Vardi ([vardi@rice.edu](mailto:vardi@rice.edu)) and provide (a) a CV, (b) the names of three or more references, (c) a one page description of their earlier work and, if desired, (d) a one paragraph statement about their interest in the advertised position.

The position is available immediately and applications will be accepted until this position is filled.

[Back to the contents](#)

#### **6.19. Postdoc: Washington University in St. Louis, USA**

Contributed by: ShiNung Ching, [shinung@wustl.edu](mailto:shinung@wustl.edu)

Postdoctoral Position at Washington University in St. Louis

A postdoctoral position is open and available at Washington University in St. Louis, USA, at the intersection of optimization, control and neuroscience. The position supports an ongoing BRAIN initiative funded project. The overall goal of the project is to synthesize and analyze new network dynamical models that enact key cognitive functions. No prior neuroscience experience is needed for this position, only an interest in using modeling and theory in basic science. Relevant areas of prior experience include: dynamical systems, optimization, machine learning, information, control and network theories. Contributions are expected to span both basic theoretical and applied domains.

Interested applicants can send a CV and a short statement of interests directly to [shinung@wustl.edu](mailto:shinung@wustl.edu)

ShiNung Ching  
Associate Professor  
Washington University in St. Louis

[Back to the contents](#)

#### **6.20. Postdoc: University of Utah, USA**

Contributed by: Masood Parvania, [masood.parvania@utah.edu](mailto:masood.parvania@utah.edu)

Postdoctoral Scholar Position on Cyber-Physical Resilience

The Utah Smart Energy Laboratory at the Department of Electrical and Computer Engineering (ECE) at the University of Utah has immediate openings for two Postdoctoral Research Associates on 1) developing solutions for integrating energy storage and distributed energy resources for enhancing the resilience of power distribution systems, 2) developing cyber security solutions for power distribution systems. Ideal candidates would have expertise in the application of machine learning methods, control theory, and mathematical optimization in power distribution systems operation.

The position comes with a benefits package and salary commensurate with experience.

Exceptional candidates would be considered for subsequent appointment as Research Assistant Professor in the ECE Department.

Applicants should apply for the position online at: <https://utah.peopleadmin.com/postings/111095>

Applications will be reviewed immediately, and the posting is open until the position is filled.

[Back to the contents](#)

## 6.21. Faculty: University of Waterloo, Canada

Contributed by: Daniel Miller, [miller@uwaterloo.ca](mailto:miller@uwaterloo.ca)

### University of Waterloo: Faculty Positions in ECE

The Department of Electrical and Computer Engineering in the Faculty of Engineering at the University of Waterloo invites applications for two tenure track positions at the rank of Assistant Professor in Systems and Control with an anticipated start date of September 1, 2021. In the case of an exceptional candidate, an appointment at the rank of Associate Professor or Full Professor will be considered.

The successful candidate must have a PhD in Electrical Engineering, Computer Engineering or a closely related discipline. Evidence of an actively developing research program with emphasis on the following is required:

(i) Robotics and autonomy. We encourage applications from candidates in all core areas of robotics and autonomy including control, planning, perception, learning, social robotics, cognitive robotics, human-robot interaction, and mechatronics.

(ii) Systems control. We encourage applications from candidates working in the broad area of systems control, ideally on a topic with significant engineering applications. Application areas of interest include but are not limited to biological systems, cyber-physical systems, digital health, the internet of things, robotics and autonomy, and transportation.

All successful applicants are expected to actively engage in teaching at the undergraduate and graduate level, supervise graduate students and to contribute to the overall development of the Department. The ability to develop and teach an array of traditional and on-line courses is required. Applicants who are, or who have demonstrated the potential to be leaders in their research field would be especially appealing.

The salary range for this position at the Assistant Professor level is \$120,000.00 to \$160,000.00. Negotiations beyond this salary range will be considered for exceptionally qualified candidates. The successful candidate will be expected to have an engineering license for practice in Canada or to apply for an engineering license or limited engineering license within five years.

Interested candidates should submit a cover letter, a current curriculum vitae, a research statement, a statement of teaching philosophy and goals, selected publications (maximum four), and the names of at least three references to

<https://ecefes.uwaterloo.ca/OFAS/index.php>.

Applications will be considered upon receipt, with full consideration assured for those received by March 15, 2021.

If you have any questions regarding the position, the application process, assessment process, eligibility, or a request for accommodation during the hiring process, please contact Brenda McQuarrie, Assistant to the Department Chair: [bmcquarr@uwaterloo.ca](mailto:bmcquarr@uwaterloo.ca).

The Department currently has more than 91 faculty members and is one of the largest engineering departments in Canada. The undergraduate programs in Computer Engineering, Electrical Engineering, Software Engineering (offered jointly with the David R. Cheriton School of Computer Science), Mechatronics Engineering (offered jointly with the Departments of Mechanical and Mechatronics Engineering and Systems Design Engineering), Nanotechnology Engineering (offered jointly with the Departments of Chemistry and Chemical Engineering), and Biomedical Engineering (offered jointly with several departments including Systems Design Engineering) attract outstanding students, both domestic and international. The department also administers a world-class graduate program, which drives cutting-edge research excelling in technological innovations and encompassing all major areas of electrical and computer engineering. Our research is led by faculty members who are internationally recognized for their expertise and holders of many prestigious awards (E. W. R. Steacie Memorial Fellowship, IEEE Fellowships, Royal Society of Canada Fellowships, etc.) and research chairs. Our graduates are highly sought out all around the world for their exceptional technical training and abilities.

The University of Waterloo regards equity and diversity as an integral part of academic excellence and is committed to accessibility for all employees. As such, we encourage applications from women, persons with disabilities, Indigenous peoples, members of visible minorities, and others who may contribute to the further diversification of ideas. At Waterloo, you will have the opportunity to work across disciplines and collaborate with an international community of scholars and a diverse student body, situated in a rapidly growing community that has been termed a “hub of innovation.”

All qualified candidates are encouraged to apply, however Canadians and permanent residents will be given priority.

Three reasons to apply: <https://uwaterloo.ca/faculty-association/why-waterloo>.

[Back to the contents](#)

## 6.22. Faculty: Maynooth University, Ireland

Contributed by: Carrie Anne Barry, [CarrieAnne.Barry@mu.ie](mailto:CarrieAnne.Barry@mu.ie)

Maynooth University  
Department of Electronic Engineering  
Lecturer/Assistant Professor in Engineering  
Centre for Ocean Energy Research  
(Permanent)

The Role: We are seeking an excellent academic to join our staff as a Lecturer/Assistant Professor in the Department of Electronic Engineering. The person appointed will have a proven record of teaching, research and publication, appropriate to career stage. The strategic requirement for this role will be expertise in areas related to the activities of the Centre for Ocean Energy Research, which include mathematical modelling, control systems, hydrodynamics and optimisation. In particular, applications will be welcome from those with experience in the ocean energy area. The appointee will be required to make a full contribution to the teaching programmes at the department. S/he may be assigned teaching duties that are related to the fields of dynamics, control and optimisation, as well as to fundamental topics in electronic engineering, such as

mathematics or software engineering. Teaching roles can be on any of the Department's undergraduate and postgraduate programmes. In addition, the appointee will be expected to supervise undergraduate projects, as well as master's and PhD students.

The appointee will be required to build a strong research profile in alignment with the University's research strategy. S/he will sustain and conduct research, engage in scholarship of quality and substance and generate publications of an international standard. Additionally, s/he will, either as an individual or in collaboration with others, prepare research proposals to bid for competitive funding at a national and international level. Affiliation with one of the Research Institutes of the University is typical, and this post aligns with the Centre for Ocean Energy Research (COER). COER has a strong international presence and legacy as a centre for excellence in ocean energy, particularly in aspects related to the control of wave energy systems. Further information on COER is available at: <http://www.eeng.nuim.ie/coer/>.

### Principal Duties

Research & Scholarship: Building a research and scholarly profile is an essential part of an academic position. This will include:

- Conducting research and engaging in scholarship of quality and substance in the discipline;
- Generating external income or securing resources to support scholarly activity as necessary;
- Disseminating research and scholarly outcomes through: peer reviewed publication; presentation at national and international conferences; preparation of professional reports; commercialisation; or other appropriate means;
- Building research capacity;
- Fostering links with other national and international institutions which will benefit both research and teaching at Maynooth University;
- Integrating research into the teaching curriculum;
- Supervising research students and post-doctoral fellows.

Teaching: Undergraduate and postgraduate teaching duties are assigned by the head of the department. The duties will include:

- Teaching and assessing students at undergraduate level. This may include lecturing, tutoring, leading practical learning activities, project supervision, and setting, supervising and grading assessments;
- Teaching, supervising and assessing postgraduate students, including lecturing, leading seminars and other learning activities, supervision of student research activities, and setting, supervising and grading assessments;
- Enhancing and innovating in teaching and assessment practice;
- Contributing as required, to the assurance and enhancement of teaching quality;
- Developing and enhancing the curriculum at undergraduate and postgraduate level.

Service: The academic staff members of the University are critical to achieving the strategic objectives of the University, and as such are required to engage in work that serves the collective strategic needs of the University. This may include:

- Administrative and service duties;
- Leading or contributing to strategic projects and initiatives;
- Contribute to academic management and development activities;

- Contribute to the academic life of the faculty, and the university overall;
- Outreach and engagement activities;
- Collaborative work with external partners;
- Activities to promote the university locally, nationally and internationally;
- Carrying out any other duties within the scope of a Maynooth University academic post.

#### Administrative and other duties:

- Undertaking administrative tasks within the research centre, department, faculty and university as required and as assigned by the head of department, the dean or the university president;
- Attending and serving on departmental, faculty, institute and university committees as appropriate;
- Attending courses and engaging in other activities associated with professional development as appropriate;
- Complying with all university policies.

#### The ideal candidate will have:

- A bachelors or master's degree in an engineering discipline, applied mathematics, or closely related area;
- A PhD in the area of dynamical systems, control systems, or a closely related area;
- A portfolio of scholarly work and publication of international quality, demonstrating the potential to become a significant contributor in their field;
- A demonstrable ability and interest in the area of ocean and wave energy;
- Familiarity with, and commitment to, working in an interdisciplinary teaching and research environment;
- Demonstrated potential for securing research funding from both national and international agencies;
- Potential synergies (commonality or complementarity) with the research of the Centre for Ocean Energy Research;
- Experience of, and a demonstrated commitment to, undergraduate and postgraduate teaching, programme development, and academic innovation;
- Experience supervising graduate students in either a taught or research capacity;
- A developed set of administrative, organisational, teamwork and communication skills.

#### Selection and Appointment

- Only shortlisted candidates will be invited to attend for interview;
- Appointments will be approved by the President based on the report of the selection board.

Terms and Conditions: The appointment will be made at Lecturer / Assistant Professor level, of which there are two grades: Lecturer and Assistant Lecturer. To be appointed at the Lecturer level, the successful candidate will have a strong record of research, publications, teaching and academic leadership.

#### Salary

Lecturer (Post 1995\*): €54,849 – €86,235 per annum (7 points)

Assistant Lecturer (2020): €34,746 – €60,985 per annum (14 points)

Appointment will be made in accordance with the Department of Finance pay guidelines.

Application Procedure: Closing Date: 23:30hrs (local Irish time) on Friday, 30 April 2021

Informal enquiries may be made to [john.ringwood@mu.ie](mailto:john.ringwood@mu.ie)

Please note all applications must be made via our Online Recruitment Portal at the following link:

<https://www.maynoothuniversity.ie/human-resources/vacancies>

[Back to the contents](#)

### **6.23. Faculty: University of Florida, USA**

Contributed by: Matthew Hale, [matthewhale@ufl.edu](mailto:matthewhale@ufl.edu)

Open faculty positions at the University of Florida

The Herbert Wertheim College of Engineering (HWCOE) at the University of Florida (UF) invites applications for a full-time, nine-month tenure track faculty position at the rank of Assistant Professor in the Department of Mechanical and Aerospace Engineering (MAE). Candidates are sought whose research focus includes (i) underwater robotics, or (ii) reinforcement learning in general, and especially those who are interested in collaborative research with the Center for Coastal Solutions (CCS), housed within the HWCOE. MAE is focused on robotics and autonomous systems as a core focus, as well as pioneering artificial learning approaches that enable fine scale analysis of dynamic matter to provide breakthrough understanding in the flow of fluids, failure of materials, energy transport, control of autonomous dynamic systems, and the building blocks of biology, disease, and life.

The CCS (<https://ccs.eng.ufl.edu/>) is advancing monitoring platforms and Earth Systems models that track and predict the risks and impacts of coastal hazards, including but not limited to flooding, sea level rise, harmful algae blooms, invasive species, and pathogen outbreaks. Fundamental research and development in underwater robotics and reinforcement learning would complement growth areas within MAE and the mission of the CCS. Applicants working in this space would find a wealth of collaborative opportunities in this position. The successful candidate is expected to have a doctoral degree in mechanical and aerospace engineering or computer science or a related field at the time of hiring. In addition, the candidate should have a record of successful proposal writing, mentoring, and classroom teaching of undergraduate and graduate students.

The University of Florida is the flagship campus of the State of Florida university system and is ranked as the #6 best public US university according to US News and World Report. UF recently announced a \$70 million artificial intelligence partnership with NVIDIA to create an AI-centric data center that houses the world's fastest AI supercomputer in higher education. The Mechanical & Aerospace Engineering Department (MAE) is one of the largest degree-granting units at the University of Florida. The Department has over 60 faculty members, 500 graduate students, 1900 undergraduate students, and \$12.5 million in annual research expenditures (ASEE). BS, MS, and PhD degrees are offered in both Mechanical Engineering and Aerospace Engineering. MAE is home to more than a dozen student societies and provides exceptional dedicated facilities and financial support for our student-led design/build/compete organizations that routinely capture top placement at national and international competitions. Traditional strengths in solid mechanics and design, thermal fluid systems, and dynamics and controls are leveraged in many interdisciplinary and cutting-edge efforts that include autonomous systems, multiphase turbulent systems, experimental mechanics, advanced manufacturing, novel energy systems, computational methods, soft-matter engineering, and aerospace technologies and systems.

The University of Florida Center for Coastal Solutions seeks to leverage innovative technologies, applied Artificial Intelligence, workforce training programs, and multi-sector collaboration to enable local communities, the state, and the nation to better track, forecast, mitigate and prevent coastal hazards, improving the quality of life and economic health of coastal residents (see more at: <http://ccs.eng.ufl.edu>). In pursuit of this mission, the CCS, established in October 2020 and led by HWCOE faculty, is integrating expertise, resources, and workforce training capabilities drawn from across the University of Florida, ranging from the Warrington School of Business to Levin College of Law, College of Design, Construction and Planning, UF—IFAS, and the College of Medicine. The Center is applying an open-source model to developing solutions to the most pressing environmental, economic and public health hazards facing coastal communities, forming extensive and rich partnerships with the public and private sector to drive innovation.

The search committee will begin reviewing applications immediately, with the first full committee screening occurring on January 25th, 2021, and will continue to receive applications until the position is filled. All applications must be submitted through Interfolio at: <https://facultyjobs.hr.ufl.edu/>.

Complete applications must include the following files in PDF format: (1) cover letter (summary, introduction related to hiring emphasis areas, and any synergies with UF ECE, CISE, or ESSIE departments, and the Center for Coastal Solutions); (2) a curriculum vitae; (3) a statement describing the applicant's experience in enhancing diversity, equity and inclusion through research, teaching, or service, and vision for promoting a more inclusive experience at the University of Florida; (4) a research program vision statement detailing short- and long-term goals; (5) a teaching statement describing the applicant's teaching experience and vision for developing a teaching program at the University of Florida; (6) up to three refereed journal or conference articles (co-)authored by the applicant; and (7) the names, addresses, phone numbers, and email addresses of no less than three and up to five references. To be competitive, candidates for this faculty position should submit a cover letter, research statement, and education vision statement that complement the overall mission of the Center for Coastal Solutions. The cover letter should be addressed to: Dr. Christine Angelini, Search Committee Chair, Director of the Center for Coastal Solutions.

The final candidate will be required to provide an official transcript to the hiring department upon hire. Selected candidate will be required to provide an official transcript to the hiring department upon hire. A transcript will not be considered "official" if a designation of "Issued to Student" is visible. Degrees earned from an educational institution outside of the United States are required to be evaluated by a professional credentialing service provider approved by National Association of Credential Evaluation Services (NACES).

The anticipated start for the position is Fall 2021 with some flexibility for a later start based on individual needs.

If an accommodation due to a disability is needed to apply for this position, please call 352-392-2477 or the Florida Relay System at 800-955-8771 (TDD). Hiring is contingent upon eligibility to work in the US. Background searches are conducted in accordance with Florida's Sunshine Law.

The University of Florida is committed to nondiscrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political



opinions or affiliations, genetic information, and veteran status in all aspects of employment including recruitment, hiring, promotions, transfers, discipline, terminations, wage and salary administration, benefits, and training.

[Back to the contents](#)

#### **6.24. Faculty: Technical University of Denmark, Denmark**

Contributed by: Jacob Østergaard, [joe@elektro.dtu.dk](mailto:joe@elektro.dtu.dk)

##### DTU Tenure Track Assistant Professors in Intelligent Energy Systems

At the Department of Electrical Engineering we seek two Tenure Track Assistant Professors in Intelligent Energy Systems for our Center for Electrical Power and Energy. Excellent candidates within various fields, e.g. power systems, power converters and components, energy analytics and markets, energy system management and distributed energy resources are encouraged to apply. At the Center for Electric Power and Energy you will be part of a vibrant, welcoming and diverse environment with an international atmosphere, superb academic collaborations, and outstanding links to the front-running Danish energy sector.

The two positions are part of DTU's Tenure Track program. We offer a rewarding and challenging job in an international environment. We strive for academic excellence in an environment characterized by collegial respect and academic freedom tempered by responsibility. We develop talent by offering a career mentor, state-of-the-art research infrastructure, and postgraduate teacher training. DTU's Tenure Track is an appointment of at most six years, during which you will receive career support in the form of professional and personal guidance. At the end of the tenure track appointment you will be evaluated by an external assessment committee, who will assess your appointment to a permanent Associate Professorship. Read more about the DTU Tenure Track program at DTU at this homepage:

<https://www.dtu.dk/english/about/job-and-career/recruitment-process/tenure-track>.

Responsibilities and qualifications: Your focus will be to strengthen our research, education and innovation within intelligent energy systems, and your profile shall contribute to DTU's strategic focus on Europe's best engineering education, sustainable transformation and digitalization. You are expected to be enthusiastic about your research and have robust abilities to teach. We will value innovative thinking and ability to translate your research into innovations and commercial solutions. You are able to fruitfully collaborate with close colleagues, leading scholars around the globe, and front-running companies in the heart of the green transformation.

Your primary tasks will be to:

- Teach and supervise BSc and MSc student projects, and be co-supervisor for PhD students
- Carry out excellent research and develop a recognized scientific profile, which over time will contribute to international visibility and reputation of the center and the department
- Build up a strong collaboration with your colleagues and external partners within academia and industry
- Contribute to attracting grants and initiate and secure external funding in close collaboration and coordination with your colleagues

You must hold a PhD degree (or equivalent).

You must be responsible for the teaching of courses. You will be expected to learn Danish and be able to

teach in Danish after 3 years. DTU can provide Danish language courses.

You will be assessed against the responsibilities and qualifications stated above and the following general criteria:

- Experience and quality of teaching
- Research experience
- Research vision and potential
- International impact and experience
- Societal impact
- Innovativeness, including commercialization and collaboration with industry
- Leadership, collaboration, and interdisciplinary skills
- Communication skills

Salary and terms of employment: The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The salary for the position will be determined by the applicants qualifications and in agreement with the relevant union. Further information on qualification requirements and job content may be found in the Ministerial Order on Job Structure for Academic Staff at Universities.

Further information may be obtained from Professor and Head of center Jacob Østergaard, mobile +45 2513 0501, e-mail: jaos@dtu.dk.

You can read more about Center for Electric Power and Energy at [www.cee.elektro.dtu.dk](http://www.cee.elektro.dtu.dk) and Department of Electrical Engineering at [www.elektro.dtu.dk](http://www.elektro.dtu.dk). You will have access to our cutting-edge labs for experimental activities; see [www.powerlab.dk](http://www.powerlab.dk). If you are applying from abroad, you may find useful information on working in Denmark and at DTU at DTU – Moving to Denmark.

Application procedure: Your complete online application must be submitted no later than 8 February 2021 (Danish time). Applications must be submitted as one PDF file containing all materials to be given consideration. To apply, please open the link "Apply online", fill out the online application form, and attach all your materials in English in one PDF file. The file must include:

- Application (cover letter)
- Vision for teaching and research for the tenure track period
- CV including employment history, list of publications, H-index (Google, Scopus and WoS) and ORCID (see <http://orcid.org/>)
- Teaching portfolio including documentation of teaching experience
- Academic Diplomas (MSc/PhD)

All interested candidates irrespective of age, gender, disability, race, religion or ethnic background are encouraged to apply.

<https://bit.ly/38UM6Ko>

Department of Electrical Engineering educates students within electrical engineering technologies. We offer studies at BSc, MSc and PhD levels, and participate in joint international programmes. We conduct

state-of-the-art research within antenna and microwave technology, robot technology, power and physical electronics, acoustic environment, electro-acoustics, and electric power and energy. Our department has more than 200 members of staff.

[Back to the contents](#)

#### **6.25. Faculty: KU Leuven, Belgium**

Contributed by: Peter Karsmakers, [peter.karsmakers@kuleuven.be](mailto:peter.karsmakers@kuleuven.be)

Faculty position: KU Leuven, Belgium

KU Leuven has a fixed-term (5 year) part-time (95%) academic vacancy in the area of Artificial Intelligence at its campus in Bruges. We are looking for internationally oriented candidates with an excellent research record, preferably focused on deploying AI in Business and Industrial Environments, and with demonstrable didactical skills. The expected start date is October 1, 2021. The successful applicant will be appointed in the Faculty of Engineering Technology. This Faculty is part of the Science, Engineering and Technology Group of KU Leuven. The position is interdepartmental, with a joint appointment in both the Department of Computer Science and the Department of Electrical Engineering (ESAT).

The successful applicant will engage in collaborations with experts in data analysis and AI and academic users of AI technology in the broader region. Overall, he/she will be an active member of the KU Leuven Institute for Artificial Intelligence (Leuven.ai). This interdisciplinary institute combines the AI expertise of 60+ professors, 100s of researchers and 500 master students. As one of the 10 most innovative universities in the world, KU Leuven has been very successful in the creation of spin-off companies, illustrating the socio-economic relevance of its research. Many of these spin-off companies are technology leaders within their domain, and their products and services are renowned internationally.

More information see:

<https://www.kuleuven.be/personeel/jobsite/jobs/56002799?hl=en&lang=en>

[Back to the contents](#)

#### **6.26. Faculty: KU Leuven, Belgium**

Contributed by: Jan Swevers, [jan.swevers@kuleuven.be](mailto:jan.swevers@kuleuven.be)

Full-time professor position at KU Leuven, Bruges Campus, Belgium

KU Leuven, Belgium has an open Full-time professor position at Campus Bruges.

Highlights of the vacancy:

- Department of Mechanical Engineering, division of Robotics, Automation and Mechatronics
- Topic: optimal control of intelligent connected mechatronic systems, with applications in, among others, Industry 4.0, autonomous systems, mobile robots and production processes. Optimal control relates in this respect to general performance, reliability, safety assurance and robustness.
- Linked to the Mechatronics research group or M-group (<https://iiw.kuleuven.be/brugge/m-group>)
- Teaching at the Faculty of Engineering Technology;
- Apply online until 15/02/2021.

Please follow this link to find the details on this open position and information how to apply.

<https://www.kuleuven.be/personeel/jobsite/jobs/55803688?hl=en&lang=en>

[Back to the contents](#)

### **6.27. Faculty: University of Maryland, USA**

Contributed by: Steve Marcus, [marcus@umd.edu](mailto:marcus@umd.edu)

Tenure-Track Faculty Position in Machine Learning

Electrical and Computer Engineering at the University of Maryland, College Park

The Department of Electrical and Computer Engineering at the University of Maryland, College Park, invites applications for at least one tenure-track faculty position in Machine Learning with methodologies and synergies based on pattern recognition, signal processing, information theory, control theory, or optimization.

The tenure-track appointments are expected to be at the Assistant Professor level, although more senior candidates with outstanding records of research achievements may be considered. Successful applicants will be expected to lead active, funded research programs, and teach undergraduate and graduate courses in Electrical and Computer Engineering. Collaborative efforts with colleagues in other disciplines to apply machine learning to achieve substantial scientific and societal impact are encouraged.

A Ph.D. in Electrical/Computer Engineering or a related discipline is required. Candidates should be creative and adaptable and should have a high potential for both research and teaching.

Interested applicants should visit this faculty hiring announcement page for full information and links to apply: <http://www.ece.umd.edu/faculty-hiring2021>. For best consideration, applications should be submitted by 15 February 2021 online through the University's eJob system (position number 126073). An application should include a cover letter, curriculum vitae, a list with contact information of three references, examples of research achievements including three significant publications, a research statement (up to three pages, not including references), and a statement of teaching philosophy (up to two pages). Inquiries can be directed to [jce-search-inquiry@umd.edu](mailto:jce-search-inquiry@umd.edu).

The University of Maryland, College Park, an equal opportunity/affirmative action employer, complies with all applicable federal and state laws and regulations regarding nondiscrimination and affirmative action; all qualified applicants will receive consideration for employment. UMD is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, sex, pregnancy, gender identity or expression, sexual orientation, marital status, age, national origin, political affiliation, physical or mental disability, religion, protected veteran status, genetic information, personal appearance, or any other legally protected status in all aspects of employment.

The University is located close to numerous funding agencies and many government research labs. The Department has strong research ties with these labs, as well as corporations and start-ups. Multiple centers, research institutes, and initiatives closely related to the hiring areas offer extensive opportunities to faculty members in research, education, technology transfer, and outreach. The Greater Washington DC metro area has three major airports and vibrant culture, and has primary and secondary schools that are among the

best in the nation. The University is committed to attracting and retaining outstanding and diverse faculty and staff who will enhance our stature of preeminence in the three missions of teaching, scholarship, and full engagement in our community, the state of Maryland, and the world.

[Back to the contents](#)