

E-LETTER on Systems, Control, and Signal Processing
Issue 332
May 2016

Editor: [Jianghai Hu](#)
School of Electrical and Computer Engineering
Purdue University
465 Northwestern Ave
West Lafayette, IN 47907
Tel: +1 (765) 496-2395
Fax: +1 (765) 494-3371

Welcome to the 332 issue of the Eletter, available electronically [here](#).
To submit new articles, go “[Article Submissions](#)” on the Eletter website
To unsubscribe, please [send an email](#) with the subject line “Eletter Unsubscribe”.

The next Eletter will be mailed out at the beginning of June 2016.

Contents

1. IEEE CSS Headlines

- 1.1 [IEEE Control Systems Society Publications Content Digest](#)
- 1.2 [IEEE Transactions on Automatic Control](#)
- 1.3 [IEEE Transactions on Control Systems Technology](#)
- 1.4 [IEEE Control Systems Society Technically Cosponsored Conferences](#)
- 1.5 [CFP: IEEE-CSS Outreach Fund](#)

2. MISC

- 2.1 [Summer School: Italian PhD Summer School in Automatic Control](#)
- 2.2 [Summer School: A Systems and Control Perspective in Human-Robot-Environment Interaction](#)
- 2.3 [Short Course: Dynamic Traffic Flow Modeling and Control](#)

3. Books

- 3.1 [Networks of Dissipative Systems: Compositional Certification of Stability, Performance, and Safety](#)
- 3.2 [Positive Markov Jump Linear Systems](#)
- 3.3 [Springer eBooks and Journals on Robotics & Control](#)

4. Journals

- 4.1 [Contents: Automatica](#)
- 4.2 [Contents: International Journal of Advanced Mechatronic Systems](#)
- 4.3 [Contents: Control Engineering Practice](#)
- 4.4 [Contents: Asian Journal of Control](#)

5. Conferences

- 5.1 [Allerton Conference on Communication, Control, and Computing](#)
- 5.2 [International Symposium on Formation Control and Distributed Coordination](#)
- 5.3 [Conference on Decision and Game Theory for Security](#)
- 5.4 [IEEE Ecuador Technical Chapters Meeting](#)
- 5.5 [Model Predictive Control Under Uncertainty: Theory, Computations and Applications](#)
- 5.6 [Workshop on Control, Optimisation and Networks](#)

- 5.7 Workshop on Mathematical Aspects of Network Synthesis
- 5.8 International Conference on Control, Automation, Robotics and Vision
- 5.9 International Conference on Control, Automation and Systems
- 5.10 World Congress: Mathematical Problems in Engineering, Aerospace and Sciences
- 5.11 International Workshop on Numerical Software Verification

6. Positions

- 6.1 PhD: Lund University, Sweden
- 6.2 PhD: L2S, France
- 6.3 PhD: UCoCoS Project, Netherlands
- 6.4 PhD: KU Leuven, Belgium
- 6.5 PhD: KU Leuven, Belgium
- 6.6 PhD/PostDoc: Clemson University, USA
- 6.7 PhD/PostDoc: Ohio State University, USA
- 6.8 PhD/PostDoc: Ohio State University, USA
- 6.9 PhD/PostDoc: Technische Universität Chemnitz, Germany
- 6.10 PostDoc: Uppsala University, Sweden
- 6.11 PostDoc: University of Michigan, USA
- 6.12 PostDoc: UC Berkeley, USA
- 6.13 PostDoc: Ohio State University, USA
- 6.14 PostDoc: Israel Institute of Technology, Israel
- 6.15 PostDoc: Northwestern University, USA
- 6.16 PostDoc: University of Florida - REEF/AFRL, USA
- 6.17 PostDoc: UC Berkeley, CA
- 6.18 Research Scientist: MathWorks, USA

1. IEEE CSS Headlines

1.1. IEEE Control Systems Society Publications Content Digest

Contributed by: Elizabeth Kovacs, ekovacs2@nd.edu

CSS Publications Content Digest 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](#)

1.2. IEEE Transactions on Automatic Control

Contributed by: Elizabeth Kovacs, ekovacs2@nd.edu

Table of Contents

IEEE Transactions on Automatic Control

Volume 61 (2016), Issue 5 (May)

Please note that the contents of the IEEE Transactions on Automatic Control, together with links to the abstracts of the papers may be found at the TAC web site: <http://www.nd.edu/ieeetac/contents.html>

Scanning-the-Issue, p. 1141

Papers

- L_1 Discretization for Sampled-Data Controller Synthesis via Piecewise Linear Approximation, J. H. Kim, T. Hagiwara p. 1143
- Optimal Steering of a Linear Stochastic System to a Final Probability Distribution, Part I, Y. Chen, T. Georgiou, M. Pavon p. 1158
- Optimal Steering of a Linear Stochastic System to a Final Probability Distribution, Part II, Y. Chen, T. Georgiou, M. Pavon p. 1170
- On the Stabilizability of Discrete-Time Switched Linear Systems: Novel Conditions and Comparisons, M. Fiacchini, A. Girard, M. Jungers p. 1181
- Stability Margins in Adaptive Mixing Control via a Lyapunov-based Switching Criterion, S. Baldi, P. A. Ioannou p. 1194
- Backstepping Control Under Multi-Rate Sampling, V. Tanasa, S. Monaco, D. Normand-Cyrot p. 1208
- Port-Hamiltonian Systems in Adaptive and Learning Control: A Survey, S. P. Nagesh Rao, G. A. D. Lopes, D. Jeltsema, R. Babuska p. 1223
- Synthesis of Maximally Permissive Supervisors for Partially-Observed Discrete-Event Systems, X. Yin, S. Lafortune p. 1239
- Bearing Rigidity and Almost Global Bearing-Only Formation Stabilization, S. Zhao, D. Zelazo p. 1255
- A Graph Laplacian Approach to Coordinate-free Formation Stabilization for Directed Networks, Z. Lin, L. Wang, Z. Han, M. Fu p. 1269
- MIMO Control over Additive White Noise Channels: Stabilization and Tracking by LTI Controllers, Y. Li, J. Chen, E. Tuncel, W. Su p. 1281

- A Unifying Framework for Robust Synchronisation of Heterogeneous Networks via Integral Quadratic Constraints, S. Z. Khong, E. Lovisari, A. Rantzer p. 1297

Technical Notes and Correspondence

- Fault Detection Filtering for Nonlinear Switched Stochastic Systems, X. Su, P. Shi, L. Wu, Y. Song p. 1310
- Convergence and Stability of a Constrained Partition-Based Moving Horizon Estimator, R. Schneider, W. Marquardt p. 1316
- Energy-Efficient Data Forwarding for State Estimation in Multi-Hop Wireless Sensor Networks, P. Cheng, Y. Qi, K. Xin, J. Chen, L. Xie p.1322
- Randomized Control Strategies under Arbitrary External Noise, K. Amelin, O. Granichin p. 1328
- Sufficient Lie Algebraic Conditions for Sampled-Data Feedback Stabilizability of Affine in the Control Nonlinear Systems, J. Tsiniias, D. Theodosis p. 1334
- Minimal Conjunctive Normal Expression of Continuous Piecewise Affine Functions, J. Xu, T. J. J. van den Boom, B. De Schutter, X. Luo p. 1340
- On the Kalman-Yakubovich-Popov Lemma for Positive Systems, A. Rantzer p. 1346
- Non-minimal Order Dynamics Model of Mechanical Systems with Singular Constraints, F. Aghili p. 1350
- Converse Barrier Certificate Theorems, R. Wisniewski, C. Sloth p. 1356
- Switching Signal Estimator Design for a Class of Elementary Systems, L. Menini, C. Possieri, A. Tornambe p. 1362
- Necessary and Sufficient Conditions for Global External Stochastic Stabilisation of Linear Systems with Input Saturation, A. A. Stoorvogel, A. Saber p. 1368
- Robust Adaptive Controller Combined with a Linear Quadratic Regulator based on Kalman Filtering, J. M. Kanieski, R. V. Tambara, H. Pinheiro, H. A. Gr $\frac{1}{4}$ ndling, R. Cardoso p. 1373
- Explicit Reference Governor for Constrained Nonlinear Systems, E. Garone, M. M. Nicotra p. 1379
- Hybrid Control of a Bioreactor with Quantized Measurements, F. Mairet, J-L. Gouz $\tilde{\text{c}}$ p. 1385
- Heterogeneous Multi-Agent Systems: Reduced-order Synchronization and Geometry, F. L. Lewis, B. Cui, T. Ma, Y. Song, C. Zhao p. 1391
- Efficient Rate Allocation in Wireless Networks Under Incomplete Information, A. Garcia, M. Hong p. 1397
- Reach Control Problem for Linear Differential Inclusion Systems on Simplices, Y. Wu, T. Shen p. 1403
- A Note on Delay Coordinates for Locally Observable Analytic Systems, Alberto Padoan, Alessandro Astolfi p. 1409
- Stability and Disturbance Attenuation for Markov Jump Linear Systems with Time-Varying Transition Probabilities, C. C. Lutz, D. J. Stilwell p. 1413

[Back to the contents](#)

1.3. IEEE Transactions on Control Systems Technology

Contributed by: Thomas Parisini, eic-ieeeetcst@units.it

Table of Contents

IEEE Transactions on Control Systems Technology

Volume 24 (2016), Issue 3 (May)

Regular papers

- Decentralized Power Management in a Hybrid Fuel Cell Ultracapacitor System, O. Madani, A. Bhattacharjee, and T. Das, page 765
- Adaptive Parameter Estimation of Blood Pressure Dynamics Subject to Vasoactive Drug Infusion, T. Luspay and K. M. Grigoriadis, page 779
- Optimization Strategy for PID-Controller Design of AMB Rotor Systems, C. Wei and D. Söffker, page 788
- Coordinated Performance Optimization of a Variable Geometry Compressor With Model Predictive Control for a Turbocharged Diesel Engine, J. Zhou, L. Fiorentini, M. Canova, and Y.-Y. Wang, page 804
- Design, Control, and Validation of a Charge-Sustaining Parallel Hybrid Bicycle, M. Corno, D. Berretta, P. Spagnol, and S. M. Savaresi, page 817
- Adaptive Quasi-Dynamic Traffic Light Control, J. L. Fleck, C. G. Cassandras, and Y. Geng, page 830
- Optimal DoS Attack Scheduling in Wireless Networked Control System, H. Zhang, P. Cheng, L. Shi, and J. Chen, page 843
- Stochastic Dynamic Programming in the Real-World Control of Hybrid Electric Vehicles, C. Vagg, S. Akehurst, C. J. Brace, and L. Ash, page 853
- Energy-Optimal Motion Planning for Multiple Robotic Vehicles With Collision Avoidance, A. J. Häusler, A. Saccon, A. P. Aguiar, J. Hauser, and A. M. Pascoal, page 867
- Maneuvering Control of Planar Snake Robots Using Virtual Holonomic Constraints, A. Mohammadi, E. Rezapour, M. Maggiore, and K. Y. Pettersen, page 884
- Modeling and Adaptive Compensation of Unknown Multiple Frequency Vibrations for the Stabilization and Control of an Active Isolation System, C. Chen, Z. Liu, Y. Zhang, and C. L. P. Chen, page 900
- Optimizing the Aero-Suspension Interactions in a Formula One Car, M. Imani Masouleh and D. J. N. Limebeer, page 912
- Fault Subspace Selection Approach Combined With Analysis of Relative Changes for Reconstruction Modeling and Multifault Diagnosis, C. Zhao and F. Gao, page 928
- A Dynamic Market Mechanism for the Integration of Renewables and Demand Response, J. Knudsen, J. Hansen, and A. M. Annaswamy, page 940
- Nonlinear Coordinated Motion Control of Road Vehicles After a Tire Blowout, F. Wang, H. Chen, and D. Cao, page 956
- Isometric Torque Control for Neuromuscular Electrical Stimulation With Time-Varying Input Delay, M. Merad, R. J. Downey, S. Obuz, and W. E. Dixon, page 971
- Optimal-Behavior-Based Dynamic Calibration of the Automotive Diesel Engine, K. Fang, Z. Li, K. Ostrowski, A. T. Shenton, P. G. Dowell, and R. M. Sykes, page 979
- Formation Tracking Control of Multiagents in Constrained Space, S. S. Ge, X. Liu, C.-H. Goh, and L. Xu, page 992

Brief papers

- Supervised Latent Factor Analysis for Process Data Regression Modeling and Soft Sensor Application, Z. Ge, page 1004
- Motion Blur-Based State Estimation, J. Tani, S. Mishra, and J. T. Wen, page 1012
- Joint Wheel-Slip and Vehicle-Motion Estimation Based on Inertial, GPS, and Wheel-Speed Sensors, K. Berntorp, page 1020

- Synthesis of Sparse Dynamic Structures via Semidefinite Programming, M. Babazadeh and A. Nobakhti, page 1028
- Integrated Optimization of Battery Sizing, Charging, and Power Management in Plug-In Hybrid Electric Vehicles, X. Hu, S. J. Moura, N. Murgovski, B. Egardt, and D. Cao, page 1036
- Sparse Optimization for Automated Energy End Use Disaggregation, D. Piga, A. Cominola, M. Giuliani, A. Castelletti, and A. E. Rizzoli, page 1044
- Switching Extensible FIR Filter Bank for Adaptive Horizon State Estimation With Application, J. M. Pak, C. K. Ahn, Y. S. Shmaliy, P. Shi, and M. T. Lim, page 1052
- Some Analytical Results on Tuning Fractional-Order [Proportional-Integral] Controllers for Fractional-Order Systems, V. Badri and M. S. Tavazoei, page 1059
- Multivariate Control Loop Performance Assessment With Hurst Exponent and Mahalanobis Distance, L. Das, B. Srinivasan, and R. Rengaswamy, page 1067
- Robust Model Predictive Control for Train Regulation in Underground Railway Transportation, S. Li, B. De Schutter, L. Yang, and Z. Gao, page 1075
- Extremum Seeking Navigation Without Derivative Estimation of a Mobile Robot in a Dynamic Environmental Field, A. S. Matveev, M. C. Hoy, and A. V. Savkin, page 1084
- A Nonlinear Blind Identification Approach to Modeling of Diabetic Patients, C. Novara, N. M. Pour, T. Vincent, and G. Grassi, page 1092
- Iterative Learning Control With Predictive Trial Information: Convergence, Robustness, and Experimental Verification, B. Chu, D. H. Owens, and C. T. Freeman, page 1101
- Diagnostic Method Combining the Lookup Tables and Fault Models Applied on a Hybrid Electric Vehicle, C. Sundström, E. Frisk, and L. Nielsen, page 1109
- Real-Time Scheduling of PI Control Tasks, S. Reimann, W. Wu, and S. Liu, page 1118
- Optimal Control of Series Plug-In Hybrid Electric Vehicles Considering the Cabin Heat Demand, J. Gissing, P. Themann, S. Baltzer, T. Lichius, and L. Eckstein, page 1126
- Two-Layered Framework for Distributed Multiagent Formation Following, R. Haghighi and C. C. Cheah, page 1134
- A Fault Detection Method for Automatic Detection of Spawning in Oysters, H. Ahmed, R. Ushirobira, D. Efimov, D. Tran, M. Sow, L. Payton, and J.-C. Massabuau, page 1140

Comments and Corrections

- Correction to “LPV Control With Decoupling Performance of 4WS Vehicles Under Velocity-Varying Motion”, M. Li, Y. Jia, and J. Du, page 1148

[Back to the contents](#)

1.4. IEEE Control Systems Society Technically Cosponsored Conferences

Contributed by: Luca Zaccarian, CSS AE Conferences, zaccarian@laas.fr

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

- 16th International Conference on Control, Automation and Systems (ICCAS 2016). Gyeongju, South Korea. Oct 16 - Oct 19, 2016. <http://2016.iccas.org/>

- 20th International Conference on System Theory, Control and Computing (ICSTCC 2016). Sinaia, Romania. Oct 13 - Oct 15, 2016. <http://ace.ucv.ro/icstcc2016/>
- 2017 Indian Control Conference. Guwahati, India. Jan 4 - Jan 6, 2017. <http://icc.org.in/>
- 14th International Conference on Control, Automation, Robotics and Vision (ICARCV 2016). Phuket, Thailand. Nov 13 - Nov 15, 2016. <http://www.icarcv.org/2016>

For a full listing of CSS technically cosponsored conferences, please visit <http://ieeecss.org/conferences/technically-cosponsored>, and for a list of the upcoming and past CSS main conferences please visit <http://ieeecss.org/conferences>

[Back to the contents](#)

1.5. CFP: IEEE-CSS Outreach Fund

Contributed by: Daniel E. Rivera, daniel.rivera@asu.edu

The IEEE CSS Outreach Task Force is providing final notice of the submission window for proposals to the 2016 spring solicitation of the CSS Outreach Fund, from May 2 to 27, 2016. Information regarding the program can be found in:

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

Inquiries, notices of intent, and requests for application forms should be made directly to Daniel E. Rivera, Outreach Task Force Chair, at daniel.rivera@asu.edu.

[Back to the contents](#)

2. MISC

2.1. Summer School: Italian PhD Summer School in Automatic Control

Contributed by: Maria Elena Valcher, meme@dei.unipd.it

Italian PhD Summer School in Automatic Control (“SIDRA 2016”)

Dates: July 11-16, 2016

Location: University Residential Centre of Bertinoro, Bertinoro (Forlì-Cesena)

Organizers: Maria Elena Valcher and Claudio Melchiorri

Topics:

- 1) Robust and constrained control (Coordinators: Franco Blanchini, Patrizio Colaneri)
- 2) Distributed Control and its applications (Coordinators: Ruggero Carli, Luca Schenato)

The School is opened to all interested PhD Students and researchers. The relevant information and the detailed program are available at: <http://sidra2016.dei.unibo.it/>

See <http://www.ceub.it/default.asp?id=346#.VVXk2dPtIBc>

The registration process consists of a two-step procedure:

- June 5, 2016: Deadline for submission of application – see the form at

<http://www.lar.dei.unibo.it/SIDRA2015/index.php/more-info#PreRegistrationForm>

- June 15, 2016: communication of admission to school

- 26 June 2016: deadline for payment of the fee, to be paid according to the instruction given in the registration form.

[Back to the contents](#)

2.2. Summer School: A Systems and Control Perspective in Human-Robot-Environment Interaction

Contributed by: Martha Otte, m.w.otte@tudelft.nl

DISC Summer School: A Systems and Control Perspective in Human-Robot-Environment Interaction

From June 14-17, 2016 the DISC Summer School on “A Systems and Control Perspective in Human-Robot-Environment Interaction” will take place in Centerparcs Zandvoort, Zandvoort, The Netherlands.

As robotics is moving away from strictly controlled factory floors and slowly entering our daily lives, the next generation of robots will need to interact with their environment, with each other, and with humans. This transition is driven by emerging societal needs and will be enabled by advances in perception, actuation, and computational power, but also by suitable modeling and control aspects tailored to robotic systems. This poses challenging questions to the research community that still require fully satisfying answers.

During the four day Summer School a set of national and international specialists will address these questions and give particular attention to:

- Modeling and Control of Fix-Based and Free-Floating Robots
- Control of Robot-Environment Physical Interaction
- Stability and Performance of Human-Robot Physical Interaction
- Multi-Robot Coordination and Control

For more information on the program and registration please visit the dedicated Summer School website: <http://disc.tudelft.nl/education/summer-school/summer-school-2016/>

[Back to the contents](#)

2.3. Short Course: Dynamic Traffic Flow Modeling and Control

Contributed by: Manolis Diamantis, dmanolis@dssl.tuc.gr

DYNAMIC TRAFFIC FLOW MODELLING AND CONTROL

12th Short Course 2016

Technical University of Crete

Dynamic Systems and Simulation Laboratory

Chania 73100, Greece

Lecturer: Prof. Markos Papageorgiou

Date: 14-18 November 2016

Location: Chania (Crete), Greece

Fee: 1.700 euro (for graduate students: 1.300 euro)

(20% reduction is granted in case of more than one participation from the same institution)

Scope

The design, analysis, and evaluation of Intelligent Transportation Systems (ITS) requires good knowledge of traffic flow modelling and control techniques as well as of powerful methodologies from the areas of optimisation, control, networks and dynamic systems. The purpose of the intensive 5-day course is to cover the basic theory, methods and tools necessary for efficient design and evaluation of ITS on road and freeway networks. After a basic introduction to dynamic systems and control, the course continues with traffic flow modelling and validation issues, the modelling of traffic networks, dynamic traffic assignment and simulation tools. Measurement devices and estimation problems in traffic networks, including automatic incident detection and OD estimation, are presented and discussed. The state-of-the-art techniques in freeway traffic control, road traffic control and integrated traffic control, employing ramp metering, signal control,

variable speed limits and route guidance, along with several field-implemented case studies are presented. Future prospects and challenges related to emerging vehicle automation and communication systems are discussed. Brief accounts of some optimisation, control and estimation techniques are provided. Some 50 exercises are used for consolidation of the provided knowledge. Extensive written materials, including all transparency copies, are handed out.

Who Should Attend

Graduate students, faculty members, engineers, researchers, consultants, and government employees who are interested in improving their understanding of advanced traffic flow modelling and control tools and in becoming familiar with their application in ITS.

For more information (Detailed Course Contents, About the Lecturer, Registration Form, Location, Accommodation, Evaluation of Previous Courses), please visit the site:

http://www.dssl.tuc.gr/en/shortcourse/12th_shortcourse_2016.pdf

or email shortcourse@dssl.tuc.gr or contact:

Prof. Markos Papageorgiou

Director

Dynamic Systems & Simulation Laboratory

TECHNICAL UNIVERSITY OF CRETE

University Campus

GR-73100 Chania, GREECE

Tel: +30-28210-37240

Fax: +30-28210-37584/69410

E-mail: markos@dssl.tuc.gr

Web: <http://www.dssl.tuc.gr>

[Back to the contents](#)

3. Books

3.1. Networks of Dissipative Systems: Compositional Certification of Stability, Performance, and Safety

Contributed by: Oliver Jackson, oliver.jackson@springer.com

Networks of Dissipative Systems: Compositional Certification of Stability, Performance, and Safety

Authors: Murat Arcaç, Chris Meissen and Andrew Packard

Springer, 2016, ISBN: 978-3-319-29927-3, Softcover, 112 pp.

<http://www.springer.com/gb/book/9783319299273>

Description:

This book addresses a major problem for today's large-scale networked systems: certification of the required stability and performance properties using analytical and computational models. On the basis of illustrative case studies, it demonstrates the applicability of theoretical methods to biological networks, vehicle fleets, and Internet congestion control. Rather than tackle the network as a whole—an approach that severely limits the ability of existing methods to cope with large numbers of physical components—the book develops a compositional approach that derives network-level guarantees from key structural properties of the components and their interactions. The foundational tool in this approach is the established dissipativity theory, which is reviewed in the first chapter and supplemented with modern computational techniques. The book blends this theory with the authors' recent research efforts at a level that is accessible to graduate students

and practising engineers familiar with only the most basic nonlinear systems concepts. Code associated with the numerical examples can be downloaded at extras.springer.com, allowing readers to reproduce the examples and become acquainted with the relevant software.

Contents:

- 1 Brief Review of Dissipativity Theory
 - 2 Stability of Interconnected Systems
 - 3 Equilibrium Independent Stability Certification
 - 4 Case Studies
 - 5 From Stability to Performance and Safety
 - 6 Searching Over Subsystem Dissipativity Properties
 - 7 Symmetry Reduction
 - 8 Dissipativity with Dynamic Supply Rates
 - 9 Comparison to Other Input/Output Approaches
- Appendices: Sum-of-Squares; Programming; Semidefinite Programming; The KYP Lemma; True/False Questions for Chapter 1

[Back to the contents](#)

3.2. Positive Markov Jump Linear Systems

Contributed by: Tanya Capawana, tanya.capawana@nowpublishers.com

Just published in Foundations and Trends in Systems and Control:

Volume 2, Issue 3-4

Positive Markov Jump Linear Systems

By Paolo Bolzern and Patrizio Colaneri (DEIB-Politecnico di Milano and IEIIT-CNR, Italy)

<http://dx.doi.org/10.1561/2600000006>

Contents:

1. Introduction and motivations
2. Positive Markov Jump Linear Systems
3. Dual switching
4. Concluding remarks; References

Abstract:

This paper presents a comprehensive study of continuous-time Positive Markov Jump Linear Systems (PMJLS). A PMJLS can be seen as a dynamical system that switches within a finite set of linear time-invariant subsystems according to a stochastic switching signal modelled as a Markov chain, and describes the time-evolution of nonnegative variables under nonnegative inputs. Contrary to the well-studied general class of Markov Jump Linear Systems (MJLS), positivity endows the model with peculiar properties. The paper collects some existing results together with original developments on the stability analysis of PMJLS and the study of their input-output properties. In particular, conditions for stability of PMJLS are discussed, mainly based on Linear Programming problems. Similar computational tools are derived to analyze performance measures, such as L_1 , L_2 and L_∞ costs and the respective input-output induced gains. The second part of the paper is devoted to the class of Dual switching Positive Markov Jump Linear Systems (D-PMJLS), namely PMJLS affected by an additional switching variable which can be either an unknown disturbance or a control signal available to the designer for stabilization and performance optimization. We discuss several problems, including stability, performance analysis, stabilization via switching control, and optimization. Some application examples are introduced to motivate the interest in PMJLS and D-PMJLS.

3.3. Springer eBooks and Journals on Robotics & Control

Contributed by: Hugo Tadashi Kussaba, htkussaba@ieee.org

Last month, Springer launched a new annual subscription that gives access to each Springer eBook and journal within Robotics and Control: <http://www.springer.com/us/custom-package/41093E>

The above link has more informations about this new subscription model and which books from Springer are included.

4. Journals

4.1. Contents: Automatica

Contributed by: Elisa Capello, automatica@polito.it

Table of Contents

Automatica

Vol. 67, May 2016

<http://www.sciencedirect.com/science/journal/00051098/67>

- Hossein Beikzadeh, Horacio J. Marquez, “Input-to-error stable observer for nonlinear sampled-data systems with application to one-sided Lipschitz systems”, pages 1-7
- Lixian Zhang, Songlin Zhuang, Richard D. Braatz, “Switched model predictive control of switched linear systems: Feasibility, stability and robustness”, pages 8-21.
- Shihong Ding, Arie Levant, Shihua Li, “Simple homogeneous sliding-mode controller”, pages 22-32.
- Kiyoshi Suzuki, “Optimal switching strategy of a mean-reverting asset over multiple regimes”, pages 33-45.
- An-Min Zou, Anton H.J. de Ruiter, Krishna Dev Kumar, “Distributed finite-time velocity-free attitude coordination control for spacecraft formations”, pages 46-53.
- Milan Korda, Didier Henrion, Colin N. Jones, “Controller design and value function approximation for nonlinear dynamical systems”, pages 54-66.
- Sheida Ghapani, Jie Mei, Wei Ren, Yongduan Song, “Fully distributed flocking with a moving leader for Lagrange networks with parametric uncertainties”, pages 67-76.
- Yanjie Li, Xinyu Wu, “A unified approach to time-aggregated Markov decision processes”, pages 77-84.
- Angelo Alessandri, Moath Awawdeh, “Moving-horizon estimation with guaranteed robustness for discrete-time linear systems and measurements subject to outliers”, pages 85-93.
- Jérémy R. Dehaye, Joseph J. Winkin, “LQ-optimal boundary control of infinite-dimensional systems with Yosida-type approximate boundary observation”, pages 94-106.
- Arnab Dey, Sourav Patra, Siddhartha Sen, “Absolute stability analysis for negative-imaginary systems”, pages 107-113.
- Giulio Bottegal, Aleksandr Y. Aravkin, Håkan Hjalmarsson, Gianluigi Pillonetto, “Robust EM kernel-based methods for linear system identification”, pages 114-126.
- Lubomír Bakule, Branislav Rehák, Martin Papík, “Decentralized image-infinity control of complex systems with delayed feedback”, pages 127-131.

- Márcio A.F. Martins, Darci Odloak, “A robustly stabilizing model predictive control strategy of stable and unstable processes”, pages 132-143.
- Robin Vujanic, Peyman Mohajerin Esfahani, Paul J. Goulart, Sébastien Mariéthoz, Manfred Morari, “A decomposition method for large scale MILPs, with performance guarantees and a power system application”, pages 144-156.
- Farnaz Adib Yaghmaie, Frank L. Lewis, Rong Su, “Output regulation of linear heterogeneous multi-agent systems via output and state feedback”, pages 157-164.
- Mirosław Galicki, “Finite-time trajectory tracking control in a task space of robotic manipulators”, pages 165-170.
- Ruslan E. Seifullaev, Alexander Fradkov, Daniel Liberzon, “Energy control of a pendulum with quantized feedback”, pages 171-177.
- Michael Margaliot, Eduardo D. Sontag, Tamir Tuller, “Contraction after small transients”, pages 178-184.
- Van Tri Nguyen, Didier Georges, Gildas Besançon, “State and parameter estimation in 1-D hyperbolic PDEs based on an adjoint method”, pages 185-191.
- Laurent Bako, “Adaptive identification of linear systems subject to gross errors”, pages 192-199.
- Amenda Chow, Kirsten A. Morris, “Control of the Landau-Lifshitz equation”, pages 200-204.
- Steffi Knorn, Anders Ahlén, “Deviation bounds in multi agent systems described by undirected graphs”, pages 205-210.
- Daniel Melchor-Aguilar, “A note on stability of functional difference equations”, pages 211-215.
- Hildo Bijl, Jan-Willem van Wingerden, Thomas B. Schön, Michel Verhaegen, “Mean and variance of the LQG cost function”, pages 216-223.
- Sandira Gayadeen, Stephen R. Duncan, “Discrete-time anti-windup compensation for synchrotron electron beam controllers with rate constrained actuators”, pages 224-232.
- Graziano Chesi, Richard H. Middleton, “Robust stability and performance analysis of 2D mixed continuous-discrete-time systems with uncertainty”, pages 233-243.
- Tarek Ahmed-Ali, Emilia Fridman, Fouad Giri, Laurent Burlion, Françoise Lamnabhi-Lagarrigue, “Using exponential time-varying gains for sampled-data stabilization and estimation”, pages 244-251.
- Xianwei Li, James Lam, Huijun Gao, Junlin Xiong, “ H_∞ and H_2 filtering for linear systems with uncertain Markov transitions”, pages 252-266.
- Junqiang Zhou, Marcello Canova, Andrea Serrani, “Predictive inverse model allocation for constrained over-actuated linear systems”, pages 267-276.
- B.G.B. Hunnekens, N.v.d. Wouw, D. Nešić, “Overcoming a fundamental time-domain performance limitation by nonlinear control”, pages 277-281.
- Konstantin Kogan, Fouad El Ouardighi, Tatyana Chernonog, “Learning by doing with spillovers: Strategic complementarity versus strategic substitutability”, pages 282-294.
- Jurgen van Zundert, Joost Bolder, Tom Oomen, “Optimality and flexibility in Iterative Learning Control for varying tasks”, pages 295-302.
- Diego Muñoz-Carpintero, Basil Kouvaritakis, Mark Cannon, “Striped Parameterized Tube Model Predictive Control”, pages 303-309.
- Daniel Alberto Burbano Lombana, Mario di Bernardo, “Multiplex PI control for consensus in networks of heterogeneous linear agents”, pages 310-320.

4.2. Contents: International Journal of Advanced Mechatronic Systems

Contributed by: Mingcong Deng, deng@cc.tuat.ac.jp

International Journal of Advanced Mechatronic Systems, vol. 6, no. 6, 2015

The articles can be retrieved on:

<http://www.inderscience.com/info/inarticletoc.php?jcode=ijamechs&year=2015&vol=6&issue=6>

Contents:

- Pneumatic stage positioning with model following control and PDD control, Naoki Ito; Shinji Wakui; Yuki-nori Nakamura, pp. 247-257
- Robust controller with a fixed compensator for underwater vehicle-manipulator systems including thruster dynamics, Yuichiro Taira; Shinichi Sagara; Masahiro Oya, pp. 258-268
- Robust tracking control system design for a nonlinear IPMC using neural network-based sliding mode approach, Aihui Wang; Qiang Zhang; Dongyun Wang, pp. 269-276
- Two-degree-of-freedom control with tuning of both prefilter and feedforward controller, Lorlynn Asuncion Mateo; Kenji Sugimoto, pp. 277-288
- Omnidirectional wheeled mobile robots: wheel types and practical applications, Kiattisin Kanjanawanishkul, pp. 289-302

[Back to the contents](#)

4.3. Contents: Control Engineering Practice

Contributed by: Tobias Glück, cep@acin.tuwien.ac.at

Control Engineering Practice

Volume 50

May 2016

- André Shiguelo Yamashita, Paulo Martin Alexandre, Antonio Carlos Zanin, Darci Odloak, Reference trajectory tuning of model predictive control, Pages 1-11
- Han Woong Yoo, Shingo Ito, Georg Schitter, High speed laser scanning microscopy by iterative learning control of a galvanometer scanner, Pages 12-21
- Alexandra Moutinho, José Raul Azinheira, Ely C. de Paiva, Samuel S. Bueno, Airship robust path-tracking: A tutorial on airship modelling and gain-scheduling control design, Pages 22-36
- Baojie Mu, Yaoyu Li, John M. House, Timothy I. Salsbury, Experimental evaluation of anti-windup extremum seeking control for airside economizers, Pages 37-47
- Bing Song, Shuai Tan, Hongbo Shi, Process monitoring via enhanced neighborhood preserving embedding, Pages 48-56
- Minlin Wang, Xuemei Ren, Qiang Chen, Shubo Wang, Xuehui Gao, Modified dynamic surface approach with bias torque for multi-motor servomechanism, Pages 57-68
- Yaxing Ren, Liuying Li, Joseph Brindley, Lin Jiang, Nonlinear PI control for variable pitch wind turbine, Pages 84-94
- Ivan Portnoy, Kevin Melendez, Horacio Pinzon, Marco Sanjuan, An improved weighted recursive PCA algorithm for adaptive fault detection, Pages 69-83
- Philipp Beckerle, Practical relevance of faults, diagnosis methods, and tolerance measures in elastically actuated robots, Pages 95-100

[Back to the contents](#)

4.4. Contents: Asian Journal of Control

Contributed by: Fu Li-Chen, lichen@ntu.edu.tw

Asian Journal of Control

Vol.18, No.2 March, 2016

CONTENTS

[Regular Paper]

1. Paper Title: Adaptive Action for Multi-Agent Persistent Coverage
Authors: Carlos Franco, Gonzalo López-Nicolás, Carlos Sagüés and Sergio Llorente
2. Paper Title: Automatic Control of Aircraft in Lateral-Directional Plane During Landing
Authors: Romulus Lungu and Mihai Lungu
3. Paper Title: An Intelligent Design for a PID Controller for Nonlinear Systems
Authors: Chung-Neng Huang and Aaron Chung
4. Paper Title: Intelligent Integral Backstepping Sliding-mode Control Using Recurrent Neural Network For Piezo-flexural Nanopositioning Stage
Authors: Faa-Jeng Lin, Shih-Yang Lee and Po-Huan Chou
5. Paper Title: Input Shaping of the Synchronous Generator for Reduction of Self-induced Oscillations
Authors: Danijel Jolevski and Ozren Bego
6. Paper Title: Joints Position Estimation of a Redundant Scara Robot by Means of the Unscented Kalman Filter and Inertial Sensors
Authors: Claudio Urrea and Rodrigo Muñoz
7. Paper Title: The Synthesis of the Proportional-Differential Regulators for the Systems with Fixed Ends of Trajectories Under Two-Sided Constraints on Control Values
Author: Z. N. Murzabekov
8. Paper Title: Nonlinear Thf-Fxlms Algorithm For Active Noise Control With Loudspeaker Nonlinearity
Authors: Sepehr Ghasemi, Raja Kamil and Mohammad Hamiruce Marhaban
9. Paper Title: State Estimation of Stochastic Impulsive System Via Stochastic Adaptive Impulsive Observer
Authors: Moosa Ayati, Mohamad Alwan, Xinzhi Liu and Hamid Khaloozadeh
10. Paper Title: Globally Stable Adaptive Tracking Control for Uncertain Strict-Feedback Systems Based on Neural Network Approximation
Authors: Dong Zhao, Weisheng Chen, Jian Wu and Jing Li
11. Paper Title: Reliable Dissipative Control for a Class of Uncertain Singular Markovian Jump Systems via Hybrid Impulsive Control
Authors: Hui Lv, Qingling Zhang and Junchao Ren
12. Paper Title: Fault Reconstruction for Continuous-Time Systems Via Learning Observers
Authors: Qingxian Jia, Wen Chen, Yingchun Zhang and Huayi Li
13. Paper Title: Guaranteed-Cost Consensus Control For High-Order Linear Swarm Systems
Authors: Xiaogang Yang, Jianxiang Xi, Jinying Wu and Zhicheng Yao
14. Paper Title: Pinning Synchronization in Networked Lagrangian Systems
Authors: Mihua Ma, Jin Zhou and Jianping Cai
15. Paper Title: Observer-Based H_∞ Control for Continuous-Time Networked Control Systems
Authors: Tian-Bao Wang, Yu-Long Wang, Heng Wang and Jian Zhang
16. Paper Title: A Novel Boundary Control Solution for Unstable Heat Conduction Systems Based on Active Disturbance Rejection Control
Authors: Dong Zhao, Donghai Li and Youqing Wang

17. Paper Title: Model-Free H_∞ Control Design for Unknown Continuous-Time Linear System Using Adaptive Dynamic Programming
Authors: Chunbin Qin, Huaguang Zhang and Yanhong Luo
 18. Paper Title: Cooperative Adaptive Fuzzy Output Feedback Control for Synchronization of Nonlinear Multi-Agent Systems in the Presence of Input Saturation
Authors: Wei Wang, Dan Wang, Zhouhua Peng and Hao Wang
 19. Paper Title: Adaptive Fuzzy PD+ Control for Attitude Maneuver of Rigid Spacecraft
Authors: Zhen Chen, Li Zhong, Xiangdong Liu and Binglong Cong
 20. Paper Title: Robust Adaptive Control of Uncertain Stochastic Hamiltonian Systems with Time Varying Delay
Authors: Weiwei Sun and Lianghong Peng
 21. Paper Title: Adaptive Control of A Servo System Based on Multiple Models
Authors: Ming-Gang Gan, Meng Zhang, Hui-Xia Ma and Jie Chen
 22. Paper Title: Decreasing-horizon Robust Model Predictive Control With Specified Settling Time To A Terminal Constraint Set
Authors: Weilin Yang, Gang Feng and TieJun Zhang
 23. Paper Title: Optimal Control for Pennes' Bioheat Equation
Authors: Alaeddin Malek and Ghasem Abbasi
 24. Paper Title: A Measurement-Based Approach for Designing Fixed-Order Controllers for Unknown Closed-Loop Architecture
Authors: Sofiane Khadraoui, Hazem N. Nounou, Mohamed N. Nounou, Aniruddha Datta and Shankar P. Bhattacharyya
 25. Paper Title: Dynamic Output Feedback Robust MPC Using General Polyhedral State Bounds for the Polytopic Uncertain System With Bounded Disturbance
Authors: Baocang Ding, Chenbo Gao and Xubin Ping
 26. Paper Title: Robust Fault Detection Using Subspace Aided Data Driven Design
Authors: Abrar Hussain, Abdul Qayyum Khan and Muhammad Abid
 27. Paper Title: Novel Conflict Resolution Model for Multi-Uav Based on CPN and 4D Trajectories
Authors: Linjun Fan, Jun Tang, Yunxiang Ling, Gang Liu and Benxian Li
 28. Paper Title: Dynamic Stability of Power Systems Using UPFC: Bat-Inspired Search and Gravitational Search Algorithms
Authors: B. Vijay Kumar and N. V. Srikanth
 29. Paper Title: Distributed Containment Control for Nonlinear Multi-Agent Systems with Time-Delayed Protocol
Authors: Jianqiang Hu, Jie Yu and Jinde Cao
- [Brief Paper]
1. Paper Title: Output Consensus of Heterogeneous Linear Multi-agent Systems Subject to Different Disturbances
Authors: Shaobao Li, Gang Feng, Xiaoyuan Luo and Xinpeng Guan
 2. Paper Title: Consensus Control for Directed Networks Under Quantized Information Exchange
Authors: Zhi-Xiang Yin, You-Rui Huang, Xian-Ya Geng and De-Quan Li
 3. Paper Title: Adaptive Tracking Control for Nonlinear Systems with a Class of Input Nonlinearities
Authors: Zongcheng Liu, Xinmin Dong, Jianping Xue and Lipeng Zhang
 4. Paper Title: Controllability of Stochastic Delay Systems with Impulse in a Separable Hilbert Space
Authors: Yingxin Guo and Chao Xu

5. Paper Title: Observer Based Control of a Missile Seeker System Using Sliding Modes
Authors: Bhagyashri Tamhane, Dharmveer Singh, Shailaja Kurode and Prasad Parkhi

[Back to the contents](#)

5. Conferences

5.1. Allerton Conference on Communication, Control, and Computing

Contributed by: Angie Ellis, amellis@illinois.edu

The Fifty-Fourth Annual Allerton Conference on Communication, Control, and Computing will kick off with Opening Tutorials being held on Tuesday, September 27, 2016 at the Coordinated Science Laboratory. The conference sessions will start on Wednesday, September 28, 2016 through Friday, September 30, 2016, at the Allerton Park and Retreat Center. The Allerton House is located twenty-six miles southwest of the Urbana-Champaign campus of the University of Illinois in a wooded area on the Sangamon River. It is part of the fifteen-hundred acre Robert Allerton Park, a complex of natural and man-made beauty designated as a National natural landmark. Allerton Park has twenty miles of well-maintained trails and a living gallery of formal gardens, studded with sculptures collected from around the world.

Papers presenting original research are solicited in the areas of biological information systems; coding techniques and applications; coding theory; data storage; information theory; multiuser detection and estimation; network information theory; sensor networks in communications; wireless communication systems; intrusion/anomaly detection and diagnosis; network coding; network games and algorithms; performance analysis; pricing and congestion control; reliability, security and trust; decentralized control systems; robust and nonlinear control; adaptive control and automation; robotics; distributed and large-scale systems; complex networked systems; optimization; dynamic games; machine learning and learning theory; signal models and representations; signal acquisition, coding, and retrieval; detection and estimation; learning and inference; statistical signal processing; sensor networks; and data analytics.

Final versions of papers to be presented at the conference are required to be submitted electronically by October 2, 2016 in order to appear in the Conference Proceedings and IEEE Xplore.

PLENARY LECTURE: Professor Naomi Leonard from the Mechanical and Aerospace Engineering, Princeton University, will deliver this year's plenary lecture. It is scheduled for Friday, September 30, 2016 at the Allerton Park and Retreat Center.

OPENING TUTORIAL LECTURES: Professor Panagiotis Tsiotras, Georgia Institute of Technology, and Professor Emmanuel Abbe, Princeton University, will both present a tutorial lecture on Tuesday, September 27, 2016 at the Coordinated Science Laboratory, University of Illinois at Urbana-Champaign.

INFORMATION FOR AUTHORS: Regular papers suitable for presentation in twenty minutes are solicited. Regular papers will be published in full (subject to a maximum length of eight 8.5" x 11" pages, in two column format) in the Conference Proceedings. Only papers that are actually presented at the conference and uploaded as final manuscripts can be included in the proceedings, which will be available after the conference on IEEE Xplore.

For reviewing purposes of papers, a title and a five to ten page extended abstract, including references and sufficient detail to permit careful reviewing, are required.

Manuscripts can be submitted during June 15-July 8, 2016 with the submission deadline of July 8th being firm. Please follow the instructions at the Conference website: <http://www.csl.illinois.edu/allerton/>.

Authors will be notified of acceptance via e-mail by August 8, 2016, at which time they will also be sent detailed instructions for the preparation of their papers for the Proceedings.

[Back to the contents](#)

5.2. International Symposium on Formation Control and Distributed Coordination

Contributed by: Hyo-Sung Ahn, hyosung@gist.ac.kr

The 1st International Symposium on Formation Control and Distributed Coordination

September 12-14, 2016, Gwangju, Korea

Call for participation:

As control, communications, sensing, and processing technologies are advanced, multi-agent systems become more realistic in our daily life as well as in industry. As the computational speed of embedded processors in distributed agents becomes extremely fast, higher level control of dynamic systems becomes more and more important. In the sense of higher level control, two key control problems have attracted research interests: Formation Control and Coordination of Multi-agent Systems. The formation control is a distributed control in Euclidean space from a topological perspective, while the coordination is distributed management or operation of interconnected network systems. The formation control focuses on relative assignment of agents' states, and the distributed coordination focuses on distribution or assignment of state and state's value. Theoretically and practically, it would be interesting to solve these problems in decentralized or distributed manners. The decentralized control implies that each agent uses only its own state for achieving a common goal of the group, while the distributed control means that agent uses relative information between neighboring agents. For examples, relative position and attitude control of unmanned aerial vehicles could be considered as a formation control, and distributed management of power generation and power flow in cyber-physical energy network may be considered distributed coordination. In this symposium, we are interested in sharing some recent ideas and advances to solve the formation control and distributed coordination problems using only local and/or relative information. If you are interested in attending this symposium as audience or as speaker, please send your "intention for participation" through email (hyosung@gist.ac.kr) by June 30.

Outline of tentative program:

The symposium will consist of special keynote talks, technical sessions, a poster session and problem definition session. Two technical sessions will be a session for distributed formation control and one more session for distributed coordination. In the problem definition session, individual speaker will be allowed to present his/her problems within a five minute in one slide. In the problem definition session, we would like to discuss the problems intensively. Students will be allowed to present their on-going works via poster session.

Specially invited speakers:

Brian D. O. Anderson, Australian National University

Daniel Zelazo, Technion (Israel Institute of Technology)

Mohamed Ali Belabbas, University of Illinois at Urbana-Champaign

Zhiyong Sun, Australian National University

Hyungbo Shim, Seoul National University, Korea

Registration fee: There will be a small amount of registration fee for speakers/students/audience

Organizer and contact information: Hyo-Sung Ahn (hyosung@gist.ac.kr), Gwangju Institute of Science and Technology (GIST), Korea

[Back to the contents](#)

5.3. Conference on Decision and Game Theory for Security

Contributed by: Quanyan Zhu, qz494@nyu.edu

The 7th Conference on Decision and Game Theory for Security

Recent advances in information and communication technologies pose significant security challenges that impact all aspects of modern society. The 7th Conference on Decision and Game Theory for Security focuses on protection of heterogeneous, large-scale and dynamic systems as well as managing security risks faced by critical infrastructures through rigorous and practically-relevant analytical methods. GameSec invites novel, high-quality theoretical and practical-relevant contributions, which apply decision and game theory, as well as related techniques such as distributed optimization, dynamic control and mechanism design, to build resilient, secure, and dependable networked systems. The goal of GameSec is to bring together academic and industrial researchers in an effort to identify and discuss the major technical challenges and recent results that highlight the connection between game theory, control, distributed optimization, economic incentives and real world security, reputation, trust and privacy problems.

SPECIAL TRACK ON “VALIDATING MODELS”

The real world use of game- and decision-theoretic models in cyber and physical security applications requires validating them. Gathering and providing empirical evidence for or against such models is a crucial step in our field’s progress. Unfortunately, it is often difficult to find a home for such pain-staking validation and empirical evidence gathering in conferences that are more focused on novelty of theoretical models and algorithms. To remedy this shortcoming, GameSec will include this year a special track on “validating models”. Papers submitted to this special track will undergo the same rigorous evaluation as the normal GameSec submissions, but the emphasis will be on validation, data gathering and empirical evaluation, possibly of existing models.

For more information, please visit <http://www.gamesec-conf.org/GameSec2016-CFP.pdf>

Abstract submission (optional): June 3, 2016

Paper submission (firm): June 10, 2016

Decision notification: July 29, 2016

Camera-ready submission: August 22, 2016

[Back to the contents](#)

5.4. IEEE Ecuador Technical Chapters Meeting

Contributed by: Alberto Sanchez, aesanchez@ieee.org

We take great pleasure in inviting you to the 2016 IEEE ETCM, which will be held for the first time from October 12th-14th in Guayaquil, Ecuador. (<http://sites.ieee.org/etcm-2016>)

The 2016 IEEE Ecuador Technical Chapters Meeting (ETCM) will be the first edition of what we expect will be the first of a running series of conferences organized by the IEEE Ecuador Section and which intends to create a highly prestigious venue for researchers, students and practitioners from the IEEE Technical Society Chapters in Ecuador.

The conference covers both theoretical and practical issues related to Communications, Computing, Control Systems, Industrial Electronics, Engineering in Medicine and Biology, Power and Energy, Robotics and Automation. Topics of interest, but not limited to, are:

SYSTEMS AND CONTROL

Adaptive Systems, Signal Processing, Embedded Systems, Fault Tolerant Systems, Identification, Predictive control.

INDUSTRIAL ELECTRONICS

Power Converters, Power semiconductors, Machines and drives, Power electronics in transportation systems, Power electronics applications.

COMMUNICATIONS

Internet of Things, Communications Systems Security, Green Communications, Wireless Communications, Optical Communications, Waveforms and Signal Processing, Access Networks and Systems, Cluster, Grid, P2P Cloud Computing, Satellite and Space Communications, Networking protocols and performance.

COMPUTER

Security and Privacy, Semantic Computing, Real Time Systems, Computational Intelligence, Multimedia Computing, Learning Technologies, Distributed Processing, Data Engineering and Data Science, Human Computer Interaction, Computer Vision.

POWER AND ENERGY

Transmission, Distribution, Power Generation, Power System Control & Operation, Reliability, Stability, Renewables, SmartGrids.

ENGINEERING IN MEDICINE AND BIOLOGY

Clinical Engineering, Telemedicine, and Health Care, Bioinformatics, Biomechanics, Biomaterials, Bioinstrumentation, Signal and Image Processing, Biophysics.

ROBOTICS AND AUTOMATION SYSTEMS

Automation, Automation in Logistics and Supply Chain Management, Sensors, Robotics, Assistive Technologies, System Integration, Sensor/Actuator Networks, Distributed and Cloud Robotics, Autonomous Vehicles, Human/Robot Interaction.

CEIS – SOFTWARE ENGINEERING INVITED SESSION

Software design, software building, software production processes, Quality, design methodologies, artificial intelligence applied to software engineering, education, process models, verification and validation, integration and operation, human aspects in software engineering, software project management.

Important Dates:

Full Paper Submission: 30 June 2016

Acceptance Notification: 17 July 2016

Final paper Submission: 30 July 2016

Workshops & Tutorials: 10-11 October 2016

Conference Dates: 12-14 October 2016

Website: <http://sites.ieee.org/etcm-2016>

[Back to the contents](#)

5.5. Model Predictive Control Under Uncertainty: Theory, Computations and Applications

Contributed by: Sasa V. Rakovic, sasa.v.rakovic@austin.utexas.edu

A full day workshop entitled “Model Predictive Control Under Uncertainty: Theory, Computations and Applications” has been organized for the 2016 American Control Conference (held at Boston Marriott Copley Place, Boston, MA, USA) by Sasa V. Rakovic, William S. Levine, Behcet Acikmese and Ilya V. Kolmanovskiy. The workshop will be held on July 05, 2016.

The workshop introduces its audience to the theory, design and applications of model predictive control under uncertainty. The workshop provides conceptual and practical principles governing rigorous and computationally effective methods for design of MPC under set-membership and probabilistic uncertainty. The

theoretical fundamentals are carefully introduced and studied within the frameworks of robust and stochastic MPC. The technical foundations are complemented with a study of related design and practical aspects as well as with an overview of effective computations based on convex and reliable real-time optimization. Thus, the workshop provides a concise and unified exposure to MPC under uncertainty.

The main themes of the workshop are Conventional MPC (by William S. Levine), Robust MPC (by Sasa V. Rakovic), Stochastic MPC (by Ilya V. Kolmanovsky), Convexification for MPC Under Uncertainty and Reliable Online Computations (by Behcet Acikmese), and Overview of Applications and Open Closing Discussion (by all organizers/speakers).

Additional info is available at the conference website <http://acc2016.a2c2.org/workshops.html> and <http://www.isr.umd.edu/files/acc2016-mpc.html>

[Back to the contents](#)

5.6. Workshop on Control, Optimisation and Networks

Contributed by: Malcolm Smith, mcs@eng.cam.ac.uk

Two workshops will be held at the University of Cambridge, United Kingdom, on September 19-22, 2016. The workshops aim to connect researchers from the sciences, mathematics, and engineering who share an interest in control theory.

WORKSHOP ON CONTROL, OPTIMISATION AND NETWORKS, 19-20 Sept 2016

This workshop marks the contributions of Professor Jan Maciejowski to the control field on the occasion of his retirement.

Invited speakers (confirmed):

K.J. Astrom, M. Deistler, R. Findeisen, M. Gallieri, M. Gevers, J. Goncalves, P. Goulart, B. Hanzon, E. Hartley, W. Heath, C. Jones, E.C. Kerrigan, I. Lestas, K.V. Ling, L. Ljung, S. Longo, J. Lygeros, M. Morari, J. Raisch, A. Richards, P. Roberts, R. Shekhar, G. Vinnicombe

Website: <http://www-control.eng.cam.ac.uk/Main/Workshop7>

[Back to the contents](#)

5.7. Workshop on Mathematical Aspects of Network Synthesis

Contributed by: Malcolm Smith, mcs@eng.cam.ac.uk

[Back to the contents](#)

Two workshops will be held at the University of Cambridge, United Kingdom, on September 19-22, 2016. The workshops aim to connect researchers from the sciences, mathematics, and engineering who share an interest in control theory.

4th WORKSHOP ON MATHEMATICAL ASPECTS OF NETWORK SYNTHESIS, 21-22 Sept 2016

Fourth in a series of workshops initiated by Uwe Helmke.

Invited speakers (confirmed):

M.Z.Q. Chen, P. Dewilde, P. Fuhrmann*, T.H. Hughes, J.Z. Jiang, R. Kalman, N. Karcanias, D.J.N. Limebeer, A. Morelli, R.T. Pates, P. Rapisarda, R. Sepulchre, M.C. Smith, A.J. van der Schaft

*Paul Fuhrmann will deliver a special In Memoriam lecture to commemorate the contributions and friendship of Uwe Helmke.

Website: <http://www-control.eng.cam.ac.uk/Main/Workshop8>

EARLY BIRD REGISTRATION: before June 10 2016

REGISTRATION DEADLINE: September 1, 2016

5.8. International Conference on Control, Automation, Robotics and Vision

Contributed by: Changyun Wen, ecywen@ntu.edu.sg

The 14th International Conference on Control, Automation, Robotics and Vision
(ICARCV 2016)

Phuket, Thailand, November 13 - 15, 2016

Conference Website: <http://www.icarcv.org/2016/>

Extension of Deadline:

Due to numerous feedbacks from researchers that they have difficulty completing paper submission by the given deadline and hence requested for an extension. After careful consideration, the organizing committee decides to extend the paper submission deadline to 31 May 2016.

No further extension will be considered.

ICARCV has a history of more than 26 years. ICARCV 2016 is organised by Nanyang Technological University, Singapore, and technically co-sponsored by IEEE Control Systems Society. It focuses on both theory and applications mainly covering the topics of control, automation, robotics and computer vision. In addition to the technical sessions, there will be invited sessions, panel sessions and keynote addresses.

Proceedings of past ICARCVs have been indexed by ISI Proceedings, EI Compendex and included in the IEEE Xplore.

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

Control:

Adaptive control; Robust control; Process control; Complex systems; Co-operative control; Identification and estimation; Nonlinear systems; Intelligent systems; Discrete event systems; Hybrid systems; Networked control systems; Sensor networks; Multi-agent systems; Delay systems; Neural networks; Fuzzy systems; Control of biological systems; Precision motion control; Control applications; Control engineering education; Marine systems; Data analytics.

Automation:

Man-machine interactions; Process automation; Intelligent automation; Factory modeling and simulation; Home, laboratory and service automation; Network-based systems; Planning, scheduling and coordination; Nano-scale automation and assembly; Instrumentation systems; Biomedical instrumentation and applications; Building energy efficiency.

Robotics:

Modeling and identification; Robot control; Mobile robotics; Mobile sensor networks; Perception systems; Micro robots and micro-manipulation; Visual servoing; Search, rescue and field robotics; Robot sensing and data fusion; Localization, navigation and mapping; Dexterous manipulation; Medical robots and bio-robotics; Human centered systems; Space and underwater robots; Tele-robotics; Mechanism design and applications.

Vision:

Image/video analysis; Image-based modeling; Stereo and Structure from motion; Feature extraction, grouping and segmentation; Scene analysis; Object recognition; Learning and Statistical methods; Human-computer interaction; Tracking and surveillance; Biometrics; Vision for robots; Activity/behavior recognition; Medical Image Analysis; Face and Gesture.

Emerging Technologies:

Internet of things; Cyber-physical systems; Smart buildings, Smart grid; Energy management systems; Big data; Electric vehicles and intelligent transportation.

Paper Submission: Papers must be written in English and should describe original work in details. Please download the template from the conference website and submit the full papers online at <http://www.icarcv.org/2016> by 31 May, 2016. Proposals for invited sessions will be submitted online at the same web address. Upon acceptance, authors are required to register and present their papers at the conference. Papers which make outstanding contributions to the relevant topics will be considered for best paper awards.

[Back to the contents](#)

5.9. International Conference on Control, Automation and Systems

Contributed by: ICCAS2016, conference@icross.org

2016 16th International Conference on Control, Automation and Systems (ICCAS 2016)

October 16(SUN)-19(WED), 2016

HICO, Gyeongju, Korea

<http://2016.iccas.org>

ICCAS 2016 will be held at HICO, Gyeongju, Korea on October 16(SUN)-19(WED), 2016. The aim of the ICCAS is to bring together researchers and engineers worldwide to present their latest works, and disseminate the state-of-the-art technologies related to control, automation, robotics, and systems.

Important Dates

May 6, 2016: Submission of organized session proposals

May 13, 2016: Submission of full papers

July 15, 2016: Notification of paper acceptance

August 12, 2016: Submission of final camera-ready papers

Plenary Speakers

Andrew Schwartz (Univ. of Pittsburgh, USA)

Maria Prandini (Politecnico di Milano, Italy)

Sangchul Won (POSTECH, Korea)

Satoshi Tadokoro (Tohoku Univ., Japan)

James Ashton-Miller (Univ. of Michigan, USA)

Huijun Gao (Harbin Institute of Technology, China)

Song K. Choi (Univ. of Hawaii, USA)

The treasure of a brilliant cultural heritage. Welcome to Gyeongju!! Gyeongju was the capital city of Shilla for 992 years. The history of Gyeongju, which was once called Seorabeol, is also the history of the thousand-year-old Shilla Dynasty. Gyeongju embraces a radiant ancient culture where Buddhism, science, and the arts and crafts of the people of Shilla flourished, and the great spirits of Hwarangdo attained the nification of the three kingdoms. This is why Gyeongju is so well preserved by its people and thus, has been designated as a World Cultural Heritage by UNESCO. The evergreen spirit of Shilla has been alive here for nearly a thousand years. Gyeongju is truly a museum without walls.

This event starts right after IROS 2016(Oct. 9-14), Daejeon, Korea. It takes 1 hour from Daejeon to Gyeongju by KTX(Korea Train eXpress).

Thank you for your contributions and we look forward to seeing you at ICCAS 2016 during October 16-19, 2016.

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

Contributed by: Seenith Sivasundaram, seenithi@gmail.com

World Congress: Mathematical Problems in Engineering, Aerospace and Sciences

WHEN: 05-08 July 2016

WHERE: La Rochelle, France, University of La Rochelle

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

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

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 of 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

La Rochelle, France, University of La Rochelle

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)

5.11. International Workshop on Numerical Software Verification

Contributed by: Sergiy Bogomolov, sergiy.bogomolov@ist.ac.at

CALL FOR PAPERS

NSV 2016 – DEADLINE EXTENSION UNTIL MAY 6

9th International Workshop on Numerical Software Verification

July 17-18, 2016

Toronto, Ontario, Canada

Web Page: <http://nsv2016.pages.ist.ac.at/>

Important Dates:

Submissions deadline: ** May 6, 2016 **

Notification: May 15, 2016

Final version: May 28, 2016

Workshop: July 17-18, 2016

** New this year **

All accepted papers will be published as Lecture Notes in Computer Science (LNCS) with Springer Verlag.

Description of the Workshop

Numerical computations are ubiquitous in digital systems: supervision, prediction, simulation and signal processing rely heavily on numerical calculus to achieve desired goals. Design and verification of numerical algorithms has a unique set of challenges, which set it apart from rest of software verification. To achieve the verification and validation of global properties, numerical techniques need to precisely represent local behaviors of each component. The implementation of numerical techniques on modern hardware adds another layer of approximation because of the use of finite representations of infinite precision numbers that usually lack basic arithmetic properties such as commutativity and associativity. Finally, the development and analysis of cyber-physical systems (CPS) which involve the interacting continuous and discrete components pose a further challenge. It is hence imperative to develop logical and mathematical techniques for the reasoning about programmability and reliability. The NSV workshop is dedicated to the development of such techniques.

Topics

The scope of the workshop includes, but is not restricted to, the following topics:

- Quantitative and qualitative analysis of hybrid systems
- Models and abstraction techniques
- Optimal control of dynamical systems
- Parameter identification for hybrid systems
- Numerical optimization methods
- Hybrid systems verification
- Applications of hybrid systems to systems biology
- Propagation of uncertainties, deterministic and probabilistic models
- Specifications of correctness for numerical programs
- Formal specification and verification of numerical programs
- Quality of finite precision implementations
- Numerical properties of control software
- Validation for space, avionics, automotive and real-time applications
- Validation for scientific computing programs

Submission information

We solicit regular and short papers. Paper submission must be performed via the EasyChair system:

<https://easychair.org/conferences/?conf=nsv2016>

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 simultaneously submitted to a journal or a conference with refereed proceedings. 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 submissions should not exceed 15 pages in LNCS style, including bibliography and well-marked appendices: <http://www.springer.com/lncs>

Program committee members are not required to read the appendices, and thus papers must be intelligible without them.

Short papers are also welcome, they should present tools, benchmarks, case-studies or be extended abstracts of ongoing research. Short papers should not exceed 6 pages.

All accepted papers will be published as Lecture Notes in Computer Science (LNCS) with Springer Verlag.

[Back to the contents](#)

6. Positions

6.1. PhD: Lund University, Sweden

Contributed by: Anders Rantzer, rantzer@control.lth.se

Applications are invited for positions as PhD student at the Department of Automatic Control, Lund University, Sweden. See http://www.lth.se/english/about_lth/vacant_positions.

[Back to the contents](#)

6.2. PhD: L2S, France

Contributed by: Antoine Chaillet, antoine.chaillet@centralesupelec.fr

PhD offer: Modeling and steering brain oscillations based on in vivo optogenetics data

Description:

Neuronal oscillations are ubiquitous in the brain, both in health and disease. Nonetheless, the precise role of these oscillations is still a matter of debate, and the mechanisms by which they are generated are still poorly understood. Technological advances offer unprecedented ways to acquire and influence these oscillations. Electrode arrays and electrodes with dense recording plots now provide excellent spatiotemporal resolution of local brain activity. Moreover, the recent advent of optogenetics is revolutionizing the way of stimulating brain structures. The combination of electrophysiological recordings and optogenetics is thus particularly appealing to decipher the mechanisms of oscillation generation, their role in brain functioning, and the development of closed-loop strategies to steer brain oscillations (especially pathological ones).

This project aims at developing and validating ad hoc methodologies to model, identify, analyze and control brain oscillations with these experimental tools. The challenges in that direction are numerous due to the nonlinear and spatiotemporal nature of the processes involved. To address these challenges, this project proposes to adapt or develop methodologies from control theory to the brain dynamics specificities. The performance of the developed methodologies will be confronted to experimental data of pathological oscillations linked to parkinsonian symptoms, that were collected on healthy and parkinsonian primates under optogenetics in the ANR project SynchNeuro.

The aim of this PhD thesis is to develop a methodological framework, based on control engineering, to address three challenges:

- 1) development of a spatiotemporal model of specific brain oscillations, whose parameters are identified based on experimental data
- 2) formal analysis of brain oscillations onset and characterization of their dynamics in terms of magnitude, frequency and phase
- 3) development of closed-loop photostimulation strategies to disrupt, attenuate, or steer brain oscillations.

Supervision:

The PhD thesis will be supervised by Antoine Chaillet (L2S), in collaboration with Alain Destexhe (UNIC) and Mario Sigalotti (CMAP).

Sought candidate:

We are looking for a brilliant motivated student, eager to work on an interdisciplinary topic. Strong background in dynamical systems is needed, as well as interest for theoretical developments. Experience in identification based on experimental data, or numerical simulations would be appreciated. No French ability is required.

[Back to the contents](#)

6.3. PhD: UCoCoS Project, Netherlands

Contributed by: Wim Michiels, Wim.Michiels@cs.kuleuven.be

6 open PhD positions, UCoCoS project

Major challenges in science, society and industry are induced by the complexity of our hyper-connected world. Examples are the climate change, artificial interconnected systems whose dynamics are beyond our understanding such as the internet, the global banking system and the power grid. A demand of performance emerges at an unprecedented scale: collaborative sensors and robots so to ensure competitiveness of the production industry, better management of traffic flows, designing (de)synchronization mechanisms applicable in neuroscience, are examples illustrating the necessity to understand and control the dynamics of complex networks.

The objectives of the UCoCoS project are to create a control-oriented framework for complex systems, and to define a common language, common methods, tools and software for the complexity scientist. UCoCoS aims at i) creating a closely connected new generation of leading scientists, capable of designing network structures and policies to affect the networks, and ii) initiating long-term partnerships and collaboration mechanisms leading to sustainable doctoral training. The UCoCoS approach builds on recent developments in three domains: control engineering, computer science, mechanical engineering.

In the framework of UCoCoS there are six open PhD positions. Every PhD researcher performs a cutting-edge project, strongly relying on the complementary expertise of three academic partners (KU Leuven, Ecole Centrale de Lille, and Eindhoven University of Technology) and benefiting from training by non-academic partners from three different sectors.

The UCoCoS project and training network is funded by the European Commission under the H2020 program, as a Marie-Sklodowska Curie Actions ITN-EJD (Innovative Training Network- European Joint Doctorates). More information on the project, and application instructions can be found at <http://www.ucocos-project.eu>

[Back to the contents](#)

6.4. PhD: KU Leuven, Belgium

Contributed by: Jan Swevers, rocsis@kuleuven.be

A fully funded open PhD position at KU Leuven

Department of Mechanical Engineering

ROBUST OPTIMAL FEEDBACK CONTROL OF MULTIVARIATE INDUSTRIAL SYSTEMS

The KU Leuven (Belgium), Department of Mechanical Engineering is searching for a motivated and skilled PhD researcher with a strong background in systems, control, numerical optimization and experience with control implementation and validation.

RESEARCH PROJECT: Many companies are dealing with systems consisting of interacting subsystems that exhibit complex dynamic behaviour. The current industrial control practice for these systems is often a decoupled PID-like control approach that focuses on controlling each subsystem separately. However, this decoupled control approach fails to address the complex behaviour of many industrial systems. Consequently, the robustness and performance that is achievable with the current industrial control approach is limited and insufficient to meet the continuously increasing economic (installation and operation costs vs. productivity/profit), and ecologic demands.

With this research project we want to take a first step in establishing a new industrial control practice that will enable companies to find economic solutions to control complex systems of interacting subsystems. The current state-of-the-art in control design can cope with complex system dynamics and uncertainty, but fails to make its way to industry mainly due to the complexity to design and tune these controllers. In addition, the current state-of-the-art ignores the economic aspects of more advanced controllers, that is, their implementation cost, which is related to the complexity of the control configuration (the number and type of sensors and actuators and the complexity of the control architecture).

Therefore, in this research project, we will develop methods and software to (i) design simple controllers that are compatible with industrial control hardware but can cope with complex uncertain system dynamics and (ii) optimize the control configuration in order to manage the costs and pay-back time of a more involved control configuration, and find a good trade-off between costs and benefits (improved performance and robustness). In addition, we will develop a user-friendly design interface that automates the design and supports use by non-experts. In order to safeguard the practical viability of the developments, we will validate the software developments continuously throughout the project on experimental test setups and models of industrial systems, which are selected in agreement with and based on the input from our industrial project partners.

For this ambitious research project, we are searching for a motivated and skilled PhD researcher. You will develop methodologies and software to design robust optimal controllers and optimize the control configuration, you will experimentally validate these methods and you will be involved in the development of the user interface.

The research will be carried out in the MECO research group at the Division PMA of the Department of Mechanical Engineering, KU Leuven, Leuven, Belgium (<https://www.mech.kuleuven.be/en/pma/research/meco>) in cooperation with Flanders Make (<http://www.flandersmake.be/>).

CANDIDATE PROFILE: An ideal candidate has a MSc degree in engineering or applied mathematics, a strong background in control, numerical optimization, mechatronics and software development (Matlab, C/C++), and experience with and a strong interest in the implementation and experimental validation of controllers. The candidate should have an enthusiasm for scientific research. Proficiency in English is a requirement, and applicants whose mother tongue is neither Dutch nor English must present an official language test report. Acceptable tests are TOEFL and Academic IELTS. Required minimum scores are:

- TOEFL: 102 (internet-based test), no sub-score under 23
- IELTS: 7.5 (only Academic IELTS test accepted), no sub-score under 6.5

APPLY NOW! A START DATE IN COURSE OF 2016 IS TO BE AGREED UPON.

To apply, send an email to Prof. Dr. Jan Swevers (rocsis@kuleuven.be). The subject of your email should be: "ROCSIS PhD application". Include:

- an academic CV
- a pdf of your diplomas and transcript of course work and grades
- statement of research interests and career goals

- sample of technical writing
- list of at least two referees: names and email addresses
- proof of English language proficiency test results.

[Back to the contents](#)

6.5. PhD: KU Leuven, Belgium

Contributed by: Goele Pipeleers, goele.pipeleers@kuleuven.be

Fully funded open PhD position at KU Leuven, Department of Mechanical Engineering:
B-SPLINE BASED RELAXATIONS FOR ROBUST OPTIMIZATION

The KU Leuven, Department of Mechanical Engineering is searching for a young, motivated and skilled PhD researcher with a strong background in numerical optimization, systems theory and control.

RESEARCH PROJECT: While many engineering problems are nowadays translated into a numerical optimization problem, the associated numerical data are often inaccurate or uncertain. As this uncertainty of data may turn the numerical optimum into a poor or even unacceptable solution for the true problem, there is a great push for robust optimization techniques suited for engineering applications. Robust optimization seeks a solution that is feasible and most optimal for all possible values of the numerical data. As the data is generally considered to vary in infinite sets (e.g. a real interval), robust optimization problems are numerically intractable in general. Therefore most problems are currently relaxed to a tractable problem by relying on either Polya's theorem or sum-of-squares certificates of positivity. As these approaches suffer from limited applicability or high computational load, we recently initiated novel relaxation schemes based on B-splines, i.e. particular piecewise polynomial basis functions, and their properties. Within this research project you will develop the initial results into a general methodology for constructing B-spline based relaxations of robust optimization problems. In addition to the theoretical research this involves, you will develop a software toolbox for efficient spline manipulations and optimization, and validate the methodology on robust optimization applications such as robust control and motion planning in obstructed environments. The research will be carried out in the MECO research group at the division PMA of the department of Mechanical Engineering, KU Leuven, Leuven, Belgium.

(www.mech.kuleuven.be/en/pma/research/meco)

CANDIDATE PROFILE: An ideal candidate holds a degree in engineering or applied mathematics. He or she has a solid background in numerical optimization, systems theory and control, a strong interest and experience in mathematical programming (Matlab, Python, C/C++), and enthusiasm for scientific research. Proficiency in English is a requirement and applicants whose mother tongue is neither Dutch nor English must present an official language test report. Acceptable tests are TOEFL and Academic IELTS, and the required minimum scores are:

- TOEFL: 610 (paper-based test), 102 (internet-based test)
- IELTS: 7.5 (only Academic IELTS test accepted)

APPLY NOW! A START DATE IN COURSE OF 2016 IS TO BE AGREED UPON.

To apply, send an email to goele.pipeleers@kuleuven.be with subject "Bspline PhD application". Include:

- an academic CV
- a pdf of your diplomas and transcript of course work and grades
- statement of research interests and career goals
- sample of technical writing
- list of at least two referees: names and email addresses
- proof of English language proficiency test results.

6.6. PhD/PostDoc: Clemson University, USA

Contributed by: Yongqiang Wang, yongqiw@clemson.edu

PhD/Post-Doc: Clemson University, USA

Applications are invited for doctoral and/or post-doctoral positions in the general area of dynamics and control of network systems. Competitive financial supports will be provided. Students with a strong background in systems and control and a clear interest in the general area of network systems are encouraged to apply. Specific areas of research include: - analysis of dynamical engineered or biochemical networks - power systems - hybrid systems - oscillator networks or synchronization. Clemson University is ranked 20st among national public universities by U.S. News & World Report (tie with Purdue University-West Lafayette and University of Maryland-College Park). It is described by students and faculty as an inclusive, student-centered community characterized by high academic standards, a culture of collaboration, school spirit, and a competitive drive to excel.

Clemson is located on Lake Hartwell in the foothills of the Blue Ridge Mountains, an area of outstanding natural beauty and temperate climate. It is 30 miles from Greenville, SC, a vibrant and growing city which provides many opportunities for entertainment, culture, and fine dining. Strong mathematical and analytic skills are desired.

Candidates with a demonstrated track record in one or more of the previous area(s) will be preferred. Interested students should send a short resume, along with representative relevant publications, if applicable, to yongqiw@clemson.edu

[Back to the contents](#)

6.7. PhD/PostDoc: Ohio State University, USA

Contributed by: Xinghua Jia, jxh831027@gmail.com

Post-doc/PhD Positions to work on Fluorescence Peptide Nanoparticles

We have openings for one graduate student and one post-doctoral research associate to work on fluorescence peptide nanoparticles. This work is a continuation of our recent Nature Nanotechnology paper “Bioinspired fluorescent dipeptide nanoparticles for targeted cancer cell imaging and real-time monitoring of drug release.”

The candidates are expected to have research experiences on peptide synthesis, nanoparticles, or biomaterials. They will work with team members with diverse background, including molecular biology, biochemistry, chemical engineering, electrical engineering, mechanical engineering, biomedical engineering, materials science and engineering, and mathematics.

Our lab is equipped with a unique combination of multiple nano-instrumentation platforms sponsored by federal agencies and industry, including AFM, Confocal, Nanoindenter, Digital Holographic Microscopy, CytoViva imaging system, HPLC, DLS, and peptide synthesizer. Research results from our laboratory have been published in Nature Nanotechnology, PNAS, Nano Letters, Advanced Functional Materials, PLoS Computational Biology, Nanomedicine, and have drawn international media attention, including Science, Nature, AAAS Science Update, BBC news, Science Daily, and many others.

To apply, please send CV along with 2-3 sample publications to Mingjun Zhang at zhang.4882@osu.edu

[Back to the contents](#)

6.8. PhD/PostDoc: Ohio State University, USA

Contributed by: Mingjun Zhang, zhang.4882@osu.edu

ONR Sponsored Post-doc/PhD Positions on Bio-inspired UUV at OSU

We have one post-doctoral researcher and one PhD student opening positions sponsored by the Office of Naval Research (ONR) to conduct research on hydrodynamics and control for a bio-inspired Underwater Unmanned Vehicle (UUV). Through this research, an energy-efficient UUV inspired by propulsion mechanisms of four unique aquatic species will be designed, optimized, constructed and tested. Six modules, including propulsion module, central control module, manipulator module, buoyancy control module, body frame module and obstacle avoidance module, will implemented and tested.

The significance of this research lies in synergistic integration of multiple unique propulsion mechanisms inspired by nature to achieve energy-efficient propulsion, and modular implementation through integration of material properties, morphological features, and advanced control for applications in underwater robotics. The focus will be on optimization of the bio-inspired propulsion mechanisms through in-depth theoretical investigation of multi-scale material properties, morphological features, dynamics, control patterns, and system integration.

Interested applicants should send in CVs along with 2-3 publications to Mingjun Zhang at zhang.4882@osu.edu.

Mingjun Zhang

Professor of Biomedical Engineering

The Ohio State University

NEWS: Nature offers plenty examples for inspiration in design and innovation. Check our recent Nature Nanotechnology paper on bio-inspired nanoparticles.

<http://www.nature.com/nnano/journal/v11/n4/full/nnano.2015.312.html>

[Back to the contents](#)

6.9. PhD/PostDoc: Technische Universität Chemnitz, Germany

Contributed by: Stefan Streif, stefan.streif@etit.tu-chemnitz.de

Two PhD and PostDoc positions at the Technische Universität Chemnitz, Germany within the newly established Laboratory of Automatic Control and System Dynamics.

Research topics:

Development of robust and adaptive methods for control and diagnosis of uncertain nonlinear systems using optimization-based approaches.

Essential responsibilities:

- * working actively and independently in new research areas
- * publishing research results in high-quality journals and on international conferences
- * participation in teaching
- * supervision of undergraduate students.

Qualifications and requirements:

- * knowledge and mathematical background in systems and control theory, uncertainty analysis, stochastic processes and optimization (in particular optimal control)
- * above-average qualification or degree (PhD or Master)
- * strong analytic and good programming skills
- * excellent communication skills in oral and written English.

Employment:

This full-time position is initially for **THREE** years with the option to extend the contract. The positions are open from July 2016 until filled. Besides a long-term perspective for your career, we offer a young and dynamical research environment with a new and well-equipped research laboratory.

Application:

To request more information or to apply, please contact Prof. Stefan Streif (stefan.streif@etit.tu-chemnitz.de) as soon as possible. Application documents (all combined into one PDF-file!) should include a cover letter, CV, relevant certificates and contact details of possible references.

[Back to the contents](#)

6.10. PostDoc: Uppsala University, Sweden

Contributed by: Anders Ahlén, anders.ahlen@angstrom.uu.se

Postdoctoral position in Signal and Information Processing
at Uppsala University, Dept of Engineering Sciences, Signals & Systems.

Duties: To conduct original research in the area of signal and information processing and control over wireless networks, in particular, theoretical analysis of fundamental limits in networked estimation and control, signal processing for wireless sensor networks (WSN) with quantization, packet loss, delay and fading, as well as design and analysis of signal processing and control algorithms over WSN. Relevant areas also include distributed and decentralized estimation and control algorithm design, e.g., with respect to wireless control applications. Experience of theoretical and experimental work within the field is important, as is experience of extensive programming in MATLAB and preferably also in LabVIEW. The duties include theoretical analysis, algorithm design and implementation via software based simulations, and documentation in the form of technical papers and reports. Some teaching may be included in the position at a level not exceeding 20%.

Qualifications required: To qualify for an employment as a post-doctor, the applicants must hold a PhD degree or a foreign qualification deemed equivalent to a PhD and the PhD degree must have been obtained no more than three years prior to the application date; however, for example, periods of sick leave or parental leave are deducted from the three-year period.

For this position it is required to have a PhD in Signal Processing, Automatic Control or Wireless Communications with applications to networked systems or a closely related subject with high quality publications in the related area of signal processing, control and wireless communications. Particular emphasis will be placed on a strong mathematical background and documented research experience in signal and information processing/control for/via wireless sensor networks.

For further information about the position, please contact Professor Anders Ahlén, anders.ahlen@angstrom.uu.se. Information about the Division of Signals and Systems can be found at www.signal.uu.se.

Apply before June 1, 2016.

Link to the position: <http://www.uu.se/en/about-uu/join-us/details/?positionId=96284>

[Back to the contents](#)

6.11. PostDoc: University of Michigan, USA

Contributed by: Dawn Tilbury, tilbury@umich.edu

We are looking for a postdoc in the area of manufacturing control systems. The postdoc would work with Professors Dawn Tilbury and Kira Barton in Mechanical Engineering and Professor Morley Mao in Computer

Science. The research will bring together large data sets collected in real time from the factory floor, and created by real-time simulations, into a cloud-based environment for analysis. New control algorithms will be developed to improve the overall performance of the manufacturing system along the dimensions of productivity, quality, flexibility, and sustainability. The postdoc will work with a small industrial testbed at the University of Michigan that includes 3 industrial robots and 4 CNC machines, connected by a conveyor, and instrumented with industrial-quality sensors and controllers. Multiple graduate and undergraduate students work in the group, and there is good collaboration with industrial partners. Funding comes from NSF and industry. Required qualifications include: a recent PhD in Mechanical or Electrical Engineering (or a related field); experience in control systems (theory and/or application); excellent communication skills. Desirable qualifications include: experience with industrial control systems; experience with manufacturing systems; experience with Big Data or Cloud Computing; C/C++/Java programming experience.

Interested candidates should send their CV and a cover letter describing their specific interest and how their background fits the qualifications to Prof. Dawn Tilbury, <tilbury@umich.edu> preferably before April 30.

[Back to the contents](#)

6.12. PostDoc: UC Berkeley, USA

Contributed by: Javad Lavaei, lavaei@berkeley.edu

A postdoctoral position is available in the Department of Industrial Engineering and Operations Research at University of California, Berkeley. The research agenda is broadly on discrete/nonconvex nonlinear optimization problems arising in the energy area. This is a minimum one-year position, with the possibility of a second year extension. To apply, please email a CV along with sample research papers to Professors Alper Atamturk and Javad Lavaei (atamturk@berkeley.edu and lavaei@berkeley.edu).

[Back to the contents](#)

6.13. PostDoc: Ohio State University, USA

Contributed by: Mingjun Zhang, zhang.4882@osu.edu

AFRL Sponsored Post-doc Position on Applied Neuron Science and Cognitive Engineering at OSU

We have one post-doctoral researcher opening position to work on applied neuron science and cognitive engineering through collaboration with AFRL. The goal of this position is to quantitatively integrate our recent research results on fluorescent peptide nanoparticles (Nature Nanotechnology, 2016), and combine single cell nano-characterization platform using systems science and mathematics approach to address the emerging needs in sensor-assess-argument-based (SAA) cognitive engineering, and Alzheimer's disease diagnosis as well as progression prediction.

Through close collaborations with group members with expertise on chemistry, biology, and nanotechnology, the postdoctoral fellow is expected to work on modeling, sensor data fusion, Kalman filtering and prediction, as well as closed control for SAA-based systems and Alzheimer's disease nano-characterization platform.

Interested applicants should send CVs along with 2-3 publications to zhang.4882@osu.edu.

Mingjun Zhang

Professor of Biomedical Engineering

The Ohio State University

NEWS: Nature offers plenty examples for inspiration in design and innovation. Check our recent Nature Nanotechnology paper on bio-inspired nanoparticles.

<http://www.nature.com/nnano/journal/v11/n4/full/nnano.2015.312.html>

[Back to the contents](#)

6.14. PostDoc: Israel Institute of Technology, Israel

Contributed by: Tal Shima, tal.shima@technion.ac.il

A post-doctoral position is available at the Department of Aerospace Engineering, Technion - Israel Institute of Technology, in Haifa, Israel.

The research is in the general area of guidance of unmanned vehicles, mainly aerial ones. The scope of the research is broad and possible topics include: 1) Cooperative guidance; 2) Integrated guidance and flight control; 3) Estimation based guidance; 4) Intertwined guidance and task assignment. The research will involve both theoretical and algorithmic aspects. Laboratory experiments on available ground and aerial robots may also be performed.

Candidates for this position should have a Ph.D. in engineering (aerospace, mechanical, electrical, or similar), computer science, or applied math. Strong background in optimal control and/or differential games is an advantage.

Application material should include:

- a cover letter
- detailed curriculum vitae, including educational background and a list of publications
- undergraduate and graduate studies grades transcripts
- contact information for at least two, preferably three, academic references

The material should be submitted, in pdf, via e-mail, to Prof. Tal Shima, tal.shima@technion.ac.il The position is available immediately and applications will be handled as they arrive until the position is filled.

For further inquiries, please contact Tal Shima at: tal.shima@technion.ac.il

[Back to the contents](#)

6.15. PostDoc: Northwestern University, USA

Contributed by: Randy Freeman, freeman@eecs.northwestern.edu

Postdoctoral Position in Control of Multi-Agent Systems
Neuroscience and Robotics Lab, Northwestern University

Applications are being accepted for a postdoctoral position in control of multi-agent systems, such as robot swarms. The ideal candidate would have excellent oral and written communication skills and a PhD in engineering, with a strong background in control theory, multi-agent systems, graph theory, motion planning, and robotics.

The successful candidate will work in the Neuroscience and Robotics Lab, <http://nrx.northwestern.edu/>, a stimulating environment at the intersection of biological and robotic systems. The research will be supervised by Profs. Randy Freeman and Kevin Lynch, in Electrical Engineering and Computer Science and Mechanical Engineering.

The expected duration of the position is two years, with other durations possible. The position is available immediately. To apply, email a single pdf file containing a brief cover letter describing your professional interests and future goals, a CV, and contact information for three references to Prof. Randy Freeman, freeman@eecs.northwestern.edu.

[Back to the contents](#)

6.16. PostDoc: University of Florida - REEF/AFRL, USA

Contributed by: Getachew K. Befekadu, gbefekadu@ufl.edu

Postdoctoral Researcher in Optimization and Inference at the University of Florida - REEF, USA

There is a postdoc opportunity in optimization and inference with Dr. Eduardo L. Pasiliao's research group at the UF-REEF/AFRL.

Responsibilities

- Conduct research and development in the area of decision optimization, implement novel algorithms and methods for solving large-scale optimization problems, and apply them to challenging real world problems.
- Formulate new research ideas and pursue them all the way to realization in prototypes. Publication in major journals is also required.
- Propose new directions and projects related to optimization problems and applications.

Qualifications

- A Ph.D. degree in Mathematics, Operations Research, Computer Science, Electrical Engineering, Industrial Engineering, or a closely related field.
- Very strong background in continuous and combinatorial optimization. Applicants with expertise in solving sequential optimization problems under uncertainty, planning, and scheduling are especially encouraged to apply.
- Background in related areas such as predictive analytics, machine learning and probabilistic inference.
- Good programming skills in Matlab, C/C++ or Java; experience with industrial grade solvers such as CPLEX and Gurobi and applying them for large-scale optimization projects.

Application

Interested candidates should send their CV, a research statement, and list of references to Dr. Getachew K. Befekadu at gbefekadu@ufl.edu

[Back to the contents](#)

6.17. PostDoc: UC Berkeley, CA

Contributed by: Javad Lavaei, lavaei@berkeley.edu

A postdoctoral position is available in the Department of Industrial Engineering and Operations Research at University of California, Berkeley. The research agenda is broadly on control theory. To apply, please email a CV along with sample research papers to Professor Javad Lavaei (lavaei@berkeley.edu).

[Back to the contents](#)

6.18. Research Scientist: MathWorks, USA

Contributed by: Pieter J. Mosterman, pieter.mosterman@mathworks.com

RESEARCH SCIENTIST POSITIONS AT MATHWORKS

Do you have a passion for emerging technologies with a knack for identifying trends and conceiving innovative solutions? Come join us to work together on strengthening our ties with the research community in the fields of either Cyber-Physical Systems or Robotics!

Be part of a dynamic multidisciplinary team that works with academic and industry customers around the world to advance the design of complex engineered systems. Help us with technology transfer and adoption while providing guidance on research directions that have industrial relevance and impact.

As a talented and enthusiastic member of our research team you will:

- Gain insight into industry needs and provide guidance to the research community with publications, presentations, as well as deep technical engagement.

- Contribute to the research community by organizing special sessions, panels, industry talks, grand challenges, special issues, etc.
- Accelerate academic research by creating and promoting case studies, benchmarks, interfaces, prototype solutions, etc.
- Work directly with MathWorks development engineers to implement relevant product capabilities.
- Help articulate key needs for research customers and provide subject matter expertise to guide the direction of and contribute to our long-term technology roadmap.
- Champion collaborative projects between thought leaders in the research community and MathWorks development engineers.
- Identify advanced technology needs and conceive innovative solutions to strengthen our intellectual property portfolio.

Find out more at:

<http://www.mathworks.com/company/jobs/opportunities/15217-cyber-physical-systems-research-scientist>

<http://www.mathworks.com/company/jobs/opportunities/15218-robotics-research-scientist>

[Back to the contents](#)