E-Letter on Systems, Control, & Signal Processing
Issue 384, August 2020

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Welcome to Issue 384 of the CSS E-letter available here.

- To submit new articles, visit article submissions on the E-Letter website.
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The next E-Letter will be mailed out at the beginning of September 2020.

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6.8 PhD: University of Kentucky, USA
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6.16 Faculty: Norwegian University of Science and Technology, Norway
6.17 Faculty: Delft University of Technology, The Netherlands
6.18 Faculty: Delft University of Technology, The Netherlands
6.19 Faculty: Chalmers University of Technology, Sweden

1 IEEE CSS Headlines

1.1. Become a CSS Member

Contributed by: Ahmad Taha, ahmad.taha@utsa.edu

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

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1.2. Follow the CSS Social Media Accounts

Contributed by: Ahmad Taha and Ankush Chakrabarty ahmad.taha@utsa.edu, chakrabarty@merl.com

Follow us on Twitter https://twitter.com/CSSIEEE
Like us on Facebook https://facebook.com/CSSIEEE

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1.3. CSS Technically Cosponsored Events

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

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

- 2020 IEEE 17th India Council International Conference (INDICON 2020). New Delhi, India. December 11-13, 2020. http://www.indicon2020.in/

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

- 24th International Conference on System Theory, Control and Computing (ICSTCC 2020). Sinaia, Romania. October 8-10, 2020. http://ace.ucv.ro/icstcc2020/

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

- 39th Chinese Control Conference (CCC2020). Shenyang, China. July 27-29, 2020. http://www.ccc2019.cn/en/index.html

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

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1.4. CSS Publications Content Digest

Contributed by: Kaiwen Chen, kaiwen.chen16@imperial.ac.uk

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

The CSS Publications Content Digest, available at
http://ieeecss.org/publications-content-digest
provides lists of current tables of contents of the periodicals sponsored by the Control Systems Society. Each issue offers readers a rapid means to survey and access the latest peer-reviewed papers of the IEEE Control Systems Society. We also include links to the Society's sponsored Conferences to give readers a preview of upcoming meetings.

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1.5. IEEE Transactions on Automatic Control

Contributed by: Alessandro Astolfi, ieeetac@imperial.ac.uk

IEEE Transactions on Automatic Control
Volume 65 (2020), Issue 8 (August)

Papers:

- Optimality and passivity of input-quadratic nonlinear systems Mario Sassano, Alessandro Astolfi, p. 3229
- Analysis of Two-Dimensional Feedback Systems over Networks Using Dissipativity Yang Yan, Lanlan Su, Vijay Gupta, Panos J. Antsaklis, p. 3241
- Information Relaxation Bounds for Partially Observed Markov Decision Processes Martin Haugh, Octavio Ruiz Lacedelli, p. 3256
- Combining linear algebra and numerical optimization for gray-box affine state-space model identification Olivier Prot, Guillaume Mercere, p. 3272
- Feedback Nash Equilibrium for Randomly Switching Differential-Algebraic Games Aneel Tanwani, Quanyan Zhu, p. 3286
- Collective Stochastic Discrete Choice Problems: A Min-LQG Dynamic Game Formulation Rabih Salhab, Roland P. Malhame, Jerome Le Ny, p. 3302
- A Dynamic Feedback Framework for Control of Time-Delay Nonlinear Systems with Unstable Zero-Dynamics Wei Lin, Xu Zhang, p. 3317
- On convergence for piecewise affine models of gene regulatory networks via a Lyapunov approach Mirko Pasquini, David Angeli, p. 3333
- Compositional and Abstraction-Based Approach for Synthesis of Edit Functions for Opacity Enforcement Sahar Mohajerani, Yiding Ji, Stephane Lafortune, p. 3349
- Decentralized Goal Assignment and Safe Trajectory Generation in Multi-Robot Networks via Multiple Lyapunov Functions Dimitra Panagou, Matthew Turpin, Vijay Kumar, p. 3365
- Hybrid Systems with Delayed Jumps: Asymptotic Stability via Robustness and Lyapunov Conditions Berk Altin, Ricardo G. Sanfelice, p. 3381
- On the chain stability of bilateral control model Liang Wang, Berthold K. P. Horn, p. 3397
- Heterogeneous Hegselmann-Krause Dynamics with Environment and Communication Noise Ge Chen, Wei Su, Songyuan Ding, Yiguang Hong, p. 3409

- Continuous-Time Accelerated Methods via a Hybrid Control Lens Arman Sharifi Kolarijani, Peyman Mohajerin Esfahani, Tamas Keviczky, p. 3425
- Proximal algorithms for large-scale statistical modeling and sensor/actuator selection Armin Zare, Hesameddin Mohammadi, Neil K Dhingra, Tryphon T. Georgiou, Mihailo R. Jovanovic, p. 3441
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- A Decentralized Event-Based Approach for Robust Model Predictive Control Arman Sharifi Kolarijani, Sander Christian Bregman, Peyman Mohajerin Esfahani, Tamas Keviczky, p. 3517
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- Risk of Collision and Detachment in Vehicle Platooning: Time–Delay–Induced Limitations and Trade–offs Christoforos Somarakis, Yaser Ghaedsharaf, Nader Motee, p. 3544
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- Relative Network Observability and its Relation with Network Observability Yunfeng Hou, Weilin Wang, Yanwei Zang, Feng Lin, Miao Yu, Chaohui Gong, p. 3584
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- Stabilization of Nonlinear Dynamic Systems over Limited Capacity Communication Channels Vahideh Sanjaroon, Alireza Farhadi, Abolfazl Seyed Motahari, Babak H. Khalaj, p. 3655

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- Tracking Control of Nonlinear Networked and Quantized Control Systems with Communication Delays Wei Ren, Junlin Xiong, p. 3685
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- Passivity-Based Control for Hidden Markov Jump Systems with Singular Perturbations and Partially Unknown Probabilities Feng Li, Shengyuan Xu, Hao Shen, Qian Ma, p. 3701
- The implicit discretization of the super-twisting sliding-mode control algorithm Bernard Brogliato, Andrey Polyakov, Denis Efimov, p. 3707
- Observer-Based Control for Cyber-Physical Systems With Periodic DoS Attacks Via A Cyclic Switching Strategy Yanzheng Zhu, Wei Xing Zheng, p. 3714

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1.6. Submission to IEEE Control Systems Letters with ACC 2021

Contributed by: Francesca Bettini, bettini@dei.unipd.it

Submission to IEEE Control Systems Letters with ACC (2021) option starting July 1, 2020, is possible

For the first year the IEEE Control Systems Letters (L-CSS) offers the opportunity for authors to not only publish a paper in the journal but also to present the same paper at the annual conference of the American Automatic Control Council (AACC): the American Control Conference (ACC).

The joint submission to IEEE Control Systems Letters and ACC 2021 will be possible from July 1 to September 1, 2020.

Manuscripts submitted to the L-CSS with the ACC option will undergo a regular review as papers submitted to the Letters (so they should be submitted only to the L-CSS and not to the ACC). At the end of the first round of review, the reviews and the Associate Editor's report will be forwarded to the ACC Program Committee, which will use them to decide on the inclusion of these manuscripts in the program of the Conference.

After the first cycle of review, the decisions about the acceptance or rejection of the manuscript for the L-CSS and for the ACC will be independent of each other. In particular, reviews and reports collected during a possible second round of review will not be forwarded to the ACC Program Committee.

Note that you can submit your paper through the Letters also if the paper will be part of an Invited Session at ACC 2021. In that case you should select "L-CSS and ACC Invited", as submission type.

For more information about joint submission to L-CSS and ACC see, specifically, https://bit.ly/2zPYVqC section "L-CSS and CDC/ACC".

For more information about the L-CSS, please check the website at
http://ieee-cssletters.dei.unipd.it/index.html.

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1.7. IEEE Transactions on Control of Network Systems: Special Issue

Contributed by: Alex Olshevsky, alexols@bu.edu

Special Issue of TCNS on Dynamics and Behaviors in Social Networks
Mathematical models of "social networks", i.e., communities of individuals interacting in some way through a proximity graph, have existed for more than 50 years and have been used extensively by Sociologists, Behavioral Scientists, and Economists. The traditional focus has been on obtaining models that capture sociological effects like interpersonal influence (tendency of individuals to be influenced by others), homophily (tendency to associate with other individuals of similar behavior, opinions and characteristics), polarization (tendency of a community to split into two opposite factions), crowd effects (tendency to follow the opinion of the majority), echo chambers (tendency of an isolated community to self-amplify their beliefs), etc.

With the advent of on-line social media, the breadth and scope of the research in social network theory has scaled drastically in both size and accuracy, as numbers of interacting individuals have soared, and recorded data streams have rendered the analysis of individual behaviors, preferences, and interpersonal relationships more quantitative than ever before.

Alongside topological notions drawn from network science such as centrality, connectivity, and resilience, in order to capture the emerging behavior of such complex system there is also a need to adopt a system perspective, and to rely on dynamical systems analysis tools familiar to the Control community. It is not surprising that the last few years have witnessed a steep increase of the number of researchers from this community involved into social network theory.

The aim of this special issue is to consolidate this trend, by giving a broad overview of the state of the art of the field, gathering together various samples of on-going research in the field, and presenting relevant research opportunities on dynamics and behaviors in social networks in which the control community could play a key role. In particular, we would like to also invite contributions by joint teams (e.g., from control systems and social sciences or economics) describing in control terms some challenges faced by the social scientists in their understanding of the opinion dynamics phenomena, or recent unexplained observations. We expect to receive papers dealing with concepts such as dynamical modeling, stability, robustness, influence of network topology on the dynamics, but also parametric identification, and perhaps even the use of feedback. The Special Issue is focused mostly on papers with methodological contribution, but interdisciplinary papers containing also experimental research will also be considered.

Specific Topics include (but not limited to)

- Opinion dynamics
- Network games
- Distributed decision-making
- Targeting and interventions in social networks
- Epidemic spreading over networks

• Emerging dynamics of collective behaviors
• Influences as control actions
• Social systems inference and identification from data

Important Dates

• Submissions open: June 15, 2020
• Submissions deadline: October 15, 2020
• Completion of first round review: January 2021
• Acceptance: June 2021
• Final submission due: August 2021
• Tentative publication date: September 2021

Submission Details: Information on the submission process and manuscript format can be found at: https://cemse.kaust.edu.sa/tcns/information-authors

Link to Call for Papers:
https://cemse.kaust.edu.sa/tcns/special-issue-dynamics-and-behaviors-social-networks

Guest Editors:

• Claudio Altafini, Department of Electrical Engineering Linkoping University, SE-58183 Linkoping, Sweden; claudio.altafini@liu.se
• Giacomo Como, Department of Mathematical Sciences Politecnico Di Torino, Torino, Italy; giacomo.como@polito.it
• Julien M. Hendrickx, Department of Mathematical Engineering, ICTEAM Institute, UCLouvain, Louvain-la-Neuve, Belgium; julien.hendrickx@uclouvain.be
• Alexander Olshevsky, Department of Electrical and Computer Engineering Boston University, Boston, MA, USA; alexols@bu.edu
• Alireza Tahbaz-Salehi, Kellogg School of Management Northwestern University, Evanston, IL, USA; alirezat@kellogg.northwestern.edu

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2 Miscellaneous

2.1. European Control Award

Contributed by: Paul Goulart, paul.goulart@eng.ox.ac.uk

The European Control Award (ECA) is to recognize outstanding contributions by a young researcher in the area of systems and control. The award is sponsored by the European Control Association (EUCA), and will be presented during the annual European Control Conference. The recipient will give a plenary lecture during the final day of the ECC.

Details of this award and the nomination procedure can be found at
https://euca-ecc.org/eca.html

The deadline for nominations for the European Control Award is November 30th, 2020.

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2.2. IFAC Activity Fund

Contributed by: Paul Goulart, paul.goulart@eng.ox.ac.uk

The IFAC Activity Fund invites applications for financial support of initiatives that foster and promote public engagement with the control engineering community.

The fund sponsors initiatives that:

- Maximize control engineering community engagement;
- Promote inclusion and diversity in alignment with the IFAC guidelines;
- Increase control engineering influence in public discourse and decision-making.

Financial assistance of Euro 5,000 is provided to activity organisers. Applications will be sought twice a year. A committee of five members from different geographical regions and technical backgrounds administers the fund. The next application deadline is the 15th of October 2020. For more information, email activityfund@ifac-control.org.

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3 Books

3.1. Linear Algebra Based Controllers

Contributed by: Pedro Albertos, pedro@aii.upv.es

Linear Algebra Based Controllers: Design and Applications by G. Scaglia, M. E. Serrano and P. Albertos
Paperback ISBN: 978-3-030-42817-4
eBook ISBN: 978-3-030-42818-1
Published Date: 14th July 2020; Springer Nature Switzerland AG
Paperback, 149 pages, Printed book $149.99. eBook $109.00
https://doi.org/10.1007/978-3-030-42818-1
https://www.springer.com/gp/book/9783030428174

Description: This book summarizes the application of linear algebra-based controllers (LABC) for trajectory tracking for practitioners and students across a range of engineering disciplines. It clarifies the necessary steps to apply this straight-forward technique to a non-linear multivariable system, dealing with continuous or discrete time models, and outline the steps to implement such controllers. In this book, the authors present an approach of the trajectory tracking problem in systems with dead time and in the presence of additive uncertainties and environmental disturbances. Examples of applications of LABC to systems in real operating conditions (mobile robots, marine vessels, quadrotor and pvtol aircraft, chemical reactors and First Order Plus Dead Time systems) illustrate the controller design in such a way that the reader attains an understanding of LABC.

Key Features:
• Describes the use of linear algebra based control algorithms (LABC) emphasizing their ease to use in various domains
• Synthesizes and generalizes the LABC, delivering realistic applications examples with additive uncertainty and time delay
• Presents an alternative perspective of control systems theories

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Chapter 7 Uncertainty Treatment
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3.2. Design of Linear Multivariable Feedback Control Systems

Contributed by: Laura Burgess, laura.burgess@springer.com

Design of Linear Multivariable Feedback Control Systems by Joseph Bongiorno and Kiheon Park
ISBN: 978-3-030-44355-9
July 2020, Springer
Hardcover, 453 pages, $219.99/€176,79
https://www.springer.com/gb/book/9783030443559

This book contains a derivation of the subset of stabilizing controllers for analog and digital linear time-invariant multivariable feedback control systems that insure stable system errors and stable controller outputs for persistent deterministic reference inputs that are trackable and for persistent deterministic disturbance inputs that are rejectable. For this subset of stabilizing controllers, the Wiener-Hopf methodology is then employed to obtain the optimal controller for which a quadratic performance measure is minimized. This is done for the completely general standard configuration and methods that enable the trading off of optimality for an improved stability margin and/or reduced sensitivity to plant model uncertainty are described. New and novel results on the optimal design of decoupled (non-interacting) systems are also presented.

The results are applied in two examples: the one- and three-degree-of-freedom configurations. These demonstrate that the standard configuration is one encompassing all possible feedback configurations. Each chapter is completed by a group of worked examples, which reveal additional insights and extensions of the theory presented in the chapter. Three of the examples illustrate the application of the theory to two physical cases: the depth and pitch control of a submarine and the control of a Rosenbrock process. In the latter case, designs with and without decoupling are compared.

This book provides researchers and graduate students working in feedback control with a valuable reference for Wiener–Hopf theory of multivariable design. Basic knowledge of linear systems and matrix theory is required.

Contents:

1. Introduction
2. Stabilizing Controllers, Tracking, and Disturbance Rejection
3. H2 Design of Multivariable Control Systems
4. H2 Design of Multivariable Control Systems with Decoupling
5. Numerical Calculation of Wiener–Hopf Controllers

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3.3. Structural Methods in the Study of Complex Systems

Contributed by: Laura Burgess, laura.burgess@springer.com

Structural Methods in the Study of Complex Systems edited by Elena Zattoni, Anna Maria Perdon, and Giuseppe Conte
ISBN: 978-3-030-18571-8

July 2020, Springer
Hardcover, 279 pages, $169.99/€145,59
https://www.springer.com/gb/book/9783030185718

Structural Methods in the Study of Complex Systems helps the reader respond to the challenge of mastering complexity in systems and control. The book details the fundamental control problems arising from complex dynamical systems and shows how they can be tackled effectively by means of methods developed from graph theory, differential algebra and geometric approaches. These "structural methods" produce abstractions that fit a wide variety of applications by taking advantage of their intrinsic focus on the essential characteristics of dynamical systems, their geometric perspective and visual representation, and their algebraic formalization and ability to generate algorithmic frameworks to complement the theoretical treatment.

The original work and latest achievements of the contributors, expanding on material presented at a workshop organized to coincide with the 2018 European Control Conference will assist systems and control scientists interested in developing theoretical and computational tools to solve analysis and synthesis problems involving complex dynamical systems. The contributions provide a comprehensive picture of available results along with a stimulating view of possible directions for future investigations in the field. Emphasis is placed on methods with solid computational background and on specific engineering applications so that readers from both theoretical and practical backgrounds will find this collection of use.

Contents

1. Complex Systems and Control: The Paradigms of Structure Evolving Systems and System of Systems
2. Stability and the Kleinian View of Geometry
3. Strong Structural Controllability and Zero Forcing
4. Output Regulation of Hybrid Linear Systems: Solvability Conditions and Structural Implications
5. A Stratified Geometric Approach to the Disturbance Decoupling Problem with Stability for Switched Systems Over Digraphs
6. Unknown-Input State Observers for Hybrid Dynamical Structures
7. Advances of Implicit Description Techniques in Modelling and Control of Switched Systems
8. Huygens Synchronization Over Distributed Media—Structure Versus Complex Behavior

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3.4. Differential Privacy for Dynamic Data

Contributed by: Jerome Le Ny, jerome.le-ny@polymtl.ca

"Differential Privacy for Dynamic Data" by Jerome Le Ny, ISBN 978-3-030-41039-1, 2020, Springer
https://www.springer.com/us/book/9783030410384

This new monograph provides the necessary foundations to understand differential privacy and describes practical algorithms enforcing this concept for the publication of real-time statistics based on sensitive data. The main application is to enforce formal privacy constraints in large-scale infrastructure systems interacting with private users. The methods described rely heavily on tools from systems and control to design

estimators that take advantage of the availability of statistical models about the data to improve their performance.

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4 Journals

4.1. Evolution Equations and Control

Contributed by: Irena Lasiecka, lasiecka@memphis.edu

Contents: Evolution Equations and Control Theory [EECT]
Volume 9, Number 3, 2020
https://www.aimsciences.org/journal/A0000-0000

Papers:

1. Forward controllability of a random attractor for the non-autonomous stochastic sine-Gordon equation on an unbounded domain
Shuang Yang and Yangrong Li
2020, 9(3): 581-604 doi: 10.3934/eect.2020025
2. Local null controllability of coupled degenerate systems with nonlocal terms and one control force
R. Demarque, J. Límaco and L. Viana
2020, 9(3): 605-635 doi: 10.3934/eect.2020026
3. Semiglobal exponential stabilization of nonautonomous semilinear parabolic-like systems
Sérgio S. Rodrigues
2020, 9(3): 635-672 doi: 10.3934/eect.2020027
4. Boundary controllability of the Korteweg-de Vries equation on a tree-shaped network
Eduardo Cerpa, Emmanuelle Crépeau and Julie Valein
2020, 9(3): 673-692 doi: 10.3934/eect.2020028
5. Pointwise control of the linearized Gear-Grimshaw system
Roberto de A. Capistrano-Filho, Vilmos Komornik and Ademir F. Pazoto
2020, 9(3): 693-719 doi: 10.3934/eect.2020029
6. Remarks on the damped nonlinear Schrödinger equation
Tarek Saanouni
2020, 9(3): 721-732 doi: 10.3934/eect.2020030
8. Approximate continuous data assimilation of the 2D Navier-Stokes equations via the Voigt-regularization with observable data
Adam Larios and Yuan Pei
2020, 9(3): 733-751 doi: 10.3934/eect.2020031
9. Existence and asymptotic stability of periodic solutions for neutral evolution equations with delay
Qiang Li and Mei Wei
2020, 9(3): 753-772 doi: 10.3934/eect.2020032
10. Continuity with respect to fractional order of the time fractional diffusion-wave equation
Nguyen Huy Tuan, Donal O'Regan and Tran Bao Ngoc
2020, 9(3): 773-793 doi: 10.3934/eect.2020033
11. Design of boundary stabilizers for the non-autonomous cubic semilinear heat equation driven by a multiplicative noise
Ionuţ Munteanu
2020, 9(3): 795-816 doi: 10.3934/eect.2020034

12. On stochastic maximum principle for risk-sensitive of fully coupled forward-backward stochastic control of mean-field type with application
Adel Chala and Dahbia Hafayed
2020, 9(3): 817-843 doi: 10.3934/eect.2020035
13. Time-varying integro-differential inclusions with Clarke sub-differential and non-local initial conditions: existence and approximate controllability
Yong-Kui Chang and Xiaojing Liu
2020, 9(3): 845-863 doi: 10.3934/eect.2020036
14. On the management fourth-order Schrödinger-Hartree equation
Carlos Banquet and Élder J. Villamizar-Roa
2020, 9(3): 865-889 doi: 10.3934/eect.2020037
15. Nonlocal final value problem governed by semilinear anomalous diffusion equations
Dinh-Ke Tran and Tran-Phuong-Thuy Lam
2020, 9(3): 891-914 doi: 10.3934/eect.2020038

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4.2. IEEE/CAA Journal of Automatica Sinica

Contributed by: Yan Ou, yan.ou@ia.ac.cn

IEEE/CAA Journal of Automatica Sinica
Volume 7 (2020), Issue 4 (July)
http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=6570654

Papers:

- Parallel Control for Continuous-Time Linear Systems: A Case Study. Q. L. Wei, H. Y. Li, and F.-Y. Wang, page 919
- Stability of Nonlinear Differential-Algebraic Systems Via Additive Identity. P. Di Franco, G. Scarciotti, and A. Astolfi, page 929
- An Iterative Pose Estimation Algorithm Based on Epipolar Geometry With Application to Multi-Target Tracking. J. H. White and R. W. Beard, page 942
- Data-based Fault Tolerant Control for Affine Nonlinear Systems Through Particle Swarm Optimized Neural Networks. H. W. Lin, B. Zhao, D. R. Liu, and C. Alippi, page 954
- A Spatial-Temporal Attention Model for Human Trajectory Prediction. X. D. Zhao, Y. R. Chen, J. Guo, and D. B. Zhao, page 965
- Approximate Dynamic Programming for Stochastic Resource Allocation Problem. A. Forootani, R. Iervolino, M. Tipaldi, and J. Neilson, page 975
- Concrete Defects Inspection and 3D Mapping Using CityFlyer Quadrotor Robot. L. Yang, B. Li, W. Li, H. Brand, B. Jiang, and J. Xiao, page 991
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4.3. Systems & Control Letters

Contributed by: Lusia Veksler, lveksler@ucsd.edu

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Volumes 140 and 141, June and July 2020

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- Time inconsistent asset–liability management with partial information, Guangchen Wang, Tianxiao Wang, Article 104687
- Stability analysis for a class of stochastic delay nonlinear systems driven by G-Brownian motion, Quanxin Zhu, Tingwen Huang, Article 104699

- Stability analysis of discrete-time semi-Markov jump linear systems with partly unknown semi-Markov kernel, Bao Wang, Quanxin Zhu, Article 104688
- Robust formation control under state constraints of multi-agent systems in clustered networks, Van Thiem Pham, Nadhir Messai, Dinh Hoa Nguyen, Noureddine Manamanni, Article 104689
- Fixed-time control design for nonlinear uncertain systems via adaptive method, Fang Wang, Guanyu Lai, Article 104704
- On the control of a class of non-strongly stabilizable SISO plants, Tomas Co, Article 104705
- Static and dynamic coherent robust control for a class of uncertain quantum systems, Chengdi Xiang, Ian R. Petersen, Daoyi Dong, Article 104702
- An efficient cooperative-distributed model predictive controller with stability and feasibility guarantees for constrained linear systems Daniel D. Santana, Márcio A.F. Martins, Darci Odloak, Article 104701
- A simple finite-time distributed observer design for linear time-invariant systems, Haik Silm, Denis Efimov, Wim Michiels, Rosane Ushirobira, Jean-Pierre Richard, Article 104707
- On polytopes in Hurwitz region, Vakif Dzhafarov, Özlem Esen, Taner Büyükköroğlu, Article 104706
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4.4. International Journal of Control, Automation, and Systems

Contributed by: Keum-Shik Hong, journal@ijcas.com

International Journal of Control, Automation, and Systems (IJCAS)
Vol. 18, No. 8, August 2020
ISSN: 1598-6446
http://www.springer.com/engineering/robotics/journal/12555
Indexed in: Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, SCOPUS, INSPEC, Google Scholar, ProQuest, Academic OneFile, Current Contents/Engineering, Computing and Technology, EI-Compendex, OCLC, SCImago, Summon by Serial Solutions

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4.5. IET Control Theory & Applications

Contributed by: Faraz Alam, farazalam@theiet.org

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Volume 14, July 2020, Issue 11 & 12
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- Walaaeldin Ghadiry ; Jalal Habibi ; Amir G. Aghdam ; Youmin Zhang , Generalised formulations for minimum distance trajectory in patrolling problems, DOI: 10.1049/iet-cta.2019.0281
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4.6. Asian Journal of Control

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

Asian Journal of Control
Vol. 22, No. 4 July, 2020

https://onlinelibrary.wiley.com/toc/19346093/2020/22/4

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1. Paper Title: A switched dynamic model for pointing tasks with a computer mouse
Authors: Stanislav Aranovskiy, Rosane Ushirobira, Denis Efimov, Géry Casiez
2. Paper Title: Optimal robot-environment interaction using inverse differential Riccati equation
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4. Paper Title: Dissipative interval observer design for discrete-time nonlinear systems
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5. Paper Title: Reduced-order sliding function design for a class of nonlinear systems
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19. Paper Title: Output tracking with disturbance attenuation for cascade control systems subject to network constraint
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22. Paper Title: Event-triggered robust state estimation for wireless sensor networks
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2. Paper Title: Back-stepping sliding mode control of one degree of freedom flight motion table
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3. Paper Title: Composite-rotating consensus of multi-agent systems with a leader and nonuniform delays
Authors: Lipo Mo, Yixuan Jiang
4. Paper Title: Robust fault detection filters design for switched systems with all subsystems unstable
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5. Paper Title: Improved energy dissipation control of overhead cranes
Authors: Shengzeng Zhang, Xiongxiong He, Qiang Chen, Yuanjing Feng -

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4.7. International Journal of Control

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International Journal of Control
Volume 92, Issue 8, 2020

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- Solution of the local boundary value problem for a nonlinear non-stationary system in the class of synthesising controls with account of perturbations, A. N. Kvitko, pages: 1931-1941
- Global output feedback control of feedforward nonlinear time-delay systems with unknown output function, Chao Guo & Xue-Jun Xie, pages: 1942-1953
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4.8. Automatica

Contributed by: Kay Tancock, k.tancock@elsevier.com

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Volume 117, July 2020

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Integrated supervised adaptive control for the more Electric Aircraft. Alberto Cavallo, Giacomo Canciello, Antonio Russo
A tool for analysis and synthesis of heterogeneous multi-agent systems under rank-deficient coupling. Jin Gyu Lee, Hyungbo Shim
Output feedback stabilization of an underactuated cascade network of interconnected linear PDE systems using a backstepping approach. Jean Auriol
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Contributed by: Kay Tancock, k.tancock@elsevier.com

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Contributed by: Kay Tancock, k.tancock@elsevier.com

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Contributed by: Kay Tancock, k.tancock@elsevier.com

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Contributed by: Kay Tancock, k.tancock@elsevier.com

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4.15. CFP: Asian Journal of Control

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

Special Issue on "Emerging Control Techniques for Mechatronic and Transportation Systems"

It is extremely important in the contemporary global society to develop reliable control techniques for mechatronic and transportation systems that can be easily implemented using modern digital and wireless technologies to force engineering systems to behave like skilled workers who work quickly, accurately, and cheaply, despite parametric variations, nonlinearities, and persistent disturbances. Many engineering control problems still remain unsolved, especially for mechatronic and transportation systems, under the following realistic hypotheses: parametric and/or structural uncertainties, fast-varying references, measurement noises, real amplifiers and actuators, and/or finite online computation time of the control signal. Furthermore, to reduce the gap between theory and practical feasibility, the designed control laws should be easy to design and implement with smart sensors, power supplies, and intelligent actuators.

The objective of this Special Issue is to present emerging control techniques for mechatronic and transportation systems that can be successfully applied to numerous engineering applications (e.g., control of

rolling mills, conveyor belts, unicycles, bicycles, cars, trains, ships, airplanes, drones, missiles, satellites, platoons, manufacturing robots, such as welding, painting, assembly, pick and place for printed circuit boards, packaging and labeling, palletizing, product inspection, and testing ones, and surgical robots). The topics include but are not limited to:
– Unmanned systems
– Industrial robots
– Remote servomechanisms
– Transportation systems
– Vehicle platoons
– Networked autonomous agents
– Smart sensors and actuators
– Human-machine interaction and human-machine cooperation
– IoT control design
– From research to industry

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Important Dates:
September 15, 2020 Deadline for Submissions
November 15, 2020 Completion of First Review
January 15, 2021 Completion of Final Review
January 31, 2021 Receipt of Final Manuscript
March 31, 2021 (Tentatively Vol. 23, No. 2) Publication

Special Issue on "Analysis and Control of Complex Cyber-Physical Networks"

A large number of coupled systems in nature and society can be modeled by complex cyber-physical networks, whose normal functioning significantly relies on the tight interactions between its physical and cyber components. Many modern critical infrastructures can be appropriately modelled as complex cyber-physical networks. Typical examples of such infrastructures are power grids, the Internet, WWW, and public transportation systems. The ubiquity of such networked systems leads to many important and fascinating scientific problems concerning how network topologies and parameters affect collective dynamics, and how to control them. Analysis and control of complex cyber-physical networks have received a lot of attention recently, from various scientific and engineering communities. Furthermore, revealing the fundamental properties and controlling the collective behaviors of networked systems not only can provide a better understanding of the emergence mechanisms for cooperative behaviors, but also can provide benefits to various applications of cyber-physical networked systems, such as smart grids, Internet of Things and unmanned aircraft systems.

The focus of this special issue is on new approaches to analysis and synthesis of complex cyber-physical networks as well as their potential practical applications. The special issue aims to establish a forum for international researchers from different fields of electrical engineering, bioinformatics, systems and control theory, and applied mathematics, to present and evaluate the most recent developments and new ideas on analysis and synthesis of complex cyber-physical networks, regarding both fundamental theory and practical applications. The topics to be covered include, but are not limited to:
– Analysis and coordination control of complex cyber-physical networks
– Bio-inspired control techniques for networked systems
– Big-data mining and analysis over complex cyber-physical networks
– Controllability and observability of complex cyber-physical networks
– Distributed cognitive architectures in robotic networks
– Distributed control and estimation of multi-agent networks
– Distributed optimization of multi-agent networks
– Deep learning and intelligent control of complex cyber-physical networks
– Distributed machine learning in complex cyber-physical networks
– Distributed reinforcement learning techniques for networked systems
– Energy management and distributed intelligent control of smart grids
– Efficient privacy protection and security of complex cyber-physical networks
– Efficient privacy protection and security of complex cyber-physical networks
– Finite-time and fixed-time control of complex cyber-physical networks
– Game analysis and control over complex cyber-physical networks

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Important Dates:
November 30, 2020 Deadline for Submissions
February 28, 2021 Completion of First Review
May 31, 2021 Completion of Final Review
August 31, 2021 Receipt of Final Manuscript
January 31, 2021 (Tentatively Vol. 24, No. 1) Publication

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5 Conferences and Workshops

5.1. IEEE International Smart Cities Conference, Online

Contributed by: Andreas A. Malikopoulos, andreas@udel.edu

Smart Cities Solutions for New Challenges, Including a Pandemic 28 September – 1 October 2020 – Virtual Conference

The IEEE International Smart Cities Conference is the flagship IEEE Smart Cities event which brings together practitioners, city policymakers & administrators, infrastructure operators, industry representatives and researchers to present technologies and applications, share their experiences & views with current and future Smart Cities applications. The conference includes keynote and panel session discussions, tutorials given by experts on state-of-the-art topics, and special sessions on emerging topics with the aim of complementing the regular program.

What is the IEEE Smart Cities IEEE Smart Cities brings together IEEE's broad array of technical societies and organizations to advance the state of the art for smart city technologies for the benefit of society and to set the global standard in this regard by serving as a neutral broker of information amongst industry, academic, and government stakeholders. The mission of the IEEE Smart Cities is:
- To be recognized as the authoritative voice and leading source of credible technical information and educational content within the scope of smart cities identified below.
- To facilitate and promote both the collaborative and individual work of its Member Societies regarding smart city technology.

More information can be found here:
https://attend.ieee.org/isc2-2020/

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5.2. IMA Conference on Mathematics of Robotics, UK

Contributed by: Victor Becerra, victor.becerra@port.ac.uk

The IMA Conference on Mathematics of Robotics aims to bring together researchers working on all areas of robotics which have significant mathematical content and highlight the mathematical depth and sophistication of techniques applicable to Robotics. The conference will be held on September 8 - 10, 2021 at Manchester Metropolitan University, Manchester, UK. Areas of interest include but are not limited to Topology, Algebraic Geometry, Dynamical Systems and Control, Combinatorial and Stochastic Methods, Statistics, and Cognitive Robotics.

Original technical contributions are currently being accepted in the form of full papers of at most 8 pages. Papers should be submitted by 26 March 2021 via https://my.ima.org.uk/. Before submitting a paper, please ensure that it follows the guidelines listed at
https://ima.org.uk/11468/ima-conference-on-mathematics-of-robotics/.

This conference will feature invited talks from Dr Mini Saag (University of Surrey, UK), Prof Frank Sottile (Texas A&M University, USA), and Prof Stefano Stramigioli – (University of Twente, The Netherlands). Further invited speakers may be listed at a later date.

Registration for this Conference is currently open at https://my.ima.org.uk/. Please visit
https://ima.org.uk/11468/ima-conference-on-mathematics-of-robotics/ for further information including delegate fees and contact information. This conference has been organized in cooperation with the Society for Industrial and Applied Mathematics (SIAM).

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5.3. World Congress: Mathematical Problems in Engineering, Prague

Contributed by: Seenith Sivasundaram, seenithi@gmail.com

World Congress: Mathematical Problems in Engineering, Aerospace, and Sciences, Prague
When: Date: June 22-25, 2021
Where: Location: Czech Technical University in Prague, Prague, Czech Republic
Website: http://www.icnpaa.com
http://www.icnpaa.com/index.php/icnpaa/ICNPAA2020

ICNPAA's AIM: Mathematical Problems in Engineering, Aerospace, and Science have stimulated cooperation among scientists from a variety of disciplines. Developments in computer technology have additionally allowed for solutions to mathematical problems. This international forum will extend scholarly cooperation and collaboration, encouraging the dissemination of ideas and information.

The conference will have a pool of active researchers, with a proper balance between academia and industry, as well as between senior and junior researchers, including graduate students and post-doctoral fellows. It is anticipated that such a balance will provide both senior and junior researchers an opportunity to interact and to have a wider picture of recent advances in their respective fields. The conference, especially, enables the setting up of new interdisciplinary research directions among its participants by establishing links with world-renowned researchers, making possible joint international projects that will no doubt bring about fresh and innovative ideas and technologies in engineering, aerospace, and sciences

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

The proceedings will be published by the American Institute of Physics. AIP Conference Proceedings are indexed in:
• Astrophysics Data System(ADS)

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

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5.4. IFAC Conference on Analysis and Design of Hybrid Systems, Belgium

Contributed by: Guillaume Berger, guillaume.berger@uclouvain.be

Call for Papers: IFAC Conference on Analysis and Design of Hybrid Systems

The 7th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 2021) will take place from 7 to 9 July 2021, in Brussels. Please find below the Call for Papers (also available on the website of the conference: https://sites.uclouvain.be/adhs21/).

Circulation of this CFP is appreciated. Please send an email to adhs2021@uclouvain.be containing your postal address if you wish to receive printed copies of the poster and or flyers.

For any questions, please answer to: adhs2021@uclouvain.be
Raphaël Jungers (UCLouvain), General chair of ADHS 2021

* Invited Session Proposals due: early-December, 2020
* Paper Submissions due: mid-December, 2020
* Author notification: mid-February, 2021

The Organizing Committee has the pleasure of inviting you to participate in the 7th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS 21) to be held in Brussels, Belgium, July 7-9, 2021.

ADHS 2021 will take place at the University Foundation, Brussels and is organized by the department of Applied Mathematics of UCLouvain. Virtual attendance will be possible, and the extent of this possibility will be adapted to the situation of the pandemia. The conference happens under the auspices of IFAC and is sponsored by the IFAC Technical Committee on Discrete Event and Hybrid Systems.

Contributions are invited in all areas pertaining to the engineering of hybrid systems including: modelling, specification, verification, analysis, control synthesis, simulation, validation, and implementation. We solicit papers and invited session proposals describing theoretical or applied research in the area. We also welcome papers describing tools, reporting case studies or connecting the cognate fields of control theory and formal verification.

Contributions are encouraged on applications of hybrid methods in various fields, such as automotive, avionics, energy and power, mobile and autonomous robotics, the process and manufacture industry, transportation and infrastructure networks, communication networks and networked control systems, cyber-

physical systems, safety-critical systems, systems and synthetic biology.

A poster session will be organized and IFAC Young Author, Best Paper, Best Repeatability and Best Poster Prizes will be awarded.

The Program Chairs are planning to edit a special issue of NAHS: the authors of selected papers will be invited to contribute with significantly revised and extended versions of their manuscripts, containing new results.

Author Guidelines
* Regular papers: Regular papers can have a length of up to 8 pages at submission. Accepted papers are limited to 6 pages in the conference preprints and on-line proceedings.
* Invited session proposals: Invited sessions consist of 4 to 6 papers related to a common theme that fits within the scope of ADHS. An invited session proposal should contain a short description of the common theme as well as the list of papers in the session and their abstracts. The invited session organiser first has to submit the pdf file of the session proposal (without participating papers). The IFAC Conference Manuscript Management System then returns an acknowledgment that contains an alpha-numeric code for the proposed session. Subsequently, the organiser has to notify the contributing authors of their invited session code. The corresponding author of each paper then submits the paper on-line as an invited paper.
* Invited session papers: Invited session papers can have a length of up to 8 pages at submission. Invited session papers go through the same review process as regular papers. Accepted papers are limited to 6 pages in the conference preprints and on-line proceedings. Submission as an invited session paper requires the invited session code, which can be obtained from the session organiser.

Submission Instructions
* The website for submission is: https://ifac.papercept.net/conferences/scripts/start.pl
* All papers submitted to ADHS 21 must be written in English and formatted in the standard IFAC 2-column format, provided on the IFAC Conference Management System website.
* For initial submissions, all regular and invited session papers are limited to eight (8) pages. The submission website will not permit longer papers to be uploaded.
* For the final upload, all accepted and invited papers are limited to six (6) pages.
* For each accepted paper, at least one of the authors should have a full registration in order to have the paper included in the preprints and the post-conference on-line proceedings at IFAC-PapersOnLine.
* Author's kits with style (.cls) files for LaTeX are available from the submission website. Go to http://ifac.papercept.net and select "Support" for these files and example files, or directly go to the support page. Please do not change the formatting in any way.

Important Dates
- Invited Session Proposals due: early-December, 2020
- Paper Submissions due: mid-December, 2020
- Author notification: mid-February, 2021
- Final papers due: TBA
- Early registration: TBA
- Conference: July 7-9, 2021

The reference timezone is Central European Summer Time.

Committees
General Chair
* Raphaël Jungers (UCLouvain, BE)
Program Chairs
* Alessandro Abate (U. Oxford, UK)
* Necmiye Ozay (U. Michigan, USA)
Program Committee
* TBA

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6 Positions

6.1. PhD: Eindhoven University of Technology, The Netherlands

Contributed by: Zhiyong Sun, z.sun@tue.nl

PhD position: Resilient and secure coordination in networked multi-robot systems

The project aims to develop a resilient and robust networked coordination framework for multi-robotic systems that are able to address local system conflict and uncertain sensor information, and to improve decision-making capability with guaranteed stability, optimality and intelligence. The objective of this PhD research is to exploit advanced control techniques (distributed adaptive control and filtering, robust control, distributed learning-based control) that improve resilience and security in networked multi-robot systems.

The PhD position is associated with support from the EAISI (Eindhoven Artificial Intelligence Systems Institute) research initiative. The Control System (CS) group at TU/e features Autonomous Motion Control (AMC) Lab which consists of multiple UAVs, ground vehicles, and VICON facilities. The AMC Lab provides an ideal testbed for testing and implementation of novel resilient and secure coordination in multi-vehicle systems from this project.

Conditions and benefits of employment: (1) Full-time temporary appointment for 4 years. (2) Gross salary between €2.395,00 and €3.061,00. (3) An extensive package of fringe benefits.

Interested candidates should email Dr. Zhiyong Sun (z.sun@tue.nl), with the required documents listed at:

https://jobs.tue.nl/en/vacancy/phd-position-resilient-and-secure-coordination-in-networked-multirobot-systems-855584.html

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6.2. PhD: George Washington University, USA

Contributed by: Peng Wei, pwei@gwu.edu

Two PhD openings at George Washington University (Washington DC, USA)

Peng Wei is an assistant professor at George Washington University Department of Mechanical and Aerospace Engineering, with a courtesy appointment in Electrical and Computer Engineering Department. With methods from control, optimization, machine learning, and artificial intelligence, he develops autonomy and decision support tools for aeronautics, aviation and aerial robotics. His current focus is on safety and scalability of decision making systems in complex, uncertain and dynamic environments. He is leading the Intelligent Aerospace Systems Lab (IASL). He received his Ph.D. degree in Aerospace Engineering from Purdue University in 2013 and his B.S. degree in Automation from Tsinghua University in 2007. He is an Associate Editor of AIAA Journal of Aerospace Information Systems.

There will be two PhD positions open in his group starting from Spring 2021. The two positions can be under either MAE department or ECE department. Motivated students with excellent mathematical background and strong programming skills are encouraged to apply, including but not limited to background

in dynamics and control, optimization, statistical machine learning, robotics, and reinforcement learning.

Please see more details about Prof. Peng Wei at his website https://web.seas.gwu.edu/pwei/. The application details and requirements can be found at SEAS website https://graduate.seas.gwu.edu/phd-admissions-requirements. If you are interested in working with Prof. Wei or have any questions, please contact him directly by sending your CV and transcripts to pwei@gwu.edu.

The application deadline for Spring 2021 is September 1st. The $80 application fee can be waived by attending an online information session.

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6.3. PhD: KU Leuven, Belgium

Contributed by: Jan Swevers, jan.swevers@kuleuven.be

Three PhD Positions at KULeuven, Belgium

1. PhD position in real-time dynamic model identification for a new generation of cobots

Collaborative robots or "cobots" are robots designed to operate in direct physical contact with a human operator. Cobots play a key role in the realization of the Industry 4.0 transformation towards efficient and agile flexible manufacturing processes. Current state-of-the-art cobots have however a limited usability because of their low payload capacity imposed by safety. This is a direct result of their traditional design with traditional actuation, limiting their payload-to-mass ratio of about 1:10.

In the Flemish ELYSA (Energy-efficient, Lightweight, safe Yet strong manipulator Arm for cobot applications) project, KU Leuven and the University of Brussels (VUB) join forces to design and develop a new generation of cobots, aiming at a payload-to-mass ratio of 1:1. The key elements of this project are a new actuator concept and a matching control framework that can cope with the complex and payload dependent nonlinear actuator characteristics.

In this research you will contribute to the development, implementation and experimental validation of the novel control framework. This framework will take into account the payload dependent dynamic model of the robot system, including its flexibilities, in order to avoid or compensate vibrations resulting from the latter. Your focus will be on the development, implementation and experimentally validation of new off-line and on-line data-driven modelling techniques: optimization based combined model structure selection, parameter and state estimation. You will research regularized estimation to find trade-offs between model complexity and accuracy, estimate model uncertainty to account for in the robust control design. You will first work on numerical models of the novel cobot, and gradually, as the hardware becomes available move towards experimental application and validation. You will closely cooperate with the other PhD researchers involved in this project and that focus on the mechanical design and controller development.

More details about these positions can be found at:
https://www.mech.kuleuven.be/en/pma/research/meco/vacancies

2. PhD position in fast optimal motion planning for robot gripping actions

The Industry 4.0 transformation is characterized by mass customization of products and advanced automation needs. As the context of an assembly or machining action moves from fixed to ever-changing, there arises a pressing need for strategies to plan robot motion on-the-fly, as opposed to classic pre-programmed motions. Current state-of-the art motion planners are lacking in optimality (do we find the fastest possible motion plan?), in computational speed (can we avoid dead-time of the system?), or in robustness (do we have a high success rate?).

In the Flemish FROGS (Flexible and Robust Robotics Gripping) project, several Flemish universities and companies join forces to design a holistic architecture to solve the robot gripping problem. In this context, KU Leuven will focus on the motion planning aspects.

In this research you will contribute to the development, implementation and experimental validation of a novel motion planning framework. This framework is proactive: it exploits a geometric and kinematic model of the robot to predict the outcome of control actions, allowing to produce those control trajectories up-front that lead to a collision free trajectory that obeys pose-to-pose boundary conditions and is optimal with respect to a chosen objective. Gradient-based constraint optimization techniques are central to the implementation. Your focus will be on identifying problem formulations that lead to fast computations with limited loss of optimality. Examples of possible formulations include a smart low-dimensional parametrization of the sought trajectory, a subdivision in geometric path generation and trajectory generation, and subdivision between offline optimization and online optimization. You will cooperate with the other researchers involved in this project in order to demonstrate your techniques on industrially relevant setups.

More details about these positions can be found at:
https://www.mech.kuleuven.be/en/pma/research/meco/vacancies

3. PhD Position in fast optimal motion planning for robot gripping actions

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For more information go to:
https://www.mech.kuleuven.be/en/pma/research/meco/vacancies

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6.4. PhD: Eindhoven University of Technology, The Netherlands

Contributed by: Carlos Murguia, c.g.murguia@tue.nl

PhD Position in Privacy-Preserving Fault Detection in Cyber-Physical Systems

The Dynamics and Control (D&C) group at Eindhoven University of Technology (TU/e) is looking for a talented PhD candidate to work on developing analysis and synthesis tools for privacy-preserving fault detection schemes for networked Cyber-Physical Systems (CPS).

Job Description: Technology companies today manufacture and sell high-tech equipment capable of measuring, processing, and transmitting operational data in real-time over the cloud. Companies collect data of the day-to-day operation of equipment to monitor the life and proper operation of their products. Online equipment monitoring allows them to forecast failures and schedule maintenance before a critical fault (event) occurs. However, sharing operational data might not be attractive to end-users as private/sensitive information of the products (services) they manufacture (provide) could be disclosed.

There are two potential privacy threats in this setting: 1) the customer does not wish the manufacturer (service provider) to infer certain information (e.g., manufactured products specs); and 2) it is the communication channel itself (e.g., the internet), what the customer does not trust. Conversely, online equipment monitoring extends the life of equipment, decreases production bottlenecks, and prevents high and unexpected costs. That is, we have two opposite aspects here, customers would like to share data to improve performance but they do not want to share it for privacy reasons. It is therefore attractive for both parties (customers and manufacturers) to have masking mechanisms that allow for: 1) coding operational data before disclosure so that private information is hidden (in some appropriate sense); and 2) the coded data to be used by the manufacturer (service provider) to detect faults and schedule maintenance.

The broad goal of this project is to develop fundamental systems, control, and information theoretic tools that allow constructing privacy-preserving fault detection schemes for networked Cyber-Physical Systems. We aim at synthesizing real-time fault detection algorithms that, on the one hand, satisfy the required prescribed detection performance; and, on the other hand, guarantee a private exchange of system data over (potentially untrusty) communication networks. The main research questions to be addressed in the project are: Depending on the class of systems under study (e.g., linear, nonlinear, stochastic, hybrid, etc.), how to properly select privacy metrics that make sense from the point of view of dynamical systems? Given a particular privacy metric and a fault detection scheme, how to quantify the privacy level (information leakage) provided by the detection scheme? And, what synthesis tools can be used to systematically design coding functions and fault detection algorithms to maximize privacy and guarantee prescribed detection performance?

Eindhoven University of Technology is a research-driven university of international standing, where excellent research and excellent education go hand in hand. We focus on a balanced approach towards educa-

tion, research and valorization of knowledge in the areas of engineering science and technology. From our lively campus, situated in the heart of the high-tech Brainport region and equipped with high-quality lab facilities, we make an impact on scientific and societal issues. We do this by delivering excellent ground-breaking research, often in close collaboration with industry, and by providing the education that turns our students into engineers of the future. Our engineers understand what the world needs and can translate scientific knowledge into societal value. To achieve this, we collaborate closely with other universities, scientific institutes, social organizations, government, and industry. We strengthen the knowledge-intensive industry by providing young academic engineers and by generating new business. We combine top-notch fundamental research with an application-oriented educational approach, characterized by frequent and intensive student-teacher interaction. This is all part of a tight-knit, small-scale community consisting of more than 80 nationalities, where everyone feels welcome and where the well-being of students and staff matters.

The Dynamics and Control (D&C) group at TU/e trains the next-generation of students to understand and predict the dynamics of complex engineering systems in order to develop advanced control, estimation, planning, and learning strategies which are at the core of the intelligent autonomous systems of the future. Autonomous vehicles, fully automated industrial value chains, high-tech systems, collaborative robots in unstructured environments, intelligent medical devices, automated transportation networks, soft robotics, together with sustainable automotive technology are key examples of the broad application domain of the (D&C) group.

The design of these systems requires a thorough understanding of their underlying dynamics. Therefore, the first focal point of our research is on both data-based and first-principles-based modelling, model complexity management, and dynamic analysis of complex, multi-physics and multi-disciplinary engineering systems. Building on this foundation, our second focal point is on "making autonomous systems smarter". To this end, we develop both model- and data-based sensing, planning, and learning and control technologies to provide autonomous systems with the intelligence needed to guarantee performance, robustness, and safety. Combining the investigation on both dynamics and control theory in one section allows to take on these challenges standing in a privileged position. In particular, it enables us to educate uniquely skilled engineers and researchers as well as to valorize our research together with the high-tech, automotive and energy sectors.

The Brainport Eindhoven is a world-class top technology region, in which companies, governments, and educational institutions (the so-called triple helix collaboration) work together on advancing technology for humanity. Brainport Eindhoven is among Europe's most prominent and innovative high-tech centers, where high-tech and design are combined with high-end manufacturing industry and entrepreneurship. Geographically situated in the southern part of the Netherlands, the Brainport region has a workforce of 400,000 people from all over the world working on high-tech solutions in areas such as health, mobility, energy, and nutrition. The region generates, by far, the most patents per thousand inhabitants in the world.

Job Requirements: We are looking for a recently graduated, talented, and enthusiastic candidate who meets the following criteria:
• Master of Science degree (or an equivalent university degree) in Mechanical or Electrical Engineering, Computer Science, Applied Physics, Applied Mathematics, Robotics, or related disciplines.
• Strong analytical skills.
• Strong Matlab programming skills.

• Fluent in spoken and written English.
• Experience in model-based fault detection and control schemes for mechanical systems is a plus.

Conditions of Employment:
• A meaningful job in a dynamic and ambitious university with the possibility to present your work at international conferences.
• A full-time employment for four years, with an intermediate evaluation after one year.
• To support you during your PhD and to prepare you for the rest of your career, you will have free access to a personal development program for PhD students (PROOF program).
• A gross monthly salary and benefits in accordance with the Collective Labor Agreement for Dutch Universities. A salary is offered starting at €2325 per month (gross) in the first year, increasing up to €2972 per month (gross) in the last year.
• Additionally, an annual holiday allowance of 8% of the yearly salary, plus a year-end allowance of 8.3% of the annual salary.
• A broad package of fringe benefits, including an excellent technical infrastructure, moving expenses, and savings schemes.
• Family-friendly initiatives are in place, such as an international spouse program, and excellent on-campus children day care and sports facilities.

More information: Do you recognize yourself in this profile and would you like to know more? Please contact Dr. Carlos Murguia, c.g.murguia@tue.nl. More information about terms of employment, can be found here. Please visit www.tue.nl/jobs to find out more about working at TU/e!

Application: We invite you to submit a complete application by email to c.g.murguia@tue.nl. The application should include:
• Cover letter in which you briefly describe your motivation and qualifications for the position;
• Curriculum vitae, including a list of your publications (if any) and the contact information of three references;
• MSc transcript indicating courses taken (including grades);
• Brief description of your MSc thesis;
• Proof of English language skills (if you are not a native speaker);

We look forward to your application and will screen it as soon as we have received it. Screening will continue until the position has been filled.

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6.5. PhD: Artificial and Natural Intelligence Toulouse Institute, France

Contributed by: Victor Magron, victor.magron@laas.fr

Open PhD position in Toulouse on data-driven techniques and polynomial optimization for deep learning
Artificial and Natural Intelligence Toulouse Institute. (4 years research project ANITI, 2019 - 2023)
Polynomial optimization for Machine Learning. Chair: Jean-Bernard Lasserre.

Positions. A PhD position is available in the MAC team at LAAS CNRS, Toulouse. This position is funded by the ANITI project (see above), under the lead of Dr. Milan Korda, Dr. Victor Magron and Dr. Jean-

Bernard Lasserre.

Summary of the research project. A large number of problems from diverse fields such as optimization, probability and statistics, dynamical systems or quantum physics can be tackled within the powerful and elegant framework of the Lasserre hierarchy, which allows one to solve challenging nonconvex and nonlinear problems by a sequence of convex optimization problems in a unified and very systematic fashion.

Additional research investigated the ability of Christoffel-Darboux kernels to capture information about the support of an unknown probability measure; a distinguishing feature of this approach is the ability to infer support characteristics based on the knowledge of finitely many moments of the underlying measure, which is precisely the information obtained from the Lasserre hierarchy. A major open question remains whether the Lasserre hierarchy can be used in a data-driven setting, where the underlying model is unknown and only observed data are available. This project will investigate this direction, building on recent work.

Progress in this direction would be an enabling factor in bringing the elegant and powerful tools of the Lasserre hierarchy to the realm of the present-day big-data applications, which are currently typically tackled using ad-hoc heuristic techniques with limited mathematical foundation. More details can be found at https://bit.ly/2B0K6lw

* Starting dates. At any time by the end of 2021.

* Required skills. A successful candidate will have a strong background in applied mathematics or physics, having a very good knowledge of probability and statistics as well as a working knowledge of convex optimization, real analysis and basic measure theory. Good programming skills are also required. The candidate should be highly motivated and creative. Knowledge of French does not constitute a per-requisite.

The candidates are kindly asked to send an e-mail with "Post-doc candidate" in the title, a CV and publication track record, to milan [dot] korda [at] laas [dot] fr, victor [dot] magron [at] laas [dot] fr and lasserre [at] laas [dot] fr.

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6.6. PhD: KU Leuven, Belgium; Czech Technical University, Czechia

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

PhD: KU Leuven, Belgium and Czech Technical University in Prague, Czechia

PhD position: "Design methods and computational tools for delay based vibration control of mechatronic systems", KU Leuven & CTU

Context and topic: Recently novel techniques for vibration absorption, which involve the use of delay based input shapers and so-called delayed resonators, have been developed and successfully applied to flexible mechatronic systems. The aim of the PhD project is to analyze properties of poles and zeros of multi-input multi-output systems with delays, and to develop and validate optimization based control design techniques, grounded in simultaneously shaping spectra of poles and zeros, and capable to solve co-design

problems of absorbers and higher-level controllers (to position a platform or to manipulate a robot's arm). The requirement for solving co-design problems stems from the property that for future-generation delay based vibration suppression techniques, a separation principle allowing a separate design of absorbers and controllers, is no longer viable, necessitating fundamentally different design tools.

Offer: We offer fully funded PhD position in an international context for four years at the KU Leuven and CTU Prague, two top European universities and hubs for interdisciplinary research in the fields of Applied Mathematics and Systems & Control, thereby aiming at a double doctorate The vacancy fits within a long-standing collaboration and a joint project between the research group of W. Michiels (KU Leuven, NAAM - Numerical Analysis and Applied Mathematics Center) and the group of T. Vyhlídal (Czech Technical University in Prague, Faculty of Mechanical Engineering). The main host will be the NAAM section of KU Leuven. The successful candidate is expected to spend one year of the PhD at the CTU, along with several short visits.

Profile: The ideal candidate has a Master degree in either computational / applied mathematics or in mechanical engineering, and have a strong interest in interdisciplinary work. Applicants whose mother tongue is not English must present an official language test report. The acceptable tests are TOEFL, IELTS, and Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE). Required minimum scores are:

- TOEFL: 600 (paper-based test), 100 (internet-based test);
- IELTS: 7 (only Academic IELTS test accepted);

How to apply: Send an electronic application (CV, motivation, reference contacts) to Prof. Wim Michiels (Wim.Michiels@cs.kuleuven.be), in CC to Prof. Vyhlídal (Tomas.Vyhlidal@fs.cvut.cz), with subject "vac-comp". Deadline: August 15.

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6.7. PhD: Delft University of Technology, The Netherlands

Contributed by: Bart De Schutter, b.deschutter@tudelft.nl

PhD position: "Control of evasive manoeuvres for automated driving" (Delft University of Technology)

The Delft Center for Systems and Control (https://www.dcsc.tudelft.nl) of Delft University of Technology, The Netherlands has a vacancy for a PhD position on "Control of evasive manoeuvres for automated driving".

Challenge: Automated driving is a promising but also challenging area of innovation in the automotive industry. Despite the recent advances in deep learning for automated driving, hazardous driving scenarios such as evasive manoeuvres are "edge cases" where learning methods are less effective because representative data are statistically rare. In this project we will tackle these edge cases by means of an integrated physics plus data-driven learning approach, especially exploiting recent advances in tire/road sensing technology to gain real-time information on vehicle states (e.g. tire forces) and road conditions. The ultimate goal of the project is to develop novel adaptive and pro-active control and robust trajectory planning approaches that can deal with such variable and non-nominal vehicle/road conditions The position is mo-

tivated by a challenging practical problem, yet it requires a strong control-theory approach.

Requirements: We are looking for a candidate with an MSc degree in Systems and Control, Applied Mathematics, Mechanical Engineering, Electrical Engineering, or a closely related discipline, with a strong background in model-based control, adaptive control, hybrid systems, and/or machine learning. The candidate is expected to work on the boundary of several research domains. A good command of the English language is required.

Opportunities: We offer the opportunity to do scientifically challenging research in a multi-disciplinary research group. The appointment will be for up to 4 years. The PhD student will also be able to participate in the research school DISC (http://www.disc.tudelft.nl). As an employee of the university you will receive a competitive salary, as well as excellent secondary benefits. Assistance with accommodation can be arranged.

Information: More information on this position and on how to apply can be found at
https://www.dcsc.tudelft.nl/ bdeschutter/vac/vacancy_phd_evolve.pdf or by contacting Bart De Schutter (b.deschutter at tudelft.nl) or Simone Baldi (s.baldi at tudelft.nl)

The application deadline for the position is September 15, 2020. However, the position will stay open until a suitable candidate has been found.

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6.8. PhD: University of Kentucky, USA

Contributed by: Xu Jin, xu.jin@uky.edu

Ph.D. Positions in intelligent control (Mechanical Engineering) at the University of Kentucky

Ph.D. openings are available beginning Spring 2021 in the Department of Mechanical Engineering at the University of Kentucky, Lexington, KY, in Dr. Xu Jin's group on the topics of intelligent control. We look for excellent students with the following one or more background areas:

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

More research details can be found on Dr. Xu Jin's website:
https://www.engr.uky.edu/directory/jin-xu
and the external links included. The positions include stipend, health care, and tuition support. The offers are valid for two years, and renewable for additional years based on performance of the students. Qualifications: The applicants MUST ALREADY HAVE, or will soon have (before September 15th) the GRE and TOEFL test scores meeting the departmental minimum requirement.

How to apply: Applications should be emailed to Dr. Xu Jin at xu.jin@uky.edu as soon as possible. Please include a full CV (including GRE and TOEFL scores), PDFs of relevant publications, and names of at least three references. Upon initial email discussions, those who are encouraged to apply should then apply to

the department as soon as possible, and indicate my name (Dr. Xu Jin) in the application package. Visiting Ph.D. students and scholars are also very welcomed for self-funded research visit for 6-24 months.

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

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6.9. PhD: Lehigh University, USA

Contributed by: Eugenio Schuster, schuster@lehigh.edu

Fully funded PhD positions in the general area of Control Systems are available within the Laboratory for Control of Complex Physical Systems in the Department of Mechanical Engineering and Mechanics at Lehigh University.

PhD candidates should have an undergraduate, or preferably a Masters degree, in engineering, physics or applied math. A solid mathematical background is required together with a broad education in control systems. Good writing and oral communications skills are needed for these positions. The candidates should be interested in doing research in the area of model predictive control of systems described by partial differential equations. These PhD projects, which combine mathematical modeling, machine learning, model-based control, real-time nonlinear optimization, and numerical methods, will focus on control problems arising in nuclear-fusion plasmas.

Lehigh University, founded in 1865, is located in Bethlehem, Pennsylvania, 50 miles north of Philadelphia and 75 miles southwest of New York City. It offers an inspiring academic environment, excellent education, state-of-the-art research and computer facilities, very competitive economic conditions (tuitions, stipend, housing, health insurance) for graduate students, and great career opportunities after graduation. More information can be found at:

https://www1.lehigh.edu/academics/graduate-studies

These PhD positions are available immediately. Admission as early as the Fall 2020 is possible but the positions will remain open in subsequent semesters until filled. Candidates interested in being part of this educational and research opportunity are encouraged to send by e-mail their Curriculum Vitae to Prof. Eugenio Schuster at schuster@lehigh.edu.

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6.10. PhD: The University of Texas at San Antonio, USA

Contributed by: Ahmad F. Taha, ahmad.taha@utsa.edu

I have **four** PhD positions for Spring 2021 or Fall 2021 in optimization and control of dynamic networks with applications to renewables-heavy power systems, transportation systems, and water distribution net-

works at the ECE Department, University of Texas at San Antonio (UTSA). The ECE department at UTSA hosts the largest PhD program in terms of the number of PhD students, and the department has 30+ faculty in various engineering disciplines, with six faculty in systems and controls.

Interested applicants should have *most* of the following qualifications:
- a master's or undergraduate degree in engineering, applied mathematics, or related fields;
- strong background in optimization, linear systems theory, and machine learning (basic)
- a solid set of GPA, TOEFL, and GRE scores.

Interested candidates can send me their transcripts and brief resume at ahmad.taha@utsa.edu, alongside any previously published papers, and copies of GRE/TOEFL scores. Emails should indicate that you have seen this ad in this E-Letter.

San Antonio is the seventh largest US city in terms of population, has moderate weather year round, and is very affordable for graduate students.

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6.11. PhD/Postdoc: Polytechnique Montreal, Canada

Contributed by: Jerome Le Ny, jerome.le-ny@polymtl.ca

I have openings for PhD students and a postdoctoral fellow focusing on stochastic controls and decision making under uncertainty, with applications in the area of: 1) autonomous systems, in particular active sensing and human-robot teaming; 2) secure and private networked control systems; 3) networked robotic systems; 4) the validation of control and robotic systems with perception modules in the loop. The students will be affiliated with the department of electrical engineering at Polytechnique Montreal and with GERAD, a multi-university research center on decision systems. More information on graduate studies at Polytechnique Montreal can be found here https://www.polymtl.ca/futur-etudes-superieures/en

Interested applicants for the PhD positions should have a master's degree in engineering or a related field; a strong background in mathematical methods applied to an area such as control theory, signal processing, game theory, statistics, machine learning, optimization, etc. Applicants with prior research experience involving stochastic methods are preferred.

Interested candidates should contact me by email at jerome.le-ny@polymtl.ca and send me their CV (including a list of publications for the postdoc position), transcripts (for the PhD positions) and a brief statement detailing their expertise, prior research experience and how they see their research interests fitting with the activities in my group.

Polytechnique Montreal is the engineering school affiliated with the Université de Montréal and is one Canada's leading engineering teaching and research institutions. While courses are typically taught in French, it is possible for non French-speaking students to take their courses in English at McGill University or Concordia University. Montreal is regularly ranked one of the best student universities in the world.

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6.12. Postdoc: Dartmouth College, USA

Contributed by: Amro Farid, amfarid@dartmouth.edu

Post-doctoral/Doctoral Research Associate in Intelligent Energy Systems
Funded Project: SPG-PRID-005
Topic: Intelligent Energy Systems
Research Theme: Interdependent Smart City Infrastructures
Level: Postdoctoral Research Associate — Mechanical & Electrical Engineering Focus

The LIINES is seeking a postdoctoral research associate in the area of intelligent energy systems. The successful candidate will have a doctoral degree in mechanical or electrical engineering or a related field. They must have experience in modeling energy systems in the electrical, thermal, fluidic, and mechanical energy domains. They must have a strong background in optimization methods and control systems; both in their theoretical understanding and their numerical implementation. The candidate must also be proficient in Python, MATLAB, and GAMS. Strong technical writing and presentation skills are highly desirable.

The appointment is for the duration of one year with the opportunity for a one-year renewal. Compensation is commensurate with experience and is competitive with typical academic rates. To apply, please follow the instruction below. For further questions, please contact Prof. Amro M. Farid.

How to Apply: Interested individuals should email Prof. Amro M. Farid, with the following items:
1. Expected dates of availability or admission
2. Cover letter expressing your research interests & motivations. Please do mention if you are interested in any the LIINES' current project ideas and if you have a specific engineering focus (e.g. electrical, mechanical, systems) that you wish to develop.
3. CV or resume
4. Transcript from most recent university
5. Relevant publications in the area of intelligent energy systems (Graduate students & senior researchers)

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6.13. Postdoc: INRIA Grenoble, France

Contributed by: Bernard Brogliato, bernard.brogliato@inria.fr

Post-doc at INRIA Grenoble, France

This 2-year post-doc position concerns the feedback control of sway in overhead cranes. It is joint project with the company Schneider Electric. The work will be located at INRIA Grenoble, France, in the Tripop team. Applicants must have a PhD degree and should possess skills in theoretical Automatic Control (nonlinear systems, hybrid systems), or in Applied Maths. Skills in C++ or Python are much welcome.

The main objectives of the work will be the control and simulation of the closed-loop system, and the implementation on an industrial setup. Gross salary is around 2600 euros, before tax. The post-doc duration is 2 years, starting preferably between October and December 2020. Interested applicants should contact either Bernard Brogliato (bernard.brogliato@inria.fr) or Christophe Prieur (christophe.prieur@gipsa-lab.fr), and send a complete resume.

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6.14. Postdoc: Tampere University, Finland

Contributed by: Azwirman Gusrialdi, azwirman.gusrialdi@tuni.fi

Postdoc position in "Resilient Distributed Optimization/Control for Cyber-Physical Systems"

Intelligent Networked Systems (IINES) group at Tampere University, Finland is looking for a highly motivated Postdoctoral Research Fellow. The successful applicant will join the Academy of Finland-funded project Resilient Distributed Optimization for Cyber-Physical Systems (CPS). The project aims at developing distributed optimization/control algorithms to ensure the safety and optimal operation of CPS with large scale and heterogenous physical dynamics under potential physical and cyber-attacks. The results will be applied to real world systems such as power system and distributed robotic system.

Job description: The main task is to develop resilient distributed optimization and control algorithms for CPS under potential physical and cyber-attacks. The Postdoctoral Research Fellow will also evaluate and demonstrate the proposed resilient control strategies using distributed robotic system and Hardware-In-the-Loop simulation environment available at Tampere University cyber labs (TUTCyberLabs) in collaboration with the Smart Grids research group and Network and Information Security research group.
During the project, the Postdoctoral Research Fellow will visit for several months research groups in the United States and Japan for collaborations.
The job also includes supervision of PhD/master/bachelor thesis and may involve some teaching duties in the future. Participation in project management and grant writing is appreciated.

Requirements
• PhD in control, automation engineering, electrical engineering, (applied) mathematics, or a related subject area
• Solid experience in distributed optimization and/or control of CPS
• A competence to pursue independent scientific work
• A track record of scientific publication in high-quality peer-reviewed journals
• Fluent in both written and spoken English

Previous international research experience is appreciated. Knowledge in power system is considered a bonus.

We offer: The position will be initially filled for a fixed-term period of 2 years and is extendable for another 2 years. The earliest starting date is in September 2020 or as mutually agreed. A trial period of six months applies to all our new employees. The salary will be based on both the job requirements and the employee's personal performance in accordance with the Finnish University Salary System. The position of a Postdoctoral Research Fellow is placed on the job demands level 5 (teaching and research staff) with a typical starting salary of 3400 EUR/month.

We offer a wide range of staff benefits, such as occupational health care, flexible working hours, excellent sports facilities on campus and several restaurants and cafés on campus with staff discounts. Please read more about working at Tampere University here. You will have many opportunities to participate at con-

ferences, trainings, projects and other relevant events which will strengthen your portfolio and extend your professional network.
Finland has been assessed to be among the best countries in the world with respect to many quality of life indicators.

How to apply: Please submit your application through our online recruitment system (https://www.tuni.fi/en/about-us/working-at-tampere-universities/open-positions-at-tampere-university) available from 5 August 2020. The closing date for applications is 21 August 2020 (at 23.59 EEST / 20.59 UTC). Please write your application and all accompanying documents in English and attach them in PDF format.

Applications should include the following documents:
• Curriculum Vitae according to TENK guidelines (https://www.tenk.fi/en/template-researchers-curriculum-vitae)
• List of publications according to Academy of Finland guidelines (https://www.aka.fi/en/funding/apply-for-funding/az-index-of-application-guidelines/list-of-publications/). Please highlight your most significant publications related to the position.
• Names with full contact information of two references
• Motivation letter (1-3 pages):
• Introduce yourself and present your qualifications.
• Describe your previous research and how it is relevant to the topic of the project

About IINES Group: Intelligent Networked Systems group led by Assistant Professor (tenure track) Azwirman Gusrialdi, which is a part of the Department of Automation Technology and Mechanical Engineering, Faculty of Engineering and Natural Sciences. Our research focusses on the development of scalable and resilient optimization and control algorithms for complex systems and networked cyber-physical-human systems. The applications include smart power grid, digital twin, intelligent transportation systems, distributed robotic network, and epidemic spreading. The group is actively collaborating with other research groups at Tampere University and international research groups in the United States, Japan, and Germany.

For more information or questions, please contact: Assistant Professor Azwirman Gusrialdi, azwirman.gusrialdi (at) tuni.fi

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6.15. Postdoc: Lehigh University, USA
Contributed by: Eugenio Schuster, schuster@lehigh.edu

Postdoctoral Position in Control Systems at Lehigh University

A postdoctoral position is available in the area of modeling and control of distributed parameter systems within the Laboratory for Control of Complex Physical Systems in the Department of Mechanical Engineering and Mechanics at Lehigh University. Candidates should have a PhD degree in engineering, physics or applied math. Candidates should also have excellent writing and oral communication skills. A solid background in control theory, machine learning, or optimization techniques is required for this position. Moreover, candidates should be interested in developing theory-driven solutions for real control problems

arising in nuclear-fusion plasmas.

Candidates interested in this postdoctoral position should send by e-mail to Prof. Eugenio Schuster (schuster@lehigh.edu) the following material: i- Curriculum Vitae including detailed list of publications, ii- Name and contact information of at least three references, iii- Two sample papers. The position is available immediately and will remain open until an ideal candidate is found.

Lehigh University, founded in 1865, is located in Bethlehem, Pennsylvania, 50 miles north of Philadelphia and 75 miles southwest of New York City. It offers an inspiring academic environment, excellent education, state-of-the-art research and computer facilities, and very competitive economic conditions including healthcare and retirement benefits.

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6.16. Faculty: Norwegian University of Science and Technology, Norway

Contributed by: Morten Breivik, morten.breivik@ntnu.no

Three faculty positions at the Norwegian University of Science and Technology

1. Professor/Associate Professor in Human-Machine Interaction for Cyber-Physical Systems

The Norwegian University of Science and Technology (NTNU, http://www.ntnu.edu/) is establishing a new professorship in Human-Machine Interaction for Cyber-Physical Systems, in collaboration with Statnett, the transmission system operator in Norway (https://www.statnett.no/en/). The position will be affiliated with the Department of Engineering Cybernetics (Institutt for teknisk kybernetikk, ITK – http://www.ntnu.edu/itk) at NTNU's Faculty of Information Technology and Electrical Engineering in Trondheim, Norway. ITK has 31 professors, 12 adjunct professors, about 15 postdocs and researchers as well as 80 PhD candidates. Approximately 190 candidates graduate annually from the three MSc programs in cybernetics, which comprise over 800 students in total. The department is involved in numerous research projects and centers, including the Centre of Excellence for Autonomous Marine Operations and Systems (NTNU AMOS, http://www.ntnu.edu/amos). Also, a new Centre on Research-based Innovation for autonomous ships (SFI Autoship) has recently been awarded and will start up in late 2020, with ITK as host department.

The position is within the field of Human-Machine Interaction for Cyber-Physical Systems. In addition to energy/power systems, such systems encompass applications in the offshore, process, maritime, aquaculture, aerospace and medical industries.

For both position categories, the following is required:
- Doctoral degree in a relevant area
- Experience with essential areas of Human-Machine Interaction for Cyber-Physical Systems, such as:
- Human-machine interfaces
- Human factors
- Interaction design
- Decision support

• Big-data analytics and visualization
• Control engineering
• Safety, risk and security
• Mastering Norwegian or another Scandinavian language
• Communicating well in English both orally and in writing
• Statnett operates the main electricity grid in Norway, which is considered to be a critical infrastructure. Statnett is therefore legally bound by safety legislations stated in "Lov om nasjonal sikkerhet" (Sikkerhetsloven). The applicant must therefore qualify for security clearance in Norway

The professor is expected to play a leading role in research and research-based education for Human-Machine Interaction for Cyber-Physical Systems at the department. Specifically, it is important to develop new methods for data-driven and model-based decision support in real time, including both new data-analytics methods for interpretation of generated big data, as well as new human-machine interfaces for effective presentation of relevant information to human decision makers. This will enable new solutions for human-machine interaction for cyber-physical systems.

The research activities at the department rely mainly on external funding, and the development of educational programs may also receive external funding. The professor is expected to engage extensively in applications for external funding, e.g. from the Research Council of Norway, European research and educational agencies, the industry sector, and other available sources. Statnett will in particular contribute with project funding and collaboration.

MSc and PhD candidates from the cybernetics study programs are expected to be competitive in an international job market. The professor will contribute toward the department's educational profile and promote an excellent learning environment, in collaboration with colleagues, students and external stakeholders. Specifically, the professor is expected to teach a minimum of one course at the department's MSc program and a specialization course at MSc or PhD level, as well as supervising MSc students, PhD candidates and postdoctoral fellows.

In addition to research and education, the professor is expected to disseminate relevant parts of the research to a wider audience. The professor is also expected to participate in the formal management of research, education, innovation and other relevant areas of activity at the department.

The candidate will join a research community at ITK which was rated "excellent from an international perspective" in the last evaluation by the Norwegian Research Council of 53 ICT communities in Norway, as one of only three ICT communities to receive such a rating in the Norwegian university and college sector. Currently, two of ITK's professors are IEEE Fellows.

The full announcement can be found at
https://www.jobbnorge.no/en/available-jobs/job/188948/professor-associate-professor-in-human-machine-interaction-for-cyber-physical-systems

2. Professor/Associate Professor in Systems Engineering for Cyber-Physical Systems

The Norwegian University of Science and Technology (NTNU, http://www.ntnu.edu/) is establishing a

new professorship in Systems Engineering for Cyber-Physical Systems.

The position will be affiliated with the Department of Engineering Cybernetics (Institutt for teknisk kybernetikk, ITK – http://www.ntnu.edu/itk) at NTNU's Faculty of Information Technology and Electrical Engineering in Trondheim, Norway.

ITK has 31 professors, 12 adjunct professors, about 15 postdocs and researchers as well as 80 PhD candidates. Approximately 190 candidates graduate annually from the three MSc programs in cybernetics, which comprise over 800 students in total. The department is involved in numerous research projects and centers, including the Centre of Excellence for Autonomous Marine Operations and Systems (NTNU AMOS, http://www.ntnu.edu/amos). Also, a new Centre on Research-based Innovation for autonomous ships (SFI Autoship) has recently been awarded and will start up in late 2020, with ITK as host department.

The position is within the field of Systems Engineering for Cyber-Physical Systems. Relevant such applications at the department include sensing and control in underwater robots, autonomous marine vessels, unmanned aerial systems, small satellite systems, and other cyber-physical systems.

For both position categories, the following is required:

- Doctoral degree in a relevant area
- Experience with essential areas of systems engineering for cyber-physical systems, which includes:
– Requirement analysis and specification
– Functional and architectural design
– Hardware and software architecture
– Systems implementation and integration
– Regulatory frameworks, certification, safety, reliability, maintenance, verification and validation
– Environmental factors (such as temperature, pressure, humidity, mechanics and vibrations, emissions, radiation, etc.), electromagnetic compatibility and energy management
— Packaging, documentation, quality and life-cycle management
- The autonomous vehicle research at NTNU has civilian objectives. However, some of the equipment being used is subject to export regulations or other limitations such as ITAR (International Traffic in Arms Regulations), and the position requires that the applicant has permission to use such equipment. Applicants who are citizens of Norway, Australia, New Zealand, Japan, Sweden or NATO countries will satisfy the requirements.

The professor is expected to play a leading role in research and research-based education for Systems Engineering for Cyber-Physical Systems at the department. The research activities at the department rely mainly on external funding, and the development of educational programs may also receive external funding. The professor is expected to engage extensively in applications for external funding, e.g. from the Research Council of Norway, European research and educational agencies, the industry sector, and other available sources.

MSc and PhD candidates from the cybernetics study programs are expected to be competitive in an international job market. The professor will contribute toward the department's educational profile and promote an excellent learning environment, in collaboration with colleagues, students and external stakeholders.

Specifically, the professor is expected to teach a minimum of one course at the department's MSc program and a specialization course at MSc or PhD level, as well as supervising MSc students, PhD candidates and postdoctoral fellows.

In addition to research and education, the professor is expected to disseminate relevant parts of the research to a wider audience.

The professor is also expected to participate in the formal management of research, education, innovation and other relevant areas of activity at the department.

The candidate will join a research community at ITK which was rated "excellent from an international perspective" in the last evaluation by the Norwegian Research Council of 53 ICT communities in Norway, as one of only three ICT communities to receive such a rating in the Norwegian university and college sector. Currently, two of ITK's professors are IEEE Fellows.

The full announcement can be found at
https://www.jobbnorge.no/en/available-jobs/job/188926/professor-associate-professor-in-systems-engineering-for-cyber-physical-systems

3. Professor/Associate Professor in Safety and Assurance of Autonomous Systems

The Norwegian University of Science and Technology (NTNU, http://www.ntnu.edu/) is establishing a new professorship in Safety and Assurance of Autonomous Systems, in collaboration with the leading quality assurance and risk management company DNV GL (https://www.dnvgl.com/).

The position will be affiliated with the Department of Engineering Cybernetics (Institutt for teknisk kybernetikk, ITK – http://www.ntnu.edu/itk) at NTNU's Faculty of Information Technology and Electrical Engineering in Trondheim, Norway. ITK has 31 professors, 12 adjunct professors, about 15 postdocs and researchers as well as 80 PhD candidates. Approximately 190 candidates graduate annually from the three MSc programs in cybernetics, which comprise over 800 students in total. The department is involved in numerous research projects and centers, including the Centre of Excellence for Autonomous Marine Operations and Systems (NTNU AMOS, http://www.ntnu.edu/amos). Also, a new Centre on Research-based Innovation for autonomous ships (SFI Autoship) has recently been awarded and will start up in late 2020, with ITK as host department.

The position is within the field of Safety and Assurance of Autonomous Systems. Relevant such systems at the department include underwater robots, autonomous marine vessels, unmanned aerial systems, small satellite systems, and other cyber-physical systems.

For both position categories, the following is required:
• Doctoral degree in a relevant area
• Experience with essential areas of Safety and Assurance of Autonomous Systems, such as:
• Autonomous systems
• Artificial intelligence methods, including explainable AI
• Control engineering

• HIL, SIL and software testing
• Safety, reliability, availability and risk engineering
• Systems engineering
• The autonomous vehicle research at NTNU has civilian objectives. However, some of the equipment being used is subject to export regulations or other limitations such as ITAR (International Traffic in Arms Regulations), and the position requires that the applicant has permission to use such equipment.

Applicants who are citizens of Norway, Australia, New Zealand, Japan, Sweden or NATO countries will satisfy the requirements.

The professor is expected to play a leading role in research and research-based education for Safety and Assurance of Autonomous Systems at the department, in particular with impact both on improving the performance of autonomous systems in terms of safety, robustness and reliability, as well as developing a solid foundation for testing, verification and validation of such systems.

The research activities at the department rely mainly on external funding, and the development of educational programs may also receive external funding. The professor is expected to engage extensively in applications for external funding, e.g. from the Research Council of Norway, European research and educational agencies, the industry sector, and other available sources.

MSc and PhD candidates from the cybernetics study programs are expected to be competitive in an international job market. The professor will contribute toward the department's educational profile and promote an excellent learning environment, in collaboration with colleagues, students and external stakeholders. Specifically, the professor is expected to teach a minimum of one course at the department's MSc program and a specialization course at MSc or PhD level, as well as supervising MSc students, PhD candidates and postdoctoral fellows.

In addition to research and education, the professor is expected to disseminate relevant parts of the research to a wider audience.

The professor is also expected to participate in the formal management of research, education, innovation and other relevant areas of activity at the department.

The candidate will join a research community at ITK which was rated "excellent from an international perspective" in the last evaluation by the Norwegian Research Council of 53 ICT communities in Norway, as one of only three ICT communities to receive such a rating in the Norwegian university and college sector. Currently, two of ITK's professors are IEEE Fellows.

The full announcement can be found at
https://www.jobbnorge.no/en/available-jobs/job/188932/professor-associate-professor-in-safety-and-assurance-of-autonomous-systems

About NTNU, Trondheim and Norway:

- About NTNU: http://www.ntnu.edu/

- NTNU Facts and Figures: http://www.ntnu.edu/facts
- NTNU International Researcher Support: http://www.ntnu.edu/nirs
- About Trondheim: https://trondheim.com/
- About Norway: https://www.visitnorway.com/?lang=primary
- Working in Norway: https://www.nav.no/en/home
- Practical info about Norway: http://www.nyinorge.no/en/Ny-i-Norge-velg-sprak/New-in-Norway/

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6.17. Faculty: Delft University of Technology, The Netherlands

Contributed by: Tamas Keviczky, t.keviczky@tudelft.nl

Faculty: Delft University of Technology, The Netherlands

The Delft Center for Systems and Control (www.dcsc.tudelft.nl) at the Delft University of Technology, The Netherlands seeks to hire an Assistant Professor in the following area:

Optimal Control of Thermofluids Networks

More information on this position and on how to apply can be found at
https://www.tudelft.nl/en/3me/departments/delft-center-for-systems-and-control/about-dcsc/vacancies/
or by contacting Prof.dr.ir. Tamas Keviczky (t.keviczky@tudelft.nl).

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6.18. Faculty: Delft University of Technology, The Netherlands

Contributed by: Bart De Schutter, b.deschutter@tudelft.nl

Faculty: Delft Center for Systems and Control, Delft University of Technology, The Netherlands

The Delft Center for Systems and Control (DCSC) of Delft University of Technology (TU Delft), The Netherlands, announces an open position for a Tenure Track Assistant Professor in the broad field of AI for Systems and Control.

Challenge: Develop novel safe and efficient AI methods to tackle high complexities of systems and control problems

Domain of research: The research area of the position will be oriented towards fundamental methods and methodologies in one or more of the following fields (non-exhaustive list):
• scalable and distributed machine learning approaches for control of large-scale systems
• system-oriented AI approaches for forecasting and control in uncertain environments
• secure, privacy-aware, reliable, fair, and/or ethical AI methods for decision making in dynamic environments
• AI methods for condition monitoring and resilient control of complex networks
• physics-informed or bio-inspired AI for systems and control
• data mining and model mining approaches to construct interpretable models
• efficient mixed human-machine decision making

or any other similar or related topic along these lines that falls into the field of AI methods for systems and control.

Prospective research activities involve the development of systematic and computationally efficient modeling, analysis, control, and/or verification methods within the topics listed above.

Position: The position offered is a tenure-track position for a period of 6 years, leading to a permanent position assuming excellent performance. The position can either be a full-time one, or if you request it, a part-time one (80% or higher). During the tenure track, you will have the opportunity to develop into an internationally acknowledged and recognized academic. To this aim, we offer a structured career and personal development program. TU Delft offers an attractive benefits package, including a flexible work week, and the option of assembling a customized compensation and benefits package. Salary and benefits are in accordance with the Collective Labor Agreement for Dutch Universities and range initially between EUR 3746 to EUR 5826 per month gross for an assistant professor, depending on your past track record.

Profile of the candidate: With a strong background in systems and control and proven experience in application of AI, you will develop a new research line in one of the departments at TU Delft that harnesses AI to address relevant scientific or engineering challenges. We are looking for a candidate with a PhD degree in systems and control, artificial intelligence, computer science, applied mathematics, mechanical engineering, electrical engineering, or a related field, and with an extensive expertise in the broad fields of AI and systems and control. You should preferably have at least 1 year of post-doctoral experience. You should already have gained an international reputation in your field of research and also have a proven track record in conducting innovative fundamental research, demonstrated by the ability to publish in leading international journals. You are expected to have an ambitious vision on the development of your own research program using AI and to establish cooperation with other groups at the university, national, and international level.

You should also have the didactic abilities for teaching systems and control courses at the BSc, MSc, and postgraduate level, and for supervising MSc projects. Experience with teaching and mentoring is considered an advantage. The ability to work in a team and inspire others, to take initiative, to be results-oriented, as well as good communication skills in verbal and written English are essential requirements.

In accordance with the equal opportunity policy of Delft University of Technology female candidates are in particular encouraged to apply.

Information and application: For more information on the position and on how to apply, please see
https://www.tudelft.nl/over-tu-delft/werken-bij-tu-delft/vacatures/details/?jobId=735
For additional information, please contact Bart De Schutter at b.deschutter@tudelft.nl

The application deadline for the position is August 30, 2020. However, the position will stay open until a suitable candidate has been found.

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6.19. Faculty: Chalmers University of Technology, Sweden

Contributed by: Tomas McKelvey, tomas.mckelvey@chalmers.se

Open rank position in machine learning for medical image and signal processing

Information about the position: This position is focused on research in applications of image and signal processing in the biomedical area, e.g. developing automatic methods to interpret images and signals from medical imaging systems and other biomedical sensor modalities. We aim to develop state-of-the-art methods for medical image and signal processing, based on key enabling techniques from machine learning, estimation, optimization and mathematical modeling. The research will be performed in close collaboration with medical researchers from Sahlgrenska Academy at Gothenburg University and other medical institutions within Sweden and from the international scene.

Major responsibilities: The holder of the position will perform research and apply for research grants. The department is responsible for both a bachelor program and a master program in biomedical engineering and the holder of the position will contribute both with teaching and continuous development of the two education programs. Supervision of students on bachelor, master and doctoral level is included.

The department has several ongoing medical research collaborations, for instance, with the Swedish CArdioPulmonary bioImage Study (SCAPIS), MedTech West, Stroke Centre West and the Department of Radiology at Sahlgrenska Academy, University of Gothenburg. One major responsibility for the candidate is to strengthen these collaborations and to establish new medical research collaborations with researchers at Sahlgrenska Academy and other medical partners. The candidate will supervise and co-supervise doctoral students in a cross disciplinary research school being established jointly by Chalmers and Sahlgrenska Academy at University of Gothenburg.

Position summary: Full-time permanent employment.

Qualifications: We are looking for a researcher with solid mathematical knowledge capable of performing research at the international forefront. As a candidate you should have experience in recent machine learning methods applied to problems in the field of medicine. Mandatory is a PhD degree in signal processing, image analysis or in a similar subject area with a proven track-record of i) an independent and internationally recognized line of research within the field and ii) good ability to supervise doctoral students iii) ability to teach in the undergraduate and graduate curriculum at the Department of Electrical Engineering https://www.chalmers.se/sv/institutioner/e2/Var-Utbildning/Masterprogram iv) have published in major scientific journals within the field v) have presented your research at main international conferences, such as ICCV, ECCV, CVPR, NIPS, MICCAI, ICASSP and EMBC vi) ability to attract research funding from external funding agencies vii) ability to perform research with collaborators from the medical sciences.

For more information see: hhttps://bit.ly/3fgKavv

Application deadline: August 31, 2020.

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