E-Letter on Systems, Control, & Signal Processing
Issue 375, November 2019

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Welcome to Issue 375 of the CSS E-letter available here.

– To submit new articles, visit article submissions on the E-Letter website.
– To **subscribe**, send an empty email to eletter-css-join@lists.it.utsa.edu and you will be automatically subscribed to the CSS E-Letter.
– To **unsubscribe**, please send a blank email to eletter-css-leave@lists.it.utsa.edu and you will be automatically unsubscribed.

The next E-Letter will be mailed out at the beginning of December 2019.

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6.7 PhD: European project MORE, Europe
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6.9 PhD: Lund University, USA
6.10 PhD: University of Louisiana at Lafayette, USA
6.11 PhD: French-German Research Institute of Saint-Louis, France
6.12 PhD: The George Washington University, USA
6.13 PhD: University of Georgia, USA

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.

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

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:

- 28th Mediterranean Conference on Control and Automation (MED 2020). St Raphaël, France. June 16-19, 2020. http://med2020.cran.univ-lorraine.fr/

- 24th International Conference on Methods and Models in Automation and Robotics (MMAR 2019). Miedzyzdroje, Poland. Aug 26 - Aug 29, 2019. http://mmar.edu.pl/

- 8th International Conference on Systems and Control (ICSC'19). Marrakech, Morocco. Oct 23 - Oct 25, 2019. http://lias.labo.univ-poitiers.fr/icsc/icsc2019/

- 23rd International Conference on System Theory, Control and Computing - ICSTCC 2019. Sinaia, Romania. Oct 9 - Oct 11, 2019. http://icstcc2019.cs.upt.ro/

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

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.

1.5. IEEE Transactions on Automatic Control
Contributed by: Alessandro Astolfi, ieeetac@imperial.ac.uk

Volume 64 (2019), Issue 11 (November)

Scanning the Issue, p. 4405

Papers:

Technical Notes and Correspondences:

1.6. IEEE Transactions on Control Systems Technology
Contributed by: Michelle Colasanti, ieeetcst@osu.edu

Volume 27 (2019), Issue 6 (November)

Regular Papers:

- Lyapunov Control of Quantum Systems Based on Energy-Level Connectivity Graphs, S. Kuang, D. Dong, and I. R. Petersen, page 2315

- Neighborhood Variational Bayesian Multivariate Analysis for Distributed Process Monitoring With Missing Data, Q. Jiang, X. Yan, and B. Huang, page 2330

- Feedforward Control With Disturbance Prediction for Linear Discrete-Time Systems, X. Li, Q.-G. Wang, X. Li, K. K. Tan, and L. Xie, page 2340

- Stable Bilateral Teleoperation With Bounded Control, S. A. Deka, D. M. Stipanovic, and T. Kesavadas, page 2351

- Robust Control Design for High-Power Density PV Converters in Weak Grids, N. A. Ashtiani, S. M. Azizi, and S. A. Khajehoddin, page 2361

- Nonlinear Optimal Control for Swing Up and Stabilization of the Acrobot via Stable Manifold Approach: Theory and Experiment, T. Horibe and N. Sakamoto, page 2374

- Information-Based Search for an Atmospheric Release Using a Mobile Robot: Algorithm and Experiments, M. Hutchinson, C. Liu, and W.-H. Chen, page 2388

- Approximate Kron Reduction Methods for Electrical Networks With Applications to Plug-and-Play Control of AC Islanded Microgrids, A. Floriduz, M. Tucci, S. Riverso, and G. Ferrari-Trecate, page 2403

- Distributed Fault-Tolerant Cooperative Control for Multi-UAVs Under Actuator Fault and Input Saturation, Z. Yu, Y. Qu, and Y. Zhang, page 2417
- Forming Distributed State Estimation Network From Decentralized Estimators, X. Yin, J. Zeng, and J. Liu, page 2430
- An Embedded Strategy for Online Identification of PMSM Parameters and Sensorless Control, L. Colombo, M. L. Corradini, A. Cristofaro, G. Ippoliti, and G. Orlando, page 2444
- Partial Lyapunov Strictification: Dual-Quaternion-Based Observer for 6-DOF Tracking Control, H. Dong, Q. Hu, M. R. Akella, and F. Mazenc, page 2453
- Robust Monotonically Convergent Spatial Iterative Learning Control: Interval Systems Analysis via Discrete Fourier Transform, B. Altın, Z. Wang, D. J. Hoelzle, and K. Barton, page 2470
- Active Fault Identification by Optimization of Test Designs, K. A. Palmer, W. T. Hale, and G. M. Bollas, page 2484
- Modeling and Control of Quantum Measurement-Induced Backaction in Double Quantum Dots, W. Cui and D. Dong, page 2499
- Optimal Coordination of Automated Vehicles at Intersections: Theory and Experiments, R. Hult, M. Zanon, S. Gros, and P. Falcone, page 2510
- Deep Principal Component Analysis Based on Layerwise Feature Extraction and Its Application to Nonlinear Process Monitoring, X. Deng, X. Tian, S. Chen, and C. J. Harris, page 2526
- Impedance Reduction Control of a Knee Joint Human-Exoskeleton System, W. Huo, S. Mohammed, and Y. Amirat, page 2541

Brief Papers:

- Supervisory Control of Multiple Switching Laws With Performance Guidance for Aeroengines, Y. Shi and J. Zhao, page 2557
- Ensemble Kalman Filters for State Estimation and Prediction of Two-Time Scale Nonlinear Systems With Application to Gas Turbine Engines, N. Daroogheh, N. Meskin, and K. Khorasani, page 2565
- Identification of Non-Markovian Environments for Spin Chains, S. Xue, J. Zhang, and I. R. Petersen, page 2574
- On the Practical Stability of Hybrid Control Algorithm With Minimum Dwell Time for a DC–AC Converter, C. Albea Sanchez, O. Lopez Santos, D. A. Zambrano Prada, F. Gordillo, and G. Garcia, page 2581
- Head-Trajectory-Tracking Control of a Snake Robot and Its Robustness Under Actuator Failure, R. Ariizumi, R. Takahashi, M. Tanaka, and T. Asai, page 2589
- Real-Time Autonomous Spacecraft Proximity Maneuvers and Docking Using an Adaptive Artificial Potential Field Approach, R. Zappulla II, H. Park, J. Virgili-Llop, and M. Romano, page 2598
- A Comprehensive Model for Control of Vaporizing Liquid Microthrusters, M. A. C. Silva, S. Silvestrini, D. C. Guerrieri, A. Cervone, and E. Gill, page 2606
- Robust Path Tracking by a Dubins Ground Vehicle, B. Jha, V. Turetsky, and T. Shima, page 2614 - Robust Autopilot Design Based on a Disturbance/Uncertainty/Coupling Estimator, B. Kürkçü and C. Kasnakoglu, page 2622
- Application of Adaptive Observer to Sensorless Induction Motor via Parameter-Dependent Transformation, J. Chen and J. Huang, page 2630
- Identification of Induction Motors Using Smart Circuit Breakers, L. Fagiano, M. Lauricella, D. Angelosante, and E. Ragaini, page 2638

1.7. IEEE Transactions on Control of Network Systems
Contributed by: Maureen Stanton, stanton@bu.edu

Special Issue: Analysis, Control, and Optimization of Energy System Networks

Volume 6, Number 3 , September 2019

http://sites.bu.edu/tcns/september-2019/

Editorial:

Papers:

- Robust Scale-Free Synthesis for Frequency Control in Power Systems R. Pates and E. Mallada p. 1174
- Variance-Aware Optimal Power Flow: Addressing the Tradeoff Between Cost, Security, and Variability D. Bienstock and A. Shukla p. 1185
- Real-Time Feedback-Based Optimization of Distribution Grids: A Unified Approach A. Bernstein and E. Dall' Anese p. 1197
- Robust Control for Renewable-Integrated Power Networks Considering Input Bound Constraints and Worst Case Uncertainty Measure A. F. Taha, M. Bazrafshan, S. A. Nugroho, N. Gatsis, and J. Qi p. 1210
- Distributionally Robust Chance-Constrained Optimal Power Flow Assuming Unimodal Distributions With Misspecified Modes B. Li, R. Jiang, and J. L. Mathieu p. 1223
- Convex Restriction of Power Flow Feasibility Sets D. Lee, H. D. Nguyen, K. Dvijotham, and K. Turitsyn p. 1235
- Geographically Coordinated Primary Frequency Control J. Comden, T. N. Le, Y. Zhao, B. J. Choi, and Z. Liu p. 1246
- Optimal Flexibility Control of Large-Scale Distributed Heterogeneous Loads in the Power Grid R. Ghaemi, M. Abbaszadeh, and P. G. Bonanni p. 1256
- Worst-Case Load Shedding in Electric Power Networks F. Lin p. 1269

1.8. CFP: IEEE Transactions on Control of Network Systems
Contributed by: Maureen Stanton, stanton@bu.edu

The Transactions on Control of Network Systems invites submissions for a special issue on Control of Very-large Scale Robotic (VLSR) Networks, scheduled for publication in March 2021.

Submissions Open: November 11, 2019
Submission Deadline: January 8, 2020
Submissions instructions can be found on the TCNS special issue web page: http://sites.bu.edu/tcns/vlsr/

Guest Editors:
- Silvia Ferrari, Professor, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY
- Richard Linares, Charles Stark Draper Assistant Professor, Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, MA
- Thomas A. Wettergren, Senior Technologist (ST) for Operational and Information Science, Naval Undersea Warfare Center (NUWC), Newport, RI
- Keith LeGrand, Senior Member of Technical Staff, Sandia National Laboratories, Albuquerque, NM

Scope: Future applications of robotics and autonomous systems will involve increasingly large numbers of collaborative robots, sensors, and unmanned vehicles that are each capable of collecting, processing, and acting upon information with little or no human intervention. By sharing and coordinating information, plans, and decisions, these very-large-scale robotic (VLSR) networks can dramatically improve their performance in various industrial and military applications. Sensing and control of collaborative agents, however, present many technical challenges, including required computations that increase with the number of agents, and the challenge of accounting for information and uncertainties propagating through the network. Probability density function (PDF) based methods and partial differential equation (PDE) mod-

els are emerging, promising approaches for deriving decentralized control strategies that scale up to VLSR networks comprised of hundreds of agents. Random finite set (RFS) theory and finite set statistics (FISST) have also emerged as a unifying approach to estimation and tracking via multi-object PDFs that can be used to describe the state of multiple objects utilizing multiple sensor measurements.

TCNS solicits original contributions which propose new scalable theory and algorithms for solving emerging challenges in the control and estimation of complex, large-scale systems, including rigorous contributions on new theoretical analysis and new methods for VLSR control, tracking, and estimation, as well as emerging VLSR applications of partial differential equation (PDE) and probability density function (PDF)-based methods, as well as other novel approaches. This special issue also solicits original contributions that explore the use of random finite set (RFS) and other emerging theories on complex systems for representing the statistical properties of large collections of agents by compact and efficient representations, such as multi-object PDFs. Furthermore, probabilistic methods have been shown to generalize traditional Bayesian filtering and estimation to include flexible detection, sensing, and dynamic behaviors to many agents. However, several unsolved technical issues remain, including but not limited to the scalability of information value functions, the assimilation of heterogeneous data, and how to determine the object dynamics from data.

Special Topics include but not limited to:

- Controllability and observability in PDE models of VLSR networks
- Optimality conditions for PDE and PDF-based control and estimation
- Efficient numerical and analytical solutions to large-scale control problems
- Solutions to large-scale control problems that utilize RFS theory
- New PDE or RFS models and state representations of VLSR systems
- New theory and analysis of VLSR discrete and continuous representations and dynamics
- Probabilistic solutions to swarming systems
- New theoretical results in stochastic control of large-scale systems leveraging RFS theory
- New formulations of estimation and control problem using RFS theory
- New applications of RFS theory to networked systems

Submission Details:

Information on the submission process and manuscript format can be found at:

http://sites.bu.edu/tcns/information-for-authors/

For more information, visit: http://sites.bu.edu/tcns/vlsr/

1.9. IEEE CSS Outreach Fund: Fall 2019 Solicitation
   Contributed by: Daniel E. Rivera, daniel.rivera@asu.edu

The IEEE Control Systems Society (CSS) Outreach Fund provides grants for projects that will benefit CSS members and the controls community in general. Since its inception in 2011, the Fund has funded 76 grants on behalf of a diverse group of CSS member-led activities. The CSS Outreach Task Force is pleased to announce that the window for proposal submission for its 2019 fall solicitation will be held from November 1 to 20, 2019. Beginning with the fall 2019 solicitation, the maximum amount that can be requested for an

Outreach grant has been increased to $20K.

Because of the delays involved in grant approval and processing, any CSS member interested in pursuing an Outreach-funded project starting fourth quarter 2020 (or early to mid-2021) needs to apply during this solicitation. Information regarding the program, which includes proposal requirements, descriptions of current and past funded projects, and an informative 10-minute video overview can be found in:

http://ieeecss.org/activities/control-systems-society-outreach-fund-0

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

https://ieeexplore.ieee.org/document/8764655

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

2 Miscellaneous

2.1. Obituary for Andrew Packard: A CSS Great
Contributed by: Peter Seiler, Kameshwar Poolla, Eilyan Bitar
seile017@umn.edu, poolla@berkeley.edu, eyb5@cornell.edu

Andrew K. Packard (*July 7, 1960 – Sept. 30, 2019*) — Obituary authored by: Johanna Sedman

Professor Andrew K. Packard, loving husband and father and adored professor, passed away on September 30, 2019 at the age of 59. He died as he lived, surrounded by friends and family. Andy is survived by his wife Johanna, son Zachary, and his mother and sisters.

Andy was born on July 7, 1960 in Chicago, Illinois, to Ann and Max Packard. He grew up in a large, loving family with his sisters Hilary, Betsy, Jean, and Kathie. He earned a B.S. degree in Mechanical Engineering at the University of Illinois Champaign-Urbana, followed by his Master's and Ph.D. at U.C. Berkeley. He completed his post-doctoral work at the California Institute of Technology. He served as a faculty member at U.C. Santa Barbara before joining the faculty at U.C. Berkeley in 1990.

Andy is recognized as a major early pioneer of robust control theory. His career was marked by profound and influential results including laying the foundational theory for structured singular value analysis and linear parameter varying systems. His work on the complex structured singular value (μ) provided methods to analytically assess the impact of unmodeled dynamics [1]. He also developed the D-K iteration to synthesize controllers to optimize robust performance [2]. Finally, he developed a theory to design controllers for parameter-varying systems [3]. These results provide a framework that enables the systematic design of robust automatic control systems, e.g., autopilots on aircraft in the presence of model uncertainty.

Andy was recognized for his seminal contributions through several awards from the control systems community. Most notably, he was awarded the 1995 Donald P. Eckman award for an outstanding researcher (under the age of 35) in automatic control, and the 2005 IEEE Control Systems Technology award. One of Andy's key contributions to the field was to transition his theoretical results from academic examples to fully functional software. In particular, Andy and his late colleague Gary Balas co-authored the Robust Control Toolbox in Matlab. This software is widely used by practicing engineers all over the world for control system design.

Andy was also a decorated educator, earning many awards including the Mechanical Engineering Department's best teaching award and the Distinguished Teaching Award, which is the highest teaching distinction conferred by U.C. Berkeley. In 2019, he received the prestigious Berkeley Citation, given to individuals whose contributions to U.C. Berkeley go beyond the call of duty and whose achievements exceed the standards of excellence in their fields.

While Andy's contributions to control systems research were deeply influential, he was equally well known for his unparalleled commitment to his students and to education, mentoring, and teaching at all levels. Whether it was lecturing to a class of 15 or 200, tutoring high school math to his son Zach and his friends, or advising a group of Ph.D. students, Andy put all of his energy into the task. He was generous with his time, his energy, and his ideas. Long lines of students always greeted him for their turn to see him during office hours.

Andy and his wife Johanna constructed a community in Berkeley around their family, friends, students, staff, and faculty. They hosted a monthly "Soup Night" at their home, which was frequented by colleagues, friends, and neighbors. Andy enjoyed five-mile runs through Berkeley with his dog, Nyack. He adored watching his son, Zach, play baseball and helping him with school projects and homework. He loved going to baseball games of any variety, whether it be Berkeley High, Cal or his beloved A's. Andy also loved logrolling and dreamed to one day have it elevated to an Olympic sport. He appreciated many genres of music; he loved playing the piano and jamming with friends. He appreciated stand up comedy and action movies, often cajoling his friends and family into watching some of his favorites.

Andy was a driven professional and a loving father and husband. When diagnosed with prostate cancer in 2014, he remained dedicated to his family and university. He fought his illness fiercely, keeping his humor and courage to his final months.

We invite you to join us as we celebrate his life on Saturday, December 7th, at 2:00 PM at the University Club atop Cal Memorial Stadium on the U.C. Berkeley campus. A book of memories will be published to commemorate Andy's life and contributions. Thoughts, memories, and pictures of Andy for inclusion in this memory book can be sent to Emily Higgins (emilyhiggins@berkeley.edu).

In lieu of flowers, contributions in Andy's memory may be sent to The Sedman-Packard Scholarship, founded to support students transferring from community college to U.C. Berkeley. Please send your check, payable to U.C. Regents, to the address below. Be sure to write "Sedman-Packard Scholarship" in the memo section of your check.

Mechanical Engineering Department, UC Berkeley

TIN # 94-6002123

Financial Services Office

6195 Etcheverry Hall, MC 1740

Berkeley, CA 94720-1740

[1] A. Packard and J. Doyle, "The complex structured singular value," *Automatica*, p. 71-109, 1993.

[2] A. Packard, J. Doyle, and G. Balas, "Linear, multivariable robust control with a μ perspective," *ASME Journal of Dynamic Systems, Measurement and Control*, p. 426-438, 1993.

[3] A. Packard, "Gain scheduling via linear fractional transformations," *Systems and Control Letters*, p. 79-92, 1994.

2.2. 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, 2019.

2.3. Nordic Process Control Award: Announcing the Winner
Contributed by: Sigurd Skogestad, skoge@ntnu.no

Nina Thornhill receives the 2019 Nordic Process Control Award.
The Nordic Process Control Award is awarded for lasting and significant contributions to the field of process control.

The 17th recipient of this award is Professor Nina Thornhill from Imperial College who received the award in recognition of her lasting and significant contributions to the field of process control and automation. In particular NCPG board recognizes Prof. Thornhill's novel contributions in research to developing innovative approaches, tools and methods for process monitoring, fault diagnosis and detection and optimal operation of large scale production facilities. Moreover, Prof Thornhill has made important contributions as a coordinator in several European Marie Sklodowska-Curie projects, which brings together industrial and academic partnership to train early stage researchers and professionals in the field of process automation and control.

The award was presented to Professor Thornhill on August 22, 2019 during the 22th Nordic Process Control Workshop held in Lyngby in Denmark. In connection with the award ceremony, Prof. Nina Thornhill delivered an inspiring award lecture with entitled "Discovery through process data analytics".

The slides of the award lecture slides and more information about the Nordic Working Group on Process Control can be found at: http://folk.ntnu.no/skoge/npc/

Previous winners of the Nordic Process Control Award:
1995: Howard H. Rosenbrock
1997: Karl Johan Åstrøm
1998: F. Greg Shinskey
2000: Jens G. Balchen
2001: Charles R. Cutler
2003: Roger W. Sargent
2004: Ernst Dieter Gilles
2006: Manfred Morari
2007: Jacques Richalet
2009: John MacGregor
2010: Graham C. Goodwin
2012: Lorenz T. Biegler
2013: James B. Rawlings
2015: Rudolf Kalman
2017: Wolfgang Marquardt
2018: Dale Seborg
2019: Nina Thornhill

2.4. Inaugural Brockett-Willems Outstanding Paper Award
Contributed by: Miroslav Krstic, krstic@ucsd.edu

Call for nominations for inaugural Brockett-Willems outstanding paper award in Systems & Control Letters

Selection Criteria: Originality, relevance, and clarity. The award will, ideally, honor a breakthrough, not ratify a paper's popularity or highly cited status.

Eligibility: Papers published in Systems & Control Letters during the five-year period of January 2014 through December 2018. In subsequent years, the eligibility period will be the two calendar years preceding the year of the award. Papers coauthored by SCL's current Editor-in-Chief (Krstic), Senior Editors (Andrieu, Borkar, Cao, Goebel), committee chair, and committee members are not eligible.

Nomination Process: Nominations should be submitted to the selection committee chair, Harry Trentelman, by email to h.l.trentelman@rug.nl. The deadline is January 31, 2020. A single letter of nomination should be submitted, along with the nominated paper, both collated into a single PDF file. The nomination letter should not exceed two pages (but can be as brief as a sentence), it can be signed by multiple nominators, and it should contain the authors' names, paper title, pages, and the year of publication.

Selection Process: Committee chair Trentelman will appoint a selection committee that includes four additional members. If members of the selection committee consider it necessary to strengthen the nomination pool, they may place nominations into the pool but without providing a nomination letter (an internally

nominated paper needs to "speak for itself"), as an internal nomination letter would require a recusal of the committee member-nominator.

Prize: $1,000, funded by Elsevier

Presentation: Possibly at the Symposium on Mathematical Theory of Networks and Systems (MTNS 2020), 24-28 August 2020, Cambridge, UK, if the winner(s) is attending

2.5. International Graduate School on Control
Contributed by: Francoise Lamnabhi-Lagarrigue, francoise.lamnabhi-lagarrigue@centralesupelec.fr

2020 International Graduate School on Control: The EECI-IGSC-2020 Early Registration is now open.
- Deadline for Modules M01-M09 : 12/01/2020
- Deadline for modules M10-M25 : 08/03/2020

Summaries of the courses: https://eeciinstitute.web-events.net/igsc-program-2020/

Grants: http://www.eeci-igsc.eu/igsc-grant-overseas/

- From Data to Decisions: the Scenario Approach (Systems, Control, Machine Learning) Marco C. Campi & Simone Garatti MUMBAI
- Control of PDEs and Nonlinear Delay Systems Miroslav Krstic & Nikolaos Bekiaris-Liberis SAN DIEGO
- Networked Control of Multi-Agent Systems Jan Lunze EINDHOVEN
- Extremum Seeking Control: Methods, Theory and Applications Denis Dochain & Martin Guay PARIS-SACLAY
- Modeling and Control of Nonlinear and Distributed Parameter Systems: the Port Hamiltonian Approach Arjan van der Schaft, Hans Zwart & Yann Le Gorrec PARIS-SACLAY
- Introduction to Nonlinear Systems & Control Hassan K. Khalil PARIS-SACLAY
- Specification, Design, and Verification of Self-driving Cars Richard M. Murray & Nok Wongpiromsarn ISTANBUL
- Cyber-Physical and data-driven Systems: Algebraic and Optimization techniques Raphaël Jungers PARIS-SACLAY
- Energy-Based Control Design to Face the Challenges of Future Power Systems Romeo Ortega & Johannes Schiffer MONTERREY
- Model Predictive Control Eduardo F. Camacho PARIS-SACLAY
- Control and Optimization of Autonomous Power Systems Florian Dörfler & Saverio Bolognani STOCKHOLM
- An Introduction to Financial Markets for the Uninitiated: New Research Directions for Engineers B. Ross Barmish PARIS-SACLAY
- Distributed Computation and Control A. Stephen Morse PADOVA
- Computational Issues in Nonlinear Control and Estimation Arthur Krener LONDON
- Stability and Stabilisation of Nonlinear Time-Varying Systems: Applications to Multi-Agent Systems Elena Panteley & Antonio Loria ISTANBUL

- Homogeneity Based Design of Sliding Mode Controllers Leonid Fridman, Jaime Alberto Moreno Pérez & Bijnan Bandyopadhyay MUMBAI
- Sparsity and Big Data in Control, Systems Identification and Machine Learning Mario Sznaier TOULOUSE
- Hybrid Control Design Ricardo G. Sanfelice SHANGHAI
- Time-Delay and Sampled-Data Systems Emilia Fridman & Pierdomenico Pepe PARIS-SACLAY
- Decentralized and Distributed Control Giancarlo Ferrari-Trecate & Marcello Farina LAUSANNE
-Introduction to Discrete Event Systems Stephane Lafortune & Christos Cassandras MARSEILLE
- Introduction to Optimal and StochasticControl Alessandro Astolfi & Giordano Scarciotti LONDON
- Dynamic Control Allocation Andrea Serrani, Sergio Galeani & Mario Sassano ROME
- LMIs for Optimization and Control Didier Henrion PRAGUE
- Robust and Adaptive Output Regulation of Multivariable and Hybrid Systems Alberto Isidori & Lorenzo Marconi BERLIN

2.6. International Graduate School on Control: Control of Multi-Agent Systems
Contributed by: Jan Lunze, Lunze@atp.rub.de

Module M03 of the International Graduate School on Control 2020
Networked Control of Multi-Agent Systems
Organised by the European Embedded Control Institute (EECI)
Venue: Eindhoven University of Technology, The Netherlands
Lecturer: Prof. Dr. Jan Lunze, Ruhr-University Bochum, Germany
Registration: www.eeci-igsc.eu

Course description: Networked control uses the flexibility of digital communication systems to connect arbitrary components on demand, which makes novel control structures possible and poses fundamental research questions: Under what conditions should information be transferred from one control loop to another one? What is the minimum requirement on the communication structure to solve a control problem at hand? Why are certain information structures more favourable than others?

Starting with fundamental notions of algebraic graph theory, the course shows how graph theory and systems theory have to be combined to find networked controllers that make linear agents to synchronise or to follow set-point commands collectively. It presents a novel methodology for the selection of an appropriate communication structure for which all agents react on leader commands as quickly as possible. Furthermore, it shows how the agents can generate an overall system with a reasonable structure based only on their local information, such that the communication structure adapts to disturbances in a self-organised way.

The introduction of the main ideas is illustrated by numerous examples from diverse fields like vehicle platooning, networks of coupled oscillators or electrical power systems. The course participants should solve exercises, partly by using MATLAB, to learn more about the interesting dynamical phenomena that occur in networked systems.

Topics:
- Introduction to networked systems

- Algebraic graph theory
- Consensus in continuous-time and discrete-time systems
- Synchronisation of multi-agent systems with identical and individual dynamics
- Design of the communication structure of networked controllers
- Self-organisation in networked systems

The course uses the new textbook:
Jan Lunze:
Networked Control of Multi-Agent Systems
BookmundoDirect 2019
ISBN 9789463867139
publish.bookmundo.de/books/176262

The book provides more than 100 exercises, some of which will be used in the course. Furthermore, the book gives supplementary material on matrix theory, probability theory and MATLAB functions for graphs.

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2.7. International Graduate School on Control: From Data to Decisions
Contributed by: Simone Garatti, simone.garatti@polimi.it

EECI International Graduate School on Control 2020 - From Data to Decisions: the Scenario Approach (Systems, Control, Machine Learning)
Course title: From Data to Decisions: the Scenario Approach (Systems, Control, Machine Learning)

Instructors:
- Marco C. Campi (University of Brescia, Italy - http://marco-campi.unibs.it/)
- Simone Garatti (Politecnico di Milano - http://home.deib.polimi.it/sgaratti/)

When/where: Mumbai (India), 27-31 January 2020

Registration: http://www.eeci-igsc.eu/

Summary: Data are pervasive in nowadays science and engineering. In this course, the attendee is introduced to the so-called "scenario approach", an emerging methodology for data-driven decision making. The course provides a broad overview of the topic and also presents the powerful generalization theory underlying this method. The scenario approach can help solve fundamental problems in system design, control, and machine learning. Various application domains will be also illustrated. A gradual presentation will allow for an easy comprehension of the delivered material.

Topics: Scenario Approach; Generalization theory; Control and system design in the presence of uncertainty; Supervised learning; Discussion of open problems that offer an opportunity for research.

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3 Books

3.1. Estimation and Inference in Discrete Event Systems
Contributed by: Laura Burgess , laura.burgess@springer.com

Estimation and Inference in Discrete Event Systems by Christoforos N. Hadjicostis
ISBN: 978-3-030-30820-9
October 2019, Springer
Hardcover, 346 pages, $169.99, €145,59
https://www.springer.com/gb/book/9783030308209

Estimation and Inference in Discrete Event Systems chooses a popular model for emerging automation systems—finite automata under partial observation—and focuses on a comprehensive study of the key problems of state estimation and event inference. The text includes treatment of current, delayed, and initial state estimation. Related applications for assessing and enforcing resiliency—fault detection and diagnosis—and security—privacy and opacity—properties are discussed, enabling the reader to apply these techniques in a variety of emerging applications, among them automated manufacturing processes, intelligent vehicle/highway systems, and autonomous vehicles.

The book provides a systematic development of recursive algorithms for state estimation and event inference. The author also deals with the verification of pertinent properties such as:
• the ability to determine the exact state of a system, "detectability";
• the ability to ensure that certain classes of faults can be detected/identified, "diagnosability"; and
• the ability to ensure that certain internal state variables of the system remain "hidden" from the outside world regardless of the type of activity that is taking place, "opacity".

This book allows students, researchers and practicing engineers alike to grasp basic aspects of state estimation in discrete event systems, aspects like distributivity and probabilistic inference, quickly and without having to master the entire breadth of models that are available in the literature.

Contents
1. Introduction to Estimation and Inference in Discrete Event Systems
2. Preliminaries and Notation
3. Finite Automata Models
4. State Estimation
5. Verification of State Isolation Properties
6. Detectability
7. Diagnosability
8. Opacity
9. Decentralized State Estimation
10. Distributed State Estimation

4 Journals

4.1. CFP: IEEE Transactions on Control of Network Systems
Contributed by: Maureen Stanton, stanton@bu.edu

The Transactions on Control of Network Systems invites submissions for a special issue on Control of Very-large Scale Robotic (VLSR) Networks, scheduled for publication in March 2021.

Submissions Open: November 11, 2019
Submission Deadline: January 8, 2020
Submissions instructions can be found on the TCNS special issue web page: http://sites.bu.edu/tcns/vlsr/

Guest Editors:
- Silvia Ferrari, Professor, Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY
- Richard Linares, Charles Stark Draper Assistant Professor, Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, MA
- Thomas A. Wettergren, Senior Technologist (ST) for Operational and Information Science, Naval Undersea Warfare Center (NUWC), Newport, RI
- Keith LeGrand, Senior Member of Technical Staff, Sandia National Laboratories, Albuquerque, NM

Scope: Future applications of robotics and autonomous systems will involve increasingly large numbers of collaborative robots, sensors, and unmanned vehicles that are each capable of collecting, processing, and acting upon information with little or no human intervention. By sharing and coordinating information, plans, and decisions, these very-large-scale robotic (VLSR) networks can dramatically improve their performance in various industrial and military applications. Sensing and control of collaborative agents, however, present many technical challenges, including required computations that increase with the number of agents, and the challenge of accounting for information and uncertainties propagating through the network. Probability density function (PDF) based methods and partial differential equation (PDE) models are emerging, promising approaches for deriving decentralized control strategies that scale up to VLSR networks comprised of hundreds of agents. Random finite set (RFS) theory and finite set statistics (FISST) have also emerged as a unifying approach to estimation and tracking via multi-object PDFs that can be used to describe the state of multiple objects utilizing multiple sensor measurements.

TCNS solicits original contributions which propose new scalable theory and algorithms for solving emerging challenges in the control and estimation of complex, large-scale systems, including rigorous contributions on new theoretical analysis and new methods for VLSR control, tracking, and estimation, as well as emerging VLSR applications of partial differential equation (PDE) and probability density function (PDF)-based methods, as well as other novel approaches. This special issue also solicits original contributions that explore the use of random finite set (RFS) and other emerging theories on complex systems for representing the statistical properties of large collections of agents by compact and efficient representations, such as multi-object PDFs. Furthermore, probabilistic methods have been shown to generalize traditional Bayesian filtering and estimation to include flexible detection, sensing, and dynamic behaviors to many agents. However, several unsolved technical issues remain, including but not limited to the scalability of information value functions, the assimilation of heterogeneous data, and how to determine the object

dynamics from data.

Special Topics include but not limited to:

- Controllability and observability in PDE models of VLSR networks
- Optimality conditions for PDE and PDF-based control and estimation
- Efficient numerical and analytical solutions to large-scale control problems
- Solutions to large-scale control problems that utilize RFS theory
- New PDE or RFS models and state representations of VLSR systems
- New theory and analysis of VLSR discrete and continuous representations and dynamics
- Probabilistic solutions to swarming systems
- New theoretical results in stochastic control of large-scale systems leveraging RFS theory
- New formulations of estimation and control problem using RFS theory
- New applications of RFS theory to networked systems

Submission Details:

Information on the submission process and manuscript format can be found at:

http://sites.bu.edu/tcns/information-for-authors/

For more information, visit: http://sites.bu.edu/tcns/vlsr/

4.2. CFP: International Journal of Adaptive Control and Signal Processing
Contributed by: Gang Tao, gt9s@virginia.edu

Special Issue: Adaptive Methods for Resilient Control Systems
International Journal of Adaptive Control and Signal Processing

The goal of this special issue is to show the state-of-the-art in recent developments of advanced control methods using adaptive control and fault-tolerant control techniques to deal with uncertain system faults (including fault induced disturbances), for the recovery of desired control system performance. Papers addressing resilient control related theory, techniques and applications are welcome, and the topics of interest to this special issue include (not limited to):
- Adaptive fault detection and fault-tolerant control for systems with uncertain actuator and sensor faults, structural damage, and actuation and sensing limitations
- Learning control based fault accommodation
- Parameter estimation and auto-tuning based fault tolerant control
- Resilient control of human-in-the-loop systems
- Resilient control techniques for smart grids
- Resilient control techniques for multi-agent systems and communication networks
- Resilient control of autonomous robot systems with uncertain faults
- Resilient cyber physical system design and demonstration
- Resilient flight control under adverse conditions
- Other resilient control theory, techniques and applications

Guest editors:
- Professor Gang Tao (gt9s@virginia.edu)
- Professor Tansel Yucelen (yucelen@usf.edu)

Initial submission deadline (extended): January 1, 2020

For more information, please visit the journal special issue webpage:
https://bit.ly/322ammW

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4.3. Systems & Control Letters
Contributed by: Lusia Veksler, lveksler@ucsd.edu

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4.4. Automatica
Contributed by: John Coca, j.coca@elsevier.com

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4.5. Control Engineering Practice
Contributed by: John Coca, j.coca@elsevier.com

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4.11. Journal of the Franklin Institute
Contributed by: John Coca, j.coca@elsevier.com

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- Finite Time Output Feedback Control for Ship Dynamic Positioning Assisted Mooring Positioning System with Disturbances Guoqing Xia, Caiyun Liu, Bo Zhao, Xinghua Chen*, and Xingchao Shao pp.2948-2960
- Least-square Matching for Mobile Robot SLAM Based on Line-segment Model Sanghyung Park, Sooyeong Yi pp.2961-2968
- Control of Supercritical Organic Rankine Cycle based Waste Heat Recovery System using Conventional and Fuzzy Self-Tuned PID Controllers Jahedul Islam Chowdhury, David Thornhill, Payam Soulatiantork , Yukun Hu, Nazmiye Balta-Ozkan, Liz Varga and Bao Kha Nguyen* pp.2969-2981

4.16. Applied and Computational Mathematics an International Journal
Contributed by: Fikret Aliev, chief_ed@acmij.az

Papers:

- Jingjing Zhang, Yue Shen, Jihuan He
Some Analytical Methods for Singular Boundary Value Problem in a Fractal Space: A Review
pages:225-235
- Shahid S. Siddiqi, Muhammad Younis
Binary 4-Point C4 Non-Stationary Subdivision Scheme for Geometric Modelling
pages: 236-246
- Allaberen Ashyralyev, Abdullah S. Erdogan, Sueda N. Tekalan
An Investigation on Finite Difference Method for the First Order Partial Differential Equation with the Nonlocal Boundary Condition
pages: 247-260
- Baghir A. Suleimanov, Khasay A. Feyzullayev, Elhan M. Abbasov
Numerical Simulation of Water Shut-off Performance for Heterogeneous Composite Oil Reservoirs
pages: 261-271
- B. Bin-Mohsin, D. Lesnic
Reconstruction of Inner Boundaries Subjected to Generalized Impedance Boundary Conditions
for the Modified Helmholtz Equation
pages:272-287
- Alper Ekinci, M. Emin Őzdemir
Some New Integral Inequalities Via Riemann-Liouville Integral Operators
pages: 288-295
- Chialiang Lin, Chieh-Wen Hsu, T. E. Simos, Ch. Tsitouras
Explicit, Semi-Symmetric, Hybrid, Six-Step, Eighth Order Methods for Solving $\ddot{y} = f(x, y)$
pages:296-304
- Tamaz Tadumadze, Phridon Dvalishvili, Tea Shavadze
On the Representation of Solution of the Perturbed Controlled Differential Equation with Delay and Continuous Initial Condition
pages:305-315

5   Conferences and Workshops

5.1. IFAC 2020 World Congress, Germany
Contributed by: Frank Allgöwer, frank.allgower@ist.uni-stuttgart.de

21st IFAC 2020 World Congress (IFAC WC 2020), July 12 - 17, 2020
Berlin, Germany, www.IFAC2020.org

Key Dates:
15 September 2019 Open invited track proposals
15 October 2019 Invited session proposals
31 October 2019 Draft manuscript submission
28 February 2020 Late breaking results submission

The IFAC World Congress is IFAC's flagship conference and is held every three years. The IFAC WC 2020 will take place July 12 - 17, 2020 in Berlin Germany. It is time to prepare your submissions and participation. With several thousand attendees from all over the world, the IFAC World Congress is the biggest and most important meeting of this kind. For six days in 2020, Berlin will be the place where new collaborations and stimulating ideas from theory development, over academic and industrial applications, to technology development and further fields can originate, in and after the sessions.

Berlin—Where Innovation Meets Science and Culture: Germany's capital is a vibrant cosmopolitan city, offering a wide range of cultural and touristic attractions. Berlin is a green city, with rivers and canals, and is particularly enjoyable in summer time. Berlin has a long tradition of science and innovation. It is the city where Alexander and Wilhelm von Humboldt, Max Planck, Gustav Hertz, Albert Einstein, and many others lived and worked. Berlin is among the most important and diverse regions of science within Europe. It has the largest concentration of universities and research institutes within Germany and a student population of about 200,000.

Conference Venue: IFAC WC 2020 will be held in the Estrel Hotel and Congress Center situated in the Neukölln district of Berlin, easily accessible by public transportation. Neukölln is a rapidly evolving lively neighborhood attractive for students and artists, with uncountable cultural and culinary attractions.

The motto of the 21st IFAC World Congress is "Automatic Control – Meeting Societal Challenges". It focuses on current and future societal challenges such as mobility and transportation, health care and medicine, the delivery of sustainable resources and green energy, digitalization, Industry 4.0, and the dramatic changes in the working environment. The junction of artificial intelligence and control will be spotlighted. This is reflected in five topics days, where the standard conference program is complemented by special keynotes, tutorial sessions, outreach lectures, and exhibitions by industrial and technological leaders.

Oral, Interactive, and Demonstrator Contributions: Oral sessions consist of six contributions of 20 minutes. Contributions in interactive sessions will take place during two hour session slots. All contributions undergo the same review process and the decision on the format is not implied by the review outcome. Demonstrator contributions will either be part of interactive sessions (for video or software demonstrators)

or demonstrators' exhibitions.

Tutorials and Pre-Congress Workshops: You are invited to submit proposals for tutorials and pre-congress workshops. Both tutorials and workshops should inform participants about the state of the art in specific areas of interest to the IFAC community.

Late Breaking Results: Extended abstract contributions spotlight work in progress, application-oriented contributions to industrial, economic or social fields, and cutting edge research from other scientific communities. Extended abstract contributions will appear only in the congress preprints, not in the proceedings of the congress.

Invited Sessions and Open Invited Tracks: Invited sessions consist of six regular papers or one survey paper/four regular papers based on invitation by the organizers. Open invited tracks have no limit on the number of papers, organizers are expected to solicit contributions, and the proposal is advertised on the IFAC 2020 website.

Technical Areas:
- Systems and Signals
- Design Methods
- Computers, Cognition and Communication
- Mechatronics, Robotics and Components
- Manufacturing and Logistics Systems
- Process and Power Systems
- Transportation and Vehicle Systems
- Bio- and Ecological Systems
- Social Systems

Congress Core Team:
- Klaus Janschek Coordinating Chair
- Frank Allgöwer IFAC President
- Sandra Hirche IPC Co-Chair
- Rolf Findeisen IPC Co-Chair
- Ulrich Jumar Industry Chair
- Jörg Raisch Local Arrangements Chair
- Uwe D. Hanebeck Publicity and Outreach Chair
- Dagmar Dirzus Finance Chair
- Silke Nienhausen Congress Officer

IFAC 2020 contact: info@ifac2020.org

5.2. Robot Learning Workshop, USA
Contributed by: Nader Motee, nam211@lehigh.edu

Robot Learning Workshop
October 14-15, 2019 Iacocca Hall, Lehigh University, Bethlehem PA

This workshop will offer a series of presentations on emerging directions within intersection of robotics, deep and reinforcement learning, control systems, and operational research. The primary objective of this event is to facilitate interactions between researchers from different disciplines interested in designing and implementing the envisioned autonomous robots, inspiring the research community to pursue new interdisciplinary directions in robotics, controls, and machine learning.

More on the workshop at:
https://wordpress.lehigh.edu/indisc/tripods-x-lehighu/workshop-two/

The workshop program:
https://wordpress.lehigh.edu/indisc/tripods-x-lehighu/workshop-two/program/ features:
- Invited talks from 16 speakers from academic, institutes and industry affiliations:
https://wordpress.lehigh.edu/indisc/tripods-x-lehighu/workshop-two/speakers/
- A poster session, open to all attendees, to share efforts among a community of complementary research interests:
https://wordpress.lehigh.edu/indisc/tripods-x-lehighu/workshop-two/poster-session/

Travel grants are available.

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5.3. International Workshop on Advanced Motion Control, Norway
Contributed by: Michael Ruderman, michael.ruderman@uia.no

Extended Deadline: AMC2020 IEEE International Workshop on Advanced Motion Control
IEEE International Workshop on Advanced Motion Control (AMC2020) will be held on April 20-22, 2020, at the University of Agder, Campus Kristiansand, in Norway.
http://ewh.ieee.org/conf/amc/2020/

AMC2020 is 16th in a series of biennial international workshops on Advanced Motion Control, started in 1990 in Yokohama, Japan, and since there uniting an always young and enthusiastic research community grown around the omnipresent motion control technologies and applications. Following to the last AMC2018 in Tokyo, Japan, our wish is to continue bringing together the researchers from both academia and industry and to maintain a highest scientific conference level, with enriching meetings and discussions and interesting and memorable events and experiences.

Main Topics:
- Advanced motion control in mechatronics
- Compliant and flexible robotics
- Intelligent and adaptive motion control systems

- Haptics and robotics in medical applications
- Hybrid and discrete motion control systems
- Actuators and sensors in motion control
- Motion control systems with human-in-the-loop
- Visual servo systems in motion control
- Micro- and nano-mechatronic systems and control
- Related topics involving motion dynamics and control

Important Dates:
- Submission of Special Session proposals: August 31, 2019
- Submission of full papers: November 15, 2019
- Notification of acceptance: January 10, 2020
- Submission of final manuscripts: February 7, 2020

5.4. International Conference on Unmanned Aircraft Systems, Greece
Contributed by: Youmin Zhang, Youmin.Zhang@concordia.ca

Call-for-Papers: 2020 International Conference on Unmanned Aircraft Systems (ICUAS'20)
http://www.uasconferences.com

On behalf of the Organizing Committee and the ICUAS Association, it is our pleasure to invite you to contribute to and participate in the 2020 International Conference on Unmanned Aircraft Systems, ICUAS'20, which will be held for the first time outside the U.S., in Athens, Greece, on June 9-12, 2020, at the luxurious Divani Caravel Hotel (http://divanicaravelhotel.com). This annual conference has grown tremendously; it has earned the respect of the professional community and it is constantly co-sponsored technically by the IEEE CSS and RAS and the Mediterranean Control Association. The conference is fully sponsored by the ICUAS Association. Following the usual tradition, the conference will be preceded by one day of tutorials and workshops, followed by three full-days of technical sessions. In 2020, we will introduce 'poster papers' again, which will go under the same thorough review process, but will report on new ideas with only preliminary results. Keynote lectures, panel discussions and a social agenda will complement and complete the four-day event.

Conference topics include (but not limited to): Airspace Control; Integration; Sense-Detect-and-Avoid Systems; Airspace Management; Interoperability; Security; Airworthiness; Levels of Safety; Sensor Fusion; Autonomy; Manned/Unmanned Aviation; Smart Sensors; Biologically Inspired UAS; Micro- and Mini- UAS; Standardization; Certification; Networked UAS; Technology Challenges; Control Architectures; Payloads; Training; Energy Efficient UAS; Path Planning and Navigation; UAS Applications; Environmental Issues; Regulations; UAS Communications; Fail-Safe Systems; Reliability of UAS; UAS Testbeds; Frequency Management; Risk Analysis; UAS Transportation Management (UTM); Policy/Regulation/Law Aspects. The major themes of ICUAS '20 are: integration of manned-unmanned aviation into the national airspace, legal, ethical and privacy issues, regulations, benefits of unmanned aviation to society, UAS/RPAS design for safety, reliability and resilience, and technology standards.

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

Dates (Please check the latest information at http://www.uasconferences.com)
February 14, 2020: Full Papers/ Invited Papers/Tutorial Proposals Due
April 15, 2020: Acceptance/Rejection Notification
May 8, 2020: Upload Final, Camera Ready Papers
April 15 - May 8, 2020: Early Registration

Paper Submission
All papers must be submitted and uploaded electronically. Go to https://controls.papercept.net.

Welcome and look forward to receiving your contributions and attendance to the ICUAS'20! For detailed information please see www.uasconferences.com.

ICUAS Association Liason Chair:
Kimon P. Valavanis, Univ. of Denver, kimon.valavanis@du.edu

Honorary Chairs:
Didier Theilliol, University of Lorraine
Fulvia Quagliotti, Politecnico di Torino

General Chairs:
Youmin Zhang, Concordia University
Anthony Tzes, NYU Abu Dhabi

Program Chairs:
Antonio Franchi, CNRS-LAAS
Kostas Alexis, University of Nevada, Reno

5.5. Workshop: Applications of Dual Quaternion Algebra to Robotics, Brazil
Contributed by: Hugo Tadashi, hugo.kussaba@unb.br

Workshop on Applications of Dual Quaternion Algebra to Robotics

We would like to invite you to participate at the 1st workshop on Applications of Dual Quaternion Algebra to Robotics at the 19th International Conference on Advanced Robotics Belo Horizonte – Brazil, December 2019.

Topics of interest include, but are not limited to:
- Robot kinematics; - Robot dynamics; - Robot control; - Filtering and estimation algorithms applied to robotics; - Problems related to perception and automation; - Problems related to different fields: medical

robotics, HRI, drones, among others.

We also encourage papers concerning theoretical contributions, advantages and limitations of dual quaternion algebra. Papers with other Lie-group representations to attitude and rigid-body transformation applied to robotics will also be considered. For further information please contact the organisers at ws.icar19.dualquaternions.robotics@gmail.com

To find out more about the workshop, please check the official website:
http://macro.ppgee.ufmg.br/ws-icar-2019/

5.6. International Conference on Networking, Sensing and Control, China
Contributed by: Daoyi Dong, daoyidong@gmail.com

The 2020 IEEE International Conference on Networking, Sensing and Control will be held in Nanjing, China from 7th to 10th March 2020.
www.icnsc2020.org

The deadline of initial submission has been extended to 15th November (regular paper) and 30th November 2019 (submission for special sessions). This conference brings together both academy and industry to address new challenges, share solutions and discuss future research directions. It will feature plenary speeches, panel sessions, tutorials, workshops, interactive sessions, and invited/special sessions. Contributions are expected from academia, industrial, and management agencies.

The conference theme is: AI for Better Life.

Submissions related to all topics in the areas of Networking, Sensing and Control are welcome.

5.7. Polish Control Conference 2020, Poland
Contributed by: Andrzej Bartoszewicz, andrzej.bartoszewicz@p.lodz.pl

On behalf of the Organizing Committee, it is our pleasure to invite you to contribute to and participate in the 2020 Polish Control Conference, which will be held in Lodz, Poland, on June 22-24, 2020.

Conference topics include (but are not limited to):
1. Modelling, identification, and analysis of automation systems.
2. Design of control systems.
3. Calculation methods, data processing and communication in control.
4. Mechatronics and robotics.
5. Automated manufacturing systems.
6. Industrial systems.
7. Transportation and vehicle systems.
8. Biological, medical and ecological systems.
9. Control of social systems.

10.Social impact of automation.

Important dates:
- Paper submission - January 12, 2020
- Acceptance/rejection notification - March 20, 2020
- Upload of final, camera ready papers - April 10, 2020

All papers must be submitted electronically via EasyChair system:
https://easychair.org/conferences/?conf=kkapcc2020

Further details can be found at
https://bit.ly/36aD2gY

We are looking forward to meeting you at the Polish Control Conference 2020 in Lodz.

5.8. International Conference on Methods in Automation and Robotics, Poland
Contributed by: Pawel Dworak, pawel.dworak@zut.edu.pl

25th International Conference on Methods and Models in Automation and Robotics
24-27 August 2020
Amber Baltic Hotel, Miedzyzdroje, Poland

It is our great pleasure to invite You to participate in the 25th International Conference on Methods and Models in Automation and Robotics, MMAR 2020 to be held in Miedzyzdroje, Poland, from August 24th to August 27th, 2020.

The Conference will be a good opportunity for highlighting the new results and directions of Automatic Control theory, technology and applications. As such, it mainly will concentrate on the following key points:
– emphasis on invited lectures including plenaries,
– industry participation promotion,
– attract young people to study and work in the field.

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

Topics of interest include, but are not limited to:
- Identification, modelling and simulation
- Signal processing
- Control and systems theory
- Robotics

- Intelligent systems and methods
- Control systems

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

Key Dates
- March 2, 2020 - Paper submission
- May 18, 2020 - Notification of acceptance
- June 22, 2020 - Registration
- June 22, 2020 - Camera-ready paper submission

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

5.9. CDC 2019 Workshop: Model Predictive Control of Hybrid Systems, France
Contributed by: Berk Altın, berkaltin@ucsc.edu

CDC '19 Workshop on Model Predictive Control of Hybrid Dynamical Systems Pre-Conference Workshop at the 2019 IEEE Conference on Decision and Control
Nice, France
Dec. 10, 2019

Hybrid systems model the behavior of dynamical systems where the states can evolve continuously as well as instantaneously. Such systems arise when control algorithms that involve digital devices are applied to continuous-time systems, or due to the intrinsic dynamics (e.g. mechanical systems with impacts, switching electrical circuits). Hybrid control may be used for improved performance and robustness properties compared to conventional control, and hybrid dynamics may be unavoidable due to the interplay between digital and analog components of a system.

This one day workshop is a complete course on the analysis and design of model predictive control (MPC) schemes for hybrid systems. It presents recently developed results on asymptotically stabilizing MPC for hybrid systems based on control Lyapunov functions. The workshop provides a detailed overview of the state of the art on hybrid MPC, and a short tutorial on a powerful hybrid systems framework (hybrid inclusions) that can model hybrid dynamics described in other frameworks (e.g. switched systems, hybrid automata, impulsive systems). Key analysis tools in this setting are demonstrated, along with several advantages over other frameworks. This background is then used to lay the theoretical foundations of a general MPC framework for hybrid systems, with guaranteed stability and feasibility. The ideas are illustrated in several applications.

The workshop targets a broad audience in academia and industry, including graduate students, looking for an introduction to an active area of research and some modern mathematical analysis tools; control practitioners interested in novel design techniques; researchers in dynamical systems in pursuit of relevant applications; and researchers in industry and labs applying hybrid predictive control methods to engineer-

ing systems. The required background is basic familiarity with continuous- and discrete-time nonlinear systems. The lectures are closely related to each other and not meant to be independent research presentations. For more information, please see the workshop website or contact the organizers.

- Website: https://hybrid.soe.ucsc.edu/hybridmpccdc19
- Organizers: Berk Altın (berkaltin@ucsc.edu), Ricardo G. Sanfelice (ricardo@ucsc.edu)
- Registration: https://css.paperplaza.net/conferences/scripts/start.pl

5.10. CDC 2019 Workshop: Learning & Control for Cyber-physical Systems, France
Contributed by: Quanyan Zhu, qz494@nyu.edu

CDC 2019 Workshop on Learning, Games, and Control for Security of Cyber-physical Systems

The workshop will present a holistic framework for CPS security from multiple perspectives. GT will be used to design incentive mechanisms, and model adversary behavior, including the behavior of human adversaries. When limited information is available about the adversary's abilities, algorithms can be devised in order to aid the agents in learning optimal security policies. Machine learning will also be useful in developing agent-strategies when there is more than one intelligent attacker. Formal methods can be used to specify additional constraints of the environment that the agent must satisfy in order to reach a goal.

This workshop will feature talks by leading experts whose recent work uses game theory and data-driven approaches to model and analyze the security of CPSs. The workshop also plans to feature a presentation by a representative from a funding agency, and a panel discussion in order to identify open research problems that will be of interest to the broader community.

Speakers and panelists include Tamer Basar (UIUC), Joao Hespanha (UCSB), Linda Bushnell (University of Washington), Hideaki Ishii (Tokyo Institute of Technology), Karl Johannsson (KTH), and program managers from DoD, NSF, and DARPA.

For more information, please visit the website at https://wp.nyu.edu/quanyan/cdc-2019-workshop/

5.11. Symposium on Network and Multi-agent Systems, South Korea
Contributed by: Hyo-Sung Ahn, hyosung@gist.ac.kr

Call for papers and Call for presentations at the ICCAS 2020 Focused Track 1 Session: Network and Multi-agent Systems, and Control
(The 1st China-Japan-Korea Joint Symposium on Network and Multi-agent Systems, and Control at ICCAS 2020)

Key Organizers:
- Zhiyun Lin: Hangzhou Dianzi University (linz@hdu.edu.cn)
- Zhongkui Li: Peking University (zhongkli@pku.edu.cn)
- Kazunori Sakurama: Kyoto University (sakurama@i.kyoto-u.ac.jp)

- Takeshi Hatanaka: Tokyo Institute of Technology (hatanaka@sc.e.titech.ac.jp)
- Hyungbo Shim: Seoul National University (hshim@snu.ac.kr)
- Hyo-Sung Ahn: GIST (hyosung@gist.ac.kr)

Description: The 1st China-Japan-Korea (CJK) Joint Symposium on Network and Multi-agent Systems, and Control, which will be held as one of the Focused Tracks of ICCAS 2020 (International Conference on Control, Automation, and Systems 2020, Oct. 13-16, Busan, Korea), attempts to share and discuss the cutting-edge trend in the field of network and multi-agent systems, and control. The number of researchers in this research field has dramatically increased recently in three neighboring countries (China, Japan, and Korea) and other Asian countries. We believe that it is essential to interact each other to define new and non-trivial problems, which motivates this symposium at ICCAS 2020. It is timely one to seek a chance of collaborations among researchers in these neighboring countries. Basically, the symposium will be organized on the basis of invitations; however, anyone who wants to attend this symposium or anyone who wants to speak at this symposium will be more than welcome. Although the invitations will be given to active researchers in China, Japan, and Korea, the door is widely open to researchers in all other countries.

The symposium would cover the following topics:
- Network systems and analysis
- Multi-agent systems and analysis
- Network control
- Multi-agent control
- Applications in smart power network, water irrigation network, traffic network, data and information processing, and social network
- Applications in multiple unmanned vehicles

If you want to join the symposium, you could contact one of the key organizers; you can just present your works (ideas, technical sketch, detailed techniques, and tutorials) in oral sessions or in poster sessions with or without papers at ICCAS. Depending on your presentation style, you will be given 5 minutes (ideas), 10 minutes (technical sketch), 20 minutes (detailed techniques), and 1 hour (tutorial & plenary).

To join the symposium, it is required to register to the ICCAS 2020. By attending this symposium, you would establish strong human networks and will get comprehensive knowledge in the field of network and multi-agent systems, and control. The symposium will be composed of oral/poster sessions, and tutorial lectures and key plenary talks.

The followings are confirmed speakers; the list of speakers will be updated.
- China: Zhiyun Lin (Hangzhou Dianzi Uni), Zhongkui Li (Peking Uni), Shiyu Zhao (Westlake Uni), Ronghao Zheng (Zhejiang Uni), Fei Chen (Northeast Uni)
- Japan: Kazunori Sakurama (Kyoto Uni), Takeshi Hatanaka (Tokyo Inst. of Tech), Hideaki Ishii (Tokyo Inst. of Tech), Toru Namerikawa (Keio Uni), Masaaki Nagahara (Uni. of Kitakyushu)
- Korea: Hyungbo Shim (Seoul National Uni), Hyo-Sung Ahn (GIST), Dongjun Lee (Seoul National Uni)

5.12. IFAC World Congress Session: Control of Wireless Networks, Germany
Contributed by: Dominik Baumann, dbaumann@tuebingen.mpg.de

Open invited session in the area of "Control for Next Generation Wireless Networks"
21st IFAC World Congress in Berlin, Germany, July 12-17, 2020.

Next generation wireless networks aim to support critical physical infrastructure, including industrial automation, connected autonomous vehicles, smart grids, and smart cities. As these networking interfaces interact with the physical world, new fundamental research questions arise. In this open invited session, we are soliciting contributions showcasing how the control and autonomous systems community addresses these challenges from various points of view. Topics include, but are not limited to
- Resource allocation for next generation wireless sensing and control applications
- Designs for low-latency, high-reliability, and freshness of information, including networking and information theoretic approaches
- Data-driven tools to support wireless autonomous applications, including reinforcement learning and statistical learning
- Methods for online adaptation to changes in the network or application dynamics
- Formal control performance guarantees under network imperfections
- Next generation wireless control application domains, such as connected vehicles, robotics, industrial automation

Please find a more detailed description here: https://bit.ly/2nJwjJi. Please note that there is no upper limit to the number of papers in these open invited sessions. The submitted papers will be reviewed via the IFAC reviewing process.

Conference website: https://www.ifac2020.org/
Submission website: https://ifac.papercept.net/conferences/scripts/start.pl
Invited Session code: x83d8
Submission deadline: November 11th, 2019

The organizers:
- Dominik Baumann, Max Planck Institute for Intelligent Systems
- Konstantinos Gatsis, University of Pennsylvania
- Karl Henrik Johansson, KTH Royal Institute of Technology
- Sebastian Trimpe, Max Planck Institute for Intelligent Systems

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5.13. IFAC World Congress Session: Control of Quantum Systems, Germany
Contributed by: Daoyi Dong, daoyidong@gmail.com

"Modelling, identification and control of quantum systems" Open Invited Track at IFAC World Congress 2020
https://bit.ly/3479wXu

We kindly invite you to submit your papers to the Open Invited Track on: "Modelling, identification and control of quantum systems" organized as part of the IFAC World Congress 2020, Berlin, Germany, July 2020.

Topics include but not limited to

- Modelling and analysis of quantum control systems
- State estimation of quantum systems
- Hamiltonian identification of quantum systems
- Parameter identification of open quantum systems
- Linear quantum systems theory
- Quantum optimal control
- Quantum robust control
- Quantum measurement-based feedback and quantum coherent feedback
- Learning control of quantum systems
- Quantum control applications in molecular systems, quantum metrology and quantum information

Deadline for submission of papers is 11 November, 2019. The session Code is na361. For details, please see the IFAC World Congress' website:
https://www.ifac2020.org/

Open Invited Track Organizers:
Daoyi Dong (University of New South Wales, Australia)
Jr-Shin Li (Washington University in St. Louis, USA)
Rebing Wu (Tsinghua University, China)

6 Positions

6.1. PhD: ETH Zurich, Switzerland
Contributed by: Alisa Rupenyan, ralisa@control.ee.ethz.ch

Funded Ph.D. Positions at the ETH Zurich Automatic Control Laboratory in data-driven process control

Industrial processes can be represented as cascaded structure where the outputs of one sub-stage in the process chain are the inputs of the next. Process control is built on the availability of these inputs and outputs, and on understanding the relationships between them, then implementing a control strategy to achieve process stability or certain quality characteristics. A process model based on the physics of the system is sometimes available, but its direct use could be limited to a certain class of problems, as it often involves complex, nonlinear physical dynamics models.

We propose to implement data-driven process modeling for the different sub-stages of an industrial process such as thermal spray plasma coating by establishing the input-output dynamic relationships at the substages of the process for use cases, where geometry, material, and type of process are specified. For each sub-stage, the input-output relationship can be learnt using data-driven techniques such as deep neural networks or gaussian process regression. In some cases, standard data-fitting techniques might be sufficient, or a simplified first principles model can be complemented by learning the model mismatch from data. Once the relationship between inputs and outputs is available at each stage, optimization-based techniques as model predictive control in combination with iterative learning, or extremum-seeking control can be applied.

The approach is comprised of three stages:
1 - Data acquisition / process monitoring strategy: defined strategy for measurement or estimation of the various process (input/output) parameters using data-driven techniques;
2 - Establishing a process set-up procedure (initial process parameter setting) using sequential data-driven optimization and active learning methods;
3- Establishing efficient feedback control during batch production using optimization-based methods to eliminate long-term drift effects due to consumption of components during the process.

An associated interdisciplinary PhD position available from the 1st of October 2019, comprises several of the following activities:
- Proposing and integrating measurement/estimation techniques for the process variables, using sensor fusion;
- Development of process models using first principles and data-driven techniques (neural networks, Gaussian process regression, data fitting / regression-based methods);
- Development of feedback control of the process to achieve low variation in the output quality: prototype and validation tests on machine.

Data modeling, programming (Matlab, Python), and understanding of control methods are essential for the successful completion of the proposed research. Experience with integration of hardware units (Labview or C/C++ programming) could be beneficial in the sensor fusion stage, however it is not critical for the project. This type of project is a collaboration with an industrial partner, and will be completed with the

continuous support of a team of industry R&D experts, engineers, and doctoral students with background in mechanical, electrical, or chemical engineering.

Applications to be sent to Prof. John Lygeros lygeros@control.ee.ethz.ch and Dr. Alisa Rupenyan rupenyan@inspire.ethz.ch with a cv, 2 reference letters/contacts, and transcripts of grades.

6.2. PhD: Max Planck Institute, Germany
Contributed by: Sebastian Trimpe, trimpe@is.mpg.de

Funded Ph.D. Positions at the International Max Planck Research School for Intelligent Systems

The Max Planck Institute for Intelligent Systems and the Universities of Stuttgart and Tübingen collaborate to offer an interdisciplinary Ph.D. program, the International Max Planck Research School for Intelligent Systems (IMPRS-IS). This doctoral program will accept its fourth generation of Ph.D. students in spring of 2020.

This school is a key element of Baden-Wurttemberg's Cyber Valley initiative to accelerate basic research and commercial development in artificial intelligence. We seek students who want to earn a doctorate while contributing to world-leading research in areas such as

- Computational Cognitive Science
- Computer Graphics
- Computer Vision
- Control Systems
- Haptics
- Human-Computer Interaction
- Machine Learning
- Micro- and Nano-Robotics
- Perceptual Inference
- Robotics

The participating faculty are Frank Allgower, Alexander Badri-Sprowitz, Philipp Berens, Matthias Bethge, Michael J. Black, Andres Bruhn, Andreas Bulling, Martin Butz, Caterina De Bacco, Peer Fischer, Andreas Geiger, Martin A. Giese, Matthias Hein, Philipp Hennig, Ardian Jusufi, Katherine J. Kuchenbecker, Hendrik Lensch, Falk Lieder, Georg Martius, Mijung Park, Tian Qiu, C. David Remy, Ludovic Righetti, Syn Schmitt, Gabriele Schweikert, Bernhard Scholkopf, Fabian Sinz, Metin Sitti, Ingo Steinwart, Jorg Stuckler, Marc Toussaint, Sebastian Trimpe, Isabel Valera, Ulrike von Luxburg, and Felix Wichmann.

Intelligent systems that can successfully perceive, act, and learn in complex environments hold great potential for aiding society. To advance human knowledge in this domain, we need doctoral students who are curious, creative, and passionate about research to join our school.

- You may join our program starting in spring of 2020
- You will be mentored by our internationally renowned faculty.

- You will register as a university doctoral student and conduct research.
- IMPRS-IS offers a wide variety of scientific seminars, workshops, and social activities.
- All aspects of our program are in English.
- Your doctoral degree will be conferred when you successfully complete your Ph.D. project.
- Our dedicated coordinator will assist you throughout your time as a doctoral student.

People with a strong academic background and a master's degree in Engineering, Computer Science, Cognitive Science, Mathematics, Control Theory, Neuroscience, Materials Science, Physics, or related fields should apply. We seek to increase the number of women in areas where they are underrepresented, so we explicitly encourage women to apply. We are committed to employing more handicapped individuals and especially encourage them to apply. We are an equal opportunity employer and value diversity at our institutions.

Admission will be competitive. If selected, you will receive funding via an employment contract, subject to the rules of the Max Planck Society and the two participating universities. You can apply at http://imprs.is.mpg.de before midday CET on **November 6, 2019.** Finalists will be invited to selection interviews that will take place from January 28 to January 31, 2020, in Stuttgart and Tübingen, Germany.

For further information, please visit http://imprs.is.mpg.de

6.3. PhD: Norwegian University of Science and Technology, Norway
Contributed by: Lars Imsland, lars.imsland@ntnu.no

PhD position at NTNU, Trondheim, Norway: Model Predictive Control under uncertainty

A fully funded PhD position is available at NTNU, Trondheim, Norway. The topic is Model Predictive Control under uncertainty, applied to offshore power systems integrating renewables.

For further details, and information about how to apply, consult:
https://www.jobbnorge.no/en/available-jobs/job/176366/phd-candidate

6.4. PhD: University of Kentucky, USA
Contributed by: Xu Jin, xu.jin@uky.edu

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

Ph.D. openings are available beginning Spring 2020 and Fall 2020 in the Department of Mechanical Engineering at the University of Kentucky, Lexington, KY, USA, on the topics of intelligent control. Our group's focus is on adaptive control and iterative learning control with applications to multiagent systems, constrained formation systems, robot manipulation systems, and 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 first pass the GRE and TOEFL tests with satisfactory scores meeting the departmental minimum requirement. Applicants with a strong background in mathematics, control systems, and/or robotics, and with experience in mathematical analysis, Matlab numerical simulations, hands-on experiences on robotic systems, are encouraged to apply. The applicant must demonstrate competent analysis, experimental skills, and programming ability. Dates: Beginning Spring 2020 (1 position) and Fall 2020 (1 position).

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 in the application package.

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. The city of Lexington is ranked #3 Best City to Raise a Family, #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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6.5. PhD: Eindhoven University of Technology, The Netherlands
Contributed by: Frank Willems, f.p.t.willems@tue.nl

AI-based control development for future automotive powertrains

The Control System Technology group at Eindhoven University of Technology (TU/e) is inviting applications for a PhD position in AI-based control development for future automotive powertrains.

In this PhD project, we aim to develop new Artificial Intelligence (AI)-based methods to dramatically reduce the required calibration effort and to enhance robust control performance for future powertrains. This research is done in close collaboration with DENSO Aachen Engineering Center. Main focal areas are the reduction of amount of control calibration parameters, auto-calibration and reduction of the measurement effort. Research will concentrate on the application of unsupervised as well as supervised machine learning methods to determine parametrized models. As a first step towards innovative adaptive control, concepts will be studied that apply these new parametrized models in (feedforward) control strategies and integrate this with on-line parameter identification methods. Next, the potential of reinforcement learning methods is examined for efficient auto-calibration of controllers and for automated testing. The potential of the developed AI-based methods is evaluated in a simulation environment (SIL), with validation potential on Hardware-In-the-Loop set-up, connected benches and vehicle.

The position is funded for four years. I am looking for a talented, outstanding PhD candidate with a M.Sc. degree in Systems and Control, Applied Mathematics, Electrical or Mechanical Engineering, or a related

field, with background and/or interest in automotive powertrain applications, and with good command of the English language. Applicants will continuously be reviewed until the position is filled. For information, please contact: prof. Frank Willems (f.p.t.willems@tue.nl) or dr. Emilia Silvas (e.silvas@tue.nl).

6.6. PhD: Maynooth University, Ireland
Contributed by: John Ringwood, john.ringwood@mu.ie

PhD position - Centre for Ocean Energy Research, Maynooth University, Ireland

The Centre for Ocean Energy Research (COER) at Maynooth University currently has a vacancy for PhD student in the area of real-time control of OWC wave energy devices. Energy maximising control systems have the capability to significantly improve the economic viability of wave energy systems and this project focusses on oscillating water column (OWC) devices, which have achieved some commercial penetration. The project will include control system design, control implementation and experimental analysis. Since the wave energy control problem is, in general, non-causal, with some of the key measurements unmeasurable, the project will also include some estimation and forecasting components.

The project will feature the recently developed moment-based wave energy control analysis and synthesis tools pioneered at COER, in partnership with Prof. Alessandro Astolfi's group at Imperial College, London. The project will include academic collaborators at Dundalk Institute of Technology (experimental wave tank facilities), Imperial College London (moment-domain analysis) and also an industry partner who is developing a commercial OWC device. The project will also be carried out as part of the MaREI (Marine and Renewable Energy Ireland) SFI-funded Research Centre, of which COER is a constituent partner. MaREI is a national network of over 200 researchers, involving 8 academic institutions and 45 industry partners (https://www.marei.ie/)

A tax-free stipend of €18,500 is available, and PhD fees are also covered. The project also provides adequate funding for equipment, materials and travel (conferences, courses, secondment, etc) and is tenable for a 4-year structured PhD. Applicants should be well qualified to bachelors or masters degree level in one of the following areas: mechanical/mechatronic engineering, electronic engineering, control engineering, or exceptional students in applied maths or hydrodynamics may be considered. The project will be supervised by Prof. John Ringwood (http://www.eeng.nuim.ie/jringwood/)

Further information on COER is available at: http://www.eeng.nuim.ie/coer/. To apply, send a full CV, along with the contact details of 3 referees, to coer@mu.ie. Informal enquiries may be made to Prof. John Ringwood (john.ringwood@mu.ie

6.7. PhD: European project MORE, Europe
Contributed by: Reza Ghabcheloo, reza.ghabcheloo@tuni.fi

8 PhD positions, H2020 European project MORE
Announcement: 8 fully-funded PhD job openings within H2020 MORE European Industrial Doctorate

MORE is educating Europe's Future Engineers in Next Generation Heavy Duty Machinery: AI driven Robotisation, Energy Efficiency and Process Optimisation.

Job description: fully funded 36 months PhD positions within an innovative research environment, international mobility (Finland, Sweden, Austria, Germany) and a network with high-profile academic and internationally leading industry partners.

Gross salary (approx. in EUR/month): 3600

Application deadline: 13th of November

More information: https://www.more-itn.eu/open-positions/

6.8. PhD: Centre for Doctoral Training in Agri-Food Robotics, UK
Contributed by: Kate Smith, kasmith@lincoln.ac.uk

EPSRC Centre for Doctoral Training in Agri-Food Robotics: AgriFoRwArdS - Fully-funded Studentships

Are you the next future technology leader, aspiring to change the world through robotics? Applications are invited for fully-funded four-year PhD studentships in the world's first Centre for Doctoral Training (CDT) in Agri-Food Robotics. This prestigious centre is a collaboration between the Universities of Lincoln, Cambridge and East Anglia, supported by industry leaders such as: John Deere, Syngenta, G's Growers, Beeswax Dyson, ABB Robotics, Saga Robotics

Year 1: Based in a vibrant and research-intensive environment, all students will study for an MSc in Robotics and Autonomous Systems at the University of Lincoln, gaining foundational knowledge and skills. Successful students will also benefit from guest lectures, seminars and workshops from University of Cambridge and University of East Anglia supervisors.

Years 2-4: Students will continue to study for a PhD at their chosen host institution (either the University of Lincoln, University of Cambridge or the University of East Anglia), investigating a research area that links both an identified industry need and individual academic interests, helping to develop a new generation of robotics systems across the food supply chain.

Associated Training: An integrated research training programme will take place throughout both the MSc and PhD phases, enabling students to specialise between possible career routes including 'engineer', 'executive', 'entrepreneur' and 'academic researcher', with training courses tailored to each of these directions. Students will also benefit from participation in the CDT's annual summer schools and conferences.

Why AgriFoRwArdS? The AgriFoRwArdS CDT provides a unique blend of technical expertise, outstanding research environments and integral industry collaboration in Agri-Food Robotics. Our fully-funded studentship package includes:
- All MSc and PhD tuition fees paid
- A tax-free stipend at EPSRC rates to cover living costs

- A Research Training Support Grant (RTSG) of £1,500 each year to support travel costs (£6,000 in total).

Additional funding to support outreach and dissemination, attendance at summer schools, research events, and development projects. For more information regarding this opportunity, and to apply, please visit https://lcas.lincoln.ac.uk/wp/cdt/

6.9. PhD: Lund University, USA
Contributed by: Anders Rantzer, rantzer@control.lth.se

Two PhD positions at Lund University, Sweden

The first position, funded by the European Research Council, is devoted to theory for large scale systems and adaptive control, in particular with applications in energy networks. The other position, also with EU-funding, is devoted to the use of adaptation and control to achieve fault and intrusion tolerance for embedded systems.

Short Deadline: November 8.

See http://www.lth.se/english/work.

6.10. PhD: University of Louisiana at Lafayette, USA
Contributed by: Afef Fekih, afef.fekih@louisiana.edu

The Advanced Controls Laboratory at the University of Louisiana at Lafayette, USA has available funding to support a PhD student in the general area of advanced control design/Fault Tolerant Control with application to dynamic systems. Special considerations will be given to students who have a strong background in power systems such as wind turbines and/or PVs. The successful candidate is expected to have a strong background in control systems theory, and a very good knowledge of power systems. Programming skills in MATLAB/Simulink are required. A genuine interest and curiosity in the subject, excellent oral and written English communication skills are needed.

Applicants shall have a Master's degree or equivalent in systems and controls, power systems, electrical engineering, mechanical engineering, applied Math or a related discipline. The PhD student is expected to carry out original research and complete coursework throughout the period of appointment. Results will be communicated in the form of journal publications, conference presentations, and the PhD dissertation.

The funding covers the cost of full tuition and stipends at a competitive rate and will start in Fall 2020. Interested individuals should send their detailed curriculum vitae to Dr. Afef Fekih (afef.fekih@louisiana.edu).

6.11. PhD: French-German Research Institute of Saint-Louis, France
Contributed by: Spilios Theodoulis, Spilios.Theodoulis@isl.eu

The Guidance, Navigation & Control (GNC) group of the French-German Research Institute of Saint-Louis (ISL) is inviting applications for a fully funded PhD position in the general area of flight dynamics and control of autonomous systems. The successful candidate must hold (or soon complete) an MSc degree on automatic control with additional skills in flight mechanics being also appreciated. Excellent programming skills in MATLAB/Simulink are also required.

The positions are to be filled immediately and are in collaboration with industry and academia from France and Germany. The institute offers a very attractive salary, a multidisciplinary working environment with great scientific interactions and is located near the metropolitan area of Basel.

To apply for this position, send a CV, transcripts and motivation letter to Spilios.Theodoulis@isl.eu (only EU citizenship applications will be considered)

6.12. PhD: The George Washington University, USA
Contributed by: Peng Wei, pwei@gwu.edu

Two PhD positions at George Washington University (Washington DC)

Peng Wei is an assistant professor in Iowa State University Aerospace Engineering Department, with courtesy appointments in Electrical and Computer Engineering Department and Computer Science Department. By contributing to the intersection of control, optimization, machine learning, and artificial intelligence, he develops autonomy and human-in-the-loop decision support tools for aeronautics, aviation and aerial robotics. His current focus is on safety, efficiency, and scalability for decision making systems in complex, uncertain and dynamic environments. Recent applications include: Air Traffic Control/Management (ATC/M), Airline Operations, UAS Traffic Management (UTM), eVTOL Urban Air Mobility (UAM) and Autonomous Drone Racing (ADR). Prof. Wei 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.

Prof. Wei's past and current graduate students obtained full time positions and internships at NASA Ames, FAA, American Airlines, Air France/KLM, MIT Lincoln Lab, Airbus, TuSimple, Airmap, and Metron Aviation. Through these close industry collaborations, Prof. Wei's group have been conducting original and impactful research for real world aviation and aeronautics problems (e.g. our models have been running at American Airlines and the FAA to benefit the society).

After spending 5 years at Iowa State, Prof. Wei will join the Department of Mechanical and Aerospace Engineering at George Washington University in January 2020. There will be two PhD positions open in his group starting from Fall 2020. Motivated students with excellent mathematical background, strong programming skills, and aviation/aeronautics passion are encouraged to apply, including but not limited to background in dynamics and control, optimization and operations research, statistical machine learning, and reinforcement learning.

Please see more details about Prof. Peng Wei at https://web.seas.gwu.edu/pwei/ If you are interested in working with Prof. Wei, please contact him directly by sending your CV and transcripts to pwei@gwu.edu

6.13. PhD: University of Georgia, USA
Contributed by: Javad Mohammadpour, javadm@uga.edu

Several open positions are available for PhD students at Velni's Lab in the School of ECE at Univ. of Georgia. The positions are available as early as January 2020. The topics and the desired background are as follows:

1. Learning-based and Uncertainty-aware Control for Complex Systems
The objective of this project is to develop fundamental tools for real-time (and data-driven) model learning and predictive control of nonlinear and stochastic systems, where uncertainties are also learned, and apply them to several practical applications. The modeling and control design would be done in the linear parameter-varying (LPV) framework. Strong background in machine learning and model predictive control (MPC) is required. Prior knowledge of LPV systems modeling and/or control is desired.

2. Development of a Big Data Analytics Pipeline for Precision Agriculture
The general goal of this project is to utilize and implement real-time learning tools (like Faster RCNN and YOLO) for a variety of applications in smart farming, and in particular in high-throughput phenotyping. Strong background in machine/deep learning theory and application and big data analytics is required.

3. Stochastic Hybrid Control Design for Mass Deployment of Autonomous Vehicles
The general goal of the project is to develop a model-based stochastic hybrid systems theoretic approach to coordinate a large group of connected and automated vehicles. In particular, the project will develop a stochastic MPC framework accounting for probabilistic uncertainties in disturbances (e.g., human actions) and vehicles' operating mode transitions. Strong background in hybrid control systems is required. Prior knowledge of statistical machine learning is desired.

4. Anomaly Detection in Cyber-human-physical Systems using Statistical Learning
The general goal of the project is to develop distributed approaches for detecting anomalies (faults or attacks) in cyber-physical systems, and in particular in smart energy systems. The development of theory and implementation of distributed real-time learning approaches is the goal, where the prior knowledge of the underlying physics-based models will be embedded in the appropriate data-driven method and used for detecting anomalies. Strong background in graph theory and machine learning is required. Prior knowledge of domain (e.g., power systems) is desired.

A competitive research assistantship and full tuition waiver will be offered. Outstanding candidates will also be considered for other fellowships provided by the UGA College of Engineering and Graduate School.

To apply, please send an application package to javadm@uga.edu. The application should be submitted as a single PDF and include a cover letter (explicitly describing the candidate background and how they fit the open positions), a detailed CV (including the list of publications), and unofficial copies of their

BS (and, if applicable, MS) transcripts.

University of Georgia (UGA), a top tier one research institution, is ranked 16th overall among all public national universities in the 2018 U.S. News & World Report rankings, and a Princeton Review top ten in value. UGA is recognized as a Public Ivy, a publicly-funded university considered to provide a quality of education comparable to that of an Ivy League university. Athens, GA is located approximately 70 miles northeast of Atlanta, GA. Consistently voted one of the best college towns in the United States, Athens has a thriving business, restaurant and music scene and is the gateway to numerous leisure activities in northern Georgia.

6.14. PhD/Postdoc: University of Melbourne, Australia
Contributed by: Girish Nair, gnair@unimelb.edu.au

Post-docs and PhD's in Robot Control, Perception and Spatial Awareness Expressions of interest are invited again for up to two postdoctoral and three PhD positions in the Dept. Electrical and Electronic Engineering at the University of Melbourne, Australia. These positions are to work on an Australia-US Multidisciplinary Research Initiative project on perception, navigation and spatial awareness in mobile robots, using vision or other sensing modalities. There will be opportunities to collaborate with and visit institutions in Boston, USA.

* Postdoctoral candidates should ideally have PhDs in areas related to control, robot navigation, optimisation, or statistical signal processing. Experience with mobile robots, and familiarity with vision-based methods, information theory, or partially observed Markov processes would be advantageous. For more information and to apply, please go to

http://jobs.unimelb.edu.au/caw/en/job/900793/research-fellow

The deadline has been extended to November 7.

* PhD candidates must have good Masters or four-year Bachelor degrees related to engineering or applied maths/probability, and familiarity with control, signal processing or stochastic models, with strong weighted averages. The living allowance is AUD30,960 per year tax-free, conditional on gaining admission into the PhD degree at the University of Melbourne with a tuition fee waiver. Please email Prof Girish Nair gnair@unimelb.edu.au if interested, with the subject heading ROBOT PHD .

6.15. Postdoc: Southern University of Science and Technology, China
Contributed by: Wei Zhang, zhangw3@sustech.edu.cn

Joint Postdoctoral Research Fellow Positions in Control & Robotics at SUSTech and SNU

Two joint postdoctoral research fellow positions are available at the Robotics Institute of Southern University of Science and Technology (SUSTech). The postdocs will be co-advised by Prof. Wei Zhang at SUSTech

and Professor Frank Park at Seoul National University (SNU).

http://www.wzhanglab.site/
https://bit.ly/2NrYCVM

We are looking for highly motivated candidates capable of making key contributions in control and learning theory for robotics. In addition to robotics, the candidates are expected to have a strong background in one or more of the following areas:
- systems and control
- optimization
- machine learning
- mechatronics
- applied mathematics
with a desire to apply these tools to practical robotics applications.

Depending on the candidate's background, the position can involve basic or applied research related to legged robots, underwater robots, or robotic manipulators. We have excellent facilities and resources to perform real robotic experiments (e.g. Minitaur, Laikago, and a high performance quadruped robot built in-house; robotic fish, ROV and other underwater robots; Kuka LBR iiwa and other collaborative robots, and many other robotic systems).

The position will involve spending time at both SUSTech and SNU, with opportunities to visit/collaborate with other world-leading research groups in control and robotics, and many robotics companies in the Shenzhen area.

Salary is internationally competitive. Excellent candidates will directly be considered for appointment to a research assistant professor position at SUSTech. Most candidates will also benefit from the Peacock Plan of Shenzhen ($\geq$ 1.6M CNY compensation without tax; see http://www.gaoxinbutie.com/haiwairencai/for further details).

Interested applicants should send their application package to clearlab@sustech.edu.cn. The package should include (1) cover letter, (2) CV, and (3) two selected recent research publications. The search will continue until the positions are filled.

6.16. Postdoc: University of Manchester, UK
Contributed by: Guido Herrmann, guido.herrmann@manchester.ac.uk

Post-doctoral Research Associate in Robotics and Intelligent Automation at the University of Manchester

Division : Department of Electrical & Electronic Engineering, University of Manchester
Closing Date (DD-MM-YYYY) : 14/11/2019
Contract Duration : 01 January 2020 until 31 December 2021
Manager: Professor Guido Herrmann,
https://www.research.manchester.ac.uk/portal/guido.herrmann.html

Email: guido.herrmann@manchester.ac.uk (for enquiries)
Link for application: https://www.jobs.manchester.ac.uk/displayjob.aspx?jobid=18077

Robotics in industrial environments and for automation of high precision processes is entering a new stage due to the significant development of mechanical, mechatronic and algorithmic intelligence combined with the growing availability of real-time computational resources. New actuation and sensing systems have led to the evolution of robotic arms, e.g. the KUKA LBR iiwa, and its use in real-time human guided / interaction based operation. We are looking for a highly motivated researcher to join the team of roboticists at Manchester, https://www.eee.manchester.ac.uk/research/themes/robotics-for-extreme-environments/.

The researcher will be working on the development and subsequent control of novel robotic systems at high technology readiness level, specifically in the nuclear energy sector, supporting also the recent UKRI funded research project RAIN (ROBOTICS AND AI IN NUCLEAR). The researcher will be cooperating with roboticists experts across the University of Manchester, with various external universities (e.g. Universities of Bristol, Oxford, Sheffield, Liverpool, and Nottingham) and with robotics specialists from RACE, Oxford (Remote Applications in Challenging Environments). The researcher will be based in the Sackville Street Building of the School of Electrical and Electronic Engineering at the University of Manchester. This project will be led by Professor Guido Herrmann.

Preferably, the candidate must hold a PhD degree (or about to finish a PhD) in Mechatronics, Robotics or a similar discipline. You must have practical experience in the development and assessment of new actuator and sensor systems, in the system integration of sensors and actuators (hardware and software) for robotics and high-precision devices, in embedded programming for control implementation and relevant implementation systems, in industrial communication, in the development, design and implementation of controllers at high Technology Readiness Level and in handling complex experimental problems. You must have excellent interpersonal skills, capable of interacting with industry and funding agencies, work effectively in a team, have experience of preparing and delivering presentations, journal papers to the highest standards and have experience of preparing funding bids either in industry or academia.

6.17. Postdoc: Carnegie Mellon University, USA
Contributed by: Keyla Cook, keylac@cs.cmu.edu

Postdoctoral Fellow Position at Carnegie Mellon University
Deep Reinforcement Learning techniques for multi-agent systems
Supervisor:
Prof. Katia Sycara (katia@cs.cmu.edu)
The Robotics Institute, Carnegie Mellon University
Website: http://ri.cmu.edu/ri-faculty/katia-sycara

Location:
The Advanced Agent-Robotics Technology Lab
The Robotics Institute, Carnegie Mellon University
Pittsburgh, Pennsylvania, USA

The successful candidate will work on Deep Reinforcement Learning algorithms for single and preferably multi-agent planning and learning where some of the agents could be humans. The position is available immediately, however the start date is negotiable, depending on candidate circumstances. The expected duration of the position is two years with possible additional renewal upon review.

Qualifications:
- PhD in a field related to robotics and/or AI.
- A strong theoretical background in Machine Learning, multi-agent planning, decision-making under uncertainty, swarm robotics, and/or human-robot interaction
- Programming skills including experiences using C++, Python, and/or MATLAB, Neural Network programming tools, eg pytorch
- Ability to present work clearly both written and orally
- Experiences with ROS and deep learning.

Applicants should provide the following material via email to Prof. Katia Sycara (katia@cs.cmu.edu). Please use the subject line: "Postdoc application." Applications will be reviewed as they are received.
- A curriculum vitae
- A statement of research expertise and interests (up to 2 pages)
- Up to 3 publications
- Names and contact information of three references
- Dates of availability
- A personal website, if available, where further details can be found

The postdoc will (a) carry out high quality research and publish the research results in the area of learning for multiple agents and human-agent teams, (b) assist in research supervision and guidance of graduate and undergraduate students, (c) present research results to sponsors, (d) participate in research proposal preparation.

6.18. Postdoc: Purdue University, USA
Contributed by: Shaoshuai Mou, mous@purdue.edu

Lillian Gilbreth Postdoctoral Fellowships at Purdue University in Multi-Agent Learning/Resilience

The Gilbreth Postdoctoral Fellowships at Purdue Engineering are awarded in memory of Dr. Lillian Moller Gilbreth, Professor at Purdue from 1935-1948. A world renowned pioneer in the application of psychology to industrial engineering, Dr. Gilbreth's work epitomized interdisciplinary research and broader impact on industry and society.

Program Goal: The goal of the Lillian Gilbreth Postdoctoral Fellowship Program at Purdue Engineering is to attract and prepare outstanding individuals with recently awarded PhDs for a career in engineering academia through interdisciplinary research, training, and professional development. The Lillian Gilbreth Postdoctoral Fellows are selected not only for their outstanding scholarly achievements and proposed innovative interdisciplinary research but also for their potential for broader impact on industry and society. They undertake research with faculty mentors in different fields and participate in professional develop-

ment activities tailored to their chosen path in academia.

Eligibility: Individuals who have either completed their PhD within two years of the Fellowship application deadline or are in the final year of their PhD program in engineering or related sciences at the time of application can apply.

Benefits: Gilbreth Fellows are appointed for a two-year term, and receive an annual stipend of $60,000 and benefits. A $5,000 grant is also provided for professional development such as attending conferences or workshops and are mentored for their future academic careers through a variety of programs.

Submission Deadline: December 6, 2019

One Research Topic: Resilience and Learning for Large-Scale Multi-Agent Autonomy

Postdoc Qualifications: Solid mathematical skills and background in relevant areas, such as networks, control, optimization, or learning; Passion and interest to solve challenging research problems using methodologies from different areas; Good communication and writing skills (English); Ability to thrive in a collaborative environment.

Co-advisors: Shaoshuai Mou (mous@purdue.edu) and Shreyas Sundaram (sundara2@purdue.edu)

6.19. Postdoc: NC A&T State University, USA
Contributed by: Ali Karimoddini, akarimod@ncat.edu

Postdoctoral Position in Control of Multi-agents Systems

The Autonomous Cooperative Control of Emergent Systems of Systems (ACCESS) Laboratory at NC A&T State University, invites applications for a full-time, post-doctoral research associate position in Multi-agent Systems applications particularly the Cooperative Control of UASs for Smart Agriculture, Environment, and Infrastructure. The project uses cooperative control of UASs and distributed remote sensing techniques for applications such as smart farming or infrastructure inspection.

This is a non-tenure-track, year-to-year appointment, renewable annually for up to two years subjected to satisfactory performance, availability of resources, and the needs of the Lab. We thus look for applicants that have a demonstrated track record in the applications of multi-agent systems. Programming and practical experiences with embedded real-time systems are desired.

The candidate will be also working with both graduate and undergraduate students in a mentoring role, and will be involved in conducting workshops, and seminars. The candidate will enjoy a dynamic and collaborative working environment. U.S. citizenship is preferred, and minority candidates are strongly encouraged to apply. If interested, please submit our application via https://jobs.ncat.edu/postings/18833. For any question, please contact Dr. Karimoddini (akarimod@ncat.edu).

6.20. Postdoc: University of Melbourne, Australia
Contributed by: Iman Shames, iman.shames@unimelb.edu.au

Postdoc/Research Fellow in Planning, Optimisation, and Control

The ideal applicant will have an outstanding background in Engineering, Computer Science, or Applied Mathematics (or equivalent), as well as experience with the implementation of numerical methods and engineering applications of optimisation techniques (continuous and discrete) in real-time control of dynamical systems with exposure to mathematical foundations of learning, graph theory, system verification, and temporal logic.

Applicant Profile:

- PhD in Engineering, Computer Science, or Applied Mathematics, or equivalent;
- quality research as evidenced by publications in leading journals and at conferences of systems and control and/or planning and optimisation;
- expertise in system modelling and control and/or planning algorithms; strong interest in the application of these to address practical problems; in real-time decision-making scenarios;
- commitment to pursue fundamental research on problems pertaining to real-time decision making in dynamic systems;
- your initiative; need for minimal supervision; and ability to prioritise tasks to meet timelines;
- capacity to communicate research concepts to technical and non-technical audiences;
- ability to work as part of a team that includes graduate and undergraduate students.

See the following link for more information and submitting your application:
http://jobs.unimelb.edu.au/caw/en/job/901101/research-fellow-in-planning-optimisation-and-control

6.21. Postdoc: Rutgers University, USA
Contributed by: laurent burlion, laurent.burlion@rutgers.edu

Postdoc Position at Rutgers University, Mechanical and Aerospace Engineering A Postdoctoral Associate is available from January 2020 to December 2021 at Rutgers, The State University of New Jersey. Candidate will work under the guidance of Professor Laurent Burlion. Position is Full Time.

Candidate should have strong background in robust control and/or constrained control and/or optimal control. The purpose of the project is to develop new control techniques for floating offshore wind turbines, or wind farms, using the discipline of control co-design.

Minimum requirements:
- Highly motivated candidates with strong background in engineering - PhD degree in control - Excellent communication skills. - Experience as first author on one or more scholarly peer reviewed publications.

Any special computer skills or equipment utilized: Matlab and/or Python

6.22. Postdoc: TU Delft, The Netherlands
Contributed by: Laura Ferranti, l.ferranti@tudelft.nl

Postdoc: Privacy-preserving algorithms for robot motion planning

We are looking for a candidate with a PhD degree in systems and control, robotics, computer science, or a related subject. The candidate must have strong analytical skills and must be able to work at the intersection of several research domains. Experience with real robot applications is a plus. The applicant should have demonstrated ability to conduct high-quality research according to international standards, as demonstrated by publications in international, high-quality journals. A very good command of the English language is required, as well as excellent communication skills.

General project description: Mobile robots can highly benefit our society. Highly automated vehicles will revolutionize the way we intend transportation. These vehicles can be used to make transportation more efficient and sustainable (for example, with platooning and ride sharing strategies). Vehicle to vehicle (V2V) communications will play a fundamental role in the development of efficient algorithms to coordinate these vehicles in our cities. This type of coordination, however, requires heterogeneous robots (from different owners) to share sensitive information. This information sharing might halt the use of these technologies due to privacy-related concerns. This project aims to explore distributed privacy-preserving motion-planning strategies to allow different robots to agree on a coordination strategy without revealing sensitive information. The main challenge will be to develop a coordination algorithm for multi-robot systems that is distributed, privacy-preserving, and real-time.

The appointment is for 1 year. More information can be found at the following link
https://vacature.beta.tudelft.nl/vacaturesite/permalink/286536/?lang=en

To apply, please prepare:
- a cover letter
- a separate letter of motivation explaining why you are the right candidate for this project,
- a detailed CV,
- electronic copies of your top three publications,
- a summary of your PhD thesis,
- the names and contact addresses of two or three references,
- any other information that might be relevant to your application.

All these items should be combined in one PDF document. Applications should be submitted by email at the earliest convenience to application-3mE@tudelft.nl. When applying for this position, please refer to vacancy number 3mE19-87. The starting date is flexible. For general inquiries, feel free to send an email to Laura Ferranti (l.ferranti@tudelft.nl)

6.23. Postdoc: SINTEF, Norway
Contributed by: Anne Marthine Rustad, AnneMarthine.Rustad@sintef.no

The research institute SINTEF is hiring a PostDoc within "Machine learning and control of dynamic systems"

https://bit.ly/31RsAYx

This exiting opportunity is collaboration between SINTEF, major companies within Norwegian process industry and academia. The research area is in the intersection between machine learning and control, and where the emphasis is on combining data-driven and model-based methods for estimation and control. SINTEF is one of the largest, independent research institutes in Europe with more than 2000 employees and 70 nationalities. Our vision is "Technology for a better society". Together with our industry partners we do applied research to uncover new knowledge and solutions that contribute to sustainable value creation, improved resource utilization and/or new revenue opportunities.

Most of your time will be spent at SINTEFs premises in Oslo, Norway. You will join our team of dedicated researchers and PhD students. A professional development plan for the full duration of the fellowship will be developed in collaboration with the candidate. You will have a PhD in machine learning, cybernetics, computer science or similar. The ideal candidate is well experienced in machine learning, has knowledge of dynamic systems as well as skills and interest in programming and program development in teams. Knowledge of control systems is an advantage. It is essential you are able to work independently and able to manage a project including meeting defined milestones.

This is a full time fixed term contract for 2 years. You submit your application through the link above by November 12th.

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6.24. Postdoc: University of Michigan, USA
Contributed by: Dawn Tilbury, tilbury@umich.edu

Postdoc in Control and Robotics at Univ. of Michigan

We are looking for a postdoc in the area of control and robotics for manufacturing systems. The postdoc would work with Professors Dawn Tilbury and Kira Barton in the Mechanical Engineering Department and the Robotics Institute at the University of Michigan. The research will bring together concepts from data analytics, machine learning, formal verification, modeling and control to improve the overall performance of manufacturing systems along the dimensions of productivity, quality, flexibility, and sustainability. More information on the types of projects related to this research can be found at https://sdc-mfg.engin.umich.edu/

The postdoc will work with a small industrial testbed at the University of Michigan that includes augmented and virtual reality software/hardware, collaborative robots, CNC machines, and off-the-shelf 3D printers; all instrumented with industrial-quality sensors and controllers. Multiple graduate and undergraduate students work in the group, and there is good collaboration with industrial partners. Funding comes from NSF and industry. Required qualifications include: a recent PhD in Mechanical or Electrical Engineering (or a related field), experience in control systems (theory and/or application), and excellent oral

and written communication skills. Desirable qualifications include: experience with collaborative robotics, experience with industrial control systems; experience with manufacturing systems, experience with Big Data and/or Cloud Computing, and programming experience with C/C++/Java.

The University of Michigan is committed to effective mentoring and training of postdoctoral researchers, to enable them achieve their career goals. More information on UMich postdoc programs can be found at: http://www.rackham.umich.edu/postdoctoral
Interested candidates should send their CV and a cover letter describing their specific interest and how their background fits the qualifications to Prof. Dawn Tilbury, tilbury@umich.edu and Prof. Kira Barton bartonkl@umich.edu preferably before November 20. Start date could be as early as January 1, or later in the spring.

6.25. Postdoc: University of Vermont, USA
Contributed by: Hamid Ossareh, hossareh@uvm.edu

The controls lab in conjunction with the power and energy research center at the University of Vermont invites applications for a postdoctoral researcher in control theory, power systems, and distributed control of distributed energy resources (DERs). The project is sponsored by NIST (the National Institute of Standards and Technology). This is a year-to-year renewable appointment, subject to satisfactory performance, availability of resources, and the needs of the project. Expected start date is January 2020. Link for the ad:

https://bit.ly/328MtKs

Desired qualifications include a demonstrated track record of publications with one or more of the following topics:
- Predictive control and set-theoretic methods in control (preferably experience with maximal admissible sets, robust invariant sets, reference governors, and/or command governors);
- Power system dynamics, and DER modeling and control (preferably knowledge of HiL testing);
- Optimization theory and numerical methods for optimization.

The responsibilities of this position include:
- Develop an efficient reference governor theory for time-varying systems, and leverage the developed theory to design constraint-aware controllers for edge devices in a power grid;
- Supervise the implementation of HiL tests to validate the resulting control systems;
- Mentor MS and PHD students working on similar topics;
- Assist with NIST reporting and project management
- Lead journal publications and top-tier conference submissions

A competitive salary and benefits are included plus living in (or near) beautiful Burlington, Vermont. The candidate will enjoy a dynamic and collaborative working environment.

Interested applicants must email Dr. Hamid Ossareh (hossareh@uvm.edu) the following:
i) your updated curriculum vitae (CV);
ii) a brief 1-paragraph statement of why you believe your background is a good fit for the position;

iii) a brief 1-paragraph summary of your Ph.D. dissertation topic;

iv) contact information of three professional references.

Applicants who do not follow the above format will not be considered for this position.

6.26. Faculty: École Polytechnique Fédérale de Lausanne, Switzerland
Contributed by: Nikolas Geroliminis, nikolas.geroliminis@epfl.ch

Faculty Position in Emerging Mobility and Technology-Aware Transportation Infrastructure.
Link: https://bit.ly/35dqHrL

Dear Colleagues,

It is a great pleasure to announce that we are looking for a tenure track Assistant Professor at EPFL in Transportation. Please help us to distribute the announcement to your networks.

Screening of application will start in November 15. Please click the link above for further information. The successful candidate will have a strong research background in transportation systems as well as the potential to develop an innovative and internationally recognized research program leading to an outstanding record of scientific accomplishments.

Do not hesitate to contact me for any questions. We look forward to receiving your application with fascinating ideas how to make mobility better.

Prof. Nikolas Geroliminis
Chair of the Search Committee
E-mail: transportsearch@epfl.ch

6.27. Faculty: Oslo Metropolitan University, Norway
Contributed by: Vahid Hassani, Vahid.Hassani@oslomet.no

Associate Professor in Electronics or Industrial Communications Systems Faculty of Technology, Art and Design, Department of Mechanical, Electronics and Chemical Engineering

OsloMet – Oslo Metropolitan University is one of Norway's largest universities, with more than 20,000 students and 2,000 employees. OsloMet delivers knowledge to solve societal challenges, in close cooperation with the society and employers. OsloMet is an urban and diverse university with a clear international profile, and an attractive place to work and study with campuses in Oslo city center and at Kjeller in the Municipality of Lillestrøm. Our location in the metropolitan area gives us good opportunities to understand and benefit from the city's diverse population.

The Faculty of Technology, Art and Design (TKD) offers higher education and research and development (R&D) activities within technical subjects, arts and design. The Faculty has approximately 3.000 students

and 280 staff members and is situated at Pilestredet Campus in downtown Oslo and at Kjeller Campus in Akershus.

The Department of Mechanical, Electronics and Chemical Engineering (MEK) is one out of five departments at TKD. The department offers three bachelor's degree programmes and will from 2020 offer a master's degree programme, in addition to research and development activities. The department has approximately 30 staff members, 10 PhD students (in Engineering Science at TKD) and researchers, and 450 students. The Department of Mechanical, Electrics and Chemical Engineering (MEK) has a vacant position as Associate Professor in Electronics or Industrial Communication Systems.

We are looking for a candidate with a talent and a passion for teaching, research, and innovation. The candidate will be expected to have conducted extensive research in the field of electronics or industrial communication systems. The research should be reflected in an extensive high international quality publication list in high impact journals and conferences. Experience from research and development work in the industry is also important. Strong emphasis is placed on academic work during the past five years. The candidate is expected to actively strengthen and shape the academic and research work at the department and the university's research community in general, including interdisciplinary work across departments at the Faculty of Technology, Art and Design, as well as in collaboration with other faculties at OsloMet.

The candidate is expected to initiate and secure external funding for new research projects. Extensive experience with applying and securing external funding from e.g. the Norwegian Research Council and EU is a requirement for this position, in addition to academic excellence.

The full announcement can be found on https://bit.ly/33M33Bh. The deadline for the application submission is November 26th, 2019.

6.28. Faculty: Northeastern University, USA
Contributed by: Rifat Sipahi, r.sipahi@northeastern.edu

Faculty positions at Northeastern University, Boston

The Department of Mechanical and Industrial Engineering (MIE) at Northeastern University invites applications for tenured or tenure-track appointments at the assistant, associate, or full professor level in the areas of control systems, robotics, nonlinear dynamics, and vibrations, with possible applications in medical robotics, autonomous and network systems, human-robot systems, and intelligent control systems. For further details, please visit this link:

https://careers.hrm.northeastern.edu/en-us/job/501879/assistantassociatefull-professor-mechanical-and-industrial-engineering

6.29. Faculty: University of New Hampshire, USA
Contributed by: May-Win Thein, may-win.thein@unh.edu

Open Faculty Position at the University of New Hampshire - Department of Mechanical Engineering: Assistant/Associate Professor of Ocean Engineering

The Department of Mechanical Engineering (ME) at the University of New Hampshire (UNH) invites applications for a tenure-track faculty position at the assistant or associate rank in the area of ocean engineering with a starting date of August 24, 2020. The Department is particularly interested in creative scholars who can make fundamental contributions to one or more of the following focus areas: marine robotics, ocean simulations, marine structures, coastal processes, ocean sensing, marine geotechnics, ocean renewable energy, and ocean acoustics.

The successful candidate will build on current strengths in the Department in these areas, have access to state-of-the-art laboratory facilities and ocean test sites, and opportunities to engage in interdisciplinary collaborations across campus. Possible affiliations include the UNH School of Marine Science and Ocean Engineering, the UNH Institute for the Study of Earth, Oceans, and Space, and/or the UNH Integrated Applied Mathematics Program. Minimum qualifications for the position include a Doctorate in Ocean Engineering, Mechanical Engineering, or a closely related field and evidence of ability to (1) establish and maintain a productive level of scholarly work; (2) excel as a teacher at both the undergraduate and graduate levels; (3) successfully mentor undergraduate and graduate research students; (4) participate in Department, College and University service activities.

The application package should include a cover letter, detailed curriculum vitae, documents stating specific teaching interests and research plans (two page maximum each) and the names of at least three references. In addition, an optional statement that demonstrates an ability to work with faculty, staff, and students as well as community groups of diverse academic, socioeconomic, cultural, sexual orientation, disability and ethnic backgrounds is encouraged. The target date for applications is November 1, 2019, but the search will remain open until the position is filled. Consideration of applications will begin immediately. Please apply directly online at: https://jobs.usnh.edu/postings/34223. Questions should be addressed to: Christopher White, Professor and Chair, Mechanical Engineering Department, University of New Hampshire, Durham, NH, 03824, chris.white@unh.edu.

UNH is a R1 Carnegie classification research institution, providing comprehensive, high-quality undergraduate programs and graduate programs of distinction. The University actively promotes a dynamic learning environment in which qualified individuals of differing perspectives, life experiences, and cultural backgrounds pursue academic goals with mutual respect and shared inquiry. The University seeks excellence through diversity among its administrators, faculty, staff, and students. The University prohibits discrimination on the basis of race, color, religion, sex, age, national origin, sexual orientation, gender identity or expression, disability, veteran status, or marital status. Application by members of all underrepresented groups is encouraged.

Interested candidates should apply at https://jobs.usnh.edu/postings/34223

6.30. Faculty: University of Tehran, Iran
Contributed by: Hamed Kebriaei , kebraei@ut.ac.ir

Faculty Position at University of Tehran

The University of Tehran offers up to three tenure track faculty member position in the field of Control in School of Electrical and Computer Engineering (ECE).

University of Tehran (UT) is the first modern and highest rank university in Iran. School of ECE, with more than 2000 students, 84 faculty members, 80 research Laboratories is the largest school in UT. ECE-UT holds the "Control and Intelligent Processing Center of Excellence" of the country and the Control department of ECE attracts the highest ranked students of the country in the field.

For more information about the control department of ECE you can visit:

http://ece.ut.ac.ir/en/control

The applicants must hold a PhD degree from renowned international universities and have a solid background in Control Systems with a strong academic records and proved world class capabilities in research.

As a faculty member your role will be to:

-Perform fundamental and applied research at the forefront of the systems and control domain;

-Publish in renowned scientific journals and conferences;

-Set up and teach inspiring courses and lab projects in the BSc, MSc and PhD programs at ECE-CS;

-Supervise PhD and MSc students as well as BSc student projects;

-Maintain and expand an effective network of cooperation partners in academia, institutes and industry

-Contribute to acquiring funding for research projects from (inter)national research funding agencies.

What is required in an application pack?

• Cover letter stating your interest in the faculty position in Control department

• A full academic CV,

• Your statement of purpose,

• Details of three references.

Interested candidates should send their application pack for consideration to:

Dr. Hamed Kebriaei: kebriaei@ut.ac.ir

6.31. Faculty: Texas A&M University, USA
Contributed by: Reza Langari, rlangari@tamu.edu

Professor – Multidisciplinary Engineering Technology Program (Mechatronics)

Assistant, Associate or Full Professor – Multidisciplinary Engineering Technology Program (Mechatronics)

The Department of Engineering Technology and Industrial Distribution, College of Engineering, at Texas A&M University invites applications for a tenured or tenure track faculty position at the assistant, associate, or full professor levels with expertise in one or more of the following areas: mechatronics, industrial and mobile robotics, automation, product design, industrial internet of things (IIoT), cyber-physical systems, and embedded systems. This is a full-time, nine-month academic appointment with an anticipated start date of fall 2020

The successful applicant will teach at the undergraduate and graduate levels; advise and mentor graduate students; develop an independent, externally funded research program; participate in all aspects of the

department's activities; and serve the profession. Through effective industrial advisory committees that provide valuable guidance, the department has numerous opportunities for the development of laboratories and sponsorship of applied research activities. Candidates should have relevant hands-on experience with applied research and technology development in robotics and automation, academic leadership experience and/or experience with the Accreditation Board of Engineering Technology and its accreditation processes. By being an integral part of the College of Engineering, there is excellent interaction with faculty in other engineering programs to support large-scale college initiatives, as well as access to graduate students to assist in instructional and applied research activities. Strong written and verbal communication skills are required. Applicants should consult the department's website to review our academic and research programs (engineering.tamu.edu/etid).

Qualifications: Applicants must have an earned doctorate in an appropriate engineering field or a closely related engineering or science discipline.

Application Instructions: Applicants should submit a cover letter, curriculum vitae, teaching statement, research statement, and a list of four references (including postal addresses, phone numbers and email addresses) by applying for this specific position at http://apply.interfolio.com/68043. Full consideration will be given to applications received by December 15, 2019. Applications received after that date may be considered until the position is filled. It is anticipated the appointment will begin fall 2020. For additional information, please contact Dr. Rainer Fink at fink@tamu.edu.

Equal Employment Opportunity Statement: Texas A&M University is committed to enriching the learning and working environment for all visitors, students, faculty, and staff by promoting a culture that embraces inclusion, diversity, equity, and accountability. Diverse perspectives, talents, and identities are vital to accomplishing our mission and living our core values.

Reza Langari, Ph.D., Professor
JR Thompson Department Head Chair
Engineering Technology and Industrial Distribution (ETID)
Texas A&M University College Station, TX 77843-3367
rlangari@tamu.edu

6.32. Faculty: Boston University, USA
    Contributed by: Yannis Paschalidis, yannisp@bu.edu

Multiple Tenure-Track Assistant Professor Openings in ECE and Systems Engineering at Boston University

The Department of Electrical & Computer Engineering (ECE) at Boston University (BU) anticipates multiple **Tenure-Track Assistant Professor** positions in the area of **engineering applications of information and data science and systems engineering** with impact in areas such as quantum information science and sensing, digital health, biological systems, machine learning and intelligence, reinforcement learning, real-time learning, cyberphysical systems, including energy systems, the internet of things, and security. The BU footprint in these areas is growing significantly. Candidates with research programs that transcend the traditional boundaries of ECE are welcome to explore affiliated appointments in appropriate departments

and divisions, such as Biomedical Engineering, Systems Engineering, Computer Science, and Mathematics and Statistics.

BU ECE is a rising department and attracts exceptional graduate student and faculty talent at all levels. Research activity by primary faculty is approximately $26M per year. The College of Engineering is currently ranked 35th in the nation by US News and World Report, and 15th among private universities. BU ECE faculty lead and participate in several high-profile, multidisciplinary research centers, including the Center for Information and Systems Engineering, the Hariri Institute for Computing and Computational Science and Engineering, the Center for Systems Neuroscience, the Rajen Kilachand Center for Integrated Life Science and Engineering, and the Photonics Center.

We are looking for outstanding candidates with a Ph.D. in a relevant area who demonstrate potential for leading an independent and vibrant research program in their area of expertise, teach effectively at the graduate and undergraduate levels, and strengthen collaborative research within the department and beyond. Boston University is an AAU institution with a rich tradition dedicated to inclusion and social justice. We are proud that we were the first American university to award a PhD to a woman and that Martin Luther King Jr. received his PhD here. We are dedicated to increasing the participation of all talented students and are committed to the pursuit of engineering by underrepresented groups at BU and beyond. For more information about BU ECE, please visit: http://www.bu.edu/ece/

We encourage candidates to apply early. Applications received by December 15, 2019 will be given full consideration.

Applications can be submitted at https://academicjobsonline.org/ajo/jobs/14410

Boston University is an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability status, protected veteran status, or any other characteristic protected by law. We are a VEVRAA Federal Contractor.

6.33. Faculty: Arizona State University, USA
Contributed by: Daniel E. Rivera, daniel.rivera@asu.edu

Faculty Opening, Professor (all ranks) in Control Theory and Applications at Arizona State

The Ira A. Fulton Schools of Engineering (FSE) at Arizona State University (ASU) and the School for Engineering of Matter, Transport and Energy seek applicants for a tenure-track or tenured faculty position in control theory and applications. The appointment will be at the assistant, associate, or full professor rank commensurate with the candidate's experience and accomplishments, beginning August 2020. Although appointments may be in any of the six schools in the Ira A. Fulton Schools of Engineering, an appointment is expected to be in the School for Engineering of Matter, Transport and Energy (SEMTE).

Applicants may contribute to programs and leverage investments by the University in promoting interdisciplinary teaching and research. These investments include, among others: a multidisciplinary team of fac-

ulty working on robotics and autonomous systems (http://robotics.asu.edu); a new multidisciplinary Master's Degree in Robotics and Autonomous Systems (http://ras.engineering.asu.edu); the Global Security Initiative (https://globalsecurity.asu.edu/); ASU LightWorks (https://sustainability.asu.edu/lightworks/); the School of Earth and Space Exploration (http://sese.asu.edu); and the BioDesign Institute (http://biodesign.asu.edu).

The current opening is intended to broaden our expertise and expand collaborations. The School for Engineering of Matter, Transport and Energy includes faculty who conduct research in the areas of dynamics, controls, and robotics, with expertise in soft robotics, multi-robot systems, bio-inspired robotics, rehabilitation robotics, control of stochastic systems, system identification, robust control, nonlinear systems and control, infinite-dimensional systems and control, convex and non-convex optimization, control of and over networks, and machine learning.

Faculty members are expected to develop an internationally recognized and externally funded research program, teach undergraduate and graduate courses, mentor undergraduate and graduate students, foster and contribute to inclusive work environment, and undertake service activities.

Required and desired qualifications, materials to submit, and other relevant information can be found in

https://apply.interfolio.com/70485

Application deadline is December 31, 2019. Applications will continue to be accepted beyond Dec. 31st on a rolling basis for a reserve pool. For more information or questions about this position, please contact the search committee co-chairs, Professor Daniel Rivera and Professor Spring Berman, via email at daniel.rivera@asu.edu and spring.berman@asu.edu. Arizona State University is a VEVRAA Federal Contractor and an Equal Opportunity/Affirmative Action Employer. All qualified applicants will be considered without regard to race, color, sex, religion, national origin, disability, protected veteran status, or any other basis protected by law.

6.34. Faculty: Lund University, Sweden
Contributed by: Anders Rantzer, rantzer@control.lth.se

Associate Senior Lecturer in Machine Learning at Lund University

A prioritized area for recruitment is machine learning for control. This direction is mainly concerned with theory and methodology for the use of machine learning in dynamic feedback systems. Examples of this are reinforcement learning and deep reinforcement learning. Also the use of control methodology, such as dynamic programming and optimization, for improved machine learning efficiency is of interest.

Application deadline: November 25.

See http://www.lth.se/english/work.

6.35. Faculty: The George Washington University, USA
Contributed by: Taeyoung Lee, tylee@gwu.edu

The George Washington University
Department of Mechanical & Aerospace Engineering
Tenure Track Openings for Assistant or Associate Professor

The Department of Mechanical & Aerospace Engineering at The George Washington University is seeking exceptional applicants for a tenure track faculty position at the Assistant or Associate Professor level, beginning as early as Fall 2020. All areas of mechanical engineering are of interest, but the areas of emphasis for this search include, but are not limited to, artificial intelligence, autonomous systems, controls, machine learning, and robotics. The successful candidate will augment or complement existing research strengths in energy, bioinspired engineering, fluid mechanics and thermal science, materials science and mechanics, nano/microsytems, and robotics and controls. The successful candidate will also create new synergies among biomedical engineering, mechanical engineering, electrical engineering, and computer science. New faculty will join a vibrant department housed in a new $275M Science and Engineering Hall that encourages interdisciplinary efforts across science and engineering. Current research is supported by federal sources including NSF, NIH, NIST, DARPA, DOD, DOE, and a variety of industrial sources.

The George Washington University is the largest academic institution in the nation's capital. The exceptional location affords the GW community unique cultural and intellectual opportunities, with close access to many federal funding agencies, research laboratories, and one of the largest concentrations of technology companies in the nation.

Minimum Qualifications: A Ph.D. in Mechanical or Aerospace Engineering, or a related area, by date of appointment is required. Applicants must demonstrate potential for developing a high quality research program and for attracting extramural research funding. All applicants must have demonstrated teaching excellence or potential at both the undergraduate and graduate levels.

Responsibilities: Faculty hired into this position will be expected to build a substantial funded research program, mentor graduate students in research and teach courses at the undergraduate and graduate levels.

Inquiries and Application: To inquire, please email to maesearch@gwu.edu or call 202-994-9800. To apply, complete the online faculty application, at http://www.gwu.jobs/postings/71364 and upload: (1) a detailed CV or resume; (2) a research statement; (3) a teaching statement; and (4) a cover letter describing your goals and why you are applying to this position, including your primary area(s) of expertise and interest, and desired professorial rank (5) and include full contact information for at least five professional references. Please have your references email their letters directly to maesearch@gwu.edu. Only complete applications will be considered. Review of applications will begin January 3, 2020 and will continue until the position is filled.

EEO/AA Policy: The George Washington University is an Equal Opportunity and Affirmative Action Employer that does not unlawfully discriminate in any of its programs or activities on the basis of race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity expression, or on any other basis prohibited by applicable law. With one of the highest percentages of women engi-

neering students nationally, the School of Engineering and Applied Science is fundamentally committed to increasing the diversity of its faculty and staff. We welcome nominations of and applications from women, members of underrepresented groups, veterans and individuals with disabilities. We also welcome others who would bring additional aspects of diversity to the university's research, teaching and service missions. Employment offers are contingent on the satisfactory outcome of a standard background screening.

6.36. Research Engineering: General Electric Research, USA
Contributed by: Eric Westervelt, westerve@ge.com

Full-time position: Control System Research Engineer at GE Research
Location: GE Research, Niskayuna, NY. Relocation assistance available.
Start Date: ASAP

Job Description: The Control Systems Research Engineer will develop models, advanced controls, optimization, estimation, and detection technologies for a variety of GE and government applications including turbo-machinery, renewable energy systems, locomotives, aerospace, security, and healthcare systems. Opportunities to learn business cases development and to create new business models.

Hiring all experienced levels. Apply online:

- New graduate:
https://jobs.gecareers.com/global/en/job/3108714/Control-Systems-Research-Engineer
- Experienced:
https://jobs.gecareers.com/global/en/job/3103395/Lead-Control-Systems-Research-Engineer
- Highly experienced:
https://jobs.gecareers.com/global/en/job/3096705/Senior-Control-Systems-Research-Engineer