

Florian Dörfler

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Academic Positions

July'14–current **ASSISTANT PROFESSOR**, *Swiss Federal Institute of Technology (ETH) Zürich*, Switzerland
Department of Information Technology and Electrical Engineering

Sep'13–July'14 **ASSISTANT PROFESSOR**, *University of California at Los Angeles*, United States
Department of Electrical Engineering

Education

Sep'09–Sep'13 **PH.D.** in Mechanical Engineering, *University of California at Santa Barbara*
Advisor: Francesco Bullo
Ph.D. thesis: *Dynamics and Control in Power Grids and Complex Oscillator Networks*

Oct'03–Dec'08 **DIPLOMA** in Engineering Cybernetics, *University of Stuttgart*
Advisors: Frank Allgöwer (University of Stuttgart) and Bruce Francis (University of Toronto)
Diploma thesis: *Geometric Analysis of the Formation Problem for Autonomous Robots*
Student thesis: *Port-Hamiltonian Systems – Stability Analysis and Application in Process Control*

Research Interests

My research interests are centered around distributed control in complex, cyber-physical, and networked systems with applications to energy systems. Topics of current interest are

1. Distributed control, optimization, and monitoring in cyber-physical systems
2. Plug-and-play control and optimization in smart grid applications
3. Synchronization and dynamic phenomena in complex networks

Best Paper & Thesis Awards

- 2017 Basil Papadias Best Student Paper Award at IEEE PES PowerTech Conference
(as advisor)
- 2016 IEEE Circuits and Systems Guillemin-Cauer Best Paper Award
(awarded for best paper in IEEE Transactions on Circuits and Systems 2016)
- 2016 Top Five Finalist for Best Student Paper Award at American Control Conference
(as advisor)
- 2015 UC Santa Barbara Mechanical Engineering Department Best PhD Award
(in recognition of outstanding achievements during PhD studies)
- 2014 IFAC Automatica Best Paper Award
(awarded for best application paper 2012–2014)
- 2013 Top Five Finalist for Best Student Paper Award at European Control Conference
(as co-author and co-advisor)
- 2011 O. Hugo Schuck Best Paper Award awarded by American Automatic Control Council
(awarded for theoretical contributions at one of the two largest annual control conferences)
- 2010 Best Student Paper Award at American Control Conference
(awarded at one of the two largest annual control conferences)

Further Honors and Awards

- 2011–2012 Peter J. Frenkel Foundation Fellowship
(one of two campus-wide awards per academic year)
- 2009–2013 Regent’s Special International Fellowship
(the Regent’s scholarships are the most prestigious UC scholarship awards)
- 2008 Diplom awarded with special distinction by the University of Stuttgart
(institutional award)
- 2008 Baden-Württemberg Stipendium Renewed
(national scholarship)
- 2007–2008 Baden-Württemberg Stipendium
(national scholarship)
- 2007–2008 Ontario Baden-Württemberg Program Fellow
(national scholarship)

Research Experience

- July’14–current **ASSISTANT PROFESSOR**, *Swiss Federal Institute of Technology (ETH) Zürich*
at *Automatic Control Laboratory*
- Sep’13–July’14 **ASSISTANT PROFESSOR**, *University of California at Los Angeles*
at *Department of Electrical Engineering*
- Mar’13–July’14 **VISITING PROFESSOR**, *California Institute of Technology*
at *Rigorous Systems Research Group* hosted by Steven Low and Adam Wierman
- Apr’09–Sep’13 **Graduate Student Researcher** at *University of California at Santa Barbara*
at *Center for Control, Dynamical Systems, and Computation* advised by Francesco Bullo

- May'11-Jul'11 **Graduate Student Researcher** at Los Alamos National Laboratories
 &
 Jun'12-Aug'12 at *Center for Nonlinear Studies* advised by Michael Chertkov and Scott Backhaus
- Aug'08-Dec'08 **Corporate Research Intern** at EADS Astrium, Friedrichshafen, Germany
 at *Attitude and Orbit Control Group* advised by Jochen M. Rieber and Trond D. Krøvel
- Aug'07-Aug'08 **Graduate Student Researcher** at University of Toronto
 at *Systems Control Group* advised by Bruce Francis
- May'07-Jul'07 **Student Research Assistant** at University of Stuttgart
 at *Institute for Systems Theory and Automatic Control* advised by Jørgen K. Johnsen and Frank Allgöwer

Educational Activities

LECTURING

Swiss Federal Institute of Technology (ETH) Zürich

- 2015-current *Distributed Systems and Control*
Control Systems I
- 2014 University of California at Los Angeles
Linear Systems: State-Space Approach
Distributed Systems and Control

GRADUATE SCHOOLS

- 2017 “Innovative controls for renewable source integration into smart energy systems” (INCITE)
 European Summer School, Barcelona
- 2016 DISC Winter Course on “Power Systems Control - from Circuits to Economics”, Groningen,
 Netherlands
- 2015 Grid Science Winter School & Conference, Santa Fe, United States
- 2015 MSE Winter School Holistic Modelling and Control of Energy Systems, Ohlstadt, Germany

DIDACTICS

- 2016 Speaker at ETH LET teaching event “Increasing Interactivity”

Advising

PhD Students at ETH Zürich

- Dec'16-current Taouba Jouini
- Jan'16-current Nicolò Pagan
- Apr'15-current Adrian Hauswirth
- Jan'15-current Catalin Arghir
- July'14-current Bala Kameshwar Poolla

PostDoc Advisees at ETH Zürich

Aug'16–current Marcello Colombino
Jan'16–current Dominic Groß
Jan'15–current Saverio Bolognani
Apr'16–Dec'16 Theodor Borsche
now at THEMA Consulting Group, Oslo, Norway

Graduate Student Mentor at ETH Zürich

Mar'17–Jun'17 Chu Zhongda (supervised jointly with C. Arghir)
Semester thesis: “Virtual-oscillator-based Analysis and Control of Induction Machines in Power Systems”

Feb'17–current Beat Stadler (supervised jointly with C. Arghir)
Tentative master thesis title: “Virtual-oscillator based control of inverters in power grids”

Jan'17–May'17 Josefine Quack (externally supervised jointly by Muriel Richard-Noca)
Semester thesis: “Prototyping and Testing of Solar Panel Residual Dipole for Nanosatellites”

Feb'17–June'17 Jean-Sébastien Brouillion (supervised jointly with M. Colombino)
Semester thesis: “Decentralized synchronization of an inverter based grid”

Nov'16–May'17 József Gábor Pázmány (supervised jointly with A. Hauswirth and S. Bolognani)
Master thesis: “Robust Optimization of Nonlinear Power Systems in Realtime”

Aug'16–Feb'17 Sebastian Martin Curi (supervised jointly with D. Groß)
Master thesis title: “Control of Low Inertia Power Grids: A model reduction approach”

Oct'16–Jan'17 Elena Arcari (supervised jointly with S. Bolognani)
Semester thesis: “Fast chance-constrained optimization using real-time measurements with applications to power distribution systems”

July'16–Jan'17 Philipp Kurt Lütolf (supervised jointly with B.K. Poolla, T. Borsche, and S. Bolognani)
Master thesis: “Optimal Placement of Virtual Damping and Inertia”

July'16–Oct'16 Ioan-Liviu Aolaritei (supervised jointly with S. Bolognani)
Semester thesis: “A decentralized Voltage Collapse Distance for Power Distribution Networks”

June'16–Oct'16 Alessandro Zanardi (supervised jointly with A. Hauswirth and S. Bolognani)
Semester thesis: “Constrained optimization over manifolds for power system application”

April'16–Nov'16 Pulkit Nahata (supervised jointly with S. Mastellone)
Master thesis: “Decentralized Coordinated Control of Photovoltaic Inverters in Residential Microgrids”

May'16–Nov'16 Alexandros Paris Ketsetzis (supervised jointly with A. Hauswirth, E. Kaffe, and A. Brenzikofer)
Master thesis: “Optimal PMU placement for State Estimation in Power Grids”

Dec'15–June'16 Yannick Meier (externally supervised by N. Li)
Master thesis: “Parallelized Interior Point Method for Security Constrained Optimal Power Flow (SCOPF) of Distribution Networks”

Dec'15–May'16 Taouba Jouini (supervised jointly with C. Arghir)
Master thesis: “Grid-Friendly Matching Control of Synchronous Machines by DC/AC converters in Bulk Power Networks”

Oct'15–Feb'16 Cyrill Frei (supervised jointly with M. Schmitt, P. Beuchat, and C. Ramesh)
Semester thesis: “Gaussian Processes in Reinforcement Learning”

- Oct'15–Feb'16 Jan Schulze (supervised jointly with S. Bolognani)
Semester thesis: “Peer to peer clock synchronization in wireless sensor networks”
- Oct'15–Jan'16 Panagiotis Kyriakis (supervised jointly with S. Bolognani)
Semester thesis: “Formation of robust networks for secure exchange of cryptocurrencies”
- Oct'15–Jan'16 Matthias Fetzner (supervised jointly with A. Hauswirth and S. Merkli)
Semester thesis: “Network Reduction applied to Optimal Power Flow Problems”
- May'15–Oct'15 Felix Kottman (supervised jointly with S. Bolognani)
Master thesis: “Computational Load and Congestion Control in Cloud Environments”
- Jun'15–Aug'15 Dalibor Drzajic (supervised jointly with S. Bolognani)
Semester thesis: “Energy Theft Detection using Compressive Sensing Methods”
- Mar'15–Jun'15 Lelouvier Aaron (supervised jointly with S. Grammatico)
Semester thesis: “Decentralized and Distributed Frequency Regulation in Power Grids”
- Apr'15–May'15 Yannick Meier (externally supervised by Mihaela van der Schaar)
Semester thesis: “Predicting Grades”
- Oct'14–Apr'15 Nahata Pulkit (supervised jointly with B.K. Poolla)
Semester thesis: “Distributed Control and Optimization in DC Microgrids”

Long-term Visiting Graduate Students and PostDoc Advisees

- 2016 Xiaofan Wu, Wei Chen
- 2015 Spyros Chatzivasileiadis, Nima Monshizadeh, John W. Simpson-Porco, Marco Todescato, Diego Romeres

Graduate Student Mentor at University of California Los Angeles

- Nov'13–July'14 Jinxin Zhao
Project title: “Distributed Control and Optimization in DC microgrids”

Graduate Student Mentor at University of California Santa Barbara

- Sep'11–Sep'13 John W. Simpson-Porco
Tentative Ph.D. thesis title: “Microgrids and Droop-Controlled Inverters”
- Feb'13–July'13 Basilio Gentile
Laurea thesis: “Approximate Solution to the Reactive Power Flow and its Application to Voltage Stability in Microgrids”
- Sep'12–Mar'13 Hedi Bouattour
Diploma thesis: “Distributed Secondary Control in Microgrids”
- Jan'12–Jul'12 Diego Romeres
Laurea thesis: “Novel Results on Slow Coherency in Power Networks”

Research Awards

- 2017 ETH Zürich and ABB Schweiz AG Contract #12376: “Decentralized Control of Power Converters”
- 2016 European Commission H2020 #691800: *Massive InteGRATion of power Electronic devices — MIGRATE*
- 2015 ETH Seed Project SP-ESC 2015-07(4): *Novel control approaches for low-inertia power grids*

- 2015 SNF Assistant Professor Energy Grant #PYAPP2_160573: *Plug-and-Play Control & Optimization in Microgrids*
- 2014 NSF EPCN Medium #1406891: *Virtual Oscillator Control for Microgrids* (returned and declined when moving from UCLA to ETH Zürich)
- 2011 NSF CPS Medium:#1219917: *The Cyber-Physical Challenges of Transient Stability and Security in Power Grids* (contributed as consultant)

Professional Service

TECHNICAL REVIEWER

Journals

Control systems: IEEE Transactions on Automatic Control ◦ IEEE Transactions on Control of Network Systems ◦ IEEE Transactions on Control Systems Technology ◦ Automatica ◦ SIAM Journal on Control and Optimization ◦ Systems and Control Letters ◦ European Journal of Control ◦ IEEE Transactions on Circuits and Systems Part II ◦ Journal of Process Control ◦ IEEE Control Systems Magazine ◦ IEEE Control Systems Letters ◦ ACM Transactions on Cyber-Physical Systems

Power systems & energy: IEEE Transactions on Power Systems ◦ IEEE Transactions on Energy Conversion ◦ IEEE Transactions on Power Delivery ◦ International Transactions on Electrical Energy Systems ◦ International Journal of Electrical Power and Energy Systems ◦ Sustainable Energy, Grids and Networks ◦ Energies

Dynamical systems: Physica D ◦ SIAM Journal on Applied Dynamical Systems ◦ Chaos: An Interdisciplinary Journal of Nonlinear Science ◦ Nonlinearity ◦ Nonlinear Analysis: Hybrid Systems ◦ Communications in Mathematical Sciences ◦ Journal of Statistical Physics ◦ Journal of Mathematical Physics ◦ Applied Mathematical Modeling ◦ New Journal of Physics ◦ Journal of Statistical Physics

Computer science & discrete mathematics: IEEE Transactions on Network Science and Engineering ◦ SIAM Journal on Applied Mathematics ◦ Discrete Applied Mathematics ◦ Journal of Complexity

Miscellaneous journals: Proceedings of the National Academy of Sciences ◦ Nature Communications ◦ Nature Scientific Reports ◦ Proceedings of the IEEE ◦ PLOS ONE ◦ Neurocomputing ◦ Robotics and Autonomous Systems ◦ IEEE Transactions on Industrial Informatics

Conferences

American Control Conference ◦ IEEE Conference on Decision and Control ◦ European Control Conference ◦ Multi-conference on Systems and Control ◦ IFAC World Congress ◦ IFAC Workshop on Distributed Estimation and Control in Networked Systems ◦ IFAC Conference on Modeling, Identification and Control of Nonlinear Systems ◦ IFAC Conference on Analysis and Control of Chaotic Systems ◦ IFAC Symposium on Nonlinear Control Systems ◦ Mediterranean Conference on Control and Automation ◦ International Symposium on Mathematical Theory of Networks and Systems ◦ Power Systems Computation Conference ◦ Indian Control Conference ◦ Africon ◦ Global Conference on Signal and Information Processing

Books

Springer ◦ Birkhäuser ◦ CRC Press, Taylor & Francis Group ◦ Elsevier

EDITORIAL SERVICE AND TECHNICAL PROGRAM COMMITTEES

- 2017 “Data Mining for Cyber-physical and Industrial Systems” Workshop at IEEE ICDM

- 2017 IEEE International Conference on Smart Grid Communications (SmartGridComm)
- 2017 Greenmetrics (Sigmetrics) Workshop
- 2016 Guest editor for IEEE Transactions on Smart Grid special issue “Distributed Control and Efficient Optimization Methods for Smart Grid”
- 2016 Workshop on Complex Networks
- 2015 IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)
- 2014 IEEE International Conference on Smart Grid Communications (SmartGridComm)

REVIEW PANELS AND FUNDING COMMITTEES

- 2017 Deutsche Bundesstiftung Umwelt (Promotionsstipendienprogramm)
- 2017 Chilean National Science and Technology Commission, FONDECYT
- 2017 German Research Foundation (DFG), Priority Program “Hybrid and multimodal energy systems: System theoretical methods for the transformation and operation of complex networks”
- 2017 Swiss National Science Foundation (SNSF) Ambizione Energy
- 2016 Swiss National Science Foundation (SNSF)
- 2016 Dutch-Indian Data Driven Science, Netherlands Organisation for Scientific Research (NWO)
- 2015 Energy System Integration - Planning, Operations and Societal Embedding, Netherlands Organisation for Scientific Research (NWO)
- 2015 Cyber Physical systems with Model Driven Architectures and resilience (CyPhyMedusa), French National Research Agency (ANR) and CHIST-ERA ERA-NET
- 2015 European PhD Award on Control for Complex and Heterogeneous Systems
- 2014 Scientific Independence of Young Researchers (SIR) 2014, Italian Ministry for Education University and Research (MIUR)

ORGANIZER/CO-ORGANIZER

- 2017 Two Invited Sessions on *Control of Low-Inertia Power Systems* at IEEE Conference on Decision and Control, Melbourne, Australia
- 2017 Invited Session on *Advances on Optimal Power Flow–Robust and Stochastic Approaches* at IEEE Conference on Decision and Control, Melbourne, Australia
- 2017 Conference on *Future Electric Power Systems and the Energy Transition*, Champéry, Switzerland
- 2016 Workshop on *Optimization and Control for Tomorrow’s Power Systems* at European Control Conference, Aalborg, Denmark
- 2016 Invited Session on *Distributed Control & Optimization in Next-Generation Power Networks* at European Control Conference, Aalborg, Denmark
- 2016 EECI International Graduate School on Control, ETH Zürich
- 2015 Invited Session on *Distributed Control & Optimization in Next-Generation Power Networks* at American Control Conference, Chicago, IL
- 2015 MSE Winter School Holistic Modelling and Control of Energy Systems, Ohlstadt, Germany.

- 2015 Invited Session on *Emerging strategies for stability analysis of electrical power grids* at SIAM Conference on Dynamical Systems, Snowbird, UT.
- 2014 Invited Session on *Control and Dynamics in Power Networks* at International Symposium on Mathematical Theory of Networks and Systems, Groningen, the Netherlands.
- 2011 Santa Barbara Control Workshop 2011

CHAIR/CO-CHAIR

- Conf. Sessions IEEE Conference on Decision and Control ◦ European Control Conference ◦ American Control Conference ◦ Southern California Nonlinear Control Workshop ◦ International Symposium on Mathematical Theory of Networks and Systems ◦ IFAC World Congress

WORKSHOPS AND TUTORIALS

- 2016 Workshop on *Smart Grid Control* at American Control Conference, Boston, MA, USA, July 2016.
- 2016 Workshop on *Distributed and Stochastic Optimization: Theory and Applications* at European Control Conference, Aalborg, Denmark, June 2016.
- 2016 Workshop on *Optimization and Control for Tomorrow's Power Systems* at European Control Conference, Aalborg, Denmark, June 2016.
- 2014 Workshop on *Open Problems in Multi-Agent Systems* at American Control Conference, Portland, OR, USA, June 2014.
- 2012 Tutorial on *Synchronization in Coupled Oscillators: Theory and Applications* at IEEE Conference on Decision and Control, Maui, HI, USA, December 2012.
- 2011 Workshop on *Control Systems Security: Challenges and Directions* at IEEE Conference on Decision and Control and European Control Conference, Orlando, FL, USA, December 2011.

Professional Affiliations

- 2016–current *Global Network of Synchrophasor Solutions* Steering Committee/Consortium
- 2009–current Member, Institute for Electrical and Electronics Engineers (IEEE)
IEEE Societies: Control Systems Society (CSS) ◦ Power and Energy Society (PES)
- 2009–current Member, Society for Industrial and Applied Mathematics (SIAM)

Talks, Seminars, and Presentations

INVITED TALKS

- Jun'17 CoNDyNet Workshop “Dynamics in Power Systems – From Science to Industry”, Potsdam
- May'17 Institute for Theoretical Studies “Collective dynamics, control and imaging”, ETH Zürich
- Mar'17 Optimization and Inference for Physical Flows on Networks, BIRS, Alberta
- Feb'17 Future Electric Power Systems and the Energy Transition, Champéry, Switzerland
- Dec'16 Energy Seminar, UC Berkeley
- Oct'16 Computer Science Departmental Talk, Swiss Federal Institute of Technology (ETH) Zürich
- Jul'16 National Renewable Energy Laboratory, Golden, CO

Jun'16 Keynote at Greenmetrics (Sigmetrics) Conference, Nice
 May'16 Automatic Control Seminar, KTH Royal Institute of Technology, Sweden
 May'16 Institute for Mathematics and its Applications, University of Minnesota
 Apr'16 Seminaire d'Automatique du Plateau de Saclay, Laboratoire de Signaux et Systèmes du Supelec
 Nov'15 Laboratoire d'Automatique Seminar, École Polytechnique Fédérale de Lausanne (EPFL)
 Oct'15 KAUST Workshop on Human-Machine Networks and Intelligent Infrastructure, KAUST
 Jun'15 Advanced Methods for Energy Systems, Skolkovo Institute for Science and Technology, Moscow
 Apr'15 Control Systems Seminar, Technical University Berlin
 Feb'15 Systems and Control Seminar, Université Catholique de Louvain
 Jan'15 Swiss Federal Laboratories for Materials Science and Technology (EMPA)
 Jan'15 Grid Science Winter School & Conference, Santa Fe, NM
 Nov'14 Department of Engineering, University of Cambridge
 Nov'14 Oxford Control Group, University of Oxford
 Nov'14 Swissgrid Seminar, Laufenburg
 Nov'14 Department of Information Engineering, University of Padova
 Oct'14 Dagstuhl Seminar Modeling, Verification, & Control of Complex Systems for Energy Networks
 Oct'14 ABB Corporate Research Center Seminar, Baden
 Oct'14 Introductory Lecture, Swiss Federal Institute of Technology (ETH) Zürich
 Oct'14 Dynamics and Control in Networks Workshop, Lund University
 Sep'14 MnDRIVE Seminar Series, University of Minnesota
 Jun'14 Rand Corporation Speaker Series, Los Angeles, CA
 Jun'14 CPS Seminar, Department of Electrical Engineering, UC Los Angeles
 May'14 Department of Electrical and Computer Engineering, UC San Diego
 May'14 Department of Civil and Environmental Science, Stanford University
 Mar'14 RASEI/ECEE Seminar, University of Colorado Boulder
 Mar'14 National Renewable Energy Laboratory, Golden, CO
 Feb'14 Rigorous Systems Research Group Seminar, California Institute of Technology
 Nov'13 Ming Hsieh Department of Electrical Engineering, University of Southern California
 Jul'13 Center for Nonlinear Studies, Los Alamos National Laboratories
 Jun'13 Hybrid Control Systems Workshop, Technical University Munich
 Jun'13 Symposium on Complex Systems Control, Swiss Federal Institute of Technology (ETH) Zürich
 Mar'13 Department of Electrical Engineering, UC Los Angeles
 Mar'13 School of Electrical and Computer Engineering, Georgia Institute of Technology
 Feb'13 Center for Nonlinear Studies, Los Alamos National Laboratories
 Oct'12 Automatic Control Laboratory, Swiss Federal Institute of Technology (ETH) Zürich
 Jul'12 Institute for Systems Theory and Automatic Control, University of Stuttgart
 Jul'12 Siemens Colloquium, Siemens AG, Munich
 Jun'12 Center for Nonlinear Studies, Los Alamos National Laboratories
 May'12 Optimization and Control for Smart Grids, Santa Fe, NM

Apr'12 Department of Mathematics, UI Urbana-Champaign
 Mar'12 Center for Nonlinear Studies, Los Alamos National Laboratories
 Feb'12 Department of Electrical Engineering, UC Los Angeles
 Oct'11 Institute for Energy Efficiency, UC Santa Barbara
 Jun'11 Center for Nonlinear Studies, Los Alamos National Laboratories
 Sep'10 Systems Control Group, University of Toronto
 Aug'10 Institute of Automatic Control Engineering, Technical University Munich
 Jun'10 Center for Control, Dynamical Systems and Computation, UC Santa Barbara
 May'10 Control and Dynamical Systems, California Institute of Technology
 Sep'08 Institute for Systems Theory and Automatic Control, University of Stuttgart
 Aug'08 Systems Control Group, University of Toronto

CONTRIBUTED TALKS AT CONFERENCES, COLLOQUIA, ETC.

Jul'17 IFAC World Congress, Toulouse, France
 Jul'16 American Control Conference, Boston, MA
 Dec'15 IEEE Conference on Decision and Control, Osaka, Japan
 Sep'15 Allerton Conference, UI Urbana-Champaign, IL
 Jun'15 NetSci 2015, Zaragoza, Spain
 May'15 Social Norms and Institutions, Monte Verità, CH
 Sep'14 Allerton Conference, UI Urbana-Champaign, IL
 Jul'14 Int. Symposium on Mathematical Theory of Networks and Systems, Groningen, Netherlands
 Jun'14 European Control Conference, Strasbourg, France
 Feb'14 Information Theory and Applications Workshop, San Diego, CA
 Dec'13 IEEE Conference on Decision and Control, Florence, Italy
 Jul'13 IEEE Power & Energy Society General Meeting
 Jul'13 SIAM Conference on Control and its Applications
 Dec'12 IEEE Conference on Decision and Control, Maui, HI
 Dec'11 IEEE Conference on Decision and Control, Orlando, FL
 Sep'11 Allerton Conference, UI Urbana-Champaign, IL
 Jun'11 American Control Conference, San Francisco, CA
 Oct'10 IEEE SmartGridComm Conference, Gaithersburg, MD
 Sep'10 IFAC NecSys Workshop, Annecy, France
 Jun'10 American Control Conference, Baltimore, MD
 Aug'09 European Control Conference, Budapest, Hungary
 Jun'08 American Control Conference, Seattle, WA

Journal Publications

[J1] F. Dörfler, J. W. Simpson-Porco, and F. Bullo. Electrical networks and algebraic graph theory: Models, properties, and applications. *Proceedings of the IEEE*, September 2017.

- [J2] C. De Persis, E.R.A. Weitenberg, and F. Dörfler. A power consensus algorithm for dc microgrids. *Automatica*, February 2017. Submitted. Available at <https://arxiv.org/pdf/1611.04192.pdf>.
- [J3] D. Molzahn, F. Dörfler, H. Sandberg, S. H. Low, S. Chakrabarti, R. Baldick, and J. Lavaei. A survey of distributed optimization and control algorithms for electric power systems. *IEEE Transactions on Smart Grid*, February 2017. In press.
- [J4] S. Bolognani, E. Arcari, and F. Dörfler. A fast method for real-time chance-constrained decision with application to power systems. *IEEE Control Systems Letters*, 1(1):152 – 157, 2017.
- [J5] T. Borsche and F. Dörfler. On placement of synthetic inertia with explicit time-domain constraints. *IEEE Transactions on Power Systems*, 2017. Submitted. Available at <https://arxiv.org/abs/1705.03244>.
- [J6] F. Dörfler and S. Grammatico. Gather-and-broadcast frequency control in power systems. *Automatica*, 79:296–305, 2017.
- [J7] T. Jouini, C. Arghir, and F. Dörfler. Grid-forming control for power converters based on matching of synchronous machines. *Automatica*, 2017. Submitted. Available at <https://arxiv.org/pdf/1706.09495.pdf>.
- [J8] J. Schiffer, F. Dörfler, and E. Fridmann. Robustness of distributed averaging control in power systems: Time delays & dynamic communication topology. *Automatica*, 80:261–271, 2017.
- [J9] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage stabilization in microgrids via quadratic droop control. *IEEE Transactions on Automatic Control*, 3(62):1239 – 1253, 2017. Available at <http://arxiv.org/pdf/1507.00431v1.pdf>.
- [J10] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Uncovering droop control laws embedded within the nonlinear dynamics of Van der Pol oscillators. *IEEE Transactions on Control of Network Systems*, 2(4):347 – 358, 2017. Available at <http://arxiv.org/abs/1411.6973>.
- [J11] M. Fazlyab, F. Dörfler, and V. M. Preciado. Optimal network design for synchronization of Kuramoto oscillators. *Automatica*, February 2016. To appear.
- [J12] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage collapse in complex power grids. *Nature Communications*, 7:1–8, February 2016.
- [J13] M. Todescato, J. W. Simpson-Porco, F. Dörfler, R. Carli, and F. Bullo. Online distributed voltage stress minimization by optimal feedback reactive power control. *IEEE Transactions on Control of Network Systems*, February 2016. In press. Available at <http://ieeexplore.ieee.org/document/7967778/>.
- [J14] F. Dörfler, J. W. Simpson-Porco, and F. Bullo. Breaking the Hierarchy: Distributed Control & Economic Optimality in Microgrids. *IEEE Transactions on Control of Network Systems*, 3(3):241–253, 2016.
- [J15] D. Groß, C. Arghir, and F. Dörfler. On the steady-state behavior of a nonlinear power system model. *Automatica*, 2016. Submitted. Available at <https://arxiv.org/abs/1607.01575>.
- [J16] B. Johnson, M. Sinha, N. Ainsworth, F. Dörfler, and S. Dhople. Synthesizing virtual oscillators to control islanded inverters. *IEEE Transactions on Power Electronics*, 31(8):6002 – 6015, 2016.
- [J17] B. K. Poolla, S. Bolognani, and F. Dörfler. Optimal placement of virtual inertia in power grids. *IEEE Transactions on Automatic Control*, 2016. In press. Available at <http://ieeexplore.ieee.org/document/7924418/>.

- [J18] X. Wu, F. Dörfler, and M. R. Jovanovic. Input-output analysis and decentralized optimal control of inter-area oscillations in power systems. *IEEE Transactions on Power Systems*, 31(3):2434 – 2444, 2016. Available at <http://arxiv.org/abs/1502.03221>.
- [J19] Y. Xiao, F. Dörfler, and M. van der Schaar. Incentive design in peer review: Rating and repeated endogenous matching. *IEEE Transactions on Network Science and Engineering*, 2016. In press. Available at <http://arxiv.org/abs/1411.2139>.
- [J20] J. W. Simpson-Porco, Q. Shafiee, F. Dörfler, J. M. Vasquez, J. M. Guerrero, and F. Bullo. Secondary frequency and voltage control of islanded microgrids via distributed averaging. *IEEE Transactions on Industrial Electronics*, 62(15):7025 – 7038, November 2015. Available at <http://arxiv.org/abs/1504.06784>.
- [J21] F. Pasqualetti, F. Dörfler, and F. Bullo. Control-theoretic methods for cyber-physical security. *IEEE Control Systems Magazine*, 35(1):110–127, February 2015.
- [J22] D. Mehta, N. Daleo, F. Dörfler, and J. D. Hauenstein. Algebraic geometrization of the kuramoto model: Equilibria and stability analysis. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 25(5), January 2015. Available at <http://arxiv.org/abs/1412.0666>.
- [J23] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. On resistive networks of constant power devices. *IEEE Transactions on Circuits and Systems II: Express Briefs*, 62(8):811–815, 2015. Available at <http://arxiv.org/pdf/1503.04769v1.pdf>.
- [J24] J. Zhao and F. Dörfler. Distributed control and optimization in DC microgrids. *Automatica*, 61:18 – 26, 2015.
- [J25] S. Dhople, B. Johnson, F. Dörfler, and A. Hamadeh. Synchronization of nonlinear circuits in dynamic electrical networks with general topologies. *IEEE Transactions on Circuits and Systems I: Regular Papers*, 61(9):2677–2690, September 2014.
- [J26] F. Dörfler, M. R. Jovanovic, M. Chertkov, and F. Bullo. Sparsity-promoting optimal wide-area control of power networks. *IEEE Transactions on Power Systems*, 29(5):2281–2291, September 2014.
- [J27] F. Dörfler and F. Bullo. Synchronization in complex oscillator networks: A survey. *Automatica*, 50(6):1539–1564, June 2014.
- [J28] F. Pasqualetti, F. Dörfler, and F. Bullo. Attack detection and identification in cyber-physical systems. *IEEE Transactions on Automatic Control*, 58(11):2715–2729, November 2013.
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