

Florian Dörfler

Associate Professor for Complex Systems Control

Swiss Federal Institute of Technology (ETH) Zürich

Automatic Control Laboratory

Department of Information Technology and Electrical Engineering

Physikstrasse 3, ETL I 26

Zürich 8092, Switzerland

Phone: +41 44 632 72 88

Fax: +41 44 632 12 11

Email: dorfler@ethz.ch

URL: <http://people.ee.ethz.ch/~floriand/>

Academic Positions

Aug'19–current **ASSOCIATE PROFESSOR**, *Swiss Federal Institute of Technology (ETH) Zürich, Switzerland*
Department of Information Technology and Electrical Engineering

July'14–July'19 **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 (UCLA), 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 general research interests are centered around distributed control and optimization in complex, cyber-physical, and networked systems with applications to smart power grids, robotic coordination, and social networks. Topics of recent interest include

1. stability and control in low-inertia power systems,
2. feedback control via online optimization
4. data-enabled predictive control, and
3. distributed and plug-and-play control and optimization.

Notable Awards

- 2020 EUCA European Control Award
(distinguished European researcher under the age of 40 in systems and control)
- 2020 IFAC Manfred Thoma medal
(distinguished researcher and/or engineer under the age of 40 in systems and control)
- 2019 Best Student Paper Award at European Control Conference
(as co-author and advisor)
- 2017 Basil Papadias Best Student Paper Award at IEEE PES PowerTech Conference
(as co-author and 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 co-author and 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)
- 2008 Diplom awarded with special distinction by the University of Stuttgart
(institutional award)

Best Thesis Awards of Supervised Students

- 2019 ABB Research Award (best master thesis award) for Liviu Aolaritei
- 2017 Willi-Studer Preis (departmental top of the year award) for Yannick Meier
- 2017 ETH Medals (best master thesis award) for Sebastian Curi
- 2017 ETH Medals (best master thesis award) for Yannick Meier

Scholarships

- 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 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'19–current **ASSOCIATE PROFESSOR**, *Swiss Federal Institute of Technology (ETH) Zürich*
at *Automatic Control Laboratory*

Mar'20–current **VISITING PROFESSOR**, *KTH Stockholm*
at *Division of Decision and Control Systems*

July'14–July'19 **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

2015–current *Control Systems I*

2015–current *ETH Control Seminar Series*

2019 *Signals and Systems II*

2015–2018 *Distributed Systems and Control*

2014 *Linear Systems: State-Space Approach (at UCLA)*

2014 *Distributed Systems and Control (at UCLA)*

GRADUATE SCHOOLS

2020 EECI Graduate School on “Control and Optimization of Autonomous Power Systems”, KTH Stockholm, Sweden.

2019 Autumn School DFG-Schwerpunktprogramm 1984 “Hybrid and multimodal energy systems”, Karlsruher Institut für Technologie (KIT), Karlsruhe, Germany.

- 2017 “Innovative controls for renewable source integration into smart energy systems” (INCITE) European Summer School, Barcelona, Spain
- 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 Modeling and Control of Energy Systems, Ohlstadt, Germany

DIDACTICS

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

Advising

Doctoral Students

- Oct’19–current Nicolas Lanzetti
- Feb’19–current Miguel Picallo Cruz
- Jan’19–current Irina Subotic (co-advised with Dominic Groß)
- Oct’18–current Lukas Ortmann (co-advised with Saverio Bolognani)
- Mar’18–current Liviu Aolaritei
- Sep’17–current Jeremy Coulson (co-advised with John Lygeros)
- Aug’17–current Ali Tayyebi-Khameneh (externally supervised from Austrian Institute of Technology)
- Jan’16–current Nicolò Pagan
- Apr’15–current Adrian Hauswirth (co-advised with Gabriela Hug)

Postdoctoral Researchers

- Feb’16–current Michael Fisher (co-advised with Gabriela Hug)
- Aug’18–current Robin Delabays (co-advised with Philippe Jacquod)
- Jun’18–current Wenjun Mei

Senior Scientist

- Jan’16–current Saverio Bolognani

Alumni

- Jan’15–Dec’19 Catalin Arghir
- Jan’16–Dec’19 Dominic Groß
now at Assistant Professor at now professor at University of Wisconsin, Madison, United States
- Aug’16–Jan’18 Marcello Colombino
now at Assistant Professor at McGill University, Montreal, Canada
- Apr’16–Dec’16 Theodor Borsche
now at Boston Consulting Group, Oslo, Norway
- July’14–July’19 Bala Kameshwar Poolla
now postdoc at UC Berkeley
- Jan’15–Jan’16 Saverio Bolognani
now Senior Scientist at ETH Zürich

Advisor for Long-Term Visiting Scientists

- 2020 Matteo Tachi, Paolo Gherardo Carlet, Andrea Favato
- 2019 Linbin Huang, Paolo Gherardo Carlet, Andrea Favato
- 2018 Linbin Huang, Miguel Picallo Cruz
- 2017 Enric Sánchez Sánchez, Robin Delabays
- 2016 Xiaofan Wu, Wei Chen
- 2015 Spyros Chatzivasileiadis, Nima Monshizadeh, John W. Simpson-Porco, Marco Todescato, Diego Romeres

Graduate Student Mentor

Nov'13–current approximately 50 master & semester theses at ETH Zürich and UCLA

Research Awards

- 2020 European Commission H2020 #883985: *POwering SYstem flexibiliTY in the Future through RES – POSYTYF*
- 2019 KAUST Office of Sponsored Research, Award No. OSR-2019-CoE-NEOM-4178.11: *GRIDX: The Autonomous Digital Grid*
- 2019 SNF Assistant Professor Energy Grant #PYAPP2_160573/2: mobility funds
- 2019 SNF Scientific Exchanges IZSEZo_185442: *International Workshop on “Future Electric Power Systems”*
- 2019 Swiss Federal Office of Energy (SFOE) Research Program Pilot-, Demonstrations- und Leuchtturmprojekte: *Renewable Management and Real-Time Control Platform (ReMaP) (SI/501810-01)*
- 2018 SNF Scientific Exchanges IZSEZo_183110: *Workshop on “Vistas in Control”*
- 2018 Swiss Federal Office of Energy (SFOE) Research Program Grids SI/501708: *a UNified COntrol framework for Real-time power system operation* (note: led by Saverio Bolognani)
- 2018 Swiss Federal Office of Energy (SFOE) Research Program Grids SI/501707: *Grid-forming control of renewable generation and power electronics* (note: led by Dominic Groß)
- 2018 SATW Scientific Conference Funding F-2018-010: *International Workshop on “Vistas in Control”*
- 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*
- 2016 SNF Scientific Conference Funding 20CO21_171241/1: *International Workshop on “Future Electric Power Systems”*
- 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)

Total amount of competitive personal third-party funding acquired thus far: 3,931,537.42 CHF

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 ◦ IEEE PES Letters ◦ 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 Physics ◦ Nature Communications ◦ Nature Scientific Reports ◦ Physical Review Letters ◦ 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 ◦ IFAC Conference on Analysis and Control of Chaotic Systems ◦ Mediterranean Conference on Control and Automation ◦ International Symposium on Mathematical Theory of Networks and Systems ◦ Power Systems Computation Conference ◦ Indian Control Conference ◦ Africon ◦ IEEE Global Conference on Signal and Information Processing

Books

Springer ◦ Birkhäuser ◦ CRC Press, Taylor & Francis Group ◦ Elsevier ◦ Institution of Engineering & Technology

EDITORIAL SERVICE (JOURNALS)

- 2018 Associate Editor for Automatica
- 2016 Guest editor for IEEE Transactions on Smart Grid special issue “Distributed Control and Efficient Optimization Methods for Smart Grid”

TECHNICAL PROGRAM COMMITTEES (CONFERENCES)

- 2019 IFAC World Congress
- 2019 IEEE Global Conference on Signal and Information Processing (GlobalSIP)
- 2019 IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA)
- 2019 IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)
- 2018 Iranian Smart Grid Conference (SGC)
- 2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP)
- 2018 IEEE International Conference on Smart Grid Communications (SmartGridComm)
- 2018 IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)
- 2018 International School and Conference on Network Science (NetSci)
- 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 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

- 2019 National Research, Development and Innovation Office of Hungary
- 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

- 2019 Conference on *Future Electric Power Systems and the Energy Transition*, Champéry, Switzerland
- 2019 Publicity Chair *ACM e-Energy Conference*, Phoenix, AZ, United States, June, 2019
- 2018 Vistas in Control: ETH Control Workshop
- 2018–2019 EECI International Graduate School on Control, ETH Zürich
- 2017 Conference on *Future Electric Power Systems and the Energy Transition*, Champéry, Switzerland
- 2016 EECI International Graduate School on Control, ETH Zürich
- 2015 MSE Winter School Holistic Modelling and Control of Energy Systems, Ohlstadt, Germany.
- 2011 Santa Barbara Control Workshop 2011

WORKSHOPS AND TUTORIALS

- 2020 Workshop on *Emerging challenges in stability, control, and optimization of power systems* at European Control Conference, St. Petersburg, Russia, May 2020.
- 2019 Tutorial on *Distributed control and optimization for autonomous power grids* at European Control Conference, Naples, Italy, June 2019.
- 2017 *Melbourne Workshop on Future Power Systems* Melbourne, Australia, December 2017.
- 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.

INVITED SESSION ORGANIZATION

- 2019 Panel Session on *Thinking Outside the "Black Box" - Analytical Foundations of Power System Research* at IEEE PES General Meeting, Atlanta, GA.
- 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
- 2016 Invited Session on *Distributed Control & Optimization in Next-Generation Power Networks* at European Control Conference, Aalborg, Denmark
- 2015 Invited Session on *Distributed Control & Optimization in Next-Generation Power Networks* at American Control Conference, Chicago, IL

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.

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

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)

2009–current Member, International Federation of Automatic Control (IFAC)

Talks, Seminars, and Presentations

PLENARIES AND INVITED TALKS

Jan'20 Symposium: Resilience and Performance of Networked Systems, Zürich, CH

Oct'19 International Conference on Control, Instrumentation, and Automation (ICCIA), Sanandaj, Kurdistan, Iran

Sep'19 Resilient Control of Infrastructure Networks, Torino, Italy

Jun'19 Mediterranean Conference on Control and Automation, Akko, Israel

Jun'19 Learning & Adaptive Systems Lab Seminar, ETH Zürich

May'19 Robotic Systems Lab Seminar, ETH Zürich

May'19 Looking forward to 2050, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK

Apr'19 Innovative Optimization and Control Methods for Highly Distributed Autonomous Systems Workshop, Golden, Colorado

Apr'19 ECEE Control, Optimization, and Learning day, CU Boulder

Jan'19 Workshop on Learning and Control in Network Systems, KTH, Stockholm, Sweden

Jan'19 Isaac Newton Institute for Mathematical Sciences, Cambridge, UK

Nov'18 Energy-Open Workshop, Eindhoven, The Netherlands

Oct'18 International Workshop on Advanced Cooperative Systems, Zagreb, Croatia

Aug'18 IFAC Workshop on Distributed Estimation and Control in Networked Systems (NECSYS), Groningen, The Netherlands

May'18 Institute for Automation and Applied Informatics, Karlsruhe Institute of Technology, Germany

Mar'18 Simons Institute, UC Berkeley, United States

Mar'18 CCDC Seminar, UC Santa Barbara, United States

Jan'18 Le laboratoire GIPSA-lab, Grenoble, France

Jan'18 Workshop on "Power Systems: Semi-Algebraic Techniques for Optimal Power Flow and Stability Assessment", Versailles, France

Jun'17 AIT Seminar, Vienna, Austria

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 Ruhr Universität Bochum, Control Seminar, Bochum, Germany

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 Séminaire d'Automatique du Plateau de Saclay, Laboratoire de Signaux et Systèmes du Supélec

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.

Dec'19 IEEE Conference on Decision and Control, Nice, France
 Oct'18 Allerton Conference, UI Urbana-Champaign, IL
 Sep'15 Allerton Conference, UI Urbana-Champaign, IL
 Dec'17 IEEE Conference on Decision and Control, Melbourne, Australia
 Jul'17 IFAC World Congress, Toulouse, France
 Dec'16 IEEE Conference on Decision and Control, Las Vegas, United States
 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] C. Arghir and F. Dörfler. The electronic realization of synchronous machines: model matching, angle tracking and energy shaping techniques. *IEEE Transactions on Power Electronics*, 35(4):4398–4410, April 2020.
- [J2] D. Alpagó, F. Dörfler, and J. Lygeros. An extended Kalman filter for data-enabled predictive control. *IEEE Control Systems Letters*, 2020. Submitted. Available at <https://arxiv.org/abs/2003.08269>.
- [J3] V. Häberle, A. Hauswirth, L. Ortmann, S. Bolognani, and F. Dörfler. Non-convex feedback optimization with input and output constraints. *IEEE Control Systems Letters*, 2020. Submitted.
- [J4] A. Hauswirth, F. Dörfler, and A. Teel. Anti-windup approximations of oblique projected dynamics for feedback-based optimization. *SIAM Journal on Control and Optimization*, 2020. Submitted. Available at <https://arxiv.org/abs/2003.00478>.
- [J5] A. Hauswirth, F. Dörfler, and A. Teel. On the differentiability of projected trajectories and the robust convergence of non-convex anti-windup gradient flows. *IEEE Control Systems Letters*, 2020. Submitted. Available at <https://arxiv.org/abs/2003.02551>.
- [J6] F. Liu, S. Cui, W. Mei, F. Dörfler, and M. Buss. Interplay between homophily-based appraisal dynamics and influence-based opinion dynamics: Modeling and analysis. *IEEE Control Systems Letters*, 2020. Submitted.
- [J7] A. Tayyebi, D. Groß, A. Anta, F. Kupzog, and F. Dörfler. Frequency stability of synchronous machines and grid-forming power converters. *IEEE Transactions on Power Systems*, 2020. In press. DOI 10.1109/JESTPE.2020.2966524.
- [J8] E.R.A. Weitenberg, Y. Jiang, C. Zhao, E. Mallada, C. De Persis, and F. Dörfler. Robust decentralized secondary frequency control in power systems: Merits and trade-offs. *IEEE Transactions on Automatic Control*, 64(10):3967–3982, October 2019.
- [J9] D. Groß, M. Colombino, J.S. Brouillon, and F. Dörfler. The effect of transmission-line dynamics on grid-forming dispatchable virtual oscillator control. *IEEE Transactions on Control of Network Systems*, 6(3):1148–1160, September 2019.

- [J10] L. Huang, H. Xin, and F. Dörfler. H_∞ -Control of Grid-Connected Converters: Design, Objectives and Decentralized Stability Certificates. *IEEE Transactions on Smart Grid*, June 2019. Submitted. Available at <https://arxiv.org/abs/1906.11331>.
- [J11] T. Jouini and F. Dörfler. Parametric local stability condition of a multi-converter system. *IEEE Transactions on Automatic Control*, April 2019. Submitted. Available at <https://arxiv.org/abs/1904.11288#>.
- [J12] E. Sanchez, D. Groß, E. Pietro, F. Dörfler, and O. Gomis. Optimal Multivariable MMC Energy-Based Control for DC Voltage Regulation in HVDC Applications. *IEEE Transactions on Power Delivery*, March 2019. In press. DOI 10.1109/TPWRD.2019.2933771.
- [J13] M. Colombino, D. Groß, J.S. Brouillon, and F. Dörfler. Global phase and magnitude synchronization of coupled oscillators with application to the control of grid-forming power inverters. *IEEE Transactions on Automatic Control*, 64(11):4496 – 4511, February 2019.
- [J14] B. K. Poolla, D. Groß, and F. Dörfler. Placement and implementation of grid-forming and grid-following virtual inertia and fast frequency response. *IEEE Transactions on Power Systems*, 34(4):3035 – 3046, January 2019.
- [J15] R. Delabays, P. Jacquod, and F. Dörfler. The Kuramoto model on oriented and signed graphs. *SIAM Journal on Applied Dynamical Systems*, 18(1):458–480, 2019.
- [J16] E. Elokda, J. Coulson, P. Beuchat, J. Lygeros, and F. Dörfler. Data-enabled predictive control for quadcopters. *International Journal of Robust and Nonlinear Control*, 2019. Submitted.
- [J17] A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Timescale separation in autonomous optimization. *IEEE Transactions on Automatic Control*, 2019. Submitted. Available at <https://arxiv.org/abs/1905.06291>.
- [J18] L. Huang, J. Coulson, J. Lygeros, and F. Dörfler. Data-driven wide-area control. *IEEE Transactions on Power Systems*, 2019. Submitted. Available at <https://arxiv.org/abs/1911.12151>.
- [J19] Y. Khayat, Q. Shafiee, R. Heydari, T. Dragicevic, M. Naderi, J. W. Simpson-Porco, F. Dörfler, M. Fathi, F. Blaabbjerg, and H. Bevrani. On the secondary control architectures of ac microgrids: A survey. *IEEE Transactions on Power Electronics*, 35(6):6482–6500, 2019.
- [J20] N. Pagan and F. Dörfler. Game theoretical inference of human behavior in social networks. *Nature Communications*, 10(5507), 2019.
- [J21] I. Subotic, D. Groß, M. Colombino, and F. Dörfler. A Lyapunov framework for nested dynamical systems on multiple time scales with application to converter-based power systems. *IEEE Transactions on Automatic Control*, 2019. Submitted. Available at <https://arxiv.org/abs/1911.08945>.
- [J22] G. Weiss, F. Dörfler, and Y. Levron. A stability theorem for networks containing synchronous generators. *Systems & Control Letters*, 134:104561, 2019. In press. DOI 10.1016/j.sysconle.2019.104561.
- [J23] 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*, 6(4):2327–4697, 2019.
- [J24] C. Arghir, T. Jouini, and F. Dörfler. Grid-forming control for power converters based on matching of synchronous machines. *Automatica*, 95:273–282, September 2018.
- [J25] 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*, 5(3):1467–1478, July 2018.

- [J26] L. Aolaritei, S. Bolognani, and F. Dörfler. Hierarchical and distributed monitoring of voltage stability in distribution networks. *IEEE Transactions on Power Systems*, 33(6):6705–6714, June 2018.
- [J27] F. Dörfler, J. W. Simpson-Porco, and F. Bullo. Electrical networks and algebraic graph theory: Models, properties, and applications. *Proceedings of the IEEE*, 106(5):977 – 1005, May 2018.
- [J28] J. W. Simpson-Porco, B. K. Poolla, N. Monshizadeh, and F. Dörfler. Input-Output Performance of Linear-Quadratic Saddle-Point Algorithms with Application to Distributed Resource Allocation Problems. *IEEE Transactions on Automatic Control*, March 2018. In press. DOI 10.1109/TAC.2019.2927328.
- [J29] C. De Persis, E.R.A. Weitenberg, and F. Dörfler. A power consensus algorithm for DC microgrids. *Automatica*, 89:364–375, February 2018.
- [J30] D. Groß, C. Arghir, and F. Dörfler. On the steady-state behavior of a nonlinear power system model. *Automatica*, 90:248–254, 2018.
- [J31] A. Hauswirth, S. Bolognani, and F. Dörfler. Projected Dynamical Systems on Irregular Non-Euclidean Domains for Nonlinear Optimization. *SIAM Journal on Control and Optimization*, 2018. Submitted. Available at <https://arxiv.org/abs/1809.04831>.
- [J32] A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Generic Existence of Unique Lagrange Multipliers in AC Optimal Power Flow. *IEEE Control Systems Letters*, 2(4):791–796, 2018.
- [J33] L. Huang, H. Xin, W. Dong, and F. Dörfler. Impacts of Grid Structure on PLL-Synchronization Stability of Converter-Integrated Power Systems. *IEEE Transactions on Power Electronics*, 2018. Submitted. Available at <https://arxiv.org/abs/1903.05489>.
- [J34] B. K. Poolla, S. Bolognani, N. Li, and F. Dörfler. A market mechanism for virtual inertia. *IEEE Transactions on Control of Network Systems*, 2018. To appear. Available at <https://arxiv.org/abs/1711.04874>. DOI 10.1109/TSG.2020.2969518.
- [J35] B. K. Poolla, S. Bolognani, and F. Dörfler. Optimal placement of virtual inertia in power grids. *IEEE Transactions on Automatic Control*, 62(12):6209–6220, December 2017.
- [J36] 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.
- [J37] 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>.
- [J38] F. Dörfler and S. Grammatico. Gather-and-broadcast frequency control in power systems. *Automatica*, 79:296–305, 2017.
- [J39] M. Fazlyab, F. Dörfler, and V. M. Preciado. Optimal network design for synchronization of coupled oscillators. *Automatica*, 84:181–189, 2017.
- [J40] 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*, 8(6):2941–2962, 2017.
- [J41] 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.
- [J42] 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.

- [J43] 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.
- [J44] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage collapse in complex power grids. *Nature Communications*, 7:1–8, February 2016.
- [J45] 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.
- [J46] 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.
- [J47] 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.
- [J48] 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.
- [J49] F. Pasqualetti, F. Dörfler, and F. Bullo. Control-theoretic methods for cyber-physical security. *IEEE Control Systems Magazine*, 35(1):110–127, February 2015.
- [J50] 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.
- [J51] 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.
- [J52] J. Zhao and F. Dörfler. Distributed control and optimization in DC microgrids. *Automatica*, 61:18 – 26, 2015.
- [J53] 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.
- [J54] 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.
- [J55] F. Dörfler and F. Bullo. Synchronization in complex oscillator networks: A survey. *Automatica*, 50(6):1539–1564, June 2014.
- [J56] 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.
- [J57] F. Dörfler, F. Pasqualetti, and F. Bullo. Continuous-time distributed observers with discrete communication. *IEEE Journal of Selected Topics in Signal Processing*, 7(2):296–304, April 2013.
- [J58] F. Dörfler, M. Chertkov, and F. Bullo. Synchronization in complex oscillator networks and smart grids. *Proceedings of the National Academy of Sciences*, 110(6):2005–2010, February 2013.
- [J59] F. Dörfler and F. Bullo. Kron reduction of graphs with applications to electrical networks. *IEEE Transactions on Circuits and Systems I: Regular Papers*, 60(1):150–163, January 2013.

- [J60] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Synchronization and power sharing for droop-controlled inverters in islanded microgrids. *Automatica*, 49(9):2603–2611, 2013.
- [J61] F. Dörfler and F. Bullo. Synchronization and transient stability in power networks and non-uniform Kuramoto oscillators. *SIAM Journal on Control and Optimization*, 50(3):1616–1642, 2012.
- [J62] F. Dörfler and F. Bullo. On the critical coupling for Kuramoto oscillators. *SIAM Journal on Applied Dynamical Systems*, 10(3):1070–1099, 2011.
- [J63] F. Dörfler and B. Francis. Geometric Analysis of the Formation Problem for Autonomous Robots. *IEEE Transactions on Automatic Control*, 55(10):2379–2384, October 2010.
- [J64] F. Dörfler, J. K. Johnsen, and F. Allgöwer. An Introduction to Interconnection and Damping Assignment Passivity-Based Control in Process Engineering. *Journal of Process Control*, 19(9):1413–1426, October 2009.

Refereed Conference Proceedings

- [C1] L. Ortmann, A. Hauswirth, I. Caduff, F. Dörfler, and S. Bolognani. Experimental validation of feedback optimization in power distribution grids. In *Power Systems Computation Conference (PSCC)*, June 2020. Submitted. Available at <https://arxiv.org/abs/1910.03384>.
- [C2] P. Gherardo, A. Favato, S. Bolognani, and F. Dörfler. Data driven predictive current control for synchronous motor drives. In *IEEE Energy Conversion Congress and Exposition*, 2020. Submitted.
- [C3] A. Hauswirth, F. Dörfler, and A. Teel. On the robust implementation of projected dynamical systems with anti-windup controllers. In *American Control Conference*, 2020. To appear.
- [C4] A. Hauswirth, L. Ortmann, S. Bolognani, and F. Dörfler. Limit behavior and the role of augmentation in projected saddle flows for convex optimization. In *IFAC World Congress*, 2020. To appear.
- [C5] M. Picallo, S. Bolognani, and F. Dörfler. Closing the loop: Dynamic state estimation and feedback optimization of distribution grids. In *Power Systems Computation Conference (PSCC)*, 2020. Submitted. Available at <https://arxiv.org/abs/1909.02753>.
- [C6] A. Tayyebi, A. Anta, and F. Dörfler. Almost globally stable hybrid grid-forming angle control. In *IEEE Conference on Decision and Control*, 2020. Submitted.
- [C7] G. Weiss, F. Dörfler, and Y. Levron. Two stability theorems concerning power networks. In *IEEE Joint 19th International Symposium on Computational Intelligence and Informatics and 7th International Conference on Recent Achievements in Mechatronics, Automation, Computer Sciences and Robotics*, November 2019.
- [C8] J. Coulson, J. Lygeros, and F. Dörfler. Data-enabled predictive control: In the shallows of the DeePC. In *European Control Conference*, pages 307–312, 2019.
- [C9] J. Coulson, J. Lygeros, and F. Dörfler. Regularized and distributionally robust data-enabled predictive control. In *IEEE Conference on Decision and Control*, 2019. Available at <https://arxiv.org/abs/1903.06804>.
- [C10] A. Crivellaro, A. Tayyebi, C. Gavriluta, D. Groß, A. Anta, F. Kupzog, and F. Dörfler. Beyond low-inertia systems: Massive integration of grid-forming power converters in transmission grids. In *PES General Meeting*, 2019. To appear. Available at <https://arxiv.org/abs/1911.02870>.

- [C11] F. Dörfler, S. Bolognani, J. W. Simpson-Porco, and S. Grammatico. Distributed control and optimization for autonomous power grids. In *European Control Conference*, pages 2436–2453, 2019.
- [C12] D. Groß and F. Dörfler. Projected grid-forming control for current-limiting of power converters. In *Allerton Conf. on Communications, Control and Computing*, pages 326–333, 2019.
- [C13] L. Huang, J. Coulson, J. Lygeros, and F. Dörfler. Data-enabled predictive control for grid-connected power converters. In *IEEE Conference on Decision and Control*, 2019. Available at <https://arxiv.org/abs/1903.07339>.
- [C14] T. Jouini, D. Groß, and F. Dörfler. Local synchronization of two DC/AC converters via matching control. In *European Control Conference*, pages 2996–3001, 2019.
- [C15] A. Mešanović, X. Wu, S. Schuler, U. Münz, F. Dörfler, and R. Findeisen. *Optimal Design of Distributed Controllers for Large-Scale Cyber-Physical Systems*, pages 181–210. Springer International Publishing, Cham, 2019.
- [C16] M. Picallo and F. Dörfler. Sieving out unnecessary constraints in scenario optimization with an application to power systems. In *IEEE Conference on Decision and Control*, 2019. Available at <https://arxiv.org/abs/1907.09822>.
- [C17] B. K. Poolla, J. W. Simpson-Porco, N. Monshizadeh, and F. Dörfler. Quadratic performance analysis of secondary frequency controllers. In *Proceedings of the 55th IEEE Conference on Decision and Control*, 2019. Available at <https://arxiv.org/abs/1909.02792>.
- [C18] G. Seo, I. Subotic, B. Johnson, M. Colombino, D. Groß, and F. Dörfler. Dispatchable virtual oscillator control for decentralized inverter-dominant power systems – analysis of droop characteristic and verification. In *Applied Power Electronics Conference (APEC)*, pages 561–566, 2019.
- [C19] S. Menta, A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Stability of dynamic feedback optimization with applications to power systems. In *Allerton Conf. on Communications, Control and Computing*, pages 136–143, October 2018.
- [C20] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Stabilizing phase-balanced or phase-synchronized trajectories of Liénard oscillators in connected electrical networks. In *Allerton Conf. on Communications, Control and Computing*, October 2018.
- [C21] J. Barreiro-Gomez, F. Dörfler, and H. Tembine. Distributed and robust population games with applications to optimal frequency control in power systems. In *American Control Conference*, pages 5762–5767, Milwaukee, WI, July 2018.
- [C22] F. Milano, F. Dörfler, G Hug, D. Hill, and G. Verbic. Foundations and challenges of low-inertia systems. In *Power Systems Computation Conference (PSCC)*, pages 1–25, Dublin, Ireland, June 2018.
- [C23] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Synchronization of Liénard oscillators in heterogenous electrical networks. In *Proceedings of the 4th Indian Control Conference*, pages 240 – 245, January 2018.
- [C24] C. Arghir and F. Dörfler. Energy-based stabilization of network flows in multi-machine power systems. In *International Symposium on Mathematical Theory of Network and Systems (MTNS)*, pages 933–938, 2018.
- [C25] J.S. Brouillon, M. Colombino, D. Groß, and F. Dörfler. The effect of transmission-line dynamics on a globally synchronizing controller for power inverters. In *European Control Conference*, 2018.

- [C26] Y. Ghaedsharaf, C. Somarakis, F. Dörfler, and N. Motee. Large area control of power networks with time-delay. In *IFAC Workshop on Distributed Estimation and Control in Networked Systems*, 2018.
- [C27] A. Hauswirth, I. Subotic, S. Bolognani, G Hug, and F. Dörfler. Time-varying projected dynamical systems with applications to feedback optimization of power systems. In *Proceedings of the 57th IEEE Conference on Decision and Control*, 2018. Available at <https://arxiv.org/abs/1809.07288>.
- [C28] C. Somarakis, Y. Ghaedsharaf, F. Dörfler, and N. Motee. Risk of phase incoherence in noisy power networks with delayed feedback control. In *IFAC Workshop on Distributed Estimation and Control in Networked Systems*, 2018.
- [C29] A. Tayyebi, Z. Miletic, F. Dörfler, F. Kupzog, and W. Hribernik. Grid-forming converters – inevitability, control strategies and challenges in future grid applications. In *International Conference on Electricity Distribution (CIRED)*, 2018.
- [C30] E.R.A. Weitenberg, Y. Jiang, C. Zhao, E. Mallada, F. Dörfler, and C. De Persis. Robust decentralized frequency control: A leaky integrator approach. In *European Control Conference*, 2018.
- [C31] M. Colombino, D. Groß, and F. Dörfler. Global phase and voltage synchronization for power inverters: a decentralized consensus-inspired approach. In *Proceedings of the 56th IEEE Conference on Decision and Control*, pages 5690 – 5695, December 2017.
- [C32] S. Curi, D. Groß, and F. Dörfler. Control of low inertia power grids: A model reduction approach. In *Proceedings of the 56th IEEE Conference on Decision and Control*, pages 5708 – 5713, December 2017.
- [C33] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Phase balancing in globally connected networks of Liénard oscillators. In *Proceedings of the 56th IEEE Conference on Decision and Control*, pages 595 – 600, December 2017.
- [C34] A. Hauswirth, A. Zanardi, S. Bolognani, F. Dörfler, and G Hug. Online optimization in closed loop on the power flow manifold. In *IEEE PES PowerTech Manchester*, pages 1–6, June 2017.
- [C35] L. Aolaritei, S. Bolognani, and F. Dörfler. A distributed voltage stability margin for power distribution networks. In *IFAC World Congress*, pages 13240–13245, 2017.
- [C36] C. De Persis, E.R.A. Weitenberg, and F. Dörfler. A power consensus algorithm for DC microgrids. In *IFAC World Congress*, pages 10009–10014, 2017.
- [C37] D. Groß, S. Bolognani, B. K. Poolla, and F. Dörfler. Increasing the resilience of low-inertia power systems by virtual inertia and damping. In *Bulk Power Systems Dynamics and Control Symposium (IREP)*, 2017.
- [C38] D. Groß and F. Dörfler. On the steady-state behavior of low-inertia power systems. In *IFAC World Congress*, pages 10735–10741, 2017.
- [C39] P. Nahata, S. Mastellone, and F. Dörfler. A Decentralized Switched System Approach to Overvoltage Prevention in PV Residential Microgrids. In *IFAC World Congress*, pages 6630–6635, 2017.
- [C40] P. Nahata, S. Mastellone, and F. Dörfler. Decentralized Optimal Projected Control of PV Inverters in Residential Microgrids. In *IFAC World Congress*, pages 6624–6629, 2017.
- [C41] B. K. Poolla, D. Groß, T. Borsche, S. Bolognani, and F. Dörfler. Virtual inertia placement in electric power grids. In Jakob Stoustrup, editor, *Energy Markets and Responsive Grids*, pages 281–305, 2017.

- [C42] C. De Persis, N. Monshizadeh, J. Schiffer, and F. Dörfler. A lyapunov approach to control of microgrids with a network-preserved differential-algebraic model. In *Proceedings of the 55th IEEE Conference on Decision and Control*, pages 2595–2600, December 2016.
- [C43] J. W. Simpson-Porco, B. K. Poolla, N. Monshizadeh, and F. Dörfler. Quadratic performance of primal-dual methods with application to secondary frequency control of power systems. In *Proceedings of the 55th IEEE Conference on Decision and Control*, pages 1840–1845, December 2016.
- [C44] C. Arghir, D. Groß, and F. Dörfler. On the steady-state behavior of a nonlinear power network model. In *6th IFAC Workshop on Distributed Estimation and Control in Networked Systems*, pages 61–66, September 2016.
- [C45] T. Jouini, C. Arghir, and F. Dörfler. Grid-friendly matching of synchronous machines by tapping into the dc storage. In *6th IFAC Workshop on Distributed Estimation and Control in Networked Systems*, pages 192–197, September 2016.
- [C46] F. Kottmann, S. Bolognani, and F. Dörfler. A separation principle for optimal iaas cloud computing distribution. In *European Signal Processing Conference (EUSIPCO)*, pages 1393–1397, August 2016.
- [C47] F. Dörfler and S. Grammatico. Amidst centralized and distributed frequency control in power systems. In *American Control Conference*, pages 5909–5914, Boston, MA, July 2016.
- [C48] B. Li, G. Sansavini, S. Bolognani, and F. Dörfler. Linear implicit AC PF cascading failure analysis with power system operations and automation. In *IEEE Power & Energy Society General Meeting*, pages 1–5, Boston, MA, July 2016.
- [C49] B. K. Poolla, S. Bolognani, and F. Dörfler. Placing rotational inertia in power grids. In *American Control Conference*, pages 2314–2320, Boston, MA, July 2016.
- [C50] X. Wu, F. Dörfler, and M. R. Jovanovic. Topology identification and design of distributed integral action in power networks. In *American Control Conference*, Boston, MA, July 2016.
- [C51] J. Schiffer and F. Dörfler. On stability of a distributed averaging PI frequency and active power controlled differential-algebraic power system model. In *European Control Conference*, pages 1487–1492, June 2016.
- [C52] S. Bolognani and F. Dörfler. Fast scenario-based decision making in unbalanced distribution networks. In *Power Systems Computation Conference (PSCC)*, pages 1–7, June, 2016.
- [C53] A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Projected gradient descent on riemannian manifolds with applications to online power system optimization. In *Allerton Conf. on Communications, Control and Computing*, pages 1–8, 2016.
- [C54] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Synchronization of lienard-type oscillators in uniform electrical networks. In *American Control Conference*, 2016.
- [C55] F. Pasqualetti, F. Dörfler, and F. Bullo. A divide-and-conquer approach to distributed attack identification. In *IEEE Conf. on Decision and Control*, pages 5801–5807, Osaka, Japan, December 2015.
- [C56] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. A solvability condition for reactive power flow. In *IEEE Conf. on Decision and Control*, pages 2013–2017, Osaka, Japan, December 2015.

- [C57] M. Todescato, J. W. Simpson-Porco, F. Dörfler, R. Carli, and F. Bullo. Optimal voltage support and stress minimization in power networks. In *IEEE Conf. on Decision and Control*, pages 6921–6926, Osaka, Japan, December 2015.
- [C58] X. Wu, F. Dörfler, and M. R. Jovanovic. Decentralized optimal control of inter-area oscillations in bulk power systems. In *IEEE Conf. on Decision and Control*, pages 5532 – 5537, Osaka, Japan, December 2015.
- [C59] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Virtual oscillator control subsumes droop control. In *American Control Conference*, pages 2353–2358, Chicago, IL, July 2015.
- [C60] M. Sinha, B. Johnson, N. Ainsworth, F. Dörfler, and S. Dhople. Nonlinear supersets to droop control. In *IEEE Workshop on Control and Modeling for Power Electronics (COMPEL)*, Vancouver, BC, July 2015.
- [C61] C. Zhao, E. Mallada, and F. Dörfler. Distributed frequency control for stability and economic dispatch in power networks. In *American Control Conference*, pages 2359–2364, Chicago, IL, July 2015.
- [C62] J. Zhao and F. Dörfler. Distributed control, load sharing, and dispatch in DC microgrids. In *American Control Conference*, pages 3304–3309, Chicago, IL, July 2015.
- [C63] S. Bolognani and F. Dörfler. Fast power system analysis via implicit linearization of the power flow manifold. In *Allerton Conf. on Communications, Control and Computing*, 2015.
- [C64] T. Summers, I. Shames, J. Lygeros, and F. Dörfler. Topology design for optimal network coherence. In *European Control Conference*, 2015. Available at <http://arxiv.org/abs/1411.4884>.
- [C65] F. Dörfler, J. W. Simpson-Porco, and F. Bullo. Plug-and-play control and optimization in microgrids. In *IEEE Conf. on Decision and Control*, pages 211–216, Los Angeles, CA, USA, December 2014.
- [C66] X. Wu, F. Dörfler, and M. R. Jovanovic. Analysis and design trade-offs for power network inter-area oscillations. In *International Symposium on Mathematical Theory of Network and Systems (MTNS)*, July 2014.
- [C67] F. Dörfler, S. Dhople, B. Johnson, and A. Hamadeh. Synchronization of nonlinear circuits in dynamic electrical networks. In *European Control Conference*, pages 552–557, Strasbourg, France, June 2014.
- [C68] B. Gentile, J. W. Simpson-Porco, F. Dörfler, S. Zampieri, and F. Bullo. On reactive power flow and voltage stability in microgrids. In *American Control Conference*, pages 759–764, Portland, OR, June 2014.
- [C69] Y. Xiao, F. Dörfler, and M. van der Schaar. Rating and matching in peer review systems. In *Allerton Conf. on Communications, Control and Computing*, pages 54–61, 2014.
- [C70] J. W. Simpson-Porco, F. Dörfler, Q. Shafiee, J. M. Guerrero, and F. Bullo. Stability, power sharing, & distributed secondary control in droop-controlled microgrids. In *IEEE Int. Conf. on Smart Grid Communications*, pages 672–677, Vancouver, BC, Canada, October 2013.
- [C71] F. Dörfler and F. Bullo. Novel Insights into Lossless AC and DC Power Flow. In *IEEE Power & Energy Society General Meeting*, July 2013.
- [C72] D. Romeres, F. Dörfler, and F. Bullo. Novel results on slow coherency in consensus and power networks. In *European Control Conference*, pages 742–747, Zürich, Switzerland, July 2013.

- [C73] F. Dörfler, M. R. Jovanovic, M. Chertkov, and F. Bullo. Sparse and optimal wide-area damping control in power networks. In *American Control Conference*, pages 4295–4300, Washington, DC, USA, June 2013.
- [C74] H. Bouattour, J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Further results on distributed secondary control in microgrids. In *IEEE Conf. on Decision and Control*, pages 1514–1519, March 2013. Extended manuscript available at <http://motion.me.ucsb.edu/pdf/2013j-bsdb.pdf>.
- [C75] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage stabilization in microgrids via quadratic droop control. In *IEEE Conf. on Decision and Control*, pages 7582–7589, February 2013.
- [C76] F. Dörfler and F. Bullo. Exploring synchronization in complex oscillator networks. In *IEEE Conf. on Decision and Control*, pages 7157–7170, Maui, HI, USA, December 2012.
- [C77] F. Dörfler, M. Chertkov, and F. Bullo. Synchronization assessment in power networks and coupled oscillators. In *IEEE Conf. on Decision and Control*, pages 4998–5003, Maui, HI, USA, December 2012.
- [C78] F. Pasqualetti, F. Dörfler, and F. Bullo. Cyber-physical security via geometric control: Distributed monitoring and malicious attacks. In *IEEE Conf. on Decision and Control*, pages 3418–3425, Maui, HI, USA, December 2012.
- [C79] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Droop-controlled inverters are Kuramoto oscillators. In *IFAC Workshop on Distributed Estimation and Control in Networked Systems*, pages 264–269, Santa Barbara, CA, USA, September 2012.
- [C80] F. Dörfler and F. Bullo. Topological equivalence of a structure-preserving power network model and a non-uniform Kuramoto model of coupled oscillators. In *IEEE Conf. on Decision and Control and European Control Conference*, pages 7099–7104, Orlando, FL, USA, December 2011.
- [C81] F. Pasqualetti, F. Dörfler, and F. Bullo. Cyber-physical attacks in power networks: Models, fundamental limitations and monitor design. In *IEEE Conf. on Decision and Control and European Control Conference*, pages 2195–2201, Orlando, FL, USA, December 2011.
- [C82] F. Dörfler, F. Pasqualetti, and F. Bullo. Distributed detection of cyber-physical attacks in power networks: A waveform relaxation approach. In *Allerton Conf. on Communications, Control and Computing*, pages 1486–1491, September 2011.
- [C83] F. Dörfler and F. Bullo. On the critical coupling strength for Kuramoto oscillators. In *American Control Conference*, pages 3239–3244, San Francisco, CA, USA, June 2011.
- [C84] F. Dörfler and F. Bullo. Spectral Analysis of Synchronization in a Lossless Structure-Preserving Power Network Model. In *Proceedings of the 1st IEEE Conference on Smart Grid Communications in Gaithersburg, Maryland, USA*, pages 179–184, October 2010.
- [C85] F. Dörfler and F. Bullo. Synchronization of Power Networks: Network Reduction and Effective Resistance. In *Proceedings of the 2nd IFAC Workshop on Distributed Estimation and Control in Networked Systems in Annecy, France*, pages 197–202, September 2010.
- [C86] F. Dörfler and F. Bullo. Synchronization and Transient Stability in Power Networks and Non-Uniform Kuramoto Oscillators. In *Proceedings of the American Control Conference in Baltimore, Maryland, USA*, pages 930–937, June 2010.
- [C87] T. D. Krøvel, F. Dörfler, M. Berger, and J. M. Rieber. High-Precision Spacecraft Attitude and Manoeuvre Control Using Electric Propulsion. In *Proceedings of the 60th International Astronautical Congress in Seoul, Korea*, October 2009.

- [C88] F. Dörfler and B. Francis. Formation control of autonomous robots based on cooperative behavior. In *European Control Conference in Budapest*, pages 2432–2437, Budapest, Hungary, August 2009.
- [C89] J. K. Johnsen, F. Dörfler, and F. Allgöwer. L₂-gain of Port-Hamiltonian systems and application to a biochemical fermenter. In *American Control Conference*, pages 153–158, Seattle, Washinton, USA, June 2008.

Theses

- [T1] F. Dörfler. *Dynamics and Control in Power Grids and Complex Oscillator Networks*. Ph.d. thesis, University of California at Santa Barbara, September 2013.
- [T2] F. Dörfler. *Geometric Analysis of the Formation Problem for Autonomous Robots*. Diploma thesis, University of Toronto, August 2008.
- [T3] F. Dörfler. *Port-Hamiltonian Systems – Stability Analysis and Application in Process Control*. Student thesis, Universität Stuttgart, July 2007.

Thesis Advised/Co-Advised

- [A1] P. Althaus. *Energy Balance and Control Modelling of a DC-supplied Metro Trainset with Storage Technology*. Semester thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A2] E. Benenati. *Optimal control of electric loads using Markov Decision Processes*. Semester thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A3] F. Böwing. *A Vehicle Coordination and Charge Scheduling Algorithm for Electric Autonomous Mobility-on-Demand Systems*. Semester thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A4] P. Burch. *Modeling of a novel digital Generator Circuit Breaker and application of Model Predictive Control strategies*. Master thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A5] G. Sridhar. *Deep Neural Architecture Optimisation for Dynamical Systems*. Semester thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A6] L. Stroppa. *Virtual oscillator control of converter-based power grids - Theory and Experiments*. Master thesis, ETH Zürich, 2020. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A7] E. Elokda. *Data-enabled Predictive Control of Quadcopters*. Semester thesis, ETH Zürich, 2019. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A8] I. Gehri. *Autonomous Flying Paramotor*. Semester thesis, ETH Zürich, 2019. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A9] R. Lazar. *Emergence of Global Leader-Follower Structure via Local Social Interactions in Opinion Dynamics*. Semester thesis, ETH Zürich, 2019. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.

- [A10] C. Li. *Measurement of Social Power in Opinion Dynamics*. Semester thesis, ETH Zürich, 2019. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A11] D. Malesevic. *Motion Retargeting for Robots*. Semester thesis, ETH Zürich, 2019. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A12] F. Böwing. *Optimal nonlinear frequency control in power systems*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A13] M. Buob. *Dynamics of cooperative agents in social network formation: theory and simulation*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A14] T. Gidron. *Centrality Games in Social and Economic Networks*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A15] B. Guo. *Energy based angle consensus in power systems*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A16] S. Menta. *Stability of Dynamic Feedback Optimisation*. Master thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A17] S. Renggli and M. Schubiger. *Impact of Inverter-Connected Generation Units on the Operation of Power Systems*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A18] D. Rodriguez. *Time Domain Performance Metrics in Optimal Inertia Placement*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A19] C. Rouault. *Control, Synchronization and Design of an Islanded Microgrid*. Master thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A20] I. Subotic. *Decentralized Synchronization of Inverter Based Grid*. Master thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A21] B. Vandenbussche. *Battery integration in a low-inertia power grid*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A22] D.O. von Arx. *Grid Forming Converter Control For Low Inertia Power Grids*. Master thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A23] A. Zhetessov. *A decentralized control methodology for multi-machine/multi-converter power systems*. Semester thesis, ETH Zürich, 2018. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A24] L. Aolaritei. *Robust stability assessment under operational constraints in power systems*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.

- [A25] E. Arcari. *Fast chance-constrained optimization using real-time measurements with applications to power distribution systems*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A26] J.S. Brouillon. *Decentralized synchronization of an inverter based grid*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A27] Q. Censier. *Using diffeomorphic matching for robot learning from demonstration*. Master thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A28] S. Curi. *Control of Low Inertia Power Grids: A model reduction approach*. Master thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A29] P. Lütolf. *Optimal Placement of Virtual Damping and Inertia*. Master thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A30] J.G. Pazmany. *Robust Optimization of Nonlinear Power Systems in Realtime*. Master thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A31] J. Quack. *Prototyping and Testing of Solar Panel Residual Dipole for Nanosatellites*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A32] B. Stadler. *Virtual oscillator based control of inverters in micro-grids: theory and experimental results*. Master thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A33] I. Subotic. *On the Existence of Solutions to Time-varying Projected Dynamical Systems*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A34] C. Zhongda. *Virtual-oscillator-based Analysis and Control of Induction Machines in Power Systems*. Semester thesis, ETH Zürich, 2017. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A35] L. Aolaritei. *A decentralized Voltage Collapse Distance for Power Distribution Networks*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A36] M. Fetzner. *Network Reduction for Optimal Power Flow Problems*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A37] C. Frei. *Gaussian Processes in Reinforcement Learning*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A38] T. Jouini. *Grid-friendly Matching Control of Synchronous Machines by DC/AC Converters in Bulk Power Networks*. Master thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A39] A. Ketsetzis. *Optimal PMU placement for State Estimation in Power Grids*. Master thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.

- [A40] P. Kyriakis. *Formation of robust networks for secure exchange of cryptocurrencies*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A41] Y. Meier. *Parallelized Interior Point Method for Security Constrained Optimal Power Flow (SCOPF) of Distribution Networks*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A42] P. Nahata. *Decentralized Active Power Control of PV Inverters in Residential Microgrids*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A43] A. Zanardi. *Constrained optimization over manifolds for power system application*. Semester thesis, ETH Zürich, 2016. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A44] D. Drzajic. *Energy Theft Detection using Compressive Sensing Methods*. Semester thesis, ETH Zürich, 2015. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A45] F. Kottmann. *Computational Load and Congestion Control in Cloud Environments*. Master thesis, ETH Zürich, 2015. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A46] A. Lelouvier. *Decentralized and Distributed Frequency Regulation in Power Grids*. Semester thesis, ETH Zürich, 2015. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A47] Y. Meier. *Predicting Grades*. Semester thesis, ETH Zürich, 2015. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A48] P. Nahata. *Distributed Control and Optimization in DC Microgrids*. Semester thesis, ETH Zürich, 2015. Available at <http://control.ee.ethz.ch/publications-and-awards/msc-theses.html>.
- [A49] H. Bouattour. *Distributed Secondary Control in Microgrids*. M.Sc. thesis, Universität Stuttgart, 2013.
- [A50] B. Gentile. *Approximate Solution to the Reactive Power Flow and its Application to Voltage Stability in Microgrids*. Laurea thesis, Università Degli Studi di Padova, 2013.
- [A51] D. Romeres. *Novel Results on Slow Coherency in Power Networks*. Laurea thesis, Università Degli Studi di Padova, 2012.

Miscellaneous

- [M1] D. Alpagó, F. Dörfler, and J. Lygeros. An extended Kalman filter for data-enabled predictive control, March 2020. Available at <https://arxiv.org/abs/2003.08269>.
- [M2] A. Hauswirth, F. Dörfler, and A. Teel. Anti-windup approximations of oblique projected dynamics for feedback-based optimization, March 2020. Available at <https://arxiv.org/abs/2003.00478>.
- [M3] A. Hauswirth, F. Dörfler, and A. Teel. On the differentiability of projected trajectories and the robust convergence of non-convex anti-windup gradient flows, 2020. Available at <https://arxiv.org/abs/2003.02551>.
- [M4] A. Crivellaro, A. Tayyebi, C. Gavriluta, D. Groß, A. Anta, F. Kupzog, and F. Dörfler. Beyond low-inertia systems: Massive integration of grid-forming power converters in transmission grids, November 2019. Available at <https://arxiv.org/abs/1911.02870>.

- [M5] L. Huang, J. Coulson, J. Lygeros, and F. Dörfler. Data-driven wide-area control, November 2019. Available at <https://arxiv.org/abs/1911.12151>.
- [M6] I. Subotic, D. Groß, M. Colombino, and F. Dörfler. A Lyapunov framework for nested dynamical systems on multiple time scales with application to converter-based power systems, November 2019. Available at <https://arxiv.org/abs/1911.08945>.
- [M7] L. Ortmann, A. Hauswirth, I. Caduff, F. Dörfler, and S. Bolognani. Experimental validation of feedback optimization in power distribution grids, October 2019. Available at <https://arxiv.org/abs/1910.03384>.
- [M8] W. Mei, F. Bullo, C. Ge, and F. Dörfler. Occam’s razor in opinion dynamics: The weighted-median influence process, September 2019. Available at <https://128.84.21.199/abs/1909.06474>.
- [M9] L. Huang, H. Xin, and F. Dörfler. H_∞ -control of grid-connected converters: Design, objectives and decentralized stability certificates, June 2019. Available at <https://arxiv.org/abs/1906.11331>.
- [M10] T Jouini and F. Dörfler. Parametric local stability condition of a multi-converter system, April 2019. Available at <https://arxiv.org/abs/1904.11288>.
- [M11] C. Arghir and F. Dörfler. The electronic realization of synchronous machines: model matching, angle tracking and energy shaping techniques, March 2019. Available at <https://www.research-collection.ethz.ch/handle/20.500.11850/331022>.
- [M12] J. Coulson, J. Lygeros, and F. Dörfler. Regularized and distributionally robust data-enabled predictive control, March 2019. Available at <https://arxiv.org/abs/1903.06804>.
- [M13] L. Huang, J. Coulson, J. Lygeros, and F. Dörfler. Data-enabled predictive control for grid-connected power converters, March 2019. Available at <https://arxiv.org/abs/1903.07339>.
- [M14] L. Huang, H. Xin, W. Dong, and F. Dörfler. Impacts of Grid Structure on PLL-Synchronization Stability of Converter-Integrated Power Systems, March 2019. Available at <https://arxiv.org/abs/1903.05489>.
- [M15] A. Tayyebi, D. Groß, A. Anta, F. Kupzog, and F. Dörfler. Interactions of grid-forming power converters and synchronous machines – a comparative study, February 2019. Available at <https://arxiv.org/abs/1902.10750>.
- [M16] A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Timescale separation in autonomous optimization, 2019. Available at <https://arxiv.org/abs/1907.09822>.
- [M17] M. Picallo, S. Bolognani, and F. Dörfler. Closing the loop: Dynamic state estimation and feedback optimization of distribution grids, 2019. Available at <https://arxiv.org/abs/1909.02753>.
- [M18] M. Picallo and F. Dörfler. Sieving out unnecessary constraints in scenario optimization with an application to power systems, 2019. Available at <https://arxiv.org/abs/1907.09822>.
- [M19] J. W. Simpson-Porco, B. K. Poolla, N. Monshizadeh, and F. Dörfler. Quadratic performance analysis of secondary frequency controllers, 2019. Available at <https://arxiv.org/abs/1909.02792>.
- [M20] G. Seo, I. Subotic, B. Johnson, M. Colombino, D. Groß, and F. Dörfler. Dispatchable virtual oscillator control for decentralized inverter-dominant power systems – analysis of droop characteristic and verification, November 2018. Available at <https://arxiv.org/abs/1811.08842>.

- [M21] S. Menta, A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Stability of dynamic feedback optimization with applications to power systems, October 2018. Available at <https://arxiv.org/abs/1810.06079>.
- [M22] B. K. Poolla, D. Groß, and F. Dörfler. Placement and implementation of grid-forming and grid-following virtual inertia, July 2018. Available at <https://arxiv.org/pdf/1807.01942>.
- [M23] C. Arghir and F. Dörfler. Energy-based stabilization of network flows in multi-machine power systems, April 2018. Available at <https://arxiv.org/abs/1804.09681>.
- [M24] J. W. Simpson-Porco, B. K. Poolla, N. Monshizadeh, and F. Dörfler. Input-output performance of linear-quadratic saddle-point algorithms with application to distributed resource allocation problems, March 2018. Available at <https://arxiv.org/abs/1803.02182>.
- [M25] J. Coulson, J. Lygeros, and F. Dörfler. Data-enabled predictive control: In the shallows of the deep, 2018. Available at <https://arxiv.org/abs/1811.05890>.
- [M26] R. Delabays, P. Jacquod, and F. Dörfler. The Kuramoto model on oriented and signed graphs, 2018. Available at <https://arxiv.org/abs/1807.11410>.
- [M27] D. Groß, M. Colombino, J.S. Brouillon, and F. Dörfler. The effect of transmission-line dynamics on grid-forming dispatchable virtual oscillator control, 2018. Available at <https://arxiv.org/abs/1802.08881>.
- [M28] A. Hauswirth, S. Bolognani, and F. Dörfler. Projected dynamical systems on irregular non-euclidean domains for nonlinear optimization, 2018. Available at <https://arxiv.org/abs/1809.04831>.
- [M29] A. Hauswirth, S. Bolognani, G Hug, and F. Dörfler. Generic existence of unique lagrange multipliers in ac optimal power flow, 2018. Available at <https://arxiv.org/abs/1806.06615>.
- [M30] A. Hauswirth, I. Subotic, S. Bolognani, G Hug, and F. Dörfler. Time-varying projected dynamical systems with applications to feedback optimization of power systems, 2018. Available at <https://arxiv.org/abs/1809.07288>.
- [M31] L. Aolaritei, S. Bolognani, and F. Dörfler. Hierarchical and distributed monitoring of voltage stability in distribution networks, November 2017. Available at <https://arxiv.org/abs/1710.10544>.
- [M32] E.R.A. Weitenberg, Y. Jiang, C. Zhao, E. Mallada, C. De Persis, and F. Dörfler. Robust decentralized secondary frequency control in power systems: Merits and trade-offs, November 2017. Available at <https://arxiv.org/abs/1711.07332>.
- [M33] M. Colombino, D. Groß, J.S. Brouillon, and F. Dörfler. Global phase and magnitude synchronization of coupled oscillators with application to the control of grid-forming power inverters, October 2017. Available at <https://arxiv.org/abs/1710.00694>.
- [M34] C. Arghir, T. Jouini, and F. Dörfler. Grid-forming control for power converters based on matching of synchronous machines, 2017. Available at <https://arxiv.org/abs/1706.09495>.
- [M35] T. Borsche and F. Dörfler. On placement of synthetic inertia with explicit time-domain constraints, 2017. Available at <https://arxiv.org/abs/1705.03244>.
- [M36] F. Dörfler. Lecture notes on "circuits & power grids", 2017. Part of the "Advanced Topics in Control" Course 2017. Available at http://people.ee.ethz.ch/~floriand/docs/Teaching/ATIC_2017/Circuits_Lecture.pdf.

- [M37] F. Dörfler. Lecture notes on "distributed consensus-based optimization", 2017. Part of the "Advanced Topics in Control" Course 2017. Available at http://people.ee.ethz.ch/~floriand/docs/Teaching/ATIC_2017/Optimization_Lecture.pdf.
- [M38] B. K. Poolla, S. Bolognani, N. Li, and F. Dörfler. A market mechanism for virtual inertia, 2017. Available at <https://arxiv.org/abs/1711.04874>.
- [M39] T. Summers, I. Shames, J. Lygeros, and F. Dörfler. Correction to "Topology design for optimal network coherence", 2017. Available at http://www.utdallas.edu/~tyler.summers/papers/ECC_Correction.pdf.
- [M40] L. Aolaritei, S. Bolognani, and F. Dörfler. A distributed voltage stability margin for power distribution networks, December 2016. Available at <https://arxiv.org/abs/1612.00207>.
- [M41] D. Groß, C. Arghir, and F. Dörfler. On the steady-state behavior of a nonlinear power system model, July 2016. Available at <https://arxiv.org/abs/1607.01575>.
- [M42] J. Schiffer, F. Dörfler, and E. Fridmann. Cyber-physical aspects of distributed averaging control in power systems: Time delays & dynamic communication topology, July 2016. Available at <http://arxiv.org/abs/1607.07743>.
- [M43] F. Dörfler and S. Grammatico. Gather-and-broadcast frequency control in power systems, May 2016. Available at <http://arxiv.org/abs/1605.09560>.
- [M44] M. Fazlyab, F. Dörfler, and V. M. Preciado. Optimal network design for synchronization of kuramoto oscillators, February 2016. Available at <http://arxiv.org/abs/1503.07254>.
- [M45] M. Todescato, J. W. Simpson-Porco, F. Dörfler, R. Carli, and F. Bullo. Voltage stress minimization by optimal reactive power control, February 2016. Available at <http://arxiv.org/abs/1602.01969>.
- [M46] B. K. Poolla, S. Bolognani, and F. Dörfler. Optimal placement of virtual inertia in power grids, January 2016. Available at <http://arxiv.org/pdf/1510.01497v2.pdf>.
- [M47] C. De Persis, E.R.A. Weitenberg, and F. Dörfler. A power consensus algorithm for dc microgrids, 2016. Available at <https://arxiv.org/abs/1611.04192>.
- [M48] B. K. Poolla, S. Bolognani, and F. Dörfler. Placing rotational inertia in power grids, October 2015. Available at <http://arxiv.org/pdf/1510.01497v1.pdf>.
- [M49] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage stabilization in microgrids via quadratic droop control, July 2015. Available at <http://arxiv.org/pdf/1507.00431v1.pdf>.
- [M50] J. W. Simpson-Porco, Q. Shafiee, F. Dörfler, J. M. Vasquez, J. M. Guerrero, and F. Bullo. Distributed averaging controllers for secondary frequency and voltage control in microgrids, April 2015. Available at <http://arxiv.org/abs/1504.06784>.
- [M51] M. Fazlyab, F. Dörfler, and V. M. Preciado. Optimal design for synchronization of kuramoto oscillators in tree networks, March 2015. Available at <http://arxiv.org/abs/1503.07254v1>.
- [M52] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. On resistive networks of constant power devices, March 2015. Available at <http://arxiv.org/pdf/1503.04769v1.pdf>.
- [M53] X. Wu, F. Dörfler, and M. R. Jovanovic. Input-output analysis and decentralized optimal control of inter-area oscillations in power systems, February 2015. Available at <http://arxiv.org/abs/1502.03221>.

- [M54] Y. Xiao, F. Dörfler, and M. van der Schaar. Incentive design in peer review: Rating and repeated endogenous matching, November 2014. Available at <http://arxiv.org/abs/1411.2139>.
- [M55] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Voltage stability of droop-controlled microgrids (Extended Abstract), July 2014. Available at http://people.ee.ethz.ch/~floriand/docs/Articles/SimpsonPorco_MTNS_2014.pdf.
- [M56] F. Dörfler, J. W. Simpson-Porco, and F. Bullo. Breaking the Hierarchy: Distributed Control & Economic Optimality in Microgrids, January 2014. Available at <http://arxiv.org/abs/1401.1767>.
- [M57] F. Dörfler and J. M. Hendrickx. Synchronization of oscillators: Feasibility and non-local analysis, 2014.
- [M58] D. Mehta, N. Daleo, F. Dörfler, and J. D. Hauenstein. Algebraic geometrization of the kuramoto model: Equilibria and stability analysis, 2014. Available at <http://arxiv.org/abs/1412.0666>.
- [M59] M. Sinha, F. Dörfler, B. Johnson, and S. Dhople. Uncovering droop control laws embedded within the nonlinear dynamics of Van der Pol oscillators, 2014. Available at <http://arxiv.org/abs/1411.6973>.
- [M60] T. Summers, I. Shames, J. Lygeros, and F. Dörfler. Topology design for optimal network coherence, 2014. Available at <http://arxiv.org/abs/1411.4884>.
- [M61] S. Dhople, B. Johnson, F. Dörfler, and A. Hamadeh. Synchronization of nonlinear circuits in dynamic electrical networks with general topologies, October 2013. Available at <http://arxiv.org/abs/1310.4550>.
- [M62] F. Dörfler, M. R. Jovanović, M. Chertkov, and F. Bullo. Sparsity-promoting optimal wide-area control of power networks, July 2013. Available at <http://arxiv.org/abs/1307.4342>.
- [M63] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Synchronization and power sharing for droop-controlled inverters in islanded microgrids, November 2012. Available at <http://arxiv.org/abs/1206.5033>.
- [M64] F. Dörfler and F. Bullo. Exploring synchronization in complex oscillator networks, September 2012. Extended version including proofs. Available at <http://arxiv.org/abs/1209.1335>.
- [M65] F. Dörfler, M. Chertkov, and F. Bullo. Synchronization in complex oscillator networks and smart grids, July 2012. Available at <http://arxiv.org/abs/1208.0045>.
- [M66] J. W. Simpson-Porco, F. Dörfler, and F. Bullo. Droop-controlled inverters are Kuramoto oscillators, June 2012. Available at <http://arxiv.org/pdf/1206.5033v1.pdf>.
- [M67] F. Pasqualetti, F. Dörfler, and F. Bullo. Attack detection and identification in cyber-physical systems – Part I: Models and fundamental limitations, February 2012. Available at <http://arxiv.org/abs/1202.6144>.
- [M68] F. Pasqualetti, F. Dörfler, and F. Bullo. Attack detection and identification in cyber-physical systems – Part II: Centralized and distributed monitor design, February 2012. Available at <http://arxiv.org/abs/1202.6049>.
- [M69] F. Pasqualetti, F. Dörfler, and F. Bullo. Cyber-physical attacks in power networks: Models, fundamental limitations and monitor design, September 2011. Available at <http://arxiv.org/abs/1103.2795>.

- [M70] F. Dörfler and F. Bullo. Kron reduction of graphs with applications to electrical networks, February 2011. Available at <http://arxiv.org/abs/1102.2950>.
- [M71] F. Dörfler and F. Bullo. On the critical coupling for Kuramoto oscillators, November 2010. Available at <http://arxiv.org/abs/1011.3878>.
- [M72] F. Dörfler and B. Francis. Geometric Analysis of the Formation Problem for Autonomous Robots, January 2010. Available at <http://arxiv.org/abs/1001.4494>.
- [M73] F. Dörfler and F. Bullo. Synchronization and transient stability in power networks and non-uniform Kuramoto oscillators, October 2009. Available at <http://arxiv.org/abs/0910.5673>.

Patents

- [P1] B. Johnson, N. Ainsworth, S. Dhople, and F. Dörfler. A systematic procedure for synthesizing virtual oscillators for inverter-based power systems. US62/329,266. November 2016.
- [P2] B. Johnson, N. Ainsworth, S. Dhople, M. Sinha, and F. Dörfler. Virtual Oscillator Control. U.S. 10,528,687 B2, January 7, 2020.
- [P3] B. Johnson, M. Rodriguez, M. Sinha, S. Dhople, and F. Dörfler. Decentralized Interleaving of Parallel-connected Converters in DC Microgrids. U.S. 10,340,801 B2, July 2, 2019.