John W. Simpson-Porco
Edward S. Rogers Sr. Department of Electrical and Computer Engineering
University of Toronto
10 King's College Road, Toronto, ON, M5S 3G4, Canada
Office: GB 340, Tel: +1 416-978-5185
Email: jwsimpson@ece.utoronto.ca or jw.simpson@utoronto.ca
URL: http://www.control.utoronto.ca/~jwsimpson/

Academic Employment

07/2025 - present	**Associate Professor** Department of Electrical and Computer Engineering University of Toronto, Toronto, ON, Canada (Asst. Prof. 2020 – 2025)
04/2016 - 06/2020	**Assistant Professor** Department of Electrical and Computer Engineering University of Waterloo, Waterloo, ON, Canada
10/2015 - 12/2015	**Visiting Scientist** Automatic Control Laboratory Swiss Federal Institute of Technology (ETH) Zürich, Switzerland

Education

09/2010 - 09/2015	**PhD** in **Mechanical Engineering** University of California, Santa Barbara, CA, USA
09/2006 - 05/2010	**BSc** in **Engineering Physics** Queen's University, Kingston, ON, Canada

Research Interests

My interests are in feedback control theory, control engineering, and applications of control in modernized energy systems. My research in control covers a broad array of topics, including linear and nonlinear systems theory, distributed and decentralized control, and the design of optimization-based control systems. This theoretical research is directly informed by modern problems in the analysis and control of energy systems, including bulk power systems, active distribution systems, and microgrids.

Links

Latest CV	https://www.control.utoronto.ca/~jwsimpson/jwsimpson_cv.pdf
Orcid	https://orcid.org/0000-0002-1589-5324
Google Scholar	https://scholar.google.com/citations?user=tyQhs60AAAAJ

Honours and Awards (2010–)

2026 Edward S. Rogers Sr. Chair in Engineering (2026 – 2033)

2026 IEEE PES Working Group Recognition Award for Outstanding Technical Report
Awarded for PES-TR-106 "Trends in Microgrid Modelling for Stability Analysis"

2024 Ontario Early Researcher Award

2020 IEEE PES Technical Committee Working Group Award for Outstanding Technical Report
Awarded for PES-TR-66 "Microgrid Stability Definitions, Analysis, and Examples"

2020 Best Task Force Award, IEEE PES Power System Dynamic Perf. Committee
Awarded for PES-TR-66 "Microgrid Stability Definitions, Analysis, and Examples"

2019 Distinguished Performance Award, Faculty of Engineering, University of Waterloo

2016 Outstanding Reviewer Award, New Journal of Physics

2016 Best PhD Thesis Award, Center for Control, Dynamical Systems and Computation, UCSB

2014 Peter J. Frenkel Foundation Fellowship, UC Santa Barbara

2014 Automatica Paper Prize, International Federation of Automatic Control

2013 CCDC Fellowship, Center for Control, Dynamical Systems, and Computation UC Santa Barbara

2011 NSERC PGS-D Fellowship (Held at UC Santa Barbara)

2010 CCDC Fellowship, Center for Control, Dynamical Systems, UC Santa Barbara

2010 NSERC PGS-M Fellowship (Held at UC Santa Barbara)

2010 Engineering Physics Design Award, Queen's University
(*best senior engineering physics thesis*)

Advising

Graduate Students

09/2025 – present Stefan Damjanovic (MASc, University of Toronto)
Awards: QEII 2026 (May 2026 to April 2027)

09/2023 – present Niloufar Yousefi (PhD, University of Toronto)

09/2022 – present Liangjie (Jeffrey) Chen (PhD, University of Toronto)
Awards: OGS '23, '24. CGS-D. Hatch Scholar. (x2), H. W. Price

09/2024 – 09/2026 John-Paolo Casasanta (MASc, University of Toronto)
Thesis: Robust D-Stability: Theory and Applications in Multiple Timescale Systems and Decentralized Integral Control
Awards: CGS-M 2025
Initial Placement: PhD Candidate, ECE, University of California, Santa Barbara
Currently (as of 2026-09): PhD Candidate, ECE, University of California, Santa Barbara

09/2023 – 08/2025 Xiangyu (Harry) Zou (MASc, University of Toronto)
Thesis: A Frequency-Constrained MILP for Power System Restoration Planning
Awards: OGS 2024
Initial Placement: PhD Student, Georgia Tech, USA
Currently (as of 2026-05-19): PhD Student, Georgia Tech, USA

01/2020 – 01/2025 Ruiqi Li (PhD, University of Waterloo, Co-Sup. Stephen L. Smith)
Thesis: Stochastic Data-Driven Predictive Control with Equiv. to Stochastic MPC
Initial Placement: Motion Control Engineer, Haichuang Robot Innovation Center, Hangzhou, China
Currently (as of 2026-09): Motion Control Engineer, Haichuang Robot Innovation Center, Hangzhou, China

09/2019 – 08/2024 Ilyas Farhat (PhD, University of Waterloo)
Thesis: Multi-Area Architecture for Real-Time FBO of Distribution Grids
Awards: Engineering Excellence Doctoral Fellowships
Initial Placement: Postdoctoral Fellow, University of Toronto
Currently (as of 2026-05-19): Power Systems Engineer, EPE Canada

09/2018 – 08/2023 Etinosa Ekomwenrenren (PhD, University of Waterloo)
Thesis: Hierarchical Coord. Fast Frequency Control using IBRs
Awards: QEII-GSST, President's Graduate Scholarship, FOE Excellence Award
Initial Placement: Postdoctoral Fellow, IREQ, Hydro Quebec
Currently (as of 2026-05-19): Research Engineer, Hitachi Energy, Montreal, QC

09/2021 – 05/2023 Spencer Kelly (MASc, University of Toronto)
Thesis: Extended Proximal Primal-Dual Online Feedback Controller
Awards: CGS-M
Initial Placement: Spacecaft GNC, Kepler Comm. Inc., Toronto, ON
Currently (as of 2026-05-19): Spacecaft GNC, Kepler Comm. Inc., Toronto, ON

09/2020 – 09/2022 Anurag Agarwal (MASc, University of Toronto, Co-Sup. Lacra Pavel)
Thesis: Robust Feedback-Based Nash Equilibrium Seeking
Initial Placement: Software Engineer, Qualcomm, Toronto, ON
Currently (as of 2026-05-19): Software Engineer, Qualcomm, Toronto, ON

09/2020 – 08/2022 Liangjie (Jeffrey) Chen (MASc, University of Toronto)
Thesis: A Fixed-Point Algorithm for the AC Power Flow Problem
Initial Placement: PhD Candidate, University of Toronto
Currently (as of 2026-05-19): PhD Candidate, University of Toronto

09/2020 – 08/2022 Youssef Al Falah (MASc, University of Toronto, Co-Sup. Joshua A. Taylor)
Thesis: *Towards Optimal Steady-State Control of Multi-Terminal HVDC Systems*
Initial Placement: Energy Consultant, Guidehouse, Toronto, ON
Currently (as of 2026-05-19): Energy Consultant, Guidehouse, Toronto, ON

09/2019 – 09/2021 Enrique Espina Gonzalez (PhD, University of Waterloo, Co-Sup. Mehrdad Kazerani)
Thesis: *Distributed Secondary Control of Hybrid ac/dc Microgrids*
Awards: Beca Doctorado Nacional y Beneficios complementarios
Initial Placement: Assistant Professor, Universidad de Santiago de Chile
Currently (as of 2026-05-19): Assistant Professor, Universidad de Santiago de Chile

09/2017 – 08/2019 Liam S. P. Lawrence (MASc, University of Waterloo)
Thesis: *The Optimal Steady-State Control Problem*
Awards: CGS-M, OGS, CGS-D
Initial Placement: PhD Student, Medical Physics, University of Toronto
Currently (as of 2026-05-19): PhD Student, Medical Physics, University of Toronto

Postdoctoral Fellows

10/2025 – 06/2026 Amir Reza Nikzad (University of Toronto)
Project: Restoration of Inverter-Based Grids
Initial Placement: Power Systems Engineer, Stantec, Canada

10/2024 – 08/2025 Ilyas Farhat (University of Toronto)
Project: Restoration of Inverter-Based Power Systems
Initial Placement: Power Systems Engineer, EPE, Canada
Currently (as of 2026-05-19): Power Systems Engineer, EPE, Canada

04/2024 – 08/2024 SungHoon Lim (University of Toronto)
Project: Restoration of Inverter-Based Power Systems
Initial Placement: Asst. Prof., Jeonbuk National University, Korea
Currently (as of 2026-05-19): Asst. Prof., Jeonbuk National University, Korea

04/2019 – 04/2021 Zhiyuan Tang (University of Waterloo)
Project: Measurement-Based Fast Coord. Voltage Control for Transmission Grids
Initial Placement: Asst. Prof., Sichuan University, China
Currently (as of 2026-05-19): Asst. Prof., Sichuan University, China

05/2018 – 08/2019 Mauricio Restrepo Restrepo (University of Waterloo, Co-Sup. Claudio A. Cañizares)
Project: Implementation and Testing of EMS at the CANREL Microgrid Facility
Initial Placement: Asst. Prof., Universidad del Norte, Barranquilla, Colombia
Currently (as of 2026-05-19): Asst. Prof., Universidad del Norte, Barranquilla, Colombia

09/2017 – 08/2018 Mostafa Farrokhabadi (University of Waterloo, Co-Sup. Claudio A. Cañizares)
Project: Optimal Design of Voltage-Frequency Controllers for Microgrids
Initial Placement: Technical Lead, BluWave-ai, Ottawa, ON
Currently (as of 2026-05-19): Asst. Prof., University of Calgary, Canada

Visiting Graduate Students

07/2025 – 10/2025 Jun Zhou (MASc, Huazhong UST)

09/2022 – 02/2023 Babak Abdolmaleki (PhD, NTNU)

09/2017 – 12/2017 Juan Sebastian Gomez Quintero (PhD, University of Chile)

09/2017 – 12/2017 Nainar Karthikeyan (PhD, Aalborg University)

05/2017 – 08/2017 Jacqueline Llanos (PhD, University of Chile)

Undergraduate Students

09/2024 – 04/2025 Katerina Vovk (EngSci Thesis)
Project: Disturbance Observability in Power Systems

05/2024 – 04/2025 Jonathan Milner (NSERC USRA / EngSci Thesis)
Project: Fast Architectures for Transmission-Distribution Coordination

09/2023 – 04/2024 David Gui (EngSci Thesis)
Project: Halley Class Methods for Power Flow Analysis

09/2023 – 04/2024 Jane Hwang (EngSci Thesis)
Project: Power System Restoration with Inverter-Based Generation

05/2023 – 08/2023 George Wang (EngSci USRA)
Project: Properties of the Asymmetrically Weighted Incidence Matrix

01/2019 – 05/2019 Audrey Avianto (URA)
Project: Topics in Neural Networks

01/2017 – 05/2017 Nicholas Olson (URA)
Project: Fast Frequency Control using Energy Storage

Teaching

1. **ECE 1659: Robust and Optimal Control (University of Toronto)**
   - *Sessions*: Winter 2021 (20), 2022 (8), 2023 (14), 2024 (15), 2026 (10)
   - *Materials*: Courseware available.
2. **ECE216: Signals and Systems (University of Toronto)**
   - *Sessions*: Winter 2021 (13), 2022 (84), 2023 (123), 2024 (75), 2026 (95)
   - *Materials*: Courseware available.
3. **ECE410: Linear Control Systems (University of Toronto)**
   - *Sessions*: Fall 2021 (22), 2022 (17), 2025 (13)
   - *Materials*: Unofficial course description.
4. **ECE557: Linear Systems Theory (University of Toronto)**
   - *Sessions*: Fall 2024 (80)
   - *Materials*: Unofficial course description.
5. **ECE 484: Digital Control Applications (University of Waterloo)**
   - *Sessions*: Fall 2016, 2017, 2018 (x2), 2019 (x2)
   - *Materials*: Courseware available.
6. **ECE 780-T09: Network Systems and Control (University of Waterloo)**
   - *Sessions*: Spring 2018
   - *Materials:* Syllabus
7. **ECE 780-T10: Multivariable Control Systems II (University of Waterloo)**
   - *Sessions*: Spring 2019
   - *Materials:* Syllabus
8. **ECE 380: Analog Control Systems (University of Waterloo)**
   - *Sessions*: Spring 2017
   - *Materials*: Syllabus

Publications

Publication categories: Publications are organized into seven categories: (1) journal articles submitted or in revision, (2) journal articles accepted, in-press, or published, (3) peer-reviewed conference articles submitted or in revision (4) peer-reviewed conference articles accepted or published, (5) technical reports, (6) works in progress, (7) thesis.

Annotation: If a document was written in collaboration with a graduate student (resp. postdoctoral fellow) whom I was formally supervising, informally supervising, or otherwise mentoring in some meaningful fashion, the student (resp. postdocotral fellow) is marked with an asterisk (resp. a double asterisk).

Order of authors: There is unfortunately no consistent convention in what follows for author order. The first author listed is *usually* the lead contributor to the work. The remaining authors are *usually* listed in order of overall contribution to the work, from greatest to least.

Journal Articles Submitted, Accepted, or In Press

[NewJ6] X. Bao*, **J. W. Simpson-Porco**, and R. Grosse, "Extending the noisy quadratic models using linear matrix inequalities," 2026, Preprint.

[NewJ5] E. Dall'Anese, **J. W. Simpson-Porco**, F. Dörfler, S. Dhople, and S. Bolognani, "Multi-time-scale Control of Power Systems: From Classical Automatic Generation Control to Feedback Optimization," *IEEE Control Systems Magazine*, 2026, Submitted.

[NewJ4] S. Damjanovic*, K. van Heusden, and **J. W. Simpson-Porco**, "Distributionally Robust Frequency Response Estimation Using Non-Steady-State Frequency-Domain Data," *IEEE Transactions on Automatic Control*, 2026, Working Paper.

[NewJ3] S. M. Mohseni Bonab, V. Choinière, E.-N. S. Youssef, A. Mercier, M. Kassouf, O. Diene, N. Rashidirad, F. Miralles, N. Menemenlis, T. Ould-Bachir, I. Kocar, J. P. David, R. Gay, D. Kundur, A. Hooshyar, **J. W. Simpson-Porco**, and C. Rehtanz, "Hedge+: A new paradigm for energy system digital transformation with edge computing," *Nature Energy*, 2026, Submitted.

[NewJ2] X. Zou*, A. R. Nikzad**, I. Farhat**, and **J. W. Simpson-Porco**, "Frequency Nadir-Constrained Power System Restoration Planning with Energy Storage," *IEEE Transactions on Power Systems*, 2026, Submitted to IEEE TPWRS on May 12th, 2026.

[NewJ1] T. Zheng, **J. W. Simpson-Porco**, and E. Mallada, "Closed-loop motion planning for differentially flat systems: A time-varying optimization framework," *IEEE Transactions on Automatic Control*, 2023, Submitted. https://arxiv.org/abs/2310.13090.

Journal Articles Published

[J44] J.-P. Casasanta* and **J. W. Simpson-Porco**, "A Lyapunov Characterization of Robust D-Stability with Application to Decentralized Integral Control of LTI Systems," *IEEE Control Systems Letters*, vol. 10, pp. 1375–1380, 2026. DOI: 10.1109/LCSYS.2026.3703779

[J43] **J. W. Simpson-Porco**, D. Astolfi, and G. Scarciotti, "Steady-state cascade operators and their role in linear control, estimation, and model reduction problems," *IEEE Transactions on Automatic Control*, vol. 71, no. 1, pp. 4–19, 2026. DOI: 10.1109/TAC.2025.3587949

[J42] I. Farhat*, E. Ekomwenrenren*, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, and A. Haddadi, "A multi-area architecture for real-time feedback-based optimization of distribution grids," *IEEE Transactions on Smart Grid*, vol. 16, no. 2, pp. 1448–1461, Mar. 2025. DOI: 10.1109/TSG.2024.3524622

[J41] Z. Hu, C. De Persis, **J. W. Simpson-Porco**, and P. Tesi, "Data-driven harmonic output regulation of a class of nonlinear systems," *Systems & Control Letters*, vol. 200, p. 106 079, Jun. 2025. DOI: 10.1016/j.sysconle.2025.106079

[J40] B. Abdolmaleki*, **J. W. Simpson-Porco**, and G. Bergna-Diaz, "Distributed optimization for reactive power sharing and stability of inverter-based resources under voltage limits," *IEEE Transactions on Smart Grid*, vol. 15, no. 2, pp. 1289–1303, Mar. 2024. DOI: 10.1109/TSG.2023.3303178

[J39] D. Espín-Sarzosa, R. Palma-Behnke, C. A. Cañizares, U. Annakkage, M. Elizondo, W. Du, L. Meegahapola, P. A. Mendoza-Araya, E. Nasr, R. Ramos, M. Ropp, **J. W. Simpson-Porco**, and K. Strunz, "Microgrid modeling for stability analysis," *IEEE Transactions on Smart Grid*, vol. 15, no. 3, pp. 2459–2479, May 2024. DOI: 10.1109/TSG.2023.3326063

[J38] E. Ekomwenrenren*, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, A. Haddadi, and L. Zhu, "Data-driven fast frequency control using inverter-based resources," *IEEE Transactions on Power Systems*, vol. 39, no. 4, pp. 5755–5768, Jul. 2024. DOI: 10.1109/TPWRS.2023.3337011

[J37] E. Espina*, R. Cárdenas-Dobson, **J. W. Simpson-Porco**, M. Kazerani, and D. Sáez, "A consensus-based distributed secondary control optimization strategy for hybrid microgrids," *IEEE Transactions on Smart Grid*, vol. 14, no. 6, pp. 4242–4255, Nov. 2023. DOI: 10.1109/TSG.2023.3263107

[J36] R. Li*, **J. W. Simpson-Porco**, and S. L. Smith, "Stochastic Data-Driven Predictive Control with Equivalence to Stochastic MPC," *IEEE Transactions on Automatic Control*, vol. 71, no. 7, pp. 4617–4632, 2023, Extended Version: arxiv:2312.15177. DOI: 10.1109/TAC.2026.3663089

[J35] Z. Tang**, E. Ekomwenrenren*, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, A. Haddadi, and H. Hooshyar, "Data-driven extension of "measurement-based fast coordinated voltage control for transmission grids"," *IEEE Transactions on Power Systems*, vol. 38, no. 1, pp. 948–951, Jan. 2023. DOI: 10.1109/TPWRS.2022.3220056

[J34] N. S. Guzman*, M. Arriaga**, C. A. Cañizares, **J. W. Simpson-Porco**, K. Bhattacharya, and D. Sohm, "Regulation signal design and fast frequency control with energy storage systems," *IEEE Transactions on Power Systems*, vol. 37, no. 1, pp. 224–236, Jan. 2022. DOI: 10.1109/TPWRS.2021.3086075

[J33] **J. W. Simpson-Porco** and N. Monshizadeh, "Diagonal stability of systems with rank-1 interconnections and application to automatic generation control in power systems," *IEEE Transactions on Control of Network Systems*, vol. 3, no. 3, pp. 1518–1530, Sep. 2022. DOI: 10.1109/TCNS.2021.3113266

[J32] E. Ekomwenrenren*, Z. Tang**, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, and H. Hooshyar, "Hierarchical coordinated fast frequency control using inverter-based resources," *IEEE Transactions on Power Systems*, vol. 36, no. 6, pp. 4992–5005, Nov. 2021. DOI: 10.1109/TPWRS.2021.3075641

[J31] E. Espina*, R. Cárdenas-Dobson, D. Sáez, M. Kazerani, and **J. W. Simpson-Porco**, "A consensus-based secondary control strategy for hybrid ac/dc microgrids with experimental validation," *IEEE Transactions on Power Electronics*, vol. 36, no. 5, pp. 5971–5984, May 2021. DOI: 10.1109/TPEL.2020.3031539

[J30] L. S. P. Lawrence*, **J. W. Simpson-Porco**, and E. Mallada, "Linear-convex optimal steady-state control," *IEEE Transactions on Automatic Control*, vol. 66, no. 11, pp. 5377–5384, Nov. 2021. DOI: 10.1109/TAC.2020.3044275

[J29] M. Restrepo**, C. A. Cañizares, **J. W. Simpson-Porco**, P. Su, and J. Taruc, "Implementation and testing of energy management systems at the CANREL microgrid facility," *Applied Energy*, vol. 290, p. 116 760, May 2021. DOI: 10.1016/j.apenergy.2021.116760

[J28] **J. W. Simpson-Porco**, "Analysis and synthesis of low-gain integral controllers for nonlinear systems," *IEEE Transactions on Automatic Control*, vol. 66, no. 9, pp. 4148–4159, Sep. 2021. DOI: 10.1109/TAC.2020.3035569

[J27] **J. W. Simpson-Porco**, "Low-gain stability of projected integral control for input-constrained discrete-time nonlinear systems," *IEEE Control Systems Letters*, vol. 6, pp. 788–793, Jun. 2021. DOI: 10.1109/LCSYS.2021.3086682

[J26] **J. W. Simpson-Porco**, "On area control errors, area injection errors, and textbook automatic generation control," *IEEE Transactions on Power Systems*, vol. 36, no. 1, pp. 557–560, Jan. 2021. DOI: 10.1109/TPWRS.2020.3029418

[J25] **J. W. Simpson-Porco**, "On stability of distributed-averaging proportional-integral frequency control in power systems," *IEEE Control Systems Letters*, vol. 5, no. 2, pp. 677–682, Apr. 2021. DOI: 10.1109/LCSYS.2020.3004024

[J24] Z. Tang[**], E. Ekomwenrenren[*], **J. W. Simpson-Porco**, E. Farantatos, M. Patel, and H. Hooshyar, "Measurement-based fast coordinated voltage control for transmission grids," *IEEE Transactions on Power Systems*, vol. 36, no. 4, pp. 3416–3429, Jul. 2021. DOI: 10.1109/TPWRS.2020.3045379

[J23] M. Farrokhabadi[**], C. A. Cañizares, **J. W. Simpson-Porco**, E. Nasr, L. Fan, P. A. Mendoza-Araya, R. Tonkoski, U. Tamrakar, N. Hatziargyriou, D. Lagos, R. W. Wies, M. Paolone, M. Liserre, L. Meegahapola, M. Kabalan, A. H. Hajimiragha, D. Peralta, M. Elizondo, K. P. Schneider, F. Tuffner, and J. Reilly, "Microgrid stability definitions, analysis, and examples," *IEEE Transactions on Power Systems*, vol. 35, no. 1, pp. 13–29, Jan. 2020. DOI: 10.1109/TPWRS.2019.2925703

[J22] J. S. Gómez[*], D. Sáez, **J. W. Simpson-Porco**, and R. Cárdenas, "Distributed predictive control for frequency and voltage regulation in microgrids," *IEEE Transactions on Smart Grid*, vol. 11, no. 2, pp. 1319–1329, Mar. 2020. DOI: 10.1109/TSG.2019.2935977

[J21] Y. Khayat, Q. Shafiee, R. Heydari, T. Dragicevic, M. Naderi, **J. W. Simpson-Porco**, F. Dörfler, M. Fathi, F. Blaabjerg, and H. Bevrani, "On the secondary control architectures of ac microgrids: A survey," *IEEE Transactions on Power Electronics*, vol. 35, no. 6, pp. 6482–6500, Jun. 2020. DOI: 10.1109/TPEL.2019.2951694

[J20] N. Karthikeyan[*], J. R. Pillai, B. Bak-Jensen, and **J. W. Simpson-Porco**, "Predictive control of flexible resources for demand response in active distribution networks," *IEEE Transactions on Power Systems*, vol. 34, no. 4, pp. 2957–2969, Jul. 2019. DOI: 10.1109/TPWRS.2019.2898425

[J19] J. Llanos[*], D. E. Olivares, **J. W. Simpson-Porco**, M. Kazerani, and D. Saez, "A novel distributed control strategy for optimal dispatch of isolated microgrids considering congestion," *IEEE Transactions on Smart Grid*, vol. 10, no. 6, pp. 6595–6606, Nov. 2019. DOI: 10.1109/TSG.2019.2908128

[J18] **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*, vol. 65, no. 5, pp. 2032–2045, Jul. 2019. DOI: 10.1109/TAC.2019.2927328

[J17] F. Dörfler, **J. W. Simpson-Porco**, and F. Bullo, "Electrical networks and algebraic graph theory: Models, properties, and applications," *Proceedings of the IEEE*, vol. 106, pp. 977–1005, 5 May 2018. DOI: 10.1109/JPROC.2018.2821924

[J16] **J. W. Simpson-Porco**, "A theory of solvability for lossless power flow equations – Part I: Fixed-point power flow," *IEEE Transactions on Control of Network Systems*, vol. 5, no. 3, pp. 1361–1372, 2018. DOI: 10.1109/TCNS.2017.2711433

[J15] **J. W. Simpson-Porco**, "A theory of solvability for lossless power flow equations – Part II: Conditions for radial networks," *IEEE Transactions on Control of Network Systems*, vol. 5, no. 3, pp. 1373–1385, 2018. DOI: 10.1109/TCNS.2017.2711859

[J14] **J. W. Simpson-Porco**, "Equilibrium-Independent Dissipativity with Quadratic Supply Rates," *IEEE Transactions on Automatic Control*, vol. 64, no. 4, pp. 1440–1455, 2018. DOI: 10.1109/TAC.2018.2838664

[J13] M. Todescato, **J. W. Simpson-Porco**, F. Dörfler, R. Carli, and F. Bullo, "Voltage stress minimization by optimal reactive power control," *IEEE Transactions on Control of Network Systems*, vol. 5, no. 3, pp. 1467–1478, 2018. DOI: 10.1109/TCNS.2017.2722818

[J12] K. Dvijotham, E. Mallada, and **J. W. Simpson-Porco**, "High-voltage solution in radial power networks: Existence, properties and equivalent algorithms," *IEEE Control Systems Letters*, vol. 1, no. 2, pp. 322–327, 2017. DOI: 10.1109/LCSYS.2017.2717578

[J11] M. Pirani*, E. Hashemi, **J. W. Simpson-Porco**, B. Fidan, and A. Khajepour, "A graph theoretic approach to the robustness of k-nearest neighbor vehicle platoons," *IEEE Transactions on Intelligent Transportation Systems*, vol. 18, no. 11, pp. 3218–3224, Nov. 2017. DOI: 10.1109/TITS.2017.2671347

[J10] **J. W. Simpson-Porco**, "Lossy DC Power Flow," *IEEE Transactions on Power Systems*, vol. 33, no. 3, pp. 2477–2485, 2017. DOI: 10.1109/TPWRS.2017.2749042

[J9] **J. W. Simpson-Porco**, F. Dörfler, and F. Bullo, "Voltage stabilization in microgrids via quadratic droop control," *IEEE Transactions on Automatic Control*, vol. 62, no. 3, pp. 1239–1253, 2017. DOI: 10.1109/TAC.2016.2585094

[J8] 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*, vol. 3, no. 3, pp. 241–253, 2016. DOI: 10.1109/TCNS.2015.2459391

[J7] **J. W. Simpson-Porco** and F. Bullo, "Distributed monitoring of voltage collapse sensitivity indices," *IEEE Transactions on Smart Grid*, vol. 7, no. 4, pp. 1979–1988, Jul. 2016. DOI: 10.1109/TSG.2016.2533319

[J6] **J. W. Simpson-Porco**, F. Dörfler, and F. Bullo, "Voltage collapse in complex power grids," *Nature Communications*, vol. 7, no. 10790, 2016. DOI: 10.1038/ncomms10790

[J5] **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*, vol. 62, no. 8, pp. 811–815, 2015. DOI: 10.1109/TCSII.2015.2433537

[J4] **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*, vol. 62, no. 11, pp. 7025–7038, 2015. DOI: 10.1109/TIE.2015.2436879

[J3] **J. W. Simpson-Porco** and F. Bullo, "Contraction theory on Riemannian manifolds," *Systems & Control Letters*, vol. 65, pp. 74–80, 2014. DOI: 10.1016/j.sysconle.2013.12.016

[J2] **J. W. Simpson-Porco**, F. Dörfler, and F. Bullo, "Synchronization and power sharing for droop-controlled inverters in islanded microgrids," *Automatica*, vol. 49, no. 9, pp. 2603–2611, 2013. DOI: 10.1016/j.automatica.2013.05.018

[J1] D. C. McKay, D. Jervis, D. J. Fine, J. W. Simpson-Porco, G. J. A. Edge, and J. H. Thywissen, "Low-temperature high-density magneto-optical trapping of potassium using the open $4S \rightarrow 5P$ transition at 405 nm," *Phys. Rev. A*, vol. 84, p. 063 420, 6 Dec. 2011. DOI: 10.1103/PhysRevA.84.063420 [Online]. Available: https://link.aps.org/doi/10.1103/PhysRevA.84.063420

Refereed Conference Articles Submitted, Accpeted, or In Press

[NewC5] A. R. Nikzad** and **J. W. Simpson-Porco**, "Frequency and voltage-constrained milp formulation for power system restoration planning," in *IEEE Electric Power and Energy Conference*, Banff, AB, Canada, Sep. 2026.

[NewC4] A. W. Hall*, **J. W. Simpson-Porco**, and A. P. Schoellig, "Time-varying optimization for the control of differentially flat systems with input constraints," in *IEEE Int. Conf. on Robotics and Automation*, To appear, 2026.

[NewC3] J.-P. Casasanta* and **J. W. Simpson-Porco**, "Decentralized Low-Gain Integrators for LTI Systems with Application to Decentralized Feedback-Based Optimization," in *Mathematical Theory of Networks and Systems*, To appear, 2026.

[NewC2] N. Yousefi* and **J. W. Simpson-Porco**, "Performance enhancement of primal-dual feedback-based optimization using estimators," in *Mathematical Theory of Networks and Systems*, To appear, 2026.

[NewC1] N. Yousefi* and **J. W. Simpson-Porco**, "Removing time-scale separation in feedback-based optimization via estimators," in *European Control Conference*, To appear, 2026.

Refereed Conference Articles Published

[C40] X. Zou*, I. Farhat**, and **J. W. Simpson-Porco**, "A method for incorporating frequency nadir limits in power system restoration planning," in *IEEE Electric Power and Energy Conference*, Waterloo, ON, Canada, Sep. 2025, pp. 254–259. DOI: 10.1109/EPEC65543.2025.11230469

[C39] D. Astolfi, **J. W. Simpson-Porco**, and G. Scarciotti, "On the role of dual sylvester and invariance equations in systems and control," in *IFAC Conference on Analysis and Control of Nonlinear Dynamics and Chaos*, vol. 58, London, UK, Jun. 2024, pp. 20–27. DOI: 10.1016/j.ifacol.2024.07.058

[C38] S. Kelly* and **J. W. Simpson-Porco**, "An interconnected systems approach to convergence analysis of discrete-time primal-dual algorithm," in *American Control Conference*, Toronto, ON, CA, Jul. 2024, pp. 662–668. DOI: 10.23919/ACC60939.2024.10644608

[C37] R. Li*, **J. W. Simpson-Porco**, and S. L. Smith, "Distributionally robust stochastic data-driven predictive control with optimized feedback gain," in *IEEE Conf. on Decision and Control*, Dec. 2024, pp. 381–386. DOI: 10.1109/CDC56724.2024.10886127

[C36] S. Zoboli, D. Astolfi, M. Mattioni, **J. W. Simpson-Porco**, and N. van de Wouw, "Forwarding for discrete-time linear systems: Optimality and global stabilization under input saturation," in *IFAC Conference of Modelling, Identification and Control of Nonlinear Systems*, vol. 58, Lyon, France, Sep. 2024, pp. 108–113. DOI: 10.1016/j.ifacol.2024.10.154

[C35] A. Agarwal*, **J. W. Simpson-Porco**, and L. Pavel, "Model-free game-theoretic feedback optimization," in *European Control Conference*, Bucharest, Romania, Jun. 2023, pp. 1–8. DOI: 10.23919/ECC57647.2023.10178314

[C34] B. Van Scoy, **J. W. Simpson-Porco**, and L. Lessard, "Automated Lyapunov analysis of primal-dual optimization algorithms: An interpolation approach," in *IEEE Conf. on Decision and Control*, Singapore, Dec. 2023, pp. 1306–1311. DOI: 10.1109/CDC49753.2023.10384285

[C33] L. Chen* and **J. W. Simpson-Porco**, "A fixed-point algorithm for the AC power flow problem," in *American Control Conference*, San Diego, CA, USA, May 2023, pp. 4449–4456. DOI: 10.23919/ACC55779.2023.10156226

[C32] L. Chen* and **J. W. Simpson-Porco**, "Data-driven output regulation using single-gain tuning regulators," in *IEEE Conf. on Decision and Control*, Singapore, Dec. 2023, pp. 2903–2909. DOI: 10.1109/CDC49753.2023.10383832

[C31] A. Agarwal*, **J. W. Simpson-Porco**, and L. Pavel, "Game-theoretic feedback-based optimization," in *IFAC Workshop on Distributed Estimation and Control in Networked Systems*, vol. 55, Zürich, Switzerland, Jul. 2022, pp. 174–179. DOI: 10.1016/j.ifacol.2022.07.255

[C30] E. Ekomwenrenren*, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, A. Haddadi, and L. Zhu, "Data-driven fast frequency control using inverter-based resources," in *IREP Bulk Power System Dynamics and Control Symposium*, Banff, AB, Canada, Jul. 2022, pp. 1–11. DOI: 10.48550/arXiv.2208.01761

[C29] E. Ekomwenrenren*, Z. Tang**, **J. W. Simpson-Porco**, E. Farantatos, M. Patel, H. Hooshyar, and A. Haddadi, "An integrated frequency-voltage controller for next-generation power systems," in *IEEE PES Innovative Smart Grid Technologies Conference Europe*, Novi Sad, Serbia, Oct. 2022, pp. 1–6. DOI: 10.1109/ISGT-Europe54678.2022.9960532

[C28] R. Li*, **J. W. Simpson-Porco**, and S. L. Smith, "Data-driven model predictive control for linear time-periodic systems," in *IEEE Conf. on Decision and Control*, Cancún, Mexico, Dec. 2022, pp. 3661–3668. DOI: 10.1109/CDC51059.2022.9992707

[C27] **J. W. Simpson-Porco**, "Low-gain stabilizers for linear-convex optimal steady-state control," in *IEEE Conf. on Decision and Control*, Cancún, Mexico, Dec. 2022, pp. 2552–2559. DOI: 10.1109/CDC51059.2022.9992895

[C26] E. Espina*, A. Navas, J. S. Gómez, **J. W. Simpson-Porco**, R. Cárdenas-Dobson, D. Sáez, and M. Kazerani, "Experimental performance evaluation of a distributed secondary control strategy for hybrid ac/dc-microgrids in the event of communication loss/delay," in *European Conference on Power Electronics and Applications*, Sep. 2021, pp. 1–10. DOI: 10.23919/EPE21ECCEEurope50061.2021.9570572

[C25] M. Farrokhabadi**, **J. W. Simpson-Porco**, and C. A. Cañizares, "Optimal design of voltage-frequency controllers for microgrids," in *IEEE PowerTech*, Jun. 2021, p. 6. DOI: 10.1109/PowerTech46648.2021.9495073

[C24] T. Zheng*, J. W. Simpson-Porco, and E. Mallada, "Implicit trajectory planning for feedback linearizable systems: A time-varying optimization approach," in *American Control Conference*, Denver, CO, USA, Jul. 2020, pp. 4677–4682. DOI: 10.23919/ACC45564.2020.9147997

[C23] M. H. Basiri*, J. G. Thistle, **J. W. Simpson-Porco**, and S. Fischmeister, "Kalman filter based secure state estimation and individual attacked sensor detection in cyber-physical systems," in *American Control Conference*, Philadelphia, PA, USA, Jul. 2019, pp. 3841–3848. DOI: 10.23919/ACC.2019.8814963

[C22] M. Colombino, **J. W. Simpson-Porco**, and A. Bernstein, "Towards robustness guarantees for feedback-based optimization," in *IEEE Conf. on Decision and Control*, Nice, France, Dec. 2019, pp. 6207–6214. DOI: 10.1109/CDC40024.2019.9029953

[C21] F. Dörfler, S. Bolognani, **J. W. Simpson-Porco**, and S. Grammatico, "Distributed control and optimization for autonomous power grids," in *European Control Conference*, Naples, Italy, Jun. 2019, pp. 2436–2453. DOI: 10.23919/ECC.2019.8795974

[C20] J. Llanos*, J. Gomez, D. Saez, D. Olivares, and **J. W. Simpson-Porco**, "Economic dispatch by secondary distributed control in microgrids," in *European Conference on Power Electronics and Applications*, Genova, Italy, Sep. 2019, pp. 1–10. DOI: 10.23919/EPE.2019.8915499

[C19] B. K. Poolla*, **J. W. Simpson-Porco**, N. Monshizadeh, and F. Dörfler, "Quadratic performance analysis of secondary frequency controllers," in *IEEE Conf. on Decision and Control*, Nice, France, Dec. 2019, pp. 7492–7497. DOI: 10.1109/CDC40024.2019.9029647

[C18] L. S. P. Lawrence*, Z. E. Nelson, E. Mallada, and **J. W. Simpson-Porco**, "Optimal steady-state control for linear time-invariant systems," in *IEEE Conf. on Decision and Control*, Miami Beach, FL, USA, Dec. 2018, pp. 3251–3257. DOI: 10.1109/CDC.2018.8619812

[C17] M. Pirani*, E. Hashemi, B. Fidan, **J. W. Simpson-Porco**, H. Sandberg, and K. H. Johansson, "Resilient estimation and control on k-nearest neighbor platoons: A network-theoretic approach," in *IFAC Workshop on Distributed Estimation and Control in Networked Systems*, vol. 51, Groningen, Netherlands, 2018, pp. 22–27. DOI: 10.1016/j.ifacol.2018.12.005

[C16] **J. W. Simpson-Porco**, "A Hill-Moylan lemma for equilibrium-independent dissipativity," in *American Control Conference*, Milwaukee, WI, USA, Jun. 2018, pp. 6043–6048. DOI: 10.23919/ACC.2018.8431557

[C15] M. Pirani*, E. Hashemi, B. Fidan, and **J. W. Simpson-Porco**, "$\mathcal{H}_\infty$ performance of mechanical and power networks," in *IFAC World Congress*, vol. 50, Toulouse, France, Jul. 2017, pp. 5196–5201. DOI: 10.1016/j.ifacol.2017.08.453

[C14] M. Pirani*, **J. W. Simpson-Porco**, and B. Fidan, "System-theoretic performance metrics for low-inertia stability of power networks," in *IEEE Conf. on Decision and Control*, Melbourne, VIC, Australia, Dec. 2017, pp. 5106–5111. DOI: 10.1109/CDC.2017.8264415

[C13] C. D. Persis, N. Monshizadeh, and **J. W. Simpson-Porco**, "The cost of dishonesty on optimal distributed frequency control of power networks," in *IEEE Conf. on Decision and Control*, Las Vegas, NV, USA, Dec. 2016, pp. 7508–7513. DOI: 10.1109/CDC.2016.7799429

[C12] **J. W. Simpson-Porco**, "Input/output analysis of primal-dual gradient algorithms," in *Allerton Conf. on Communications, Control and Computing*, Monticello, IL, USA, Sep. 2016, pp. 219–224. DOI: 10.1109/ALLERTON.2016.7852233

[C11] **J. W. Simpson-Porco** and N. Monshizadeh, "Model-free wide-area monitoring of power grids via cutset voltages," in *IEEE Conf. on Decision and Control*, Las Vegas, NV, USA, Dec. 2016, pp. 7508–7513. DOI: 10.1109/CDC.2016.7799429

[C10] **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 *IEEE Conf. on Decision and Control*, Las Vegas, NV, USA, Dec. 2016, pp. 1840–1845. DOI: 10.1109/CDC.2016.7798532

[C9] E. Tegling, M. Andreasson, **J. W. Simpson-Porco**, and H. Sandberg, "Improving performance of droop-controlled microgrids through distributed PI-control," in *American Control Conference*, Boston, MA, USA, Jul. 2016, pp. 2321–2327. DOI: 10.1109/ACC.2016.7525264

[C8] **J. W. Simpson-Porco**, F. Dörfler, and F. Bullo, "A solvability condition for reactive power flow," in *IEEE Conf. on Decision and Control*, Osaka, Japan, Dec. 2015, pp. 2013–2017. DOI: 10.1109/CDC.2015.7402502

[C7] 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*, Osaka, Japan, Dec. 2015, pp. 6921–6926. DOI: 10.1109/CDC.2015.7403310

[C6] F. Dörfler, **J. W. Simpson-Porco**, and F. Bullo, "Plug-and-play control and optimization in microgrids," in *IEEE Conf. on Decision and Control*, Los Angeles, CA, USA, Dec. 2014, pp. 211–216. DOI: 10.1109/CDC.2014.7039383

[C5] 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*, Portland, OR, USA, Jun. 2014, pp. 759–764. DOI: 10.1109/ACC.2014.6859434

[C4] 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*, Florence, Italy, Dec. 2013, pp. 1514–1519. DOI: 10.1109/CDC.2013.6760097

[C3] **J. W. Simpson-Porco**, F. Dörfler, and F. Bullo, "Voltage stabilization in microgrids via quadratic droop control," in *IEEE Conf. on Decision and Control*, Florence, Italy, Dec. 2013, pp. 7582–7589. DOI: 10.1109/CDC.2013.6761093

[C2] **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*, Vancouver, BC, Canada, Oct. 2013, pp. 672–677. DOI: 10.1109/SmartGridComm.2013.6688036

[C1] **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*, Santa Barbara, CA, USA, Sep. 2012, pp. 264–269. DOI: 10.3182/20120914-2-US-4030.00055

Book Chapters

[BC1] J. Schiffer, J. W. Simpson-Porco, and A. Parisio, "Control in low-inertia power and integrated energy systems," in *Encyclopedia of Systems and Control Engineering*, Z. Ding, Ed., First Edition, Elsevier, 2024. DOI: 10.1016/B978-0-443-14081-5.00068-4

Technical Reports

[TR1] D. Espín-Sarzosa, R. Palma-Behnke, C. A. Cañizares, U. Annakkage, M. Elizondo, W. Du, L. Meegahapola, P. A. Mendoza-Araya, E. Nasr, R. Ramos, M. Ropp, **J. W. Simpson-Porco**, and K. Strunz, "Trends in microgrid modeling for stability analysis," IEEE PES Task Force on MG Dynamic Modeling, Tech. Rep. PES-TR-106, Nov. 2022.

[TR2] **J. W. Simpson-Porco**, "Low-gain stabilizers for linear-convex optimal steady-state control (extended version)," U. Toronto, Tech. Rep., 2022, Available online.

[TR3] **J. W. Simpson-Porco**, "Low-gain stability of projected integral control for input-constrained discrete-time nonlinear systems (extended version)," U. Toronto, Tech. Rep., 2021, Available online.

[TR4] M. Farrokhabadi**, C. A. Cañizares, **J. W. Simpson-Porco**, E. Nasr, L. Fan, P. A. Mendoza-Araya, R. Tonkoski, U. Tamrakar, N. Hatziargyriou, D. Lagos, R. W. Wies, M. Paolone, M. Liserre, L. Meegahapola, M. Kabalan, A. H. Hajimiragha, D. Peralta, M. Elizondo, K. P. Schneider, F. Tuffner, and J. Reilly, "Microgrid stability definitions, analysis, and modeling," IEEE-PES Task Force on Microgrid Stability Analysis and Modeling, Tech. Rep. PES-TR-66, Apr. 2018.

[TR5] M. Farrokhabadi**, **J. W. Simpson-Porco**, and C. A. Cañizares, "Optimal design of voltage-frequency controllers for microgrids (extended version)," U. Waterloo, Tech. Rep., 2017, Available online.

Dissertation

[TH1] J. W. Simpson-Porco, "Distributed control of inverter-based power grids," Ph.D. dissertation, Mechanical Engineering Department, University of California at Santa Barbara, Sep. 2015, ISBN: 9781339471594.

Talks, Seminars, and Presentations

Departmental Seminars

[D30] Electrical and Computer Engineering, University of British Columbia, Canada. *On Low-Gain Integral Action and Tuning Regulators*. Feb. 2026.

[D29] Electrical and Computer Engineering Department, Iowa State University, Ames, IA, USA. *Hierarchical Power System Control using Fast Inverter-Based Resources*. Jan. 2024.

[D28] Faculty of Engineering, Cornell University, Ithaca, NY, USA. *Low-Gain Integral Control for Linear and Nonlinear Systems*. Oct. 2023.

[D27] Faculty of Engineering, University of Groningen, The Netherlands. *On Low-Gain Integral Action and Tuning Regulators*. Sep. 2023.

[D26] Laboratory of Automatic Control, Chemical and Pharmaceutical Engineering, University of Lyon, France. *Advances in Feedback Control for Power Grid Modernization*. Jul. 2023.

[D25] Department of Electrical and Computer Engineering, Concordia University, Montreal, QC, Canada. *On Low-Gain Integral Action, Optimal Steady-State Control, and Tuning Regulators*. Jun. 2023.

[D24] Delft Center for Systems and Control, TU Delft, Netherlands. *Advances in Feedback Control for Power Grid Modernization*. Nov. 2022. [Slides]

[D23] Department of Mechanical and Aerospace Engineering, UC San Diego. *Advances in Feedback Control for Power Grid Modernization*. Oct. 2020.

[D22] Waterloo Institute for Sustainable Energy, University of Waterloo. *Advances in Feedback Control for Power Grid Modernization*. Oct. 2020.

[D21] Center for Control, Dynamical Systems, and Computation, UC Santa Barbara. *Frameworks for Feedback-Based Optimization with Application to Energy Systems*. Feb. 2020.

[D20] Department of Electrical and Computer Engineering, UC Riverside. *Advances in Feedback Control for Grid Modernization*. Feb. 2020.

[D19] Department of Electrical and Computer Engineering, University of Toronto. *Advances in Feedback Control for Grid Modernization*. Jan. 2020.

[D18] Department of Electrical and Computer Engineering, University of Toronto. *Frameworks for Feedback-Based Optimization with Application to Energy Systems*. Nov. 2019. [Slides]

[D17] Jan C. Willems Center for Systems and Control, University of Groningen, Netherlands. *A Theory of Solvability for Power Flow Equations*. Nov. 2019. [Slides]

[D16] Electrical Engineering Department, University of Michigan, Ann Arbor, MI, USA. *Optimal Steady-State Control and Frequency Regulation of Transmission Systems*. Apr. 2019.

[D15] Automatic Control Laboratory, Swiss Federal Institute of Technology (ETH) Zürich. *The Optimal Steady-State Control Problem*. Jan. 2019. [Slides]

[D14] Electrical Engineering Department, Universidad de Chile. *A Theory of Solvability for Power Flow Equations*. Mar. 2018.

[D13] Clarkson Center for Complex Systems Science, Clarkson University. *A Theory of Solvability for Power Flow Equations*. Apr. 2017.

[D12] Electrical Engineering Department, Universidad de Chile. *Lossy DC Power Flow*. Mar. 2017. [Slides]

[D11] Center for Control, Dynamical Systems, and Computation, UC Santa Barbara. *A Theory of Solvability for Power Flow Equations*. Jan. 2017. [Slides]

[D10] Centre for Power and Information, University of Toronto. *Distributed Control of Inverter-Based Power Grids*. Feb. 2016.
[D9] National Renewable Energy Laboratory (NREL), Golden, CO, USA. *Distributed Control of Inverter-Based Power Grids*. Jan. 2016.
[D8] Automatic Control Laboratory, Royal Institute of Technology (KTH), Stockholm. *Distributed Control of Inverter-Based Power Grids*. Dec. 2015.
[D7] Engineering and Technology Institute, University of Groningen. *Voltage Control of Micro and Power Grids*. Nov. 2015.
[D6] Automatic Control Laboratory, Swiss Federal Institute of Technology (ETH) Zürich. *Conditions for Voltage Stability of Power Grids*. Oct. 2015.
[D5] Department of Electrical and Computer Engineering, University of Waterloo. *Power Grid Stability and Distributed Control*. Jun. 2015.
[D4] Department of Electrical and Computer Engineering, University of British Columbia. *Power Grid Stability and Distributed Control*. May 2015.
[D3] Department of Electrical Engineering, University of Southern California. *Power Grid Voltage Stability and Distributed Control*. Mar. 2015.
[D2] Advanced Power and Energy Systems, Pacific Northwest National Laboratory. *Distributed Frequency and Voltage Control of Islanded Microgrids*. Mar. 2015.
[D1] Department of Information Engineering, University of Padova. *Droop-Controlled Inverters in Microgrids: Stability, Secondary Control, & Optimization*. Dec. 2013.

Workshop and Conference Presentations

[P38] European Control Conference. *Removing Time-Scale Separation in Feedback-Based Optimization via Estimators*. Jul. 2026.
[P37] (**Invited**) Workshop on Systems Theory of Optimization, Learning, and Control Algorithms, European Control Conference. *Dynamic Performance Considerations in Feedback-Based Optimization and Applications in Power Systems*. Jul. 2026. [Slides]
[P36] (**Invited**) Allerton Conference on Communication, Control, and Computing. *Hierarchical Control of Distribution Grids with Application to Transmission-Distribution Fast Frequency Control*. Jul. 2026.
[P35] (**Invited**) International Symposium on Mathematical Programming, Montreal, QC, Canada. *Hierarchical Feedback-Based Optimization of Distributed Energy Resources in Distribution Grids*. Jul. 2024.
[P34] (**Invited**) Special Session on Recent Systems and Control Research in Canada, American Control Conference, Toronto, Canada. *Advances in Feedback Control for Power Grid Modernization*. Jul. 2024.
[P33] (**Keynote**) PowerWeb Annual Conference, TU Delft, The Netherlands. *Hierarchical Power System Control using Fast Inverter-Based Resources*. Sep. 2023. [Slides]
[P32] (**Invited**) Workshop on Online Optimization Methods for Data-driven Feedback Control, American Control Conference, San Diego, CA, USA. *Optimal Steady-State Control*. Jun. 2023.
[P31] 9th Meeting on Systems and Control Theory, University of Waterloo, Canada. *The Return of the Tuning Regulator*. May 2023. [Slides]
[P30] IEEE Conference on Decision and Control, Cancún, Mexico. *Low-Gain Stabilizers for Linear-Convex Optimal Steady-State Control*. Dec. 2022. [Slides]
[P29] (**Invited**) Workshop on polynomial optimization and applications in control and energy, CWI, Amsterdam, Netherlands. *Understanding the Power Flow Solution Space: History, Practice, Theory, and Recent Progress*. Nov. 2022. [Slides]

[P28] (**Invited**) 54th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL. *From Automatic Generation Control to Fast Frequency Control using Inverter-Based Resources*. Sep. 2022.

[P27] IEEE Conference on Decision and Control, Austin, TX, USA. *Stability of Projected Integral Control for Input-Constrained Discrete-Time Nonlinear Systems*. Dec. 2021.

[P26] (**Invited**) Workshop on Resilient Autonomous Energy Systems, NREL, Golden, CO, USA. *Next-Generation Frequency and Voltage Control using Inverter-Based Resources*. Sep. 2021. [Slides]

[P25] (**Invited**) Canadian Operations Research Conference, Toronto, ON, Canada. *Advances in Feedback Control for Power Grid Modernization*. Aug. 2021.

[P24] (**Invited**) Conference on Information Science and Systems, Baltimore, MD, USA. *On Stability of Automatic Generation Control*. Mar. 2021. [Slides]

[P23] (**Keynote**) Energy Open, Groningen, Netherlands. *Feedback Optimization of Uncertain Dynamic Systems with Application to Energy Systems*. Nov. 2019. [Slides]

[P22] (**Invited**) Tutorial on Distributed Control for Autonomous Power Grids, ECC, Naples, Italy. *Optimal and Distributed Frequency Control of Transmission Grids*. Jun. 2019. [Slides]

[P21] (**Invited**) Workshop on Mathematics of Energy Systems, Isaac Newton Institute, Cambridge, UK. *Optimal Steady-State Control with Application to Frequency Regulation of Power Grids*. May 2019.

[P20] (**Invited**) Innovative Optimization and Control Methods for Highly Distributed Autonomous Systems Workshop, National Renewable Energy Laboratory (NREL), Golden, CO, USA. *Optimal Steady-State Control and Frequency Regulation of Transmission Systems*. Apr. 2019.

[P19] (**Invited**) Workshop on Future Electric Power Systems and the Energy Transition, Champéry, Switzerland. *A Theory of Solvability for Power Flow Equations*. Feb. 2019. [Slides]

[P18] (**Invited**) Conference on Information Science and Systems, Baltimore, MD, USA. *Optimal Steady-State Control and Frequency Regulation of Transmission Systems*. Mar. 2019.

[P17] (**Invited**) INFORMS Annual Meeting, Phoenix, AZ, USA. *A Theory of Solvability for Power Flow Equations*. Nov. 2018. [Slides]

[P16] (**Invited**) INFORMS Annual Meeting, Phoenix, AZ, USA. *Optimal Steady-State Control for Frequency Regulation of Power Systems*. Nov. 2018. [Slides]

[P15] American Control Conference, Milwaukee, WI. *A Hill-Moylan Lemma for Equilibrium-Independent Dissipativity*. Jun. 2018. [Slides]

[P14] (**Keynote**) Workshop on Power Electronics and Control Strategies for Energy Storage Systems in Microgrids and Power Systems, Valparaiso, Chile. *Distributed Control of Inverter-Based Power Grids*. Mar. 2017.

[P13] IEEE Conference on Decision and Control, Las Vegas, NV. *Quadratic Performance of Primal-Dual Methods for Distributed Optimization*. Dec. 2016. [Slides]

[P12] IEEE Conference on Decision and Control, Las Vegas, NV. *Model-Free Wide-Area Monitoring of Power Grids via Cutset Voltages*. Dec. 2016. [Slides]

[P11] (**Invited**) 54th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL. *Input/Output Analysis of Primal-Dual Gradient Algorithms*. Sep. 2016. [Slides]

[P10] (**Keynote**) Workshop on Communications, Computation and Control for Resilient Smart Energy Systems (co-located with ACM e-Energy), Waterloo, ON. *Distributed Control of Inverter-Based Power Grids*. Jun. 2016. [Slides]

[P9] 7th Biennial Meeting on Systems and Control Theory, Kingston, ON, Canada. *Quadratic Performance of Distributed Optimization Algorithms*. May 2016.

[P8] SIAM Conference on Applied Dynamical Systems, Salt Lake City, UT. *Voltage Stability of Power Networks and Microgrids*. May 2015.

[P7] LANL Grid Science Winter School and Conference, Santa Fe, NM. *The Transmission Capacity of Power Networks*. Jan. 2015.

[P6] IEEE Conference on Decision and Control, Los Angeles, CA. *Plug-and-play Control and Optimization in Microgrids*. Dec. 2014.

[P5] IEEE Conference on Decision and Control, Los Angeles, CA. *Voltage Stabilization in Microgrids via Quadratic Droop Control*. Dec. 2013.

[P4] IEEE SmartGridComm, Vancouver, BC. *Stability, Power Sharing, & Distributed Secondary Control in Droop-Controlled Microgrids*. Oct. 2013.

[P3] Southern California Control Workshop, San Diego, CA. *Synchronization and Distributed Integral Control in Droop-Controlled Microgrids*. Nov. 2012.

[P2] IFAC Workshop on Distributed Estimation and Control in Networked Systems, Santa Barbara. *Droop Controlled Inverters are Kuramoto Oscillators*. Sep. 2012.

[P1] LANL Workshop on Optimization and Control for Smart Grids, Santa Fe, NM. *Droop Controlled Inverters are Kuramoto Oscillators*. May 2012.

Summer School Lecture Series

[SS1] Dutch Institute for Systems and Control Summer School on Power Systems Control, Noordwijkerhout, The Netherlands. *Power Systems Operations and Control: An Overview*. Sep. 2023. [Slides]

Professional Service

Editorial Service

2026 Technical Program Committee, IEEE Electric Power and Energy Conference
2025 – 2026 Technical Program Committee, ACM e-Energy
2020 – 2025 Associate Editor, IEEE Transactions on Smart Grid
2020 – 2025 Associate Editor, IEEE Power & Energy Society Letters
2023 – 2023 Associate Editor, American Control Conference
2017 – 2018 Technical Program Committee, IEEE Smart Grid Comm.
2016 – 2016 Technical Program Committee, IEEE GLOBECOMM

Society Memberships

2010 – present Institute for Electrical and Electronics Engineers (IEEE)
Senior Member, 2022 – present
Member, 2015 – 2022
Student Member, 2010 – 2015
2010 – present IEEE Control Systems Society (CSS)
2015 – present IEEE Power and Energy Society (PES)
2020 – present Member, IEEE PES Power System Dynamic Performance Committee (PSDPC)

Major Conference Organization / Service

2025 – 2026 Program Chair, International Symposium on Mathematical Theory of Networks and Systems

Miscellaneous External Committee Memberships

2026 Committee Member, AACC O. Hugo Schuck Best Paper Award
2023 – present Committee Member, NSERC CREATE HyTEM Program
2022 – 2025 Awards Lead, IEEE CSS Technical Committee on Energy Systems
2020 – 2022 Section Lead, IEE PES PSDPC Task Force *Trends in Microgrid Modelling for Stability Analysis*. Published as contribution [TR1].
2017 – 2019 Contributor, IEEE PES PSDPC Task Force *Microgrid Stability Definitions, Analysis, and Modeling*. Published as contribution [TR2].

External Grant Reviewer

2026 Dutch Research Council (NWO)
2024 NSERC Discovery
2020 MITACS Accelerate
2020 NSERC Canada Research Chair Program
2019 Swiss National Science Foundation
2019 NSERC Discovery

University Service

Internal Committee Memberships

2024 – 2025 Member, ECE Curriculum Matters Committee, U. Toronto
2023 – 2024 Member, Graduate Matters Committee, ECE Department, U. Toronto
2022 – 2023 Graduate Chair, Systems Control Group, ECE Department, U. Toronto
2017 – 2018 Member, Power Systems Hiring Committee, ECE, U. Waterloo
2017 – 2019 Member, Engineering Faculty Committee, U. Waterloo

PhD Committee Memberships

2025 Emily Vukovich, ECE, University of Toronto
2025 Xuchan Bao, CS, University of Toronto
2025 Gianluca Villani, ECE, University of Toronto
2025 Behnam Mafakheri, EE, University of Melbourne
2024 Shuyao Tan, CE, University of Toronto
2023 Pietro Lorenzetti, EE, Tel Aviv University
2023 Mohamed Hafez, ECE, University of Toronto
2023 Tian Xia, ECE, University of Toronto
2023 Enrique Vera, ECE, University of Waterloo
2022 Mattia Giaccagli, Automatiqe, Universite Claude Bernard of Lyon 1, LAGEPP
2022 Bolin Gao, ECE, University of Toronto
2021 Baheej Alghamdi, ECE, University of Waterloo
2020 Nur Zengin, SYDE, University of Waterloo
2020 Ahmad Bilal Asghar, ECE, University of Waterloo
2020 Ivan Calero, ECE, University of Waterloo
2019 Juan C. Machado, Electrical Engineering, LSS-Supelec Paris
2019 Bala Kameshwar Poolla, IFA, Swiss Federal Institute of Technology (ETH) Zürich
2016 Ebrahim Moradi Shahrivar, ECE, University of Waterloo

MASc Committee Memberships

2025 Orest Cobani, ECE, University of Toronto
2023 Erick Uzeda, ECE, University of Toronto
2023 Yuheng Wang, ECE, University of Toronto
2022 Kuei-Fang (Albert) Hsueh, ECE, University of Toronto
2020 Ahmad Abdel Gawad, ECE, University of Toronto
2018 Joel Simard, ECE, University of Waterloo
2017 Dario Peralta, ECE, University of Waterloo
2017 Come Carquex, ECE, University of Waterloo

Visitors Hosted

2026 Pietro Lorenzetti, CNRS Nancy, France
2026 Daniele Astolfi, CNRS Lyon, France
2026 Veronica Centorrino, ETH Zürich, Switzerland
2026 Sijia Geng, Johns Hopkins University, USA
2026 Yang Zheng, University of California at San Diego, USA
2025 Klaske van Heusden, University of British Columbia, Canada
2025 Michael Fisher, University of Waterloo, Canada
2025 Jeremy Coulson, University of Wisconsin, Madison
2025 Alberto Padoan, University of British Columbia, Canada
2024 Dominic Liao-McPherson, University of British Columbia, Canada
2024 Yu Kawano, Hiroshima University, Japan
2024 Michele Cucuzzella, University of Groningen, The Netherlands
2024 Nima Monshizadeh, University of Groningen, The Netherlands
2023 James Rawlings, University of California at Santa Barbara, USA
2023 Iman Shames, Australian National University, Australia
2019 Romeo Ortega, Laboratoire de Signaux et Systemes (SUPELEC), France
2018 Daniel Olivares Quero, Universidad Adolfo ibáñez, Chile
2018 Catalin Arghir, ETH Zürich, Switzerland
2018 Enrique Mallada, John's Hopkins University, USA
2017 Joshua Taylor, University of Toronto, Canada

Research Funding

09/2024 – 09/2026 *Restoration of Inverter-Based Grids*
Source: NSERC Alliance (Partner: Hydro One Networks Inc.)
Amount: $248,800
Sole PI, 100% share of funding

09/2025 – 08/2030 *Making Ontario Buildings Smart: Develop. of a Pathway to Smart Building Adoption*
Source: Ontario Research Fund – Research Excellence
Amount: $1,970,000
Lead PI: Jenn McArthur (Ryerson), 5% share of funding

04/2024 – 03/2029 Title: *Data-Driven Control for Renewable Integration in Next-Gen. Power Systems*
Source: Ontario Early Researcher Award
Amount: $150,000
Sole PI, 100% share of funding

04/2024 – 03/2029 Title: *Feedback-Based Optimization: Theory, Design, and Applications*
Source: NSERC Discovery
Amount: $318,000
Sole PI, 100% share of funding

2021-2022 Title: *Robust-High Performance Algorithms for Feedback Optimization*
Source: Connaught New Researcher Award, University of Toronto
Amount: $17,965
Sole PI, 100% share of funding

2018-2022 Title: *Next-Generation Grid Monitoring and Control*
Source: Electric Power Research Institute: Grid Operations Division
Amount: $220,000
Sole PI, 100% share of funding

2018-2019 Title: *Interface and Testing Platform Design for CANREL*
Source: NSERC Engage (Partner: Canadian Solar Solutions Inc.)
Amount: $25,000
Sole PI, 100% share of funding

2017-2024 Title: *Real-Time Distributed Control for Low-Inertia Power Grids*
Source: NSERC Discovery
Amount: $168,000
Sole PI, 100% share of funding

2017-2018 Title: *Frequency Control Strategies for Future Microgrids*
Source: WISE-Cisco Smart Grid Research Fund, University of Waterloo
Amount: $15,000
Sole PI, 100% share of funding