John W. Simpson-Porco

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Employment

04/2025 - present	Associate Professor Department of Electrical and Computer Engineering University of Toronto, Toronto, ON, Canada
07/2020 - 04/2025	Assistant Professor Department of Electrical and Computer Engineering University of Toronto, Toronto, ON, Canada
07/2020 - present	Adjunct Assistant Professor Department of Electrical and Computer Engineering University of Waterloo, Waterloo, ON, Canada
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	$https://www.control.utoronto.ca/{\sim} jwsimpson_jwsimpson_cv.pdf$
Orcid	https://orcid.org/0000-0002-1589-5324
Google Scholar	https://scholar.google.com/citations?user=tyQhs60AAAJ

Honours and Awards (2010–)

- 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

09/2024 - present	John-Paolo Casasanta (MASc, University of Toronto) Awards: CGS-M 2025
09/2023 - present	Xiangyu (Harry) Zou (MASc, University of Toronto) Awards: OGS 2024
09/2023 - present	Niloufar Yousefi (PhD, University of Toronto) Awards:
09/2022 - present	Liangjie (Jeffrey) Chen (PhD, University of Toronto) Awards: OGS '23, '24. Hatch Scholar. for Energy Research (x2), H. W. Price
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 Awards: Initial Placement: TBD Currently: TBD
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: Postdoctoral Fellow, University of Toronto
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: 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: 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 Awards: Initial Placement: Software Engineer, Qualcomm, Toronto, ON Currently: 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 Awards: Initial Placement: PhD Candidate, University of Toronto Currently: 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 Awards: Initial Placement: Energy Consultant, Guidehouse, Toronto, ON Currently: 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: 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: PhD Student, Medical Physics, University of Toronto

Postdoctoral Fellows

10/2024 - present	Ilyas Farhat (University of Toronto) Project: Restoration of Inverter-Based Power Systems
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: 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: 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: 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: Asst. Prof., University of Calgary, Calgary, AB

Visiting Graduate Students

09/2022 - 02/2023	Babak Abdolmaleki (PhD, NTNU) Currently: Systems Engineer, Kongsburg Automotive, Norway
05/2017 - 08/2017	Jacqueline Llanos (PhD, University of Chile) Currently: Asst. Prof., Polytechnical School of the Army, Ecuador
09/2017 - 12/2017	Nainar Karthikeyan (PhD, Aalborg University) Currently: Senior Engineer, KK Wind Solutions, Denmark
09/2017 - 12/2017	Juan Sebastian Gomez Quintero (PhD, University of Chile) Currently: Asst. Prof., UNAB, Santiago, Chile

Undergraduate Students

09/2024 - 04/2025	 Katerina Vovk (EngSci Thesis) Project: Disturbance Observability in Power Systems Initial Placement: PhD Candidate, University of Wisconsin-Madison Currently: PhD Candidate, University of Wisconsin-Madison
05/2024 - 08/2024	Jonathan Milner (NSERC USRA Student) Project: Fast Architectures for Transmission-Distribution Coordination Initial Placement: MASc Candidate, University of Toronto Currently: MASc Candidate, University of Toronto
09/2023 - 04/2024	Jane Hwang (Engineering Science Senior Thesis) Project: Power System Restoration with Inverter-Based Generation Initial Placement: MASc Candidate, University of Toronto Currently: MASc Candidate, University of Toronto
09/2023 - 04/2024	David Gui (Engineering Science Senior Thesis) Project: Halley Class Methods for Power Flow Analysis Initial Placement: MASc Candidate, University of Toronto Currently: MASc Candidate, University of Toronto
05/2023 - 08/2023	George Wang (EngSci USRA) <i>Project:</i> Properties of the Asymmetrically Weighted Incidence Matrix
01/2019 - 05/2019	Audrey Avianto Project: Topics in Neural Networks Initial Placement: BSc Candidate, University of Waterloo Currently: Validation Engineer, AMD
01/2017 - 05/2017	Nicholas Olson Project: Fast Frequency Control using Energy Storage Initial Placement: BSc Candidate, University of Waterloo Currently: PhD Student, University of Texas, Austin

Teaching

- 1. ECE 1659: Robust and Optimal Control (University of Toronto)
 - Sessions: Winter 2021 (20), 2022 (8), 2023 (14), 2024 (15)
 - *Materials*: Courseware available.
- 2. ECE216: Signals and Systems (University of Toronto)
 - Sessions: Winter 2021 (13), 2022 (84), 2023 (123), 2024 (75)
 - *Materials*: Courseware available.
- 3. ECE410: Linear Control Systems (University of Toronto)
 - Sessions: Fall 2021 (22), 2022 (17)
 - *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

- [NewJ3] 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*, 2024, Revised May 1st, 2025.
- [NewJ2] 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*, 2023, Revision submitted to IEEE TAC April 13th, 2025. Extended Version: arxiv:2312.15177.
- [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 to IEEE TAC October 18th, 2023. Under Revision as of March 14th, 2024.

Journal Articles Published or Accepted

- [J41] 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.
- [J40] 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. 106079, Jun. 2025. DOI: 10.1016/j.sysconle.2025.106079.
- [J39] 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.
- [J38] 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.
- [J37] 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.
- [J36] 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.

- [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 steadystate 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

[NewC1] 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.

Refereed Conference Articles Published or Accepted

- [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 primaldual 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 voltagefrequency 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 steadystate 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}_{∞} 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.

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] 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.

Book Chapters Submitted

[NewBC1] 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., Elsevier, 2024. DOI: 10.1016/B978-0-443-14081-5.00068-4.

Theses

[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

Note: Slides for some of the below seminars are available via my webpage under "Talks".

Departmental Seminars

- [D29] Electrical and Computer Engineering Department, Iowa State University, Ames, IA, USA. *Hierar-chical Power System Control using Fast Inverter-Based Resources*. Jan. 2024.
- [D28] Faculty of Engineering, Cornell University, Ithica, 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. July 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. June 2023.
- [D24] Delft Center for Systems and Control, TU Delft, Netherlands. Advances in Feedback Control for Power Grid Modernization. Nov. 2022.
- [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.
- [D17] Jan C. Willems Center for Systems and Control, University of Groningen, Netherlands. A Theory of Solvability for Power Flow Equations. Nov. 2019.
- [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.
- [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.
- [D11] Center for Control, Dynamical Systems, and Computation, UC Santa Barbara. A Theory of Solvability for Power Flow Equations. Jan. 2017.
- [D10] Centre for Power and Information, University of Toronto. Distributed Control of Inverter-Based Power Grids. Feb. 2016.

- [D9] National Renewable Energy Lab, Golden, CO. 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

- [P36] (Invited) Allerton Conference on Communication, Control, and Computing, Monticello, IL. Hierarchical Control of Distribution Grids with Application to Transmission-Distribution Fast Frequency Control. Sep 2024.
- [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.
- [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.
- [P30] IEEE Conference on Decision and Control, Cancún, Mexico. Low-Gain Stabilizers for Linear-Convex Optimal Steady-State Control. Dec 2022.
- [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.
- [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.
- [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.
- [P23] (Keynote) Energy Open, Groningen, Netherlands. Feedback Optimization of Uncertain Dynamic Systems with Application to Energy Systems. Nov 2019.
- [P22] (Invited) Tutorial on Distributed Control for Autonomous Power Grids, ECC, Naples, Italy. Optimal and Distributed Frequency Control of Transmission Grids. Jun 2019.
- [P21] (Invited) Workshop on Mathematics of Energy Systems, Issac 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 Lab, 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.
- [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.
- [P16] (Invited) INFORMS Annual Meeting, Phoenix, AZ, USA. Optimal Steady-State Control for Frequency Regulation of Power Systems. Nov 2018.
- [P15] American Control Conference, Milwaukee, WI. A Hill-Moylan Lemma for Equilibrium-Independent Dissipativity. Jun 2018.
- [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.
- [P12] IEEE Conference on Decision and Control, Las Vegas, NV. Model-Free Wide-Area Monitoring of Power Grids via Cutset Voltages. Dec 2016.
- [P11] (Invited) 54th Annual Allerton Conference on Communication, Control, and Computing, Monticello, IL. Input/Output Analysis of Primal-Dual Gradient Algorithms. Sep 2016.
- [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.
- [P9] 7th Biannual Meeting on System and Control Theory, Kingston, ON. 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.

Professional Service

Editorial Service

01/2020 - 12/2025	Associate Editor, IEEE Transactions on Smart Grid
01/2020 - 12/2025	Associate Editor, IEEE Power & Energy Society Letters
2023 - 2023	Associate Editor, American Control Conference
2017 - 2018	Technical Committee, IEEE Smart Grid Comm.
2016 - 2016	Technical Committee, IEEE GLOBECOMM

Society Memberships

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

Conference Organization / Service

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

Miscellaneous External Committee Memberships

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 <i>Trends in Microgrid Modelling for Stability</i> Analysis. Published as contribution [TR1].
2017 - 2019	Contributor, IEEE PES PSDPC Task Force <i>Microgrid Stability Definitions, Analysis, and Modeling.</i> Published as contribution [TR2].

External Grant Reviewer

- 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 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

- 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

- 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: <i>I</i>	Robust-High Performance Algorithms for Feedback Optimization
So	urce: Connaught New Researcher Award, University of Toronto
An	nount: \$17,965
So	le PI, 100% share of funding
2018-2022 Title: <i>I</i>	Next-Generation Grid Monitoring and Control
So	urce: Electric Power Research Institute: Grid Operations Division
An	nount: \$220,000
So	le PI, 100% share of funding
2018-2019 Title: <i>I</i>	Interface and Testing Platform Design for CANREL
So	urce: NSERC Engage (Partner: Canadian Solar Solutions Inc.)
An	nount: \$25,000
So	le PI, 100% share of funding
2017-2024 Title: <i>I</i>	Real-Time Distributed Control for Low-Inertia Power Grids
So	urce: NSERC Discovery
An	nount: \$168,000
So	le PI, 100% share of funding
2017-2018 Title: A	Frequency Control Strategies for Future Microgrids
So	urce: WISE-Cisco Smart Grid Research Fund, University of Waterloo
An	nount: \$15,000
Sol	le PI, 100% share of funding