

Curriculum Vitae

Joshua Adam Taylor

Personal information

Birth date: October 14, 1983

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Employment

New Jersey Institute of Technology, Electrical and Computer Engineering
Associate Professor (with tenure), 2023 - present

University of Toronto, Electrical and Computer Engineering
Associate Professor (with tenure), 2018 - 2023
Percy Edward Hart Associate Professor in Electrical and Computer Engineering, 2019 - 2022
Assistant Professor, 2013 - 2018
Director, Institute for Sustainable Energy, 2018 - 2021
Associate Director, Institute for Sustainable Energy, 2015 - 2018

University of California, Berkeley, Electrical Engineering and Computer Sciences
Postdoctoral scholar, July 2011 - December 2012

Education

Massachusetts Institute of Technology, Cambridge, MA
PhD, Mechanical Engineering, May 2011
SM, Mechanical Engineering, June 2008

Carnegie Mellon University, Pittsburgh, PA
BS, Mechanical Engineering, June 2006

Publications

Books and book chapters

- B1. J.A. Taylor. *Convex optimization of power systems*. Cambridge University Press, 2015
- B2. J.A. Taylor and J.L. Mathieu. “Uncertainty in Demand Response—Identification, Estimation, and Learning”. In: *The Operations Research Revolution*. Tutorials in Operations Research. INFORMS, 2015. Chap. 5, pp. 56–70. DOI: 10.1287/educ.2015.0137

Journal

- J1. J.A. Taylor and A.D. Dominguez-Garcia. “Active Fault Detection in Static Systems”. In: *Automatic Control, IEEE Transactions on* (2025). DOI: 10.1109/TAC.2025.3547848
- J2. C. Guo, M. Bodur, and J.A. Taylor. “Copositive Duality for Discrete Energy Markets”. In: *Management Science* (2025). URL: <http://arxiv.org/abs/2101.05379>
- J3. R. Perryman, J.A. Taylor, and B.W. Karney. “Automated Flow Control of Water Distribution Networks”. In: *Journal of Hydraulic Research* 62 (6 2024), pp. 520–530. DOI: 10.1080/00221686.2024.2426008
- J4. S. Tan, A. Rapaport, D. Dochain, P. Vanrolleghem, E. Passepourt, and J.A. Taylor. “Predictive control of flow rates and concentrations in sewage transport and treatment systems”. In: *Journal of Process Control* 147 (2025), p. 103386. DOI: 10.1016/j.jprocont.2025.103386
- J5. J.A. Taylor, A. Rapaport, and D. Dochain. “Convex representation of metabolic networks with Michaelis-Menten kinetics”. In: *Bulletin of Mathematical Biology* 86.65 (2024). DOI: 10.1007/s11538-024-01293-1
- J6. A. Lesage-Landry, F. Pellerin, D.S. Callaway, and J.A. Taylor. “Optimally scheduling public safety power shutoffs”. In: *Stochastic Systems* 13.4 (2023). DOI: 10.1287/stsy.2022.004
- J7. R. Perryman, J.A. Taylor, and B.W. Karney. “Port-Hamiltonian based control of water distribution networks”. In: *Systems & Control Letters* 170 (2022), p. 105402. DOI: 10.1016/j.sysconle.2022.105402
- J8. M. Pirani, M. Hosseinzadeh, J.A. Taylor, and B. Sinopoli. “Optimal Active Fault Detection in Inverter-Based Grids”. In: *Control Systems Technology, IEEE Transactions on* 31.3 (May 2023), pp. 1411–1417. DOI: 10.1109/TCST.2022.3207661
- J9. S. Tan, E. Krichen, A. Rapaport, E. Passepourt, and J.A. Taylor. “Fitting second-order cone constraints to microbial growth data”. In: *Journal of Process Control* 118 (2022), pp. 165–169. DOI: 10.1016/j.jprocont.2022.08.018
- J10. J.A. Taylor, A. Rapaport, and D. Dochain. “A sequential convex moving horizon estimator for bioprocesses”. In: *Journal of Process Control* 116 (2022), pp. 19–24. DOI: 10.1016/j.jprocont.2022.05.012
- J11. A. Deshpande and J.A. Taylor. “Optimal Energy Management and Storage Sizing for Electric Vehicles With Dual Storage”. In: *Control Systems Technology, IEEE Transactions on* 31.2 (Mar. 2023), pp. 872–880. DOI: 10.1109/TCST.2022.3179615
- J12. J.A. Taylor, A. Rapaport, and D. Dochain. “Convex Optimization of Bioprocesses”. In: *Automatic Control, IEEE Transactions on* 67.9 (Sept. 2022), pp. 4932–4938. DOI: 10.1109/TAC.2022.3167310
- J13. S. Tan, J.A. Taylor, and E. Passepourt. “Efficient prediction of microplastic counts from mass measurements”. In: *ACS ES&T Water* 2.2 (2022), pp. 299–308. DOI: 10.1021/acsestwater.1c00316
- J14. J.A. Taylor and A. Rapaport. “Second-order cone optimization of the gradostat”. In: *Computers & Chemical Engineering* 151 (2021), p. 107347. DOI: 10.1016/j.compchemeng.2021.107347
- J15. L.A. Bobo, L. Mitridati, J.A. Taylor, J. Kazempour, and P. Pinson. “Price-Region Bids in Electricity Markets”. In: *European Journal of Operational Research* 295.3 (2021), pp. 1056–1073. DOI: 10.1016/j.ejor.2021.03.024
- J16. A. Lesage-Landry, J.A. Taylor, and D.S. Callaway. “Online Convex Optimization with Binary Constraints”. In: *Automatic Control, IEEE Transactions on* 66.12 (2021), pp. 6164–6170. DOI: 10.1109/TAC.2021.3061625

- J17. M. Pirani, J.A. Taylor, and B. Sinopoli. “Strategic Sensor Placement on Graphs”. In: *Systems & Control Letters* 148 (2021), p. 104855. DOI: 10.1016/j.sysconle.2020.104855
- J18. M. Pirani and J.A. Taylor. “Controllability of AC Power Networks with DC Lines”. In: *Power Systems, IEEE Transactions on* 36.2 (2021), pp. 1649–1651. DOI: 10.1109/TPWRS.2020.3042381
- J19. A. Lesage-Landry, J.A. Taylor, and I. Shames. “Second-order Online Nonconvex Optimization”. In: *Automatic Control, IEEE Transactions on* 66.10 (2021), pp. 4866–4872. DOI: 10.1109/TAC.2020.3040372
- J20. A. Lesage-Landry, I. Shames, and J.A. Taylor. “Predictive Online Convex Optimization”. In: *Automatica* 113 (2020), p. 108771. DOI: 10.1016/j.automatica.2019.108771
- J21. A. Lesage-Landry, H. Wang, I. Shames, P. Mancarella, and J.A. Taylor. “Online Convex Optimization of Multi-energy Building-to-grid Ancillary Services”. In: *Control Systems Technology, IEEE Transactions on* 28.6 (2020), pp. 2416–2431. DOI: 10.1109/TCST.2019.2944328
- J22. A. Lesage-Landry, S. Chen, and J.A. Taylor. “Estimating the Frequency Coupling Matrix From Network Measurements”. In: *Control of Network Systems, IEEE Transactions on* 7.2 (2020), pp. 724–733. DOI: 10.1109/TCNS.2019.2940265
- J23. A. Lesage-Landry and J.A. Taylor. “A Second-order Cone Model of Transmission Planning with Alternating and Direct Current Lines”. In: *European Journal of Operational Research* 281.1 (2020), pp. 174–185. DOI: 10.1016/j.ejor.2019.08.016
- J24. A. Stupar, T. McRae, N. Vukadinović, A. Prodić, and J.A. Taylor. “Multi-Objective Optimization of Multi-Level DC-DC Converters Using Geometric Programming”. In: *Power Electronics, IEEE Transactions on* 34.12 (Dec. 2019), pp. 11912–11939. DOI: 10.1109/TPEL.2019.2908826
- J25. M. Bazrafshan, N. Gatsis, A. F. Taha, and J.A. Taylor. “Coupling Load-Following Control With OPF”. in: *Smart Grid, IEEE Transactions on* 10.3 (May 2019), pp. 2495–2506. DOI: 10.1109/TSG.2018.2802723
- J26. A. S. Zamzam, E. Dall’Anese, C. Zhao, J.A. Taylor, and N. D. Sidiropoulos. “Optimal Water-Power Flow-Problem: Formulation and Distributed Optimal Solution”. In: *Control of Network Systems, IEEE Transactions on* 6.1 (Mar. 2019), pp. 37–47. DOI: 10.1109/TCNS.2018.2792699
- J27. B. Vellaboyana and J.A. Taylor. “Optimal Decentralized Control of DC-Segmented Power Systems”. In: *Automatic Control, IEEE Transactions on* 63.10 (Oct. 2018), pp. 3616–3622. DOI: 10.1109/TAC.2018.2796620
- J28. A. Lesage-Landry and J.A. Taylor. “Setpoint Tracking with Partially Observed Loads”. In: *Power Systems, IEEE Transactions on* 33.5 (Sept. 2018), pp. 5615–5627. DOI: 10.1109/TPWRS.2018.2804353
- J29. D. Fooladivanda and J.A. Taylor. “Energy-Optimal Pump Scheduling and Water Flow”. In: *Control of Network Systems, IEEE Transactions on* 5.3 (Sept. 2018), pp. 1016–1026. DOI: 10.1109/TCNS.2017.2670501
- J30. A. Lesage-Landry and J.A. Taylor. “The Multi-Armed Bandit With Stochastic Plays”. In: *Automatic Control, IEEE Transactions on* 63.7 (July 2018), pp. 2280–2286. ISSN: 0018-9286. DOI: 10.1109/TAC.2017.2765501
- J31. S.F. Barot and J.A. Taylor. “A concise, approximate representation of a collection of loads described by polytopes”. In: *International Journal of Electrical Power & Energy Systems* 84 (2017), pp. 55–63. DOI: 10.1016/j.ijepes.2016.05.001
- J32. J.A. Taylor, N. Luangsomboon, and D. Fooladivanda. “Allocating Sensors and Actuators via Optimal Estimation and Control”. In: *Control Systems Technology, IEEE Transactions on*

- 25.3 (May 2017), pp. 1060–1067. DOI: 10.1109/TCST.2016.2575799
- J33. J.A. Taylor, J.L. Mathieu, D.S. Callaway, and K. Poolla. “Price and capacity competition in balancing markets with energy storage”. In: *Energy Systems* 8.1 (2017), pp. 169–197. DOI: 10.1007/s12667-016-0193-9
- J34. J.A. Taylor, S.V. Dhople, and D.S. Callaway. “Power systems without fuel”. In: *Renewable and Sustainable Energy Reviews* 57 (May 2016), pp. 1322–1336. DOI: 10.1016/j.rser.2015.12.083
- J35. S. Sun, B. Liang, M. Dong, and J.A. Taylor. “Phase Balancing Using Energy Storage in Power Grids Under Uncertainty”. In: *Power Systems, IEEE Transactions on* 31.5 (Sept. 2016), pp. 3891–3903. DOI: 10.1109/TPWRS.2015.2492359
- J36. S. Pirooz Azad, J.A. Taylor, and R. Iravani. “Decentralized Supplementary Control of Multiple LCC-HVDC Links”. In: *Power Systems, IEEE Transactions on* 31.1 (Jan. 2016), pp. 572–580. DOI: 10.1109/TPWRS.2015.2393372
- J37. J.A. Taylor. “Financial storage rights”. In: *Power Systems, IEEE Transactions on* 30.2 (Mar. 2015), pp. 997–1005. DOI: 10.1109/TPWRS.2014.2339016
- J38. J.A. Taylor and J.L. Mathieu. “Index Policies for Demand Response”. In: *Power Systems, IEEE Transactions on* 29.3 (May 2014), pp. 1287–1295. DOI: 10.1109/TPWRS.2013.2289972
- J39. J.A. Taylor, A. Nayyar, D.S. Callaway, and K. Poolla. “Consolidated Dynamic Pricing of Power System Regulation”. In: *Power Systems, IEEE Transactions on* 28.4 (Nov. 2013), pp. 4692–4700. DOI: 10.1109/TPWRS.2013.2268391
- J40. J.A. Taylor, D.S. Callaway, and K. Poolla. “Competitive energy storage in the presence of renewables”. In: *Power Systems, IEEE Transactions on* 28.2 (May 2013), pp. 985–996. DOI: 10.1109/TPWRS.2012.2210573
- J41. J.A. Taylor and F.S. Hover. “Conic AC transmission system planning”. In: *Power Systems, IEEE Transactions on* 28.2 (May 2013), pp. 952–959. DOI: 10.1109/TPWRS.2012.2214490
- J42. J.A. Taylor and F.S. Hover. “Convex Models of Distribution System Reconfiguration”. In: *Power Systems, IEEE Transactions on* 27.3 (Aug. 2012), pp. 1407–1413. ISSN: 0885-8950. DOI: 10.1109/TPWRS.2012.2184307
- J43. J.A. Taylor and F.S. Hover. “Laplacians for flow networks”. In: *SIAM Journal on Discrete Mathematics* 25.3 (2011), pp. 1349–1364. DOI: DOI:10.1137/100787726
- J44. J.A. Taylor and F.S. Hover. “Linear Relaxations for Transmission System Planning”. In: *Power Systems, IEEE Transactions on* 26.4 (Nov. 2011), pp. 2533–2538. ISSN: 0885-8950. DOI: 10.1109/TPWRS.2011.2145395
- J45. G.F. Christopher, N.N. Noharuddin, J.A. Taylor, and S.L. Anna. “Experimental observations of the squeezing-to-dripping transition in T-shaped microfluidic junctions”. In: *Phys. Rev. E* 78.3 (Sept. 2008), p. 036317. DOI: 10.1103/PhysRevE.78.036317

Conference

- C1. Josh Taylor. “Information Structures in AC/DC Grids”. In: *Decision and Control (CDC), IEEE Annual Conference on*. 2024, pp. 5763–5770. DOI: 10.1109/CDC56724.2024.10886008
- C2. C. Tasiaux, D. Dochain, J.A. Taylor, A. Rapaport, and P. Vanrolleghem. “Optimization of the Paris wastewater treatment plants and sewer network: preliminary results”. In: *Control Conference Africa*. 2024
- C3. J.P. Macht, J.A. Taylor, and F. Azhari. “Vaulting detection with the multi-model unscented Kalman filter”. In: *IEEE International Conference on Automation Science and Engineering*. 2024
- C4. J.A. Taylor and A.D. Dominguez-Garcia. “Auxiliary signal-based distance protection in

- inverter-dominated power systems”. In: *European Control Conference*. 2024, pp. 1974–1978. DOI: 10.23919/ECC64448.2024.10591019
- C5. M. Pirani, J.A. Taylor, and B. Sinopoli. “Attack Resilient Interconnected Second Order Systems: A Game-Theoretic Approach”. In: *Decision and Control (CDC), IEEE 58th Annual Conference on*. Dec. 2019, pp. 4391–4396. DOI: 10.1109/CDC40024.2019.9029630
- C6. A. Deshpande and J.A. Taylor. “Optimal Energy Management of Electric Vehicles”. In: *CIGRÉ Canada Conference*. Sept. 2019. **Best student paper award**.
- C7. A. Alam and J.A. Taylor. “An Auction for Financial Storage Rights”. In: *Mediterranean Conference on Power Generation, Transmission, Distribution and Energy Conversion*. Nov. 2018. DOI: 10.1049/cp.2018.1858. **2nd place, best paper award competition**.
- C8. J.A. Taylor, R. Perryman, A. Bazylak, and B. Karney. “Safely landing water networks during power outages with energy storage”. In: *56th Annual Allerton Conference on Communication, Control, and Computing*. Invited. Oct. 2018, pp. 346–350. DOI: 10.1109/ALLERTON.2018.8635893
- C9. L. Mitridati and J.A. Taylor. “Power Systems Flexibility from District Heating Networks”. In: *Power Systems Computation Conference*. June 2018, pp. 1–7. DOI: 10.23919/PSCC.2018.8442617
- C10. R. Henriquez, A. Lesage Landry, J.A. Taylor, D. Olivares, and M. Negrete-Pincetic. “Managing load contract restrictions with online learning”. In: *Signal and Information Processing (GlobalSIP), IEEE Global Conference on*. Nov. 2017, pp. 1035–1039. DOI: 10.1109/GlobalSIP.2017.8309118
- C11. A.S. Mohamed, A. Lesage-Landry, and J.A. Taylor. “Dispatching Thermostatically Controlled Loads for Frequency Regulation Using Adversarial Multi-armed Bandits”. In: *IEEE Electrical Power and Energy Conference*. Oct. 2017. DOI: 10.1109/EPEC.2017.8286168
- C12. Y. Tian, N. Li, and J.A. Taylor. “Harmonic Reduction via Optimal Power Flow and the Frequency Coupling Matrix”. In: *Control Technology and Applications, IEEE Conference on*. Aug. 2017, pp. 2150–2157. DOI: 10.1109/CCTA.2017.8062771
- C13. A. Lesage Landry and J.A. Taylor. “Online Convex Optimization for Demand Response”. In: *Bulk Power Systems Dynamics and Control Symposium (IREP)*. Aug. 2017
- C14. A. Lesage Landry and J.A. Taylor. “Learning to shift thermostatically controlled loads”. In: *Hawaii International Conference on System Sciences*. Jan. 2017. DOI: hdl.handle.net/10125/41522
- C15. Y. Tian and J.A. Taylor. “Sparsity-promoting controller design for VSC-based microgrids”. In: *Signal and Information Processing (GlobalSIP), IEEE Global Conference on*. Dec. 2016, pp. 836–840. DOI: 10.1109/GlobalSIP.2016.7905960
- C16. S. Barot and J.A. Taylor. “An outer approximation of the Minkowski sum of convex conic sets with application to demand response”. In: *Decision and Control (CDC), IEEE 55th Annual Conference on*. Dec. 2016, pp. 4233–4238. DOI: 10.1109/CDC.2016.7798912
- C17. M. Bazrafshan, N. Gatsis, A. Taha, and J.A. Taylor. “Augmenting the optimal power flow for stability”. In: *Decision and Control (CDC), IEEE 55th Annual Conference on*. Dec. 2016, pp. 4104–4109. DOI: 10.1109/CDC.2016.7798891
- C18. A. Stupar, T. McRae, N. Vukadinović, A. Prodić, and J.A. Taylor. “Multi-Objective Optimization and Comparison of Multi-Level DC-DC Converters using Convex Optimization Methods”. In: *European Conference on Power Electronics and Applications*. Sept. 2016, pp. 1–10. DOI: 10.1109/EPE.2016.7695665
- C19. A. Stupar, J.A. Taylor, and A. Prodić. “Posynomial Models of Inductors for Optimization of Power Electronic Systems by Geometric Programming”. In: *IEEE Workshop on Control*

- and Modeling for Power Electronics (COMPEL)*. June 2016, pp. 1–8. DOI: 10.1109/COMPEL.2016.7556660
- C20. J.L. Mathieu and J.A. Taylor. “Controlling Nonlinear Batteries for Power Systems: Trading Off Performance and Battery Life”. In: *Power Systems Computation Conference*. June 2016, pp. 1–7. DOI: 10.1109/PSCC.2016.7540856
- C21. J.A. Taylor and J.L. Mathieu. “Strategic Bidding in Electricity Markets with Only Renewables”. In: *American Control Conference*. July 2016, pp. 5885–5890. DOI: 10.1109/ACC.2016.7526592
- C22. D. Fooladivanda and J.A. Taylor. “Optimal pump scheduling and water flow in water distribution networks”. In: *Decision and Control (CDC), IEEE 54th Annual Conference on*. Dec. 2015, pp. 5265–5271. DOI: 10.1109/CDC.2015.7403043
- C23. D. Fooladivanda and J.A. Taylor. “Dispatching thermal power plants under water constraints”. In: *53rd Annual Allerton Conference on Communication, Control, and Computing*. Sept. 2015, pp. 396–401. DOI: 10.1109/ALLERTON.2015.7447031
- C24. B.R. Vellaboyana, A. Oroojlooyjadid, D. Fooladivanda, J.A. Taylor, and L.V. Snyder. “Optimal scheduling of networked energy storages”. In: *Signal and Information Processing (GlobalSIP), IEEE Global Conference on*. Dec. 2015, pp. 982–986. DOI: 10.1109/GlobalSIP.2015.7418344
- C25. S. F. Barot and J.A. Taylor. “Load aggregation for demand response using polytopic models and the Minkowski sum”. In: *CIGRÉ Canada Conference*. Aug. 2015
- C26. S. Sun, J.A. Taylor, M. Dong, and B. Liang. “Distributed Real-Time Phase Balancing for Power Grids with Energy Storage”. In: *American Control Conference*. July 2015, pp. 3032–3037. DOI: 10.1109/ACC.2015.7171798
- C27. J.A. Taylor and L. Scardovi. “Decentralized control of DC-segmented power systems”. In: *Communication, Control, and Computing, 52nd Annual Allerton Conference on*. Invited. Sept. 2014, pp. 1046–1050. DOI: 10.1109/ALLERTON.2014.7028570
- C28. J.A. Taylor. “Financial rights and tracing for energy storage”. In: *PES General Meeting*. July 2014, pp. 1–5. DOI: 10.1109/PESGM.2014.6938936
- C29. J.A. Taylor and J.L. Mathieu. “Index Policies for Demand Response Under Uncertainty”. In: *Decision and Control (CDC), IEEE 52nd Annual Conference on*. Invited. Dec. 2013, pp. 6262–6267. DOI: 10.1109/CDC.2013.6760879
- C30. A. Nayyar, J.A. Taylor, A. Subramanian, D.S. Callaway, and K. Poolla. “Aggregate flexibility of collections of loads”. In: *Decision and Control (CDC), IEEE 52nd Annual Conference on*. Invited. Dec. 2013, pp. 5600–5607. DOI: 10.1109/CDC.2013.6760772
- C31. J.A. Taylor, A. Nayyar, D.S. Callaway, and K. Poolla. “Dynamic pricing in consolidated ancillary service markets”. In: *European Control Conference*. July 2013, pp. 3032–3037. DOI: 10.23919/ECC.2013.6669505
- C32. A. Subramanian, J.A. Taylor, E. Bitar, D. Callaway, K. Poolla, and P. Varaiya. “Optimal power and reserve capacity procurement policies with deferrable loads”. In: *Decision and Control (CDC), IEEE 51st Annual Conference on*. Dec. 2012, pp. 450–456. DOI: 10.1109/CDC.2012.6426102
- C33. J.A. Taylor, J.L. Mathieu, D.S. Callaway, and K. Poolla. “Price and capacity competition in zero-mean storage and demand response markets”. In: *50th Annual Allerton Conference on Communication, Control, and Computing*. Invited. 2012, pp. 1316–1323. DOI: 10.1109/Allerton.2012.6483370
- C34. J.A. Taylor, D.S. Callaway, and K. Poolla. “Inventory control of storage in distribution systems”. In: *American Control Conference*. June 2012, pp. 2147–2152. DOI: 10.1109/ACC.

2012.6315148

- C35. J.A. Taylor and F.S. Hover. “Conic relaxations for transmission system planning”. In: *North American Power Symposium*. Aug. 2011, pp. 1–4. DOI: 10.1109/NAPS.2011.6024861
- C36. J.A. Taylor and F.S. Hover. “Lift-and-project relaxations of AC microgrid distribution system planning”. In: *Grand Challenges in Modeling and Simulation*. June 2011
- C37. J.A. Taylor, E. Gilbertson, J. Chalfant, and F.S. Hover. “Linear network design for AC shipboard distribution systems”. In: *IEEE Electric Ship Technologies Symposium*. Apr. 2011. DOI: 10.1109/ESTS.2011.5770866
- C38. J.A. Taylor and F.S. Hover. “Economical simulation in particle filtering using interpolation”. In: *Information and Automation, International Conference on*. June 2009, pp. 1326–1330. DOI: 10.1109/ICINFA.2009.5205122
- C39. J.A. Taylor, F.S. Hover, and A. Ouroua. “Uncertainty analysis of large-scale power systems using collocation”. In: *Grand Challenges in Modeling and Simulation*. June 2008
- C40. J. Langston, J.A. Taylor, F.S. Hover, J. Simpson, M. Steurer, and T. Baldwin. “Uncertainty analysis for a large-scale transient simulation of a notional all-electric ship pulse load charging scenario”. In: *Probabilistic Methods Applied to Power Systems*. May 2008
- C41. J.A. Taylor and F.S. Hover. “High Dimensional Stochastic Simulation and Electric Ship Models”. In: *Electric Ship Technologies Symposium*. May 2007, pp. 402–407. DOI: 10.1109/ESTS.2007.372117

Theses

- T1. J.A. Taylor. “Conic optimization of electric power systems”. PhD thesis. Massachusetts Institute of Technology, 2011. URL: <http://dspace.mit.edu/handle/1721.1/67601>
- T2. J.A. Taylor. “Uncertainty analysis of power systems using collocation”. MA thesis. Massachusetts Institute of Technology, 2008. URL: <http://dspace.mit.edu/handle/1721.1/45891>

Invited talks

- *Pricing in Discrete Markets Using Copositive Duality*. Electrical and Computer Engineering Seminar, Johns Hopkins University. Baltimore, MD, Dec. 2024
- *Pricing in Discrete Markets Using Copositive Duality*. Integrated Systems Engineering Seminar, Ohio State University. Columbus, OH, Nov. 2024
- *Convex Optimization of Wastewater Treatment*. Industrial and Systems Engineering Seminar, Rutgers University. Piscataway, NJ, Oct. 2024
- *Information Structures in AC/DC Grids*. 60th Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, Sept. 2024
- *Active fault detection in static systems*. Le Laboratoire d’Informatique, de Robotique et de Microélectronique de Montpellier, Université de Montpellier. Montpellier, France, May 2024
- *Active fault detection in static systems*. Decision and Control Seminar, University of Illinois Urbana-Champaign. Urbana, IL, Feb. 2024
- *Convex optimization of bioprocesses*. Mathematical Science Colloquium, New Jersey Institute of Technology. Newark, NJ, Mar. 2024
- *Active distance protection in inverter-fed grids*. Technical University of Denmark. Lyngby, Denmark, Jan. 2024
- *Convex optimization of bioprocesses*. Chemical and Materials Engineering, New Jersey Institute of Technology. Newark, NJ, Sept. 2023

- *Convex optimization of bioprocesses*. Imperial College London. London, England, June 2023
- *Convex optimization of bioprocesses*. Technical University of Denmark. Lyngby, Denmark, June 2023
- *Convex optimization of bioprocesses*. University of California, Santa Barbara. Santa Barbara, CA, Nov. 2022
- *Convex optimization of bioprocesses*. University of California, San Diego. San Diego, CA, Nov. 2022
- *Convex optimization of bioprocesses*. University of California, Berkeley. Berkeley, CA, Nov. 2022
- *Convex optimization of bioprocesses*. Cornell University. Ithaca, NY, Nov. 2022
- *Convex optimization of bioprocesses*. University of Michigan. Ann Arbor, MI, Oct. 2022
- *Convex optimization of bioprocesses*. École Polytechnic Montréal, GERAD. Montréal, Quebec, Oct. 2022
- *Convex Optimization of Bioprocesses*. 58th Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, Sept. 2022
- *Convex optimization of bioprocesses*. Le Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier, Université de Montpellier. Montpellier, France, July 2022
- *Convex optimization of bioprocesses*. Delft University of Technology. Delft, Netherlands, July 2022
- *Power system harmonics: identification and mitigation*. National Institute of Standards and Technology. Gaithersburg, MD, Apr. 2022
- *Convex optimization of bioprocesses*. 10th Scientific Days of the LabEx NUMEV, Université de Montpellier. Montpellier, France, Nov. 2021
- *Convex optimization of bioprocesses*. Département of Mathematical Engineering, Université catholique de Louvain. Louvain-la-Neuve, Belgium, Sept. 2021
- *Financial storage rights*. MISTEA Seminar, Université de Montpellier. Montpellier, France (virtual), Nov. 2020
- *Decentralized control of DC-segmented power systems*. Conference on Decision and Control, Workshop on the Resilience and Controllability of Large Scale Systems. Nice, France, Dec. 2019
- *Power system harmonics: identification and mitigation*. Machine Learning, Optimization and Security for Future Energy Delivery Systems, GlobalSIP. Ottawa, ON, Nov. 2019
- *Optimal planning and control of direct current lines in power systems*. Technical University of Denmark. Lyngby, Denmark, July 2019
- *Optimal planning and control of direct current lines in power systems*. Center for Operations Research and Econometrics, Université catholique de Louvain. Louvain-la-Neuve, Belgium, June 2019
- *Optimal planning and control of direct current lines in power systems*. McGill University, Informal Systems Seminar. Montréal, Quebec, May 2019
- *Optimal planning and control of direct current lines in power systems*. École Polytechnic Montréal, GERAD. Montréal, Quebec, May 2019
- *Optimal planning and control of direct current lines in power systems*. University of Maryland, College Park. College Park, MD, Feb. 2019
- *Decentralized control of DC-segmented power systems*. 23rd International Symposium on Mathematical Programming. Bordeaux, France, July 2018
- *Financial storage rights*. Ontario Power Generation. Toronto, ON, June 2018
- *Power system harmonics: identification and mitigation*. Smart Grid Seminar, California In-

- stitute of Technology. Pasadena, CA, June 2018
- *Online learning for demand response*. Panel on Distributed Control, 9th Annual IEEE Green Technologies Conference. Denver, CO, Mar. 2017
 - *Online learning for demand response*. Conference on Information Sciences and Systems, Johns Hopkins University. Baltimore, MD, Mar. 2017
 - *Leveraging energy storage and demand response in power system operations*. Waterloo Institute for Sustainable Energy, University of Waterloo. Waterloo, ON, Mar. 2017
 - *Power systems without fuel*. Keynote, Symposium on Signal and Information Processing for Smart Grid Infrastructures, GlobalSIP. Washington, DC, Dec. 2016
 - *Leveraging energy storage and demand response in power system operations*. Pontificia Universidad Católica de Chile. Santiago, Chile, Oct. 2016
 - *Leveraging energy storage and demand response in power system operations*. MAESTRO group, INRIA. Sophia-Antipolis, France, June 2016
 - *Representing storage and demand response in power system operations*. Centre for Power and Information Research Showcase, University of Toronto. Toronto, ON, Apr. 2016
 - *Representing storage and demand response in power system operations*. Mechanical & Industrial Engineering Colloquium, New Jersey Institute of Technology. Newark, NJ, Feb. 2016
 - *Representing storage and demand response in power system operations*. Workshop on frontiers in distributed optimization and control of sustainable power systems, National Renewable Energy Laboratory. Boulder, CO, Jan. 2016
 - *Strategic Price Bidding in Electricity Markets with Only Renewables*. INFORMS Annual Meeting. Philadelphia, PA, Nov. 2015
 - *Representing storage and demand response in power system operations*. Control Seminar, University of Michigan. Ann Arbor, MI, Oct. 2015
 - *Dispatching Thermal Power Plants under Water Constraints*. 53rd Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, Oct. 2015
 - *Financial storage rights*. Industrial and Systems Engineering Seminar, Lehigh University. Bethlehem, PA, Jan. 2015
 - *Financial storage rights*. UC Berkeley. Berkeley, CA, Nov. 2014
 - *Financial rights for energy storage*. INFORMS Annual Meeting. San Francisco, CA, Nov. 2014
 - *Decentralized control of DC-segmented power systems*. 52nd Annual Allerton Conference on Communication, Control, and Computing. Monticello, IL, Oct. 2014
 - *Financial storage rights*. Purdue University. West Lafayette, IN, Sept. 2014
 - *Load-based power system regulation: algorithms and incentives*. Center for Nonlinear Studies, Los Alamos National Lab. Los Alamos, NM, Apr. 2014
 - *Load-based power system regulation: algorithms and incentives*. Informal Systems Seminar, McGill University. Montréal, Quebec, Mar. 2014
 - *Leveraging aggregations of flexible loads*. Pillai Institute of Information Technology, Engineering, Media Studies & Research. Navi Mumbai, India, Dec. 2013
 - *Load-based power system regulation: algorithms and incentives*. Electric Energy Systems Group, Electrical and Computer Engineering, Carnegie Mellon University. Pittsburgh, PA, Oct. 2013
 - *Learning algorithms for demand response*. UC Berkeley. Berkeley, CA, Oct. 2013
 - *Restless Bandit Index Policies for Demand Response*. INFORMS Annual Meeting. Minneapolis, MN, Oct. 2013
 - *Load-based power system regulation: algorithms and incentives*. Information, Systems, and

Networks Seminar, Electrical Engineering Department, Cornell University. Ithaca, NY, Sept. 2013

- *Load-based power system regulation: algorithms and incentives*. Mechanical Engineering Department, Columbia University. New York, NY, Sept. 2013

Service

Editorial roles

- *Journal of Optimization Theory and Applications*. Associate Editor. 2021 - present
- *IEEE Transactions on Control of Network Systems*. Associate Editor. 2021 - present
- *IEEE Canada Conference Editorial Board*. 2016 - 2018
- *Journal of Modern Power Systems and Clean Energy*. Associate Editor for Special Issue on Ultra-high Levels of Variable Renewable Energy. 2017

Conference organization

- *IEEE Conference on Decision and Control*. Advanced Strategies to Control Distributed Energy Resources. 2021
- *IEEE Conference on Decision and Control*. Machine Learning for Control of Power Systems. 2021
- *Canadian Operational Research Society Conference (CORS)*. Energy, Natural Resources, and the Environment Cluster Co-Chair. 2021
- *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. Symposium on Machine Learning, Optimization, and Security for Future Energy Delivery Systems, Symposium Co-organizer. 2019
- *IEEE Conference on Decision and Control*. Learning in Power Systems, Session Organizer. 2018
- *IEEE Conference on Control Technology and Application*. Distributed Energy Resources, Session Organizer. 2018
- *IEEE Conference on Control Technology and Application*. Control applications for renewable integration, Session Organizer. 2017
- *INFORMS Annual Meeting*. Optimization in converter-based power systems, Session Organizer. 2016

Program committees

- *IEEE Electric Power and Energy Conference (EPEC)*. 2017
- *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. Symposium on Signal and Information Processing for Smart Grid Infrastructures. 2016
- *Workshop on System and Control Perspectives for Smart City*. 2015
- *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. Symposium on Signal and Information Processing for Optimizing Future Energy Systems. 2015
- *IEEE International Conference on Smart Grid Communications (SmartGridComm)*. Architectures, Control and Operation for Smart Grids and Microgrids Symposium. 2015
- *CIGRÉ Canada Conference on Power Systems*. Trends in Power System Planning and Operating for Evolving Grid. 2014
- *IEEE International Conference on Smart Grid Communications (SmartGridComm)*. Architectures, Control, and Operation for Smart Grids, Microgrids and Distributed Resources

Symposium. 2014

- *IEEE International Conference on Smart Grid Communications (SmartGridComm)*. Symposium on Demand Side Management, Demand Response, and Dynamic Pricing. 2013

External thesis examiner

- Enrica Raheli. Supervisors: Jalal Kazempour. *Physics-Aware Operation of Power-to-X and Natural Gas Systems*. Technical University of Denmark. 2024
- Abdel Rahman Ahmad Amin Aldik. Supervisor: Bala Venkatesh. *Convex Relaxation of Line-Wise Power Systems Model for Optimal Planning and Operations*. Toronto Metropolitan University. 2022
- Andrea Tosatto. Supervisors: Spyros Chatzivasileiadis, Pierre Pinson, Tilman Weckesser. *Optimization and Market Integration of Multi-Area AC/HVDC Grids*. Technical University of Denmark. 2021
- Navdeep Dhaliwal. Supervisor: François Bouffard. *Generation expansion planning with renewable energy*. McGill University. 2020
- Christian Bingane. Supervisor: Miguel Anjos. *Application de l'optimisation conique au problème d'écoulement de puissance optimal*. École Polytechnic Montréal. 2019
- Raheel Zafar. Supervisor: Jayashri Ravishankar. *Multi-timescale Volt/VAR Optimization with Battery Energy Storage using Convex Relaxations in Smart Distribution Grids*. University of New South Wales. 2019

Community engagement and outreach

- (Virtual) booth organizer, *Science Rendezvous*, University of Toronto. May, 2021
- Organizer, *Sustainable Energy Symposium*, University of Toronto. January, 2020
- Panel moderator, *Power Infrastructure in Africa*, Accelerating Africa. October, 2018
- Panelist, *Network cost allocation: who should pay for green network infrastructure?* PES General Meeting, Latin American Working Group. 2017.
- Speaker, *Game theory in renewable only electricity markets*, Technical University of Denmark, Center for Electric Power and Energy, Summer School, 2017.
- Speaker, *Financial Transmission and Storage Rights*, IEEE Smart Grid Webinar. April, 2017
- Panelist, *The Future of Energy Symposium*, Oakville Chamber of Commerce. June, 2015

Grant reviewer/panelist

- NSERC Electrical and Computer Engineering Evaluation Group (EG 1510), 2023
- NSF, ARPA-E, CHIST-ERA.

Journal reviewer

IEEE Transactions on {Automatic Control, Control of Network Systems, Energy Conversion, Power Electronics, Power Systems, Sustainable Energy}; IEEE Journal on Selected Areas in Communications; IEEE Control Systems Letters; Automatica; Systems & Control Letters; Operations Research; Optimization and Engineering; Sustainable Energy, Grids and Networks; IET Generation, Transmission & Distribution; International Journal of Electrical Power & Energy Systems; Energy Economics.

Internal service

- Faculty Search Committee, Mechanical & Industrial Engineering, 2021 - 2022, 2022 - 2023
- Director, Institute for Sustainable Energy, 2018 - 2022
- Associate Director, Institute for Sustainable Energy, 2015 - 2018
- ECE Computer User Committee, 2021 - present
- ECE Awards Committee, 2021 - present
- ECE Workload Committee, 2019
- Faculty Search Committee, ECE Energy Systems Group, 2017 - 2018, 2018 - 2019
- Faculty Search Committee, ECE Systems Control Group, 2017 - 2018, 2018 - 2019
- Graduate Coordinator, Energy Systems Group, 2014 - 2020

Teaching

University of Toronto, Department of Electrical and Computer Engineering

Instructor

- Probability and Statistics (ECE286), Winter 2022
- Signals and Systems (ECE216), Winter 2013 - 2016, 2018 - 2020
- Energy Systems and Distributed Generation (ECE413), Winter 2014 - 2016
- Circuit Analysis (ECE212), Fall 2016
- Power System Operations and Economics (ECE1094), Winter 2015, Fall 2015 - 2016, 2018 - 2020

Supervision

Graduate students

1. Jesse Macht, MASc, 2021 - present. *Co-advised with F. Azhari.*
2. Johnson Tang, MASc, 2021 - present.
3. Youssef Al Falah, PhD, 2020 - present. *Co-advised with J. Simpson-Porco.*
4. Shuyao Tan, PhD, 2019 - present. *Co-advised with E. Passepport.*
5. Richard Perryman, PhD, 2017 - present.
6. Siyu Chen, MASc, 2017 - 2019.
7. Alok Deshpande, MASc, 2017 - 2019.
8. Zhongbin Huang, MASc, 2016 - 2018. *Co-advised with B. Liang.*
9. Abu Alam, MEng, 2016.
10. Yanhua Tian, MASc, 2015 - 2017.
11. Antoine Lesage-Landry, PhD, 2015 - 2019.
12. Andrija Stupar, PhD, 2015 - 2017. *Co-advised with A. Prodic.*
13. Bharath R. Vellaboyana, MASc, 2014 - 2016.
14. Suhail F. Barot, PhD, 2013 - 2017.

Postdoctoral fellows

1. Mohammad Pirani, 2019 - 2021.
2. Dariush Fooladivanda, 2015 - 2016.
3. Sahar PiroozAzad, 2013 - 2014.

Visiting students

1. Jure Konjevod, 2019, PhD student at University of Zagreb.
2. Andrea Tosatto, 2017, Masters student at Grenoble Institute of Technology.
3. Lesia Marie-Jeanne Mariane Mitridati, 2017, PhD student at Technical University of Denmark.
4. Mirna Grzanić, 2016, PhD student at University of Zagreb.
5. Rodrigo Henriquez, 2016, Masters student at Pontificia Universidad Católica de Chile.
6. Ahmad Taha, 2014, PhD student at Purdue University.

Funding

US

1. 2024-2027, PI, Collaborative Research: Auxiliary Signal-Based Fault Detection in Inverter-Dominated Power Systems, National Science Foundation, total: \$550,000, my portion:\$275,000.

Canada

Note: Items are displayed as [year(s); my role as applicant; source; amount (total, annual); purpose (operating or equipment)], followed by the project title.

1. 2013; PI; ECE; \$100,000; operating.
Startup funds.
2. 2013; PI; Connaught new researcher award; total: \$10,000, annual: \$10,000; Operating.
Project: Coordinated control of distributed energy resources.
3. 2014-2020; PI; NSERC Discovery; total: \$150,000, annual: \$30,000; Operating.
Project: Control and economics of power systems with renewables.
4. 2013; PI; Canada Foundation for Innovation Leaders Opportunity Fund & Ontario Research Fund match; total: \$187,378, annual: \$187,378; Equipment.
Project: Real-time digital simulation of large, renewable powered distribution systems with energy storage.
5. 2014-2016; PI; HydroOne Networks; total: \$120,000, annual: \$60,000 (\$52,173 after 15% overhead); Operating.
Project: Flexible utilization of storage in distribution systems with renewables.
6. 2015-2017; PI; NSERC Collaborative Research and Development (Industry partner: HydroOne Networks); total: \$104,346, annual: \$52,173; Operating.
Project: Optimal utilization of energy storage in distribution systems.
7. 2017; PI; NSERC Engage (Industry partner: Hydro-Quebec Research Institute); total: \$25,000, annual: \$25,000; Operating.
Project: Using online learning to manage uncertainty in load-shifting with water heaters.
8. 2017; PI; Ontario Ministry of Research, Innovation and Science Early Researcher Award; total: \$140,000 (\$100,00 after overhead), annual: \$20,000; Operating.
Project: Learning to Leverage Flexible Electric Loads.
9. 2018-2020; Co-PI (with P. Lehn, S. Hum, and J. Salmon); NSERC Collaborative Research and Development (Industry partner: Havelaar Canada); total (my portion): \$60,000, annual: \$30,000; Operating.
Project: High efficiency electric vehicle drivetrains with integrated fast-charging and dual storage media.

10. 2018; Co-PI (with E. Passeport); CECSeed; total (my portion): \$30,000, annual: \$15,000; Operating.
Project: Estimating chemical partition coefficients with low-rank matrix completion.
11. 2019; PI; NSERC Engage (Industry partner: Ontario Power Generation); total: \$25,000, annual: \$25,000; Operating.
Project: Providing multiple services on multiple time scales with energy storage.
12. 2019-2022; PI; Percy Edward Hart Professorship (FASE at UofT); total: \$225,000, annual: \$75,000; Operating.
13. 2020-2026; PI; NSERC Discovery; total: \$234,000, annual: \$39,000; Operating.
Project: Control and optimization of electric power systems.
14. 2020; Co-PI (with F. Azhari); CARTE Seed; total (my portion): \$60,000, annual: \$30,000; Operating.
Project: Imitation and Reinforcement Learning for Gait Training of Lower-Limb Prosthesis Users.
15. 2022; Co-PI (with B. Karney); WaterSeed; total (my portion): \$30,000, annual: \$15,000; Operating.
Project: Nonlinear control of water distribution networks.
16. 2022; Co-PI (with F. Azhari, J. Campbell, C. MacKay); The War Amps; total (shared): \$169,805; Operating.
Project: GAITGNOSIS: A Mobile Gait Lab for Lower-Limb Prosthesis Users.

Consulting

- Opus One Solutions (now part of GE)
- Tapestry group at X - The Moonshot Factory