

Johanna L. Mathieu

Department of Electrical Engineering and Computer Science
University of Michigan – Ann Arbor
✉ jlmath@umich.edu

Education

University of California, Berkeley <i>Ph.D., Mechanical Engineering</i> Advisors: Duncan Callaway & Ashok Gadgil	Berkeley, CA 2012
University of California, Berkeley <i>M.S., Mechanical Engineering</i>	Berkeley, CA 2008
Massachusetts Institute of Technology <i>S.B., Ocean Engineering</i> Minor in Ancient and Medieval Studies	Cambridge, MA 2004

Positions

University of Michigan <i>Associate Professor with Tenure, EECS (Electrical and Computer Engineering Division)</i> <i>Associate Director, CoE Institute for Energy Solutions</i> <i>Assistant Professor, EECS (Electrical and Computer Engineering Division)</i>	Ann Arbor, MI <i>Sep 2020 - Present</i> <i>Sep 2022 - Present</i> <i>Jan 2014 - Aug 2020</i>
National Renewable Energy Laboratory <i>Collaborative Appointment</i>	Golden, CO <i>Oct 2020 - Mar 2021</i>
ETH Zurich <i>Postdoctoral Researcher, Power Systems Laboratory</i>	Zurich, Switzerland <i>Jul 2012 - Dec 2013</i>
Lawrence Berkeley National Laboratory <i>Affiliate, Environmental Energy Technologies Division</i>	Berkeley, CA <i>Feb 2007 - Aug 2012</i>
Bangladesh University of Engineering and Technology <i>Visiting Researcher, Department of Civil Engineering</i>	Dhaka, Bangladesh <i>May 2008 - Jul 2008</i>
MIT Sea Grant College Program <i>Research Assistant, Center for Coastal Resources</i>	Cambridge, MA <i>Dec 2005 - Jun 2006</i>
U.S. Peace Corps <i>Education Volunteer</i>	Morogoro & Mahiwa, Tanzania <i>Sep 2004 - Oct 2005</i>
Woods Hole Oceanographic Institution <i>Summer Student Fellow, Advanced Engineering Laboratory</i>	Woods Hole, MA <i>Summer 2003</i>
University of Southampton <i>Visiting Researcher, Institute for Sound and Vibration Research</i>	Southampton, United Kingdom <i>January 2003</i>
Massachusetts Institute of Technology <i>Undergraduate Researcher, Deep Sea Archaeology Research Group</i>	Cambridge, MA <i>Fall 2001, Spring 2002, Fall 2002</i>
University of Rhode Island Graduate School of Oceanography <i>Summer Undergraduate Research Fellow in Oceanography</i>	Narragansett, RI <i>Summer 2002</i>

Teaching

UM EECS 460, Control System Analysis & Design <i>Instructor</i>	Ann Arbor, MI <i>Winter '20</i>
UM EECS 463, Power System Design and Operation <i>Instructor</i>	Ann Arbor, MI <i>Winter '14; Fall '15, '18, '21</i>
UM EECS 498, Grid Integration of Alternative Energy Sources <i>Instructor</i>	Ann Arbor, MI <i>Winter '15, '23</i>
UM EECS 534, Analysis of Electric Power Distribution Systems and Loads <i>Course Developer & Instructor</i>	Ann Arbor, MI <i>Fall '14, '16, '22; Winter '19</i>
UM EECS 536, Power System Markets & Optimization <i>Course Developer & Instructor</i>	Ann Arbor, MI <i>Fall '19; Winter '16, '18, '22</i>
Short Course: Grid 101 <i>Course Developer (with I. Hiskens) & Instructor</i>	Ann Arbor, MI <i>May '18</i>
UC Berkeley CE 290, Design for Sustainable Communities <i>Graduate Student Instructor</i>	Berkeley, CA <i>Spring '09, '10</i>
Mahiwa Secondary School, Physics & Mathematics <i>U.S. Peace Corps Volunteer & Secondary School Teacher</i>	Mahiwa, Tanzania <i>Jan - Oct '05</i>
St. Walburg's Hospital Adult Education Program, Physics <i>U.S. Peace Corps Volunteer & Adult Education Teacher</i>	Nyangao, Tanzania <i>Spring '05</i>

Guest Lectures

- Earth Day at 50 Teach-Out: Reimagining the Future of Sustainability, *A Sustainable Power Grid*, Mar 2020.
- Technical University of Denmark Center for Electric Power and Energy Summer School, *Data-Driven Distributionally Robust Optimization*, Jun 18, 2019.
- UM ESE 501, *A Brief Introduction to the Grid*, Oct 9, 2019.
- UM ESE 501, *A Brief Introduction to the Grid*, Oct 10, 2018.
- UM EECS 500, *Coordinating Electric Loads to Improve Power System Reliability and Economics*, Oct 16, 2015.
- UM EECS 500, *How Your Refrigerator Can Help Get More Renewable Energy on the Power Grid*, Oct 3, 2014.
- UM CEE 679, *Energy Arbitrage with Thermostatically Controlled Loads*, Feb 24, 2014.
- UC Berkeley ERG 254, *Demand Response*, Nov 29, 2011.

Awards & Honors

- C3E Award Finalist, 2022.
- Outstanding Associate Editor for IEEE Transactions on Power Systems, 2021.
- National Academy of Engineering EU-US Frontiers of Engineering Symposium Participant, 2021.
- National Academy of Engineering US Frontiers of Engineering Symposium Presenter, 2021.
- Henry Russel Award, 2021.
- Outstanding Reviewer for IEEE Transactions on Sustainable Energy, 2020.
- National Academy of Engineering US Frontiers of Engineering Symposium Participant, 2019.

- NSF CAREER Award, 2019.
- Ernest and Bettine Kuh Distinguished Faculty Award, 2018.
- Senior Member of the IEEE, 2018.
- ACEEE Summer Study on Energy Efficiency in Buildings paper selected for a special issue of *Energy Efficiency*, 2018. (with A. Keskar, D. Anderson, J.X. Johnson, and I.A. Hiskens)
- A Best Paper on Distribution Systems, Microgrids, and Renewables, IEEE PES General Meeting, 2018. (with G.S. Ledva and S. Peterson)
- Honorable Mention, INFORMS Junior Faculty Interest Group Paper Competition, 2017. (with B. Li and R. Jiang)
- Energy Policy Research Conference paper selected for a special issue of *The Electricity Journal*, 2017. (with S. Forrester, A. Zaman, and J.X. Johnson)
- IEEE PES PowerTech Conference High Quality Paper Award, 2017. (with M. Yao and D.K. Molzahn)
- Power Systems Computation Conference paper selected for a special issue of the *International Journal of Electrical Power and Energy Systems*, 2014. (with O. Mégel and G. Andersson)
- A Best Paper on Markets, Economics, and Planning, IEEE PES General Meeting, 2014. (with T.B. Rasmussen, M. Sørensen, H. Jóhannsson, and G. Andersson)
- First Prize in Global Poverty Reduction Category, UC Berkeley Bears Breaking Boundaries White Paper Competition, 2007. (with T. Khan, K. Jahani, M. Seflek, and A.J. Gadgil)
- UC Berkeley Chancellor’s Fellowship, 2006.
- National Defense Science and Engineering Graduate Research Fellowship, 2006.
- Honorable Mention, National Science Foundation Graduate Research Fellowship Program, 2006.
- MIT Department of Ocean Engineering Robert Bruce Wallace Prize, 2003.
- Best Undergraduate Paper, Society of Naval Architects and Marine Engineers New England Section Paper Night, 2004. (with M.B. Greytak, K.S. Wasserman, A.K. Baker, J.D. Chambers, and B.M. Mueller)
- Best Undergraduate Paper, Autonomous Undersea Systems Institute Symposium on Unmanned Untethered Submersible Technologies, 2003.
- Best Undergraduate Paper, Society of Naval Architects and Marine Engineers New England Section Paper Night, 2003.
- MIT Sea Grant College Program Dean A. Horn Award, 2003.
- Marine Technology Society Remotely Operated Vehicle Scholarship, 2002.

Publications

- Journal Papers.....
- [J43] S. Jang, N. Ozay, and **J.L. Mathieu**. “Probabilistic constraint construction for network-safe load coordination”. In: (review).
 - [J42] S. Jang, N. Ozay, and **J.L. Mathieu**. “An invariant set construction method, applied to safe coordination of thermostatic loads”. In: (review).
 - [J41] M. Yao, S. Roy, and **J.L. Mathieu**. “Using demand response to improve power system small-signal stability”. In: (review).
 - [J40] J. Buchsbaum, C. Hausman, **J.L. Mathieu**, and J. Peng. “Multi-product firms in electricity markets: Implications for climate policy”. In: *The RAND Journal of Economics* (accepted).

- [J39] K. Girigoudar, M. Yao, **J.L. Mathieu**, and L. Roald. "Integration of centralized and distributed methods to mitigate voltage unbalance using solar inverters". In: *IEEE Transactions on Smart Grid* (accepted).
- [J38] B. Li, R. Jiang, and **J.L. Mathieu**. "Integrating unimodality into distributionally robust optimal power flow". In: *TOP (Special Issue on OR & Statistics in Energy)* 30 (2022), pp. 594–617.
- [J37] A. Keskar, S. Lei, T. Webb, S. Nagy, I.A. Hiskens, **J.L. Mathieu**, and J.X. Johnson. "Assessing the performance of global thermostat adjustment in commercial buildings for load shifting demand response". In: *Environmental Research: Infrastructure and Sustainability* 2.1 (2022), p. 015003.
- [J36] A. Andrews, J. Roth, R.K. Jain, and **J.L. Mathieu**. "Data-driven examination of the impact energy efficiency has on demand response capabilities in institutional buildings". In: *ASME Journal of Engineering for Sustainable Buildings and Cities* 3.2 (2022), p. 024501.
- [J35] S. Lei, **J.L. Mathieu**, and R.K. Jain. "Performance of existing methods in baselining demand response from commercial building HVAC fans". In: *ASME Journal of Engineering for Sustainable Buildings and Cities* 2.2 (2021), p. 021002.
- [J34] M. Yao, I.A. Hiskens, and **J.L. Mathieu**. "Mitigating voltage unbalance using distributed solar photovoltaic inverters". In: *IEEE Transactions on Power Systems* 36.3 (2021), pp. 2642–2651.
- [J33] S.C. Ross and **J.L. Mathieu**. "Strategies for network-safe load control with a third-party aggregator and a distribution operator". In: *IEEE Transactions on Power Systems* 36.4 (2021), pp. 3329–3339.
- [J32] L. Herre, **J.L. Mathieu**, and L. Söder. "Impact of market timing on the profit of a risk-averse load aggregator". In: *IEEE Transactions on Power Systems* 35.5 (2020), pp. 3970–3980.
- [J31] A. Stuhlmacher and **J.L. Mathieu**. "Chance-constrained water pumping to manage water and power demand uncertainty in distribution networks". In: *Proceedings of the IEEE (Special Issue on Multi-Energy Systems)* 108.9 (2020), pp. 1640–1655.
- [J30] G.S. Ledva and **J.L. Mathieu**. "Separating feeder demand into components using substation, feeder, and smart meter measurements". In: *IEEE Transactions on Smart Grid* 11.4 (2020), pp. 3280–3290.
- [J29] A. Keskar, D. Anderson, J.X. Johnson, I.A. Hiskens, and **J.L. Mathieu**. "Do commercial buildings become less efficient when they provide grid ancillary services?" In: *Energy Efficiency (Special Issue for the 2018 ACEEE Summer Study on Energy Efficiency in Buildings)* 13.3 (2020), pp. 487–501.
- [J28] B. Li, R. Jiang, and **J.L. Mathieu**. "Distributionally robust optimal power flow assuming unimodal distributions with misspecified modes". In: *IEEE Transactions on Control of Network Systems (Special Issue on Analysis, Control, and Optimization of Energy Networks)* 6.3 (2019), pp. 1223–1234.
- [J27] M. Yao, D.K. Molzahn, and **J.L. Mathieu**. "An optimal power flow approach to improve power system voltage stability using demand response". In: *IEEE Transactions on Control of Network Systems (Special Issue on Analysis, Control, and Optimization of Energy Networks)* 6.3 (2019), pp. 1015–1025.
- [J26] S.C. Ross, G. Vuylsteke, and **J.L. Mathieu**. "Effects of load-based frequency regulation on distribution network operation". In: *IEEE Transactions on Power Systems* 34.2 (2019), pp. 1569–1578.
- [J25] M. Vrakopoulou, B. Li, and **J.L. Mathieu**. "Chance constrained reserve scheduling using uncertain controllable loads, Part I: Formulation and scenario-based analysis". In: *IEEE Transactions on Smart Grid* 10.2 (2019), pp. 1608–1617.
- [J24] B. Li, M. Vrakopoulou, and **J.L. Mathieu**. "Chance constrained reserve scheduling using uncertain controllable loads, Part II: Analytical reformulation". In: *IEEE Transactions on Smart Grid* 10.2 (2019), pp. 1618–1625.
- [J23] B. Li, R. Jiang, and **J.L. Mathieu**. "Ambiguous risk constraints with moment and unimodality information". In: *Mathematical Programming* 173.1-2 (2019), pp. 151–192.

- [J22] N.A. Ryan, Y. Lin, N. Mitchell-Ward, **J.L. Mathieu**, and J.X. Johnson. “Use-phase drives lithium ion battery life cycle environmental impacts when used for frequency regulation”. In: *Environmental Science & Technology* 52.17 (2018), pp. 10163–10174.
- [J21] G.S. Ledva, L. Balzano, and **J.L. Mathieu**. “Real-time energy disaggregation of a distribution feeder’s demand using online learning”. In: *IEEE Transactions on Power Systems* 33.5 (2018), pp. 4730–4740.
- [J20] G.S. Ledva, E. Vrettos, S. Mastellone, G. Andersson, and **J.L. Mathieu**. “Managing communication delays and model error in demand response”. In: *IEEE Transactions on Power Systems* 33.2 (2018), pp. 1299–1308.
- [J19] S. Forrester, A. Zaman, **J.L. Mathieu**, and J.X. Johnson. “Policy and market barriers to energy storage providing multiple services”. In: *The Electricity Journal (Special Issue for the Energy Policy Institute’s Seventh Annual Energy Policy Research Conference)* 30.9 (2017), pp. 50–56.
- [J18] P. Fortenbacher, **J.L. Mathieu**, and G. Andersson. “Modeling and optimal operation of distributed battery storage in low voltage grids”. In: *IEEE Transactions on Power Systems* 32.6 (2017), pp. 4340–4350.
- [J17] Y. Lin, **J.L. Mathieu**, J.X. Johnson, I.A. Hiskens, and S. Backhaus. “Explaining inefficiencies in commercial buildings providing power system ancillary services”. In: *Energy and Buildings* 152 (2017), pp. 216–226.
- [J16] O. Mégel, **J.L. Mathieu**, and G. Andersson. “Hybrid stochastic-deterministic multi-period DC optimal power flow”. In: *IEEE Transactions on Power Systems* 32.5 (2017), pp. 3934–3945.
- [J15] Y. Zhang, S. Shen, and **J.L. Mathieu**. “Distributionally robust chance-constrained optimal power flow with uncertain renewables and uncertain reserves provided by loads”. In: *IEEE Transactions on Power Systems* 32.2 (2017), pp. 1378–1388.
- [J14] Y. Lin, P. Barooah, and **J.L. Mathieu**. “Ancillary services through demand scheduling and control of commercial buildings”. In: *IEEE Transactions on Power Systems* 32.1 (2017), pp. 186–197.
- [J13] 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.
- [J12] T. Haring, **J.L. Mathieu**, and G. Andersson. “Comparing centralized and decentralized contract design enabling direct load control for reserves”. In: *IEEE Transactions on Power Systems* 31.3 (2016), pp. 2044–2054.
- [J11] Y. Lin, J.X. Johnson, and **J.L. Mathieu**. “Emissions impacts of using energy storage for power system reserves”. In: *Applied Energy* 168 (2016), pp. 444–456.
- [J10] O. Mégel, **J.L. Mathieu**, and G. Andersson. “Scheduling distributed energy storage units to provide multiple services under forecast error”. In: *International Journal of Electrical Power and Energy Systems (Special Issue for the 18th Power Systems Computation Conference)* 72 (2015), pp. 48–57.
- [J9] **J.L. Mathieu**, M. Kamgarpour, J. Lygeros, G. Andersson, and D.S. Callaway. “Arbitraging intraday wholesale energy market prices with aggregations of thermostatic loads”. In: *IEEE Transactions on Power Systems* 30.2 (2015), pp. 763–772.
- [J8] **J.L. Mathieu**, M.E.H. Dyson, and D.S. Callaway. “Resource and revenue potential of California residential load participation in ancillary services”. In: *Energy Policy* 80 (2015), pp. 76–87.
- [J7] N.J. Addy, S. Kiliccote, D.S. Callaway, and **J.L. Mathieu**. “How baseline model implementation choices affect demand response assessments”. In: *ASME Journal of Solar Energy Engineering – Including Wind Energy and Building Energy Conservation* 137.2 (2015), p. 021008.
- [J6] J.A. Taylor and **J.L. Mathieu**. “Index policies for demand response”. In: *IEEE Transactions on Power Systems* 29.3 (2014), pp. 1287–1295.

- [J5] **J.L. Mathieu**, S. Koch, and D.S. Callaway. “State estimation and control of electric loads to manage real-time energy imbalance”. In: *IEEE Transactions on Power Systems* 28.1 (2013), pp. 430–440.
- [J4] **J.L. Mathieu**, D.S. Callaway, and S. Kiliccote. “Variability in automated responses of commercial buildings and industrial facilities to dynamic electricity prices”. In: *Energy and Buildings* 43.12 (2011), pp. 3322–3330.
- [J3] **J.L. Mathieu**, P.N. Price, S. Kiliccote, and M.A. Piette. “Quantifying changes in building electricity use, with application to demand response”. In: *IEEE Transactions on Smart Grid* 2.3 (2011), pp. 507–518.
- [J2] **J.L. Mathieu** and J.K. Hedrick. “Transformation of a mismatched nonlinear dynamic system into strict feedback form”. In: *ASME Journal of Dynamical Systems, Measurement, & Control* 133.4 (2011), p. 041010.
- [J1] **J.L. Mathieu**, A.J. Gadgil, S.E.A. Addy, and K. Kowolik. “Arsenic remediation of drinking water using iron-oxide coated coal bottom ash”. In: *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances & Environmental Engineering* 45.11 (2010), pp. 1446–1460.

Book Chapters.....

- [B4] **J.L. Mathieu**. “Algorithms for Energy Justice”. In: *Women in Power: Research and Development Advances in Electric Power Systems*, Springer Women in Engineering and Science Series. Ed. by Jill S. Tietjen, Marija D. Ilic, Lina Bertling Tjernberg, and Noel N. Schulz. Cham, Switzerland: Springer Nature Switzerland AG, 2023.
- [B3] **J.L. Mathieu**. “Demand response: Coordination of flexible electric loads”. In: *Encyclopedia of Systems and Control, 2nd Edition*. Ed. by J. Baillieul and T. Samad. London: Springer, 2020.
- [B2] G.S. Ledva, Z. Du, L. Balzano, and **J.L. Mathieu**. “Disaggregating load by type from distribution system measurements in real-time”. In: *Energy Markets and Responsive Grids*. Ed. by S. Meyn, T. Samad, I.A. Hiskens, and J. Stoustrup. London: Springer, 2018. Chap. 17, pp. 413–437.
- [B1] J.A. Taylor and **J.L. Mathieu**. “Uncertainty in demand response - identification, estimation, and learning”. In: *Tutorials in Operations Research: The Operations Research Revolution*. Ed. by D. Aleman, A. Thiele, J.C. Smith, and H.J. Greenberg. INFORMS, 2015. Chap. 4, pp. 56–70.

Conference Proceedings (**presenter, *contributed equally).....

- [C95] I. Granitsas, G.S. Ledva, I.A. Hiskens, and **J.L. Mathieu**. “Parameter identifiability and estimation of thermostatically controlled loads”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Belgrade, Serbia, June 2023.
- [C94] **H. Moring and **J.L. Mathieu**. “A comparison of strategies for managing energy constraints of energy storage providing frequency regulation”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Lahaina, Maui, HI, Jan. 2023.
- [C93] S. Jang, N. Ozay, and ****J.L. Mathieu**. “Data-driven estimation of probabilistic constraints for network-safe distributed energy resource control”. In: *Proceedings of the Allerton Conference on Communication, Control, and Computing*. Monticello, IL, Oct. 2022, (Invited).
- [C92] **O. Oyefeso, G.S. Ledva, M. Almassalkhi, I.A. Hiskens, and **J.L. Mathieu**. “Control of Aggregate Air-Conditioning Load Using Packetized Energy Concepts”. In: *Proceedings of the IEEE Conference on Control Technology and Applications*. Trieste, Italy, Aug. 2022.
- [C91] **I. Granitsas, I.A. Hiskens, and **J.L. Mathieu**. “Incorporating Delayed Temperature Dynamics into Residential Air Conditioner Models for Grid Frequency Regulation”. In: *Proceedings of the IEEE Conference on Control Technology and Applications*. Trieste, Italy, Aug. 2022.

- [C90] **A. Stuhlmacher and **J.L. Mathieu**. “Uncertainty-Aware Methods for Leveraging Water Pumping Flexibility for Power Networks”. In: *Proceedings of the IREP Symposium on Bulk Power System Dynamics and Control*. Banff, Canada, July 2022.
- [C89] **S. Chen, **J.L. Mathieu**, and P. Seiler. “Stochastic Model Predictive Controller for Wind Farm Frequency Regulation in Waked Conditions”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. Porto, Portugal, June 2022.
- [C88] **A. Stuhlmacher and **J.L. Mathieu**. “Flexible Drinking Water Pumping to Provide Multiple Grid Services”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. Porto, Portugal, June 2022.
- [C87] **H. Moring and **J.L. Mathieu**. “Scheduling battery energy storage systems under battery capacity degradation uncertainty”. In: *Proceedings of the American Control Conference (ACC)*. Atlanta, GA, June 2022.
- [C86] **S.A. Nugroho, I.M. Granitsas, **J.L. Mathieu**, and I.A. Hiskens. “Aggregate modeling and non-disruptive control of residential air conditioning systems with two-zone cooling capacity”. In: *Proceedings of the American Control Conference (ACC)*. Atlanta, GA, June 2022.
- [C85] **J. Peng, **J.L. Mathieu**, C. Hausman, and J. Buchsbaum. “Long-term impacts of energy storage providing regulation on power plant retirements and system emissions”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. (virtual), Jan. 2022.
- [C84] **A. Stuhlmacher, L. Roald, and **J.L. Mathieu**. “Tractable robust drinking water pumping to provide power network voltage support”. In: *Proceedings of the IEEE Conference on Decision and Control (CDC)*. (virtual), Dec. 2021.
- [C83] **S. Jang, N. Ozay, and **J.L. Mathieu**. “Large-scale invariant sets for safe coordination of thermostatic loads”. In: *Proceedings of the American Control Conference (ACC)*. (virtual), May 2021.
- [C82] **H. Lee, S. Lei, and **J.L. Mathieu**. “Generation scheduling to limit PM2.5 emissions and dispersion: A study on the Seasonal Management System of South Korea”. In: *Proceedings of the International Conference on Smart Grids and Energy Systems*. (virtual), Nov. 2020.
- [C81] A. Keskar, S. Lei, T. Webb, S. Nagy, H. Lee, I.A. Hiskens, **J.L. Mathieu**, and J.X. Johnson. “Stay cool and be flexible: energy-efficient grid services using commercial buildings HVAC systems”. In: *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*. (virtual), Aug. 2020.
- [C80] S.C. Ross and ****J.L. Mathieu**. “A method for ensuring a load aggregator’s power deviations are safe for distribution networks”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. (virtual), June 2020.
- [C79] **A. Stuhlmacher and **J.L. Mathieu**. “Water distribution networks as flexible loads: a chance-constrained programming approach”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. (virtual), June 2020.
- [C78] **M. Yao and **J.L. Mathieu**. “Overcoming the practical challenges of applying Steinmetz circuit design to mitigate voltage unbalance using distributed solar PV”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. (virtual), June 2020.
- [C77] **S. Lei, D. Hong, **J.L. Mathieu**, and I.A. Hiskens. “Baseline estimation of commercial building HVAC fan power using tensor decomposition”. In: *Proceedings of the Power Systems Computation Conference (PSCC) and a Special Issue of Electric Power Systems Research*. (virtual), June 2020.
- [C76] **D. Hong, S. Lei, **J.L. Mathieu**, and L. Balzano. “Exploration of tensor decomposition applied to commercial building baseline estimation”. In: *Proceedings of the IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. Ottawa, Canada, Nov. 2019.

- [C75] **A. Stuhlmacher and **J.L. Mathieu**. “Chance-constrained water pumping managing power distribution network constraints”. In: *Proceedings of the North American Power Symposium (NAPS)*. Wichita, KS, Oct. 2019.
- [C74] N. Farquhar and ****J.L. Mathieu**. “Demand response potential of residential thermostatically controlled loads in Michigan”. In: *Proceedings of the IEEE Power & Energy Society General Meeting*. Atlanta, GA, Aug. 2019.
- [C73] **S.C. Ross, P. Nilsson, N. Ozay, and **J.L. Mathieu**. “Managing voltage excursions on the distribution network by limiting the aggregate variability of thermostatic loads”. In: *Proceedings of the American Control Conference (ACC)*. Philadelphia, PA, July 2019, (Invited).
- [C72] **S.C. Ross, N. Ozay, and **J.L. Mathieu**. “Coordination between an aggregator and distribution operator to achieve network-aware load control”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Milan, Italy, June 2019.
- [C71] **M. Yao, I.A. Hiskens, and **J.L. Mathieu**. “Applying Steinmetz circuit design to mitigate unbalance using distributed solar PV”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Milan, Italy, June 2019.
- [C70] A. Kern, J.X. Johnson, and ****J.L. Mathieu**. “Environmental impacts of using energy storage aggregations to provide multiple services”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Wailea, Maui, HI, Jan. 2019.
- [C69] **M. Yao, I.A. Hiskens, and **J.L. Mathieu**. “Improving power system voltage stability by using demand response to maximize the distance to the closest saddle-node bifurcation”. In: *Proceedings of the IEEE Conference on Decision and Control*. Miami, FL, Dec. 2018.
- [C68] **G.S. Ledva, L. Balzano, and **J.L. Mathieu**. “Exploring connections between a multiple model Kalman filter and dynamic fixed share with applications to demand response”. In: *Proceedings of the IEEE Conference on Control Technology and Applications*. Copenhagen, Denmark, Aug. 2018.
- [C67] **A. Keskar, D. Anderson, J.X. Johnson, I.A. Hiskens, and **J.L. Mathieu**. “Experimental investigation of the additional energy consumed by building HVAC systems providing grid ancillary services”. In: *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*. Pacific Grove, CA, Aug. 2018, (Updated version in a special issue of *Energy Efficiency*).
- [C66] **G.S. Ledva, S. Peterson, and **J.L. Mathieu**. “Benchmarking of aggregate residential load models used for demand response”. In: *Proceedings of the IEEE Power & Energy Society General Meeting*. Portland, OR, Aug. 2018, (A best conference paper on “Distribution Systems, Microgrids, and Renewables”, Also a poster).
- [C65] B. Li, R. Jiang, and ****J.L. Mathieu**. “Distributionally robust chance-constrained optimal power flow assuming log-concave distributions”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Dublin, Ireland, June 2018.
- [C64] **L. Herre, L. Söder, and **J.L. Mathieu**. “The flexibility of thermostatically controlled loads a function of price notice time”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Dublin, Ireland, June 2018.
- [C63] M. Yao, D.K. Molzahn, and ****J.L. Mathieu**. “The impact of load models in an algorithm for improving voltage stability via demand response”. In: *Proceedings of the Allerton Conference on Communication, Control, and Computing*. Monticello, IL, Oct. 2017, (Invited).
- [C62] **S. Forrester, **A. Zaman, **J.L. Mathieu**, and J.X. Johnson. “Policy and market barriers to energy storage providing multiple services”. In: *Proceedings of the Energy Policy Institute’s 2017 Energy Policy Research Conference*. Park City, UT, Sept. 2017, (Updated version in a special issue of *The Electricity Journal*).

- [C61] *K. Koorehdavoudi, *M. Yao, **J.L. Mathieu**, and **S. Roy. “Using demand response to shape the fast dynamics of the bulk power network”. In: *Proceedings of the IREP Symposium on Bulk Power System Dynamics and Control*. Espinho, Portugal, Aug. 2017.
- [C60] **M.S. Nazir, S.C. Ross, **J.L. Mathieu**, and I.A. Hiskens. “Performance limits of thermostatically controlled loads under probabilistic switching”. In: *Proceedings of the IFAC World Congress*. Toulouse, France, July 2017.
- [C59] **M. Yao, **J.L. Mathieu**, and D.K. Molzahn. “Using demand response to improve power system voltage stability margins”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Manchester, UK, June 2017, (High quality paper award).
- [C58] **S.C. Ross, G. Vuylsteke, and **J.L. Mathieu**. “Effects of load control for real-time energy balancing on distribution network constraints”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Manchester, UK, June 2017, (Poster presentation).
- [C57] Y. Zhang, S. Shen, **B. Li, and **J.L. Mathieu**. “Two-stage distributionally robust optimal power flow with flexible loads”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Manchester, UK, June 2017, (Poster presentation).
- [C56] J. Chang, **S. Maroukis, F. Pinto, A. Zeynu, **J.L. Mathieu**, and S. Shen. “An interactive game introducing power flow optimization concepts”. In: *Proceedings of the ASEE Annual Conference and Exposition*. Columbus, OH, June 2017.
- [C55] **G.S. Ledva and **J.L. Mathieu**. “A linear approach to manage input delays while supplying frequency regulation using residential loads”. In: *Proceedings of the American Control Conference (ACC)*. Seattle, WA, May 2017, (Invited).
- [C54] **S. Afshari, J. Wolfe, M.S. Nazir, I.A. Hiskens, J.X. Johnson, **J.L. Mathieu**, Y. Lin, A.K. Barnes, D.A. Geller, and S.N. Backhaus. “An experimental study of energy consumption in buildings providing ancillary services”. In: *Proceedings of the IEEE Conference on Innovative Smart Grid Technologies (ISGT), USA*. Arlington, VA, Apr. 2017.
- [C53] **B. Li, R. Jiang, and **J.L. Mathieu**. “Distributionally robust risk-constrained optimal power flow using moment and unimodality information”. In: *Proceedings of the IEEE Conference on Decision and Control (CDC)*. Las Vegas, NV, Dec. 2016.
- [C52] **B. Li, S. Maroukis, Y. Lin, and **J.L. Mathieu**. “Impact of uncertainty from load-based reserves and renewables on dispatch costs and emissions”. In: *Proceedings of the North American Power Symposium (NAPS)*. Denver, CO, Sept. 2016.
- [C51] Y. Lin, ****J.L. Mathieu**, J.X. Johnson, I.A. Hiskens, and S. Backhaus. “Explaining inefficiencies in buildings providing ancillary services”. In: *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*. Pacific Grove, CA, Aug. 2016.
- [C50] **S. Crocker and **J.L. Mathieu**. “Adaptive state estimation and control of thermostatic loads for real-time energy balancing”. In: *Proceedings of the American Control Conference (ACC)*. Boston, MA, July 2016, (Invited, ASME Energy Systems Best Paper Competition Finalist).
- [C49] J.A. Taylor and ****J.L. Mathieu**. “Strategic bidding in electricity markets with only renewables”. In: *Proceedings of the American Control Conference (ACC)*. Boston, MA, July 2016, (Invited).
- [C48] **O. Mégel, G. Andersson, and **J.L. Mathieu**. “Reducing the computational effort of stochastic multi-period DC optimal power flow with storage”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Genoa, Italy, June 2016.
- [C47] ****J.L. Mathieu** and J.A. Taylor. “Controlling nonlinear batteries for power systems: trading off performance and battery life”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Genoa, Italy, June 2016.

- [C46] **Y. Lin, **J.L. Mathieu**, and J.X. Johnson. “Stochastic optimal power flow formulation to achieve emissions objectives with energy storage”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Genoa, Italy, June 2016.
- [C45] J. Liu, G. Martinez, B. Li, **J.L. Mathieu**, and **C.L. Anderson. “Comparing robust and probabilistic reliability for systems with renewables and responsive demand”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Koloa, Kauai, HI, Jan. 2016.
- [C44] **C. Zhong and **J.L. Mathieu**. “Relation between overheating of distribution transformers and switching frequency of electric loads used for demand response”. In: *Proceedings of the North American Power Symposium (NAPS)*. Charlotte, NC, Oct. 2015.
- [C43] **G. Vuylsteke, **J.L. Mathieu**, and P.D. Howe. “Environmental and economic benefits of non-disruptive demand response as a function of consumer information sharing”. In: *Proceedings of the North American Power Symposium (NAPS)*. Charlotte, NC, Oct. 2015.
- [C42] G.S. Ledva, L. Balzano, and ****J.L. Mathieu**. “Inferring the behavior of distributed energy resources with online learning”. In: *Proceedings of the Allerton Conference on Communication, Control, and Computing*. Monticello, IL, Oct. 2015, (Invited).
- [C41] G. Martinez, J. Liu, B. Li, **J.L. Mathieu**, and **C.L. Anderson. “Enabling renewable resource integration: The balance between robustness and flexibility”. In: *Proceedings of the Allerton Conference on Communication, Control, and Computing*. Monticello, IL, Oct. 2015, (Invited).
- [C40] Y. Zhang, S. Shen, and ****J.L. Mathieu**. “Data-driven optimization approaches for optimal power flow with uncertain reserves from load control”. In: *Proceedings of the American Control Conference (ACC)*. Chicago, IL, July 2015, (Invited).
- [C39] **Y. Lin, P. Barooah, and **J.L. Mathieu**. “Ancillary services to the grid from commercial buildings through demand scheduling and control”. In: *Proceedings of the American Control Conference (ACC)*. Chicago, IL, July 2015, (Invited).
- [C38] **B. Li and **J.L. Mathieu**. “Analytical reformulation of chance-constrained optimal power flow with uncertain load control”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Eindhoven, Netherlands, June 2015.
- [C37] **P. Fortenbacher, **J.L. Mathieu**, and G. Andersson. “Optimal real-time control of multiple battery sets for power system applications”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Eindhoven, Netherlands, June 2015.
- [C36] **O. Mège, **J.L. Mathieu**, and G. Andersson. “Stochastic dual dynamic programming to schedule energy storage units providing multiple services”. In: *Proceedings of the IEEE Power & Energy Society PowerTech Conference*. Eindhoven, Netherlands, June 2015.
- [C35] **G.S. Ledva, E. Vrettos, S. Mastellone, G. Andersson, and **J.L. Mathieu**. “Applying networked estimation and control algorithms to address communication bandwidth limitations and latencies in demand response”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Koloa, Kauai, HI, Jan. 2015.
- [C34] Q. Wang, **M. Liu, and **J.L. Mathieu**. “Adaptive demand response: Online learning of restless and controlled bandits”. In: *Proceedings of the IEEE International Conference on Smart Grid Communications (SmartGridComm)*. Venice, Italy, Nov. 2014.
- [C33] **E. Vrettos, **J.L. Mathieu**, and G. Andersson. “Control of thermostatic loads using moving horizon estimation of individual load states”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Wroclaw, Poland, Aug. 2014.

- [C32] **O. Mégel, **J.L. Mathieu**, and G. Andersson. “Scheduling distributed energy storage units to provide multiple services”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Wroclaw, Poland, Aug. 2014, (Updated version in a special issue of the *International Journal of Electrical Power and Energy Systems*).
- [C31] **P. Fortenbacher, **J.L. Mathieu**, and G. Andersson. “Modeling, identification, and optimal control of batteries for power system applications”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Wroclaw, Poland, Aug. 2014.
- [C30] ****J.L. Mathieu**, T.B. Rasmussen, M. Sørensen, H. Jóhannsson, and G. Andersson. “Technical resource potential of non-disruptive residential demand response in Denmark”. In: *Proceedings of the IEEE Power & Energy Society General Meeting*. National Harbor, MD, July 2014, (A best conference paper on “Markets, Economics, and Planning”, Also a poster).
- [C29] **E. Vrettos, **J.L. Mathieu**, and G. Andersson. “Demand response with moving horizon estimation of individual thermostatic load states from aggregate power measurements”. In: *Proceedings of the American Control Conference (ACC)*. Portland, OR, June 2014.
- [C28] **M. Vrakopoulou, **J.L. Mathieu**, and G. Andersson. “Stochastic optimal power flow with uncertain reserves from demand response”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Waikoloa, Hawaii, HI, Jan. 2014.
- [C27] **J. Liu, S. Li, W. Zhang, **J.L. Mathieu**, and G. Rizzoni. “Planning and control of electric vehicles using dynamic energy capacity models”. In: *Proceedings of the IEEE Conference on Decision and Control (CDC)*. Florence, Italy, Dec. 2013.
- [C26] **J.A. Taylor and **J.L. Mathieu**. “Index policies for demand response under uncertainty”. In: *Proceedings of the IEEE Conference on Decision and Control (CDC)*. Florence, Italy, Dec. 2013, (Invited).
- [C25] N.J. Addy, **J.L. Mathieu**, **S. Kiliccote, and D.S. Callaway. “Understanding the effect of baseline modeling implementation choices on analysis of demand response performance”. In: *Proceedings of the ASME International Mechanical Engineering Congress & Exposition (IMECE)*. LBNL-5560E. San Diego, CA, Nov. 2013.
- [C24] ****J.L. Mathieu**, M. González Vayá, and G. Andersson. “Uncertainty in the flexibility of aggregations of demand response resources”. In: *Proceedings of the IEEE Industrial Electronics Society Conference (IECON)*. Vienna, Austria, Nov. 2013, (Invited).
- [C23] **O. Mégel, **J.L. Mathieu**, and G. Andersson. “Maximizing the potential of energy storage for fast frequency control”. In: *Proceedings of the IEEE Conference on Innovative Smart Grid Technologies (ISGT), Europe*. Copenhagen, Denmark, Oct. 2013.
- [C22] **M. Vrakopoulou, S. Chatzivasileiadis, E. Iggland, M. Imhof, T. Krause, O. Mäkelä, **J.L. Mathieu**, L. Roald, R. Wiget, and G. Andersson. “A unified analysis of security-constrained OPF formulations considering uncertainty, risk, and controllability in single and multi-area systems”. In: *Proceedings of the IREP Symposium on Bulk Power System Dynamics and Control*. Rethymnon, Greece, Aug. 2013.
- [C21] **M. Kamgarpour, C. Ellen, S. Esmaeil Zadeh Soudjani, S. Gerwinn, **J.L. Mathieu**, N. Müller, A. Abate, D.S. Callaway, M. Franzle, and J. Lygeros. “Modeling options for demand side participation of thermostatically controlled loads”. In: *Proceedings of the IREP Symposium on Bulk Power System Dynamics and Control*. Rethymnon, Greece, Aug. 2013.
- [C20] **F. Oldewurtel, T. Borsche, M. Bucher, P. Fortenbacher, M. González Vayá, T. Haring, **J.L. Mathieu**, O. Mégel, E. Vrettos, and G. Andersson. “A framework for and assessment of demand response and energy storage in power systems”. In: *Proceedings of the IREP Symposium on Bulk Power System Dynamics and Control*. Rethymnon, Greece, Aug. 2013.

- [C19] ****J.L. Mathieu**, M. Kamgarpour, J. Lygeros, and D.S. Callaway. “Energy arbitrage with thermostatically controlled loads”. In: *Proceedings of the European Control Conference (ECC)*. Zürich, Switzerland, July 2013, (Invited).
- [C18] ****J.L. Mathieu**, T. Haring, J. Ledyard, and G. Andersson. “Residential demand response program design: engineering and economic perspectives”. In: *Proceedings of the European Energy Markets (EEM) Conference*. Stockholm, Sweden, May 2013.
- [C17] ****T. Haring, J.L. Mathieu**, and G. Andersson. “Decentralized contract design for demand response”. In: *Proceedings of the European Energy Markets (EEM) Conference*. Stockholm, Sweden, May 2013.
- [C16] ****J.A. Taylor, J.L. Mathieu**, D.S. Callaway, and K. Poola. “Price and capacity competition in zero-mean storage and demand response markets”. In: *Proceedings of the Allerton Conference on Communication, Control, and Computing*. Monticello, IL, Oct. 2012, (Invited).
- [C15] ****J.L. Mathieu, **M.E.H. Dyson**, and D.S. Callaway. “Using residential electric loads for fast demand response: The potential resource and revenues, the costs, and policy recommendations”. In: *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*. Pacific Grove, CA, Aug. 2012.
- [C14] ****J.L. Mathieu** and D.S. Callaway. “State estimation and control of heterogeneous thermostatically controlled loads for load following”. In: *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*. Wailea, Maui, HI, Jan. 2012, pp. 2002–2011.
- [C13] ****J.L. Mathieu**, D.S. Callaway, and S. Kiliccote. “Examining uncertainty in demand response baseline models and variability in automated responses to dynamic pricing”. In: *Proceedings of the IEEE Conference on Decision and Control and European Control Conference (CDC-ECC)*. LBNL-5096E. Orlando, FL, Dec. 2011, (Invited).
- [C12] ****S. Koch, J.L. Mathieu**, and D.S. Callaway. “Modeling and control of aggregated heterogeneous thermostatically controlled loads for ancillary services”. In: *Proceedings of the Power Systems Computation Conference (PSCC)*. Stockholm, Sweden, Aug. 2011.
- [C11] ****P.N. Price, J.L. Mathieu**, S. Kiliccote, and M.A. Piette. “Using whole-building electric load data in continuous or retro-commissioning”. In: *Proceedings of the National Conference on Building Commissioning*. Cincinnati, OH, Aug. 2011.
- [C10] ****G. Ghatikar, J.L. Mathieu**, M.A. Piette, and S. Kiliccote. “Open automated demand response technologies for dynamic pricing and smart grid”. In: *Proceedings of the Grid Interop Forum*. LBNL-4028E. Chicago, IL, Dec. 2010.
- [C9] S. Kiliccote, ****M.A. Piette, **J.L. Mathieu**, and K. Parrish. “Findings from seven years of field performance data for automated demand response in commercial buildings”. In: *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*. LBNL-3643E. Pacific Grove, CA, Aug. 2010.
- [C8] ****J.L. Mathieu** and J.K. Hedrick. “Robust multivariable dynamic surface control for position tracking of a bicycle”. In: *Proceedings of the American Control Conference (ACC)*. Baltimore, MD, June 2010, pp. 1159–1165.
- [C7] ****J.L. Mathieu**, A.J. Gadgil, D.S. Callaway, P.N. Price, and S. Kiliccote. “Characterizing the response of commercial and industrial facilities to dynamic pricing signals from the utility”. In: *Proceedings of the ASME International Conference on Energy Sustainability*. LBNL-3682E. Phoenix, AZ, May 2010.
- [C6] **J.L. Mathieu, **A.J. Gadgil**, K. Kowolik, S. Qazi, and A.M. Agogino. “Design strategies and preliminary prototype for a low-cost arsenic removal system for rural Bangladesh”. In: *Proceedings of the WEDC Conference on Water, Sanitation, and Hygiene: Sustainable Development and Multisectoral Approaches*. LBNL-2696E. Addis Ababa, Ethiopia, May 2009.

- [C5] ****J.L. Mathieu**, A. Gadgil, K. Kowolik, and S.E.A. Addy. “Removing arsenic from contaminated drinking water in rural Bangladesh: Recent fieldwork results and policy implications”. In: *Proceedings of the UNC Environmental Symposium on Safe Drinking Water: Where Science Meets Policy*. LBNL-2717E. Chapel Hill, NC, Nov. 2008.
- [C4] ****M.B. Greytak**, ****J.L. Mathieu**, K.S. Wasserman, A.K. Baker, J.D. Chambers, and B.M. Mueller. “From waves to watts: a wave energy conversion device for the Charles River Basin”. In: *Proceedings of the Society of Naval Architects and Marine Engineers (SNAME) New England Section Student Paper Night*. Cambridge, MA, Feb. 2004, (Best undergraduate paper award).
- [C3] ****K.S. Wasserman**, **J.L. Mathieu**, M.I Wolf, A. Hathi, S.E. Fried, and A.K. Baker. “Dynamic buoyancy control of an ROV using a variable ballast tank”. In: *Proceedings of the Marine Technology Society/IEEE OCEANs conference*. Vol. 5. San Diego, CA, Sept. 2003, SP2888–SP2893, (Also a poster).
- [C2] ****J.L. Mathieu** and A.K. Hansen. “A chemical sensor to aid in the search for underwater archaeological sites”. In: *Proceedings of the Autonomous Undersea Systems Institute (AUSI) International Symposium on Unmanned, Untethered Submersible Technologies (UUST)*. Durham, NH, Aug. 2003, (Student paper competition winner).
- [C1] ****J.L. Mathieu** and A.K. Hansen. “A chemical sensor to aid in the search for underwater archaeological sites”. In: *Proceedings of the Society of Naval Architects and Marine Engineers (SNAME) New England Section Student Paper Night*. Cambridge, MA, Feb. 2003, (Best undergraduate paper award).

Technical Reports, White Papers, and Discussion Papers.....

- [R16] **J.L. Mathieu**. *Enabling the Operation of Future Grids Using New Tools in Control Theory and AI*. The Bridge. National Academy of Engineering, 51.4 - Winter, 2022.
- [R15] D. Molzahn, L. A. Roald, **J.L. Mathieu**, I. Hiskens, D. Pinney, B. Li, K. Girigoudar, M. Yao, and S. Geng. *Mitigating phase unbalance for distribution systems with high penetrations of solar PV*. Technical Report ANL-21/44. Argonne National Laboratory, Sept. 2021.
- [R14] D. Shropshire, J. Hansen, H. Bryan, A. Wrobel, S. Aumeier, T. Allen, **J.L. Mathieu**, K. Araujo, C. Bell, J. Parsons, and T. Righetti. *Review of feasibility study for nuclear power in West Kalimantan Indonesia: Economic, electricity, finance, and management aspects*. Technical Report INL/LTD-21-64506. Idaho National Laboratory, Sept. 2021.
- [R13] S. Lei, **J.L. Mathieu**, and R. Jain. *Performance of existing baseline models in quantifying the effects of short-term load shifting of campus buildings*. Technical Report SLAC-R-1131. SLAC National Accelerator Laboratory, Sept. 2019.
- [R12] B. Li, R. Jiang, and **J.L. Mathieu**. *The value of including unimodality information in distributionally robust optimal power flow*. arXiv:1811.10217v2. Aug. 2019.
- [R11] P.D. Howe and **J.L. Mathieu**. *Age and perceived benefits are associated with willingness to participate in an electric load control program*. SocArXiv Paper. doi:10.31235/osf.io/rpg46, July 2018.
- [R10] M. Vrakopoulou, S. Chatzivasileiadis, E. Iggland, M. Imhof, T. Krause, O. Mäkelä, **J.L. Mathieu**, L. Roald, R. Wiget, and G. Andersson. *Closure of “A unified analysis of security-constrained OPF formulations considering uncertainty, risk, and controllability in single and multi-area systems”*. Prepared Discussion. IREP Symposium on Bulk Power System Dynamics and Control, Rethymnon, Greece, Sept. 2013.
- [R9] D.S. Callaway, **J.L. Mathieu**, M.E.H. Dyson, M. Kamgarpour, S. Koch, and J. Lygeros. *Mitigating renewables intermittency through non-disruptive distributed load control*. Technical Report. PSERC Industry-University Meeting on Preparing for the Future Grid, Madison, WI, May 2013.
- [R8] **J.L. Mathieu**, T. Haring, and G. Andersson. *Harnessing residential loads for demand response: engineering and economic considerations*. White Paper. Interdisciplinary Workshop on Smart Grid Design and Implementation, Gainesville, FL, Dec. 2012.

- [R7] **J.L. Mathieu** and D.S. Callaway. *The value of real-time data in controlling electric loads for demand response*. White Paper. Carnegie Mellon University Conference on the Electricity Industry: Data Driven Sustainable Energy Systems, Pittsburgh, PA, Mar. 2012.
- [R6] S. Oren, D. Callaway, **J.L. Mathieu**, A. Papavasiliou, T. Mount, M. Zhang, R. Thomas, G. Gross, and A. Dominguez-Garcia. *Renewable energy integration and the impact of carbon regulation on the electric grid*. White Paper. PSERC Future Grid Initiative, 2012.
- [R5] G. Ghatikar, **J.L. Mathieu**, M.A. Piette, E. Koch, and D. Hennage. *Open automated demand response dynamic pricing technologies and demonstration*. Technical Report LBNL-3921E. Lawrence Berkeley National Laboratory, Aug. 2010.
- [R4] **J.L. Mathieu**, T. Khan, K. Jahani, M. Seflek, and A.J. Gadgil. *Berkeley arsenic alleviation group*. White Paper. UC Berkeley Bears Breaking Boundaries Competition, 2007, (First prize – ‘Global Poverty Reduction’ category).
- [R3] **J.L. Mathieu**. *A long range optical hydrothermal plume detector*. Technical Report. Woods Hole Oceanographic Institution, Project supervisor: A. Bradley, 2003.
- [R2] **J.L. Mathieu**. *Acoustic backscatter from sediment and archaeological wood*. Technical Report. University of Southampton Institute for Sound, Vibration Research & MIT Undergraduate Research Opportunities Program, Project supervisors: J. Dix, and D. Mindell, 2003.
- [R1] **J.L. Mathieu** and A.K. Hansen. *A chemical sensor to aid in the search for underwater archaeological sites*. Technical Report No. 2003-1. University of Rhode Island, 2002, pp. 55–62.

Theses.....

- [T2] **J.L. Mathieu**. “Modeling, analysis, and control of demand response resources”. PhD thesis. University of California, Berkeley (LBNL-5544E), May 2012.
- [T1] **J.L. Mathieu**. “Design of a rural water provision system to decrease arsenic exposure in Bangladesh”. MS project report. University of California, Berkeley (LBNL-1422E), Dec. 2008.

Abstracts with Oral Presentations (**presenter, *contributed equally).....

- [A32] S. Jang, N. Ozay, and ****J.L. Mathieu**. *Aggregator-Utility Coordination for Network-Aware DER Control*. Conference on Information Sciences and Systems, Baltimore, MD. Mar. 2023.
- [A31] ****J.L. Mathieu**, S. Jang, N. Ozay, and S.C. Ross. *Network-aware electric load coordination*. INFORMS Annual Meeting, Indianapolis, IN. Oct. 2022.
- [A30] ****J. Peng, J.L. Mathieu, C. Hausman, and J. Buchsbaum**. *Long-term impacts of energy storage providing regulation on power plant retirements and system emissions*. INFORMS Annual Meeting, Indianapolis, IN. Oct. 2022.
- [A29] J. Buchsbaum, ****C. Hausman, J.L. Mathieu, and J. Peng**. *Spillovers from ancillary services to wholesale power markets: Implications for climate policy*. American Economic Association Meeting. Jan. 2022.
- [A28] *****K. Girigoudar, *M. Yao, J.L. Mathieu, and L. Roald**. *Control strategies to mitigate voltage unbalance using solar PV inverters*. INFORMS Annual Meeting (virtual). Oct. 2021.
- [A27] ****A. Stuhlmacher, L. Roald, and J.L. Mathieu**. *An adjustable robust optimization model for drinking water pumping as a flexible load*. INFORMS Annual Meeting (virtual). Oct. 2021.
- [A26] J. Buchsbaum, ****C. Hausman, J.L. Mathieu, and J. Peng**. *Multi-product firms in electricity markets: Implications for climate policy*. Association of Environmental and Resource Economists Summer Conference (virtual). June 2021.

- [A25] J. Buchsbaum, **C. Hausman, **J.L. Mathieu**, and J. Peng. *Multi-product firms in electricity markets: Implications for batteries and climate policy*. Western Economic Association International Conference (virtual). Mar. 2021.
- [A24] J. Buchsbaum, **C. Hausman, **J.L. Mathieu**, and J. Peng. *Spillovers from ancillary services to wholesale power markets: Implications for climate policy*. University of California Energy Institute POWER Conference (virtual). Mar. 2021.
- [A23] A. Keskar, D. Anderson, **J.X. Johnson, I.A. Hiskens, and **J.L. Mathieu**. *Buildings as batteries: An experimental investigation into energy efficiency impacts of demand response*. International Symposium on Sustainable Systems and Technology, Portland, OR. June 2019.
- [A22] **A. Keskar, D. Anderson, J.X. Johnson, I.A. Hiskens, and **J.L. Mathieu**. *Buildings as batteries: An experimental investigation into energy efficiency impacts of demand response*. Engineering Sustainability Conference, Pittsburgh, PA. Apr. 2019.
- [A21] ****J.L. Mathieu** and S.C. Ross. *Distribution network-aware load coordination architectures and control strategies*. Conference on Information Sciences and Systems, Baltimore, MD. Mar. 2019.
- [A20] **B. Li, R. Jiang, and **J.L. Mathieu**. *Distributionally robust chance-constrained optimal power flow assuming log-concave distributions*. INFORMS Annual Meeting, Phoenix, AZ. Nov. 2018.
- [A19] **S.C. Ross and **J.L. Mathieu**. *Stability of electrical grids with 100% renewable generation*. Michigan University-Wide Sustainability & Environment Conference, Ann Arbor, MI. Feb. 2018.
- [A18] **D.K. Molzahn, M. Yao, and **J.L. Mathieu**. *A multi-period OPF approach to improve voltage stability using demand response*. INFORMS Annual Meeting, Houston, TX. Oct. 2017.
- [A17] B. Li, **R. Jiang, and **J.L. Mathieu**. *Ambiguous risk constraints with moment and unimodality information*. INFORMS Annual Meeting, Houston, TX. Oct. 2017.
- [A16] ****J.L. Mathieu** and J. Taylor. *Reducing degradation in batteries used for frequency regulation via nonlinear control*. INFORMS Annual Meeting, Houston, TX. Oct. 2017, Invited.
- [A15] **D.K. Molzahn, M. Yao, and **J.L. Mathieu**. *A multi-period optimal power flow approach to improve power system voltage stability using demand response*. FERC Technical Conference on Increasing Real-Time and Day-Ahead Market Efficiency through Improved Software, Washington, DC. June 2017.
- [A14] **N. Ryan, Y. Lin, N. Mitchell-Ward, **J.L. Mathieu**, and J.X. Johnson. *Life cycle environmental impacts of using lithium ion batteries for power system reserves and strategies for mitigation*. International Society for Industrial Ecology and International Symposium on Sustainable Systems and Technology Joint Conference, Chicago, IL. June 2017.
- [A13] **N. Ryan, Y. Lin, N. Mitchell-Ward, **J.L. Mathieu**, and J.X. Johnson. *Life cycle environmental impacts of using lithium ion batteries for power system reserves and strategies for mitigation*. Association of Environmental Engineering and Science Professors Biennial Conference, Ann Arbor, MI. June 2017.
- [A12] **N. Ryan, Y. Lin, N. Mitchell-Ward, **J.L. Mathieu**, and J.X. Johnson. *Life cycle environmental impacts of using lithium ion batteries for power system reserves and strategies for mitigation*. Engineering Sustainability Conference, Pittsburgh, PA. Apr. 2017.
- [A11] **B. Li, R. Jiang, and **J.L. Mathieu**. *Distributionally robust risk-constrained optimal power flow using moment and unimodality information*. INFORMS Annual Meeting, Nashville, TN. Nov. 2016, Invited.
- [A10] Y. Lin, N. Mitchell-Ward, **J.L. Mathieu**, and **J.X. Johnson. *Examining life cycle environmental impacts of energy storage for power system reserves*. INFORMS Annual Meeting, Nashville, TN. Nov. 2016, Invited.
- [A9] Y. Lin, **J.L. Mathieu**, **N. Mitchell-Ward, and J. Johnson. *Examining life cycle environmental impacts of energy storage for power system reserves*. International Symposium on Sustainable Systems and Technology, Phoenix, AZ. May 2016.

- [A8] ****J.** Taylor and **J.L. Mathieu**. *Strategic price bidding in electricity markets with only renewables*. INFORMS Annual Meeting, Philadelphia, PA. Nov. 2015, Invited.
- [A7] ****J.L. Mathieu**, O. Mgel, and G. Andersson. *Scheduling energy storage resources to provide multiple services*. INFORMS Annual Meeting, Philadelphia, PA. Nov. 2015, Invited.
- [A6] ****J.L. Mathieu**, Y. Zhang, S. Shen, and B. Li. *Chance-constrained optimal power flow with uncertain reserves*. INFORMS Annual Meeting, Philadelphia, PA. Nov. 2015, Invited.
- [A5] ****J.L. Mathieu**, S. Shen, Y. Zhang, and B. Li. *Data-driven optimization approaches for optimal power flow with uncertain reserves from load control*. FERC Technical Conference on Increasing Real-Time and Day-Ahead Market Efficiency through Improved Software, Washington, DC. June 2015.
- [A4] ****J.L. Mathieu**, M. Vrakopoulou, G. Andersson, and S. Shen. *Stochastic optimal power flow with uncertain reserves from flexible loads*. FERC Technical Conference on Increasing Real-Time and Day-Ahead Market Efficiency through Improved Software, Washington, DC. June 2014.
- [A3] ****J.L. Mathieu** and E. Vrettos and G. Andersson. *Control of thermostatic loads using moving horizon estimation of individual load states*. Midwest Workshop on Control and Game Theory, Columbus, OH. Apr. 2014.
- [A2] ****J.L. Mathieu**, M.E.H. Dyson, and D.S. Callaway. *Using residential loads like grid-scale batteries: The resource, potential revenues, and costs*. Los Alamos National Laboratory Conference on Optimization and Control for Smart Grids, Santa Fe, NM. May 2012.
- [A1] ****J.L. Mathieu** and D.S. Callaway. *Using residential electric loads in energy and ancillary services markets*. Trans-Atlantic INFRADAY Conference on Applied Infrastructure Modeling and Policy Analysis, Pre-conference Event at FERC, Washington, DC. Nov. 2011.

Posters (****denotes presenter**).....

- [P39] ****A.** Stuhlmacher, **J.L. Mathieu**, and P. Seiler. *Optimizing dual-axis solar panel operation in an agrivoltaic system under uncertainty*. AgriVoltaics World Conference (virtual). Apr. 2023.
- [P38] ****N.** Ozay, **J.L. Mathieu**, and ****S.** Jang. *Scalable and safe control synthesis for systems with symmetries*. NSF CPS PI Meeting (Arlington, VA). Nov. 2022.
- [P37] ****J.L. Mathieu**, C. Gronlund, M. O'Neill, S. Miller, T. Reames, ****Z.** Rowe, ****S.** Clark, R. Garcia, ****G.** Washington, R. Nikodem, M. Miller, ****J.** Brooks, X. Farrell, ****M.** Hall, D. Smith, and K.C. Ketenci. *Reducing barriers to residential energy security*. NSF Smart and Connected Communities PI Meeting (Arlington, VA). Oct. 2022.
- [P36] ****S.** Jang, N. Ozay, and **J.L. Mathieu**. *Safe coordination of thermostatic loads with scalable invariant set construction*. NREL Workshop on Autonomous Energy Systems (Golden, CO). July 2022.
- [P35] ****H.** Moring and **J.L. Mathieu**. *Scheduling battery energy storage systems under battery capacity degradation uncertainty*. NREL Workshop on Autonomous Energy Systems (Golden, CO). July 2022.
- [P34] ****A.** Stuhlmacher and **J.L. Mathieu**. *Computationally tractable uncertainty-aware framework for optimal water pumping in coupled power-water systems*. NREL Workshop on Autonomous Energy Systems (Golden, CO). July 2022.
- [P33] ****D.** Li, A. Stuhlmacher, and **J.L. Mathieu**. *Estimating the demand response potential of drinking water distribution networks in Arizona*. University of Michigan Undergraduate Research Symposium, Ann Arbor, MI. Apr. 2022.
- [P32] ****C.** Bertcher, A. Stuhlmacher, and **J.L. Mathieu**. *Comparison of linearized three-phase unbalanced power flow models*. IEEE Power & Energy Society General Meeting Student Poster Competition (virtual). July 2021.

- [P31] **N. Ozay and **J.L. Mathieu**. *Scalable and safe control synthesis for systems with symmetries*. NSF CPS PI Meeting (virtual). May 2021.
- [P30] **O. Oyefeso, G.S. Ledva, **J.L. Mathieu**, and I.A. Hiskens. *Aggregate modeling and asynchronous, anonymous coordination of distributed air conditioning load resources under packetized energy management*. UM Engineering Research Symposium (virtual). Feb. 2021.
- [P29] ****J.L. Mathieu**. *Overcoming the technical challenges of coordinating distributed load resources at scale*. ARPA-E 2018 OPEN Grid Projects Kick-off Meeting, New Orleans, LA. Feb. 2020.
- [P28] N. Ozay and ****J.L. Mathieu**. *Scalable and safe control synthesis for systems with symmetries*. NSF CPS PI Meeting, Arlington, VA. Nov. 2019.
- [P27] **B. Hicks, H. Lee, S. Lei, and **J.L. Mathieu**. *Alternative technique in the approximation of comparative baselines for the energy efficiency evaluation of HVAC systems during demand response events*. UM Summer Research Opportunities Program Symposium, Ann Arbor, MI. July 2019.
- [P26] **C. Bertcher, A. Stuhlmacher, and **J.L. Mathieu**. *UM bus electrification: Challenges and solutions*. University of Michigan Undergraduate Research Symposium, Ann Arbor, MI. Apr. 2019.
- [P25] **A. Stuhlmacher and **J.L. Mathieu**. *Stochastic water distribution network operation considering power distribution network constraints*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2018.
- [P24] **S.C. Ross, G. Vuylsteke, and **J.L. Mathieu**. *Effects of load-based frequency regulation on distribution network operation*. University of Vermont Future of Energy Workshop, Burlington, VT. Sept. 2018. (Best poster award).
- [P23] **B. Li, R. Bent, H. Nagarajan, R. Jiang, and **J.L. Mathieu**. *Decomposition and cutting-plane based algorithm for stochastic climate adaptation problem using special ordered sets*. Los Alamos National Laboratory Student Symposium, Los Alamos, NM. July 2018. (Outstanding poster award - computing).
- [P22] **A. Keskar, S. Afshari, P. Giessner, D. Anderson, I. Hiskens, J.X. Johnson, and **J.L. Mathieu**. *Using University of Michigan buildings as batteries*. Michigan University-Wide Sustainability & Environment Conference, Ann Arbor, MI. Feb. 2018.
- [P21] **M. Yao, D.K. Molzahn, and **J.L. Mathieu**. *The impact of load models in an algorithm for improving voltage stability via demand response*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2017.
- [P20] **A. Kern, O. Mégel, J.X. Johnson, and **J.L. Mathieu**. *Approximation methods for scheduling battery energy storage for multiple services*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2017.
- [P19] **A. Stuhlmacher, **J.L. Mathieu**, and V. Gupta. *Water-power distribution network coupling for optimal pumping to reduce energy costs and promote resilience*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2017.
- [P18] **A. Keskar, S. Afshari, I. Hiskens, J.X. Johnson, and **J.L. Mathieu**. *Quantifying energy efficiencies of buildings providing ancillary services*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2017.
- [P17] **S.C. Ross, G. Vuylsteke, and **J.L. Mathieu**. *Impacts on the local power network when residential loads provide energy balancing services to the regional network*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2017.
- [P16] **A. Keskar, S. Afshari, I. Hiskens, J.X. Johnson, and **J.L. Mathieu**. *Improving the energy efficiency of buildings participating in power system ancillary services*. MCubed Symposium, Ann Arbor, MI. Nov. 2017.
- [P15] **P. Giessner, I. Hiskens, **J.L. Mathieu**, J. Johnson, S. Afshari, and A. Keskar. *Energy storage through building HVAC systems*. UM Undergraduate Research Opportunities Program Symposium, Ann Arbor, MI. Aug. 2017.

- [P14] **M. Yao, **J.L. Mathieu**, and D.K. Molzahn. *Using demand response to improve electric power system stability margins*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2016.
- [P13] **S. Crocker, A. Stuhlmacher, and **J.L. Mathieu**. *Effects of aggregate load control on the physical components of distribution networks*. IEEE Power & Energy Society General Meeting Student Poster Competition, Boston, MA. July 2016.
- [P12] **A. Stuhlmacher, S. Crocker, and **J.L. Mathieu**. *Effects of aggregate load control on the physical components of distribution networks*. UM Summer Research Opportunities Program Symposium, Ann Arbor, MI. July 2016.
- [P11] **S. Crocker and **J.L. Mathieu**. *Adaptive state estimation and control of thermostatic loads for real-time energy balancing*. UM Engineering Research Symposium, Ann Arbor, MI. Oct. 2015.
- [P10] **B. Li and **J.L. Mathieu**. *Chance-constrained optimal power flow with uncertain load control*. UM Engineering Research Symposium, Ann Arbor, MI. Oct. 2015.
- [P9] **Y. Lin, **J.L. Mathieu**, and J. Johnson. *Environmental impacts of using distributed energy storage for power system reserves*. International Symposium on Sustainable Systems and Technology, Dearborn, MI. May 2015.
- [P8] **G.S. Ledva, E. Vrettos, S. Mastellone, G. Andersson, and **J.L. Mathieu**. *Applying networked estimation and control algorithms to address communication bandwidth limitations and latencies in demand response*. UM Engineering Research Symposium, Ann Arbor, MI. Nov. 2014.
- [P7] **G. Vuylsteke, **J.L. Mathieu**, and P. Howe. *Tangible benefits of using non-disruptive demand response to help the power grid*. UM Undergraduate Research Opportunities Program Symposium, Ann Arbor, MI. Aug. 2014.
- [P6] ****J.L. Mathieu** and D.S. Callaway. *Mitigating renewables intermittency through non disruptive load control*. PSERC Future Grid Initiative Workshop, Berkeley, CA. Dec. 2011.
- [P5] ****J.L. Mathieu**, S. Koch, and D.S. Callaway. *Modeling, state estimation, and control of thermostatically controlled loads for load following and regulation*. UC Berkeley Energy Symposium, Berkeley, CA. Oct. 2011.
- [P4] ****J.L. Mathieu**, S. Koch, and D.S. Callaway. *Modeling, state estimation, and control of thermostatically controlled loads for load following and regulation*. Lawrence Livermore National Laboratory Current Challenges in Computing Conference: Energy Resources Modeling, Napa, CA. Aug. 2011.
- [P3] ****J.L. Mathieu**, A.J. Gadgil, D.S. Callaway, P.N. Price, and S. Kiliccote. *Response of commercial and industrial facilities to dynamic electricity prices*. UC Berkeley Energy Symposium, Berkeley, CA. Mar. 2010.
- [P2] **M. Seflek, **T. Khan, **J.L. Mathieu**, K. Jahani, and A.J. Gadgil. *Arsenic-free Bangladesh*. National Collegiate Inventors and Innovators Alliance Annual Conference, Tampa, FL. Mar. 2007.
- [P1] **K. Wasserman, M.B. Greytak, **J.L. Mathieu**, A.K. Baker, J.D. Chambers, and B.M. Mueller. *From waves to watts: A wave energy conversion device for the Charles river basin*. Marine Technology Society & IEEE OCEANs Conference Student Poster Session, Kobe, Japan. Feb. 2004.

Funding

NSF Civic Innovation Challenge Stage 1

\$50k

Designing a Decarbonization-Ready Common Home Assessment

Oct 2022 - Mar 2023

Co-PI, with PI Suzanne Russo (Pecan Street) and team members Joshua Elling (Jefferson East Inc) and Gibran Washington (EcoWorks)

UM Bold Challenges Winter 2022 Incubation + Nurture Phases	\$75k
<i>Equitable Mitigation, Adaptation, and Resilience for Infrastructure Systems</i>	
Jan 2022 - Apr 2023	
Team Member, with Lead Parth Vaishnav (SEAS), and team members Michael Craig (SEAS) and Carina Gronlund (ISR)	
UM Research Catalyst and Innovation (RCI) Program Anti-Racism Grant	\$50k
<i>Enhanced Energy Monitoring for Energy Justice in Detroit</i>	
Sep 2021 - Aug 2023	
PI, with team members Tony Reames (SEAS), Carina Gronlund (ISR), Marie O'Neill (SPH), Rachel Jenkins (Pecan Street), and Gibran Washington (EcoWorks)	
NSF Smart and Connected Communities Grant (Track 1) & REU Supplement	\$2,116k
<i>Reducing Barriers to Residential Energy Security through an Integrated Case-management, Data-driven, Community-based Approach</i>	
Sep 2020 - Aug 2024	
Co-PI, with PI Tony Reames (SEAS) and Co-PIs Carina Gronlund (ISR), and Marie O'Neill (SPH)	
NSF I-Corps Grant	\$50k
<i>Fast Timescale Residential Demand Response</i>	
Jun 2020 - Nov 2023	
Technical Lead, with Entrepreneurial Lead Gregory Ledva and Industry Mentor Hawk Asgeirsson	
ARPA-E OPEN Project	\$2,900k
<i>Overcoming the Technical Challenges of Coordinating Distributed Load Resources at Scale</i>	
Jun 2019 - Mar 2023	
PI, with team members Ian Hiskens, Duncan Callaway, Drew Geller (LANL), and Scott Hinson (Pecan Street)	
NSF CAREER Award & REU Supplement	\$516k
<i>Stochastic Capacity Scheduling and Control of Distributed Energy Storage Enabling Stacked Services</i>	
Feb 2019 - Jan 2024	
PI	
Alfred P. Sloan Foundation Grant	\$250k
<i>Price, Generation, Emissions, and Transmission Impacts of Energy Storage in PJM</i>	
Jan 2019 - Dec 2021	
Co-PI, with PI Catherine Hausman (Public Policy)	
NSF CPS Grant (Small)	\$500k
<i>Scalable and Safe Control Synthesis for Systems with Symmetries</i>	
Jan 2019 - Dec 2023	
Co-PI, with PI Necmiye Ozay	
DOE Building Technologies Office – Subcontract from SLAC National Accelerator Laboratory	\$525k
<i>I-DREEM: Impact of Demand Response on short and long term building Energy Efficiency Metrics</i>	
Feb 2018 - Feb 2022	
UM PI and Lead Co-PI, with Lead PI Rishee Jain and team members Ian Hiskens and Jeremiah Johnson	
Full project funding: \$1,700k	
DOE Solar Energy Technologies Office – Subcontract from Argonne National Laboratory	\$220k
<i>Mitigating Phase Unbalance for Distribution Systems with High Penetrations of Solar PV</i>	
Nov 2018 - Dec 2019	
UM PI, with Lead PI Daniel Molzahn and team members Ian Hiskens, Line Roald, and David Pinney (NRECA)	
Full project funding: \$750k	

<p>NSF Engineering Research Center Planning Grant <i>Comprehensive Energy Storage Solutions in Electrified Transportation</i> Sep 2018 - Aug 2019 Co-I, with PI Anna Stefanopoulou and Co-PIs Heath Hofmann, Don Siegel, Christian Lastoskie, and Chris Mi</p>	\$100k
<p>Michigan Institute for Computational Discovery and Engineering Catalyst Grant <i>Computational Energy Systems</i> Apr 2017 - Mar 2018 Co-PI, with PI Pascal Van Hentenryck and Co-PIs Jon Lee, Ruiwei Jiang, and Eunshin Byon</p>	\$75k
<p>UM College of Engineering Team Development Seed Funding <i>Harnessing Highly Distributed Load Resources for Renewable Integration</i> Sep 2016 Collaboration with Ian Hiskens</p>	\$7k
<p>UM Office of Research Seminar Grant & Renewal <i>Seminar Series on Emerging Topics in Sustainable Electric Power Systems</i> Jul 2016 - Jun 2018 PI, with organizational team Ian Hiskens, Pascal Van Hentenryck, Ruiwei Jiang, and Jeremiah Johnson Matching funds from ECE, IOE, SNRE/SEAS, UMEI: \$11.5k</p>	\$15k
<p>UM Graham Sustainability Institute MCubed Sustainability Block Grant <i>Urban Sustainability: Energy, Food and Health</i> Jun 2016 - May 2017 Collaboration with Marie O'Neill and Ming Xu</p>	\$10k
<p>UM MCubed Program Grant <i>Improving the Energy Efficiency of Buildings Participating in Power System Ancillary Services</i> Oct 2015 - Dec 2017 Collaboration with Jeremiah Johnson and Ian Hiskens</p>	\$60k
<p>NSF EAGER: Renewables <i>Demand Response Algorithms to Improve Electric Power System Stability Margins</i> Sep 2015 - Aug 2018 PI</p>	\$279k
<p>NSF Environmental Sustainability Grant <i>Environmental Impacts of Using Distributed Energy Storage for Power System Reserves</i> Sep 2015 - Aug 2019 Co-PI, with PI Jeremiah Johnson</p>	\$310k
<p>NSF EPCN Grant & REU Supplement <i>Inferring the Behavior of Distributed Energy Resources from Incomplete Measurements</i> Aug 2015 - Jul 2019 PI, with Co-PI Laura Balzano</p>	\$408k
<p>NSF CyberSEES Grant (Type 1) & REU Supplement <i>Data-Driven Approaches to Managing Uncertain Load Control in Sustainable Power Systems</i> Sep 2014 - Aug 2017 PI, with Co-PIs Siqian Shen and Ian Hiskens</p>	\$416k

UM Energy Institute PISET Grant & Renewal

\$80k

Assessing the Environmental Impacts of Providing Power System Reserves with Demand Response and Distributed Energy Storage

Sep 2014 - Dec 2016

Collaboration with Jeremiah Johnson

Talks

- (Upcoming) IEEE PES PowerTech (Belgrade, Serbia), Panel: DER operating envelopes and their applications in energy markets and planning, *Network-aware control of DER aggregations through utility-aggregator coordination*, Jun 2023.
- (Upcoming) NSF Joint US-European Workshop: Flexible Electric Grid Critical Infrastructure for Resilient Society (Philadelphia, PA), Panel: TBD, TBD, Apr 2023.
- Cell Press Sustainability Forum (virtual), Panel: Interfacing Renewable Energy Infrastructure and Human Behavior to Pursue Energy Security, Mar 1, 2023.
- Faculty Symposium on Anti-Racism Research & Scholarship at UM (Ann Arbor, MI), Panel: Developing Anti-Racist Practices, Protocols, & Interventions, *Energy Justice for Detroit*, Jan 31, 2023.
- University of Vermont (Burlington, VT), *Balancing Power Grids with Aggregations of Residential Air Conditioning Units – Control Design, Experiments, and Field Tests*, Nov 11, 2022.
- DOE SETO Solar Colloquium (virtual), *Algorithms for Energy Justice*, Sep 15, 2022.
- University of Washington Clean Energy Institute International Conference on Energy Conversion and Storage (Friday Harbor, WA), *How Energy Storage Affects Grid Emissions: Empirical and Simulation Results*, Sep 10, 2022.
- IEEE PES General Meeting (Denver, CO), Panel: Cyber Secure Grid-Interactive Efficient Buildings to Enhance Power System Flexibility and Resilience, *Aggregations of Houses Improving Grid Reliability Through Provision of Fast Grid Services - Preliminary Results from Experimental and Field Testing*, Jul 21, 2022.
- IEEE PES General Meeting (Denver, CO), Panel: Women in Power (WIP) Technical Session, *Aggregate Load Coordination to Balance Renewable Generation*, Jul 19, 2022.
- NREL Workshop on Autonomous Energy Systems (Golden, CO), *Data-Driven Algorithms for Energy Justice in Detroit*, Jul 14, 2022.
- Pecan Street Webinar (virtual), *Air Conditioning and the Grid: Can Better Technology Ease the Pressure of a Warming Planet*, Jun 2, 2022. (with Scott Hinson and Gregory Ledva)
- DISTRIBUTECH (Dallas, TX), *Field Testing Fast Timescale Energy Balancing Using Residential Compressor-based Loads*, May 24, 2022. (with Scott Hinson)
- IEEE PES T&D Conference, Panel: Distribution Network-Aware DER Coordination (New Orleans, LA), *Network Safe Control of TCLs Using Formal Methods*, Apr 26, 2022.
- MIT enOPTIMAL Seminar Series (virtual), *Planning for Uncertainty in Coupled Power-Water Distribution Networks*, Mar 11, 2022.
- Swiss National Competence Center for Research (NCCR) Automation Seminar Series (virtual), *Managing Uncertainty in Coupled Power and Water Distribution Networks*, Sep 27, 2021.
- NREL Workshop on Resilient Autonomous Energy Systems (virtual), *Impact of Market Timing on the Profit of a Risk-Averse Load Aggregator*, Sep 8, 2021.
- IEEE PES General Meeting (virtual), Super Session: Grid Edge - Devices, Control, Applications and System Operation, *Establishing Credibility for Load Coordination at Scale*, Jul 28, 2021.
- IEEE PES General Meeting (virtual), Panel: Physics-Informed Machine Learning for Power Systems, *Separating Feeder Demand Into Components Using Diverse Measurements from the Distribution Network, Physics-based Models, and Online Learning*, Jul 26, 2021.

- University of Massachusetts (virtual), *Real-Time Disaggregation of Electric Feeder Demand Using Online Learning*, Apr 16, 2021.
- National Academy of Engineering US Frontiers of Engineering Symposium (virtual), *Enabling the Operation of Future Grids Using New Tools in Control Theory and AI*, Feb 25, 2021.
- Implementing the A²Zero Carbon Neutrality Plan in Buildings Series (virtual), Panel: Electrification & Decarbonization Strategies, *Leveraging (existing + newly electrified) Flexible Resources to Decarbonize the Grid*, Feb 9, 2021.
- University of Washington (virtual), *Managing Uncertainty in Coupled Power and Water Distribution Networks*, Jan 19, 2021.
- International Workshop on Non-Intrusive Load Monitoring (virtual), *Applications of Non-Intrusive Load Monitoring (NILM) to Power Systems and New NILM-type Problems*, Nov 18, 2020. (Keynote)
- IEEE SmartGridComm (virtual), Special Session: Special Topics @ SmartGridComm 2020, *Coordinating DERs to Provide Ancillary Services Without Hurting the Distribution Network*, Nov 11, 2020.
- Carnegie Mellon University (virtual), *Network-Aware Electric Load Coordination Architectures and Control Strategies*, Oct 9, 2020.
- International Conference on Probabilistic Methods Applied to Power Systems (virtual), Panel: Economic Considerations of Risk and Uncertainty, *Strategies for Network-Safe Load Control by a Third-Party Aggregator*, Aug 20, 2020.
- IEEE PES General Meeting (virtual), Panel: Research and Educational Experiences of NSF CAREER Awardees, *Stochastic Capacity Scheduling and Control of Distributed Energy Storage Enabling Stacked Services*, Aug 5, 2020.
- Iowa State University (virtual), *Network-Aware Electric Load Coordination Architectures and Control Strategies*, Jul 21, 2020.
- Colorado School of Mines (Golden, CO), *Network-Aware Electric Load Coordination Architectures and Control Strategies*, Feb 28, 2020.
- ARPA-E Open 2018 – Grid Projects Kick-off Meeting (New Orleans, LA), *Overcoming the Technical Challenges of Coordinating Distributed Load Resources at Scale*, Feb 19, 2020.
- NSF CPS PI Meeting (Arlington, VA), *Lightning Talk: Scalable and Safe Control Synthesis for Systems with Symmetries*, Nov 22, 2019.
- Georgia Tech Workshop on Electric Energy Systems and Optimization (Atlanta, GA), *The Value of Including Unimodality Information in Distributionally Robust Optimal Power Flow*, Nov 15, 2019.
- IEEE Global Conference on Signal and Image Processing (Ottawa, Canada), Symposium: Machine Learning, Optimization, and Security for Future Energy Delivery Systems, *Learning About Loads to Improve Power System Operation and Control*, Nov 13, 2019. (Keynote)
- North Carolina State University (Raleigh, NC), Panel: Power Shift – The Future of Energy and the Women Shaping It, Nov 5, 2019.
- Michigan Public Services Commission Distribution Planning Stakeholder Meeting (Lansing, MI), *DER Coordination as a Non-wire Solution: Opportunities and Challenges in Michigan*, Oct 16, 2019.
- IEEE PES General Meeting (Atlanta, GA), Panel: The Economics of Battery Storage under Different Market Structures, *Scheduling and Controlling Aggregations of Distributed Energy Storage Devices to Provide Stacked Services*, Aug 8, 2019.
- IEEE PES General Meeting (Atlanta, GA), Panel: Distributed Demand Response Dilemma: Defect or Engage, *Coordinating Loads to Provide Ancillary Services While Keeping Consumers Happy*, Aug 6, 2019.
- Ford Motor Company Research and Innovation Center (Dearborn, MI), *Coordinating Uncertain Electric Vehicles for Grid Services*, Jun 5, 2019.

- Isaac Newton Institute (Cambridge, UK), The Mathematics of Energy Systems Closing Workshop: Looking forward to 2050, *Optimal Power Flow with Stochastic Reserves*, Apr 30, 2019.
- Ceres and UM Energy Institute Electric Vehicle Open Forum and Policy Roundtable (Ann Arbor, MI), Panel: Michigan's Grid and Charging Infrastructure: Empirical Analysis and Outlook, Apr 3, 2019.
- UM SEAS Climate + Energy Theme Lightning Talks (Ann Arbor, MI), *Supporting Renewable Energy Integration with Flexible Loads and Storage*, Mar 21, 2019.
- UM SEAS Cities + Mobility + Built Environment Theme Lightning Talks (Ann Arbor, MI), *Using Appliances and University of Michigan Buildings as Batteries to Support Renewable Energy Integration*, Feb 27, 2019.
- Indian Institute of Technology Bombay – NSF – Japan Science and Technology Agency – Research Council of Norway Workshop on Distributed Energy Management and Data Sciences for Smart Grids (Mumbai, India), *Network-Aware Cost-Effective Coordination of Distributed Energy Resources*, Jan 15, 2019.
- Michigan State University (East Lansing, MI), *An Optimal Power Flow Approach to Improve Power System Voltage Stability Using Demand Response*, Oct 11, 2018.
- University of Vermont Future of Energy Workshop (Burlington, VT), *Coordinating Distributed Energy Resources Without Breaking the Bank, or the Grid*, Sep 27, 2018. (Keynote)
- IEEE PES General Meeting (Portland, OR), Panel: The Role of DERs in the Transmission-Distribution Coordination, *Using DERs in the Distribution System to Improve Transmission System Voltage and Rotor Angle Stability*, Aug 9, 2018.
- University of Michigan Energy Institute UROP Lunchbox Discussion (Ann Arbor, MI), *Coordinating Electric Loads to Improve Power System Sustainability, Reliability, and Economics*, Jul 24, 2018.
- University of Illinois Urbana Champaign (Urbana, IL), *Real-Time Energy Disaggregation of a Distribution Feeder's Demand Using Online Learning*, Apr 23, 2018.
- Stanford Smart Grid Seminar (Palo Alto, CA), *A Multiperiod Optimal Power Flow Approach to Improve Power System Voltage Stability Using Demand Response*, Mar 1, 2018.
- Technical University of Denmark (Lyngby, Denmark), *Demand Response Algorithms to Improve Electric Power System Stability Margins*, Jun 26, 2017.
- Commonwealth Scientific and Industrial Research Organisation (CSIRO) Energy Centre (Newcastle, Australia), *Overview of Load Control Research*, Nov 10, 2016.
- IEEE SmartGridComm (Sydney, Australia), Workshop: Smart Buildings As Enablers for a Smarter Grid, *Engaging Distributed Flexible Electric Loads in Power System Operation*, Nov 6, 2016.
- UM Control Seminar (Ann Arbor, MI), *Optimal Scheduling and Control of Distributed Energy Storage to Provide Power Grid Support*, Sep 23, 2016.
- IEEE PES General Meeting (Boston, MA), Panel: Modeling the End-User in CPS-based Simulation Studies, *Scheduling and Controlling Building Power Consumption to Provide Ancillary Services*, Jul 20, 2016.
- NSF Workshop on Cyber-Physical Systems Applications to the Power Grid (Boston, MA), *Scheduling, Inference, and Coordination of Distributed Energy Resources: Overview of 3 NSF-funded projects*, Jul 16, 2016.
- Göran Andersson's Farewell Event at ETH Zurich (Zurich, Switzerland), *Managing Communication Delays and Model Error in Demand Response*, Jun 10, 2016.
- Institute for Mathematics and its Applications (Minneapolis, MN), Workshop: Control at Large Scales – Energy Markets and Responsive Grids, *Inferring the Behavior of Distributed Flexible Electric Loads*, May 12, 2016.
- University of California at San Diego Seminars in Energy Research (San Diego, CA), *Inference and Control of Electric Loads Given Sparse Measurements and Communications Delays*, Apr 20, 2016.
- MIT Department of Mechanical Engineering (Cambridge, MA), *Inference and Control of Electric Loads Given Sparse Measurements and Communications Delays*, Apr 8, 2016.

- University of Toronto Centre for Power and Information Seminar (Toronto, Canada), *Inference and Control of Distributed Energy Resources with Sparse Measurements and Communications Delays*, Dec 4, 2015.
- LBNL/UC Berkeley DR/Renewables/ISO Meeting (Berkeley, CA), *Scheduling and Coordinating Uncertain Electric Loads to Provide Power System Reserves*, Mar 6, 2015.
- Cornell University Information, Systems, and Networks Seminar Series (Ithaca, NY), *Uncertain Power System Reserves from Electric Loads*, Nov 14, 2014.
- Schloss Dagstuhl (Wadern, Germany), Seminar: Modeling, Verification, and Control of Complex Systems for Energy Networks, *Uncertain Power System Reserves from Loads*, Oct 30, 2014.
- UM ECE Administrative Staff Lecture (Ann Arbor, MI), *How Your Refrigerator Can Help Get More Renewable Energy on the Power Grid*, Oct 17, 2014.
- IEEE Transportation Electrification Conference and Expo (Dearborn, MI), Panel: Transportation Technologies of Vehicle to Infrastructure Interaction: Current Status and Challenges, *Coordinating Uncertain Electric Vehicles for Demand Response*, Jun 16, 2014.
- Los Alamos National Laboratory Center for Nonlinear Studies (Los Alamos, NM), *Planning and Control of Uncertain Electric Loads to Help out the Power Grid*, Apr 29, 2014.
- University of New Mexico Department of Mechanical Engineering (Albuquerque, NM), *How Your Refrigerator Can Help Get More Renewable Energy on the Power Grid*, Apr 11, 2014.
- IEEE UM Student Branch – Professor Speaker Series (Ann Arbor, MI), *How Your Refrigerator Can Help Get More Renewable Energy on the Power Grid*, Mar 12, 2014.
- UM Control Seminar (Ann Arbor, MI), *Planning and Control of Uncertain Electric Loads to Help Out the Power Grid*, Feb 14, 2014.
- IEEE Conference on Decision and Control (Florence, Italy), Workshop: Ancillary Services from Flexible Loads to Help the Electric Grid of the Future, *Demand Response Today and Thermostatic Loads for Ancillary Services*, Dec 9, 2013.
- University College Dublin Electricity Research Centre, (Dublin, Ireland), *Planning and Control of Demand Response Resources Given Partial Information and Uncertainty*, Nov 26, 2013.
- IEEE PES General Meeting (Vancouver, Canada), Panel: Grid Integration of Energy Efficient Buildings, *Theoretical, Practical and Market-related Issues Associated with the Challenges of Making Buildings Responsive to Real-Time Power System Conditions*, Jul 24, 2013.
- IEEE PES General Meeting (Vancouver, Canada), Transaction Paper Presentation, *State Estimation and Control of Electric Loads to Manage Real-Time Energy Imbalance*, Jul 24, 2013.
- University of Washington Departments of Electrical and Mechanical Engineering (Seattle, WA), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Apr 23, 2013.
- INRIA – National Institute for Research in Computer Science and Control (Paris, France), *Controlling Electric Loads to Manage Energy Imbalances in Power Systems*, Apr 17, 2013.
- Dartmouth College Thayer School of Engineering (Hanover, NH), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Apr 4, 2013.
- UM Department of Electrical Engineering and Computer Science (Ann Arbor, MI), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Mar 25, 2013.
- University of Vermont School of Engineering (Burlington, VT), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Mar 21, 2013.
- York University Lassonde School of Engineering (Toronto, Canada), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Feb 28, 2013.
- University of California at Santa Barbara Department of Mechanical Engineering (Santa Barbara, CA), *Harnessing Distributed Flexible Resources for Sustainable Electric Energy Systems*, Feb 4, 2013.

- University of Florida Laboratory for Cognition and Control in Complex Systems Interdisciplinary Workshop on Smart Grid Design and Implementation (Gainesville, FL), *Harnessing Residential Loads for Demand Response: Engineering and Economic Considerations*, Dec 8, 2012.
- Lucerne University of Applied Science and Arts (Lucerne, Switzerland), *Residential Loads for Demand Response*, Nov 26, 2012. (with Evangelos Vrettos)
- Austrian Institute of Technology Energy Department (Vienna, Austria), *Understanding the Capabilities of Electric Loads in Traditional and Emerging Demand Response Programs*, Nov 6, 2012.
- EPFL – Swiss Federal Institute of Technology (Lausanne, Switzerland), *Managing Energy Imbalances in Power Systems using Residential Appliances*, Oct 30, 2012.
- ETH Zurich – Swiss Federal Institute of Technology (Zurich, Switzerland), *Modeling, Analysis, and Control of Electric Loads for Traditional and Emerging Demand Response Programs*, Sept 28, 2012.
- Pacific Northwest National Laboratory Smart Grid Controls, Optimization, and Economics Workshop (Richland, WA), *Moving from Open-loop to Closed-loop Control of Demand Response Resources*, Jun 15, 2012.
- LBNL Environmental Energy Technologies Division Seminar (Berkeley, CA), *Modeling, Analysis, and Control of Demand Response Resources*, Apr 27, 2012.
- UC Berkeley Department of Mechanical Engineering (Berkeley, CA), *Modeling, Analysis, and Control of Demand Response Resources*, Apr 19, 2012.
- UC Berkeley Expert System Technologies Lab Seminar (Berkeley, CA), *How your refrigerator can help the smart grid: understanding the size of the resource in California, potential revenues, and costs*, Apr 4, 2012.
- Carnegie Mellon University Conference on the Electricity Industry (Pittsburgh, PA), *The Value of Real-Time Data in Controlling Electric Loads for Demand Response*, Mar 13, 2012.
- UC Berkeley Center for the Built Environment Building Science Group Seminar (Berkeley, CA), *Estimating What Didn't Happen: Demand Response Baseline Models and their Errors*, Nov 30, 2011.
- LBNL/UC Berkeley DR/Renewables/ISO Meeting (Berkeley, CA), *Modeling, State Estimation, and Control of Aggregated Heterogeneous Appliances for Load Following*, Oct 17, 2011.
- UC Berkeley Variaya Energy Group (Berkeley, CA), *Modeling, State Estimation, and Control of Aggregated Heterogeneous Appliances for Power Systems Services*, Jul 21, 2011.
- LBNL/UC Berkeley DR/Renewables/ISO Meeting (Berkeley, CA), *Examining Uncertainty in Demand Response Baseline Models and Variability in Automated Responses to Dynamic Pricing*, Apr 7, 2011.
- LBNL Environmental Energy Technologies Division Seminar (Berkeley, CA), *Methods for Analyzing Electric Load Shape*, Jun 17, 2010. (with Phillip Price)
- UC Berkeley Blum Center Safe Water and Sanitation Symposium (Berkeley, CA), *Recent Fieldwork, Preliminary Prototype, and Preliminary Survey Results for ARUBA in Bangladesh*, Apr 10, 2009.
- UC Berkeley Blum Center Safe Water and Sanitation Symposium (Berkeley, CA), *Design for Sustainable Communities: Removing Arsenic from Drinking Water in Rural Bangladesh*, Feb 13, 2008.
- Engineers for a Sustainable World (ESW) Annual Conference (San Francisco, CA), *Design for Sustainable Communities: Removing Arsenic from Drinking Water in Rural Bangladesh*, Feb 5, 2008.
- Aquatic Nuisance Species Task Force Spring Meeting (Hyannis, MA), *MIT Sea Grant Multilingual Aquatic Invasive Species Outreach Campaign*, May 25, 2006.

Workshop Participation

- CMU Smart Cities (Energy) Listening Session to Inform NSF Future Funding (virtual), Nov 2022.
- NSF Smart & Connected Communities PI Meeting, Arlington, VA, Oct 2022.
- ARPA-E Energy Innovation Summit, Denver, CO, May 2022.

- Institute for Policy Integrity at New York University School of Law and DOE Office of Economic Impact and Diversity Conference on Advancing Energy Justice: Tools for Justice40 and Equitable Deep Decarbonization (virtual), May 2022.
- NREL Workshop on Responsible and Trustworthy AI in Clean Energy (virtual), Mar 2022.
- NSF Cyber-Physical Systems PI Meeting (virtual), Jun 2021.
- ARPA-E Energy Innovation Summit (virtual), May 2021.
- NSF Workshop on Next Big Research Challenges in Cyber-Physical Systems (virtual), Apr 2021.
- NSF Workshop on Grid at the Edge, From Unresolved Problems to Research Questions and Directions (virtual), Mar 2021.
- ARPA-E Engineering Microgrids with Control Co-Design Workshop (virtual), Oct 2020.
- NSF I-Corps (virtual), Apr-Jun 2020.
- NSF Workshop on Forging Connections between Machine Learning, Data Science, & Power Systems Research, Alexandria, VA, Mar 2020.
- NREL Workshop and Demo on Real-time Optimization and Control of Next-Generation Distribution Infrastructure, Golden, CO, Jan 2020.
- NSF Cyber-Physical Systems PI Meeting, Arlington, VA, Nov 2019.
- ARPA-E Energy Innovation Summit, Denver, CO, Jul 2019.
- Indian Institute of Technology Bombay – NSF – Japan Science and Technology Agency – Research Council of Norway Workshop on Distributed Energy Management and Data Sciences for Smart Grids, Mumbai, India, Jan 2019.
- NSF Cyber-Physical Systems PI Meeting, Alexandria, VA, Nov 2018.
- NREL Autonomous Energy Grids Workshop, Golden, CO, Sep 2017.
- IEEE PES Power and Energy Education Committee Workshop: Cyber-Physical Systems Applications to the Power Grid, Boston MA, Jul 2016.
- Institute for Mathematics and its Applications Workshop: “Control at Large Scales: Energy Markets and Responsive Grid,” Minneapolis, MN, May 2016.
- Big Ten Women’s Workshop, Milwaukee, WI, Mar 2016.
- Michigan Road Scholars, May 2015.
- NSF CAREER Proposal Writing Workshop, Boston, MA, Apr 2015.
- Dagstuhl Seminar: “Modeling, Verification, and Control of Complex Systems for Energy Networks,” Schloss Dagstuhl, Wadern, Germany, Oct 2014.
- ARPA-E Grid of the Future Workshop: From Vertical to Flat, Washington, DC, Jul 2014.
- IEEE PES Power and Energy Education Committee Workshop: Transforming Cyber-Physical Systems Education with Emphasis on the Power Grid, Washington, DC, Jul 2014.
- Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS) Symposium, Colorado Springs, CO, Oct 2013.
- University of Florida Laboratory for Cognition and Control in Complex Systems Interdisciplinary Workshop on Smart Grid Design and Implementation, Gainesville, FL, Dec 2012.
- PSERC Future Grid Initiative Workshop, University of California, Berkeley, CA, Dec 2011.
- International Development Design Summit, MIT, Cambridge, MA, Jul-Aug 2008.
- National Collegiate Inventors and Innovators Alliance (NCIIA) Advanced Innovation to Venture Workshop, MIT, Cambridge, MA, Mar 2008.
- Engineers for a Sustainable World Business/Engineering Sustainability Workshop, University of Maryland, College Park, MD, Feb 2007.

In the News

- "From the lab: Innovations for the green energy transition." *Social Impact Design for Business Podcast*, Feb 9, 2023.
- "DTE to charge more for peak-time power." *The Detroit News*, Feb 8, 2023.
- "Streamlining home assessments for energy justice." *UM ECE News and Awards*, Dec 2, 2022.
- "Our Ailing Power Grid Isn't Cut Out for Climate Change." *CNET*, Oct 27, 2022.
- "Why hasn't Henry Ford's ideal power grid become a reality?" *Popular Science*, Jul 27, 2022.
- "Extreme heat, weather may lead to blackouts for millions this summer." *The National Desk*, May 21, 2022.
- "The global shift to clean energy." *Connected World*, May 1, 2022.
- "New collaborative project for advancing energy justice in Detroit." *UM ECE News and Awards*, Nov 1, 2021.
- "Energy equity depends on data, and experts say there isn't enough of it." *Utility Dive*, Jul 8, 2021.
- "U-M, community partners tackle energy insecurity in three Detroit neighborhoods." *Michigan News*, Nov 23, 2020.
- "Student Energy Club hosts all-female panel: discusses women in STEM and the future of energy." *NC State University Technician*, Nov 7, 2019.
- "The National Academy of Engineering invites Prof. Johanna Mathieu to symposium to advance the engineering frontier." *The Michigan Engineer News Center*, Jul 16, 2019.
- "New research for the future of sustainable power and energy." *UM ECE News and Awards*, Feb 20, 2019.
- "Battery economics could power the future of energy." *The Michigan Engineer News Center*, Feb 19, 2019.
- "Innovative project tests the boundaries of HVAC demand response systems." *Electric Light and Power*, Feb 15, 2019.
- "How air conditioners could advance a renewable power grid." *The Michigan Engineer News Center & The University Record*, Feb 6, 2019.
- "Johanna Mathieu receives NSF CAREER Award to help build a smarter, more sustainable grid." *UM ECE News and Awards*, Feb 1, 2019.
- "What this week's natural gas crisis tells us about Michigan's energy infrastructure needs." *Michigan Radio Stateside*, Feb 1, 2019.
- "Using University of Michigan buildings as batteries." *The Michigan Engineer News Center*, Sep 21, 2017.
- "The Hidden Systems that our Society Relies on are Stupid: Power." *The Michigan Engineer Magazine*, Spring 2015.
- "EmPOWERing Homeowners: For those with smart meters, energy knowledge is power. And money." *Consumers Energy Re: Energize Publication*, 2014.
- "Prof. Johanna Mathieu Working to Bring Power from Sustainable Sources to Your Home." *UM ECE News and Awards*, 2014.

Students, Postdocs, and Visitors

- Ph.D. Students.....
- Bowen Li, Jan 2014 - Dec 2018, now a postdoc at Argonne National Laboratory
 - Gregory Ledva, Sep 2014 - Dec 2018, now at Virtual Peaker
 - Stephanie Crocker Ross, Sep 2014 - Dec 2019, now at Green Mountain Power
NSF Graduate Research Fellow
Rackham Predoctoral Fellow
 - Mengqi (Molly) Yao, Sep 2016 - Aug 2020, now at Lucid Motors

- Anna Stuhlmacher, Sep 2017 - Apr 2023, incoming assistant professor at Michigan Tech
NSF Graduate Research Fellow
Rackham Predoctoral Fellow
- Oluwagbemileke Oyefeso, Sep 2019 - Present, co-advised by I. Hiskens
- Ioannis Granitsas, Sep 2019 - Present, co-advised by I. Hiskens
- Jing Peng, Sep 2019 - Present
- Sunho Jang, Sep 2019 - Present, co-advised by N. Ozay
- Hannah Moring, Sep 2020 - Present
- Sunny Chen, Sep 2020 - Present, co-advised by P. Seiler
- Austin Lin, Sep 2020 - Present
NSF Graduate Research Fellow
- Joshua Brooks, Sep 2021 - Present
Michigan Difference Student Leadership Award - Innovation or Research Award
- Xavier Farrell, Sep 2021 - Present
Michigan Difference Student Leadership Award - Innovation or Research Award

Postdocs.....

- Yashen Lin, Sep 2014 - May 2016, co-advised by J. Johnson, now at NREL
UM Energy Institute Partnerships for Innovation in Sustainable Energy Technologies Fellow
Dow Sustainability Postdoctoral Fellow
- Sina Afshari, Sep 2016 - Jul 2017, co-advised by J. Johnson and I. Hiskens, now at Ecosense Lighting
- Anulekha Dhara, Oct 2018 - Mar 2019, now at Target India
- Gregory Ledva, Jan 2019 - Feb 2021, now at Virtual Peaker
- Shunbo Lei, Apr 2019 - Jun 2021, co-advised by I. Hiskens, now at CUHK-Shenzhen
- Sebastian Nugroho, Jun 2021 - Nov 2022, co-advised by I. Hiskens, now at Cummins

Master's Students.....

- Anthoula Panagou (ETH Zurich), Master's thesis, May - Nov 2013, co-advised by M. Vrakopoulou and M. Zima, examined by G. Andersson
- Gregory Ledva (ETH Zurich), Master's thesis, Sep 2013 - Mar 2014, co-advised by E. Vrettos and S. Mastellone, examined by G. Andersson
- William Gourlay, Energy Systems Engineering project, May - Aug 2014
- Pragma Agrawal, Research, Jun - Aug 2014, co-advised by L. Balzano and D. Molzahn
- Priya Thyagarajan, Energy Systems Engineering project, May - Aug 2015
- Mengqi Yao, Research, Sep 2015 - Aug 2016
- Abigail Kern, Research, Jan 2017 - Jun 2018, co-advised by J. Johnson
- Aditya Keskar, Research + Master's thesis, May 2017 - Apr 2018, co-advised by J. Johnson and I. Hiskens
Rackham Summer Awardee
- Han Pyo Lee, Research, Jan 2019 - Jun 2020
- Han Lee, Research + Energy Systems Engineering project, Jun 2019 - Apr 2020
- Ruikai Xu, Research, Sep 2019 - Apr 2020
- Yaoyu Fan, Research, Jul - Dec 2021
- Sehwan Joo, Research, Sep - Dec 2021
- Wonjae Lee, Research, Sep - Dec 2022

- Kira Edwards, Research, Oct 2022 - Present
Dow Sustainability Fellow

Undergraduate Students.....

- Kristin Kowolik (UC Berkeley), Sep 2007 - Aug 2008, co-advised by A. Gadgil
- Shefah Qazi (UC Berkeley), Jan - Aug 2008, co-advised by A. Gadgil
- Mads Sørensen (DTU), Bachelor's Thesis, Feb - Jun 2013, co-advised by H. Jóhannsson
- Theis Bo Rasmussen (DTU), Bachelor's Thesis, Feb - Jun 2013, co-advised by H. Jóhannsson
- Gabrielle Vuylsteke, Jun - Dec 2014 & Sep 2016 - Apr 2017
UM Energy Institute Undergraduate Research Opportunities Program (UROP) Student
- Spencer Maroukis, Jun 2015 - Jun 2016
NSF Research Experiences for Undergraduates (REU) Student
- Sarah Peterson, May 2016 - Apr 2017
Summer Undergraduate Research in Engineering (SURE) Student
NSF Research Experiences for Undergraduates (REU) Student
- John Wolfe, May - Nov 2016
Summer Undergraduate Research in Engineering (SURE) Student
- Anna Stuhlmacher (Boston University), Jun - Jul 2016
UM Summer Research Opportunity Program (SROP) Student
- Paul Giessner, Jun - Aug 2017, co-advised by I. Hiskens and J. Johnson
UM Energy Institute Undergraduate Research Opportunities Program (UROP) Student
- Maggie Chen, May 2018 - Apr 2019
- Jordan Dongmo Nzangue, May 2018 - Apr 2019
- Catherine Bertcher, Sep 2018 - May 2021
NSF Research Experiences for Undergraduates (REU) Student
- Bruce Hicks (Mississippi State University), Jun - Jul 2019
UM Summer Research Opportunity Program (SROP) Student
- Miguel Siller (Universidad de Monterrey, Mexico), Jun - Aug 2019
UM Summer Undergraduate Research in Engineering (SURE) Student
- Brendan Mathews, Jul 2020 - May 2021, co-advised by P. Seiler
NSF Research Experiences for Undergraduates (REU) Student
- Joshua Brooks, Feb - Aug 2021
- Bereket Barma (Addis Ababa Institute of Technology), Jun - Aug 2021
African Undergraduate Research Adventure (AURA) Student
- Amanuel Solomon (Addis Ababa Institute of Technology), Jun - Aug 2021
African Undergraduate Research Adventure (AURA) Student
- Daniel Li, Jan - Apr 2022
NSF Research Experiences for Undergraduates (REU) Student
- Mayani Emmanuel (University of Rwanda), Jun - Aug 2022
African Undergraduate Research Adventure (AURA) Student

Visiting Ph.D. Students.....

- Martin Wittrock (DTU), Feb - Jul 2015
- Lars Herre (KTH), May - Oct 2017

Ph.D. Committees.....

- Sina Sadeghi Baghsorkhi (EE:S), 2015, Advisor: Ian Hiskens
- Kan Zhou (EE:S), 2015, Advisor: Heath Hoffman
- Ian Beil (EE:S), 2015, Advisor: Ian Hiskens
- Elizabeth Ratnam (University of Newcastle, Australia), 2016, Advisor: Steven Weller
- Chanaka Keerthisinghe (University of Sydney, Australia), 2016, Advisors: Gregor Verbič, Archie Chapman
- Shankar Mohan (EE:S), 2017, Advisor: Anna Stefanopoulou
- Jonathan Martin (EE:S), 2017, Advisor: Ian Hiskens
- Olivier Mégel (ETH, ITET), 2017, Advisor: Göran Andersson
- Daniel Esteban Morales Bondy (DTU, EE), 2017, Advisor: Henrik Bindner
- Jennifer Marley (EE:S), 2017, Advisor: Ian Hiskens
- Jun Hou (EE:S), 2017, Advisors: Jing Sun, Heath Hofmann
- Erik Miebling (EE:S), 2018, Advisor: Demosthenis Teneketzis
- Yiling Zhang (IOE), 2019, Advisor: Siqian Shen
- Yuanyuan Guo (IOE), 2019, Advisor: Ruiwei Jiang
- Md Salman Nazir (EE:S), 2019, Advisor: Ian Hiskens
- Jonas Kersulis (ECE), 2019, Advisor: Ian Hiskens
- Geunyeong Byeon (IOE), 2020, Advisor: Pascal Van Hentenryck
- Yejun (Wayne) Lao (CEE), 2020, Advisor: Jeffrey Scruggs
- Youngchan Jang (IOE), 2021, Advisor: Eunshin Byon
- Sijia Geng (ECE), 2021, Advisor: Ian Hiskens
- Ahmad Attarha (Australian National University), 2022, Advisor: Paul Scott, Sylvie Thiebaux
- Elvin Vindel (CMU CEE), 2022, Advisors: Burcu Akinci, Mario Bergés
- Aditya Keskar (NCSU CCEE), 2023, Advisor: Jeremiah Johnson
- Maitreyee Marathe (UW-Madison ECE), Advisors: Line Roald, Giri Venkataramanan

Service

Society Memberships.....

- Institute of Electrical and Electronics Engineers (IEEE)
 - Power and Energy Society (PES)
 - Control Systems Society (CSS)
- International Institute for Research and Education in Power Systems (IREP)
- (*Intermittently*) Institute for Operations Research and the Management Sciences (INFORMS)

Technical Committees.....

- IEEE PES Smart Buildings, Loads, and Customer Systems (SBLC) Technical Committee
 - Chair, Jul 2021 - Present
 - Vice Chair, Jul 2019 - Jul 2021
 - Secretary, Sep 2018 - Aug 2019
 - Technical Committee Program Chair, Sep 2016 - Sep 2018

- Task Force on Demand Response in the DER Era (co-sponsored by the Power System Economics Subcommittee of IEEE PES PSOPE and the Loads Subcommittee of IEEE PES SBLC)
 - Vice Chair, Jul 2022 - Present
- IEEE CSS Technical Committee on Smart Grids
- INFORMS ENRE Section Student Best Paper Award Committee, 2018

Editorships & Technical Program Committees.....

- Associate Editor, IEEE Transactions on Control of Network Systems, Jan 2022 - Present
- Associate Editor, IEEE Transactions on Power Systems, Jan 2018 - Dec 2021
- Associate Editor, IEEE Power Engineering Letters, Jan 2018 - Dec 2021
- Editorial Board, Sustainable Energy, Grids and Networks, Oct 2020 - Present
- Technology Conferences Editorial Board, IEEE Control Systems Society, Jan 2022 - Present
- Conference Editorial Board, IEEE Control Systems Society, Jul 2019 - Present
- Chair, Technical Program Committee (SBLC papers), IEEE PES General Meeting, 2017, 2018
- Chair, Technical Program Committee (SBLC papers), IEEE PES T&D Conference, 2018
- Technical Program Committee, ACM e-Energy, 2022
- Technical Program Committee, Power Systems Computation Conference, 2018, 2020, 2022
- Technical Program Committee, IEEE Conference on Smart Grid Communications, 2013, 2017, 2018
- Reviewer Committee, Conference on Probabilistic Methods Applied to Power Systems, 2020
- Contributor, IEEE PES Trending Tech: Intelligent Electrification, 2022
- Contributor, IEEE Communications Society Best Readings in Smart Grid Communications, 2014

Conferences, Workshops, and Tutorials.....

- Panel Session Organizer and Chair, IEEE PES T&D Conference, 2022:
 - "Distribution network-aware DER coordination"
- Invited Session Organizer, IEEE Conference on Decision and Control, 2021:
 - "Advanced Strategies to Control Distributed Energy Resources",
 - "Machine Learning for Control of Power Systems"
- Panel Session Organizer and Chair, IEEE PES General Meeting, 2021:
 - "The Interplay Between Energy Efficiency and Demand Response for Smart Buildings: Implications for Power Systems - Parts I & II"
- Invited Session Organizer and Chair, INFORMS Annual Meeting, 2018:
 - "Managing Uncertainty in Electric Power Networks"
- Tutorial Co-Organizer, INFORMS Annual Meeting, 2015:
 - "Uncertainty in Demand Response – Identification, Estimation, and Learning"
- Invited Session Organizer and Chair, American Control Conference, 2015:
 - "Load Coordination and Control in Electric Power Systems"
- Workshop Co-Organizer, IEEE Conference on Decision and Control, 2013:
 - "Ancillary Services from Flexible Loads to Help the Electric Grid of the Future"
- Session Chair, IEEE Conference on Decision and Control, 2013, 2016, 2018, 2021
- Session Chair, American Control Conference, 2022
- Session Chair, IEEE Conference on Smart Grid Communications, 2020
- Session Chair, IEEE PES General Meeting, 2017, 2019, 2021
- Session Chair, IEEE PES PowerTech Conference, 2019

- Session Chair, North American Power Symposium, 2015
- Session Chair, Power System Computation Conference, 2014, 2018, 2020, 2022
- Session Chair, IREP Bulk Power Systems Dynamics and Control Symposium, 2022
- Session Chair, Hawaii International Conference on System Sciences, 2023

Reviewing.....

- *Journals*: Annual Reviews in Control; Applied Energy; ASME Journal of Dynamic Systems, Measurement, and Control; Automatica; Complexity; Energy; Energy and Buildings; Energy Policy; Energy Systems; Environmental Science and Technology; IEEE Control Systems Letters; IEEE Journal on Selected Areas in Communications: Smart Grid Communications Series; IEEE Power Engineering Letters; IEEE Transactions on Automatic Control; IEEE Transactions on Control of Network Systems; IEEE Transactions on Control Systems Technology; IEEE Transactions on Energy Conversion; IEEE Transactions on Power Systems; IEEE Transactions on Smart Grid; IEEE Transactions on Sustainable Energy; International Journal of Control; International Journal of Electrical Power and Energy Systems; Journal of Energy Storage; Plos One; Proceedings of the IEEE; Sustainable Cities and Society; Sustainable Energy, Grids, and Networks; Utilities Policy
- *Conferences*: American Control Conference; Conference on Probabilistic Methods Applied to Power Systems; European Control Conference; First International Workshop on Smart Grid Modeling and Simulation; Hawaii International Conference on System Sciences; IEEE Conference on Control Technology and Application; IEEE Conference on Decision and Control; IEEE Conference on Smart Grid Communications; IEEE PES General Meeting; IEEE PES PowerTech Conference; IEEE PES T&D Conference; IEEE Photovoltaics Specialists Conference; Mediterranean Conference on Control and Automation; North American Power Symposium; Power Systems Computation Conference
- *Proposals/Projects*: ARPA-E; Department of Energy; Ohio State University Sustainable and Resilient Economy Program; National Science Foundation; Sloan Foundation; State of Utah Science, Technology, and Research Initiative

Advisory Roles.....

- Technical Advisory Group Member, LBNL/DOE project: A framework to characterize the performance of building components in providing flexible loads and building services using a hardware-in-the-loop approach, 2020 - Present
- Independent Panel Member, Assessment of extreme rainfall events in Detroit in 2021, conducted for the Board of Directors of the Great Lakes Water Authority, Sep 2021 - May 2022
- Technical Review Committee Member (Modeling Subcommittee), National Transmission Planning Study, conducted by NREL and PNNL, May 2022 - Present

Internal Service.....

- ECE Faculty Search Committee, Sep 2014 - Aug 2020
- ECE Power/Energy Graduate Student Advisor, Sep 2014 - Dec 2016, Sep 2019 - Aug 2020
- Power System Seminar Series Organizer, Sep 2016 - Apr 2018
- CoE Dow Sustainability Selection Committee, 2017
- Energy Institute Visioning & Director Search Committee, Dec 2017 - Jul 2018
- School for Environment and Sustainability Faculty Search Committee, Sep - Dec 2018
- CoE Nominating Committee, Fall 2019
- ECE Faculty Workload Task Force, Sep 2021 - May 2022
- PhD Admissions Committee, Sep 2021- May 2022
- CoE Energy Task Force, Sep 2021 - Mar 2022

- UM Renewable Energy Purchase Agreement RFP Evaluation Committee, Apr - Jun 2022
- ECE Executive Committee, Sep 2022 - Present
- Graham Sustainability Institute Clean Energy Conversations Convener, Sep 2022 - Present