

# Kyri Alysa Baker, Ph.D.

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Boulder, CO, USA

<b>Research Interests</b>	Power systems, Optimization, Smart Grid, Renewable Energy, Building-to-Grid Integration, Applications of Machine Learning in Energy
<b>Current Position</b>	<b>Assistant Professor</b> August 2017 - Present <i>University of Colorado Boulder</i> Department of Civil, Environmental, and Architectural Engineering
	<b>Assistant Professor</b> (by courtesy) August 2017 - Present <i>University of Colorado Boulder</i> Department of Electrical, Computer, and Energy Engineering
	<b>Fellow</b> May 2020 - Present Renewable and Sustainable Energy Institute (RASEI)
<b>Previous Position</b>	<b>Research Engineer, Power Systems Group</b> Feb. 2016 - August 2017 <i>National Renewable Energy Laboratory</i>
<b>Postdoctoral Position</b>	<b>Postdoctoral Researcher, Residential Buildings Group</b> Jan. 2015 - Feb. 2016 <i>National Renewable Energy Laboratory</i>
<b>Education</b>	<b>Ph.D, Electrical and Computer Engineering</b> 2010 - Dec. 2014 <b>Carnegie Mellon University</b> , Pittsburgh, PA <i>Thesis:</i> “Coordination of Resources across Areas for the Integration of Renewable Generation: Operation, Sizing and Siting of Storage Devices.” [ <a href="#">Online</a> ]
	<b>M.S., Electrical and Computer Engineering</b> 2009-2010 <b>Carnegie Mellon University</b> , Pittsburgh PA
	<b>B.S., Electrical and Computer Engineering</b> 2006-2009 <b>Carnegie Mellon University</b> , Pittsburgh PA
<b>Selected Awards and Honors</b>	<b>Best Paper Award</b> , IEEE Transactions on Power Systems (7 awards given across papers published between 2017-2019), 2020 <b>Faculty Appreciation Award</b> , (by undergraduate student vote), 2020 <b>Top Ten Performer</b> , ARPA-E Grid Optimization (GO) Competition, 2020 <b>Best Paper Finalist</b> , IEEE Power & Energy Society General Meeting, 2019 <b>Most Innovative Award</b> , NASA BIG Idea Challenge (Faculty advisor), 2019 <b>R&amp;D 100 Award</b> , for <i>foresee</i> , led by NREL, 2018 <b>Best Paper Award Honorable Mention</b> , International Workshop on NILM, 2018 <b>2nd Place</b> , NASA BIG Idea Challenge (Faculty advisor), 2018 <b>Best Paper Award</b> , Power and Energy Conference at Illinois (PECI), 2017 <b>Employee of the Month</b> , National Renewable Energy Lab., Oct. 2016
<b>Patents</b>	<b>(P1) K. Baker</b> , A. Bernstein, and E. Dall’Anese, “Network-Cognizant Voltage Droop Control,” Pub. No. US20180226799A1, awarded Sept. 2020. [ <a href="#">Online</a> ]

## Publications

Since joining CU: **16** journal papers; **17** peer-reviewed conference papers

Journal	No. of Papers	Impact Factor
IEEE Transactions on Smart Grid	2	10.49
Applied Energy	3	8.558
Energy Conversion and Management	1	7.181
IEEE Transactions on Power Systems	4	6.074
IEEE Journal of Photovoltaics	1	3.052
Energies	2	2.702
Acta Astronautica*	1	2.482
New Space*	1	0.95
IEEE Control Systems Letters	1	N/A

Table 1: Journal publications since joining CU in August 2017. The \* denotes that these publications were pursued with the NASA student teams I advised.

*Note: underline denotes CU student (at time of submission); double underline denotes undergraduate (at time of submission), and asterisk (\*) denotes my PhD advisor(s).*

### Journal Articles

(J19) J. Hurtt and **K. Baker**, “Sensitivity Analysis of Photovoltaic System Design Parameters to Passively Mitigate Ramp Rates,” *IEEE Journal of Photovoltaics*, accepted, 2021.

(J18) D. Biagioni, P. Graf, X. Zhang, A. Zamzam, **K. Baker**, and J. King, “Learning-Accelerated ADMM for Distributed DC Optimal Power Flow,” *IEEE Control Systems Letters*, accepted, 2021. [[Online](#)]

(J17) J. Wang, K. Garifi, **K. Baker**, W. Zuo, Y. Zhang, S. Huang, D. Vrabie, “A Coordination Mechanism for Reducing Price Spikes in Distribution Grids,” *Energies*, Special Issue on Building-to-Grid Integration through Intelligent Optimization and Control, Vol. 13, No. 21, Oct 2020. [[Online](#)]

(J16) J. Chin, **K. Baker**, and G. Hug\*, “Consumer privacy protection using flexible thermal loads: Theoretical limits and practical considerations,” *Applied Energy*, vol. 281, Jan. 2021. [[Online](#)]

(J15) Y. Fu, X. Han, **K. Baker**, and W. Zuo, “Assessments of Data Centers for Provision of Frequency Regulation,” *Applied Energy*, vol. 277, Nov. 2020. [[Online](#)]

(J14) H. Hava, L. Zhou, C. Mehlenbeck, E. Lombardi, A. King, **K. Baker**, A. Kaufman, and N. Correll, “SIRONA: Sustainable Integration of Regenerative Outer-space Nature and Agriculture. Part 2 - Design Development and Projected Performance,” *Acta Astronautica*, in press, 2020. [[Online](#)]

(J13) A. Allen, G. Henze, **K. Baker**, and G. Pavlak, “Evaluation of Low-Exergy Heating and Cooling Systems and Topology Optimization for Deep Energy Savings at the Urban District Level,” *Energy Conversion and Management*, vol. 222, Oct. 2020. [[Online](#)]

(J12) K. Garifi, **K. Baker**, D. Christensen, and B. Touri, “Convex Relaxation of Grid-Connected Energy Storage System Models with Complementarity Constraints in DC OPF,” *IEEE Transactions on Smart Grid*, vol. 11, no. 5, pp. 4070 - 4079, Sept. 2020. [[Online](#)]

(J11) S. Chakraborty, R. Verzijlbergh, **K. Baker**, M. Cvetkovic, L. de Vries, and Z. Lukszo, “A Coordination Mechanism for Reducing Price Spikes in Distribution Grids,”

*Energies*, Special Issue on Flexibility in Distribution Systems from EVs and Batteries, Vol. 13, No. 10, May 2020. [\[Online\]](#)

(J10) **K. Baker** and A. Bernstein, “Joint Chance Constraints in AC Optimal Power Flow: Improving Bounds through Learning,” *IEEE Transactions on Smart Grid*, Vol. 10., No. 6, Nov. 2019. [\[Online\]](#)

(J9) Y. Guo, **K. Baker**, E. Dall’Anese, Z. Hu, and T.H. Summers, “Data-based distributionally robust stochastic optimal power flow, Part I: Methodologies,” *IEEE Transactions on Power Systems*, Vol. 34, No. 2, Mar. 2019 [**Best Paper Award**]. [\[Online\]](#)

(J8) Y. Guo, **K. Baker**, E. Dall’Anese, Z. Hu, and T.H. Summers, “Data-based distributionally robust stochastic optimal power flow, Part II: Case Studies,” *IEEE Transactions on Power Systems*, Vol. 34, No. 2, Mar. 2019 [**Best Paper Award**]. [\[Online\]](#)

(J7) N. Glascock, B. Huber, C. Cantrall, W. Evonosky, E. Robinson, B. Dharmadasa, and **K. Baker**, “MAFSA: Mars Autonomous and Foldable Solar Array,” *New Space*, Vol. 6, No. 4, Dec. 2018. [\[Online\]](#)

(J6) **K. Baker**, A. Bernstein, E. Dall’Anese, and C. Zhao, “Network-Cognizant Voltage Droop Control for Distribution Grids,” *IEEE Transactions on Power Systems*, Vol. 33, No. 2, pp 2098-2108, Mar 2018. [\[Online\]](#)

(J5) X. Jin, **K. Baker**, D. Christensen, and S. Isley, “Foresee<sup>TM</sup>: A User-Centric Home Energy Management System for Energy Efficiency and Demand Response,” *Applied Energy*, Vol. 205, pp 1583-1595, Nov 2017. [\[Online\]](#)

(J4) E. Dall’Anese, **K. Baker**, and T.H. Summers, “Chance-Constrained AC Optimal Power Flow for Distribution Systems with Renewables,” *IEEE Transactions on Power Systems*, Vol. 32, No. 5, pp 3427-3438, Sep 2017. [\[Online\]](#)

(J3) **K. Baker** and B. Toomey, “Efficient Relaxations for Joint Chance Constrained AC OPF,” *Electric Power Systems Research*, 148 (2017), pp. 230-236. [\[Online\]](#)

(J2) **K. Baker**, G. Hug\*, and X. Li\*, “Energy Storage Sizing Taking into Account Wind Forecast Uncertainties,” *IEEE Transactions on Sustainable Energy*, Vol. 8, No. 1, pp. 331-340, Jan 2017. [\[Online\]](#)

(J1) **K. Baker**, G. Hug\*, and X. Li\*, “Distributed MPC for Efficient Coordination of Storage and Renewable Energy Sources across Control Areas,” *IEEE Transactions on Smart Grid, Special Issue on Distributed Energy Management Systems*, Vol. 7, No. 2, pp. 992-1001, Mar. 2016 (444 submissions, 20 published). [\[Online\]](#)

#### Journal Articles Under Review/Revision

(J21) K. Garifi, **K. Baker**, D. Christensen, and B. Touri, “Guarantees for Omitting Complementarity Constraints in Energy Management System Models,” *under review*, 2020.

(J20) J. Kravits, J. Kasprzyk, **K. Baker**, and K. Andreadis, “Screening Tool for Dam Hazard Potential Classification Using Machine Learning and Multi-Objective Hyperparameter Tuning,” *under review*, 2020.

#### Book Chapters

(B1) **K. Baker**, “Power, Buildings, and Other Critical Networks: Integrated Multi-System Operation,” *New Technologies for Power System Operation and Analysis*, H. Jiang, Y. Zhang, and E. Muljadi (Eds.), Cambridge, MA: Academic Press, 2020.

## Peer-reviewed Conference Proceedings

- (C30) S. Kim, **K. Baker**, and J. Kasprzyk, “Operational Revenue Insufficiency in Highly Renewable DC and AC-based LMP Markets,” 52nd North American Power Symposium, *accepted*, 2020.
- (C29) A. Zamzam and **K. Baker**, “Learning Optimal Solutions for Extremely Fast AC Optimal Power Flow,” IEEE SmartGridComm, Dec. 2020. [[Online](#)]
- (C28) J. Wang, K. Garifi, **K. Baker**, W. Zuo, and Y. Zhang, “Optimal Operation for Resilient Communities through a Hierarchical Load Scheduling Framework,” 2020 Building Performance Analysis Conference and SimBuild, Chicago, IL, 2020. [[Online](#)]
- (C27) Y. Fu, W. Zuo, and **K. Baker**, “Multi-market Optimization of a Data Center without Storage Systems,” *The American Modelica Conference*, Boulder, CO, 2020.
- (C26) K. Garifi and **K. Baker**, “Considering Integer Chance Constraints for Enforcing Flexible Line Flow Ratings,” *American Control Conference*, Denver, CO, 2020. [[Online](#)]
- (C25) B. Kreiger, **K. Baker**, and W.V. Srubar, “Quantifying Grid Interaction Capabilities of Dynamic Building Envelopes,” *ASHRAE Annual Conf.*, Austin, TX, 2020.
- (C24) **K. Baker**, “Learning Warm-Start Points for AC Optimal Power Flow,” *IEEE International Conference on Machine Learning for Signal Processing* (acceptance rate  $\approx 48\%$ ), Pittsburgh, PA, 2019. [[Online](#)]
- (C23) A. Allen, G. Henze, **K. Baker**, and G. Pavlak, “Analysis of HVAC Systems for Deep Energy Savings at the Urban District Level,” *The International Centre for Sustainable Development of Energy, Water and Environment Systems (SDEWES) Conference*, Dubrovnik, Croatia, 2019.
- (C22) H. Hava, L. Zhou, E. Lombardi, K. Cui, H. Joung, S. Manzano, A. King, H. Kinlaw, **K. Baker**, A. Kaufman, and N. Correll, “SIRONA: Sustainable Integration of Regenerative Outer-space Nature and Agriculture,” *International Conference on Environmental Systems (ICES)*, Boston, MA, 2019.
- (C21) S. Chakraborty, M. Cvetkovic, **K. Baker**, R. Verzijlbergh, and Z. Lukszo, “Consumer Hedging Against Price Volatility Under Uncertainty,” *IEEE PES PowerTech*, Milan, Italy, 2019.
- (C20) K. Garifi, **K. Baker**, D. Christensen, and B. Touri, “Stochastic Home Energy Management Systems with Varying Controllable Resources,” *IEEE Power and Energy Society General Meeting*, Atlanta, GA, 2019.
- (C19) S. Chakraborty, **K. Baker**, M. Cvetkovic, R. Verzijlbergh, and Z. Lukszo, “Directly Constraining Marginal Prices in Distribution Grids Using Demand-Side Flexibility,” *IEEE Power and Energy Society General Meeting* [**Best Paper Finalist**], Atlanta, GA, 2019.
- (C18) S. Chakraborty, R. Verzijlbergh, M. Cvetkovic, **K. Baker** and Z. Lukszo, “The Role of Demand-Side Flexibility in Hedging Electricity Price Volatility in Distribution Grids,” *IEEE Innovative Smart Grid Technologies Conference*, Washington DC, 2019.
- (C17) **K. Baker** and A. Bernstein, “Joint Chance Constraints Reductions through Learning in Active Distribution Networks,” *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Anaheim, CA, 2018.
- (C16) K. Garifi, **K. Baker**, B. Touri, and D. Christensen, “Stochastic Model Predictive Control for Demand Response in a Home Energy Management System,” *IEEE*

*Power and Energy Society General Meeting*, Portland, OR, 2018.

(C15) **K. Baker** and **K. Garifi**, “Power Signature Obfuscation using Flexible Building Loads,” *4th International Workshop on Non-Intrusive Load Monitoring*, [**Best Paper Award Honorable Mention**], Austin, TX, 2018. [[Online](#)].

(C14) Y. Guo, **K. Baker**, E. Dall’Anese, Z. Hu, and T.H. Summers, “Stochastic optimal power flow based on data-driven distributionally robust optimization,” *American Controls Conference*, Milwaukee, WI, 2018. [[Online](#)].

(C13) **K. Baker**, A. Bernstein, C. Zhao, and E. Dall’Anese, “Network-cognizant Design of Decentralized Volt/VAR Controllers,” *Innovative Smart Grid Technologies (ISGT)*, Arlington, VA, 2017. [[Online](#)].

(C12) X. Jin, **K. Baker**, S. Isley, and D. Christensen, “User-Preference-Driven Multi-Objective Model Predictive Control of Residential Building Loads and Battery Storage for Demand Response,” *American Controls Conference*, Seattle, WA, 2017 [[Online](#)].

(C11) **X. Zhou**, L. Chen, E. Dall’Anese, and **K. Baker**. “Incentive-Based Voltage Regulation in Distribution Networks,” *American Controls Conference*, Seattle, WA, 2017. [[Online](#)]

(C10) **E. Raszmann**, **K. Baker**, Y. Shi, and D. Christensen, “Modeling Stationary Lithium-Ion Batteries for Optimization and Predictive Control,” *Power and Energy Conference at Illinois (PECI)*, [**Best Paper Award**], Champaign, IL, 2017. [[Online](#)]

(C9) E. Dall’Anese, **K. Baker**, and T.H. Summers, “Adaptive Optimal Power Flow for Distribution Systems under Uncertain Forecasts,” *2016 Conference on Decision and Control (CDC)*, Las Vegas, NV, Dec. 2016. [[Online](#)]

(C8) **K. Baker**, X. Jin, D. Vaidhynathan, W. Jones, D. Christensen, B. Sparr, J. Woods, H. Sorensen, and M. Lunacek, “Short Paper: Frequency Regulation Services from Connected Residential Devices,” *ACM BuildSys ’16*, Stanford, CA, Nov. 2016. [**5 out of 68 Short Papers accepted  $\approx$  7%**]. [[Online](#)]

(C7) **K. Baker**, E. Dall’Anese, and T.H. Summers, “Distribution-Agnostic Stochastic Optimal Power Flow for Distribution Grids,” *IEEE North American Power Symposium*, Denver, CO, Sept. 2016. [[Online](#)]

(C6) B. Palmintier, E. Hale, B.-M. Hodge, **K. Baker**, and T. Hansen, “Experiences integrating transmission and distribution simulations for DERs with the Integrated Grid Modeling System (IGMS),” *Power Systems Computation Conference (PSCC)*, Genoa, Italy, 2016. [[Online](#)]

(C5) F. Ding, B. Mather, N. Ainsworth, P. Gotseff, and **K. Baker**, “Locational Sensitivity Investigation on PV Hosting Capacity and Fast Track PV Screening,” *IEEE PES T&D*, Dallas, TX, 2016 [[Online](#)].

(C4) **K. Baker**, G. Hug\*, and X. Li\*, “Optimal Storage Sizing using Two-Stage Stochastic Optimization for Intra-Hourly Dispatch,” *IEEE North American Power Symposium*, Pullman, WA, 2014 [[Online](#)].

(C3) **K. Baker**, D. Zhu, G. Hug\*, and X. Li\*, “Jacobian Singularities in Optimal Power Flow Problems Caused by Intertemporal Constraints,” *IEEE North American*

*Power Symposium*, Manhattan, KS, 2013 [[Online](#)].

**(C2) K. Baker**, G. Hug\*, and X. Li\*, “Inclusion of Inter-Temporal Constraints into a Distributed Newton-Raphson Method,” *IEEE North American Power Symposium*, Urbana-Champaign, IL, 2012 [[Online](#)].

**(C1) K. Baker**, G. Hug\*, and X. Li\*, “Optimal Integration of Intermittent Energy Sources Using Distributed Multi-step Optimization,” *IEEE Power and Energy Society General Meeting*, San Diego, CA, 2012 [[Online](#)].

### Technical Reports

**(TR3) Home Battery System for Cybersecure Energy Efficiency and Demand Response**, Technical Report NREL/TP-5500-72184, D. Christensen, X. Jin, B. Sparr, S. Isley, S. Balamurugan, S. Carmichael, A. Michalski, A. Sanghvi, M. Martin, **K. Baker**, K. Garifi, W. Gillies, S. Averitt, E. Gantumur, B. Mendrick, S. Suryanarayanan, P. Aloise-Young, R. Kadavil, S. Lurbe, Nat. Renewable Energy Lab., Nov. 2018 [[Online](#)].

**(TR2) On the Path to SunShot: Emerging Issues and Challenges in Integrating Solar with the Distribution System**, Technical Report NREL/TP-5D00-6533, B. Palmintier, R. Broderick, B. Mather, M. Coddington, **K. Baker**, F. Ding, M. Reno, M. Lave, and A. Bharatkumar, Nat. Renewable Energy Lab., May 2016 [[Online](#)].

**(TR1) Integrated Distribution-Transmission Analysis for Very High Penetration Solar PV**, Technical Report NREL/TP-5D00-65550, B. Palmintier, E. Hale, T. Hansen, W. Jones, D. Biagioni, **K. Baker**, H. Wu, J. Giraldez, H. Sorensen, M. Lunacek, N. Merket, J. Jorgenson, B-M. Hodge, Nat. Renewable Energy Lab., Jan. 2016 [[Online](#)].

### Datasets

**K. Baker et. al.**, *Grid Connected Functionality*, NREL, 2016. [[Online](#)]

### Active Projects

#### **Electric vehicle adoption and impacts on associated infrastructure and society**

Sponsor: University of Colorado Boulder, Resilient Infrastructure with Sustainability and Equity (RISE)

Total Award: **\$8,500**

PI: **Kyri Baker**

Co-PIs: Cristina Torres-Machi, Amy Javernick-Will, and Constance Crozier

Period: 1/11/2021 - 9/10/2021

#### **Optimal Co-Design of Integrated Thermal-Electrical Networks and Control Systems for Grid-interactive Efficient District (GED) Energy Systems**

Sponsor: Department of Energy - Advanced Manufacturing Office

Total Award: **\$4,159,922** (\$3,327,878 federal, \$832,044 cost share)

PI: Wangda Zuo

Co-PIs: **Kyri Baker**, Michael Wetter, Kyle Benne, Luigi Vanfretti, Atila Novoselac, and Raymond Kaiser

Period: 10/1/2020 - 12/31/2023

#### **Intelligent System Partitioning for Agent-Based Security Constrained Optimal Power Flow**

Sponsor: U.S. Dept. of Energy Advanced Research Projects Agency-Energy (ARPA-E)

Total Award: **\$649,178**

PI: **Kyri Baker**

Co-PIs: Javad Mohammadi and Soumya Kar

Period: 12/13/2018 - 8/11/2022

**Integrative Reengineering of Infrastructure for Tomorrow's Communities**

Sponsor: Dept. of Education Graduate Assistance in Areas of National Need (GAANN)

Total Award: **\$1,210,235** (\$895,500 federal, \$314,735 cost share)

Director: Abbie Liel

Co-directors: **Kyri Baker**, Sherri Cook, Shideh Dashti, Amy Javernick-Will, and Joseph Kasprzyk, Wil Srubar, Cristina Torres-Machi, and Brad Wham

Period: 1/2019 - 12/2021

**Previous  
Projects**

**Optimization Under Uncertainty for Improved Economic Efficiency of Cold Storage Warehouses**

Sponsor: Lineage Logistics

Total Award: **\$53,992**

PI: **Kyri Baker**

Period: 12/9/2019 - 8/24/2020

**Drought-Contingent Regional Coordination of Thermoelectric Power Plants**

Sponsor: University of Colorado Boulder, Water Energy Nexus IRT

Total Award: **\$45,682**

PI: Joseph Kasprzyk

Co-PIs: **Kyri Baker**, Ben Livneh, and Ashlynn Stillwell (UIUC)

Period: 6/2019 - 6/2020

**Reducing Water Consumption via Free Market Renewable Integration**

Sponsor: University of Colorado Boulder, Water Energy Nexus IRT

Total Award: **\$19,197**

PI: **Kyri Baker**

Co-PI: Rafael Frongillo

Period: 2/2018 - 12/2018

**Gifts**

**Mars Autonomous and Foldable Solar Array**

Sponsor: National Institute of Aerospace (NIA) / NASA

Total Amount: **\$6,000**

**Sustainable Integration of Regenerative Outer-space Nature & Agriculture**

Sponsor: National Institute of Aerospace (NIA) / NASA

Total Amount: **\$6,000**

**Research  
Advising**

**Postdoctoral Researchers:**

*Constance Crozier*, Civil, Environmental, and Architectural Engr, Sept. 2020 - Present.

**PhD Students:**

*Amy Allen*, Architectural Engr. (Co-advised by Gregor Henze), Fall 2017 - Present.

*James Hurtt*, Electrical and Computer Engr., Fall 2017 - Present.

*Sung Min Kim*, Civil Systems. (Co-advised by Joseph Kasprzyk), Fall 2019 - Present.

*Jacob Kravits*, Civil Systems (Co-advised by Joseph Kasprzyk), Summer 2019 - Present.

*Aisling Pigott*, Architectural Engr. Summer 2020 - Present.

*Mostafa Mohammadi*, Civil Systems. Starting Spring 2021.

**Masters Students:**

*Sarah Dafoe*, Architectural Engr., Summer 2020 - Present.



Jessica Stershic, Architectural Engr., Summer 2020 - Present.

Nick Shenberger, Architectural Engr., Fall 2020 - Present.

**Former Advisees:**

Kaitlyn Garift, PhD in Electrical and Computer Engr. (Co-advised by Behrouz Touri), Fall 2017- Oct. 2020.

Mohammadhafez Bazrafshan, Postdoctoral Researcher, Civil, Environmental, and Architectural Engr, July 2019 - November 2019.

Sarah Dafoe, B.S. in Architectural Engr., Fall 2019 - Summer 2020.

Zachary Peterson, M.S. thesis in Architectural Engr, Fall 2017 - Spring 2019.

Landon Baxter, B.S. in Computer Science, Fall 2018.

Sameera Gudladona, M.S. in Electrical and Computer Engr., Summer 2018 - Jan. 2019.

**Teaching**

**AREN 4830/CVEN 5830: Grid Connected Systems** - S19, S20, S21.

*Course created by Dr. Baker.*

**AREN 5001: Building Energy Systems (co-taught with 2 others)** - F18, F19, F20.

**AREN 3040: Electrical Circuits for Architectural Engineers** - S18, S20, S21.

*Course created by Dr. Baker.*

**ECEN 3030: Circuits for Non-Majors** - F18, F19.

**AREN 4570/CVEN 5830: Electrical Systems for Buildings** - F17, F20.

**CVEN 5849/AREN 4849: Independent Study** - S19, F19, S20.

**Student Group Advising**

**Faculty Advisor**, University of Colorado Boulder Energy Club 2018 - Present

**Faculty Advisor**, NASA BIG Idea Challenge 2017 - 2019

**Faculty Advisor**, IEEE, University of Colorado Boulder Chapter 2017 - 2019

**Vice President**, CMU Energy Club, Carnegie Mellon University, 2012

**Faculty Course Questionnaire (FCQ) Results**

Semester/Course	Response Rate	Amount Learned	Overall Course	Overall Instructor
F19: Circuits for Non-Majors	32/32 (100%)	5.8	5.8	5.9
F19: Building Energy Systems	6/9 (67%)	5.5	5.3	5.7
S19: Grid Connected Systems	18/20 (90%)	5.3	5.7	5.8
F18: Circuits for Non-Majors	27/27 (100%)	5.5	5.6	5.9
F18: Building Energy Systems	8/11 (73%)	5.3	5.4	5.9
S18: Circuits for AREN	14/14 (100%)	5.5	5.7	5.7
F17: Electrical Systems	12/12 (100%)	5.1	5.3	5.8
<b>Average</b>	117/125 (94%)	<b>5.5/6.0</b>	<b>5.6/6.0</b>	<b>5.8/6.0</b>

**Invited Talks / Panels**

**Climate Change AI and the Energy Innovation Network**, *Optimizing Large-Scale Grids in Real-Time with ML*, virtual [video], Nov. 23, 2020.

**Newcastle University**, *From Transmission to Thermostat: Integrated Building/Grid Operations*, virtual [video], Nov. 11, 2020.



**Denver Museum of Nature and Science and the Institute of Science and Policy**, *The Future of Energy: Grid Innovations*, virtual [[video](#)], Oct. 13, 2020.

**Workshop on Autonomous Energy Systems**, *Learning-Boosted Optimal Power Flow*, National Renewable Energy Laboratory, virtual, August 20, 2020.

**Keynote speaker at the International Virtual Conference on AI and ML Applications in Smart Buildings (AMSB2020)**, *The Future of ML for Smart Energy Systems*, virtual, July 22, 2020.

**CU Boulder Alumni Exclusive COVID-19 Webinar Series**, *How is COVID 19 Affecting the Electric Power Grid?*, virtual [[video](#)], May 26, 2020.

**ARPA-E GO Competition Challenge 1 Outreach Event**, *Tartan Buffs: Grid Armor (Grid Analytics, Rapid Modeling, and Optimization Routines)*, New Orleans, LA, Feb. 18, 2020.

**Colorado State University**, *Integrating Renewable Energy: From Transmission to Thermostat*, Fort Collins, CO, Oct. 24, 2019.

**Carnegie Mellon University**, *Integrating Renewable Energy: From Transmission to Thermostat*, Pittsburgh, PA, Oct. 14, 2019.

**CU Boulder Statistics, Optimization, and Machine Learning Seminar**, *Chance Constraints for Smart Grids and Smarter Buildings*, Boulder, CO, Sept. 4, 2018.

**CU Boulder Electrical, Computer, and Energy Engineering Dept. Seminar**, *Optimization Under Uncertainty in Power Systems*, Boulder, CO, Dec. 5, 2017.

**University of Utah**, *Optimization Under Uncertainty in Power Systems*, Salt Lake City, UT, Nov. 4, 2016.

**National/  
International  
Service**

**Associate Editor**, IEEE Transactions on Smart Grid and IEEE Power Engineering Letters, May 2020 - Present

**Guest Editor**, Journal of Modern Power Systems and Clean Energy (MPCE), Special Issue on “Power Systems with Increasing Renewable Penetration: Market, Operations, Planning and Regulation,” 2020-21.

**Guest Editor**, MDPI Energies, Special Issue on “Building-to-Grid Integration through Intelligent Optimization and Control,” 2020

**Vice Chair**, IEEE Smart Buildings, Loads, and Customer Services (SBLC) Loads subcommittee, Fall 2019 - present.

**Conference Session Organizer** (responsible for inviting speakers, organizing, and chairing session), Architectural Engineering Institute Conference 2021; Modeling and Optimization: Theory and Applications (MOPTA) 2019.

**Technical Committee Member** (responsible for making decisions on papers and finding reviewers), Architectural Engineering Institute Conference 2021, SmartGrid-Comm 2016, 2019; International Workshop on Non-Intrusive Load Monitoring 2018, 2020

**Conference Session Chair** (responsible for chairing conference session), Architectural Engineering Institute Conference 2021, Modeling and Optimization: Theory and

Applications (MOPTA) 2019; IEEE Power & Energy Society General Meeting 2019; International Workshop on Non-Intrusive Load Monitoring 2018; IEEE North American Power Symposium 2016

**Panel Reviewer**, National Science Foundation (NSF), 2015, 2016.

**Journal, Conference, and Book Reviewer**, names available upon request.

Various other activities including participating in a high school shadowing program, interviews for high school students, facilitating field trips for students, etc.

**Service to  
the Campus**

**Seminars and Conferences Committee**, Renewable and Sustainable Energy Institute (RASEI), 2020-present

**Search Committee Member**, For an institute search, 2019-2020

**ACTIVE volunteer**, Speaker, application reviewer, participant in the CU Engineering Faculty Development and Leadership Intensive, 2018, 2019.

Various other activities including student interviews, survey participation, guest judge for design courses, thesis committee member for students in other departments, etc.

**Service to  
the College  
and Dept.**

**Search Committee Member**, For a college-wide search, 2018-2019

**Visit Day Speaker**, 2020

**Graduate Committee Member**, Fall 2019 - Present

**Curriculum Committee Member**, Fall 2018 - Spring 2019

**Computer Committee Member**, Fall 2017 - Present

Various other activities including ARPAC external review meetings, writing preliminary and comprehensive exam questions, guest lectures, thesis committees, department meeting scribe, etc.

More information about service activities available upon request.