

Constance Crozier
Assistant Professor
H. Milton Stewart School of Industrial and Systems Engineering
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Earned Degrees

University of Oxford

P.h.D	Engineering Science	2020
	Advisor: Malcolm McCulloch	
	Thesis: The Impact of Domestic Electric Vehicles on Electricity Networks	
M.Eng	Engineering Science	2016
	Advisor: Michael Osborne	
	Thesis: Bayesian Non-parametrics for the War in Afghanistan	

Employment History

Georgia Institute of Technology

2023–pres	Assistant Professor	H. Milton Stewart School of Industrial and Systems Engineering
2023–pres	Faculty Fellow	Brook Byers Institute for Sustainable Systems

University of Colorado Boulder

2020–2023	Postdoctoral Fellow	Dept. of Civil, Environmental and Architectural Engineering
	Advisor: Kyri Baker	

UK Department of Business, Energy & Industrial Strategy

2019–2020	Technical Energy Specialist
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I. Honors and Awards

A. International or National Awards

- Prize Winner, ARPA-E Grid Optimization Competition Challenge 3, 2023.
- Rising Star in Electrical Engineering and Computer Science, 2022.
- Prize Winner, ARPA-E Grid Optimization Competition Challenge 2, 2021.

B. Institute or School Awards

- Outstanding Postdoc Award (CU Boulder), 2021. Two awards across all departments.
- Gibbs Prize (Oxford), 2015. For the best 3rd year undergraduate project.

II. Research, Scholarship, and Creative Activities

Publications from work done at Georgia Tech are indicated by ‘*’, and the student authors are **bold**.

A. Refereed Publications and Submitted Articles

A.1. Published and Accepted Journal Articles

- [14] C. Crozier, **A. Pigott**, K. Baker, Price perturbations for privacy preserving demand response with distribution network awareness, *IEEE Transactions on Smart Grid*, 2023.
- [13] C. Crozier, K. Baker, The effect of renewable electricity generation on the value of cross-border interconnection, *Applied Energy*, 2022.
- [12] **A. Pigott**, C. Crozier, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Electric Power Systems Research*, 2022.
- [11] C. Crozier, K. Baker, B. Toomey, Feasible region-based heuristics for optimal transmission switching, *Sustainable Energy, Grids and Networks*, 2022.
- [10] C. Crozier, C. Querton, N. Mansor, D. Pagnano, I. Llewellyn, Modeling of the ability of a mixed renewable generation electricity system with storage to meet consumer demand, *Electricity*, 2022.
- [9] K. Collett, S. Hirmer, H. Dalkmann, C. Crozier, Y. Mulugetta, M. McCulloch, Can electric vehicles be good for Sub-Saharan Africa?, *Energy Strategy Review*, 2021.
- [8] C. Crozier, T. Morstyn, M. McCulloch, Capturing diversity in electric vehicle charging behaviour for network capacity estimation, *Transportation Research Part D: Transport and Environment*, 2021.
- [7] C. Crozier, T. Morstyn, M. McCulloch, The opportunity for smart charging to mitigate the impact of EVs on the GB transmission and distribution systems, *Applied Energy*, 2020.
- [6] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Co-ordinated electric vehicle charging to reduce losses without network impedance information, *IET Smart Grid*, 2020.
- [5] T. Morstyn, C. Crozier, M. Deakin, M. McCulloch, Electric vehicle smart charging with battery voltage awareness using second-order cone programming, *IEEE Transactions on Transport Electrification*, 2020.
- [4] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, The case for bi-directional charging of electric vehicles in low voltage distribution networks, *Applied Energy*, 2020.
- [3] K. Collett, M. Byamukama, C. Crozier, M. McCulloch, Energy and transport in Africa and South Asia, *Energy and Economic Growth*, 2020.
- [2] C. Crozier, D. Apostolopoulou, M. McCulloch, Mitigating the impact of personal vehicle electrification: A power generation perspective, *Energy Policy*, 2018.
- [1] J. Cao, C. Crozier, M. McCulloch, Optimal design and operation of a low carbon community based multi-energy systems considering EV integration, *IEEE Transactions on Sustainable Energy*, 2018.

A.2. Conference Presentations with Proceedings (Refereed)

- [15] * H. Sharadga, J. Mohammadi, C. Crozier, K. Baker, Optimizing Multi-Timestep Security-constrained optimal power flow for large power grids, *IEEE Texas and Power Engineering Conference*, 2024.
- [14] **Priyadarshan**, E. Pergantis, C. Crozier, K. Baker, K. Kircher, EDGIE: A simulation test-bed for investigating the impacts of building and vehicle electrification on distribution grids, *Hawaii International Conference on System Sciences*, 2024.
- [13] **S. Curtis, J. Montagu**, C. Crozier, C. Torres-Machi, K. Baker, Trends in equitable electric vehicle adoption and impacts on pavement quality and electric power reliability, *ASCE*, 2024.
- [12] **C. Winner, J. Garland**, C. Crozier, K. Baker, Carbon emissions resulting from different power flow models for dispatch, *IEEE PES General Meeting*, 2023.
- [11] C. Crozier, K. Baker, Data-driven probabilistic constraint elimination for accelerated optimal power flow, *IEEE PES General Meeting*, 2022.
- [10] C. Crozier, **A. Pigott**, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging, *IEEE PES General Meeting*, 2022.
- [9] **M. Li, Y. Du**, J. Mohammadi, C. Crozier, K. Baker, Numerical comparisons of linear power flow approximations: optimality, feasibility, and computation time, *IEEE PES General Meeting*, 2022.
- [8] **A. Pigott**, C. Crozier, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Power Systems Computation Conference*, 2022.
- [7] C. Crozier, K. Baker, **Y. Du, M. Li**, J. Mohammadi, Data driven methods for contingency filtering in security constrained optimal power flow, *International Conference on Probabilistic Methods Applied to Power Systems*, 2022.
- [6] C. Crozier, K. Baker, Optimal sizing of an energy storage portfolio considering multiple time-scales, *IEEE PES General Meeting*, 2021.
- [5] M. Deakin, C. Crozier, T. Morstyn, D. Apostolopoulou, M. McCulloch, Stochastic hosting capacity in distribution networks, *IEEE PES General Meeting*, 2019.
- [4] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Incorporating charger efficiency into electric vehicle charging optimization, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2019.
- [3] L. Han, T. Morstyn, C. Crozier, M. McCulloch, Improving the scalability of a prosumer cooperative game with k-means clustering, *IEEE PowerTech*, 2019.
- [2] C. Crozier, D. Apostolopoulou, M. McCulloch, Clustering of usage profiles for electric vehicle behaviour analysis, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2018.
- [1] C. Crozier, D. Apostolopoulou, M. McCulloch, Numerical analysis of national travel data to assess the impact of UK fleet electrification, *Power Systems Computation Conference*, 2018.

A.3. Submitted Journal Articles

- [3] * **Mostafa Mohammadian**, C. Crozier, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging with delivery fleets.
- [2] * **M. Sagastuy-Breña**, A. Ahsan, C. Halloran, C. Crozier, J. López Prol, K. Williges, K. Steininger, W. Grossman, M. McCulloch, Least-regrets approach to evaluate inter-hemispheric HVDC connections.

- [1] * C. Crozier, M. Neaimeh, M. Deakin, Learning by Charging: Understanding Consumers' Changing Attitudes Towards Vehicle-to-Grid.

B. Presentations

B.1. Invited Conference and Workshop Presentations

- [3] Scaling security constrained optimal power flow to multi-timestep, INFORMS Annual Meeting, Phoenix, Oct 2023.
- [2] Approximations and heuristics for fast security constrained optimal power flow, INFORMS Annual Meeting, Anaheim, Oct 2021.
- [1] Approximations and heuristics for fast security constrained optimal power flow, ARPA-E Grid Optimization Competition Outreach Event, Online, Oct 2021.

B.2. Submitted Conference and Workshop Presentations

- [6] Optimal sizing of an energy storage portfolio considering multiple time-scales, IEEE PES General Meeting, Online, Jul 2021.
- [5] Large scale low carbon electricity networks with human-in-the-loop, Imperial College London Department of Electrical and Electronic Engineering, Mar 2022.
- [4] Incorporating charger efficiency into electric vehicle charging optimization, IEEE PES ISGT Europe, Sarajevo, Oct 2019.
- [3] Incorporating charger efficiency into electric vehicle charging optimization, IEEE PES ISGT Europe, Sarajevo, Oct 2019.
- [2] Clustering of usage profiles for electric vehicle behaviour analysis, IEEE PES ISGT Europe, Sarajevo, Oct 2018.
- [1] Numerical analysis of national travel data to assess the impact of UK fleet electrification, PSSC, Dublin, Jun 2018.

B.3. Invited Seminar Presentations

- [14] Power sector decarbonization with human-in-the-loop, Stanford University Department of Mechanical Engineering, Aug 2023.
- [13] Power sector decarbonization with human-in-the-loop, Newcastle University Department of Electrical Engineering, Mar 2023.
- [12] Power sector decarbonization with human-in-the-loop, UC Davis Department of Electrical and Computer Engineering, Mar 2023.
- [11] Power sector decarbonization with human-in-the-loop, Duke University Department of Civil & Environmental Engineering, Mar 2023.
- [10] Power sector decarbonization with human-in-the-loop, Cornell University Department of Civil & Environmental Engineering, Mar 2023.
- [9] Power sector decarbonization with human-in-the-loop, Cornell Tech Department of Electrical and Computer Engineering, Mar 2023.

- [8] Power sector decarbonization with human-in-the-loop, Carnegie Mellon University Department of Electrical and Computer Engineering, Feb 2023.
- [7] Power sector decarbonization with human-in-the-loop, Georgia Tech Institute School of Industrial and Systems Engineering, Feb 2023.
- [6] Power sector decarbonization with human-in-the-loop, Rice University Department of Civil & Environmental Engineering, Jan 2023.
- [5] Power sector decarbonization with human-in-the-loop, Texas A&M University Department of Electrical and Computer Engineering, Dec 2022.
- [4] Large scale low carbon electricity networks with human-in-the-loop, Imperial College London Department of Electrical and Electronic Engineering, Mar 2022.
- [3] Large scale low carbon electricity networks with human-in-the-loop, Boston University Department of Electrical and Computer Engineering, Mar 2022.
- [2] Large scale low carbon electricity networks with human-in-the-loop, MIT Department of Mechanical Engineering, Feb 2022.
- [1] Large scale low carbon electricity networks with human-in-the-loop, Temple University Department of Electrical and Computer Engineering, Feb 2022.

C. Grants and Contracts

C.1. As Co-Principal Investigator

1. Title of Project: Fast and robust strategies for large-scale mixed-integer SCOPF
 Agency/Company: ARPA-E
 Total Dollar Amount: \$400,000
 Role: Co-PI
 Collaborators: Javad Mohammadi (PI), Kyri Baker (Co-PI)
 Period of Contract: 6/2022 – 10/2024

III. Education

A. Courses Taught

Semester, Year	Course Number	Course Title	Number of Students
Spring 2024	ISyE 4501	Energy, Efficiency and Sustainability	19
Fall 2023	ISyE 6669	Deterministic Optimization	24

B. Individual Student Guidance

B.1. Ph.D. Students

B.1.a. In Process

1. Name: Rina Davilla-Severiano
Tentative Thesis Title: TBD
Advising Start Date: Fall 2023.

B.2. M.S. Students

1. Name: Sung Heon Kwon
Advising Start Date: Spring 2024

B.3. Service on Thesis or Dissertation Committees

B.4.a Internal

Name	School	Advisor	Committee	Date
Paprapee Buason	ECE	Daniel Molzahn	Defense	Dec 2023

C. Educational Innovations and Other Contributions

- Co-Lead a VIP Team of 15 students investigating geographic variations in power outages

IV. Service

A. Professional Contributions

A.1. Editorial Board Memberships

1. Associate Editor, *IEEE Transactions on Energy Markets, Policy, and Regulation*, Oct 2023–pres.

A.2. Society Officers, Activities, and Membership

- Leadership Roles:
 1. Chair of IEEE PES SBSC Task Force on Electric Vehicles

A.3. Organization and Chairmanship of Technical Sessions, Workshops and Conferences

- Session Chair
 1. IEEE PES General Meeting, Electric Vehicles and the Grid, 2024.
 2. International Conference on Probabilistic Methods Applied to Power Systems, 2022.
 3. INFORMS Annual Meeting, ARPA-E Grid Optimization Participants, 2021.