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

Employment History

Georgia Institute of Technology

2023–pres Assistant Professor H. Milton Stewart School of Industrial and Systems Engineering

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

I. Honors and Awards

A. International or National Awards

- Energy and Climate-Tech Innovation Policy "Boot Camp" for Early Career Researchers, 2024.
- 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

[J14] C. Crozier, A. Pigott, K. Baker, Price perturbations for privacy preserving demand response with distribution network awareness, *IEEE Transactions on Smart Grid*, 2023.

[J13] C. Crozier, K. Baker, The effect of renewable electricity generation on the value of cross-border interconnection, *Applied Energy*, 2022.

[J12] A. Pigott, C. Crozier, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Electric Power Systems Research*, 2022.

[J11] C. Crozier, K. Baker, B. Toomey, Feasible region-based heuristics for optimal transmission switching, *Sustainable Energy, Grids and Networks*, 2022.

[J10] C. Crozier, C. Quarton, 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.

[J9] 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.

[J8] 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.

[J7] 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.

[J6] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Co-ordinated electric vehicle charging to reduce losses without network impedance information, *IET Smart Grid*, 2020.

[J5] 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.

[J4] 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.

[J3] K. Collett, M. Byamukama, C. Crozier, M. McCulloch, Energy and transport in Africa and South Asia, *Energy and Economic Growth*, 2020.

[J2] C. Crozier, D. Apostolopoulou, M. McCulloch, Mitigating the impact of personal vehicle electrification: A power generation perspective, *Energy Policy*, 2018.

[J1] 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)

[C17] * **C. Ju**, C. Crozier, Learning a local trading strategy: Deep reinforcement learning for grid-scale renewable energy integration, *Hawaii International Conference on System Sciences*, 2025.

[C16] * **R. Davila-Severiano**, C. Crozier, Scheduling electrified freight transportation to increase renewable generation utilization, *IEEE North American Power Systems Conference*, 2024.

[C15] * E. Marchesini, B. Donnot, C. Crozier, I. Dytham, C. Merz, L. Schewe, N. Westerbeck, C. Wu, A. Marot, P. Donti, RL2Grid: Benchmarking reinforcement learning in power grid operations, Submitted: *International Conference on Machine Learning*

[C14] * 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.

[C13] **Priyadarshan**, E. Pergantis, C. Crozier, K. Baker, K. Kircher, EDGIE: A simulation testbed for investigating the impacts of building and vehicle electrification on distribution grids, *Hawaii International Conference on System Sciences*, 2024.

[C12] 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.

[C11] C. Winner, J. Garland, C. Crozier, K. Baker, Carbon emissions resulting from different power flow models for dispatch, *IEEE PES General Meeting*, 2023.

[C10] C. Crozier, K. Baker, Data-driven probabilistic constraint elimination for accelerated optimal power flow, *IEEE PES General Meeting*, 2022.

[C9] C. Crozier, A. Pigott, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging, *IEEE PES General Meeting*, 2022.

[C8] 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.

[C7] 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.

[C6] C. Crozier, K. Baker, Optimal sizing of an energy storage portfolio considering multiple timescales, *IEEE PES General Meeting*, 2021.

[C5] M. Deakin, C. Crozier, T. Morstyn, D. Apostolopoulou, M. McCulloch, Stochastic hosting capacity in distribution networks, *IEEE PES General Meeting*, 2019.

[C4] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Incorporating charger efficiency into electric vehicle charging optimization, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2019.

[C3] L. Han, T. Morstyn, C. Crozier, M. McCulloch, Improving the scalability of a prosumer cooperative game with k-means clustering, *IEEE PowerTech*, 2019.

[C2] C. Crozier, D. Apostolopoulou, M. McCulloch, Clustering of usage profiles for electric vehicle behaviour analysis, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2018.

[C1] 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

[S5] * **Priyadarshan**, C. Crozier, K. Baker, K. Kircher, Distribution Grids May Be a Barrier to Residential Electrification.

[S4] * C. Crozier, Closing the feasibility gap: Modeling to generate alternatives for AC topology optimization.

[S3] * M. Mohammadian, C. Crozier, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging with delivery fleets.

[S2] * 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.

[S1] * 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

[7] Learning a local trading strategy: Deep reinforcement learning for grid-scale renewable energy integration, Hawaii International Conference on Systems Science, Hawaii, Jan 2025.

[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, PSCC, Dublin, Jun 2018.

B.3. Invited Seminar Presentations

[15] Decision tools for more flexible electric power grids, NC State University Department of Industrial & Systems Engineering, Oct 2024.

[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 Principal Investigator

1. Title of Project: Mitigating the risk of life threatening power outages during extreme weather
   Agency/Company: Brook Byers Institute for Sustainable Systems
   Total Dollar Amount: $20,000
   Candidate's Share: 100%
   Collaborators: Brian An (Co-PI)
   Period of Contract: 8/2024 – 7/2025

C.2. 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
   Collaborators: Javad Mohammadi (PI), Kyri Baker (Co-PI)
   Period of Contract: 6/2022 – 10/2024

III. Education

A. Courses Taught

Semester	Course Number	Course Title	# 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

2. Xiangxin An

   Advising Start Date: Fall 2024
   Co-Advisor: Santanu Dey
   Tentative Thesis Title: *TBD*

1. Rina Davila-Severiano

   Advising Start Date: Fall 2023
   Degree Program: Industrial Engineering
   Tentative Thesis Title: Power Demand Flexibility from Electrified Supply Chains
   Milestones: Comprehensive examination Fall 2024.
   Activities: First author on 1 accepted conference paper

B.1.b. Additional Ph.D. Students Co-Advised on Presentations or Articles

2. Caleb Ju

   Advisor: George Lan
   Collaboration Dates: Fall 2023 – pres
   Project: Energy Applications of Reinforcement Learning
   Activities: Co-authored 1 accepted conference paper

1. Priyadarshan

University:	Purdue University
Advisor:	Kevin Kircher
Collaboration Dates:	Spring 2023 – pres
Project:	Spatio-temporal modeling of the cost of electrification
Activities:	Co-authored 1 accepted conference Co-authored 1 submitted journal paper

B.2. M.S. Students

1. Name: Sung Heon Kwon
   Advising: Spring 2024
   Topic: Spatiotemporal power outage analysis

B.3. Service on Thesis or Dissertation Committees

B.4.a Internal

Name	School	Advisor	Committee	Date
Zhengrong Chen	ECE	Sakis Meliopoulos	Defense	Dec 2024
Siyao Cai	ECE	Sakis Meliopoulos	Defense	Nov 2024
La'Darius Thomas	ECE	Daniel Molzahn	Proposal	Nov 2024
Rachel Harris	ECE	Daniel Molzahn	Proposal	Nov 2024
Haoruo Zhao	ISyE	Pascal Van-Henteryck	Proposal	Oct 2024
Alejandro Owen	ECE	Daniel Molzahn	Defense	Sep 2024
Nicole Redder	ISyE	Santanu Dey	Proposal	May 2024
Babak Taheri	ECE	Daniel Molzahn	Proposal Defense	May 2024 Dec 2024
Paprapee Buason	ECE	Daniel Molzahn	Defense	Dec 2023

C. Educational Innovations and Other Contributions

- Co-Lead a VIP Team of investigating geographic variations in power outages (Spring 24–pres)
- Initiated and lead a bi-weekly journal club for power and energy research (Spring 24–pres)

IV. Service

A. Professional Contributions

A.1. Editorial Board Memberships

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

A.2. Society Officers, Activities, and Membership

- Leadership Roles:
  1. Chair of IEEE PES SBSC Task Force on Electric Vehicles, Aug 2023 – Jul 2025.

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

- Member of Organizing Committee for Conferences and Workshops:
    1. Los Alamos National Laboratory's Grid Science Winter School and Conference, 2025.
- Session Chair
    4. Annual Conference on Information Science and Systems CISS, 2025.
    3. IEEE PES General Meeting, Electric Vehicles and the Grid, 2024.
    2. International Conference on Probabilistic Methods Applied to Power Systems, 2022.
    1. INFORMS Annual Meeting, ARPA-E Grid Optimization Participants, 2021.