Constance Crozier

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Education

University of Oxford

2016-2020 D.Phil in Engineering Science

2012-2016 M.Eng in Engineering Science (First Class)

Experience

Georgia Institute of Technology

2023-pres Assistant Professor, *Department of Industrial & Systems Engineering*

University of Colorado Boulder

2020-2023 Postdoctoral Associate, *Department of Civil, Environmental & Architectural Engineering*

UK Department of Business, Energy and Industrial Strategy

2019-2020 Technical Energy Specialist, *Department for Science, Innovation & Technology*

Select Prizes & Awards

2022 Rising Star in EECS, *UT Austin* (Selective workshop for underrepresented genders in academia)

2021 Outstanding Postdoc Award, *CU Boulder* (University-wide award, two given annually)

2021 ARPA-E Grid Optimization Competition Challenge 2 Prize Winner (**$140,000** prize)

2020 Winner of UK Power Networks Charge Challenge (Data science competition, solo entrant)

2017 Best Presentation at Manchester Energy and Electrical Power Systems Workshop

2015 Gibbs Prize for Best Part B Project, *University of Oxford* (Best research project out of 150 students)

2014-2016 Academic Scholarship, *University of Oxford* (Awarded for high performance in exams)

Funding

Current

2022-2024 **Fast and robust strategies for large-scale mixed-integer SCOPF**
PI: Javad Mohammadi, Co-PIs: Kyri Baker, **Constance Crozier**
Budget: **$400,000**, Funding organization: *ARPA-E*.

Previous

2021-2022 **Predicting Binding Constraints using Physics-Informed Deep Learning**
PI: Kyri Baker, Co-PI: **Constance Crozier**
Budget: **$23,090**, Funding organisation: *Solea*.

2021-2022 **Efficacy and equity of demand response programs across socioeconimic groups**
PI: Kyri Baker, Co-PI: Barry Mather, Collaborator: **Constance Crozier**
Budget: **$25,000**, Funding organisation: *Renewable and Sustainable Energy Initiative*.

2021-2022 **Electric vehicle adoption and associated impacts on infrastructure and society**
PI: Kyri Baker, Co-PIs: Cristina Torres-Machi, Amy Javernick-Will, **Constance Crozier**
Budget: **$8,500**, Funding organisation: *RISE Seed Grant - University of Colorado, Boulder*.

Publications

Ordered reverse chronologically, my author position is highlighted in **bold**, mentored students/postdocs denoted by underline.
Open access versions are posted at: https://constancecrozier.github.io/pubs/, also check out my google scholar.

Journal articles - Published

[j.14] **C. Crozier**, A. Pigott, K. Baker, Price perturbations for privacy preserving demand response with distribution network awareness, *IEEE Transactions on Smart Grid*, 2023.

[j.13] **C. Crozier**, K. Baker, The effect of renewable electricity generation on the value of cross-border interconnection, *Applied Energy*, 2022.

[j.12] A. Pigott, **C. Crozier**, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Electric Power Systems Research*, 2022.

[j.11] **C. Crozier**, K. Baker, B. Toomey, Feasible region-based heuristics for optimal transmission switching, *Sustainable Energy, Grids and Networks*, 2022.

[j.10] **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.

[j.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.

[j.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.

[j.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

[j.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.

[j.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.

[j.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

[j.3] K. Collett, M. Byamukama, **C. Crozier**, M. McCulloch, Energy and transport in Africa and South Asia, *Energy and Economic Growth*, 2020.

[j.2] **C. Crozier**, D. Apostolopoulou, M. McCulloch, Mitigating the impact of personal vehicle electrification: A power generation perspective, *Energy Policy*, 2018.

[j.1] J. Cao, **C. Crozier**, M. McCulloch, Optimal design and operation of a low carbon community based multi-energy systems considering EV integration, *IEEE Trans. on Sustainable Energy*, 2018.

Journal articles - Under review

Peer reviewed conference papers

[c.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, *Submitted to: ASCE*.

[c.12] C. Winner, J. Garland, **C. Crozier**, K. Baker, Carbon emissions resulting from different power flow models for dispatch, *IEEE PES General Meeting*, 2023.

[c.11] **C. Crozier**, K. Baker, Data-driven probabilistic constraint elimination for accelerated optimal power flow, *IEEE PES General Meeting*, 2022.

[c.10] **C. Crozier**, A. Pigott, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging, *IEEE PES General Meeting*, 2022.

[c.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.

[c.8] A. Pigott, **C. Crozier**, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Power Systems Computation Conference*, 2022.

[c.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.

[c.6] **C. Crozier**, K. Baker, Optimal sizing of an energy storage portfolio considering multiple timescales, *IEEE PES General Meeting*, 2021.

[c.5] M. Deakin, **C. Crozier**, T. Morstyn, D. Apostolopoulou, M. McCulloch, Stochastic hosting capacity in distribution networks, *IEEE PES General Meeting*, 2019.

[c.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.

[c.3] L. Han, T. Morstyn, **C. Crozier**, M. McCulloch, Improving the scalability of a prosumer cooperative game with k-means clustering, *IEEE PowerTech*, 2019.

[c.2] **C. Crozier**, D. Apostolopoulou, M. McCulloch, Clustering of usage profiles for electric vehicle behaviour analysis, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2018.

[c.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.

Select Invited Talks

Oct 2023 INFORMS "Scaling security constrained optimal power flow to multi-timestep"

Jun 2023 Newcastle University "Power sector decarbonization with human-in-the-loop"

Mar 2023 UC Davis "Power sector decarbonization with human-in-the-loop"

Mar 2023 Duke University "Power sector decarbonization with human-in-the-loop"

Mar 2023 Cornell University "Power sector decarbonization with human-in-the-loop"

Mar 2023 Cornell Tech "Power sector decarbonization with human-in-the-loop"

Feb 2023 Carnegie Mellon University "Power sector decarbonization with human-in-the-loop"

Feb 2023 Georgia Tech "Power sector decarbonization with human-in-the-loop"

Jan 2023 Rice University "Power sector decarbonization with human-in-the-loop"

Dec 2022 Texas A&M University "Power sector decarbonization with human-in-the-loop"

Oct 2022 INFORMS "Robust pricing for residential demand response with human-in-the-loop"

Mar 2022 Imperial College London "Large scale low carbon electricity networks with human-in-the-loop"

Mar 2022 Boston University "Large scale low carbon electricity networks with human-in-the-loop"

Feb 2022 MIT "Large scale low carbon electricity networks with human-in-the-loop"

Feb 2022 Temple University "Large scale low carbon electricity networks with human-in-the-loop"

Jan 2022 University of Oxford "Developing scalable algorithms for ARPA-E grid optimization competition"

Dec 2021 Newcastle University "Developing scalable algorithms for ARPA-E grid optimization competition"

Oct 2021 INFORMS "Approximations and heuristics for fast security constrained optimal power flow"

Oct 2021 ARPA-E Grid Optimization Competition Outreach Event "Approximations and heuristics for fast security constrained optimal power flow"

Professional Service

2022 Session Chair, *International Conference on Probabilistic Methods Applied to Power Systems*

2021 Session Chair, *INFORMS Annual Meeting*

2017-pres Reviewer, *IEEE TSG, TPWRS, TTE, PESGM, PES Letters*

Outreach & Engagement

2020-pres Created scientific animations for Twitter that have attracted over 600,000 views.

2020-pres Write and manage a personal science communication blog, which has had over 40,000 views.

2019 Filmed video series showing an undergraduate engineering interview with over 75,000 views.

2019 Helped create a series of challenges designed to help students teach themselves to code in Python.

2018 Ran an engineering workshop for school leavers as part of Christ Church Horizons program.

2015-2016 Access and academic affairs officer at Christ Church – co-ordinated outreach and the open day.