

# XIN QIN

Office BN4-81, Trumpington Street ◊ Cambridge, UK, CB2 1PZ

◊ Email: xq234@cam.ac.uk ◊ [Google Scholar](#) ◊ [Website](#)

## EDUCATION

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### University of Cambridge

PhD in Information Engineering

Supervisor: Prof. [Ioannis Lestas](#)

*September 2021 - Present*

### Columbia University

Admitted PhD student in Earth and Environmental Engineering

Advisor: Prof. [Bolun Xu](#)

*August 2020 - July 2021*

### Tsinghua University

MSc in Electrical Engineering

Supervisor: Prof. [Hongbin Sun](#)

*August 2017 - June 2020*

### Harbin Institute of Technology

BEng in Electrical Engineering

*August 2013 - June 2017*

## WORKING

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### Research Assistant, Tsinghua-UC Berkeley Shenzhen Institute (TBSI)

Research Topic: Electricity market, energy system operation

*July 2020 - June 2021*

### Research Assistant (Remote), Columbia University

Research Topic: Electricity market, energy storage control

*June 2020 - August 2021*

## RESEARCH INTEREST

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My research interests encompass a wide array of compelling topics, ranging from **power system control and optimization** to **energy storage in electricity markets**, and **multi-energy systems**. Additionally, I hold a strong fascination for **smart grids** and the pursuit of **energy system decarbonization**.

## PUBLICATIONS

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### Ongoing Journal Articles:

- **X. Qin**, I. Lestas, B. Xu. Economic Capacity Withholding Bounds of Competitive Energy Storage Bidders. Under review by Manufacturing & Service Operations Management (MSOM), 2024.

### Published Journal Articles:

- **X. Qin**, B. Xu, I. Lestas, Y. Guo, H. Sun. The Role of Electricity Market Design for Energy Storage in Cost-Efficient Decarbonization. *Joule*, 2023.
- N. Zheng, **X. Qin**, D. Wu, G. Murtaugh, B. Xu. Energy Storage State-of-Charge Market Model. *IEEE Transactions on Energy Markets, Policy and Regulation*, 2023.
- **X. Qin**, Y. Guo, X. Shen, H. Sun. Increasing flexibility of combined heat and power systems through optimal dispatch with variable mass flow. *IEEE Transactions on Sustainable Energy*, 2022.
- **X. Qin**, X. Shen, H. Sun, et. al. Combined Electric and Heat System Testbeds for Power Flow Analysis and Economic Dispatch. *CSEE Journal of Power and Energy Systems*, 2021.
- **X. Qin**, H. Sun, Y. Guo. Asynchronous Economic Dispatch for Combined Heat and Power Systems. *IEEE Open Access Journal of Power and Energy*, 2020.
- **X. Qin**, H. Sun, X. Shen, Y. Guo, et. al. A Generalized Quasi-Dynamic Model for Electric-Heat Coupling Integrated Energy System with Distributed Energy Resources. *Applied Energy*, 2019.

### Selected Conference Papers:

- **X. Qin**, I. Lestas. Frequency Control and Power Sharing in Combined Heat and Power Networks. *2024 IEEE Conference on Decision and Control (CDC)*, IEEE, 2024 (Accepted).
- R. Shi, X. Zhang, **X. Qin**, H. Sun. Optimal Heat Flow in District Heat Networks with Tree Topology: A Convex Approach. *2020 IEEE PES General Meeting*, IEEE, 2020.

- **X. Qin**, X. Zhang, X. Shen, Y. Xu, M. Shahidepour, H. Sun. Distributed Optimal Frequency Control for Integrated Energy Systems with Electricity and Heat. *2019 IEEE PES General Meeting*, IEEE, 2019.
- **X. Qin**, X. Shen, H. Sun, et al. A Quasi-Dynamic Model and Corresponding Calculation Method for Integrated Energy System with Electricity and Heat. *Energy Procedia (the 10th International Conference on Applied Energy)*, 2019, 158: 6413-6418.

## SELECTED AWARDS

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<b>Postgraduate Research and Expenses Fund</b> , Clare College, University of Cambridge	2024
<b>Ford of Britain Fund</b> , Department of Engineering, University of Cambridge	2024
<b>Chinese Government Award for Outstanding Self-financed Students Abroad</b> , MOE of China	2024
<b>CSEE JPES Excellent Paper Award</b> , CSEE Journal of Power and Energy Systems	2023
<b>Li Memorial Fellowship</b> , Columbia University	2020
<b>Columbia University TA/RA Scholarships</b> , Columbia University	2020
<b>National Scholarship for Postgraduates</b> , MOE of China	2019
<b>Excellent Comprehensive Scholarship</b> , Tsinghua University	2018
<b>Best Paper Candidate</b> , the 10th International Conference on Applied Energy	2018
<b>Outstanding Contribution Award</b> for Voluntary Work, IEEE Power and Energy Society	2017
<b>Excellent Graduate</b> , Harbin Institute of Technology	2017
<b>First Class People's Scholarship</b> (several times), Harbin Institute of Technology	2014-2017
<b>National Scholarship for Undergraduates</b> , Ministry of Education (MOE) of China	2014

## INVITED PRESENTATION

### Talks:

- Economic Capacity Withholding Bounds of Competitive Energy Storage Bidders. *2024 IEEE PES General Meeting*, Seattle, US, July 2024. (Poster)
- The Role of Electricity Market Design for Energy Storage in Cost-Efficient Decarbonization. *King's College London*, London, UK, July 2023.
- Impact of Market Bidding and Dispatch Model over Energy Storage Utilization. *2022 Federal Energy Regulatory Commission (FERC) Technical Conference*, Washington DC, US, June 2022. (Presenter: Prof. Bolun Xu)
- Agent-based Storage Valuation and Market Participation Analysis. *2021 FERC Technical Conference*, Washington DC, US, June 2021. (Presenter: Prof. Bolun Xu)
- Distributed Optimal Frequency Control for Integrated Energy Systems with Electricity and Heat. *2019 IEEE PES General Meeting*, Atlanta, US, August 2019.
- A Quasi-Dynamic Model and Corresponding Calculation Method for Integrated Energy System with Electricity and Heat. *10th International Conference on Applied Energy*, Hong Kong, China, August 2018.
- Heating Network Quasi-Dynamic Model of Multi-Energy Flow System Based on Forward Method. *2017 IEEE Conference on Energy Internet and Energy System Integration*, Beijing, China, November 2017.

### Journal Articles:

- Combined Electric and Heat System Testbeds for Power Flow Analysis and Economic Dispatch. *CSEE Journal of Power and Energy Systems*, 2019.
- Asynchronous Economic Dispatch for Combined Heat and Power Systems. *IEEE Open Access Journal of Power and Energy (OAJPE)*, Invited by Editor-in-Chief, 2020.

## SELECTED MEDIA COVERAGE

### Improving Market Design for Energy Storage

News and Twitter

[Links](#)

June 2023

- Featured in reputable media outlets such as *Today Headline*, *Tech Xplore*, *Bioengineer*, *EurekAlert*, and *Columbia University School of Engineering and Applied Science*.
- Recognized by influential Twitter accounts with high impact, including *@Cell Press*, *@Cell Press Sustainability*, *@TechXplore*, and *@Lorenzo H. Gomez*.

### Latest original research from Applied Energy: A generalized quasi-dynamic model for electric-heat coupling integrated energy system with distributed energy resources

WeChat post

[Link](#)

May 2019

- Post has 1.3k Reads.

## ACTIVITIES

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### Teaching:

- **Supervisor**, 3F2 Systems and control, University of Cambridge 2023 Lent
- **Supervisor**, 3F1 Signals and systems, University of Cambridge 2022 Michaelmas
- **Demonstrator**, 3F2 Systems and Control, University of Cambridge 2022 Lent
- **Teaching Assistant**, Introduction of Smart Grid, Tsinghua University 2019 Spring  
Evaluation: A (Highest)
- **Teaching Assistant**, Operations Research and Statistics, Tsinghua University 2018 Fall  
Evaluation: A (Highest)

### Volunteering and Social Work:

- **Student helper**, 26th International Symposium on Mathematical Theory of Networks and Systems 2024
- **Committee Member**, UK Tsinghua Association 2021
- **Volunteer for IEEE PES Energy Internet Coordinating Committee (EICC)**, Prepared the materials for founding EICC and contacted related technical committees for support 2020
- **Volunteer for Defending Typhoon**, Helped clean campus after typhoon Mangosteen 2018
- **Voluntary Presenter at Tsinghua External Advisory Board Conference**, Presented my research work for Tsinghua international advisors from MIT, Stanford, UC Berkeley 2018
- **Volunteer Team Leader at IEEE Conference on Energy Internet and Energy System Integration**, Led a team of 6 people to serve for the keynote speech with 800+ audiences. 2017

## INDUSTRIAL PROJECTS / ENGINEERING APPLICATION WORK

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### Design and develop algorithms for power flow analysis and optimal dispatch

*Role: Participant and researcher*

*March 2017 - June 2021*

- Supported by the National Key R&D Programs of China (2018YFB0905000 and 2016YFB0901300) and the National Natural Science Foundation of China (51537006).
- Conducted research on nonlinear power flow calculation and economic dispatch for integrated energy systems, and contributed to industrial implements. Example: Innovated combined heat and power dispatch methods to help Guangzhou Pearl Industrial Park reduce operational costs and carbon emissions.

### Design Integrated Energy Management Systems (I-EMS) for Jilin Provincial Power Grid

*Role: Participant and developer*

*March 2019 - June 2020*

- Supported by State Grid Corporation of China, \$1.08 million.
- Designed optimal dispatch frameworks and communication mechanisms for the provincial power dispatch center in Jilin province, China.

### Design and develop nonlinear power flow analysis module for I-EMS

*Role: Module leader*

*November 2017 - June 2020*

- Supported by China Power International Development Limited, \$2.90 million.
- Designed and developed algorithms for dynamic power flow calculation, and deployed the I-EMS software in Beike Technology Park, China.

## PROFESSIONAL ENGAGEMENT

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Reviewer for IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, IEEE Transactions on Sustainable Energy, CSEE Journal of Power and Energy Systems, IEEE Transactions on Energy Markets, Policy and Regulation, IET Renewable Power Generation; IEEE PES General Meeting, and IEEE Conference on Energy Internet and Energy System Integration