XINYI YI

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PROFILE

PhD Candidate in Engineering at the University of Cambridge, with research interests in data-driven and robust control, energy markets, and language-informed decision-making for energy systems.

EDUCATION

University of Cambridge Oct. 2023 – Present
PhD in Engineering *Fully Funded PhD Scholarship*
Supervisor: Prof. Ioannis Lestas
Research interests: data-driven control, robust control, and market-aware decision-making for energy systems.

Tsinghua University Sep. 2020 – Jun. 2023
M.S. in Electrical Engineering *Fully Funded*
Supervisor: Associate Prof. Ye Guo
Overall GPA: 3.96/4.0 Rank: 3/114
Honors: Departmental Scholarship (Top 5%)

North China Electric Power University Sep. 2016 – Jun. 2020
B.S. in Electrical Engineering and Automation
Major GPA: 90.27/100 Overall GPA: 89.92/100
Honors: First-Class Scholarship (Top 6%)

SELECTED PUBLICATIONS AND WORKING PAPERS

Control and optimisation of electricity and heating systems

X. Yi, I. Lestas, *A Mixed $\mathcal{H}_\infty$–Passivity Approach for Leveraging District Heating Systems as Frequency Ancillary Service in Electric Power Systems*, IEEE Power & Energy Society General Meeting (PESGM), 2026. *Selected for the Emerging Technologies Best Paper Session.*

X. Yi, I. Lestas, *On-Policy Reinforcement-Learning Control for Optimal Energy Sharing and Temperature Regulation in District Heating Systems*, IEEE Conference on Decision and Control (CDC), 2025.

X. Yi, I. Lestas, *Optimal Energy-Sharing and Temperature Regulation in District Heating Systems*, IFAC Conference on Networked Systems (NecSys), 2025.

X. Yi, I. Lestas, *Optimality-Embedded Data-Enabled Policy Optimization for Real-Time Economic Dispatch and Temperature Regulation in District Heating Systems*, manuscript under review.

Market signals in system dynamics and operational decisions

X. Yi, Y. Guo, H. Sun, X. Qin, Q. Wu, *Energy-Grade Double Pricing for Combined Heat and Power Systems*, IEEE Transactions on Power Systems, vol. 39, no. 2, pp. 3769–3784, 2024.

X. Yi, Y. Guo, H. Sun, *Energy-Grade Double Pricing Rule in the Heating Market*, IEEE Conference on Decision and Control (CDC), 2022.

X. Yi, Y. Guo, H. Sun, Q. Wu, L. Xiao, *Energy-Grade Double Pricing Mechanism for a Combined Heat and Power System Using the Asynchronous Dispatch Method*, IEEE Conference on Energy Internet and Energy System Integration, 2022.

X. Yi, I. Lestas, *Mixed $\mathcal{H}_\infty$–Passivity Loop Shaping for Frequency Support in Heat-Pump-Connected Power–Heat Systems*, manuscript in preparation.

Forecasting and contextual information in the loop

X. Yi, I. Lestas, *LiFT-MPC: Language-in-the-Loop Feedback Tuning of Cost Previews for MPC*, IEEE Conference on Decision and Control (CDC), 2026 (accepted).

X. Yi, I. Lestas, *Economic MPC for Battery Energy Storage Systems with Language-Informed Electricity Price Forecast Refinement*, work in preparation.

X. Yi, I. Lestas, *EPNews: A Multi-Market Benchmark for Text-Informed Electricity Price Forecasting*, work in preparation.

X. Yi, I. Lestas, *SPARK: A Scenario-Based Price Correction Agent with Retrieval Knowledge for Electricity Price Forecast Correction*, work in preparation.

AWARDS, GRANTS, AND SCHOLARSHIPS

Fully Funded PhD Scholarship, University of Cambridge	2023 – Present
Churchill College Opportunities Fund Grant	2026
Department of Engineering Travel Grant, University of Cambridge	2026, 2025
Cambridge Trust Travel Fund	2026
IEEE CDC Student Travel Grant	2025
Departmental Scholarship, Tsinghua University	2021, 2022
Meritorious Winner, Mathematical Contest in Modeling (MCM)	2018

TEACHING EXPERIENCE

University of Cambridge, United Kingdom
Lab Demonstrator / Senior Lab Demonstrator Oct. 2023, 2024, 2025

- Demonstrated undergraduate control laboratories, including Vehicle Motion Control (I2) and Position Control (I3).
- Guided students in feedback control implementation, tuning, and experimental analysis.
- Served as Senior Lab Demonstrator in 2025, supporting coordination of junior demonstrators.

Tsinghua University, China
Teaching Assistant, Power Systems and Market Operation Feb. 2022 – Jul. 2022

- Assisted with teaching, grading, and examination administration for a graduate-level course.
- Supported a simulation-based project on electricity market operation.

ACADEMIC SERVICE AND LEADERSHIP

Reviewer: *IEEE Conference on Decision and Control (CDC)*, *IEEE Power & Energy Society General Meeting (PESGM)*, *IEEE Transactions on Smart Grid*, *IEEE Transactions on Power Systems*.

University of Cambridge, Department of Engineering, United Kingdom
Organising Committee Member, Division F Conference Oct. 2025

- Helped coordinate keynote sessions and programme planning for the Division F conference.

Cambridge Philosophical Society, United Kingdom
Fellow Oct. 2025 – Present

Tsinghua University, China
Founder, Energy Internet Association (Graduate College) Nov. 2020 – Jun. 2023

- Founded and led a graduate academic association focused on energy and networked systems.

SELECTED RESEARCH EXPERIENCE

National Development and Reform Commission (NDRC), China Mar. 2021 – Jun. 2021
Research Contributor
Contributed to comparative studies on integrated and multi-energy systems for policy-oriented analysis under carbon-neutrality targets.

China Southern Power Grid Corporation, China Oct. 2020 – Oct. 2021
Research Assistant
Worked on unified modelling and optimisation methods for coupled electricity, heat, and gas systems.

China Southern Power Grid Co., Ltd., China Nov. 2021 – Jan. 2022
Research Intern, AI Research and Development Center
Studied data-driven methods for oscillation source identification in large-scale dynamical systems.

RESEARCH METHODS AND TOOLS

Coupled energy systems and markets: modelling and optimisation of coupled power–heat systems, market-aware operation, and operational decision-making under uncertainty.
Control and optimisation under uncertainty: data-driven, robust, and stochastic control of large-scale dynamical systems, with experience in reinforcement learning and H_∞ / loop-shaping design.
Forecasting and contextual decision support: electricity price forecasting, forecast correction, time-series analysis, prediction-in-the-loop methods, multimodal and language-informed forecasting, and embedding-based retrieval.
Programming: Python, MATLAB, C, SQL.
Languages: Chinese (native), English (fluent).