RUIKE LYU

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Princeton, NJ, 08540, USA

EDUCATION

- **MAE & Andlinger Center for Energy and the Environment, Princeton University** *Feb. 2025 - Present*
  Visiting Scholar, Advisor: Prof. Jesse Jenkins Princeton, NJ
- **Department of Electrical Engineering, Tsinghua University** *Sept. 2021 - Present*
  Ph.D. Student, Advisor: Prof. Chongqing Kang, Prof. Hongye Guo Beijing, China
- **Department of Electrical Engineering, Tsinghua University** *Sept. 2017 - Jun. 2021*
  B.E. in Electrical Engineering Beijing, China
- **School of Economics and Management, Tsinghua University** *Sept. 2018 - Jun. 2021*
  Bachelor of Business Administration (Second Degree) Beijing, China

TEACHING EXPERIENCE

- **Department of Electrical Engineering, Tsinghua University** *2023/2024 Academic Year*
  Teaching Assistant for Energy Internet Operation Scheduling and Planning Beijing, China

HONORS AND AWARDS

- **Best Presentation Award**, IEEE PES Ph.D. Dissertation Challenge *2025*
- **Best Presentation/Paper Award**, PESGM2025, EECT2025, PSSGT2025, CEEPE2024
- **Outstanding Undergraduate Student Mentor**, Tsinghua University *2024*
- **National Scholarship for Graduate Students**, Ministry of Education of China *2023*
- **First-Class Comprehensive Excellence Scholarship**, Tsinghua University *2022*
- **Future Scholar Scholarship**, Tsinghua University *2021*
- **Outstanding Bachelor Thesis**, Tsinghua University *2021*
- **Outstanding Student Leader Award**, Tsinghua University *2020*

SELECTED PUBLICATIONS

J=JOURNAL, C=CONFERENCE

English Journal Papers

[J.1] **R. Lyu**, X. Su, E. Du, H. Guo, Q. Chen and C. Kang, "Efficient Scheduling of Discrete Industrial Processes through Continuous Modeling," *IEEE Transactions on Smart Grid*, in press.

[J.2] **R. Lyu**, H. Guo, G. Strbac and C. Kang, "Data-Driven Dimension Reduction for Industrial Load Modeling Using Inverse Optimization," *IEEE Transactions on Smart Grid*, vol. 16, no. 3 (2025): 2695-2698.

[J.3] **R. Lyu**, H. Guo, Q. Tang, Q. Chen, and C. Kang, "Production Scheduling Identification: An Inverse Optimization Approach for Industrial Load Modeling Using Smart Meter Data," *IEEE Transactions on Smart Grid*, vol. 16, no. 2 (2025): 1207-1220.

[J.4] Q. Chen, **R. Lyu**, H. Guo, and X. Su, "Real-Time Operation Strategy of Virtual Power Plants With Optimal Power Disaggregation Among Heterogeneous Resources," *Applied Energy*, vol. 361 (2024): 122876.

[J.5] **R. Lyu**, H. Guo, K. Zheng, M. Sun, and Q. Chen, "Co-Optimizing Bidding and Power Allocation of an EV Aggregator Providing Real-Time Frequency Regulation Service," *IEEE Transactions on Smart Grid*, vol. 14, no. 6 (2023): 4594-4606.

[J.6] **R. Lyu**, Y. Gu, and Q. Chen, "Electric Vehicle Charging Right Trading: Concept, Mechanism, and Methodology," *IEEE Transactions on Smart Grid*, vol. 13, no. 4 (2022): 3094-3105.

[J.7] Q. Chen, X. Fang, H. Guo, K. Zheng, Q. Tang, **R. Lyu**, K. Pan, P. Palensky, D. S. Kirschen, and C. Kang, "The Competition and Equilibrium in Power Markets Under Decarbonization And Decentralization," *iEnergy*, vol. 1, no. 2 (2022): 188-203.

[J.8] H. Zhou, Q. Shao, X. Zhu, S. Liu, X. Liu and **R. Lyu***, "An Incentive-Compatible Frequency Regulation Market for Flexible Resources in Microgrid," *IEEE Access*, vol. 11 (2023): 18983-18994.

Conference Papers

[C.1] J. Li, **R. Lyu**, Y. Zhang, X. Cha, K. Zheng, and H. Guo, "Value-Based Industrial Load Shedding with Supply Chain Coordination Reduces Electricity Cost," *2026 IEEE PES International Meeting*, accepted.

[C.2] J. Zhang, **R. Lyu**, X. You, J. Wang, Y. Cai, and H. Guo, "When Will Real-Time Pricing Outperform Time-of-Use Pricing Significantly?," *2026 IEEE PES International Meeting*, accepted.

[C.3] H. Huang, **R. Lyu**, C. Feng, H. Zhong, H. B. Gooi, B. Li and R. Liang, "Learning for Feasible Region on Coal Mine Virtual Power Plants with Imperfect Information," *2025 IEEE PES General Meeting*, in press.

[C.4] Q. Liu, **R. Lyu**, Z. Zhai, Y. Shen, X. Liu and H. Guo, "Integrating Fast-response Capability into Virtual Power Plant Operation for Ancillary Services," *2025 IEEE Powertech*, Kiel, Germany.

[C.5] R. Chen, Z. Tang, **R. Lyu**, Q. Zheng, H. Song and H. Guo, "Combining AI and Simulation to Assess Building Demand Response Potential at Scale," *2025 5th International Conference on Advances in Electrical, Electronics and Computing Technology (EECT)* (**Best Presentation**), Guangzhou, China, 2025, pp. 1-6.

[C.6] Y. Shen, **R. Lyu**, H. Guo and C. Kang, "An Improved Modeling Method for Electrolyte Aluminum Loads Considering Thermal Balance and Flexible Regulation Cost," *2025 IEEE International Conference on Power Systems and Smart Grid Technologies (PSSGT)* (**Best Presentation**), Chongqing, China, 2025, pp. 331-337.

[C.7] A. Luo, **R. Lyu**, H. Guo, Y. Cai and Q. Chen, "An Incentive-Compatible VPP Profit Allocation Model Considering the Operating Characteristics of Air Conditioning Loads," *2024 7th International Conference on Energy, Electrical and Power Engineering (CEEPE)* (**Best Presentation**), Yangzhou, China, 2024, pp. 1270-1278.

[C.8] L. Su, **R. Lyu**, H. Guo, Y. Cai and Q. Chen, "Coordinating Air Conditioning Load Clusters to Provide Frequency Regulation Using Setpoint Changes," *2024 7th International Conference on Energy, Electrical and Power Engineering (CEEPE)*, Yangzhou, China, 2024, pp. 905-910.

[C.9] **R. Lyu**, H. Guo and Q. Chen, "Approximating Energy-Regulation Feasible Regions of Virtual Power Plants: A Data-Driven Inverse Optimization Approach," *2024 IEEE Power & Energy Society General Meeting (PESGM)*, Seattle, WA, USA, 2024, pp. 1-5.

[C.10] **R. Lyu**, H. Guo, Y. Zheng, Y. Bai and Q. Chen, "LSTN: A Linear Model of Industrial Production Process for Demand Response," *2023 IEEE PES Innovative Smart Grid Technologies Europe (ISGT EUROPE)*, Grenoble, France, 2023, pp. 1-5.

Chinese Journal Papers

[J.9] X. Su, **R. Lyu**, Y. Bai, X. Wang, W. Zhao, and H. Guo, "A Method for Modeling the Feasible Region of Industrial Production Processes Based on the Optimal Adjustable Load Model," *Automation of Electric Power Systems*, in press.

[J.10] X. Su, **R. Lyu**, H. Guo, and Q. Chen, "A Method for Optimal Selection of High-Capacity Industrial Users for Demand Response Based on Load Step Data Processing Mode," *Electric Power*, 2024, 57(01): 18-29.

[J.11] Q. Chen, **R. Lyu**, H. Guo, H. Jia, Y. Ding, Y. Wang, and C. Kang, "Electricity User Behavior Modeling for Demand Response: Research Status Quo and Applications," *Electric Power Automation Equipment*, 2023, 43 (10): 23-37.

[J.12] Q. Chen, **R. Lyu**, Q. Tang, K. Li, H. Gao, and H. Guo, "Emergency Response of Electricity Market from Perspectives of Suspension of Spot Market in Australia," *Automation of Electric Power Systems*, 2022, 46 (16): 214-223.

PATENTS

[P.1] Q. Chen, Y. Chen, K. Zheng, and **R. Lyu**, "Method for estimating state of power based on electrochemical model of lithium-ion battery," US Patent App. 18/919,593, 2025.

[P.2] Q. Chen, Y. Chen, K. Zheng, and **R. Lyu**, "Method for updating state of charge based on power characteristic of electrochemical model of lithium-ion battery," US Patent App. 18/919,638, 2025.

PARTICIPATED RESEARCH PROJECTS

- **Key Technologies of Interactive Regulation of Large-Scale Flexible Resources Aggregation in Virtual Power Plant**
  The National Key Research and Development Program of China (2021YFB2401200), 2021 - 2025
- **Energy Conservation and Supply-Demand Interaction Technology for High-Energy-Consumption Industrial Users**
  The National Key Research and Development Program of China (2023YFB2407300), 2023 - Present

PARTICIPATED INDUSTRIAL PROJECTS

- **Optimized Operation Strategy for Auto Manufacturing Plant** *State Power Investment Corporation (SPIC)*
  Chongqing, China 2024
  - This project involved designing an optimized operation strategy for an auto manufacturing plant (BYD) in Chongqing, integrating 60MW industrial load (manufacturing facilities), 60MW/240MWh energy storage system, and 10MW solar generation capacity. The project is generating approximately $4 million in annual savings, demonstrating the significant value that can be created through intelligent energy management of industrial loads and distributed energy resources.