CHENBEI LU

Beijing, P.R. China
lcb20@mails.tsinghua.edu.cn ◇ www.luchenbei.com

RESEARCH INTERESTS

My research focuses on the theory of stochastic optimization and reinforcement learning with applications to the power systems and energy markets. The ultimate goal is to enable a more efficient, robust, and sustainable power grid. Specifically, my current research topics include 1. Developing (offline) robust and effective scheduling algorithms for power system and EV charging networks considering high renewable energy penetration. 2. Developing online decision-making algorithms in stochastic power system applications with performance guarantees. 3. Designing financial instruments and regulation policies to improve the efficiency and fairness of the electricity market.

EDUCATION

Tsinghua University Institute of Interdisciplinary Information Sciences *Beijing, CN*
Ph.D. in Computer Science and Technology Sept. 2020 - Expected 2025
Advisor: Prof. Chenye Wu

California Institute of Technology Department of Computing & Mathematical Sciences *Pasadena, US*
Visiting Ph.D. Student Aug. 2023 - Feb. 2024
Advisor: Prof. Adam Wierman

Huazhong University of Science & **Technology** School of Software Engineering *Wuhan, CN*
B.E. in Computer Software Engineering Sept. 2016 - Jun. 2020
GPA 3.97, Rank 1/180

INDUSTRIAL EXPERIENCES

Didi Chuxing Technology Co. Department of Data Science and Intelligence *Beijing, CN*
Research Intern Jan. 2021 - Nov. 2021
Topics: Transportation Systems Optimization via Carpooling Design

PUBLICATIONS

Journal Articles

1. **Chenbei Lu**, Hongyu Yi, Jiahao Zhang, and Chenye Wu*. "Self-Improving Online Storage Control for Stable Wind Power Commitment." in *IEEE Transactions on Smart Grid*, (2024).
2. **Chenbei Lu**, Jinhao Liang, Nan Gu, Haoxiang Wang, and Chenye Wu*. "Manipulation-Proof Virtual Bidding Mechanism Design." in *IEEE Transactions on Energy Market, Policy and Regulation*, (2023).
3. **Chenbei Lu**, Jingshi Cui, Haoxiang Wang, Hongyu Yi, and Chenye Wu*. "Privacy Preserving User Energy Consumption Profiling: From Theory to Application." in *IEEE Transactions on Smart Grid*, (2023).
4. **Chenbei Lu**, Gu Nan, Wenqian Jiang, and Chenye Wu*. "Sample-Adaptive Robust Economic Dispatch With Statistically Feasible Guarantees." in *IEEE Transactions on Power Systems*, (2023).
5. **Chenbei Lu**, Jinhao Liang, Wenqian Jiang, Jiaye Teng, and Chenye Wu*. "High-Resolution Probabilistic Load Forecasting: A Learning Ensemble Approach." in *Journal of the Franklin Institute* (2023).
6. **Chenbei Lu**, Jiaman Wu, Jingshi Cui, Yanyan Xu, Chenye Wu*, and Marta C. Gonzalez. "Deadline Differentiated Dynamic EV Charging Price Menu Design." in *IEEE Transactions on Smart Grid* 14, no. 1 (2022): 502-516.
7. **Chenbei Lu**, Wenqian Jiang, and Chenye Wu*. "Effective End-to-end Learning Framework for Economic Dispatch." in *IEEE Transactions on Network Science and Engineering* 9, no. 4 (2022): 2673-2683.
8. **Chenbei Lu**, Jiaman Wu, and Chenye Wu*. "Privacy-preserving Decentralized Price Coordination for EV Charging Stations." in *Electric Power Systems Research* 212 (2022): 108355.

9. Jinhao Liang, Wenqian Jiang, **Chenbei Lu**, and Chenye Wu*. "Joint Chance-constrained Unit Commitment: Statistically Feasible Robust Optimization with Learning-to-Optimize Acceleration." in *IEEE Transactions on Power Systems* (2024).

10. Wenqian Jiang, **Chenbei Lu**, and Chenye Wu*. "Robust Scheduling of Thermostatically Controlled Loads with Statistically Feasible Guarantees." in *IEEE Transactions on Smart Grid* (2023).

11. Jiaman Wu, **Chenbei Lu**, Chenye Wu*, Jian Shi, Marta C. Gonzalez, Dan Wang, Zhu Han, "A cluster-based appliance-level-of-use demand response program design." in *Applied Energy* 362, 123003.

12. Gaoyuan Xu, Jian Shi, Jiaman Wu, **Chenbei Lu**, Chenye Wu*, Dan Wang, Zhu Han, "An optimal solutions-guided deep reinforcement learning approach for online energy storage control." in *Applied Energy* 361, 122915

13. Jiaman Wu, **Chenbei Lu**, and Chenye Wu*. "Learning-aided Framework for Storage Control Facing Renewable Energy." in *IEEE Systems Journal* (2022).

14. Haoxiang Wang, Jiasheng Zhang, **Chenbei Lu**, and Chenye Wu*. "Privacy Preserving in Non-intrusive Load Monitoring: A Differential Privacy Perspective." in *IEEE Transactions on Smart Grid* 12, no. 3 (2020): 2529-2543.

Conference Proceedings

1. **Chenbei Lu**, Jiaman Wu, and Chenye Wu*. "Privacy-preserving Decentralized Price Coordination for EV Charging Stations." in *the 22nd Power Systems Computation Conference (PSCC 2022)*.

2. **Chenbei Lu**, Zhiqi Wang, and Chenye Wu*. "Storage-aided Service Surcharge Design for EV Charging Stations." In *the 60th IEEE Conference on Decision and Control (CDC)*, pp. 5653-5658. IEEE, 2021.

3. **Chenbei Lu**, Jiaman Wu, Chenye Wu*, Yongli Qin, Qun Li, and Nan Ma. "Efficiency or Fairness? Carpooling Design for Online Ride-hailing Platform in Transport Hubs at Midnight." In *Proceedings of the 29th International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL)*, pp. 244-255. 2021.

4. Hongyu Yi, **Chenbei Lu***, Chenye Wu, "Online Storage Control for Stable Wind Power Commitment via Lyapunov Optimization", in *IEEE Sustainable Power and Energy Conference 2023 (iSPEC 2023)*.

5. Yiyang Zhang, Chenye Wu, **Chenbei Lu***. "Risk-Limiting Multi-Station EV Charging Scheduling with Imperfect Prediction." *2022 the 7th IEEE Workshop on the Electronic Grid (eGRID)*. IEEE, 2022.

6. Wenqian Jiang, Jinhao Liang, **Chenbei Lu**, Chenye Wu*. "Robust Online EV Charging Scheduling with Statistical Feasibility." in *the 62nd IEEE Conference on Decision and Control (CDC)*, 2023.

7. Jinhao Liang, **Chenbei Lu**, Wenqian Jiang, Chenye Wu*. "Few-shot Residential Load Forecasting Boosted by Learning to Ensemble". in *the 7th IEEE Conference on Energy Internet and Energy System Integration (EI2)*, 2023.

8. Jiaman Wu, **Chenbei Lu**, Chenye Wu*, Yongli Qin, Qun Li, Nan Ma, and Jun Fang. "Mobility Data-driven Complete Dispatch Framework for the Ride-hailing Platform." In *Adjunct Proceedings of the 2021 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2021 ACM International Symposium on Wearable Computers (Ubicomp)*, pp. 684-690. 2021.

ACADEMIC SERVICES

- **TPC Member**:
  - *SmartGridComm*
- **Reviewer**:
  - *IEEE Transactions on Smart Grid*
  - *IEEE Transactions on Industrial Application*
  - *IEEE Systems Journal*
  - *International Journal of Electrical Power & Energy Systems*

- *Electric Power Systems Research*
- *Scientific Reports*
- *American Control Conference (ACC)*
- *Power Systems Computation Conference (PSCC)*
- *SmartGridComm*

TEACHING ASSISTANCE

- 2021 Fall: **Combinatorial Mathematics** (Graduate Course), Tsinghua University
- 2022 Fall: **AI Research Practice** (Yao Class Undergrad Course), Tsinghua University

SELECTED HONORS

- Ubiquant Excellence Scholarship, Tsinghua University — Oct. 2023
- Yangtze River Research Institute Excellence Scholarship, Tsinghua University — Oct. 2022
- Huiyan Excellence Scholarship, Tsinghua University — Oct. 2021
- Outstanding Graduate, Huazhong University of Science & Technology — Jul. 2020
- Excellent Dissertation Award (4%), Huazhong University of Science & Technology — Jun. 2020
- National Scholarship (1%), Huazhong University of Science & Technology — Oct. 2017