Zhekai Li

https://lizhekai.com/

Email: zhekai_li.work@sjtu.edu.cn
Mobile: +86 18972578060
Address: 800 Dongchuan Rd., Shanghai, China 200240

Education

Shanghai Jiao Tong University (SJTU) Shanghai, China
M.S. in Electrical Engineering September 2022 - March 2025 (expected)

- GPA: 3.94/4.0 (2/114)
- Scholarships and Honors: First-Class Academic Scholarship (Top 1%, $5000, 2023 & 2024 & 2025), Sieyuan Electric Co., Ltd. Scholarship (Top 5%, $750, 2024), Wen-Yuan Pan Scholarship (Top 1%, $1200, 2023)
- Courses: Numerical Analysis, Convex Optimization and Optimal Power Flow, Nonlinear Control Theory

Huazhong University of Science and Technology (HUST) Wuhan, China
B.S. in Electrical Engineering September 2018 - June 2022

- GPA: 3.94/4.0 (Top 1%)
- Scholarships and Honors: National Scholarship (Top 0.2% highest scholarship from Ministry of Education of China, $3000, 2019 & 2021), Tellhow Sci-tech Co., Ltd. Scholarship (Top 1%, $3000, 2021)
- Courses: Mathematical Analysis I/II, Probability Theory and Statistics, Linear Algebra, Advanced Mathematical Physics, Complex Analysis, Introduction to Management, Principles of Economics

Research Interests

My research interests lie in sequential decision-making and online learning, with a particular emphasis on the value of exploration and adaptability. Additionally, I am engaged in studying low-carbon economy within sustainable operations, focusing on cost-effective coordination of renewable and traditional energy sources. As I am still in the early stages of my academic path, I remain open to exploring other research areas.

Working Papers (∗ Indicates presentations by me)

[1] **Zhekai Li**, Tianyi Ma, Cheng Hua, and Ruihao Zhu, *Identifying ε-Best Arms In Linear Bandits With Misspecification*.
- Invited Talk, Stern MOILS Seminar∗, New York University, December 2024
- Invited Talk, INFORMS Annual Meeting∗, October 2024
- **Finalist**, **Best Paper Award**, INFORMS Conference on Quality, Statistics, and Reliability (ICQSR)∗, July 2024
- To be submitted to *Operations Research*

Publications

[2] **Zhekai Li**, Renxin Yang, Zixi Fang, Haotian Yu, and Xu Cai (2024), *Research on Commutation Mechanism and Harmonic Suppression of Offshore Wind Farm Integration With DRU-VSC Hybrid Transmission System*, **Proceedings of the CSEE**. [Journal Information][Paper][Link]

[3] **Zhekai Li**, Kun Han, Xu Cai, Renxin Yang, Haotian Yu, Kepeng Xia, and Lulu Liu (2023), *Frequency-Reactive Power Optimization Strategy of Grid-forming Offshore Wind Farm Using DRU-HVDC Transmission*, **IEEE EI^2**. [Paper][Link][Poster]

[4] **Zhekai Li**, Liliuyuan Liang, Renxin Yang, and Xu Cai (2023), *The Virtual Admittance Control of Sending End Converter for Offshore Wind Farm Integration*, **IEEE PEDG**. [Paper][Link][Poster]

[5] Xiangwen Sun, Zicheng Liu, **Zhekai Li**, Qianchen Sun, An Li, and Dong Jiang (2021), *Three-phase Motor Drive Topology with the Fault-tolerant Capability of Open-circuit on the Multiplexing Bridge*, **IEEE ECCE**. [Paper][Link]

Patents

[6] Xiangwen Sun, Zhiyuan Wang, **Zhekai Li**, et al. (2022), *Phase Sequence and Modulation of Series Multiphase Winding With Minimum Current Stress of Bridge Arm*, CN214799254U, China National Intellectual Property Administration.

[7] Xiangwen Sun, Zhiyuan Wang, **Zhekai Li**, et al. (2021), *A Multi-Rotor UAV and Its Power System With Fault-Tolerant Capability*, CN214799254U, China National Intellectual Property Administration.

[8] Xiangwen Sun, Zhiyuan Wang, **Zhekai Li**, et al. (2021), *Topology and Modulation Method of Six-Phase Seven-Bridge Arm Series Winding Circuit with Reverse Winding*, CN113078839A, China National Intellectual Property Administration.

Research Experience (Selected)

Identifying All ε-Best Arms In Linear Bandits With Misspecification [1]　　August 2023 - present
Supervised by Professor Ruihao Zhu and Professor Cheng Hua

- Generalized the all ε-best arms identification problem from the stochastic bandit framework to the linear setting, motivated by the need to efficiently identify multiple candidates in complex and high trial-and-error cost tasks.
- Proposed LinFACT (**Lin**ear **F**ast **A**rm **C**lassification with **T**hreshold estimation), a nearly optimal adaptive algorithm to identify all ε-best arms (i.e., at most ε worse compared to the optimum). Introduced the first information-theoretic lower bound on the sample complexity and showed that LinFACT achieves instance optimality up to a logarithmic term.
- Developed extended upper bounds for LinFACT under model misspecification, refined our algorithm using orthogonal parameterization, and provided theoretical results in the generalized linear models (GLMs).
- Conducted numerical simulations to demonstrate the practical advantages of LinFACT over baselines on both synthetic and real datasets, highlighting its ability to accelerate early-stage exploratory experiments in real applications.

Coordination of Cost-Effective Renewable Energy Integration[2][3][4]　　January 2022 - April 2024
Master's Thesis - Supervised by Professor Xu Cai

- Conducted research on cost-effective coordination of renewable and traditional energy sources, focusing on the huge impact of large-scale renewable integration and the global transition to grid parity and subsidy-free deployment.
- Developed analytical models and control strategies to support renewable integration coordination and stability analysis. Improved overall economic efficiency by optimizing power flow and reducing losses with low-cost topologies.

Reducing Tardiness: Field Experimental Evidence from a Hospital　　June 2023 - August 2023
Research Assistant for Professor Meng Li and Professor Qiang Li

- Designed the associated laboratory experiment as a part of the response letter of the paper (Reject and Resubmit to *Management Science*) regarding the field experiment of patient no-shows at the hospital.
- Conducted a literature review of Human-Centered Artificial Intelligence (HCAI) about AI's influence on human decision-making, productivity, and operational efficiency across sectors like finance, psychology, and healthcare.

A High-Reliability UAV Power System with Fault-Tolerant Capability[5]　　October 2020 - November 2021
Supervised by Professor Dong Jiang

- Proposed a high-power-density, low-cost drive topology, increasing the system power density by more than 50%.
- Developed a novel motor drive algorithm to significantly enhance fault tolerance in complex, high-risk environments.

Invited Talks and Conferences

- Stern MOILS Seminar, New York University, December 2024
- INFORMS Annual Meeting, Seattle (Chaired by David Simchi-Levi and Chonghuan Wang), October 2024
- INFORMS Conference on Quality, Statistics, and Reliability (ICQSR), Lake Como and Milan, July 2024
- IEEE Conference on Energy Internet and Energy System Integration (EI^2), Hangzhou, December 2023
- IEEE Conference on Power Electronics for Distributed Generation Systems (PEDG), Shanghai, June 2023

Extracurricular Experience

Academic Service

- Assisted in the Peer Review Process for the Production and Operations Management Society (POMS)
- Reviewer for the 2024 IEEE Conference on Energy Internet and Energy System Integration (EI^2)

Competitions

- Grand Prize, the "Challenge Cup" Academic Competition (Top 0.05%, China's foremost academic competition)　　2021
- First Prize, the Electrician Mathematical Contest in Modeling (Top 3%)　　2021
- Honorable Mention, the MCM/ICM　　2021
- Second Prize, the National Mathematics Competition for College Students　　2019

Jock for Sports

- Volleyball (Varsity team), Soccer (Qualification of athletes for the national level), Badminton (7 years of professional training), Go (Third place in the national competition, first dan), Ultimate Frisbee (Varsity team), Fitness

Relevant Skills

Languages: English (Proficient, TOEFL: 107, GRE: 331), Mandarin (Native)
Programming: Python, C++, MATLAB, LaTeX, Markdown, Fortran, HTML
Modeling and Simulation: Simulink, PSCAD, PSIM, Ansoft Maxwell, COMSOL, SOLIDWORKS, AutoCAD