Zhekai Li

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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)**
  - **Courses:** Numerical Analysis, Convex Optimization and Optimal Power Flow, Nonlinear Control Theory
  - **Scholarships and Honors**: First-Class Academic Scholarship ($2000, 2023 & 2024 & 2025), Sieyuan Electric Co., Ltd. Scholarship (Top 5%, $750, 2024), Wen-Yuan Pan Scholarship (Top 1%, $1200, 2023)
- **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%)**
  - **Courses:** Mathematical Analysis I/II, Probability Theory and Statistics, Linear Algebra, Advanced Mathematical Physics, Complex Analysis, Introduction to Management, Principles of Economics
  - **Scholarships and Honors**: National Scholarship (Top 0.2% highest scholarship from Ministry of Education of China, $1500, 2019 & 2021), Tellhow Sci-tech Co., Ltd. Scholarship (Top 1%, $3000, 2021)

Research Interests

- Multi-armed bandits and adaptive sequential decision-making, with a particular focus on healthcare challenges
- Low-carbon economy research in sustainable operations, focusing on energy integration and cost-effective technologies

Working Papers

- [1] **Zhekai Li**, Tianyi Ma, Cheng Hua, Ruihao Zhu, Identifying ε-Best Arms In Linear Bandits With Misspecification. [Slide]
  - Invited Talk, NYU Stern MOILS seminar, December 2024 (Scheduled)
  - 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, Xu Cai, "Research on Commutation Mechanism and Harmonic Suppression of Offshore Wind Farm Integration With DRU-VSC Hybrid Transmission System," Proceedings of the CSEE, pp. 1–16, doi: 10.13334/j.0258-8013.240697. (*Ranked first in power and energy engineering journals, and second in citations among all Chinese journals*) [Paper][Link]
- [3] **Zhekai Li**, Kun Han, Xu Cai, Renxin Yang, Haotian Yu, Kepeng Xia, Lulu Liu, "Frequency-Reactive Power Optimization Strategy of Grid-forming Offshore Wind Farm Using DRU-HVDC Transmission," in 2023 IEEE 7th Conference on Energy Internet and Energy System Integration (EI^2), Hangzhou, China: IEEE, Dec. 2023, pp. 1193–1199. doi: 10.1109/EI259745.2023.10512674. [Paper][Link][Poster]
- [4] **Zhekai Li**, Liliuyuan Liang, Renxin Yang, and Xu Cai, "The Virtual Admittance Control of Sending End Converter for Offshore Wind Farm Integration," in 2023 IEEE 14th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), Jun. 2023, pp. 133–136. doi: 10.1109/PEDG56097.2023.10215304. [Paper][Link][Poster]
- [5] Xiangwen Sun, Zicheng Liu, **Zhekai Li**, Qianchen Sun, An Li, and Dong Jiang, "Three-phase Motor Drive Topology with the Fault-tolerant Capability of Open-circuit on the Multiplexing Bridge," in 2021 IEEE Energy Conversion Congress and Exposition (ECCE), Oct. 2021, pp. 5043–5047. doi: 10.1109/ECCE47101.2021.9595370. [Paper][Link]

Patents

- 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.
- 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.
- 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 ε-Best Arms In Linear Bandits With Misspecification** [1] — Shanghai, China
  Supervised by Professor Ruihao Zhu and Professor Cheng Hua — October 2023 - present
  - Expanded All ε-Best Arms Identification Problem (a fundamental pure exploration challenge) from the stochastic bandit framework to the linear setting, motivated by the need to successfully identify multiple candidates that can dramatically enhance outcomes in complex and high-stakes tasks such as drug discovery.
  - Proposed LinFACT (**Lin**ear **F**ast **A**rm **C**lassification with **T**hreshold estimation), an algorithm designed to optimize the identification of all ε-best arms in linear bandits.
  - Provided the first information-theoretic lower bound on the complexity of this problem and showed that our algorithm achieves instance optimality, matching this lower bound up to a logarithmic term, while extending our theoretical contributions to the misspecified setting and the generalized linear model (GLM).
  - Conducted numerical experiments to show the practical advantages of LinFACTE over baseline methods, highlighting its ability to accelerate early-stage drug development and outstanding performance with various synthetic data.

- **Coordination of Cost-Effective Renewable Energy Integration**[2][3][4] — Shanghai, China
  Master's Thesis - Supervised by Professor Xu Cai — January 2022 - April 2024
  - Conducted research on cost-effective offshore wind power transmission solutions driven by the significant impact of large-scale renewable integration on traditional power system stability, and the global shift toward grid parity and subsidy-free renewables 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** — Shanghai, China
  Research Assistant for Professor Meng Li and Professor Qiang Li — June 2023 - August 2023
  - 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 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] — Wuhan, China
  Supervised by Professor Dong Jiang — October 2020 - November 2021
  - Proposed a high-power-density, low-cost drive topology, which increased the system power density by more than 50%.
  - Developed a novel motor drive algorithm to significantly enhance fault tolerance in complex, high-risk environments.

Extracurricular Experience

- **Invited Talks and Presentations**
  - NYU Stern MOILS Seminar, New York, December 2024 (Scheduled)
  - INFORMS Annual Meeting, Seattle, October 2024 (Chaired by David Simchi-Levi and Chonghuan Wang)
  - INFORMS Conference on Quality, Statistics, and Reliability (ICQSR), Lake Como and Milan, July 2024

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

- **Competitions**
  - First Prize, the 17th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Competition (National academic competition with the largest number of participants in China) 2021
  - First Prize, the Electrician Mathematical Contest in Modeling (Top 3%) - Operation Analysis and Modeling of High-Speed Rail Traction Power Supply System 2021
  - Honorable Mention, the MCM/ICM - Post-Disaster Response to Australian Wildfires Based on Drone Monitoring 2021
  - Second Prize, the National Mathematics Competition for College Students 2019

- **Jock for Sports**
  - Volleyball (Varsity volleyball 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 sports 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