

CHENGRUI QU

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RESEARCH INTERESTS

- Theoretical Foundations of Decision-Making
- Learning and Control in Multi-Agent Systems
- Data-Driven Optimization for Real-World Systems

EDUCATION

- **California Institute of Technology** Jun. 2024 - Sep. 2024
Summer Undergraduate Research Fellowships (SURF) Pasadena, CA, USA
 - Advisor: Adam Wierman
- **Peking University** Sep. 2021 - Jun. 2025 (expected)
Major: Theoretical and Applied Mechanics (Applied Mathematics) Beijing, China
 - GPA: 3.894/4.0, Average Score: 92.5/100, **Rank: 1/39**

PUBLICATIONS & PREPRINTS

- **C. Qu, L. Shi, K. Panaganti, P. You, and A. Wierman.** [Hybrid Transfer Reinforcement Learning: Provable Sample Efficiency from Shifted-Dynamics Data](#), AISTATS 2025 (**Oral, top 2%**)
- **K. Mukhi, C. Qu, P. You, and A. Abate.** [Robust Aggregation of Electric Vehicle Flexibility](#), ACM HSCC 2025 (**Best Poster Award** in DTU PES Summer School 2024)

RESEARCH EXPERIENCES

- **Hybrid Transfer Reinforcement Learning: Provable Sample Efficiency From Shifted-Dynamics Data** 2024
Instructors: Dr. Laixi Shi, Dr. Kishan Panaganti; Advisor: Prof. Adam Wierman, Caltech
 - Formulated a novel RL framework for finite-sample analysis in practical hybrid transfer scenarios
 - Established a minimax lower bound on sample complexity within this framework
 - Developed an algorithm that provably outperforms state-of-the-art pure online RL in terms of sample efficiency
- **Data-driven Distributionally Robust Pricing with Price-Aware Demand** 2024
Advisor: Prof. Pengcheng You, Peking University
 - Developed a pricing strategy framework that accounts for price-sensitive, time-coupled stochastic demand
 - Constructed a decision-dependent ambiguity set with asymptotic convergence guarantees
 - Developed tractable distributionally robust optimization methods with finite-sample guarantees
- **Distributionally Robust Aggregation of Electric Vehicle Flexibility** 2024
Collaborator: Karan Mukhi, Oxford; Advisor: Prof. Pengcheng You
 - Proposed a systematic way of characterizing feasibility under high-dimensional stochastic energy demand
 - Designed distributionally robust methods to delineate the aggregate feasible set for downstream applications
 - Formulated a tractable optimization reformulation incorporating probabilistic guarantees

TEACHING EXPERIENCES

- **Principle of Economics (English taught)** Spring 2024
TA, National School of Development, Peking University
- **International Trade (English taught)** Spring 2024
TA, National School of Development, Peking University
- **Reinforcement Learning Reading Group** Fall 2023-Spring 2024
Co-organizer, Peking University
- **Power System Reading Group** Fall 2023-Spring 2024
Co-organizer, Peking University
- **Financial Economics Reading Group** Summer 2022
Co-organizer, Peking University

HONORS AND AWARDS

- **Li Yanhong Scholarship (Top undergraduate student award)** 2024
- **NSFC 1st Youth Student Basic Research Grant** 2023
- **National Scholarship (Top undergraduate student award)** 2023
- **Pacemaker to Merit Student, Peking University** 2023
- **The First Prize in 14th National Zhou Peiyuan Mechanics Competition (Top 0.3%)** 2023
- **Merit Student, Peking University** 2022
- **The First Prize in 37th Chinese Physics Olympiad (Jiangsu Province)** 2020
- **The First Prize in 34th Chinese Chemistry Olympiad (Jiangsu Province)** 2020
- **The First Prize in 36th Chinese Maths Olympiad (Jiangsu Province)** 2020

INVITED TALKS

- **Hybrid Transfer Reinforcement Learning: Provable Sample Efficiency From Shifted-Dynamics Data** Sep. 2024
ORSC Data Science 2024, Beijing
- **Distributionally Robust Aggregation of Electric Vehicle Flexibility** Mar. 2024
School of Data Science, The Chinese University of Hong Kong, Shenzhen

PROFESSIONAL SKILLS

Programming Skills: C++, Python, MATLAB, CUDA, Shell

Leadership: President of the Jiangsu Cultural Association, Peking University