

Yingzhu Liu

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RESEARCH INTEREST

- Saddle Flow Dynamics: Algorithm Design & Analysis
- Contraction Theory for Dynamical Systems
- Optimization Theory of Reinforcement Learning

EDUCATION

- **Peking University** Sep. 2022 - Jun. 2027 (expected)
Ph.D. in Mechanics (Dynamical Systems and Control)
Beijing, China
 - Advisor: Prof. Zhongkui Li and Prof. Pengcheng You
- **Peking University** Sep. 2018 - Jun. 2022
B.S. in Theoretical and Applied Mechanics
Beijing, China
 - Advisor: Prof. Zhongkui Li
 - Thesis: Robust performance analysis of distributed optimization algorithms

PUBLICATIONS & PREPRINTS

Preprints

1. P. You, **Y. Liu**, and E. Mallada, A Unified Analysis of Saddle Flow Dynamics: Stability and Algorithm Design, 2024, under review. [\[arXiv\]](#)

Conference

1. **Y. Liu**, E. Mallada, Z. Li, and P. You, “Accelerated Saddle Flow Dynamics for Bilinearly Coupled Minimax Problems,” in 63rd IEEE Conference on Decision and Control (CDC), 2024. [\[PDF\]](#)

RESEARCH PROJECTS

- **Saddle Flow Dynamics: Stability and Algorithm Design** Feb. 2023 - Present
Doctoral Research Assistant, advised by Prof. Pengcheng You & Prof. Zhongkui Li
Beijing, China
 - Featured a unified analysis and provided convergence conditions based on properties of the objective function.
 - Systematically inspired novel algorithm designs and/or explained existing algorithms from a new perspective.
- **Distributed Optimization Algorithms: Robust Performance Analysis** Sep. 2021 - Nov. 2022
Research Intern, advised by Prof. Zhongkui Li
Beijing, China
 - Viewed the iterative algorithm as a discrete-time controller, and the function to be optimized as an uncertain plant.
 - Analyzed the internal stability and input-output stability from a frequency-domain perspective.

TEACHING EXPERIENCE

- **Introduction to Probability and Mathematical Statistics** Beijing, China
Teaching Assistant at Yuanpei College, Peking University
Fall 2024
- **Theoretical Mechanics** Beijing, China
Teaching Assistant at Yuanpei College, Peking University
Fall 2023

SKILLS & ACTIVITIES

- **Programming Skills:** Python, MATLAB, Mathematica
- **Languages:** Chinese (Native), English (Proficient)
- **Activities:** Photography, Squash

HONORS AND AWARDS

- The Student Travel and Workshop Support for CDC, 2024.
- Outstanding Research Award, Peking University, 2024.
- Outstanding Undergraduate Thesis/Design from Beijing Universities, 2022. Top 1% of students.
- Outstanding Undergraduate Graduate, Peking University, 2022.
- Merit Student, Peking University, 2019.