Xiaopeng Li

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Education

Columbia University — New York, U.S.
Ph.D. in Operations Research. — Sept 2020 – present
M.S. in Operations Research. — Sept 2020 – May 2021
Advisor: Cédric Josz

The Chinese University of Hong Kong, Shenzhen (CUHK(SZ)) — Shenzhen, China
B.S. in Applied Mathematics. — Sept 2016 – May 2020

Research Interests

- Nonconvex and nonsmooth optimization.
- Stochastic optimization for machine learning.
- Applied semialgebraic geometry.
- Dynamical systems.

Preprints & Publications

- Fougereux T., Josz, C., & Li, X. (2024). *Global convergence of gradient descent for phase retrieval with optimal sample complexity.* Submitted to ICLR 2025.
- Josz, C., Lai, L., & Li, X. (2024). Proximal random reshuffling under local Lipschitz continuity. *arXiv preprint arXiv:2408.07182*. Submitted to Mathematics of Operations Research.
- Josz, C., & Li, X. (2024). Singular perturbation in heavy ball dynamics. *arXiv preprint arXiv:2407.15044*. Major revision in Journal of Dynamics and Differential Equations.
- Josz, C., Lai, L., & Li, X. (2023). Convergence of the Momentum Method for Semialgebraic Functions with Locally Lipschitz Gradients. *SIAM Journal on Optimization*, *33*(4), 3012–3037.
- Josz, C., & Li, X. (2023). Certifying the Absence of Spurious Local Minima at Infinity. *SIAM Journal on Optimization, 33*(3), 1416–1439.

Teaching Experience

Teaching Assistant — **Columbia University**
- IEOR E 4007 Optimization Methods & Models for Financial Engineering, Fall 2024
- EEOR E 6616 Convex Optimization, Spring 2024.
- IEOR E 3404 Simulation, Spring 2021.

Undergraduate Student Teaching Fellows — **CUHK(SZ)**
- Ordinary Differential Equations, Spring 2019 & Spring 2020.
- Elementary Real Analysis, Fall 2019.
- Mathematical Analysis I & II, Fall 2017 & Spring 2018.

Presentations

- NYC Operations Day, New York, May 10th, 2024, *Convergence of the momentum method for semi-algebraic functions with locally Lipschitz gradients.*
- INFORMS Annual Meeting, Phoenix, Oct. 18th, 2023, *Convergence of the momentum method for semi-algebraic functions with locally Lipschitz gradients.*
- Young Researcher Workshop, Cornell University Ithaca, Oct. 1st, 2023, *Convergence of the momentum*

method for semi-algebraic functions with locally Lipschitz gradients.

- SIAM Conference on Optimization, Seattle, June 2nd, 2023, *Certifying the absence of spurious local minima at infinity*.
- NYC Operations Day, New York, May 5th, 2023, *Certifying the absence of spurious local minima at infinity*.
- INFORMS Annual Meeting, Indianapolis, Oct. 18th, 2022, *Certifying the absence of spurious local minima at infinity*.
- International Conference on Continuous Optimization, Lehigh University, July 26th, 2022, *Certifying the absence of spurious local minima at infinity*.

Honors & Awards

- Academic Performance Scholarship (CUHK(SZ), 2017, 2018 & 2019)
- Dean's List (CUHK(SZ), 2017, 2018 & 2019)
- Undergraduate Research Award (CUHK(SZ), 2018 & 2019)
- Second Prize in China Undergraduate Mathematical Contest in Modeling (China, 2018)
- Second Prize in National College Students Mathematical Competition (China, 2018)

Professional Service

Session Chair

- International Conference on Continuous Optimization, Lehigh University, July 26th, 2022.

Reviewer

- SIAM Journal on Optimization
- US Office of Naval Research

Mentoring

Undergraduates

- Théodore Fougereux (École Polytechnique). Project: *Bounded flows in phase retrieval*. Summer Internship at Columbia University. May 1 – Sept 31, 2024.
- Cristian Pena (Florida Atlantic University). Project: *Moving Object Detection*. Columbia University Summer Undergraduate Research Experience (SURE) Program. May 29 – July 31, 2024.

Internship

National Renewable Energy Laboratory Golden, CO, USA

Graduate PhD Intern June 2024 – Aug 2024

- Smoothed progressive hedging algorithm for multi-stage stochastic MILP (available in mpi-sppy).
- L1-penalized ADMM algorithm for solving transmission expansion problems.