Lexiao Lai

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Education

Columbia University in the City of New York — New York, U.S.
Doctor of Philosophy in Operations Research — Sept. 2019 - May 2024 (expected)
Advisor: Cédric Josz [website]
Master of Science in Operations Research — Sept. 2019 - May 2020

The University of Hong Kong — Hong Kong, China
Bachelor of Science Major in Mathematics, Minor in Finance — Sept. 2015 - June 2019

Interests

Nonconvex optimization, applied semi-algebraic geometry, data science

Preprints

1. Cédric Josz, Lexiao Lai, Global stability of first-order methods for coercive tame functions, *arXiv preprint*, 2023*, Under minor revision at Mathematical Programming, Series A* [preprint]

Publications

1. Cédric Josz, Lexiao Lai, Xiaopeng Li, Convergence of the momentum method for semi-algebraic functions with locally Lipschitz gradients, *SIAM Journal on Optimization (to appear)*, 2023 [preprint]
2. Cédric Josz, Lexiao Lai, Sufficient conditions for instability of the subgradient method with constant step size, *SIAM Journal on Optimization (to appear)*, 2023 [preprint]
3. Cédric Josz, Lexiao Lai, Lyapunov stability of the subgradient method with constant step size, *Mathematical Programming, Full Length Paper, Series A*, 2023 [preprint] [journal doi]
4. Cédric Josz, Lexiao Lai, Nonsmooth rank-one matrix factorization landscape, *Optimization Letters*, 2022 [preprint] [journal doi]
5. Elliot Cartee, Lexiao Lai, Qianli Song, Alexander Vladimirsky, Time-dependent surveillance-evasion games, *58th IEEE Conference on Decision and Control*, 2019 [preprint] [conference doi]

Talks

1. INFORMS Annual Meeting, Phoenix, October 17th 2023, *Global stability of first-order methods for coercive tame functions*
2. International Congress on Industrial and Applied Mathematics, Tokyo, August 24th 2023, *Global stability of first-order methods for coercive tame functions*
3. SIAM Conference on Optimization, Seattle, June 1st 2023, *Global stability of first-order methods with constant step size for coercive tame functions*
4. CUHK SEEM Department Seminar, Hong Kong, December 8th 2022, *Lyapunov stability of the subgradient method with constant step size*
5. HKU Optimization and Machine Learning Seminar, Hong Kong, December 6th 2022, *Lyapunov stability of the subgradient method with constant step size*
6. PGMODAYS 2022, Paris, November 29th 2022, *Lyapunov stability of the subgradient method with constant step size*
7. INFORMS Annual Meeting, Indianapolis, October 17th 2022, *Lyapunov stability of the subgradient method with constant step size*

Awards & Honours

- Columbia IEOR Department Fellowship — 2019
- Walter Brown Memorial Prizes in Mathematics, HKU — 2019
  Awarded to the best final year student in Mathematics
- Doris Chen Undergraduate Project Prize, HKU — 2018
- Liu Ming-Chit Prize in Mathematics, HKU — 2018
- Outstanding Winner of *Mathematical Contest in Modelling* — 2017
  Top 13 winners out of 8843 teams
- Ranked 134 out of 4638 in *78th William Putnam Mathematical Competition* — 2017
- Alan John Allis Prize in Mathematics, HKU — 2016,2017
- Dean's Honours List, HKU — 2016,2017,2019
- HKSAR Government Scholarship, HKU — 2015-2019

Teaching Experience

As Teaching Assistant:

- **Columbia**: Convex Optimization (TA evaluation: 4.42/5) — Spring 2023
- **HKU**: Linear Algebra I — Spring 2019

Service

Session chair:

- *Structured and tame optimization*, INFORMS, Annual Meeting, 2023

Reviewer:

- AISTATS
- Computational Optimization and Applications
- Journal of Optimization Theory and Applications

Internship

TCL Corporate Research (Hong Kong) Company Limited — Hong Kong
Research Intern, AI Research Lab — May-Sept. 2021

Computer Skills

Programming Languages: Python, MATLAB, LaTeX