

# Lexiao Lai

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## Education

<b>Columbia University in the City of New York</b>	New York, U.S.
Doctor of Philosophy in Operations Research	Sept. 2019 - May 2024 (expected)
Advisor: Cédric Jozs [ <a href="#">website</a> ]	
Master of Science in Operations Research	Sept. 2019 - May 2020
<b>The University of Hong Kong</b>	Hong Kong, China
Bachelor of Science Major in Mathematics, Minor in Finance	Sept. 2015 - June 2019

## Interests

Nonconvex optimization, applied semialgebraic geometry, data science

## Publications

- (with Cédric Jozs) Sufficient conditions for instability of the subgradient method with constant step size, *SIAM Journal on Optimization*, 2024 [[preprint](#)] [[journal doi](#)]
- (with Cédric Jozs and Xiaopeng Li) Convergence of the momentum method for semialgebraic functions with locally Lipschitz gradients, *SIAM Journal on Optimization*, 2023 [[preprint](#)] [[journal doi](#)]
- (with Cédric Jozs) Global stability of first-order methods for coercive tame functions, *Mathematical Programming, Full Length Paper, Series A*, 2023 [[preprint](#)] [[journal doi](#)]
- (with Cédric Jozs) Lyapunov stability of the subgradient method with constant step size, *Mathematical Programming, Full Length Paper, Series A*, 2023 [[preprint](#)] [[journal doi](#)]
- (with Cédric Jozs) Nonsmooth rank-one matrix factorization landscape, *Optimization Letters*, 2022 [[preprint](#)] [[journal doi](#)]
- (with Elliot Cartee, Qianli Song, and Alexander Vladimírsky) Time-dependent surveillance-evasion games, *58th IEEE Conference on Decision and Control*, 2019 [[preprint](#)] [[conference doi](#)]

## Talks

- IMS Young Mathematical Scientists Forum – Applied Mathematics, Singapore, January 9th 2024, *Global stability of first-order methods for coercive tame functions*
- INFORMS Annual Meeting, Phoenix, October 17th 2023, *Global stability of first-order methods for coercive tame functions*
- UCSD Optimization and Data Science Seminar, San Diego, October 4th 2023, *Global stability of first-order methods for coercive tame functions*
- International Congress on Industrial and Applied Mathematics, Tokyo, August 24th 2023, *Global stability of first-order methods for coercive tame functions*
- SIAM Conference on Optimization, Seattle, June 1st 2023, *Global stability of first-order methods with constant step size for coercive tame functions*
- CUHK SEEM Department Seminar, Hong Kong, December 8th 2022, *Lyapunov stability of the subgradient method with constant step size*
- HKU Optimization and Machine Learning Seminar, Hong Kong, December 6th 2022, *Lyapunov stability of the subgradient method with constant step size*
- PGMODAYS, Paris, November 29th 2022, *Lyapunov stability of the subgradient method with constant step size*
- 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 Spring 2023
- Optimization Methods & Models for Financial Engineering Fall 2023
- Optimization Methods & Models Spring 2024

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  
Research Intern, AI Research Lab

Hong Kong  
May-Sept. 2021

## Computer Skills

Python, MATLAB, L<sup>A</sup>T<sub>E</sub>X