

LING LIANG

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RESEARCH INTEREST

- **Large-scale Optimization**

Design, analyze and implement efficient algorithmic frameworks for solving large-scale optimization problems, including conic programming problems, nonsmooth optimization problems, nonlinear programming problems, and their applications.

- **Machine Learning and Data Science**

- **Numerical Computation**

EXPERIENCE

- **Postdoctoral Associate, University of Maryland at College Park**

August 2023 – Present

Advisor: Professor Haizhao Yang

- **Visiting Postdoctoral Researcher, Weierstrass Institute**

March 2023 – June 2023

Advisor: Professor Jia-Jie Zhu

- **Research Fellow, National University of Singapore**

January 2022 – July 2023

Advisor: Professor Kim-Chuan Toh

- **Research Assistant, National University of Singapore**

August 2021 – December 2021

Advisor: Professor Kim-Chuan Toh

EDUCATION

- **Ph.D. in Mathematics, National University of Singapore**

August 2017 – November 2021

Advisor: Professor Kim-Chuan Toh

- **B.Sc. in Mathematics, University of Science and Technology of China**

September 2013 – July 2017

Advisor: Professor Zhouwang Yang

AWARDS AND ACKNOWLEDGEMENTS

- **Louis Chen Hsiao Yun Best Dissertation Prize, National University of Singapore, 2022**
(Awarded annually to the student with the best PhD thesis in mathematics and its applications)
- **Top Graduate Tutor Award, National University of Singapore, 2019 and 2020**
- **Research Scholarship, National University of Singapore, 2017-2021**

TEACHING

- **Graduate Tutor, National University of Singapore, August 2017 – May 2021**

PROGRAMMING SKILLS

- **MATLAB & Julia**
Strong experience in developing efficient and robust packages in optimization
- **C/C++ & Python**
Intermediate experience

INVITED TALKS

- **Argonne National Laboratory, Online Seminar, May 2022**
An Inexact Projected Gradient Method with Rounding and Lifting by Nonlinear Programming for Solving Rank-One Semidefinite Relaxation of Polynomial Optimization
- **SIAM Conference on Optimization, Online Conference, July 2021**
On Degenerate Doubly Nonnegative Projection Problems
- **Workshop on Matrix Optimization, Beijing, November 2019**
A New Homotopy Proximal Variable-Metric Framework for Composite Convex Minimization
- **The Sixth International Conference on Continuous Optimization, Berlin, August 2019**
A New Homotopy Proximal Variable-Metric Framework for Composite Convex Minimization

PUBLICATIONS

(Note: * = Corresponding Author)

- Hong T.M. Chu, **Ling Liang**, Kim-Chuan Toh, and Lei Yang.
“An Efficient Implementable Inexact Entropic Proximal Point Algorithm for A Class of Linear Programming Problems.”
Computational Optimization and Applications (2023): 1-40.
- Heng Yang, **Ling Liang***, Luca Carlone, and Kim-Chuan Toh.
“An Inexact Projected Gradient Method with Rounding and Lifting by Nonlinear Programming for Solving Rank-One Semidefinite Relaxation of Polynomial Optimization.”
Mathematical Programming (2022): 1-64.
- **Ling Liang***, Xudong Li, Defeng Sun, and Kim-Chuan Toh.
“QPPAL: A Two-Phase Proximal Augmented Lagrangian Method for High Dimensional Convex Quadratic Programming.”
ACM Transactions on Mathematical Software (TOMS) 48, no. 3 (2022): 1-27.
- Ying Cui, **Ling Liang***, Defeng Sun, and Kim-Chuan Toh.
“On Degenerate Doubly Nonnegative Projection Problems.”
Mathematics of Operations Research 47, no. 3 (2022): 2219-2239.
- Tran-Dinh Quoc, **Ling Liang**, and Kim-Chuan Toh.
“A New Homotopy Proximal Variable-Metric Framework for Composite Convex Minimization.”
Mathematics of Operations Research 47, no. 1 (2022): 508-539.
- **Ling Liang***, Defeng Sun, and Kim-Chuan Toh.
“An Inexact Augmented Lagrangian Method for Second-Order Cone Programming with Applications.”
SIAM Journal on Optimization 31, no. 3 (2021): 1748-1773.

PREPRINTS

- **Ling Liang**, Defeng Sun, and Kim-Chuan Toh.
“A Squared Smoothing Newton Method for Semidefinite Programming.”
arXiv preprint arXiv: 2303.05825 (2023).
- Ching-Pei Lee, **Ling Liang**, Tianyun Tang, and Kim-Chuan Toh.
“Escaping Spurious Local Minima of Low-Rank Matrix Factorization through Convex Lifting.”
arXiv preprint arXiv:2204.14067 (2022).

PROFESSIONAL SERVICES

- **Referee for Journals**

Mathematical Programming, SIAM Journal on Optimization, Mathematical Programming Computation, SIAM Journal on Mathematics of Data Science, Computational Optimization and Applications, Journal of Scientific Computing, Optimization Methods and Software

- **Conference and Workshop Organizations**
 - Session Chair, Optimization in the Big Data Era, National University of Singapore, 2022.
- **Judge for Singapore International Mathematics and Computational Challenge, November 2022.**
- **AD-HOC Non-Teaching Consultation Work, National University of Singapore, November 2022.**

REFERENCES

- **Professor Kim-Chuan Toh**
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- **Professor Defeng Sun**
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The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong
- **Professor Ying Cui**
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- **Professor Victor Tan (Concerns Teaching)**
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