LING LIANG

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EXPERIENCE

- **Postdoctoral Associate, University of Maryland at College Park (UMD), USA**
  - Advisor: Dr. Haizhao Yang (August 2023 – Present)
- **Visiting Postdoctoral Researcher, Weierstrass Institute (WIAS), Germany**
  - Advisor: Dr. Jia-Jie Zhu (March 2023 – June 2023)
- **Research Fellow, National University of Singapore (NUS), Singapore**
  - Advisor: Dr. Kim-Chuan Toh **(**January 2022 – July 2023)
- **Research Assistant, National University of Singapore (NUS), Singapore**
  - Advisor: Dr. Kim-Chuan Toh (August 2021 – December 2021)

EDUCATION

- **Ph.D. in Mathematics, National University of Singapore, Singapore**
  - Advisor: Dr. Kim-Chuan Toh (August 2017 – November 2021)
- **B.Sc. in Mathematics, University of Science and Technology of China, China**
  - Advisor: Dr. Zhouwang Yang (September 2013 – July 2017)

AWARDS AND ACKNOWLEDGEMENTS

- **Louis Chen Hsiao Yun Best Dissertation Prize, NUS (2022)**

  Awarded annually to the graduate student with the best PhD thesis in mathematics and its applications.

- **Top Graduate Tutor Award, NUS (2019 and 2020)**
- **Research Scholarship, NUS (2017-2021)**

TEACHING AND MENTORING

- **University of Maryland at College Park**
  - Instructor (Fall 2023), *AMSC460 Computational Methods*
  - Instructor (Spring 2024), *MTH401 Applications of Linear Algebra*
  - Instructor (Fall 2024), *MTH241 Calculus III*
- **National University of Singapore**
  - Graduate Tutor (Fall 2018), *MA1101R Linear Algebra*
  - Graduate Tutor (Spring 2019), *MA1101R Linear Algebra*
  - Graduate Tutor (Fall 2019), *MA1101R Linear Algebra*
  - Graduate Tutor (Spring 2020), *MA1101R Linear Algebra*
- **Graduate Students Co-Mentoring**
  - Tianyun Tang, with Dr. Kim-Chuan Toh, *Low-Rank Matrix Optimization*
  - Hong T.M. Chu, with Dr. Kim-Chuan Toh, *Computational Optimal Transport*
  - Di Hou, with Dr. Kim-Chuan Toh, *Computational Optimal Transport*
  - Sanghong Na, with Dr. Haizhao Yang, *Computational Optimal Transport*
  - Michael Browder, with Dr. Haizhao Yang, *Learning to Optimize*
  - Di Wu, with Dr. Haizhao Yang, *Computational Optimal Transport*
  - Cameron Austin, with Dr. Haizhao Yang, *Hyperparameter Learning*
- **Undergraduate Students Co-Mentoring**
  - Rohan Bhatnagar, with Dr. Haizhao Yang, *Scientific Machine Learning*
  - Fouad Ayoub, with Dr. Haizhao Yang, *Scientific Machine Learning*
  - Krish Patel, with Dr. Haizhao Yang, *In-Context Learning*
  - Joseph Vincent, with Dr. Haizhao Yang, *Finite Expression Method*

PUBLICATIONS

(Note: * = Corresponding Author)

- Shucheng Kang, Xiaoyang Xu, Jay Sarva, **Ling Liang**, Heng Yang. *Fast and Certifiable Trajectory Optimization*. WAFR (2024).
- **Ling Liang***, Haizhao Yang. *On the Stochastic (Variance-Reduced) Proximal Gradient Method for Regularized Expected Reward Optimization.* TMLR (2024).
- Di Hou, **Ling Liang***, Kim-Chuan Toh. *A Sparse Smoothing Newton Method for Solving Discrete Optimal Transport Problems*. ACM Transactions on Mathematical Software (2024). (Accepted)
- Lei Yang, **Ling Liang***, Hong T.M. Chu, Kim-Chuan Toh. *A Corrected Inexact Proximal Augmented Lagrangian Method with a Relative Error Criterion for a Class of Group-quadratic Regularized Optimal Transport Problems.* Journal of Scientific Computing 99, no. 79 (2024).
- 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 85, no. 1 (2023): 107-146.
- 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 201, no. 1-2 (2023): 409-472.
- **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 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***, Kim-Chuan Toh, Haizhao Yang. *Vertex Exchange Method for a Class of Convex Quadratic Programming Problems*. arXiv:2407.03294 (2024).
- **Ling Liang***, Qiyuan Pang, Kim-Chuan Toh, Haizhao Yang. *Nesterov's Accelerated Jacobi-Type Methods for Large-scale Symmetric Positive Semidefinite Linear Systems*. arXiv:2407.03272 (2024).
- **Ling Liang***, Kim-Chuan Toh, Jia-Jie Zhu. *An Inexact Halpern Iteration with Application to Distributionally Robust Optimization.* arXiv:2402.06033 (2024).
- **Ling Liang***, Defeng Sun, and Kim-Chuan Toh. *A Squared Smoothing Newton Method for Semidefinite Programming.* arXiv: 2303.05825 (2023). (Minor Revision)
- Ching-Pei Lee, **Ling Liang**, Tianyun Tang, and Kim-Chuan Toh. *Escaping Spurious Local Minima of Low-Rank Matrix Factorization through Convex Lifting.* *a*rXiv:2204.14067 (2022).

INVITED TALKS

- **25th International Symposium on Mathematical Programming, Montreal (July 2024).** *Escaping Spurious Local Minima of Low-Rank Factorization Through Convex Lifting.*
- **2024 INFORMS Optimization Society Conference, Houston (March 2024).** *Escaping Spurious Local Minima of Low-Rank Factorization Through Convex Lifting.*
- **Workshop on Scientific Machine Learning: Theory and Algorithms, College Park (February 2024).** *On the Stochastic (Variance-Reduced) Proximal Gradient Method for Regularized Expected Reward Optimization.*
- **SIAM Conference on Optimization, Seattle (May 2023).** *A Squared Smoothing Newton Method for Semidefinite Programming.*
- **The Hua Luogeng Youth Forum of Applied Mathematics, Beijing (March 2023).** *A Squared Smoothing Newton Method for Semidefinite Programming.*
- **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.*

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
    - Journal of Industrial and Management Optimization
    - Asia-Pacific Journal of Operational Research
- **Conference, Workshop and Seminar Organizations**
    - Session Chair, *Optimization in the Big Data Era*, NUS (2022)
    - Seminar Chair, *Numerical Analysis Seminar*, UMD (Spring 2024)
    - Organizer, *Numerical Analysis Seminar*, UMD (Fall 2024)
    - Session Chair, *Conic and Semidefinite Optimization*, USC (ICCOPT 2025)
- **Professional Member**
    - Mathematical Optimization Society (MOS)
    - Society for Industrial and Applied Mathematics (SIAM)
- **Volunteer Experience**

- Judge for Singapore International Mathematics and Computational Challenge (November 2022)
- AD-HOC Non-Teaching Consultation Work, NUS (November 2022)

REFERENCES

- **Dr. Kim-Chuan Toh** (Ph.D. Supervisor)
  - Department of Mathematics and Institute of Operations Research and Analytics
  - National University of Singapore
  - mattohkc@nus.edu.sg
- **Dr. Haizhao Yang** (Postdoc Supervisor)
  - Department of Mathematics and Department of Computer Science
  - University of Maryland, College Park
  - hzyang@umd.edu
- **Dr. Defeng Sun**
  - Department of Applied Mathematics
  - The Hong Kong Polytechnic University
  - defeng.sun@polyu.edu.hk
- **Dr. Ying Cui**
  - Department of Industrial Engineering and Operations Research
  - University of California, Berkeley
  - yingcui@berkeley.edu
- **Dr. Lawrence C. Washington** (Teaching)
  - Department of Mathematics
  - University of Maryland, College Park
  - lcw@umd.edu