LING LIANG

Address: Weierstrass Institute, Mohrenstrasse 39, 10117 Berlin, Germany
Phone: (65) 94478207, (1) 3016408592
Email: liang.ling@u.nus.edu
Website: https://liangling98.github.io/

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**

  mattohkc@nus.edu.sg

  Department of Mathematics and Institute of Operations Research and Analytics

  National University of Singapore, 10 Lower Kent Ridge Road, 119076, Singapore

- **Professor Defeng Sun**

  defeng.sun@polyu.edu.hk

  Department of Applied Mathematics

  The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

- **Professor Ying Cui**

  yingcui@umn.edu

  Department of Industrial and Systems Engineering

  University of Minnesota, Minneapolis, Minnesota, U.S.A

- **Professor Victor Tan** (Concerns Teaching)

  mattanv@nus.edu.sg

  Department of Mathematics

  National University of Singapore, 10 Lower Kent Ridge Road, 119076, Singapore