Zhijian Lai

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Connect Information

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Research Interests

Mathematical Optimization, Riemannian Optimization, Machine Learning, Deep Learning, Quantum Computing

Education

University of Tsukuba — Tsukuba, Japan
Ph.D. of Science in Policy and Planning Sciences — Apr. 2021 – Mar. 2024 (expected)
Master of Science in Policy and Planning Sciences — Apr. 2019 – Mar. 2021
Supervisor: Prof. Akiko Yoshise

Dongbei University of Finance and Economics — Dalian, China
Bachelor of Management — Sep. 2013 – June 2017

Grants

Research fellowship of *Support for Pioneering Research Initiated by the Next Generation* (SPRING), Japan Science and Technology Agency — Sep. 2021 – Present

Working Papers

CLAP: A Contrastive Learning Structure for App-usage Prediction
Xin Yang, **Zhijian Lai**, Qian Wu, Maiko Shigeno.

HGCL4REC: Hyperbolic Graph Contrastive Learning for Recommender System
Xin Yang, **Zhijian Lai**, Qian Wu, Maiko Shigeno.

Publications and Preprints

Completely Positive Factorization by a Riemannian Smoothing Method
Zhijian Lai, Akiko Yoshise.
Computational Optimization and Applications, 2022.

Riemannian Interior Point Methods for Constrained Optimization on Manifolds
Zhijian Lai, Akiko Yoshise.
arxiv.org/abs/2203.09762, 2023. (Submitted to JOTA)

International Conference Talks

ICIAM 2023 — Aug. 2023
Zhijian Lai, Akiko Yoshise. *Riemannian Interior Point Methods for Constrained Optimization on Manifolds*, Tokyo.

SIAM OP23 — June 2023
Zhijian Lai, Akiko Yoshise. *Interior Point Methods for Nonlinear Optimization on Riemannian Manifolds*, Seattle.

International Workshop on Continuous Optimization — Dec. 2022
Zhijian Lai, Akiko Yoshise. *Riemannian Interior Point Methods for Constrained Optimization on Manifolds*, Tokyo (virtual).

SIAM OP21 — July 2021
Zhijian Lai, Akiko Yoshise. *Completely Positive Factorization via Orthogonality Constrained Problem*, Hong Kong (virtual).

Domestic (Japan) Conference Talks

RAOTA: Gathering of Young Researchers for the Future 2023 — May 2023
Zhijian Lai, Akiko Yoshise. *Riemannian Interior Point Methods for Constrained Optimization on Manifolds*, Tsukuba, Japan.

The 2023 spring national conference of Operations Research Society of Japan Mar. 2023
Zhijian Lai, Akiko Yoshise. *Riemannian Interior Point Methods for Constrained Optimization on Manifolds*, Tokyo, Japan.

The 2022 autumn national conference of Operations Research Society of Japan Sep. 2022
Zhijian Lai, Akiko Yoshise. *On the Global Convergence of Riemannian Interior Point Method*, Niigata (virtual), Japan.

The Japan Society for Industrial and Applied Mathematics 2022 annual meeting Sep. 2022
Zhijian Lai, Akiko Yoshise. *On the Global Convergence of Riemannian Interior Point Method*, Sapporo, Japan.

The 2022 spring national conference of Operations Research Society of Japan Mar. 2022
Zhijian Lai, Akiko Yoshise. *Superlinear and Quadratic Convergence of Riemannian Interior Point Methods*, Gunma (virtual), Japan.

Meeting 2021 of Kyoto University Research Institute for Mathematical Sciences Aug. 2021
Zhijian Lai, Akiko Yoshise. *Application of Smoothing Methods for Completely Positive Matrices via Orthogonality Constrained Problem*, Kyoto (virtual), Japan.

The 2021 spring national conference of Operations Research Society of Japan Mar. 2021
Zhijian Lai, Akiko Yoshise. *Completely Positive Factorization via Orthogonality Constrained Problem*, Tokyo (virtual), Japan.

Meeting 2020 of Kyoto University Research Institute for Mathematical Sciences Aug. 2020
Zhijian Lai, Akiko Yoshise. *A New Approach to the Recognition Problem of Completely Positive Matrices*, Kyoto (virtual), Japan.

Poster

Poster Session of 2022 SPRING Fellowship Mar. 2023
Zhijian Lai. *Riemannian Interior Point Methods for Manifold Optimization*, Tsukuba, Japan.

Research Experience

Research Assistant, University of Tsukuba Apr. 2021 – Present
Supervisor: Prof. Akiko Yoshise

Teaching Experience

Teaching Assistant, College of Policy and Planning Sciences, University of Tsukuba
- FH61141: Society and Optimization Fall 2023
- FH35012: Problem Identification and Resolution Fall 2022
- FH61141: Problem Identification and Resolution Fall 2022
- 0AL5100: Supply Chain Management Fall 2021

Mathematics Tutoring for Graduate Admission Examination, Graduate School for Policy and Planning Sciences, University of Tsukuba
- Linear Algebra Aug. 2021
- Calculus Dec. 2019
- Calculus Aug. 2019

Additional Experience

ARC Tokyo Japanese Language School Tokyo, Japan
Graduate School Preparation Class Jul. 2017 – Mar. 2019

Academic Service

Membership of
- The Operations Research Society of Japan

Computer Skills

Matlab, Python, Latex, GuRoBi, Xpress.

Languages

Chinese (Native), English (Fluent), Japanese (Fluent): JLPT N1.