

# ZHIJIAN LAI

Updated July 24, 2023

## CONNECT INFORMATION

Email: [s2130117@s.tsukuba.ac.jp](mailto:s2130117@s.tsukuba.ac.jp)  
Office: 3E310, 1-1-1 Tennodai, Tsukuba, Ibaraki, 305-8577, Japan  
Homepage: <https://galvinlai.github.io/>

**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](https://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 <b>Zhijian Lai</b> , Akiko Yoshise. <i>Riemannian Interior Point Methods for Constrained Optimization on Manifolds</i> , Tokyo, Japan.	Mar. 2023
	The 2022 autumn national conference of Operations Research Society of Japan <b>Zhijian Lai</b> , Akiko Yoshise. <i>On the Global Convergence of Riemannian Interior Point Method</i> , Niigata (virtual), Japan.	Sep. 2022
	The Japan Society for Industrial and Applied Mathematics 2022 annual meeting <b>Zhijian Lai</b> , Akiko Yoshise. <i>On the Global Convergence of Riemannian Interior Point Method</i> , Sapporo, Japan.	Sep. 2022
	The 2022 spring national conference of Operations Research Society of Japan <b>Zhijian Lai</b> , Akiko Yoshise. <i>Superlinear and Quadratic Convergence of Riemannian Interior Point Methods</i> , Gunma (virtual), Japan.	Mar. 2022
	Meeting 2021 of Kyoto University Research Institute for Mathematical Sciences <b>Zhijian Lai</b> , Akiko Yoshise. <i>Application of Smoothing Methods for Completely Positive Matrices via Orthogonality Constrained Problem</i> , Kyoto (virtual), Japan.	Aug. 2021
	The 2021 spring national conference of Operations Research Society of Japan <b>Zhijian Lai</b> , Akiko Yoshise. <i>Completely Positive Factorization via Orthogonality Constrained Problem</i> , Tokyo (virtual), Japan.	Mar. 2021
	Meeting 2020 of Kyoto University Research Institute for Mathematical Sciences <b>Zhijian Lai</b> , Akiko Yoshise. <i>A New Approach to the Recognition Problem of Completely Positive Matrices</i> , Kyoto (virtual), Japan.	Aug. 2020
POSTER	Poster Session of 2022 SPRING Fellowship <b>Zhijian Lai</b> . <i>Riemannian Interior Point Methods for Manifold Optimization</i> , Tsukuba, Japan.	Mar. 2023
RESEARCH EXPERIENCE	Research Assistant, University of Tsukuba Supervisor: Prof. Akiko Yoshise	Apr. 2021 – Present
TEACHING EXPERIENCE	Teaching Assistant, College of Policy and Planning Sciences, University of Tsukuba - FH61141: Society and Optimization - FH35012: Problem Identification and Resolution - FH61141: Problem Identification and Resolution - 0AL5100: Supply Chain Management	Fall 2023 Fall 2022 Fall 2022 Fall 2021
	Mathematics Tutoring for Graduate Admission Examination, Graduate School for Policy and Planning Sciences, University of Tsukuba - Linear Algebra - Calculus - Calculus	Aug. 2021 Dec. 2019 Aug. 2019
ADDITIONAL EXPERIENCE	ARC Tokyo Japanese Language School Graduate School Preparation Class	Tokyo, Japan Jul. 2017 – Mar. 2019
ACADEMIC SERVICE	Membership of - The Operations Research Society of Japan - Society for Industrial and Applied Mathematics - The Institute for Operations Research and the Management Sciences	
COMPUTER SKILLS	Matlab, Python, Latex, GuRoBi, Xpress.	

LANGUAGES

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