rluo@ist.ac.at or luor00@univie.ac.at Am Campus 1, 3400 Klosterneuburg, Austria

Ruichen Luo

Education

2023–2027 **Ph.D.** (Ongoing), Computer Science, Institute of Science and Technology Austria
Advisor: Prof. Krishnendu Chatterjee
Research Areas: Optimization, Reinforcement Learning, Game Theory, Machine Learning
Ph.D. (Co-registered), Statistics and Operations Research, Faculty of Business, Economics and Statistics, University of Vienna

2018–2022 **B.Eng.**, Computer Science, Zhejiang University
GPA: 3.92/4.00, *Rank:* Top 10%

Employments

Jun 2023–Sep 2023 **Research Assistant** @ MBZUAI — Abu Dhabi, UAE
Advisor: Prof. Samuel Horvath and Prof. Martin Takac
Contributions:
- Developed the first non-convex speedup results of Local SGD and SCAFFOLD (two important algorithms in federated learning)
- Written a first author paper [3] at AISTATS'2025

Jan 2022–May 2022 **Research Intern** @ Tencent ARC Lab — Shenzhen, China
Project: Pretrained Model Selection for Downstream Tasks
Contributions:
- Developed a practical tool for the selection of pretrained model checkpoints for various downstream tasks

Research Visits

Oct 2025–Nov 2025 CISPA Helmholtz Center — St. Ingbert, Germany
Host: Dr. Sebastian U Stich
Collaboration Project: Minimax Optimization with General Conditioning

Oct 2024–Dec 2024 CISPA Helmholtz Center — St. Ingbert, Germany
Host: Dr. Sebastian U Stich
Collaboration Project: Monotone Near-Zero-Sum Games

Publications

Also see my Google Scholar page. '*' stands for equal contribution.

[6] Krishnendu Chatterjee*, **Ruichen Luo***, Raimundo Saona*, and Jakub Svoboda*. **2025a**. "Algorithms for Linear Equations with Min and Max Operators under (Absolutely) Halting Conditions". In: *Preparation.* [Slides].

[5] Krishnendu Chatterjee*, **Ruichen Luo***, Raimundo Saona*, and Jakub Svoboda*. **2025b**. "Linear Equations with Min and Max Operators: Computational Complexity". In: *AAAI'2025.* [Oral Presentation] [Slides].

[4] **Ruichen Luo**, Sebastian U Stich, and Krishnendu Chatterjee. **2025c**. "Monotone Near-Zero-Sum Games". In: *Submitted to ICLR'2026.* [Slides].

[3] **Ruichen Luo**, Sebastian U Stich, Samuel Horvath, and Martin Takac. **2025d**. "Revisiting LocalSGD and SCAFFOLD: Improved Rates and Missing Analysis". In: *AISTATS'2025.* [Poster] [Slides].

[2] Ali Zindari, **Ruichen Luo**, and Sebastian U Stich. **2023**. "On the Convergence of Local SGD under Third-Order Smoothness and Hessian Similarity". In: *OPT'2023 NIPS Workshop.*

[1] Longqian Huang, **Ruichen Luo**, Xu Liu, and Xiang Hao. **2022**. "Spectral Imaging with Deep Learning". In: *Light: Science & Applications* 11.61. **[Top Downloaded Paper 2022, 2023, 2024]**.

Working Papers

1. Algorithms for Linear Equations and Min and Max Operators under (Absolutely) Halting Conditions
2. Faster Algorithms for Two-Player Discounted-Sum Games with Few Stochastic Nodes
3. The Complexity of Matrix Games with Regularization

Student Mentorships

Elahe Tohidi	Feb 2025–Jun 2025	Scientific Intern @ ISTA (from Sharif University of Technology)
Yizhou Mao	Aug 2024–Dec 2024	Scientific Intern @ ISTA (from Shanghai Jiaotong University)

Talks and Presentations

Nov 1, 2025	From Simple Stochastic Games to Linear Equations with Min and Max Operators: Complexities and Algorithms Control Software Systems Group Seminar, Kaiserslautern, Germany
Oct 10, 2025	Monotone Near-Zero-Sum Games: A Generalization of Convex-Concave Minimax Machine Learning and Optimization Group Meeting, St. Ingbert, Germany
Jun 30, 2025	New Nonconvex Analysis of LocalSGD and SCAFFOLD Monday Session D, EUROPT'2025, Southampton, England
Jun 23, 2025	The Complexity of A Class of Linear Equations with Min and Max Operators Monday Session D, EURO'2025, Leeds, England
May 4, 2025	Revisiting LocalSGD and SCAFFOLD: Improved Rates and Missing Analysis Poster Session 2, AISTATS'2025, Phuket, Thailand
Oct 23, 2024	New Nonconvex Analysis of LocalSGD and SCAFFOLD Machine Learning and Optimization Group Meeting, St. Ingbert, Germany

Academic Services

Reviewer for	NeurIPS'2023, NeurIPS'2025, ICLR'2026