

RESEARCH INTEREST

My previous and ongoing research revolves around the analysis and improvement of algorithms originating from the fields of optimization, statistics, and machine learning. More specifically, I have focused on analyzing and improve sampling algorithms such as Stein Variational Gradient Descent (SVGD) and Langevin-type algorithms. Additionally, I have explored optimization algorithms, including Stochastic Gradient Descent and zeroth-order Consensus-Based Optimization methods. Nevertheless, my research interests are beyond the aforementioned areas. I aspire to broaden my research horizons by exploring more general problems that encompass intriguing physics, challenging mathematics, and possess significant practical applications.

EDUCATION

King Abdullah University of Science and Technology

Ph.D. in Computer Science

Thuwal, Saudi Arabia

2021–Current

Nanjing University

M.S. in Pure Mathematics

Nanjing, China

2017–2020

– Thesis: “Harmonic functions on $RCD(K,N)$ spaces”

Jilin University

B.S. in Mathematics and Applied Mathematics

Changchun, China

2013–2017

PUBLICATIONS

- [1] M. Fornasier, P. Richtárik, K. Riedl, and L. Sun, “Consensus-based optimization with truncated noise”, *arXiv preprint arXiv:2310.16610*, 2023.
- [2] L. Sun, A. Karagulyan, and P. Richtarik, “Convergence of stein variational gradient descent under a weaker smoothness condition”, in *International Conference on Artificial Intelligence and Statistics*, PMLR, 2023, pp. 3693–3717.
- [3] L. Sun and P. Richtárik, “Improved Stein Variational Gradient Descent with Importance Weights”, *NeurIPS Optimal Transport and Machine Learning Workshop*, 2023.
- [4] A. Tyurin, L. Sun, K. Burlachenko, and P. Richtárik, “Sharper Rates and Flexible Framework for Nonconvex SGD with Client and Data Sampling”, *accepted to Transactions on Machine Learning Research (TMLR)*, 2023.
- [5] A. Salim, L. Sun, and P. Richtarik, “A Convergence Theory for SVGD in the Population Limit under Talagrand’s Inequality T1”, in *International Conference on Machine Learning*, PMLR, 2022, pp. 19 139–19 152.
- [6] L. Sun and P. Richtárik, “A Note on the Convergence of Mirrored Stein Variational Gradient Descent under (L_0, L_1) – Smoothness Condition”, *arXiv preprint arXiv:2206.09709*, 2022.
- [7] L. Sun, A. Salim, and P. Richtárik, “Federated Learning with a Sampling Algorithm under Isoperimetry”, *arXiv preprint arXiv:2206.00920*, 2022.

EXPERIENCE

Technical University of Munich

Visited Professor Massimo Fornasier

Munich, German

June 19th 2023 – July 2nd 2023

Georgia Institute of Technology

Exchange student/School of Mathematics

Atlanta, US

Jan 2016 – May 2016

The Hong Kong University of Science and Technology

Visiting student/Mathematics department

Hong Kong, China

One week, Dec 2015

TEACHING

- **Teaching Assistant** at Nanjing University Fall 2016
Advanced Mathematics
- **Teaching Assistant** at Nanjing University Spring 2016
Calculus

SKILLS

- **Coding Language:** Latex, Matlab and Python
- **Mathematical Analysis:** Optimal Transport, Stochastic Calculus

SCHOLARSHIPS AND AWARDS

- KAUST Dean's List Award 2023

REFEREES

- Prof. Dr. Peter Richtárik (Advisor), Professor of Computer Science, King Abdullah University of Science and Technology (KAUST). Address: Office 3145, Bldg 12, 4700 KAUST, Thuwal 23955-6900, Saudi Arabia. Email: peter.richtarik@kaust.edu.sa
- Prof. Dr. Massimo Fornasier, Chair of Applied Numerical Analysis, Technical University of Munich (TUM). Address: Room 5610.02.058, Boltzmannstr. 3, 85748 Garching b. München, German. Email: massimo.fornasier@ma.tum.de