

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 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 advised by **Peter Richtárik**

Thuwal, Saudi Arabia

2021–Current

Nanjing University

M.S. in Pure Mathematics advised by **Xiaoping Yang**

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

Journal, Conference and Workshop

1. A. Salim, L. Sun, and P. Richtárik “A Convergence Theory for SVGD in the Population Limit under Talagrand’s Inequality T1”, *International Conference on Machine Learning*, 2022
2. L. Sun, K. Avetik and P. Richtárik “Convergence of Stein variational gradient descent under a weaker smoothness condition”, *International Conference on Artificial Intelligence and Statistics*, 2023
3. A. Tyurin, L. Sun, B. Konstatin and P. Richtárik “Sharper Rates and Flexible Framework for Nonconvex SGD with Client and Data Sampling”, *Transactions on Machine Learning Research*, 2023
4. L. Sun and P. Richtárik “Improved Stein Variational Gradient Descent with Importance Weights”, *NeurIPS Optimal Transport and Machine Learning Workshop*, 2023

Preprints

1. M. Fornasier, P. Richtárik, K. Riedl and L. Sun “Consensus-Based Optimization with Truncated Noise”, *submitted to European Journal of Applied Mathematics*
2. L. Sun, A. Salim and P. Richtárik “Federated Learning with a Sampling Algorithm under Isoperimetry”, *arXiv preprint arXiv:2206.00920*
3. 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*

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 (PhD Degree 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
- **Prof. Dr. Xiaoping Yang (Master Degree Advisor)**, Professor of Mathematics, Nanjing University (NJU). Address: No. 22 Hankou Rd., Gulou District, Nanjing, Jiangsu 210093, P.R.China. Email: xpyang@nju.edu.cn