Qiang Fu

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🖥 **personal website**

Education

2024-Present	**Yale University**, Department of Computer Science, New Haven, CT, USA
	Ph.D. student, advised by Prof. Andre Wibisono
2021-2024	**Sun Yat-sen University**, School of Mathematics, Guangzhou, China
	M.S. in Mathematics
2017-2021	**Sun Yat-sen University**, School of Mathematics, Guangzhou, China
	B.S. in Mathematics

Research Interest

My research lies broadly in **optimization**, **statistics** and **machine learning**. I am particularly focused on developing provably efficient algorithms for optimization and sampling to improve the training and inference of modern machine learning models.

Publications (Google Scholar)

Kyurae Kim, **Qiang Fu**, Yi-An Ma, Jacob R. Gardner, Trevor Campbell. "Stochastic Gradient Variational Inference with Price's Gradient Estimator from Bures-Wasserstein to Parameter Space." *arXiv Preprint* 2026.

Qiang Fu, Andre Wibisono. "Hamiltonian Descent Algorithms for Optimization: Accelerated Rates via Randomized Integration Time." *NeurIPS* 2025 (Spotlight).

Qiang Fu, Siddharth Mitra, Vishwak Srinivasan, Xiuyuan Wang, Andre Wibisono, and Ashia Wilson. "Accelerated Convex Optimization via Hamiltonian Dynamics with Deterministic Integration Time." *Under review*.

Austin Feng, **Qiang Fu**, Xiuyuan Wang, Andre Wibisono. "From Randomized Hamiltonian Flow to Fast Stochastic Optimization." *NeurIPS 2025 Workshop on Dynamics at the Frontiers of Optimization, Sampling, and Games*.

Qiang Fu, Ashia Wilson. "Mean-field Underdamped Langevin Dynamics and its Spacetime Discretization." *ICML* 2024.

Qiang Fu, Dongchu Xu, Ashia Wilson. "Accelerated Stochastic Optimization Methods under Quasar-convexity." *ICML* 2023.

Xiangkai Lian, **Qiang Fu**, Weijie Su, Xinyu Zhang, Jia Li and Zhengan Yao. "The Fractional Laplacian-based Image Inpainting." *Inverse Problems and Imaging*. 2024.

Research Experience

2024-Present **Yale CS**, Research assistant advised by Prof. Andre Wibisono.
- Research on generative models, exploring whether non-Gaussian priors in flow-based frameworks (e.g., flow matching, rectified flow and stochastic interpolants) can improve generalization and inference compared to the Gaussian priors typically used in diffusion models.
- Designing new optimizers for LLM pretraining based on Hamiltonian flows.
- Research on accelerating convex optimization as well as bridging optimization and sampling via Hamiltonian flow (NeurIPS 2025, spotlight).

2022-2024 **MIT EECS**, Research student advised by Prof. Ashia Wilson.
- Conducted research on fast algorithms for training two-layer neural networks based on the spacetime discretization of mean-field underdamped Langevin dynamics with provable convergence guarantees (ICML 2024).
- Developed new provably accelerated stochastic optimization algorithms for minimizing quasar-convex functions with applications in efficiently training linear dynamical systems and generalized linear models (ICML 2023).

2021-2022 **School of Mathematics, Sun Yat-sen University**, Research student.
- Collaborated on fractional Laplacian-based image inpainting (IPI 2023).

Honors and Awards

2025 Yale GSA Conference Travel Fellowship

2024 Yale University PhD Fellowships

2023 National Scholarship (top 0.2% in China), Ministry of Education

2023 First Prize Scholarship, Sun Yat-sen University

2022 National Scholarship (top 0.2% in China), Ministry of Education

2022 First Prize Scholarship, Sun Yat-sen University

2022 Meritorious Winner, Mathematical Contest in Modeling

2021 First Prize Scholarship, Sun Yat-sen University

Skills

Programming: Python (PyTorch, scikit-learn, pandas, NumPy), MATLAB, LaTeX

Language: Chinese (native), English (fluent)

Services

Reviewer of AISTATS 2023, ICLR (2025, 2026), NeurIPS 2025, ALT 2026

Seminar Talks and Presentations

2025   NeurIPS 2025, San Diego Convention Center. Spotlight Poster presentation: *Hamiltonian Descent Algorithms for Optimization: Accelerated Rates via Randomized Integration Time.*

2025   Optimization and Statistical Learning Workshop, Columbia University. Poster presentation: *Hamiltonian Descent Algorithms for Optimization: Accelerated Rates via Randomized Integration Time.*

2024   Yale FDS Conference: Recent Advances and Future Directions for Sampling. Poster presentation: *Mean-field Underdamped Langevin Dynamics and its Spacetime Discretization.*

2024   ICML 2024, Vienna, Austria, Messe Wien Exhibition Congress Center. Poster presentation: *Mean-field Underdamped Langevin Dynamics and its Spacetime Discretization.*

2023   ICML 2023, Hawaii Convention Center. Poster presentation: *Accelerated Stochastic Optimization Methods under Quasar-convexity.*