Yuqing Wang

686 Cherry St NW,
Atlanta, GA 30332-0160 USA
ywang3398@gatech.edu
https://ywang3398.math.gatech.edu

RESEARCH INTERESTS

machine learning, optimization, (stochastic) dynamical systems, sampling, computational mathematics

PROFESSIONAL EXPERIENCE

Fall 2024 Research Fellow
Program: *Modern Paradigms in Generalization*
joint with *Large Language Models and Tranformers*
Simons Institute for the Theory of Computing, University of California, Berkeley

EDUCATION

Aug 2024 Ph.D. in Mathematics
Georgia Institute of Technology
Advisor: Prof. Molei Tao

June 2018 B.S. in Mathematics
Nankai University

PREPRINTS AND PUBLICATIONS

Yuqing Wang, Ye He, Molei Tao. "Evaluating the design space of diffusion-based generative models". arXiv preprint arXiv:2406.12839.

Yuqing Wang, Zhenghao Xu, Tuo Zhao, Molei Tao. "Good regularity creates large learning rate implicit biases: edge of stability, balancing, and catapult". Short version is accepted in Mathematics of Modern Machine Learning, NeurIPS 2023 Workshop; long version is under review.

Bo Yuan, Jiaojiao Fan, **Yuqing Wang**, Molei Tao, and Yongxin Chen. "Markov Chain Monte Carlo for Gaussian: A Linear Control Perspective", in IEEE Control Systems Letters, vol. 7, pp. 2173-2178, 2023, doi: 10.1109/LCSYS.2023.3285140.

Lingkai Kong, **Yuqing Wang**, and Molei Tao. "Momentum Stiefel Optimizer, with Applications to Suitably-Orthogonal Attention, and Optimal Transport". International Conference on Learning Representations (2023).

Yuqing Wang, Minshuo Chen, Tuo Zhao and Molei Tao. "Large Learning Rate Tames Homogeneity: Convergence and Balancing Effect". International Conference on Learning Representations (2022).

Kaixuan Huang*, **Yuqing Wang***, Molei Tao, and Tuo Zhao."Why Do Deep Residual Networks Generalize Better than Deep Feedforward Networks?—A Neural Tangent Kernel Perspective." Advances in neural information processing systems 33 (2020): 2698-2709. (*: equal contribution)

TALKS

Apr 2024	What creates edge of stability, balancing, and catapult, the second Southeast Applied and Computational Math Student Workshop, Georgia Institute of Technology
Dec 2023	Quantitative acceleration of convergence to invariant distribution by irreversibility in diffusion processes, PDE seminar, Georgia Institute of Technology
Oct 2023	What creates edge of stability, balancing, and catapult, ACO student seminar, Georgia Institute of Technology
May 2023	Implicit bias of large learning rate, SIAM Conference on Applications of Dynamical Systems (DS23), Machine Learning for Dynamical Systems & Dynamical Systems for Machine Learning - Part I of III (MS143), Portland, Oregon
Feb 2023	Implicit bias of large learning rate, Data Sciences Symposium, Spelman College

POSTERS

Feb 2024	Georgia Scientific Computing Community, Emory University
Nov 2023	Rising Stars in Data Science workshop, University of Chicago
Nov 2023	EECS Rising Star workshop, Georgia Institute of Technology
June 2023	Machine Learning Theory Summer School, Princeton University
Mar 2023	Algorithms, Combinatorics and Optimization Research Network (ACORN) workshop, Georgia Institute of Technology

HONERS

2024	Outstanding Teaching Assistant, Georgia Institute of Technology
2023	Rising star in data science

2023 Rising star in EECS

2023 Top graduate student, Georgia Institute of Technology

2022 "Thank a teacher" award, Georgia Institute of Technology

SERVICE

Reviewer for NeurIPS and Nature Communications

Vice President for SIAM Student Chapter, Georgia Institute of Technology, Fall 2021
co-organizer of SIAM student seminar

TEACHING

Teaching Assistant in the School of Mathematics, Georgia Institute of Technology:

Fall 2018, Spring 2019, Fall 2019, Fall 2020, Spring 2021, Fall 2023
MATH 2552 Differential Equation

Spring 2020
MATH 2551 Multivariable Calculus

Summer 2019, Summer 2024
MATH 2550 Introduction to Multivariable Calculus

Head Teaching Assistant in the School of Mathematics, Georgia Institute of Technology:

Spring 2022, Spring 2023
MATH 2552 Differential Equation