YE HE

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Employment

Aug. 2023 – present, Hale Visiting Assistant Professor, School of Mathematics, Georgia Institute of Technology.
Mentor: Prof. Molei Tao.

Education

Sep. 2018 – Jun. 2023, Ph,D. in Mathematics, University of California Davis.
Advisor: Prof. Krishna Balasubramanian.
Sep. 2016 - Jun. 2018, M.A. in Mathematics, University of Wisconsin Madison.
Sep. 2013 - Jun. 2017, B.A. in Mathematics, Shanghai Jiao Tong University.

Research

➤ My research focuses on the mathematical foundations of artificial intelligence, machine learning and data science, with an emphasis on developing scalable inference methods, including sampling, diffusion models and stochastic optimization.

Honors and Awards

June 2022 Alice Siu-Fun Leung Scholarship in mathematics, UC Davis.

Publications

1. Krishnakumar Balasubramanian, Promit Ghosal, and Ye He (2024. Authors listed alphabetically). High-dimensional Scaling Limits and Fluctuations of Online Least-squares SGD with Smooth Covariance. *Annals of Applied Probability, 2024*.
2. Ye He, Kevin Rojas, and Molei Tao (2025). What Exactly Does Guidance Do in Masked Discrete Diffusion Models. *arXiv preprint arXiv:2506.10971*.
3. Kevin Rojas, Ye He, Chieh-Hsin Lai, Yuta Takida, Yuki Mitsufuji, and Molei Tao (2025). Theory-Informed Improvements to Classifier-Free Guidance for Discrete Diffusion Models. *arXiv preprint arXiv:2507.08965*.
4. Ye He, Alireza Mousavi-Hosseini, Krishnakumar Balasubramanian, and Murat A Erdogdu (2024). A Separation in Heavy-Tailed Sampling: Gaussian vs. Stable Oracles for Proximal Samplers. *NeurIPS, 2024*.
5. Ye He, Kevin Rojas, and Molei Tao (2024). Zeroth-Order Sampling Methods for Non-Log-Concave Distributions: Alleviating Metastability by Denoising Diffusion. *NeurIPS, 2024*.
6. Yuqing Wang, Ye He, and Molei Tao (2024). Evaluating the design space of diffusion-based generative models. *NeurIPS, 2024*.
7. Alireza Mousavi-Hosseini, Tyler Farghly, Ye He, Krishnakumar Balasubramanian, and Murat A Erdogdu (2023). Towards a Complete Analysis of Langevin Monte Carlo: Beyond Poincaré Inequality. *COLT 2023*.
8. Ye He, Krishnakumar Balasubramanian, and Murat A Erdogdu (2022). An analysis of Transformed Unadjusted Langevin Algorithm for Heavy-tailed Sampling. *IEEE Transactions on Information Theory*.
9. Ye He, Krishnakumar Balasubramanian, Bharath Sriperumbudur, and Jianfeng Lu (2022). Regularized Stein Variational Gradient Flow. *Foundations of Computational Mathematics*.
10. Ye He, Tyler Farghly, Krishnakumar Balasubramanian, and Murat A. Erdogdu (2022). Mean-square Analysis of Discretized Itô Diffusions for Heavy-tailed Sampling. *Journal of Machine Learning Research*.
11. Ye He, Krishnakumar Balasubramanian, and Murat A Erdogdu (2020). On the ergodicity, bias and asymptotic normality of randomized midpoint sampling method. *NeurIPS, 2020*.

Attended Workshops and Summer Schools

June 2025	Summer School: Informs Applied Probability, Georgia Tech.
April 2022	Workshop: Stein's method and its applications in Machine Learning and Optimization, Online.
Oct. 2021	Workshop: Dynamics and Discretization: PDEs, Sampling, and Optimization, Berkeley.
Sep. 2021	Workshop: Sampling Algorithms and Geometries on Probability Distributions, Berkeley.
Aug. 2021	Workshop: Probability, Geometry, and Computation in High Dimensions Boot Camp, Berkeley.
Summer 2021	Summer School: Online Open Probability School (a second series of online courses after the 2020 Online Open Probability School).
Summer 2020	Summer School: Online Open Probability School (joint ofthe 2020 Séminaire de mathématiques supérieures on Discrete Probability, Physics and Algorithms and the 2020 CRM-PIMS school).

Teaching

Introduction to Linear Algebra; Differential Equations; Short Calculus III.

Professional Services

Reviewer in AAAI, AISTATS, COLT, NeurIPS, ICML, ICLR, TMLR, FOCS, Mathematical Programming, Annals of Applied Probability, SIMODS.

References

Molei Tao,	Associate professor, Georgia Institute of Technology,	mtao@gatech.edu.
Krishna Balasubramanian,	Associate professor, University of California Davis,	kbala@ucdavis.edu.
Murat A. Erdogdu,	Assistant professor, University of Toronto,	erdogdu@cs.toronto.edu.
Bharath K Sriperumbudur,	Professor, Pennsylvania State University,	bharathsv.ucsd@gmail.com
Haomin Zhou,	Professor, Georgia Institute of Technology,	hmzhou@math.gatech.edu