

# YE HE

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## Employment

Aug. 2023 – present, Hale visiting assistant professor, School of Mathematics, Georgia Institute of Technology.

## 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 applying probabilistic and Partial Differential Equations (PDE) tools to understand sampling and stochastic optimization algorithms used in Machine Learning (ML).

## Honors and Awards

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

## Publications

1. 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. *arXiv preprint arXiv:2405.16736*.
2. Ye He, Kevin Rojas, and Molei Tao (2024). Zeroth-Order Sampling Methods for Non-Log-Concave Distributions: Alleviating Metastability by Denoising Diffusion. *arXiv preprint arXiv:2402.17886*.
3. Ye He, Krishnakumar Balasubramanian, and Promit Ghosal (2023). High-dimensional Scaling Limits and Fluctuations of Online Least-squares SGD with Smooth Covariance. *Submitted to Annals of Applied Probability*.
4. 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. *Conference on Learning Theory 2023*.
5. 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*.
6. Ye He, Krishnakumar Balasubramanian, Bharath Sriperumbudur, and Jianfeng Lu (2022). Regularized Stein Variational Gradient Flow. *To appear in Foundations of Computational Mathematics*.
7. 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*.
8. Ye He, Krishnakumar Balasubramanian, and Murat A Erdogdu (2020). On the ergodicity, bias and asymptotic normality of randomized midpoint sampling method. *Advances in Neural Information Processing Systems* **33**, 7366–7376.

## Works in progress

1. Tyler Farghly, Ye He, Jun Yang, and Patrick Rebeschini (2023). Adaptive Langevin Monte Carlo Methods for Heavy-tailed Sampling via Weighted Functional Inequalities. *Request for the manuscript*.
2. Ye He, Krishna Balasubramanian, and Xiucui Ding (2023). High-dimensional Scaling Limits for Kernel Ridge Regression. *Request for the manuscript*.

## Conference Talks and Posters

- April 2022** Workshop: Stein's method and its applications in Machine Learning and Optimization, 1-hour talk.  
**Dec. 2020** The 34th Conference on Neural Information Processing Systems(NeurIPS 2020), poster.

## Attended Workshops and Summer Schools

- 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 of the 2020 Séminaire de mathématiques supérieures on Discrete Probability, Physics and Algorithms and the 2020 CRM-PIMS school).

## Professional Services

Reviewer in AISTATS, TMLR, COLT, NeurIPS, ICML, ICLR, FOCS, Mathematical Programming.

## References

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| Krishna Balasubramanian, | Assistant professor, University of California Davis, | kbala@ucdavis.edu.        |
| Murat A. Erdogdu,        | Assistant professor, University of Toronto,          | erdogdu@cs.toronto.edu.   |
| Bharath K Sriperumbudur, | Associate professor, Pennsylvania State University,  | bharathsv.ucsd@gmail.com. |
| Jianfeng Lu,             | Professor, Duke University,                          | jianfeng@math.duke.edu.   |