MATTHEW SHUNSHI ZHANG

10330 Yonge St., Richmond Hill ON, L4C 5N1

(+1) 647-470-5998 ⋄ matthew.zhang@mail.utoronto.ca ⋄ **Website:** matthewzhang1998.github.io

EDUCATION

University of Toronto January 2022 -
PhD, Computer Science, Supervised by Prof. Murat Erdogdu. Affiliated with the Vector Institute for Artificial Intelligence. GPA: 4.00/4.00

University of Toronto September 2020 - January 2022
MS, Computer Science, Supervised by Profs. Murat Erdogdu and Animesh Garg. Affiliated with the Vector Institute for Artificial Intelligence. GPA: 4.00/4.00

University of Toronto September 2016 - May 2020
BASc, Engineering Science, Machine Intelligence Specialization. High Honours, GPA: 3.94/4.00

JOURNAL PUBLICATIONS

Analysis of Langevin Monte Carlo from Poincaré to Log-Sobolev
Sinho Chewi, Murat A. Erdogdu, Mufan (Bill) Li, Ruoqi Shen, Matthew S. Zhang FoCM, 2024

CONFERENCE PUBLICATIONS

Rényi-infinity constrained sampling with d^3 membership queries
Yunbum Kook, Matthew S. Zhang SODA, 2025

In-and-Out: Algorithmic diffusions for sampling convex bodies
Yunbum Kook, Santosh Vempala, Matthew S. Zhang NeurIPS, 2024 (spotlight)

Sampling from the mean-field stationary distribution
Yunbum Kook, Matthew S. Zhang, Sinho Chewi, Murat A. Erdogdu, Mufan Li COLT, 2024

Improved discretization analysis for the underdamped Langevin Monte Carlo
Matthew S. Zhang, Sinho Chewi, Mufan Li, Krishnakumar Balasubramanian, Murat A. Erdogdu
COLT, 2023

Tight regret and complexity bounds for Thompson Sampling via Langevin Monte Carlo
Tom Huix, Matthew S. Zhang, Alain Durmus AISTATS, 2023

Towards a Theory of Non-Log-Concave Sampling: First-Order Stationarity Guarantees for Langevin Monte Carlo
Krishnakumar Balasubramanian, Sinho Chewi, Murat A. Erdogdu, Mufan Li, Adil Salim, Matthew S. Zhang COLT, 2022

Convergence and Optimality of Policy Gradient Methods in Weakly Smooth Settings
Matthew S. Zhang, Murat A. Erdogdu, Animesh Garg AAAI, 2022

Convergence of Langevin Monte Carlo in Chi-Squared and Rényi Divergence
Murat A. Erdogdu, Rasa Hosseinzadeh, Matthew S. Zhang AISTATS, 2022

One-Shot Pruning of Recurrent Neural Networks by Jacobian Spectrum Evaluation
Matthew S. Zhang, Bradly Stadie ICLR, 2020

PREPRINTS

Covariance estimation with Markov chain Monte Carlo
Yunbum Kook, Matthew S. Zhang Preprint, 2024

Uniform-in-N log-Sobolev inequality for the mean-field Langevin dynamics with convex energy
Sinho Chewi, Atsushi Nitanda, Matthew S. Zhang   Preprint, 2024

Benchmarking Model-Based Reinforcement Learning
Tingwu Wang, Xuchan Bao, Ignasi Clavera, Jerrick Hoang, Yeming Wen, Eric Langlois, Matthew S. Zhang, Guodong Zhang, Pieter Abbeel, Jimmy Ba   Preprint, 2019

INVITED TALKS AND PRESENTATIONS

Uniform-in-N log-Sobolev inequality for finite-particle systems
Seminar, University of Tokyo   November 2024

Sampling and isoperimetry for finite particle approximations
SIAM Conference on the Mathematics of Data Science   October 2024

Sampling in the mean-field regime
Probability Summer School, Saint Flour (Student talk)   July 2024

Sampling from mean-field stationary measures
Seminar, Yale University   March 2024

Isoperimetry and the convergence of LMC
Machine Learning Summer School, ÉMINES   July 2022

Convergence of LMC in Rényi Divergence
Applied Mathematics Seminar, CERMICS   June 2022

Analysis of LMC from Poincaré to log-Sobolev
Complexity of Sampling Working Group, Simons Institute   November 2021

AWARDS

Canada Graduate Scholarship (Doctoral)   2023

University of Toronto Fellowships   2021

Daisy Intelligence Scholarship for Engineering Science   2019

Faculty of Applied Science and Engineering Award   2018

Engineering Society Awards   2018

Jane Elizabeth Ham Scholarship   2017

Canadian Freshman Debating Champion   2017

SERVICE

Conference Reviewer   AISTATS 2022, NeurIPS 2022, AISTATS 2023, ICML 2023, NeurIPS 2023, ICLR 2023, ALT 2024, AISTATS 2024, ICML 2024, NeurIPS 2024, AAAI 2025, ALT 2025, ICLR 2025, AISTATS 2025, COLT 2025, ICML 2025

Journal Reviewer   Stochastic Processes and their Applications, JAA, FoCM, JMLR, TMLR

Organized a **reading group on sampling algorithms and stochastic localization** at the Georgia Institute of Technology, 2023-2024.

REFERENCES

Murat Erdogdu, Assistant Professor   erdogdu@cs.toronto.edu

Sinho Chewi, Assistant Professor   sinho.chewi@yale.edu