

DARIO SHARIATIAN

dario.shariatian@inria.fr \diamond github.com/darioShar \diamond https://darioshar.github.io

Paris, France

Developing methodologies for diffusion-based generative models. See my Github for associated repos.

EDUCATION

PhD in Computer Science, ENS Paris, *Paris, France* *October 2023 - 2026*

Inria, Sierra team led by Francis Bach. Advised by Umut Simsekli and Alain Durmus

Developing methodologies for diffusion-based generative models (e.g., heavy-tailed diffusion models, discrete diffusion, alternative stochastic processes like PDMPs etc.)

MSc in Mathematics - Part C (Distinction), University of Oxford, *UK* *2022 - 2023*

Main focus on ML, deep learning, statistics. Various broadening courses, e.g., random matrices, differential geometry, algebraic topology

BSc/MSc in Applied Mathematics, École Polytechnique, *Paris, France* *2019 - 2022*

Well rounded education with strong scientific components. Major in ML/probability/stats. Minor in CS, pure maths, theoretical physics, and humanities (I also enjoy art, philosophy and music)

PREPRINTS AND PUBLICATIONS

preprint – Algorithm- and Data-Dependent Generalization Bounds for Diffusion Models *2025*

*Shariatian, D.**, *Dupuis, B.**, *Haddouche, M.**, *Durmus, A.O.*, & *Simsekli, U.*

We establish novel algorithm- and data-dependent generalization bounds for score-based generative models (SGMs), accounting for optimization dynamics and provide supporting empirical results.

ICML 25 – Bit-Level Diffusion with Discrete Markov Probabilistic Models (DMPM) *2025*

*Shariatian, D.**, *Pham, L.T.N.**, *Ocello, A.*, *Conforti, G.*, & *Durmus A.O.*

We introduce a novel framework for discrete diffusion on bit data, beating state-of-the-art MD4 and discrete flow matching on binarized MNIST with 2.5x fewer network calls

ICLR 25 – Heavy-Tailed Diffusion with Denoising Lévy Probabilistic Models (DLPM) *2024*

Shariatian, D., *Simsekli, U.*, & *Durmus, A.O.*

We introduce a novel framework to use heavy-tailed noise in diffusion models

NeurIPS 24 – Piecewise Deterministic Generative Models *2024*

Bertazzi, A., *Shariatian, D.*, *Durmus, A.O.*, *Simsekli, U.*, & *Moulines, É*

We introduce a novel class of generative models based on piecewise deterministic Markov processes (PDMPs), which combine deterministic motion with random jumps at random times

WORK EXPERIENCE

Research Intern, Sakana AI, *Tokyo, Japan* *May-September 2025*

- Developed Latent-conditional Discrete Diffusion Models for text modeling (to be published).
- Designed and co-organised the first of Sakana AI's retreat, a 5-day trip with the research staff.

Quantitative Research Intern, Squarepoint Capital, *London, UK* *March-August 2022*

- Developed predictive mathematical models for equities (mid-frequency)
- Developed a novel spectral graph approach presented to various teams and management

Software Engineer Intern, Ledger, *Paris, France* *June-September 2021*

- Wrote emulator for flagship Ledger Nano X in C, streamlining debugging and accelerating development

Research Intern, Gendarmerie Elite Unit (GIGN), *Versailles, France* *November-April 2020*

- Led a small team developing projects to support elite unit (noise reduction, object detection etc.)
- Collaborated with field agents, technical teams, and French institutions to optimize projects outcome

ACADEMIC EXPERIENCE

Organizer	Reading group on diffusion models in INRIA Paris	2025
Reviewer	ICML24, NEURIPS24, AAAI25, TMLR, ICLR25, ICML25	
Teaching Assistant	MAA106 Numerical Analysis, École Polytechnique	March-June 2024
Oral Examiner	MSc Data Science for Business/Finance, X-HEC	2024, 2025
Oral Presentations		
• DLPM, Alan Turing Institute, <i>London</i> ,		June 2024
• DLPM, Inria, <i>Paris</i> ,		February 2025
• DMPM, Inria, <i>Paris</i> ,		February 2025
• DLPM, Oberwolfach Research Institute for Mathematics, <i>Oberwolfach</i> ,		February 2025

PRE-PHD RESEARCH / SELECTED PROJECT WORK

An Alternative to the Log-Likelihood (Master thesis)	December-April 2023
<i>Department of Statistics, University of Oxford</i> , supervised by Dr. Gonzalo Mena	
• Study on Sinkhorn EM, an alternative to log-likelihood for parameter estimation inspired by entropic optimal transport, in the non-asymptotic regime	
Discrete Morse Theory for Relative/Persistent Cosheaf Homology	March 2023
<i>Department of Mathematics, University of Oxford</i> , Supervised by Dr. Vidit Nanda	
• Explored discrete Morse theory to accelerate homology computations in various contexts	
On-Board Computer (OBC) for Nano-Satellite, IONSAT project	2020 - 2021
<i>Space Center of École Polytechnique</i>	
• Led team designing OBC architecture with FPGA. Collaborated with CNES on multi-core systems	
• Project presented at Dubai IAC 2021	

SKILLS

Programming	Python, C/C++, q/KDB, Java, Ocaml, SQL
Tools, Softwares	PyTorch, PyTorch Lightning, Slurm, git, gdb, Qt, OpenGL
Languages	English (<i>fluent</i>), French (<i>native</i>), Spanish (<i>notions</i>), Persian (<i>notions</i>)

VARIOUS

- **Music** Guitar, bass, drums. I enjoy playing funk/rock, with my band or during jam sessions
- **Sports** Volley-ball, ski, kung-fu, surf, sky-diving
- **Community Involvement** Rehabilitation of Chateau de Guédelon, in France