DARIO SHARIATIAN

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Paris, France

PhD student in ML at INRIA/ENS Paris developing novel methodology for generative models, especially continuous and discrete diffusion (as in Stable Diffusion or Diffusion LLMs). My work combines principled probabilistic analysis, scalable experimentation, evaluation design, end-to-end ownership of projects.

EDUCATION

PhD in Computer Science, ENS Paris - PSL, *France*　　　　　　　　*October 2023 – 2026*
INRIA, Sierra project team. Advised by Umut Simsekli and Alain Durmus
Research on continuous and discrete diffusion models, spanning methodology, theory, and empirical evaluation for modern generative modeling.

MSc in Mathematics - Part C (Distinction), University of Oxford, *UK*　　　*2022 – 2023*
Focused on deep learning, statistics, and applied mathematics, additional coursework in pure maths.

BSc/MSc in Applied Mathematics (Top 10%), École Polytechnique, *France*　　*2019 – 2022*
Ingénieur Polytechnicien. Major in machine learning and applied mathematics, with coursework in computer science, pure mathematics, theoretical physics, and humanities.

Additional training: International Mathematical Olympiad training program, Animaths (Summer 2016). Selective program for the final French IMO team selection.

PUBLICATIONS AND PREPRINTS

arXiv preprint – Latent-Augmented Discrete Diffusion Models (LADD)　　　　*2026*
Shariatian, D., Durmus, A.O., & Peluchetti, S.
We augment the masking process of diffusion language models with continuous latent embeddings, enabling cross-token modeling and improving few-step generation.

NeurIPS 2025 – Algorithm- and Data-Dependent Generalization Bounds for Diffusion Models　*2025*
Shariatian, D.*, Dupuis, B.*, Haddouche, M.*, Durmus, A.O., & Simsekli, U.
We establish new generalization bounds for diffusion models that account jointly for optimization dynamics and data distribution, together with supporting empirical results.

ICML 2025 – Bit-Level Diffusion with Discrete Markov Probabilistic Models (DMPM)　　*2025*
Shariatian, D.*, Pham, L.T.N.*, Ocello, A., Conforti, G., & Durmus, A.O.
We develop a discrete diffusion method for bit data that outperforms MD4 and Discrete Flow Matching on binarized MNIST, using 2.5x fewer network evaluations, alongside supporting theoretical analysis.

ICLR 2025 – Heavy-Tailed Diffusion with Denoising Lévy Probabilistic Models (DLPM)　　*2024*
Shariatian, D., Simsekli, U., & Durmus, A.O.
We develop a diffusion-model framework for better modeling heavy-tailed and imbalanced data.

NeurIPS 2024 – Piecewise Deterministic Generative Models　　　　　　　*2024*
Bertazzi, A., Shariatian, D., Durmus, A.O., Simsekli, U., & Moulines, É
We introduce a class of generative models based on piecewise-deterministic Markov processes, combining deterministic motion with random jumps, and report promising empirical results.

EXPERIENCE

Research Intern, Sakana AI, *Tokyo, Japan*　　　　　　　　*May – September 2025*
- Developed Latent-Augmented Discrete Diffusion Models for categorical generation (e.g., text or molecules), with improved few-step generation performance.

- Designed and executed multi-node H200 experiments for large-scale modeling.
- Drove methodological comparisons and empirical analysis across model variants.
- Proposed and co-organized the first Sakana AI research retreat, a 5-day offsite with the research staff.

Quantitative Research Intern, Squarepoint Capital, *London, UK*   *March – August 2022*
- Developed predictive statistical models for mid-frequency equities.
- Proposed a modeling approach later shared across several teams.

Software Engineer Intern, Ledger, *Paris, France*   *June – September 2021*
- Built a C emulator for the Ledger Nano X, accelerating debugging and internal development workflows.

Research Intern, Gendarmerie Intervention Unit, *Versailles, France*   *November 2019 – April 2020*
- Led a small team developing ML tools for operational support (e.g., noise reduction, object detection)
- Coordinated with field agents, technical teams, and public institutions.

ACADEMIC SERVICE, INITIATIVE, AND TALKS

Academic Service
- Reviewer: ICML 2024, NeurIPS 2024, AAAI 2025, TMLR, ICLR 2025, ICML 2025, ICML 2026.
- Organizer: diffusion models reading group, INRIA Paris (2025).
- Organizer: Sakana AI research retreat (2025).

Teaching
- Teaching Assistant, MAA106 Numerical Analysis, École Polytechnique   *March – June 2024*
- Oral Examiner, MSc Data Science for Business/Finance, X-HEC   *2024, 2025*

Selected Talks
- Heavy-Tailed Diffusion with DLPMs, Alan Turing Institute, London   *June 2024*
- Heavy-Tailed Diffusion with DLPMs, Oberwolfach MFO, Oberwolfach   *February 2025*
- Bit-Level Diffusion with DMPM, Sakana AI, Tokyo   *July 2025*
- Generalization Bounds for Diffusion Models, GDR IASIS / ENS Lyon, Lyon   *October 2025*
- Latent-Augmented Discrete Diffusion, ENS Lyon, Lyon   *November 2025*
- Generalization in Diffusion, NeurIPS@Paris (oral), Paris   *November 2025*
- Latent-Augmented Discrete Diffusion, Califrais, Paris   *December 2025*

Research Visit
Università di Padova, Departments of Mathematics and Physics & Astronomy, *Italy*   *March 2025*
- Initiated a joint mathematics/physics project on diffusion-based generative models for cosmology with Giovanni Conforti, spanning problem framing, collaboration setup, and early technical direction.

PRE-PHD RESEARCH AND SELECTED PROJECTS

An Alternative to the Log-Likelihood (Master thesis)   *December 2022 – April 2023*
Department of Statistics, University of Oxford, supervised by Dr. Gonzalo Mena
- Studied Sinkhorn EM, an EOT alternative to max-likelihood. Showed improvements in some regimes.

On-Board Computer (OBC) for Nano-Satellite, IONSAT project   *2020 – 2021*
Space Center of École Polytechnique
- Led the team designing OBC architecture, in collaboration with CNES. Presented at Dubai IAC 2021.

Programming	Python, C/C++, q/KDB, SQL, Ocaml, Qt, OpenGL
ML/Experimental stack	PyTorch, PyTorch Lightning, Slurm, git, gdb
Languages	English *(fluent)*, French *(native)*, Spanish *(basic)*
Technical Strengths	Generative and probabilistic modeling, diffusion models, evaluation, project ownership, large-scale training, experiment design

Music Guitar, bass, drums. **Sports** Volleyball, ski. **Community** Rehabilitation, Château de Guédelon.