DARIO SHARIATIAN

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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 project team, advised by Umut Simsekli and Alain Durmus
Developing methodologies for diffusion-based generative models

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*
Ingénieur Polytechnicien program. Major in ML/probability/stats. Minor in CS, pure maths, theoretical
physics, and humanities (I enjoy art, philosophy and music)

PREPRINTS AND PUBLICATIONS

NeurIPS 25 – 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): e.g., we account for optimization dynamics. We 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*
- Developped 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 shared with various teams

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, *London*,   *June 2024*
- DLPM, Inria, *Paris*,   *February 2025*
- DMPM, Inria, *Paris*,   *February 2025*
- DLPM, Oberwolfach Research Institute for Mathematics, *Oberwolfach*,   *February 2025*

PRE-PHD RESEARCH / SELECTED PROJECT WORK

An Alternative to the Log-Likelihood (Master thesis)   *December-April 2023*
Department of Statistics, University of Oxford, 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*
Department of Mathematics, University of Oxford, 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*
Space Center of École Polytechnique
- 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 *(fluent)*, French *(native)*, Spanish *(notions)*, Persian *(notions)*

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