

DARIO SHARIATIAN

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Paris, France

Developing methodologies for deep generative models, focus on diffusion models and related approaches. See my Github page for repos and implementations.

EDUCATION

PhD, Inria, SIERRA team, *Paris, France*

October 2023 - 2026

Francis Bach's lab. Supervised by Umut Simsekli, Alain Durmus

Developing methodologies for diffusion-like generative models (extension to heavy-tails, discrete data, alternative stochastic processes etc.)

MSc in Mathematics - Part C, 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

After an initial focus on CS and system design, I switched to applied maths and data science. Major in ML/probability/stats. Minor in CS, pure maths, theoretical physics, and humanities

PREPRINTS AND PUBLICATIONS

Arxiv – 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 – 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

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

Firmware Engineer Intern, Ledger, *Paris, France*

June-September 2021

World leader in cryptocurrency hardware wallets

- Wrote emulator for flagship Ledger Nano X in C, to streamline debugging and accelerate development

R&D 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

SKILLS

Programming

Python, C/C++, q/KDB, Java, Ocaml, SQL

Tools, Softwares

PyTorch, Slurm, git, gdb, Qt, OpenGL

Languages

English (*fluent*), French (*native*), Spanish (*notions*), Persian (*notions*)

ACADEMIC EXPERIENCE

- Co-animator** 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, École Polytechnique, IP Paris, *Paris*, January 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

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