

DARIO SHARIATIAN

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

Paris, France

I am interested in designing efficient ml algorithms, and building innovative, ambitious systems as a result. Currently, I focus on modern generative methods using stochastic processes, like diffusion models. Associated implementations can be found in my github page.

EDUCATION

PhD, Inria, Sierra lab, *Paris, France* *October 2023 - now*

Supervised by Umut Simsekli, Alain Durmus

- Deep generative models, developing novel approaches similar to diffusion

MSc in Mathematics - Part C, University of Oxford (**Distinction**), *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, (**Top 20%**) *France* *2019 - 2022*

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

Preparatory Program MPSI/MP*, Lycée Saint-Louis, (**Top 4%**), *Paris, France* *2019 - 2022*

Classical french 2 years preparation for Grandes Écoles

- Advanced maths, physics, CS, humanities

WORK EXPERIENCE

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

Supervised by Dr. Asgeir Birikisson

Quantitative hedge fund focused on a collaborative approach

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

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

Supervised by Mr. Raphael Geslain

World leader in cryptocurrency hardware wallets

- Wrote emulator for flagship Ledger Nano X, to streamline debugging and accelerate development
- Gained expertise in ARM SE architecture, QEMU emulation and secure OS principles

R&D Intern, Gendarmerie Elite Unit (GIGN), *Versailles, France* *November-April 2020*

- Selected to lead a team in developing innovative projects to support elite military unit
- Developed and implemented projects like audio noise reduction and object detection
- Collaborated with field agents, technical teams, and French institutions to optimize projects outcomes

SKILLS

Programming

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

API, Tools, Softwares

PyTorch, Anaconda/Jupyter, Qt, git, gdb, 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

PUBLICATIONS

- Piecewise Deterministic Generative Models** *Neurips 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
- Denosing Lévy Probabilistic Models (DLPM)** *submitted, 2024*
Shariatian, D., Simsekli, U., & Durmus, A.O.
We introduce a novel framework to use heavy-tailed noise in diffusion models

VARIOUS ACADEMIC EXPERIENCE

- Reviewer: ICML24, NEURIPS24, AAI25, TMLR, ICLR25
Teaching Assistant: MAA106 Numerical Analysis, École Polytechnique *March-June 2024*
Oral Examiner: MSc Data Science for Business/Finance, X-HEC *2024, 2025*
Oral Presentations:
Denosing Lévy Probabilistic Models, Inria, Sierra, *Paris*, *February 2024*
Denosing Lévy Probabilistic Models, Alan Turing Institute, *London*, *July 2024*

PRE-PHD RESEARCH / SELECTED PROJECT WORK

- An Alternative to the Log-Likelihood** *December-April 2023*
Department of Statistics, University of Oxford (Master thesis), *supervised by Dr. Gonzalo Mena*
(Master thesis) Studied an alternative to log-likelihood for parameter estimation inspired by entropic optimal transport (Sinkhorn EM), 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
- Can Neural ODEs Offer Free Robustness?** *November-December 2022*
Department of Mathematics, University of Oxford, *Supervised by Dr. Jared Tanner*
Studied robustness and expressivity of neural ODEs vs neural SDEs, examined as regularization
- Spectral graph theory for stock market graphs** *May - August 2022*
Squarepoint Capital, London, *Supervised by Dr. Asgeir Birkisson*
Used tools from spectral graph theory to determine behaviors and best practices for quant strategies
- Risk Analysis and Portfolio Management on Financial Markets** *2021*
Center for Applied Mathematics, École Polytechnique, *Supervised by Prof. Grégoire Loeper*
Applied Derman & Kani's "Volatility Smile and Implied Tree" for risk analysis; focused on stochastic calculus, approximation schemes like binomial/trinomial trees, and Black-Scholes formulas
- Monte-Carlo Methods for Simulation Challenge** *2021*
Center for Applied Mathematics, École Polytechnique, *Supervised by Prof. Emmanuel Gobet*
Provided efficient benchmarks on control functions for systems under random perturbations
- 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
- Elliptic Curves on Finite Fields and Algorithms** *2018 - 2019*
Lycée Saint-Louis
Studied elliptic curves over finite fields for cryptography (e.g., Schoof's algorithm)
Developed fast C++ library with GMP implementing these results