DARIO SHARIATIAN

dario.shariatian@inria.fr ⋄ www.github.com/darioShar
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.

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., networks, differential geometry, algebraic topology...

BSc/MSc in Applied Mathematics, **École Polytechnique**, (**Top 20%**), *France* *2019 - 2022*
• Minor in CS, pure mathematics, theoretical physics, and humanities

Preparatory Program MPSI/MP*, **Lycée Saint-Louis**, (**Top 5%**), *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, United Kingdom* *March-August 2022*
Supervised by Dr. Asgeir Birkisson
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, qemu
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., Durmus, A.O., **Shariatian, D.**, 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

Denoising Lévy Probabilistic Models (DLPM), *preprint*
Shariatian, D., Simsekli, U., & Durmus, A.O.
We introduce a novel framework to use heavy-tailed noise in the denoising diffusion paradigm

VARIOUS ACADEMIC EXPERIENCE

Reviewer: ICML24, NEURIPS24, AAAI25, 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:
Denoising Lévy Probabilistic Models, **Inria, Sierra**, *Paris*, *February 2024*
Denoising 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
• 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