LOUIS GRENIOUX

Research Fellow at Flatiron Institute

lgrenioux@flatironinstitute.org | New York, USA | h2o64.github.io | lgrenioux | h2o64

EXPERIENCE

Fellow Researcher

Flatiron Institute

Jan 2026 – Current | New York, USA

- Using ML-enhanced sampling techniques to solve scientific problems and improve Bayesian inference
- Reviewer: ICML, ICLR, NeurIPS, JMLR, TMLR
- **Research interests**: Deep learning, generative modeling, sampling, diffusion models, flow matching, Bayesian inference

Full Stack Data Scientist

Freelance

Jan. 2021 – May 2023 | Paris, France

- Developped machine learning pipelines for internal usage
- Scaled proof of concepts for production usage

Software Engineer (part-time)

YU Televenture

Oct. 2014 – May. 2015 | Paris, France

- Developed the Android 6.0 production operating system
- Developed open-source toolkits for the community

EDUCATION

PhD in Applied Mathematics

École Polytechnique / École Normale Supérieure

Apr 2022 – Nov 2025 | Palaiseau, France

- Supervised by Marylou Gabrié (ENS, LPENS) and Éric Moulines (X, CMAP)
- Visiting researcher in José Miguel Hernández-Lobato's group University of Cambridge, United Kingdom (4 months)
- Co-organizer, NeurIPS 2025 workshop: Frontiers in Probabilistic Inference

M.Sc. in Data Science

École Polytechnique

2021 – 2022

- Reinforcement Learning, Computer Vision, Natural Langage Processing, Generative Models, MCMC, Optimal Transport

M.Sc. in Statistics and Computer Science (Engineer title)

Télécom SudParis

2019 – 2022

- Valedictorian of the TSP2022 promotion
- Java, C, Unix, Web Fronted/Backend, SQL, Statistics, Stochastic Processes

PROJECTS

Hi!ckathon March 2022

Hi! Paris

AI for climate | Computer Vision

- 1st place on innovation
- 2nd place on business opportunity
- 2nd place on scientific approach

2nd edition of Hi! Paris's high-level hackathon

Generative Modelling for Financial Losses

BNP Paribas / X

1st place | GAN

AI competition aiming at improving financial stress test methods with deep learning

AI towards Trading - Project leader

Cassiopée 2020-2021

1st place | Monte-Carlo

Unique real-time trading bot without neural networks

Android ROMs development

Developed sustainable opensource tools for Android community helping thousands of users
(2019-2021) Xiaomi SDM439
(2016-2020) Tinno MSM8937
(2015-2017) AOSParadox

SKILLS

Python | Java | C | C++ | SQL | HTML | Flask

pytorch | pytorch-lightning | jax | numpy | tensorflow | keras | scikit-learn

PUBLICATIONS

- L. Grenioux* and M. Noble*, *Diffusion-based annealed boltzmann generators : Benefits, pitfalls and hopes*, 2026. arXiv: 2601.21026 [stat.ML]. [Online]. Available: https://arxiv.org/abs/2601.21026.
- L. Grenioux*, R. OuYang*, and J. M. Hernández-Lobato, *A diffusive classification loss for learning energy-based generative models*, 2026. arXiv: 2601.21025 [stat.ML]. [Online]. Available: https://arxiv.org/abs/2601.21025.
- L. Grenioux, "Interactions and opportunities at the crossroads of deep probabilistic modeling and statistical inference through markov chains monte carlo," Ph.D. dissertation, Institut Polytechnique de Paris, Oct. 2025. [Online]. Available: https://theses.hal.science/tel-05438658.
- L. Grenioux*, L. Galliano*, L. Berthier, G. Biroli, and M. Gabrié, *Riemannian stochastic interpolants for amorphous particle systems*, 2025. arXiv: 2512.16607 [stat.ML]. [Online]. Available: https://arxiv.org/abs/2512.16607.
- L. Grenioux*, M. Noble*, and M. Gabrié, "Improving the evaluation of samplers on multi-modal targets," in *Frontiers in Probabilistic Inference: Learning meets Sampling*, 2025. [Online]. Available: https://openreview.net/forum?id=d91E9RhVFU.
- M. Noble*, L. Grenioux*, M. Gabrié, and A. O. Durmus, "Learned reference-based diffusion sampler for multi-modal distributions," in *The Thirteenth International Conference on Learning Representations*, 2025. [Online]. Available: https://openreview.net/forum?id=fmJUYgmMbL.
- L. Grenioux*, M. Noble*, M. Gabrié, and A. Oliviero Durmus, "Stochastic localization via iterative posterior sampling," in *Proceedings of the 41st International Conference on Machine Learning*, R. Salakhutdinov et al., Eds., ser. Proceedings of Machine Learning Research, vol. 235, PMLR, 2024, pp. 16 337–16 376. [Online]. Available: https://proceedings.mlr.press/v235/grenioux24a.html.
- L. Grenioux, É. Moulines, and M. Gabrié, "Balanced training of energy-based models with adaptive flow sampling," *Workshop on Structured Probabilistic Inference & Generative Modeling*, 2023.
- L. Grenioux, A. Oliviero Durmus, E. Moulines, and M. Gabrié, "On sampling with approximate transport maps," in *Proceedings of the 40th International Conference on Machine Learning*, A. Krause, E. Brunskill, K. Cho, B. Engelhardt, S. Sabato, and J. Scarlett, Eds., ser. Proceedings of Machine Learning Research, vol. 202, PMLR, 2023, pp. 11 698–11 733. [Online]. Available: https://proceedings.mlr.press/v202/grenioux23a.html.

TALKS AND POSTERS

- **(Poster)** BayesComp 2023 (*Levi*, *Finland*) | "Balanced Training of Energy-Based Models with Adaptive Flow Sampling"
- **(Poster)** MCM 2023 (*Paris*, *France*) | "Balanced Training of Energy-Based Models with Adaptive Flow Sampling"
- **(Poster)** ICML 2023 (*Honolulu*, *USA*) | "On sampling with approximate transport maps"
- **(Poster)** SPIGM 2023 (*Honolulu*, *USA*) | "Balanced Training of Energy-Based Models with Adaptive Flow Sampling"
- **(Poster)** SINEQ Summer School (*Marne la Vallée*, *France*) | "On sampling using Transport Maps and training EBMs"
- **(Talk)** SIMPAS Group Meeting (*Palaiseau*, *France*) | "On sampling using Transport Maps and training EBMs"
- **(Talk)** Virual MCMC-seminar (*Passau*, *Germany*) | "On sampling using Transport Maps and training EBMs"
- **(Talk)** INRIA MIND team seminar (*Palaiseau*, *France*) | "On sampling using Transport Maps and training EBMs"
- **(Talk)** Journée Young Statisticians and Probabilists (*Paris*, *France*) | "On sampling using Transport Maps"
- **(Talk)** ISBA 2024 (Venice, Italy) | "Sampling from multimodal distributions with stochastic localization"
- **(Spotlight poster)** ICML 2024 (*Vienna*, *Austria*) | "Stochastic Localization via Iterative Posterior Sampling"
- **(Talk)** GT CSD (*Paris*, *France*) | "Stochastic Localization via Iterative Posterior Sampling"
- **(Talk)** Flatiron Institue @ CCM (*New York*, *USA*) | "Sampling meets Generative Modeling"
- **(Talk)** IMS Bernoulli 2024 (*Bochum*, *Germany*) | "On sampling with approximate transport maps"
- **(Talk)** MMC Seminar 2024 (*Paris*, *France*) | "Learned Reference-based Diffusion Sampling for multi-modal distributions"
- **(Poster)** ICLR 2025 (*Singapore*) | "Learned Reference-based Diffusion Sampling for multi-modal distributions"
- **(Poster)** FPI workshop @ ICLR 2025 (*Singapore*) | "Improving the evaluation of samplers on multi-modal targets"
- **(Talk)** CBL Seminar (*Cambridge*, *UK*) | "Sampling Meets Generative Modeling"
- **(Talk)** SampTA 2025 (*Vienna*, *Austria*) | "Learned Reference-based Diffusion Sampling for Multi-Modal Distributions"
- **(Talk)** CJC Reims (*Reims*, *France*) | "Quand l'échantillonnage rencontre la modélisation générative"