

François ROZET

PhD student · Machine learning · Developer

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 francois-rozet

 FrancoisRozet

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Education

PhD in Deep Learning

 Sep 2021 – Present  University of Liège  Belgium

I currently pursue a PhD degree in the field of deep learning under the supervision of Prof. Gilles LOUPPE. My research consists in developing and applying deep learning methods to Bayesian inference problems in large-scale dynamical systems (oceans, atmospheres, molecules, ...). My work lies at the intersection of many subjects, most notably generative modeling, inverse problems and density estimation.

MSc in Data Science and Engineering

 Sep 2019 – Jul 2021  University of Liège  Belgium

My Master's degree program was built around data technologies, artificial intelligence and their mathematical and computational foundations. I graduated *summa cum laude* with the congratulations of the examination committee (top 1%) and received two awards for my Master's thesis, titled "Arbitrary Marginal Neural Ratio Estimation for Likelihood-free Inference".

Publications

- [1] **François Rozet**, G r me Andry, Fran ois Lanusse, and Gilles Louppe. "Learning Diffusion Priors from Observations by Expectation Maximization" in *Advances in Neural Information Processing Systems*, 2024. URL: <https://arxiv.org/abs/2405.13712>
- [2] **Fran ois Rozet** and Gilles Louppe. "Score-based Data Assimilation for a Two-Layer Quasi-Geostrophic Model" in *Machine Learning and the Physical Sciences workshop*, 2023. URL: <https://arxiv.org/abs/2310.01853>
- [3] **Fran ois Rozet** and Gilles Louppe. "Score-based Data Assimilation" in *Advances in Neural Information Processing Systems*, 2023. URL: <https://arxiv.org/abs/2306.10574>
- [4] Malavika Vasist, **Fran ois Rozet**, Olivier Absil, Paul Molli re, Evert Nasedkin, and Gilles Louppe. "Neural Posterior Estimation For Exoplanetary Atmospheric Retrieval" in *Astronomy & Astrophysics*, 2023. URL: <https://arxiv.org/abs/2301.06575>
- [5] Arnaud Delaunoy, Joeri Hermans, **Fran ois Rozet**, Antoine Wehenkel, and Gilles Louppe. "Towards Reliable Simulation-Based Inference with Balanced Neural Ratio Estimation" in *Advances in Neural Information Processing Systems*, 2022. URL: <https://arxiv.org/abs/2208.13624>
- [6] Joeri Hermans, Arnaud Delaunoy, **Fran ois Rozet**, Antoine Wehenkel, and Gilles Louppe. "A Trust Crisis In Simulation-Based Inference? Your Posterior Approximations Can Be Unfaithful" in *Transactions on Machine Learning Research*, 2022. URL: <https://arxiv.org/abs/2110.06581>
- [7] **Fran ois Rozet** and Gilles Louppe. "Arbitrary Marginal Neural Ratio Estimation for Simulation-based Inference" in *Machine Learning and the Physical Sciences workshop*, 2021. URL: <https://arxiv.org/abs/2110.00449>

Talks

- *Learning Diffusion Priors from Observations by Expectation Maximization* – T bingen AI Center (Jul 2024)
- *Diffusion Models meet Data Assimilation* – ENGIE (Jul 2024)
- *Score-based Generative Models meet Data Assimilation* – ESA-ECMWF Workshop (May 2024)

Community

Reviewing

Since 2022, I am a recurrent peer-reviewer for machine learning journals, conferences and workshops such as NeurIPS, ICML, ICLR, AISTATS and TMLR.

Honors & Awards

- Research fellow grant – F.R.S.-FNRS (2022)
- Best Master's thesis award – AIM (2021)
- Best Master's thesis award – AILg & NRB (2021)
- Pisart scholarship – University of Liège (2016)
- National Physics olympiad 3rd laureate – ABPPC (2016)
- National Chemistry olympiad 7th laureate – ACLg (2015)

Software

Azula

 July 2024  probabilists/azlua ★ 85

Azula is a Python package that implements diffusion models in PyTorch. Its goal is to unify the different formalisms and notations of the generative diffusion models literature into a single, convenient and hackable interface.

Inox

 Dec 2023  francois-rozet/inox ★ 30



Inox is a minimal JAX library for neural networks with an intuitive PyTorch-like syntax. Modules are represented as PyTrees, which enables complex architectures, easy manipulations, and functional transformations.

Zuko

 Oct 2022  probabilists/zuko ★ 324

Zuko is a Python package that implements normalizing flows in PyTorch. It relies heavily on PyTorch's built-in distributions and transformations, which makes the implementation concise, easy to understand and extend.

LAMPE

 Dec 2021  probabilists/lampe ★ 119

LAMPE is a Python package that focuses on amortized estimation of the posterior distribution of simulators, without relying on explicit likelihood functions. The package provides PyTorch implementations of modern amortized simulation-based inference algorithms like neural ratio estimation (NRE), neural posterior estimation (NPE) and more.

PIQA

 Oct 2020  francois-rozet/piqa ★ 405

PIQA is a collection of PyTorch metrics for image quality assessment in various image processing tasks such as generation, denoising, super-resolution, interpolation, etc. It focuses on the efficiency, conciseness and understandability of its (sub-)modules, such that anyone can easily reuse and/or adapt them to its needs



Languages

French native

English proficient (C1, TOEFL 106)

Dutch elementary (A1)



Skills

Python  (NumPy, PyTorch, JAX, ...), C/C++, Julia, HTML 

JavaScript , Git , GitHub , Linux , Docker , Slurm



Teaching

Teaching assistant

 Sep 2021 – Present  University of Liège

- Introduction to artificial intelligence – Prof. Gilles LOUPPE (since 2021)
- Deep learning – Prof. Gilles LOUPPE (since 2021)
- Data structure and algorithms – Prof. Pierre GEURTS (2021-2022)
- Functional programming – Prof. Christophe DEBRUYNE (2021-2022)

Student instructor

 Sep 2017 – Jul 2021  University of Liège

- Introduction to machine learning – Prof. Pierre GEURTS (2020-2021)
- Introduction to artificial intelligence – Prof. Gilles LOUPPE (2020-2021)
- Elements of statistics – Prof. Louis WEHENKEL (2019-2020)
- Applied mathematics – Prof. Christophe GEUZAIN (2019-2020)