

Emile Pierret

Born on January 21, 1997.

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🌐 <https://emilepi.github.io>

Education

- 2025 – Present 📖 **Post-doc.** *Université Paris Cité, ENS, France*
Advisor: Julie Delon.
- 2022 – 2025 📖 **Ph.D. in Mathematics.** *University of Orléans, France*
Thesis topic: *Stochastic Super-resolution and Inverse Problems: From Gaussian Conditional Sampling to Diffusion Models.*
Ph.D. advisor: Bruno Galerne.
- 2021 – 2022 📖 **Master's Degree (M2) in Mathematics, Vision, Learning (MVA).** *ENS Paris-Saclay, Gif-sur-Yvette, France*
Research-oriented Master's program.
- 2020 – 2021 📖 **French National Agrégation in Mathematics (external track).** *ENS Paris-Saclay, Gif-sur-Yvette, France*
Option B.
- 2019 – 2020 📖 **Master's Degree (M1) – Jacques Hadamard Program.** *ENS Paris-Saclay, Cachan, France*
Research internship: *Uncertainty quantification in COVID-19 spread: lockdown effects.*
Supervisor: Ana Carpio, *Universidad Complutense de Madrid.*
- 2018 – 2019 📖 **Double Bachelor's Degree in Mathematics and Computer Science.** *ENS Paris-Saclay, Cachan, France*
- 2018 📖 **Admitted as a normalien at ENS Paris-Saclay (4-year program)**
Admission via the Computer Science competitive entrance exam.
- 2015 – 2018 📖 **Preparatory Classes for the French Grandes Écoles.** *Lycée Descartes, Tours, France*
MPSI (Mathematics, Physics, Engineering Science), followed by MP* (Advanced Mathematics and Physics).

Publications

Preprint

- 1 É. Pierret and B. Galerne, *Exact evaluation of the accuracy of diffusion models for inverse problems with gaussian data distributions*, 2025.

Journal papers

- 1 É. Pierret and B. Galerne, "Stochastic super-resolution for gaussian microtextures," *SIAM Journal on Imaging Sciences*, vol. 18, no. 2, pp. 1176–1207, 2025. 🔗 DOI: 10.1137/24M1657407.
- 2 A. Carpio and E. Pierret, "Uncertainty quantification in covid-19 spread: Lockdown effects," *Results in Physics*, vol. 35, p. 105 375, 2022, ISSN: 2211-3797. 🔗 DOI: <https://doi.org/10.1016/j.rinp.2022.105375>.


Conference papers

- 1 E. Pierret and B. Galerne, "Diffusion models for gaussian distributions: Exact solutions and wasserstein errors," in *Forty-second International Conference on Machine Learning*, 2025. 🔗 URL: <https://openreview.net/forum?id=bxYbxzCI2R>.

Talks


Invited Talks

- June 2025




A Precise Examination of Diffusion Models via Their Application to Gaussian Distributions.

Images, Optimization and Probability Seminar, University of Bordeaux.
- June 2025




On the accuracy of diffusion models in Bayesian image inverse problems: A Gaussian case study.

SMAI 2025, Carcans Maubuisson.
- May 2025




On the accuracy of diffusion models in Bayesian image inverse problems: A Gaussian case study.

ANR MISTIC days, Lyon.
- February 2025




Diffusion models for Gaussian distributions: Exact solutions and Wasserstein errors.

Mathematical Imaging and Surface Processing Workshop, MFO Oberwolfach, Germany.
- January 2025




Diffusion models for Gaussian distributions: Exact solutions and Wasserstein errors.

Imaging in Paris Seminar, Paris.
- November 2024




Diffusion models for Gaussian distributions: Exact solutions and Wasserstein errors.

Workshop on Stochastic Geometry and Mathematics for Imaging, Nice.
- October 2024




Stochastic super-resolution for Gaussian microtextures.

ANR MISTIC days, Vannes.
- June 2024



Stochastic super-resolution for Gaussian microtextures.

LAREMA PhD Seminar, Angers.
- May 2024




Introduction to diffusion models and their restriction to the Gaussian case.

CANUM 2024, Île de Ré.


Posters

- July 2025



Diffusion models for Gaussian distributions: Exact solutions and Wasserstein errors.


Poster presentation, *ICML 2025*, Vancouver.
- January 2025







Diffusion models for Gaussian distributions: Exact solutions and Wasserstein errors.

Poster presentation, *Mathematics and Image Analysis (MIA'25)*, Paris.




Talks (continued)

- June 2023  **Stochastic super-resolution for Gaussian textures.**
Poster presentation, *ICASSP 2023*, Rhodes, Greece.



Outreach Talks and Working Group Presentations

- June 2024  **Tutorial: *Introduction to Neural Networks*.**
IDP PhD Week, Courcimont Farm.
- June 2023  **Introduction to diffusion models and practical session.**
IDP Deep Learning Working Group, Orléans.
- June 2023  **Presentation of the “RePaint” method.**
Diffusion Models Working Group, MAP5, Paris.
- June 2023  **Stochastic super-resolution for Gaussian textures.**
IDP PhD Week, Courcimont Farm.

Teaching Experience



- 2022 – 2025  **Lectures and practicals – Image Learning (15h).** *University of Orléans*
Master’s level (M1) in Applied Mathematics.
Introductory course on neural networks for image classification.
- 2023 – 2025  **Tutorials – Algebra 3 (49h).** *University of Orléans*
Second-year undergraduate level (L2) in Mathematics.
Tutorials in linear algebra.
- 2022 – 2023  **Tutorials – Calculus (49h).** *University of Orléans*
First-year undergraduate level (L1), first semester.
Tutorials introducing fundamental tools in analysis and algebra.

Service and Responsibilities



- 2024  **Elected alternate member of the Research Committee**, University of Orléans
- 2022–2025  **Organizer of the PhD seminar**, Institut Denis Poisson (Orléans–Tours)

Skills

Languages

- English  **C1 level** (IELTS 7/9, 2020)
- Spanish  **C1 level**

Programming

- Advanced proficiency  Python, PyTorch, MATLAB, \LaTeX , Caml
- Basic knowledge  C, C++, Assembly language, R