Emile Pierret

Born on January 21, 1997.

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Education

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

Publications

1. E. Pierret and B. Galerne, "Diffusion models for gaussian distributions: Exact solutions and Wasserstein errors," *Forty-second International Conference on Machine Learning*, 2025.
2. É. Pierret and B. Galerne, "Stochastic super-resolution for gaussian microtextures," *SIAM Journal on Imaging Sciences*, vol. 18, no. 2, pp. 1176–1207, 2025.
3. É. Pierret and B. Galerne, "Stochastic super-resolution for gaussian textures," *ICASSP 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.
4. A. Carpio and E. Pierret, "Uncertainty quantification in covid-19 spread: Lockdown effects," *Results in Physics*, 2022.

Presentations

Invited Talks

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

Presentations (continued)

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.

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.

Presentations (continued)

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