Georges Le Bellier

Ph.D. Student - Generative Deep Learning

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Professional Summary

I am a third-year Ph.D. student at CNAM in Paris, and I research generative models (diffusion and flow-matching models) and data-to-data translation methods to develop robust pipelines and enable pixel-space domain adaptation for satellite imagery.

Professional Experience

01/2023 - Present | **Conservatoire National des Arts et Métiers (Ph.D)**
I research generative models and domain adaptation for Earth Observation; focusing on flow-based methods (diffusion and flow-matching models) and data-to-data translation (diffusion and Schrödinger bridges), targeting remote sensing applications.

04/2022 - 10/2022 | **SONY Computer Science Lab (Research Intern)**
I explored advanced diffusion generative models and designed conditional generation pipelines to provide enhanced controllability for musicians in AI-driven music creation.

03/2021 - 08/2021 | **IRCAM / Pixtunes GmbH (Research Intern)**
I designed and implementated multiple generative deep learning algorithms for expressive MIDI-to-audio translation. I focused on autoregressive and diffusion models for pitch and loudness timeseries generation.

02/2019 - 03/2019 | **INRIA (Research Intern)**
I carried out an internship in the LINKS computer science research team from INRIA laboratories and wrote a bibliographic research review on this topic.

Main publications and projects

1. ***FlowEO: Generative Unsupervised Domain Adaptation for Earth Observation***, Georges Le Bellier, and Nicolas Audebert. (IEEE/CVF WACV 2026)
2. ***Riemannian Flow Matching for SAR Interferometry***, Georges Le Bellier, Dana El Hajjar, Arnaud Breloy, and Nicolas Audebert. (GRETSI 2025)
3. ***PANGAEA: A Global and Inclusive Benchmark for Geospatial Foundation Models***, V. Marsocci, Y. Jia, G. Le Bellier, D. Kerekes, L. Zeng, S. Hafner, S. Gerard, E. Brune, R. Yadav, A. Shibli, H. Fang, Y. Ban, M. Vergauwen, N. Audebert, A. Nascetti (IEEE Geoscience and Remote Sensing Magazine 2025)
4. ***Detecting Out-Of-Distribution Earth Observation Images with Diffusion Models***, Georges Le Bellier , and Nicolas Audebert. (IEEE/CVF EarthVision CVPR 2024)
5. ***Educational notebooks on flow matching***, I developed educational implementations and detailed explanations of fundamental ideas from flow matching and discrete flow matching research articles.

Education

2018 - 2022 | **École Centrale de Lille**, Lille
M.Sc. SDIA - machine learning, deep learning, signal processing, optimization.

2020 - 2021 | **Sorbonne University/IRCAM/ParisTech**, Paris
M.Sc. ATIAM - signal processing, deep learning, generative modeling, acoustics.

2016 - 2018 | **Lycée Victor Grignard**, Cherbourg
CPGE MP - 2-year advanced undergraduate studies in mathematics, physics, computer science.