OLIVIER BOUËT-WILLAUMEZ

PhD Student ~ Computer Science

[GitHub]

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RESEARCH INTERESTS

My research focuses on the modeling and analysis of dynamical systems described by Ordinary Differential Equations (ODEs). To overcome the high dimensionality and computational cost of these continuous models, I make use of discrete probabilistic approximations, more specifically Dynamic Bayesian Networks (DBNs). My work explores model reduction techniques, global sensitivity analysis, and deterministic sampling (such as Quasi-Monte Carlo sequences) to reduce computational costs while ensuring accurate structural and probabilistic approximations.

EDUCATION

2024 – · · · **PhD - Computer Science** / Université Paris-Est Créteil
Under the supervision of *Nihal Pekergin*, *Adrien Le Coënt* and *Benoît Barbot*, in the Laboratory of Algorithms, Complexity, and Logic (LACL). Title: Machine Learning of Continuous Systems Based on Probabilistic Approximations.

2022 - 2024 **Master's Degree - Mathematics, Modeling and Statistical Learning** / Université Paris Cité
Specialization: Modeling, Analysis, and Simulation. Graduated with High Honors.

2020 - 2022 **Bachelor's Degree - Fundamental and Applied Mathematics** / Université Paris Cité
Graduated with Honors.

2019 - 2020 **Double Bachelor's Degree - Mathematics and Computer Science** / Université Paris Cité
Completed first year with Honors.

TEACHING

2025-2026 **Website Design** / Université Paris-Est Créteil
First year of Computer Science Bachelor's Degree, 1st semester, 32h.

2025-2026 **Coding, Compression & Cryptography** / Université Paris-Est Créteil
Second year of Computer Science Bachelor's Degree, 2nd semester, 16h.

2025-2026 **Introduction to Complexity & Algorithms** / Université Paris-Est Créteil
Third year of Computer Science Bachelor's Degree, 2nd semester, 16h.

PUBLICATIONS

2026 **Conference - ECMS 2026** / Grimstad, Norway **[Paper]**
A Sensitivity-Driven Sampling Reduction Method For Probabilistic Approximations of ODEs, O. Bouët-Willaumez, A. Le Coënt, B. Barbot, N. Pekergin, *International Conference on Modelling and Simulation (ECMS), 2026.*

2026 **Conference - ROADEF 2026** / Tours, France **[Paper]**
Sampling Methods for Probabilistic Approximations of ODEs, O. Bouët-Willaumez, A. Le Coënt, B. Barbot, N. Pekergin, *French Society of Operations Research and Decision Support (ROADEF), 2026.*

2025 **Conference - QEST + FORMATS 2025** / Aarhus, Denmark **[Paper]**
Conservation Analysis and Discrete Probabilistic Approximations for Parameter Estimation of Biochemical Networks, O. Bouët-Willaumez, A. Le Coënt, B. Barbot, N. Pekergin, *Quantitative Evaluation of SysTems + Formal Modeling and Analysis of Timed Systems (QEST+FORMATS), 2025.*

EXPERIENCE

02 - 08/2024 **Research Engineer – Internship** / Dassault Systèmes
Research project on Deep Gaussian Processes for multi-fidelity simulation, with applications in thermal systems. Tasks included literature review, model development, experimentation, and results presentation via technical reports and seminars in the company's Research Division.

06 - 10/2023 **Administrative Assistant – University Contact Center** / Université Paris Cité
Assisted students with administrative procedures (enrollment, applications, diploma requests) through a contact center (phone and email support).

PROJECTS

2026 **ode2dbn-sensitivity** **[Source Code]**
A Python sensitivity-guided framework for constructing reduced Dynamic Bayesian Networks from ODE models with efficient sampling of key dynamical dependencies.

2025 **NebulaNet** **[Source Code]**
Python library for generating abstract SVG backgrounds using random point placement and proximity-based connectivity to produce constellation-like graph structures.

2025 **BayeSBML** **[Source Code]**
Python library for conservation analysis and discrete probabilistic approximations to estimate parameters in biochemical networks.

SKILLS

Programming Languages
Python, Julia, R, MATLAB, JavaScript.

Tools
Git, Docker, Bash, GitLab CI, LaTeX, (HTML, CSS, Bootstrap).

LANGUAGES

French – Native, **English** – Fluent, **Spanish** – Basics.