Maxime Nicaise

Applied Mathematics & Machine Learning / CentraleSupélec & MVA
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Research interests: Optimal transport, statistical learning, and generative models.

EDUCATION

ENS Paris-Saclay | M2 Mathematics, Vision and Learning (MVA) 2026 – Sep. 2027 (expected)
Selected coursework: Optimal Transport for Machine Learning, Probabilistic Graphical Models and Deep Generative Models, Stochastic Calculus in Machine Learning, Statistical Learning with Extreme Values.

CentraleSupélec | Diplôme d'ingénieur (Master's level) 2023 – Sep. 2027 (expected)
Applied mathematics.

Lycée International de Valbonne | Classes préparatoires MP2I / MPI 2021–2023

PUBLICATIONS & PREPRINTS

A Gauge-Fixed Sinkhorn Algorithm for Semi-Relaxed Optimal Transport
M. Nicaise, Y. Bermudez, S. M. Perlaza. Under review. Earlier version: Inria research report. [Report] [Code]

Equivalence of optimal transport problems to regularization on the family of f-divergences
M. Nicaise, Y. Bermudez, S. M. Perlaza. IEEE ISIT 2026, Guangzhou, China (oral presentation). [Paper]

On optimal transport with f-divergence regularization
M. Nicaise, Y. Bermudez, S. M. Perlaza. Inria research report, 2026. [Report]

RESEARCH EXPERIENCE

CentraleSupélec / CMAP | Wasserstein Gradient Flows Project Oct. 2026 – Present
Supervisor: Clément Bonet. Two-semester research project: we study the connections between Sinkhorn-drifting generative models and Wasserstein gradient flows for the Sinkhorn divergence with implicit JKO discretization.

CentraleSupélec / L2S | Neural Network Optimization Project Sep. 2026 – Oct. 2026
Supervisor: Joseph Gabet. Studied "continuation" methods for training CNNs. We investigated the impact of progressive augmentation of the feature-map resolution, as well as Gaussian smoothing in the internal layers, across various datasets, architectures and optimizers. [Code]

Inria Sophia Antipolis | Research Intern, Optimal Transport Sep. 2025 – Feb. 2026
Supervisor: Samir M. Perlaza.

- Studied and implemented a stabilized variant of the Sinkhorn algorithm for semi-relaxed entropic optimal transport; proved explicit linear convergence rates, bounds on the sample complexity, and evaluated the method numerically.
- Established equivalences between optimal transport problems regularized by different f-divergences through transformations of the transport cost.

CentraleSupélec / MICS | Research Project, Functional Analysis & PDEs Jan. 2024 – Jun. 2025
Supervisor: Anna Rozanova-Pierrat. Studied the Stokes system and Hodge decompositions on domains with irregular boundaries.

INDUSTRY EXPERIENCE

Hypertrade, Bangkok | Data Science & ML Intern Feb. 2026 – Aug. 2026
Developed retail demand-forecasting and recommendation models. Contributed to building an analytics agent combining database queries and predictive models on client data. Built an application automating BigQuery queries.

TEACHING & SCIENTIFIC SERVICE

Mathematics Oral Examiner | Lycée International de Valbonne Sep. 2025 – Feb. 2026
Weekly oral examinations in CPGE MPI/MPI* and PC.

Mathematics Teaching Assistant | CentraleSupélec Sep. 2024 – Feb. 2025
Designed and taught weekly two-hour tutorials in probability and PDEs for undergraduate students.

Reviewer: IEEE International Symposium on Information Theory (ISIT), 2026.

SKILLS & LANGUAGES

Programming: Python (PyTorch, NumPy), SQL, LaTeX, OCaml, R, C, MATLAB.
Languages: French (native), English (proficient), Spanish (intermediate), Thai (conversational).