Damien Rouchouse

Master's student at Mines Paris – PSL and MVA seeking a Research Internship in AI

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Education

École Normale Supérieure Paris-Saclay — Paris, France
Master MVA – "Mathématiques, Vision, Apprentissage" — 2025–2026
- Main courses: Advanced Learning for Text and Graph Data, Geometric Data Analysis, Optimal Transport, Robotics, Computational Statistics, Convex Optimization.

Mines Paris – PSL — Paris, France
Master's Degree in Science and Executive Engineering, Major in Mathematics and Computer Science — 2022–2026
- Main courses: Machine & Deep Learning, Generative Models, Probability Theory, Advanced Statistics, Applied Mathematics, Computer Science (Python, C++, Haskell).

Lycée Hoche — Versailles, France
Preparatory Classes MPSI - MP* — 2020–2022
- 2 years of intensive preparation for French Grande Écoles exams (Ranked top 2% in national entrance exams).
- Research project: Radon Transform for tomography.

Research & Professional Experience

Inria (Supervised by *A. Gonon*, *R. Gribonval*, and *B. Guedj*) — Lyon, France & London, UK
Machine Learning Research Intern – Deep Learning Generalization Theory — 2025 (4 months)
- Conducted research on the theoretical foundations of deep learning generalization.
- Leveraged symmetries of ReLU networks (weight-rescaling invariances) to improve standard PAC-Bayesian bounds.
- Implemented, and evaluated the derived method using PyTorch Lightning and wandb.
- Achieved a $2\times$ improvement over standard bounds on MNIST/CIFAR-10, successfully transforming vacuous bounds into non-vacuous ones.
- First author of a paper under review at ICLR 2026 (arxiv.org/abs/2509.26149).

Scortex – TRIGO Group — Paris, France
AI Research & Software Engineering Intern – Industrial Vision — 2024–2025 (6 months)
- Adapted advanced computer vision models (e.g., diffusion/reconstruction methods) for high-speed industrial anomaly detection.
- Systematically fine-tuned and evaluated model performance across client use cases using PyTorch and MLflow.
- Industrialized promising models into the product codebase, prioritizing speed optimization to meet strict real-time processing requirements.

Harvard SEAS (Bertoldi Group) — Boston, USA
Research Intern – Programmable Metamaterials & Optimization — 2024 (5 months)
- Conducted research on programmable origami metamaterials, including mathematical modeling of origami pattern compatibility, origami fabrication and state-of-the-art analysis.
- Developed a Python-based automation tool for the design-to-fabrication origami pipeline (.dxf files generation), accelerating the research process.
- Explored multi-stability transitions of origami through Abaqus simulation and experimental validation using macro/micro scale prototypes; results contributed to an ongoing paper.

French Ministry of Education — Versailles, France
Oral Examiner in Mathematics — 2023–2024 (6 months)
- Mentored and assessed advanced STEM students preparing for the competitive oral exams of the top engineering schools.

Trium Forum Organization (Volunteering) — Paris, France
Corporate Relations & Partnerships Manager — 2023–2024 (1 year)
- Managed a team coordinating 100+ corporate partners for a forum with €1.3M turnover.

Technical & Soft Skills

- **Programming**: *Python* (Advanced), *C/C++* (Basics), Functional programming (Learning Haskell / Lean).
- **Machine Learning**: PyTorch, PyTorch Lightning, Transformers, Sklearn, Numpy, Weights & Biases.
- **Tools:** Git, Bash, Linux, Docker, GCP, LaTeX.
- **Languages:** French (Native), English (Advanced).
- **Hobbies:** Trail, Running, Climbing, Mountaineering, Chess, Cooking, Photography.