Martin Van Waerebeke

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Education

INRIA Paris — ARGO Team — Paris, France
PhD Candidate in Machine Unlearning — Adv.: K. Scaman, M. Lorenzi, G. Neglia — *Jun 2023 – Present*

ENS Paris-Saclay — Paris, France
M2 MVA (Mathématiques, Vision, Apprentissage) — Deep Learning, Optimization, Computer Vision — *2022 – 2023*

CentraleSupélec — Université Paris-Saclay — Paris, France
Master of Engineering — Mathematics, Machine Learning, Signal Processing — *2019 – 2023*

Technical Skills

Languages & Frameworks: Python, PyTorch, NumPy, Scikit-learn, LaTeX, Git, Linux
ML & Math: Deep Learning, Convex & Non-Convex Optimization, Differential Privacy, Federated Learning, NLP
Infrastructure: HPC clusters (SLURM), multi-GPU training, distributed computing

Research Experience

PhD Candidate — Machine Unlearning — Jun 2023 – Present
INRIA Paris, ARGO Team — *Paris, France*

- Designed **VRU**, the first certified unlearning algorithm leveraging forget-set gradients, improving excess-risk scaling from $O(1/\varepsilon^2)$ to $O(1/\varepsilon)$ and provably outperforming all first-order methods that ignore the forget set. *Submitted to ICML 2026.*
- Established the **first minimax computation-time bounds** for machine unlearning, identifying three distinct complexity regimes that characterize when unlearning is cheaper than retraining. *Published at ICML 2025.*
- Developed **SIFU**, a federated unlearning method providing differential-privacy-based guarantees for FedAvg, applicable to non-convex objectives with improved convergence for convex losses. *Published at AISTATS 2024.*

Research Intern — Self-Supervised Medical Imaging — Sep 2021 – Mar 2022
École de technologie supérieure (LIVIA Lab) — *Montréal, Canada*

- Published **2 first-author papers** (MICCAI Workshop *Spotlight* + CNPRM) proposing a novel uncertainty measure for self-supervised segmentation that corrects entropy-based failures in multi-class settings.
- Implemented 5 SOTA semi-supervised segmentation methods from scratch in PyTorch; benchmarked on GPU clusters.

Research Assistant — Image Reconstruction & Optimization — Oct 2019 – Jul 2023
CVN, CentraleSupélec — *Paris, France*

- Built a Plug-and-Play deep denoiser that **outperformed SOTA** on image reconstruction tasks with provable convergence guarantees, leading to a publication in *PNAS Nexus* (2024).

Industry Experience

Data Science Intern — Feb 2021 – Jul 2021
Paris Digital Lab — Taptrove Ventures, Ministère des Armées, Saint-Gobain — *Paris, France*

- Built an end-to-end demand forecasting pipeline (LSTM, SARIMAX, VAR) for Saint-Gobain, integrating domain-expert knowledge to predict construction-site volumes.
- Automated question-answering and classification tasks for Taptrove Ventures by developing a Transformer-based financial data extraction system, increasing precision and accelerating the human annotation process by a factor of 5.

Selected Publications

[1] **M. Van Waerebeke**, M. Lorenzi, K. Scaman, E. M. El Mhamdi, G. Neglia. "Variance-Reduced (ε, δ)-Unlearning using Forget Set Gradients." *ICML 2026 (submitted).* [arXiv]
[2] **M. Van Waerebeke**, M. Lorenzi, G. Neglia, K. Scaman. "When to Forget? Complexity Trade-offs in Machine Unlearning." *ICML 2025.* [arXiv]
[3] Y. Fraboni*, **M. Van Waerebeke***, R. Vidal, L. Kameni, K. Scaman, M. Lorenzi. "SIFU: Sequential Informed Federated Unlearning." *AISTATS 2024.* [arXiv]

Awards & Invited Talks

Best Contributed Talk Award — Recent Advances in ML, Aussois Autumn School (2025)
Invited Talks — EUROPT Conference (2025), Centre Bernoulli (2026); Full list available upon request.
Spotlight Paper — MICCAI Workshop on Uncertainty for Safe ML in Medical Imaging (2022)
Science Communication — Articles in *The Conversation* (2024) and *Sciences et Avenir* (2025)