Nassim ARIFETTE

ML Engineer — Computer Vision • 3D • Medical Imaging
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MSc (MVA), ENS Paris-Saclay — GPA 17/20 (awarded Sep 2025). Deep learning, 3D vision, and medical imaging; PyTorch/JAX/CUDA; experience scaling models and research-grade development at CEA and Collège de France.

Education

Master 2 (M2) in Mathematics, Vision, Learning (MVA) *2024 – 2025 (MSc awarded Sep 2025)*
École Normale Supérieure Paris-Saclay Gif-sur-Yvette
– Deep Learning for Medical Imaging, 3D Modeling & Point Clouds, Geometric Deep Learning, Generative Models, Computer Vision, Convex and Non-Convex Optimization
– GPA: 17/20, top 1%

Master 1 (M1) in Artificial Intelligence *2023 – 2024*
Université Paris-Saclay Orsay
– Neural Network Verification, Natural Language Processing, Convex Optimization, Deep Learning Theory,
– GPA: 16/20, top 1%

Bachelor in Mathematics and Computer Science (Research Track) *2021 – 2023*
Université Paris-Saclay Orsay
– Statistical Learning, Advanced Algorithms, Database Systems, Mathematical Logic

Professional Experience

Research Intern: 3D Medical Image Translation *Apr 2025 – Present*
BioMaps, CEA & Université Paris-Saclay (Supervised by Dima Rodriguez) Saclay
– Built a reproducible 3D CT↔UTE-MRI pipeline and trained 3D CycleGAN variants on 311 CT / 292 MRI
– Added histogram loss (*match MRI intensity distribution*) and Rician-aware loss (*model MRI noise*) → CT→MRI FID 225.96→217.89 (−3.6%), KID 0.1158→0.0969 (−16.3%); cycle fidelity PSNR ≈ 23.4 dB, SSIM ≈ 0.68.

Research Intern: Constrained Neural Networks for Phylogenetics *Jun 2023 – Aug 2023*
Collège de France, CIRB (Supervised by Laurent Jacob) Paris
– Enhanced Phyloformer by integrating triangle-inequality constraints; trained on 1,000 genetic sequences (30 min on V100).
– Maintained Robinson–Foulds distance performance while reducing constraint violations from 15% to $<1\%$ across tree sizes (10–100 leaves).

Projects

Neural Network Verification via Set Analysis *Jan 2024 – Apr 2024*
École Polytechnique, LIX (Supervised by É. Goubault, S. Putot)
∗ Implemented abstraction-based verification using zones (DBM) and tropical geometry for ReLU network robustness analysis.
∗ Developed a Julia library for tropical polyhedra operations, achieving 2–3× tighter bounds than interval methods on ACAS Xu benchmarks.
∗ Verified safety properties on neural networks with up to 5 layers, proving adversarial robustness for ϵ-ball perturbations.

Deep Learning for Voiced/Unvoiced Speech Classification *Mar 2023 – May 2023*
Université Paris-Saclay, LISN (Supervised by Marc Evrard)
∗ Built a CNN classifier achieving 85.2% validation accuracy on MFCC features, a 3.2% improvement over a baseline (82%).
∗ Conducted an ablation study across Mel-spectrogram resolutions (32/64/128 bands) using 7-fold cross-validation on a 3-speaker dataset.
∗ Reduced overfitting from 11% to 6% through hyperparameter tuning (dropout 0.2–0.6) and sliding-window augmentation.

YOLOv1: Full Reimplementation & Benchmarking
Reproduced YOLOv1 from the paper and evaluated against newer YOLO models
∗ Re-implemented YOLOv1 in PyTorch and matched paper-level mAP on Pascal VOC; released weights and a demo; built a 7-video benchmarking harness to compare five YOLO variants with loss and mAP curves.

Technical Skills

Languages: French (Native), English (C1)
Programming: Python, C++, Julia, OCaml, SQL, Rust, Coq, JavaScript (React, Node.js)
ML/DL Frameworks: PyTorch, TensorFlow, JAX, MONAI, Scikit-learn, Hugging Face
Tools & Infrastructure: CUDA, Docker, Git, Linux, SLURM, AWS, MLflow, Hydra & OmegaConf