Nassim ARIFETTE

M2 Student in Mathematics, Vision, Learning at École Normale Supérieure Paris-Saclay
Paris, France | nassim.ari@gmail.com
github.com/nassim-arifette | linkedin.com/in/nassim-arifette | nassim-arifette.github.io

Education

Master 2 (M2) in Mathematics, Vision, Learning *2024 – Present*

École Normale Supérieure Paris-Saclay Gif-sur-Yvette
- Advanced coursework: Deep Learning for Medical Imaging, 3D Modeling & Point Clouds, Geometric Deep Learning, Generative Models
- GPA: 17/20

Master 1 (M1) in Artificial Intelligence *2023 – 2024*

Université Paris-Saclay Orsay
- Core focus: Neural Network Verification, Natural Language Processing, Convex Optimization, Deep Learning Theory
- GPA: 16/20

LDD Informatique-Mathématiques (Research Track) *2021 – 2023*

Université Paris-Saclay Orsay
- Foundation: 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
- Developing 3D CycleGAN for CT-to-MRI translation using MONAI framework, optimizing memory usage to fit models on 24GB GPUs
- Building vessel segmentation pipeline for synthetic MRI validation, targeting 0.85+ Dice score for clinical applicability
- Implementing distributed training strategy to handle full-resolution 3D medical volumes (512×512×256 voxels)

Research Intern: Constrained Neural Networks for Phylogenetics *Jun 2023 – Aug 2023*

Collège de France, CIRB (Supervised by Laurent Jacob) Paris
- Enhanced Phyloformer model by integrating triangle inequality constraints, trained on 1,000 genetic sequences (30min on V100)
- Implemented POCS and Dykstra's projection algorithms in PyTorch, achieving constraint satisfaction in single iteration
- 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 Julia library for tropical polyhedra operations, achieving 2-3x tighter bounds than interval methods on ACAS Xu benchmarks
- Verified safety properties on neural networks with up to 5 layers, proving adversarial robustness for *epsilon*-ball perturbations

Deep Learning for Voiced/Unvoiced Speech Classification *Mar 2023 – May 2023*

Université Paris-Saclay, LISN (Supervised by Marc Evrard)
- Built CNN classifier achieving 85.2% validation accuracy on MFCC features, 3.2% improvement over baseline (82%)
- Conducted ablation study across Mel spectrogram resolutions (32/64/128 bands) using 7-fold cross-validation on 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 paper and evaluated against newer YOLO models
- Authored a technical report and poster benchmarking YOLOv1 against 5 newer YOLO variants on 7 real-world videos (loss and mAP curves).
- Re-implemented YOLOv1 in PyTorch (5-script modular repo); trained for 100 epochs on Pascal VOC (9,963 images) and exported reproducible weights and demos.

Technical Skills

Languages: Python, C++, Julia, OCaml, SQL, Rust, Coq, JavaScript
ML/DL Frameworks: PyTorch, TensorFlow, JAX, MONAI, Scikit-learn, HuggingFace
Tools & Infrastructure: CUDA, Docker, Git, Linux, Weights&Biases, SLURM, AWS
Specialized: Medical Imaging (NIfTI, DICOM), Neural Network Verification, 3D Computer Vision, Formal Methods