Amine MAAZIZI

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Research Interests

My research centers on geometric and representation learning methods for biomedical imaging and biological systems.

Education

ENS Paris-Saclay — Université Paris-Saclay 2025 – Present
MVA Master (Mathematics, Vision, Learning) *Expected Oct 2026*

ENSTA Paris — Institut Polytechnique de Paris 2023 – Present
Engineering degree, computer science and artificial intelligence *GPA: 4.05/4.3 (Top 5%)*

Moulay Youssef Preparatory School 2021 – 2023
CPGE MPSI/MP (Mathematics and Physics preparatory classes)* *Top 5% national ranking*

Relevant Coursework: probabilistic graphical models, deep generative models, geometric deep learning, representation learning for computer vision, deep learning for medical imaging, statistical learning, stochastic processes, reinforcement learning.

Research Experience

Research Intern — EPFL, Artificial Intelligence in Molecular Medicine (AIMM) Lab, Lausanne *Apr 2026 – Sep 2026*
Supervisor: Prof. Charlotte Bunne

- Developing **deep learning** models for **panoptic cell segmentation** in **multiplex spatial proteomics imaging**.
- Designing preprocessing and curation pipelines addressing imaging artifacts and class imbalance.
- Training architectures on the **SwissAI Alps HPC cluster** in collaboration with computational and clinical partners.

Research Intern & Collaborator — Institut Pasteur, Biomedical Image Analysis Unit, Paris *Jun 2025 – Present*
Supervisor: Prof. Giacomo Nardi

- Designed **geometry-aware shape matching** models for **biological membrane morphology**.
- Implemented simulations using **Helfrich curvature energy** and elasticity-based deformation models.
- Conducted numerical experiments identifying **curvature-driven mechanisms** of membrane morphogenesis.

Research Collaborator — NAIST, Cybernetics & Reality Engineering (CaRE) Laboratory (Remote) *Oct 2024 – Dec 2024*
Supervisor: Prof. Hideaki Uchiyama

- Studied **geometric deep learning** methods for **multimodal 3D generation** across meshes, point clouds, and implicit representations.

Manuscripts & Publications

- **Nardi et al.** Morphodynamic study of hematopoietic stem cell emergence using geometry-aware shape matching with mechanical constraints. Drafting (second author).
- **Amine MAAZIZI et al.** not-MIWAE and a supervised MNAR extension. In preparation.

Research Software

Geometry-Aware Shape Matching Library [UPCOMING]

- Research software for constrained mesh shape matching using energies for biological morphology analysis.

not-MIWAE PyTorch Library PyPI

- Variational autoencoder framework for learning with missing-not-at-random data.

Clairvoyance : Assistive Perception System GitHub

- Embedded edge-AI system integrating computer vision and language-agent interaction on smart glasses hardware.

Awards

Best Research Project Award : Finalist (22/340) 2025
SAE

Bourse de mérite (Academic Excellence Scholarship) 2023–2026
Ministry of Education, Morocco

Technical Skills

Programming: Python, C++, C
Machine Learning: PyTorch, JAX, TensorFlow
Scientific Computing: NumPy, SciPy, Linux, Git, HPC

Languages

Arabic (native), French (bilingual), English (fluent)