

Sepehr Khodadadi Hosseinabadi

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RESEARCH INTERESTS

Trustworthy machine learning (machine unlearning, data privacy), model evaluation and auditing, and machine unlearning in federated settings; privacy-critical AI for medical imaging.

EDUCATION

- 2024 – Present **M.Sc. in Data Science and Engineering (AI track)**, University of Genoa, Italy
GPA: 30.2/30 (1ode counted as 31); **Ranked 1st among 130 students**
Thesis: *Machine Unlearning for Model Debiasing* (in progress; advisors: [Prof. V. P. Pastore \(MaLGa\)](#), [Prof. E. Tartaglione](#) (Télécom Paris))
Relevant Coursework: Trustworthy AI (30/30; adversarial robustness, evasion & poisoning attacks, LLM security, EU AI Act), Deep Learning (Transformers, Diffusion Models, representation learning), Machine Learning, Computational Vision (segmentation, pose estimation, 3D reconstruction), Natural Language Processing & Symbolic and Data-driven AI (multi-agent systems, Prolog), High-Performance Computing (CUDA), Digital Signal & Image Processing
- 2019 – 2024 **B.Sc. in Computer Engineering**, Isfahan University of Technology, Iran
GPA: 3.2/4.0; Last 60 credits GPA: 3.55/4.0
Thesis: *Exploring the Efficacy of Local Search Methods for Enhancing the Performance of the BRADO algorithm*. **Grade: 20/20**

PUBLICATIONS

- S. Khodadadi Hosseinabadi, E. Iakovleva, E. Tartaglione, and V. P. Pastore (2026). *TRAIL: Navigating the Jungle of Machine Unlearning Evaluation*. Accepted (oral presentation), ECCV 2026 Workshop and Challenge on Unlearning and Model Editing (U&ME).
- S. Khodadadi Hosseinabadi et al. (2026). *Forget-Conditioned Subnetworks for Machine Unlearning*. Manuscript in preparation (target: ICLR 2027).
- S. Ramezani Jolfaei and S. Khodadadi Hossein Abadi (2025). *Application of the Brain Drain Optimization Algorithm to the N-Queens Problem*. arXiv:2504.18953.

RESEARCH EXPERIENCE

M.Sc. Thesis Research: Machine Unlearning Feb 2026 – Present
MaLGa (Machine Learning Genoa Center), in collaboration with [Télécom Paris](#)

- Developed *forget-conditioned subnetworks*: a structural approach to machine unlearning.
- Delivered the SOTA results and evaluated under membership-inference (MIA) and domain-specific metrics, e.g., relearning attacks.
- Devised the critical idea of a two-phase fine-tuning schedule and adding the critical ~ 5 retain-accuracy points, validated across seeds.

TRAIL: Reproducible Evaluation of Machine Unlearning May 2026 – Jul 2026
First-author paper, accepted as an oral presentation at the ECCV 2026 Workshop and Challenge on Unlearning and Model Editing (U&ME)

- Led development of **TRAIL**, a protocol-only, multi-metric evaluation library running on user-supplied checkpoints and data loaders, producing **provenance-stamped reports** with unified metric definitions.
- Produced a **metric-correlation analysis** over a registry of 45 metrics across three axes (41 of them measured) for four unlearning methods on CIFAR-10/100 (public and lab-trained checkpoints), illustrating which metrics are

orthogonal and which redundant.

TEACHING EXPERIENCE

University Teaching Assistant, Database Laboratory

Isfahan University of Technology, Isfahan, Iran

Sep 2022 – Sep 2024

- Led weekly lab sessions on **SQL Server** for **50+** students across four semesters; co-developed the lab curriculum with faculty.

AWARDS & HONORS

- Ranked **1st among 130 students**, M.Sc. Data Science and Engineering, University of Genoa.
- **Reviewer**, ECCV 2026 FAILED Workshop (Model Debiasing).
- **IELTS 8.0**.

TECHNICAL SKILLS

Trustworthy ML	Membership-inference evaluation (MIA , LiRA/U-LiRA), Iterative Magnitude Pruning, relearning-attack protocols, unlearning method design and benchmarking, seeded deterministic pipelines, provenance-stamped reporting
ML & Deep Learning	PyTorch (multi-GPU), TensorFlow/Keras, OpenCV CUDA C/C++ (custom kernel development, memory-hierarchy optimization)
Deep Learning Engineering	Experiment management (Weights & Biases , Hydra) Git, $\LaTeX$, Linux/HPC clusters

RESEARCH PROJECTS

Multi-Agent Clinical Decision Support for Lung-Nodule Assessment

Python, Prolog (PySwip), scispaCy

- Built a BDI multi-agent system fusing imaging agents (chest X-ray CNNs via TorchXRayVision, rule-based Lung-RADS) and report-text agents (dependency-anchored frame extraction, NegEx-style negation and uncertainty detection) under a Prolog weighted-voting consensus with conflict-resolution rules and explanation generation.
- Separated aleatory from epistemic uncertainty and computed per-case dynamic agent weights from information richness: graded, interpretable confidence instead of categorical labels.

Retinal Blood Vessel Segmentation with Attention U-Net

TensorFlow/Keras, PyTorch

- Built an Attention U-Net with a hybrid Dice+Focal loss after densely augmenting 20 images into 63,800 patches (original course project in TensorFlow/Keras).
- Audited the model’s failure modes via ground-truth/prediction overlays, localizing systematic errors on thin, low-contrast vessels which led to the analysis that motivated the hybrid loss design.
- Re-implemented the pipeline in PyTorch: the version published in the linked repository.

Interpretable Vessel Segmentation with Anisotropic Directional LoG (ALoG)

Python, OpenCV

- Built a training-free, interpretable-by-design classical pipeline for DRIVE vessel segmentation (CLAHE preprocessing; multi-scale, multi-orientation anisotropic LoG filtering with grid-searched filter parameters), a data-efficient counterpart to the Attention U-Net for studying the accuracy–interpretability trade-off.

3D Geological Modeling and Optimization

Trimesh, Open3D

- Designed a mesh slicing, voxelization, and optimization pipeline reaching **95% material utilization**, with real-time Jupyter/Plotly visualization and live efficiency metrics.

LANGUAGES

English (IELTS: 8)	Listening: C2	Reading: C2	Speaking: C1	Writing: C1
Italian	Listening: B1	Reading: B1	Speaking: A2	Writing: B1
Persian (Farsi)	Mother tongue.			

REFERENCES

Prof. Vito Paolo Pastore, MaLGa / DIBRIS, University of Genoa vito.paolo.pastore@unige.it

VOLUNTEERING

Co-organized an IELTS-preparation class to strengthen English skills among peers at Isfahan University of Technology.