

Jaume Mora i Ladària

MSc Computer Vision Student | Medical Imaging & Deep Learning

Barcelona, Catalonia

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Research Profile

MSc Computer Vision student and Artificial Intelligence graduate with hands-on research experience developing deep learning systems for real-world medical imaging. At SCOPIA (Hospital Universitari Son Espases & UIB), independently developed an end-to-end PyTorch pipeline for wound-infection classification, benchmarking CNN and Vision Transformer architectures and conducting clinically motivated error analysis under severe class imbalance.

Experienced with Linux-based research environments, SSH, SLURM job scheduling and high-performance computing infrastructure including BOADA and MareNostrum. Research interests include medical imaging, Vision Transformers, foundation models, multimodal learning and reliable clinical AI. Seeking a self-funded visiting research placement for an MSc thesis from May to August 2027.

Research & Technical Experience

SCOPIA – Hospital Universitari Son Espases & UIB

AI & Multimodal Machine Learning Research Assistant

Palma, Mallorca

Jun 2026 – Aug 2026

- Designed and implemented an end-to-end PyTorch research pipeline for infection classification from 394 real-world wound images, covering preprocessing, augmentation, model training, fine-tuning, evaluation, threshold selection and systematic experiment comparison.
- Benchmarked eight CNN and Transformer architectures, including ResNet50, EfficientNet-B0, DenseNet121, InceptionV3, ViT-B/16, ConvNeXt-Tiny, Swin-T and Xception.
- Developed wound-focused preprocessing strategies using wound-region crops and dilated segmentation masks to investigate the effect of irrelevant visual context on model discrimination.
- The strongest ViT-B/16 configuration achieved **98.3% accuracy, 0.933 macro-F1 and 0.981 ROC-AUC** on the held-out test set.
- Investigated clinically relevant model failures, with particular emphasis on **false negatives**, minority-class performance, decision-threshold trade-offs and severe class imbalance.
- Analysed model behaviour across architectures and preprocessing configurations to distinguish genuine generalisation improvements from metric gains driven by dataset composition.
- Evaluated multimodal extensions combining image representations with structured clinical questionnaire variables through direct feature fusion and post-hoc calibration strategies.
- Built reproducible experimentation and result-comparison workflows and produced technical research documentation for the REDSCAR project.

Universitat Politècnica de Catalunya

Learning Grant Student – Python & Computer Vision

Barcelona, Catalonia

Sep 2025 – Jun 2026

- Independently migrated approximately 30 computer vision and image-processing laboratory assignments from MATLAB to Python using NumPy, OpenCV and Matplotlib.
- Re-engineered legacy procedural implementations into reusable Python workflows covering image transformations, filtering, feature extraction, visualisation and quantitative analysis.
- Validated implementations against reference and legacy outputs, diagnosing numerical discrepancies, regressions, edge cases and implementation-specific differences.
- Produced and maintained approximately 90 localised laboratory versions across Catalan, Spanish and English for undergraduate teaching.

Outlier

Generative AI Evaluator

Remote

Nov 2024 – Jan 2025

- Evaluated large language model outputs for factual correctness, reasoning quality, completeness, relevance and instruction adherence.
- Performed systematic failure analysis covering hallucinations, unsupported claims, contradictions, ambiguity and incomplete reasoning.

Education

UAB, UB, UPC, UPF & UOC

MSc in Computer Vision

Barcelona, Catalonia

Sep 2026 – Present

60 ECTS, English-taught interuniversity programme focused on computer vision, deep learning, image analysis and research methodology.

Research interests: Medical Imaging, Vision Transformers, representation learning, multimodal learning, foundation models and reliable clinical AI.

MSc thesis objective: Self-funded external visiting research placement, May–August 2027.

Universitat Politècnica de Catalunya

BSc in Artificial Intelligence

Barcelona, Catalonia

2022 – 2026

Graduated June 2026. Relevant coursework: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Statistics, Distributed Systems, Large-Scale Computing, Software Engineering and MLOps.

Bachelor's Thesis

Universitat Politècnica de Catalunya

*A Novel Computer Vision Framework to Enhance Robot Skills, **Grade: 9.5/10***

Barcelona, Catalonia

2026

- Designed and implemented an end-to-end real-time computer vision system in Python and ROS 2 for gesture-based teleoperation of a TurtleBot3 Waffle Pi.
- Built the full perception-to-control pipeline, including image acquisition, MediaPipe-based extraction of 21 hand landmarks, neural-network inference, ROS 2 communication and robot-control logic.
- Trained and integrated a lightweight EurekaNet gesture classifier using the IPN Hand dataset and evaluated the complete system through **600 quantitative trials across 10 gesture classes**.
- Engineered reliability and safety mechanisms including confidence thresholds, temporal voting, gesture locking, emergency-stop gestures and LiDAR-based checks.
- Achieved real-time teleoperation with approximately 200–300 ms perceived latency over Wi-Fi.

Technical Skills

Medical Imaging & CV: PyTorch, OpenCV, Vision Transformers, ViT-B/16, CNNs, transfer learning, fine-tuning, medical image classification, segmentation-based preprocessing, multimodal learning, model evaluation and error analysis

Research Computing: Linux, SSH, **SLURM**, **MareNostrum**, BOADA, batch jobs, queue management and Docker

Machine Learning: PyTorch, TensorFlow, scikit-learn, deep learning, representation learning, class-imbalance analysis, threshold analysis, model validation and generalisation analysis

Programming: Python, C++, SQL, MATLAB, Git, GitHub, object-oriented programming, testing and debugging

Engineering: ROS 2, REST APIs, distributed systems, structured logging, reliability engineering and technical documentation

Additional ML: Hugging Face, Llama, Qwen, LoRA/QLoRA, multimodal models, embeddings, RAG and LLM evaluation

Selected Awards

2024: 2nd Place – Datathon 2024, UPC/FME. Developed the Aider Assistant project in a competitive data and AI challenge, combining rapid prototyping, analytical reasoning, teamwork and technical communication.

Languages

Catalan: Native

Spanish: Native

English: Advanced professional proficiency

German: Basic

Links

Portfolio: jaumemil.cat

GitHub: github.com/JaumeMiL

LinkedIn: linkedin.com/in/jaumemil