Cai Selvas Sala

caiselvassala@gmail.com | linedin.com/in/caiselvas | github.com/caiselvas | huggingface.co/caiselvas

Education

Technical University of Munich (TUM) | Exchange Program **Oct. 2025 – Mar. 2026**

Erasmus+ Program (24 ECTS)

- Advanced graduate-level coursework in Computer Vision (3D/4D, Detection, Segmentation, Tracking), Deep Learning, and Machine Learning for Business Analytics.

Polytechnic University of Catalonia (UPC) | BSc **Sep. 2022 – Present**

Bachelor of Science in Artificial Intelligence (240 ECTS) GPA: 8.83/10

- Honors: *Unsupervised and Reinforcement Learning*, *Programming and Algorithms I*
- Mentor for first-year students.

Experience & Research

Computer Vision Center (CVC) | Research Intern (Bachelor's Thesis) **Feb. 2026 – Present**

- Developing my Bachelor's Thesis within the Learning and Machine Perception (LAMP) group.
- Bachelor Thesis: *Low-Rank Continual Learning for Foundation Models.*
- Supervisors: Dr. Joost van de Weijer, Dr. Bartłomiej Twardowski, Prof. Ramón Sangüesa (UPC).

Computer Vision Center (CVC) | Research Intern **Apr. 2025 – Aug. 2025**

- Awarded the competitive Rosa Sensat Fellowship to join the CVC; supervised by Dr. Lluis Gomez.
- First-authored a research paper on a novel benchmark for Machine Unlearning in CLIP, training large-scale ViT models from scratch on 400M pairs and engineering a 60k-pair synthetic dataset with identity-preserving diffusion models to test sensitive data removal.
- Paper under review for CVPR 2026 (Previously advanced to Phase 2 at AAAI 2026).

Projects

NanoMoE: From-Scratch Sparse Mixture-of-Experts | Personal Project **Dec. 2025 – Present**

- Designing and implementing a Sparse Mixture-of-Experts (MoE) Transformer in PyTorch, featuring vectorized Noisy Top-K Gating and a custom BPE tokenizer for training on 500M FineWeb-Edu tokens.
- Developing auxiliary load-balancing losses to prevent expert collapse, with the goal of evaluating scaling laws and convergence efficiency against parameter-equivalent dense baselines.
- Roadmap includes extending the architecture by integrating a modular vision encoder.

GPTasty: Intelligent Nutritional Recommender | University Project **Feb. 2025 – May 2025**

- Designed and developed a full-stack Intelligent Decision Support System (IDSS) for personalized nutritional planning, integrating user profiles, dietary restrictions, and available ingredients.
- Engineered a hybrid recommender system combining recipe embeddings (SBERT), knowledge-based rules (fuzzy logic, ontology), and an image recognition module to generate and justify daily meal plans.

LaIA: Administrative Assistant | Hackathon Project **Nov. 2024**

- Winner project of Aina Hack 2024, organized by Barcelona Supercomputing Center (BSC).
- AI assistant for public administration that accepts files and images as inputs, supports internet searches, and generates informative text and video outputs to guide users through administrative processes.

Other Projects & Hackathons

- Participated in 10+ national and international hackathons applying AI to real-world challenges, including HackaTUM, LauzHack, HackUPC, HackBCN AI, DatathonFME, and more.
- Additional personal and collaborative AI-related projects can be found in my GitHub & Hugging Face.

Skills

Programming Languages: Python, R, SQL, C/C++, MATLAB, PDDL.

Key Libraries & Frameworks: PyTorch, TensorFlow, NumPy, Scikit-learn, OpenCV, Spark, ...

Expertise: Machine Learning, Deep Learning, Computer Vision, Reinforcement Learning, NLP, AI Algorithms, Data Science & Analysis, Databases, Robotics, Mathematics, Statistics.

Languages: English (C2 CEFR Level, 2025), Spanish (Native), Catalan (Native), German (Elementary).