

Carlos Collado Capell

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Education

EPFL: Swiss Federal Institute of Technology Lausanne <i>MSc in Computational Science and Engineering (120 ECTS)</i>	(Grade: 5.43 / 6.00)	Sept. 2023 – Dec. 2025 <i>Fellow Mutua Madrileña</i>
University Carlos III of Madrid <i>BSc in Industrial Technologies Engineering (240 ECTS)</i>	(Grade: 9.32 / 10.00)	Sept. 2019 – May 2023 <i>Top #1/159 in my year</i>
• University of California Berkeley	Exchange Scholarship (Grade: 3.85 / 4.00)	Aug. 2022 – May 2023
• Georgia Institute of Technology	Exchange Scholarship (Grade: 4.00 / 4.00)	Aug. 2021 – May 2022

Professional Experience

European Space Agency (ESA) <i>AI Research Intern</i>	Sept. 2024 – Feb. 2025 <i>Frascati, Italy</i>
<ul style="list-style-type: none">• Pretrained a Foundation Model for onboard AI (Φsat-2) via multi-task learning with multi-node DDP.• Created 800+ GB datasets to pretrain and benchmark model against SOTA models (Prithvi, SatMAE, SeCo).• Developed a novel Sentinel-2 preprocessing technique that accelerates model training.• Created a database to compare training policies, architectures, and datasets of Foundation Models for EO.• First author on upcoming paper, working with experts in onboard AI, Foundation Models, and dataset creation.	
Peninsula Clean Energy <i>Data Science Intern</i>	June 2023 – Sept. 2023 <i>Silicon Valley, CA</i>
<ul style="list-style-type: none">• Improved electricity load forecast in Silicon Valley by 10%, and identified key trends in load divergence of up to 15% (SQL, Google Cloud Platform, Pandas, time series).	
Técnicas Reunidas <i>Engineering Intern</i>	May 2022 – July 2022 <i>Madrid, Spain</i>
<ul style="list-style-type: none">• Benchmarked green hydrogen tech and led study on the success rate of energy transition projects (Excel, SQL).	

Research Experience

Sensor-Agnostic Foundation Model Compression for Onboard AI	Feb. 2025 – July 2025
<ul style="list-style-type: none">• Compressing ViT-based Foundation Models via pruning and knowledge distillation (DynamicViT, NViT).• Pretraining a ViT-Tiny backbone from scratch to benchmark against compressed ViT-Base and ViT-Large.• Supervised by Prof. Devis Tuia.	
Multi-Modal Hate Speech Detection in Videos	March 2024 – March 2025
<ul style="list-style-type: none">• Finalizing conference publication on a multi-modal model (for video, audio, and text) that outperformed SOTA.• <i>Tools:</i> SLURM, ViT, BERT, Cross-Modal Attention (CMA).• At Idiap Research Institute (Remote). Supervised by Andrea Cavarallo.	
Distributed Multi-Agent Bayesian Optimization in Building Temperature Control	Feb. 2024 – July 2024
<ul style="list-style-type: none">• <i>Tools:</i> Python (SciPy, Pandas, GPy), SLURM, parallel computing (MPI, CUDA).• Journal paper submitted to IEEE Transactions on Automatic Control (under review).	
Performance modeling and cost optimization of a solar desalination system [...]	Jan. 2022 – June 2024
<ul style="list-style-type: none">• Optimized cost and energy use to competitive market levels via <i>Particle Swarm Optimization (PSO)</i>.• First-author publication in journal <i>Renewable Energy</i> (IF 9.0) - https://doi.org/10.1016/j.renene.2024.120866	

Skills

Programming: Python (proficient), C++, Linux CLI, Git, Big Data (SQL, Google Cloud), Matlab, Jupyter Notebook.
High-Performance Computing: SLURM, CUDA, multi-node DDP, MPI, GPU/CPU memory profiling, Docker, SSH.
Machine Learning Tools:
• Models: SSL, ViT, MAE, ResNet, U-Net, LSTM, BERT, Multimodal models, Few-shot, Foundation Models for EO.
• Optimization & Deployment: Model Pruning, Knowledge Distillation, Edge Deployment, QAT, AMP.
• Experiment Tracking: Weights & Biases, TensorBoard.
• Frameworks: PyTorch, TensorFlow, Keras, JAX, ONNX, OpenVINO, Scikit-Learn.
Remote Sensing & GeoAI Tools: Sentinel Hub API, GDAL, Rasterio, GeoTIFF, GeoPandas, Pyproj, Folium.
Soft Skills: Scientific writing (papers, abstracts), presentations, team leadership, cross-functional communication.

Other Projects

Other DL Projects	UC Berkeley, EPFL	Aug. 2022 – June 2024
<ul style="list-style-type: none">Projects on solar jet identification in videos, cardiovascular disease prediction, and solar power plant control.		
Technology Consultant	UC Berkeley - Tetra Pak (Sidel)	Jan. 2023 – May 2023
<ul style="list-style-type: none">Optimized energy consumption on production lines, resulting in \$47,000 in annual cost savings.		
Product Management	UC Berkeley	Aug. 2022 – Dec. 2022
<ul style="list-style-type: none">Developed a social-based map search engine prototype, integrating Agile practices and strategic business planning, collaborating with experts at GoogleMaps and TripAdvisor.		

Distinctions and Awards

- Bachelor's Degree Extraordinary Award (2023):** Best academic record of my year (#1/159).
- Fellowship Mutua Madrileña Foundation (2023):** To fully cover my master's tuition and accommodation expenses.
- Award of Excellence of Madrid (2020, 2021, 2022, 2023):** Among the top 1% of students in the region.
- Excellence Award of University Carlos III of Madrid Social Council (2022):** Most important internal award of my university - given to 8 students in STEM majors based on academic achievements, among more than 5000 students.
- Santander Excellence Scholarship (2021, 2022):** Awarded to top students with extra funding for studies abroad.
- University Carlos III of Madrid Talent Program (2019):** Awarded to the top 30 (2%) of admitted STEM students.
- Nova Talent member:** Merit-based access network aimed to connect the top 3% of each field.
- Honors in University Courses:** Top 5% with excellent grades in 14 courses, for a total of 84 ECTS.

Leadership & Volunteering

- i-Atlanta President:** Organized activities in Atlanta for international students (budget/team management).
- Computer Tutor** at an occupational center for women with disabilities.
- Berkeley Certificate in Technology and Entrepreneurship:** product development, and technical consulting.
- Berkeley Changemaker Certificate:** first at Berkeley to receive it - critical thinking, communication, and collaboration.
- Geography Tournament Lead at Georgia Tech:** led the the successful tournament (ideation, budget, regulations).
- Berkeley Changemaker Project:** involved in cleaning mountain trails to promote nature conservation.