Luis A. Ortega

Machine Learning Researcher (Bayesian Deep Learning & Uncertainty Estimation)

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Machine learning researcher specializing in uncertainty quantification and generalization. Published at top-tier venues (ICLR, ICML, NeurIPS). Developer of widely adopted open-source PyTorch libraries for scalable uncertainty estimation.

Experience

12/2021– Present — **Research Scientist (PhD)**, *Autonomous University of Madrid*, Spain
- Conduct research on **Bayesian deep learning**, **uncertainty quantification**, and **PAC-Bayes generalization bounds** for modern deep networks.
- Developed and released **Variational Linearized Laplace** and **post-hoc uncertainty estimation** methods in **PyTorch**, adopted by 5+ academic research groups.
- Collaborated with the **University of Cambridge** (LLM uncertainty quantification) and **Aalborg University** (PAC-Bayes/Chernoff bounds).
- Published 3 first-author papers at **ICLR**, **ICML** and **AISTATS**; and 2 second-author papers at **NeurIPS** and **JAIR** (with oral talk at **ECAI** 2025).
- Taught **Python Programming** (BSc) and **Bayesian Methods** (MSc) courses.
- Tracked experiments with **MLFlow** and deployed **Docker** images using **Google Cloud** & **AWS**.

09/2023– 12/2023 — **Visiting Researcher**, *University of Cambridge (CBL Lab)*, UK
- Investigated **Uncertainty Estimation in Large Language Models** using the Linearized Laplace Approximation.
- Built benchmarking pipelines for **uncertainty metrics** and **confidence-based model evaluation** in **vision transformers**.
- Deployed scalable inference and evaluation code on GPU clusters using **PyTorch** and **SLURM**.

02/2021– 12/2021 — **Research Assistant**, *University of Almería*, Spain
- Conducted experiments on **ensemble diversity** and **generalization** in neural networks using **TensorFlow** and **Uncertainty Baselines** from Google.
- Contributed analysis and experimental results for an **AISTATS 2022** publication.

Selected Publications

AISTATS'22 — **Diversity and Generalization in Neural Network Ensembles** [PDF]
Luis A. Ortega, Rafael Cabañas and Andrés R. Masegosa

ICLR'23 — **Deep Variational Implicit Processes** [PDF]
Luis A. Ortega, Simón Rodríguez-Santana and Daniel Hernández-Lobato

ICML/AABI'24 — **Variational Linearized Laplace Approximation for Bayesian Deep Learning** [PDF]
Luis A. Ortega, Simón Rodríguez-Santana and Daniel Hernández-Lobato

NeurIPS'24 — **PAC-Bayes-Chernoff Bounds for Unbounded Losses** [PDF]
Ioar Casado, **Luis A. Ortega**, Aritz Pérez and Andrés R. Masegosa

TMLR'24 — **The Cold Posterior Effect Indicates Underfitting** [PDF]
Yijie Zhang, Yi-Shan Wu, **Luis A. Ortega** and Andrés R. Masegosa

JAIR/ECAI'25 — **PAC-Chernoff Bounds: Understanding Generalization in Interpolators** [PDF]
Andrés R. Masegosa and **Luis A. Ortega**

ICML'22 Workshop — **Correcting Model Bias with Sparse Implicit Processes** [PDF]
Simón Rodríguez Santana, **Luis A. Ortega**, Daniel Hernández-Lobato, Bryan Zaldívar

Projecs & Open Source Contributions

Laplace   A Bayesian deep learning uncertainty library ([GitHub](#)). Implemented Functional (GP) Laplace; working on Variational & Nyström extensions.

BayesiPy   A probabilistic ML library for **post-hoc uncertainty estimation** in neural networks. Bayesian uncertainty estimation in pre-trained networks with no performance degradation. ([GitHub](#)). See 1D playground made with **Docker** and **FastAPI** at `https://ludvins.github.io/BayesiPy/`.

Variational-LLA   **Variational** implementation of the Linearized Laplace Approximation for scalable uncertainty quantification ([GitHub](#)).

AI-Generated Image Detector   Designed, implemented, and deployed a complete **MLOps Pipeline on AWS** to **detect AI-generated images** using a custom-trained ResNet18 model, **SageMaker**, **Docker**, **AWS Lambda** and **Terraform**. ([GitHub](#)).

Education

2021–2025   **Ph.D. in Computer Science**, *Autonomous University of Madrid*
Thesis: Uncertainty Estimation and Generalization Bounds for Modern Deep Learning.
Deposited, awaiting defense. Expected date: Feb. 2026.

2020–2022   **M.S. in Data Science**, *Autonomous University of Madrid*

2015–2020   **B.S. in Computer Science**, *University of Granada*

2015–2020   **B.S. in Mathematics**, *University of Granada*

Certificates, Honors & Awards

2025   **Building RAG Agents with LLMs** – Developed Retrieval-Augmented Generation (RAG) agents using NVIDIA's LLM frameworks ([certificate url](#)).

2024   **Speaker at Royal Academy of Science** – Seminar on Variational inference in function space for Machine Learning.

2023   **Santander-UAM Scholarship** – Research stay at the University of Cambridge (CBL Lab).

2021   **FPI-UAM Predoctoral Contract** – Competitive Spanish national research fellowship.

2020   **Research Collaboration Scholarship** – Competitive Spanish national research scholarship with the Autonomous University of Madrid during my MSc.

Skills

Programming   Python (**expert**), C++, Rust, Bash, SQL

ML/Probabilistic Modeling   Bayesian Deep Learning, Gaussian Processes, PAC-Bayes Bounds, Variational Inference.

Frameworks & Tools   PyTorch (**advanced**), JAX (intermediate), TensorFlow, Git, Docker, SLURM, LaTeX, FastAPI, MLFlow, Google Cloud, AWS, AWS Lambda, Sagemaker, ECR, Terraform