LUIS VELA VELA PHD

Sr. AI Scientist & ML Team Lead | Computational Physicist

CONTACT

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- in Luis Vela Vela

CORE COMPETENCIES

ML Engineering & HPC

PyTorch / TensorFlow ●●●●●
GPU Computing ●●●●●
(A100, H200, mixed precision)
Distributed Computing ●●●●○
(CuPy, Dask, RAPIDS, Numba)
MLflow / Experiment Tracking ●●●○○

AI Weather & NWP Models

AI-NWP Deployment ●●●●●
(AIFS, Aurora, FourCastNet, GraphCast)
AI Data Assimilation ●●●●○
(system design)
S2S Forecasting ●●●●○
(weather regimes, ensemble methods)
Probabilistic Verification ●●●●●
(CRPS, ensemble statistics)

Data Engineering & Processing

Satellite Data Processing ●●●●●
GRIB2 & Data Pipelines ●●●●●
ERA5 Reanalysis ●●●●●

Programming & Tools

Python ●●●●●
(xarray, NumPy, Pandas, Matplotlib, Cartopy)
Bash ●●●●○
FORTRAN ●●●●○
Git / CI/CD / Conda ●●●●●
AWS / Cloud ●●●●○

Solution Architecture

HPC Infrastructure Design ●●●●○
Technical Discovery ●●●●○
Client Engagement ●●●●○

Leadership

ML Team Management ●●●●○
(2 direct reports)
Cross-functional Collab ●●●●○
Stakeholder Communication ●●●●○

LANGUAGES

Spanish ●●●●●
Native
English ●●●●●
Fluent / Professional
French ●●●○○
Conversational
Serbian ●●●●○
Conversational
Czech ●●●○○
Conversational
German ●●○○○
Working knowledge

KEY ATTRIBUTES

- ‣ **Production AI/ML delivery at scale**
- ‣ **Scientific rigor & operational focus**
- ‣ **Customer success & stakeholder communication**
- ‣ **Cross-functional team builder**

⚙ PROFESSIONAL SUMMARY

Sr. AI Scientist & ML Team Lead with deep expertise in machine learning, computational physics, and high-performance computing. Leads a team building AI-powered weather forecasting systems at a global satellite data company, with production experience spanning model deployment, large-scale data engineering, and distributed GPU computing. PhD in Computational Physics with a track record across scientific research (Amazon), HPC solution architecture (LuxProvide), and operational AI systems (Spire Global). Combines scientific depth with hands-on ML engineering, team leadership, and client-facing technical communication.

⚙ PROFESSIONAL EXPERIENCE

📅 Nov 2022 – Present
● Spire Global, Luxembourg

Sr. AI Scientist & ML Team Lead

Lead a team of ML engineers at a global satellite data and analytics company, building AI-powered weather forecasting systems for energy, maritime, aviation, and smart agriculture markets.

- ‣ **AI Model Deployment:** Architected and deployed production infrastructure for multiple AI numerical weather prediction models (AIFS, Aurora), including full pipeline from data ingestion through ensemble-based forecast delivery.
- ‣ **Subseasonal Forecasting:** Built S2S forecasting pipelines with weather regime classification and ensemble probability tracking across 46-day forecast horizons.
- ‣ **Data Engineering:** Designed multi-source data pipelines handling satellite observations, GRIB2 datasets, and ERA5 reanalysis data at scale.
- ‣ **Renewable Energy Forecasting:** Developed weather-to-energy production forecast pipelines, translating atmospheric predictions into wind and solar energy output estimates.
- ‣ **Model Verification:** Created forecast intercomparison tooling for multi-model evaluation across ensemble statistics, spatial fields, and weather regime projections.
- ‣ **AI-Assisted Development:** Pioneered Claude Code adoption on HPC infrastructure, achieving 6–12x speedup in model repository development.
- ‣ **Team Leadership:** Established engineering practices including experiment tracking (MLflow), shared repositories, code review standards, and documentation workflows.

📅 Feb 2021 – Nov 2022
● LuxProvide, Luxembourg

Sr. Solutions Engineer

Designed and delivered custom HPC/AI solutions for enterprise and research clients at Luxembourg's national supercomputing center.

- ‣ **Solution Architecture:** Led technical discovery sessions and designed compute solutions for GPU-intensive ML and simulation workloads.
- ‣ **GPU Infrastructure:** Evaluated and benchmarked GPU platforms (A100, H200) for client workloads, including mixed-precision training configurations.
- ‣ **Client Engagement:** Managed pre-sales technical engagements, proof-of-concept demonstrations, and onboarding for HPC clients across research and industry.

📅 Oct 2019 – Jan 2021
● Amazon, Luxembourg

Research Scientist

- ‣ Applied advanced ML and statistical methods to deliver actionable business insights at scale.

🎓 EDUCATION

📅 Sep 2013 – Feb 2019
● UC3M, Madrid | UGent, Ghent

PhD in Computational Physics

Specialized in computational methods for complex physical systems. Developed algorithms for HPC environments.

📅 Sep 2011 – Jul 2013
● UC3M, Madrid | UGent, Ghent

MSc in Plasma Physics

Statistical analysis and modeling of complex dynamic systems.

📅 Sep 2007 – Jul 2010
● Charles University, Prague

BSc in Physics

Foundation in computational physics and simulation methods.

🏆 ACHIEVEMENTS & RECOGNITION

- 🏆 Outstanding Colombian Abroad — Award by the Colombian Government
- 🏆 Summa Cum Laude — PhD Thesis
- 🏆 Greatest Distinction — 2013 Erasmus Mundus Master
- 🏆 UNESCO Fellowship — Bachelor Studies Scholarship

📚 SELECTED PUBLICATIONS

- 📄 Magneto-hydrodynamical nonlinear simulations of magnetically confined plasmas using smooth particle hydrodynamics (SPH)
- 📄 A positioning algorithm for SPH ghost particles in smoothly curved geometries
- 📄 ALARIC: An algorithm for constructing arbitrarily complex initial density distributions with low particle noise for SPH/SPMHD applications