

PHOTO

WILMAR CARDONA, PhD

Senior Data Scientist — AI Software Engineer

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PROFESSIONAL SUMMARY

Senior Data Scientist & AI Software Engineer (PhD) specializing in the development of high-performance numerical codes and predictive modeling for complex systems. With an extensive background in Bayesian statistics, Machine Learning, and Computer Vision, I have a proven track record of translating massive, multi-dimensional datasets into actionable insights across diverse fields, including biotechnology and astrophysics. Expert in managing the full data lifecycle (from characterization to large-scale deployment on HPC and Cloud infrastructures) to drive evidence-based decision-making in fast-paced, multi-disciplinary environments.

TECHNICAL SKILLS

- **Data Science & AI:** Bayesian Inference, Machine Learning (Classification, Clustering, Regression), Neural Networks, Computer Vision (e.g., Segmentation), Genetic Algorithms.
- **Programming:** Python (Advanced Data & ML Stack), R, Fortran, C, SQL, Linux.
- **Infrastructure & Tools:** Docker, Git/GitHub, Google Cloud Platform, HPC (SLURM, HTCondor), LaTeX.
- **Research & Management:** Grant Writing & Fundraising, Project Leadership, Scientific Peer Reviewing, Mentoring & Supervision (MSc/PhD), Cross-functional Collaboration.
- **Specialized Expertise:** Multidimensional Image Analysis, Scientific Software Development, Mathematical & Stochastic Modelling, Bayesian Parameter Inference, Decision-Support Systems.

PROFESSIONAL EXPERIENCE

Menarini Silicon Biosystems

Software Engineer

Castel Maggiore, Italy

March 2024 – Present

- Leading AI-driven biotechnology initiatives, specializing in high-fidelity automated image interpretation and cell classification.
- Developing robust software for biological data analysis using advanced tools like CELLSEARCH, QuPath, ImageJ, and Stardist.

Universidad Antonio Nariño

Senior Post-doctoral Researcher

Bogotá, Colombia

Dec 2022 – Oct 2023

- Directed the end-to-end Data Science lifecycle for Big Data cosmology projects, from initial data characterization to the production-level deployment of machine learning models.
- Engineered predictive models for complex dataset analysis, ensuring high reliability and statistical significance of results.

ICTP-SAIJR & IFT UNESP

Senior Post-doctoral Researcher

São Paulo, Brazil

Jan 2022 – Nov 2022

- Leveraged Genetic Algorithms and Machine Learning to optimize complex mathematical functions, deriving simplified analytical models with high predictive accuracy for large-scale galaxy catalogues.
- Implemented high-performance numerical codes for Bayesian inference, achieving superior model-fitting against massive international datasets.

Universidad del Valle*Post-doctoral Researcher*Cali, Colombia
July 2019 – Dec 2021

- Managed the full project lifecycle for parameter inference and performance forecasting of forthcoming experimental datasets.
- Developed and validated open-source software for physical model testing, ensuring rigorous code quality and data integrity.
- Acted as a senior technical lead, mentoring MSc and PhD students while serving as a scientific referee for international journals and funding agencies.

Instituto de Física Teórica UAM-CSIC*Post-doctoral Researcher*Madrid, Spain
June 2017 – May 2019

- Optimized alternative cosmological models using High-Performance Computing (HPC) environments to manage and cross-validate multi-terabyte datasets.
- Translated complex technical findings into reports and presentations for international scientific stakeholders and journals.

University of Geneva*PhD Researcher*Geneva, Switzerland
June 2012 – Sept 2016

- Developed mission-critical forecasting software for the European Space Agency (ESA) EUCLID mission, utilizing MCMC and Fisher matrix methods.
- Engineered Bayesian statistical frameworks to handle outliers via hyper-parameters, significantly reducing bias in parameter estimation.
- Authored high-performance numerical codes in Python, C, and Fortran to solve complex systems of differential equations.

EDUCATION

University of Geneva**Ph.D. in Physics**Geneva, Switzerland
2012 – 2016*Thesis: "Cosmological constraints: anisotropic dark energy, the Hubble constant, and the neutrino mass".***Centro Brasileiro de Pesquisas Físicas (CBPF)****M.Sc. in Physics**Rio de Janeiro, Brazil
2010 – 2012**Universidad del Valle****B.Sc. in Physics**Cali, Colombia
2002 – 2009**LANGUAGES**

Spanish: Native**Italian:** Full Professional Proficiency (C1 equivalent; Residing in Italy since February 2023)**English:** Full Professional Proficiency (C1 equivalent; extensive experience in international research and industry)**Portuguese:** Full Professional Proficiency (C1 equivalent; 3 years residency in Rio de Janeiro and São Paulo, Brazil)**French:** Professional Working Proficiency (B2 equivalent; 4 years residency in Geneva, Switzerland)**INTERESTS**

Sports: Cycling (endurance training); Capoeira (Angola/Contemporânea); Basketball.**Arts & Humanities:** Oil Painting (hobbyist); Cinema (interest in award-winning films from international festivals); Sociology (undergraduate level).