Leonardo A. Lugarini

Software Engineer | AI/ML Researcher

+55 (41) 99659-2226
lugaleonardo@gmail.com
leonardo-antonio-lugarini-7769911a6
leoluga
Curriculum Lattes

Aerospace Engineer (B.S.) and Physics Master's student (M.S.) with 2+ years of experience in software development and AI/ML. Proven expertise in building and deploying C++ and Python-based systems for simulation, data processing, and quantitative analysis. Deeply skilled in AI/ML model development, including Deep Learning for complex physical systems. Seeking to leverage a strong foundation in large-scale systems and data to build next-generation AI solutions at Google.

Education

2024 – Present **Master of Physics**, *Aeronautics Institute of Technology (ITA)*, São José dos Campos, Brazil
Focus: Developing Deep Learning models to predict nanoscale material properties by combining sparse experimental (sSNOM) data with physical models.

2020 – 2024 **Bachelor of Aerospace Engineering**, *Aeronautics Institute of Technology (ITA)*, São José dos Campos, Brazil, GPA: 8.9/10.0

Experience

Mar 2024 – Present **GNC Researcher**, *Institute of Advanced Studies (IEAv)*, São José dos Campos, Brazil
- Designed and developed a high-fidelity 6DOF simulation environment in C++ for rockets and hypersonic vehicles, focusing on aerodynamic model analysis and flight envelope validation.
- Co-designed and deployed a team development server (Ubuntu LTS) with Gitea (Git) and Samba, improving version control and shared data access for research.
- Leading development in C/C++ and Python within a collaborative Git-based workflow, managing complex codebases for simulation and analysis.

Apr 2023 – Dez 2024 **Intern, Volatility Table**, *Legacy Capital*, São Paulo, Brazil
- Designed, developed, and maintained full-stack data processing and quantitative analysis tools using Python (Pandas, SQLAlchemy, Dash), Flask, and JavaScript (AG Grid).
- Engineered and optimized data ingestion pipelines and complex SQL queries for a high-frequency volatility database.
- Developed and evaluated quantitative trading strategies using time-series algorithms and rigorous backtesting frameworks; performed parameter optimization to enhance model performance.
- Owned and refactored a legacy Python library, implementing design patterns to improve maintainability and extensibility for the quantitative research team.
- Managed CI/CD pipelines and deployment using Git and Azure DevOps in a high-stakes, deadline-driven environment.

Apr 2024 – Sep 2024 **Intern**, *ITA Space Center (CEI)*, São José dos Campos, Brazil
- Developed a Python library for processing and ingesting binary CCSDS space packets, enabling real-time telemetry analysis for the Sports Satellite Mission.
- Built a telemetry data dashboard using the library, enabling rapid issue debugging and system monitoring.
- Designed the initial software architecture for a CRUD application to manage the mission's satellite database.

Sep 2022 – Sep 2023 **Scientific Initiation (PIBIC) Scholarship**, *Aeronautics Institute of Technology (ITA)*, São José dos Campos, Brazil

- Conducted computational physics research, implementing numerical models with Python (SciPy) to simulate quantum photon emissions and plasmon-polariton interactions.

Key AI/ML Project (MS Thesis)

2024 – Present **Deep Learning for sSNOM Data Analysis**
Developing and evaluating novel Deep Learning models (e.g., CNNs, Transformers) to interpret and predict nanoscale material properties from sparse sSNOM data. This research bridges physical models with advanced ML concepts to analyze complex, high-dimensional datasets.

Technical Skills

AI/ML	Deep Learning, ML Model Development & Evaluation, Quantitative Modeling, Data Processing, Optimization, Pandas, NumPy, SciPy, MatLab
Programming	Python, C/C++ (Advanced); SQL (Advanced); Go, HTML, CSS, VBA (Basic)
Developer Tools	Git, Git Flow, Linux, Azure DevOps, Gitea, Docker, Samba
Engineering	Fluid Simulation (SU2, GMSH), 6DOF Modeling, CCSDS Standards

Languages

English	C2 Level (Certified)
Portuguese	Native