

Leonardo Sampaio Rocha

Machine Learning Engineer

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Machine Learning Engineer with 12+ years in Data Science and 5+ years building and deploying intelligent systems. Specialized in Graph ML, LLM agents, embeddings, RAG pipelines, and automation of real-world workflows. Proven ability to lead projects that delivered >40% efficiency gains in production environments using state-of-the-art techniques with startup-level execution. I bring a research-driven mindset, hands-on expertise, entrepreneurial vision, and strong leadership skills to deliver real-world ML solutions.

Key Achievements

- Led the design and deployment of an AI-powered robotic agent at the Attorney General's Office of Ceará (9M+ inhabitants, 10K+ processes/month), achieving 95%+ accuracy, reducing workload by 40%, and saving 400+ hours/month.
- Led the design and deployment of adaptive learning innovations at the IREDE Institute (R\$5M+ annual R&D budget), including a recommendation engine that powered a national ICT training platform for 5,000+ students.
- Founded SoftIA Tech, an academic spin-off company delivering AI training, consulting, and applied solutions, bridging state-of-the-art research and market applications.
- Consulted for Moena.ai, a US fintech startup focused on hyperpersonalization and expansion into Brazilian fintechs (Stone, C6 Bank), providing guidance that informed the co-founders' decision not to advance to full implementation.
- Supervised 20+ research projects and mentored MSc, PhD, and undergraduate students, while publishing 20+ peer-reviewed papers (AI, NLP, graph, intelligent systems) with international visibility.
- Coordinated the IncubaUECE incubator, designing and implementing programs that supported 30+ startups and deep techs in their growth and innovation strategies.

Skills

- **Programming Languages:** Python, Java, C++
- **Machine Learning & NLP:** PyTorch, Scikit-learn, NumPy, Transformers (Hugging Face), Fine-tuning, Embeddings, Sentence-Transformers, Retrieval-Augmented Generation (RAG), Prompt Engineering
- **Vector & Graph Systems:** FAISS, ChromaDB, Neo4j, Cypher, Knowledge Graphs, Ontology Modeling
- **Data Science & Analytics:** Pandas, NumPy, Scikit-learn, Matplotlib, Power BI, SQL, Jupyter
- **AI & LLM Tools:** OpenAI API, Gemini API, LangChain, LangGraph, Tool Use & Function Calling, Conversational Memory
- **Cloud & ML Platforms:** AWS (SageMaker, Lambda, Bedrock, S3), Google Cloud (Vertex AI, Cloud Storage), Google Colab
- **Development & DevOps:** Docker, Git, CI/CD, Flask, FastAPI, Linux

Experience

Attorney General's Office of Ceará

Machine Learning Engineer

Nov 2023 - Present

Ceará, Brazil

Led the full-cycle development of an AI-powered robotic agent to automate legal workflows at the Attorney General's Office of Ceará, the government body responsible for defending the State in over 10,000 legal cases a month, in a region with 8 million inhabitants.

- Gathered requirements from legal and IT stakeholders through workshops and interviews to define pain points and goals.
- Analyzed internal case/process data using BI dashboards and complex SQL to identify high-impact automation opportunities.
- Designed and prototyped an AI-RPA pipeline combining LLMs, rule engines, and retrieval components.
- Led development and testing, fine-tuning extraction/classification, applying rule-based validation and fallback logic, and reporting progress to both client and internal leadership.
- Deployed and monitored the system in homologation and production environments, ensuring traceability, explainability, and reproducibility. Achieved >90% accuracy in key tasks and 98.7% dispatch approval without human revision.
- Delivered a full automation workflow, from retrieving documents in external portals to decision-making and dispatch generation integrated with internal systems, yielding >40% productivity gains.

Moena.ai Consultant – AI Research Engineer Short-term consulting	Mar 2025 – July 2025 Remote, Florida, USA
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Consulted for Moena.ai, a US-based fintech startup focused on the hyperpersonalization of financial services and expansion into Brazilian fintechs, advising on the design of a reinforcement learning system for customer personalization.

- Mapped requirements and defined the technical architecture, modeling the approach to maximize customer engagement and financial outcomes, and discussing adoption with potential clients such as Stone and C6 Bank.
- Evaluated infrastructure, costs, and risks, providing strategic guidance that helped the founders realign the product roadmap based on cost-benefit analysis and implementation complexity.

IREDE Institute R&D Engineer	Sep 2022 - Mar 2024 Ceará, Brazil
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The IREDE Institute manages over R\$5 million annually to develop innovation projects for both the public and private sector, working in partnership with researchers and engineers. Within this context, I led a team in the design and implementation of adaptive learning features for a national ICT training platform reaching 5,000+ students in Information Technology. The platform's core innovation was a personalized learning environment that dynamically adjusted course content and paths based on student profiles and performance.

- Researched, prototyped, and tested adaptive learning strategies, including approaches based on knowledge graphs and semantic embeddings, to personalize student learning journeys.
- Developed and integrated a recommendation engine for learning content, achieving a 95% success rate in human-supervised evaluations.
- Designed a PoC framework leveraging knowledge graph-based user modeling to analyze learner behavior in immersive and interactive e-learning environments.

State University of Ceará Associate Professor	May 2013 - Present Ceará, Brazil
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Lead R&D in Data Science and AI, with a focus on algorithms, deep learning, NLP, and intelligent systems. Over the past decade, I have combined teaching, research, and innovation leadership to advance both academic and entrepreneurial ecosystems.

- Supervised and mentored 20+ MSc, PhD, and undergraduate projects in AI, NLP, and intelligent systems, fostering next-generation talent and applied innovation.
- Published 20+ peer-reviewed papers in top international conferences and journals (graph learning, NLP, AI-driven decision support), contributing to global research visibility (full list at: <https://orcid.org/0000-0002-2608-1844>)
- Coordinated the IncubaUECE incubator, designing and implementing programs that supported 30+ startups and deep techs in their growth and innovation strategies.
- Taught graduate and undergraduate courses on algorithms, machine learning, deep learning and NLP, while serving in academic leadership and administrative roles.
- Founded the Graph and Computational Intelligence Lab (LAGIC), leading research on graph-based models and AI for decision-making, automation, and intelligent systems.

Education

University of Nice Sophia Antipolis, France - PhD, Computer Science	2009 - 2012
Federal University of Ceará, Brazil - Master, Computer Science	2007 - 2009
Federal University of Ceará, Brazil - Bachelor, Computer Science	2003 - 2006

Languages

Portuguese (Native)
English (Fluent)
French (Fluent)