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# MARIANA EMAUZ VALDETARO

## R&D Software Engineer | Independent Researcher

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Multidisciplinary researcher and technical professional with expertise in telecommunications, machine learning, and complex systems. Combining analytical rigor with creative and critical thinking to develop novel approaches to address complex problems while bridging technical implementation with theoretical frameworks across disciplines.

### Skills

**Technical:** 5G Technologies, Digital Signal Processing, C/C++, Machine Learning, Generative AI, Complex Systems Modeling, Software Architecture, Python, Julia, HG, TensorFlow, Scikit-learn, Openmm, MDAnalysis, Py3Dmol, Amber14-all, QMD, SentenceTransformer, Dash, TfidfVectorizer, LatentDirichletAllocation, FrameSemanticTransformer, Spacy, Umap, Torch, Tqdm, NLTK, BERT, Flask

>Development: Prototyping, System Design, Unit Integration Testing, Interface Adaptation, Code Optimization  
>Research: Quantitative Methods, Experimental Design, Literature Review, Interdisciplinary Synthesis  
>Communication: Technical Writing, Public Speaking, Workshop Facilitation, Requirements & Documentation  
>Leadership:Strategic Planning, Team Coordination, Community Building, Stakeholder Management  
>Languages: English (Fluent), Portuguese (Native), Spanish (Intermediate), French (Basic)

### Highlight

Date	Job	Term
April 2025 - May 2025	GEN AI MVP Commission	Self-Employed
Dec 2024 - April 2025	Senior Consultant Technology & AI	Self-Employed
Oct 2024 - Present	Board Member & Vice President @ SEMF	Pro-Bono
April 2023 - Oct 2024	R&D Software Engineer 5G Physical Layer	Without Term
May 2022 - April 2023	Applied R&D Software Engineer Cloud and Networks	Fixed Term

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## PROFESSIONAL EXPERIENCE

### **GEN AI MVP Commission: Multi-Agent GenAI Onboarding MVP for Startup X *April 2025 - May 2025***

- Roles: Solo developer, Head of Engineering, PM
- Decided and Designed the entire infrastructure, presented and documented the process
- Deployed the setup using minimal memory on the VMs (each part was running separately) to reduce unnecessary costs (Small Batch Setup Scripts)
- Gen AI DevOps: Connected multiple services and wrote scripts to automate the process for maximum flexibility when scaling / adapting to market needs
- Stack: Python, Flask, Firebase, OpenAI, Apollo, Docker, Multi-VM deployment, Agent Orchestration
- Product: Multi-agent onboarding conversational app, API integrations (OpenAI, Apollo, Firebase) on a website with login / register functionality and main product dashboard
- Created a class for agents wrapping the `pydanticai` agent with Memory (short and long) and State (agent state) classes.
- classes and agent flow were fully documented for next developer teams to scale the MVP
- This served as a custom alternative to Langgraph and Langsmith.
- Classes and Agent flow were fully documented for next developer teams to scale the MVP

### **SEMF: Vice President | Society for Multidisciplinary and Fundamental Research *October 2024 - Present: Technology and Infrastructure Office***

- Collaborate on strategic initiatives for advancing fundamental research across conventionally disparate fields of inquiry
- Oversee community development and engagement initiatives
- Participate in community live streams reporting on internal progress and promoting multidisciplinary discussions
- Coordinate interdisciplinary events including the yearly interdisciplinary school
- Collaborate on organizational partnerships and funding initiatives
- Maintain and develop SEMF's technical infrastructure alongside the secretary and manager of operations

### **Independent Senior Consultant | Machine Learning & GenAI *January 2024 - Present***

- Advise organizations on implementing and adopting AI systems and machine learning solutions
- Develop custom frameworks for data processing and analysis
- R&D custom generative AI pipelines for workflow automation
- Design novel technical architectures for complex data processing systems
- Bridge technical teams with non-technical stakeholders to ensure alignment on project goals

**Nokia: Embedded Software Engineer - Physical Layer - R&D - 5G (Contract) *April 2023 - December 2024***

- Conduct digital signal processing and code optimization for 5G systems
- Perform feasibility studies of 3GPP 5G features and draft technical requirements
- Plan and organize work as part of global software development teams
- Implement features using C/C++ for telecommunications infrastructure
- Design system architecture and conduct various testing levels (unit, component, integration)
- Perform interface adaptation, testing, and troubleshooting
- Execute SW co-verification with Matlab models and build time optimization
- Create documentation and advocate for software lifecycle best practices

**Nokia: Applied R&D Engineer (Full-time) *February 2022 - April 2023***

- Contributed to research and development initiatives for telecommunications technology
- Participated in early-stage development of 5G technologies
- RAN Infrastructure and Product Development

**Independent Researcher | Agency & Multi-scale Interaction Dynamics *2023 - Present***

- Investigate theoretical frameworks for generalizing interaction patterns across temporal and spatial scales
- Develop computational models for analyzing complex social and cognitive systems
- Writing research literature

**Independent Researcher | Computational Linguistics & Machine Learning *2023 - Present***

- Investigate theoretical frameworks for generalizing meaning development
- Develop computational models for analyzing polysemic terms across interdisciplinary academic publications
- Participate in interdisciplinary research projects at the intersection of linguistics and machine learning

**Colisão Studios: Founder and Manager R&D Studio *February 2018 - November 2021***

- Led a Zero-to-One Innovation Studio operating at the intersection of technology, art, and natural resources
- Developed novel technical solutions and creative applications
- Managed a Multidisciplinary Team of 200
- [Lead an R&D footwear manufacturing project with biodegradable filament using 3D printing technology](#)
- [Re-contextualized Portuguese Marble Stone for the high-end export market resulting in an increase of ~32% and for the first time, surpassing the previous boundary of 400million](#)

**Newlife.ai: External Funding Coordinator *May 2020 - November 2020***

- Coordinated funding initiatives for a Decentralized AI-driven social network
- Worked on strategic alignment for Portuguese based partnerships

**reboot.fashion: Founder *November 2019 - March 2020***

- Created a decentralized fashion system addressing supply-chain complexities through smart contracts
  - Developed on-chain platform/marketplace connecting independent and MSNE players
  - Implemented transparency solutions for fashion industry value chain
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**EDUCATION****SEMF Interdisciplinary School**

*2024 Intellectual cross-pollination by bringing together researchers, practitioners, students and creators from diverse areas of expertise that share a common vision on fundamental questions.*

- [Beyond the Nyquist Sampling Theorem](#)
- [Notions of Structure in Mathematics](#)
- [The Evolution of Biological Complexity](#)
- [Computational Foundations of Everything](#)

**Johns Hopkins University**

*Mooc in [Neuroscience and Neuroimaging Specialization](#)*

- Neuroanatomy & Neuroimaging • Experimental design • Imaging techniques
- Certificates: [Certificate 1](#), [Certificate 2](#), [Principles of fMRI 1](#)

**Icahn School of Medicine at Mount Sinai**

[Systems Biology and Biotechnology Specialization](#)

**42 School - 42 Lisboa**

*A private institution of [higher education](#) in [computer science](#) opened in Paris in 2013. The school does not have any professors and is open 24/7. Students are trained through [peer-to-peer pedagogy](#) “Peer learning”, and [project-based learning](#).*

- Focused on: Software Engineering and Computer Science Imperative programming in C, Object-Oriented Programming in C++, Data Structures & Algorithms, Concurrent programming, Network programming, Systems administration, Graphics programming
- [Projects](#)

**Bachelor in Management and Corporate Communication***ISCEM, Lisbon Portugal 2015***Bachelor of Arts in Semiotics and Visual Culture***IADE, Lisbon Portugal 2008*

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**VOLUNTEER EXPERIENCE****Katefriends***April 2022 - Present*

- Volunteer in animal welfare, focusing on fostering and rehabilitation of rescued greyhounds
- Support transition of animals until they find permanent homes

**A Avó veio Trabalhar (Grandma Came to Work)***February 2015 - April 2019*

- Community volunteer for intergenerational creative hub in Lisbon
- Helped build social and emotional bonds within local community
- Supported program enabling elderly people to participate in creative activities