Gabriel Nascimento

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Languages: Portuguese, English, Spanish
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RESEARCH EXPERIENCE

Research Student Assistant - UPenn X-Ray Physics Lab [Philadelphia, PA - Remote] 05/2024 - Present

Researched ways to improve state-of-art Generative Denoising Diffusion Models to enhance the generation, restoration and denoising of medical PET, CT and MRI images, solving Partial and Stochastic Differential Equations (PDEs and SDEs) to refine the model. We also, apply Physics-Informed Neural Networks(PINNs), Deep Learning and Signal and Imaging Processing concepts to evaluate and improve those models.

Quantitative Researcher Intern - NEW EIC [Boston, MA - Remote] 01/2025 - 04/2025

I conducted research and implemented state-of-the-art Diffusion models and Graph Neural Networks for stock trend prediction. These models were validated through rigorous backtesting methods to ensure feasibility and accuracy. The deployment of these models significantly **enhanced the results for thousands of investors**, leading to improved financial decision-making and performance across a diverse portfolio

Student Researcher Fellow - TAIL [João Pessoa, PB - On-site] 02/2024 - 02/2025

Participated as a student member at the Reinforcement Learning board with 4 colleagues studying RL key concepts such as Markovian Processes, Q-Learning and Deep Q-learning. After that we developed a project, applying what we have learned to simulate a food chain environment in Python, writing a article after that.

EXPERIENCE

Software Engineer Intern - CEBRASPE [Brasília, BR - Remote] 06/2024 - 02/2025

Developed an API designed for the automated grading of ENEM, Superior Electoral Court of Brazil essays. The API leverages natural language processing techniques to evaluate essays based on the exam's criteria, providing automated feedback on aspects such as coherence, cohesion, and argumentation. The system aims to increase the efficiency of the grading process by five times while maintaining **95% accuracy** in evaluations, enabling the assessment of **80,000 essays in less than 24 hours**.

Founding Software Engineer - Promozap [Cambridge, US - Remote] 08/2024 - 02/2025

Architected and deployed Promozap's scalable backend platform in collaboration with US-based teams, achieving high availability and optimized performance for thousands of users by integrating microservices and event-driven design with Kafka and gRPC. Implemented a microservices architecture with Kafka for event-driven flow and gRPC for efficient inter-service communication, **supporting high availability for hundreds of thousands of users**.

Lead Software Engineer - DHART [João Pessoa, BR - Hybrid] 05/2024 - 01/2025

Led the creation of an AI agent designed to consult accounting data for all cities in the State of Paraíba, summarizing it as requested. The system utilized multi-agent structures to ensure accurate and reliable answers, functioning as if it were an accountability specialist. It successfully **reduced state costs by over 1 million reais**.

Software Developer Intern - Workverse [São Paulo, BR - Remote] 12/2023 - 06/2024

Developed an authentication API with my two partners that authenticates 12 different Federal Document images via OCR using several authentication conditions to do it. It **improved significantly in a 60%** the Porto Seguro authentication process in new employers admission. We used Python and Clean Architecture principles.

EXTRACURRICULAR ACTIVITIES

Active Deep Learning Open Source Contributor - Apple [Remote] 12/2024 - Present

Work on improving and adding new features to Matryoshka Diffusion Model, which is an end-to-end framework for high-resolution image and video synthesis. Implemented new non-linear noise scheduling methods and Neural Network structures based on MLX framework. Contributed to the privacy-preserving federated learning (PFL) framework for secure training on distributed sensitive data, optimizing dataset iteration using Apple's MLX framework.

Tutor & Mentorship Program Member - Trilha 02/2024 - 02/2025

I give lectures in Trilha at UFPB to support first semester students from various tech disciplines. We cover essential programming concepts through interactive sessions, hands-on workshops, and guest talks from industry professionals.

Academic Tutor - Calculus II 01/2024 - 01/2025

As a Calculus II tutor, I help students grasp fundamental concepts like limits, derivatives, and integrals. Through personalized tutoring and exam prep support, we have achieved a class pass rate **exceeding 80%**.

Python and Data Visualization Teacher - IFRN Ceará Mirim 09/2024 - 09/2024

Taught a minicourse on 'Introduction to Mathematical Concepts with Python' to a class of **40 Mathematics students at the Federal Institute of Rio Grande do Norte**. The course introduced fundamental concepts of mathematical functions, representations, and operations using Python, as well as data visualization, exploratory data analysis, and Machine Learning.

EDUCATION

Bachelor of Computer Engineering - UFPB (Federal University of Paraíba) 07/2023 - 07/2028 (expected)

SKILLS

Tools: Algorithms, Python, PyTorch/Tensorflow, PyTorch Geometric,Golang, Typescript, C++, Eigen, Swift, MLX, Multiprocessing, AWS, Microservices, FastAPI, Llama, Distillation.

Interests: Software Engineering, Geometric Processing, Applications of AI in the medical imaging field, Deep Learning, Physics-Informed Neural Networks, Machine Learning, Time Series Analysis.