Madson Aragão

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Summary

I am a bioinformatician with experience in Genomics, Molecular Biology, Structural Biology, Protein Design and Machine Learning. I have expertise in advanced computational methods, including generative neural networks and data pipelines, to transform complex biological information into practical solutions. I have hands-on experience in molecular modeling, analyzing large datasets, and developing bioinformatics tools. My goal is to drive innovation in diagnostics and personalized therapies, with a focus on accurate diagnosis and tailored treatment approaches.

Education

PhD in Bioinformatics (ongoing)
Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil
- Focus on machine learning for the identification of antimicrobial compounds and analysis of biological interactions.

MSc in Genetics and Molecular Biology (2024)
Federal University of Pernambuco (UFPE), Recife, Brazil
- Development of AMP-Identifier, a machine learning-based tool for genome mining aimed at discovering bioactive molecules.

Postgraduate in Data Science and Analytics (ongoing)
Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brazil
- Advanced machine learning, data engineering and governance, strategic analysis.

BSc in Biomedical Sciences (2022)
Federal University of Pernambuco (UFPE), Recife, Brazil
- Research in clinical and hospital settings focusing on bioinformatics and genetics.

Professional Experience

Researcher and Development Analyst
October 2020 - August 2022

PickCells
- Developed IoT solutions and validated clinical systems using computer vision.
- Implemented MVPs and gathered feedback for continuous improvements.
- Created machine learning models applied to clinical diagnostics.
- Collaborated with multidisciplinary teams to optimize hospital workflows and drive technological innovation.

Academic Researcher
2015 – Present

FIOCRUZ – Aggeu Magalhães Research Center
- Molecular modeling of proteins for diagnostics and vaccines.
- Development of computational methods for characterizing viral proteins.

LIKA – Keizo Asami Immunopathology Laboratory
- Research in Human Genetics and Bioinformatics, focusing on Forensic Genetics, ancestry markers and phenotype prediction.
- Conducted molecular analyses in collaboration with the Forensic Genetics Institute of Pernambuco for establishment of protocols for forensic analysis.

Department of Genetics, Federal University of Pernambuco (UFPE)
- Developed bioinformatics tools for discovering antimicrobial peptides and characterizing molecules in plant species.
- Conducted omics analyses to identify plant defense mechanisms against pathogens.

Institute of Biological Sciences, Federal University of Minas Gerais (UFMG)
- Works on machine learning and computational modeling applied to the discovery of antimicrobial compounds and develops pipelines for analyzing genomic and structural data.
- Performs biomolecular modeling and simulation of proteins, synthetic peptides and various types of pathogen membranes to describe action mechanisms and develop enhanced workflows for reinforced generative models in protein design using deep learning.

Technical Skills

Bioinformatics: Development of pipelines, NGS analysis, transcriptomics analysis, biomarker prediction and genome mining.
Machine Learning: Linear models, generative neural networks, supervised and unsupervised learning.
Programming: Bash, Python, Java and C.
Data Management: Integration of omics data, cleaning, and transformation of large datasets.
Operating Systems: Advanced knowledge in Linux/Unix (MacOS, Debian, Ubuntu, RedHat).
Computational Structural Biology: Theorical chemistry, biomolecular modeling, protein design and molecular dynamics simulations.

Certifications and Licenses

Advanced Gemini for Developers (Google DeepMind, Dec 2024)
Skills: Generative Neural Networks, Patterns, Market Research, Google Gemini.
Career Essentials in GitHub Professional Certificate (GitHub, Dec 2024)
Skills: Continuous Integration, Python, Versioning, Backlog Management.
Project Management: Preventing Scope Creep (PMI, Dec 2024)
Skills: Agile Management, Product Development, Lifecycle Analysis.
Certified Peer Reviewer (Elsevier, Nov 2024)
Skills: Scientific Writing and Review, Technical Reports.
Python Programming from Basic to Advanced (Udemy, Jun 2022)
Skills: Computational Genomics, Generative Networks, Bioinformatics.
Bioinformatics with Python (Udemy, May 2022)
Skills: Structural Bioinformatics, Machine Learning, Computational Chemistry.
NGS Data Analysis (Next-Generation Sequencing) (UFPE, Sep 2016)
Skills: Computational Genomics, Biotechnology.

Publications

M. V. F. Ferraz et al., **Association strength of E6 to E6AP/p53 complex correlates with HPV‐mediated oncogenesis risk**, Biopolymers, vol. 113, no. 10, p. e23524, 2022.

L. M. B. Vilela et al., **Approaches for Identification and Validation of Antimicrobial Compounds of Plant Origin: A Long Way from the Field to the Market, in Eco-Friendly Biobased Products Used in Microbial Diseases**, CRC Press, 2022, pp. 183–222.

R. C. C. da Silva et al., **Omics-driven bioinformatics for plant lectins discovery and functional annotation – A comprehensive review**, International Journal of Biological Macromolecules, p. 135511, 2024.

Awards and Recognitions

Honorable Mention – *Human and Forensic Genetics (CNPq/UFPE)*
Young Geneticist Award of the Northeast *(XXI Northeast Genetics Meeting - ENGNE)*
Honorable Mention – *Postgraduate Genetics Journey (UFPE)*
Best Poster Award – *XIII Journey of the Genetics and Molecular Biology Program*
Travel Grant Award*, AI for Protein Design (AI4PD) – The Protein Society*
Certificate of Excellence *in the Peer Reviewing – Elservier*

Languages

Portuguese (Native)
English (Intermediate/Professional)