Matheus Gomes Cordeiro

matheusgomescord@gmail.com | +55 (85) 98760-7589
github.com/fobos123deimos | linkedin.com/in/matheus-cordeiro-453373ba/|
matheuscordeiro.com

Skills

Languages: Python, SQL, C/C++, MATLAB/Octave, Wolfram Mathematica

Technologies & Tools: Git, Github, Gitlab, Databricks, RabbitMQ, ElasticSearch, Tensorflow/Keras, Scikit-Learn, PyTorch, NLTK, SpaCy, statsmodels, NeuralForecast-Nixtla, prophet, pyspark, python-bcb, BacenAPI, sktime, Numpy, Numba, Cython, mpmath, pytest, pip, Pandas, pymove, Matplotlib, Plotly, Seaborn, Voila, Panel, Streamlit, pdoc, Transformers/Huggingface, PostgreSQL, MongoDB, Jupyter Notebook, Google Colab, LaTeX, Markdown

Work Experience

ACT Digital Ago 2025 - Present

Mid-level Data Scientist

i) Bank Budget Projection:
   - AI-driven forecasting of credit-loss provisions using the monthly Expected Credit Loss percentage (ECL%) to meet Central Bank of Brazil (BACEN) Resolution 4.966.

ii) Tools and Methodologies:
   - Time-series and machine learning models: ARIMA/ARIMAX, SARIMA/SARIMAX, AutoARIMA, N-BEATS, N-HiTS, Autoformer, FEDformer, prophet, KNeighborsRegressor, XGBRegressor.

iii) Development of technical solutions in R (Rstudio) and Python (NumPy, pandas, scikit-learn, Matplotlib, statsmodels, sktime, NeuralForecast - Nixtla, prophet, pyspark, ,python-bcb, BacenAPI). Using SQL and Databricks.

iv) Companies:
   - Banco BMG.

Banco do Nordeste do Brasil - Model Compliance Center Dec 2024 - Jul 2025

Mid-level Data Scientist

i) Risk Model Validation through VOYAGER ITInnovativeSolutions (outsourcing):
   - Specialization in validating Credit Risk, Microcredit, Operational Risk, Market Risk, and Social, Environmental, and Climate Risk models — 4 models validated.
   - Ensuring model compliance and governance by aligning with internal policies, external regulations, and governance frameworks, through detailed documentation analysis.
   - Conducting advanced technical analyses, including:
     - Exploratory Data Analysis (EDA) to identify patterns and insights.
     - Data preprocessing to improve information quality and reliability.
     - Reproduction of existing models to verify result accuracy and consistency.
     - Development of challenger models to test and enhance predictive performance.
     - Model performance evaluation for benchmarking and continuous improvement.

ii) Tools and Methodologies:
   - Machine Learning Applications: supervised algorithms such as MLP, XGBoost, LightGBM, XGBse, and unsupervised techniques such as K-means, PAM, and Clara.
   - Statistical Modeling: probabilistic methods like Value at Risk (VaR), rule-based systems, and simplified mathematical models (RAROC).

iii) Development of technical solutions in R (RStudio), Python (using libraries such as Numpy, Pandas, Scikit-learn, Matplotlib, TensorFlow for machine learning), and SQL.

Quantum Optics and Information Group (GIQ), Fortaleza, Brazil Feb 2023 - Feb 2025

Researcher in Quantum Computing Simulation

- Conducted research on precise and efficient simulation of the Quantum Harmonic Oscillator, a widely used model in Photonic Quantum Computing. The research led to the development of the **Fast Wave** Python package, co-advised by Dr. Scott Glancy (NIST member): Fast Wave GitHub, Fast Wave Documentation.
- Python 3, Numba, Cython, mpmath, pytest, pdoc, pip, Google Colab, Git, Github.

Seafortress, Fortaleza, Brazil Jan 2018 - Present

Chief Artificial Intelligence Officer (CAIO)

- Co-founder and CAIO of **SeaFortress**, operating under a hybrid business model: both an independent game studio and a software house. We develop indie games and create custom virtual experiences, integrating Artificial Intelligence to deliver affordable and efficient solutions. Our work attracted Unity Technologies, the largest independent game engine company. As a result, we contributed directly to their Deep Learning library, **Sentis**, and had our game showcased at **GDC 2024**: Seafortress Website.
- Python 3, Transformers/Huggingface, PyTorch, C#, Sentis, Unity.

Insight Data Science Lab, Fortaleza, Brazil Jan 2022 - Jan 2023

Researcher in Artificial Intelligence

- Participated in a research project combining Natural Language Processing (NLP) and Trajectory Analysis, using BERT-like models from Huggingface's Transformers to predict the next step in a car trajectory sequence, analogously to next-word prediction in sentences. Developed the dashboard tool **teach**: teach GitHub.
- Python 3, Transformers/Huggingface, PyTorch, Pandas, pymove, Voila, Jupyter Notebook, Github.

Lead Dell, Fortaleza, Brazil Jul 2021 - Jan 2022

Artificial Intelligence Developer

- Member of a Research and Development team that built an anomaly detection application for Dell Systems based on system logs using Machine Learning. The integrated model was an Isolation Forest from Scikit-Learn, processing logs from RabbitMQ and storing outputs in an ElasticSearch database.
- Python 3, Scikit-Learn, RabbitMQ, ElasticSearch.

Education

Federal University of Ceará (UFC), Fortaleza, Brazil Feb 2023 - Feb 2025

Master's in Teleinformatics Engineering

Main research topics: Scientific Computing, Computational Physics, Quantum Computing Simulation, Quantum Devices and Systems, Quantum Optics.

Federal University of Ceará (UFC), Fortaleza, Brazil Jan 2017 - Jan 2023

Bachelor's Degree in Computer Engineering

Relevant Courses: Linear Algebra; Calculus (Differential, Integral, Vector, and Numerical); Ordinary Differential Equations; Probability and Statistics; Data Mining; Programming (Logic, Object-Oriented, and Data Structures); Image Processing; Graph Theory; Neural Networks.

Publications

[1] Cordeiro, M., Bezerra, I. P., & Vasconcelos, H. H. M. (2024). Efficient computation of the wave function $\psi_n(x)$ using Hermite coefficient matrix in Python. In *Anais do 7º Workshop-Escola de Computação e Informação Quântica (7ª WECIQ)* (pp. 56–60). Rio de Janeiro: CEFET/RJ.

[2] Cordeiro, M., Markert, C., Araújo, S. S., Campos, N. G. S., Gondim, R. S., da Silva, T. L. C., & da Rocha, A. R. (2022). Towards smart farming: Fog-enabled intelligent irrigation system using deep neural networks. *Future Generation Computer Systems*, 129, 115–124. https://doi.org/10.1016/j.future.2021.11.013

[3] Cordeiro, M. G., Serafim, P. B. S., Nogueira, Y. L. B., Vidal, C. A., & Cavalcante Neto, J. B. (2019). A minimal training strategy to play Flappy Bird indefinitely with NEAT. In *2019 18th Brazilian Symposium on Computer Games and Digital Entertainment (SBGames)* (pp. 21–28). https://doi.org/10.1109/SBGames.2019.00014

[4] Cruz, L. A., Coelho da Silva, T. L., Magalhães, R. P., Melo, W. C. D., Cordeiro, M., de Macedo, J. A. F., & Zeitouni, K. (2022). Modeling Trajectories Obtained from External Sensors for Location Prediction via NLP Approaches. *Sensors*, 22(19), 7475. https://doi.org/10.3390/s22197475

[5] Freitas, N. A. de, da Silva, T. C., de Macêdo, J. F., Melo Junior, L., & Cordeiro, M. (2021). Using deep learning for trajectory classification. In *Proceedings of the 13th International Conference on Agents and Artificial Intelligence - Volume 2: ICAART* (pp. 664–671). SciTePress. https://doi.org/10.5220/0010227906640671

Certificates

- Credit Risk Modeling in Python
- Presentation Certificate - 7th Workshop-School on Quantum Computing and Information
- NVIDIA Fundamentals of Deep Learning
- Publication Certificate - Sensors
- Speaker Certificate - Insight Data Science Lab
- Publication Certificate - Future Generation Computer Systems
- Scientific Initiation Certificate 2
- Scientific Initiation Certificate 1