RAHMA BEN MBAREK

Actuarial Data Scientist

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Summary

AI-focused Data Scientist with a Master's in Applied Mathematics specializing in Data Science and Actuarial Science. Skilled in developing predictive models using machine learning and statistical techniques (ANNs, SVMs, regression models) with Python and R. Strong foundation in financial mathematics, risk modeling, and quantitative analysis. Fast learner and adaptable professional eager to apply analytical expertise to insurance pricing, risk assessment, and data-driven decision-making.

Education

Research Master's in Applied Mathematics with a specialisation in Data Science, Actuarial Science, and Stochastic Control — Sept 2022 – Jan 2025
Faculty of Sciences of Tunis

Licence in Applied Mathematics with a specialisation in Data Science — Sept 2019 – Jun 2022
Faculty of Sciences of Tunis

Professional Experiences

End-of-Study Master Thesis Intern — Feb 2024 – Jul 2024

Project: Predicting the Directional Movement of the Tunisian Stock Market Index Using ANNs and SVMs
BH BANK

- Developed predictive models using Artificial Neural Networks and Support Vector Machines
- Engineered features from historical stock data
- Preprocessed time-series data and optimized hyperparameters for improved accuracy

End-of-Study Licence Intern — Mar 2022 – May 2022

Project: Market research and credit risk management
QNB BANK

- Assisted in credit decisions and created amortization schedules for personal and professional loans.
- Handled banking operations: cards, deposits, withdrawals, and transfers.
- Analyzed 10 unpaid loans post-COVID, segmented clients, and diagnosed 4 defaulted cases.

Projects

Project: AI-Based Research Paper Analyzer & RAG Q&A System — Ongoing

- Exploring methods to extract and process text from multi-format research documents (.docx, .pdf, .csv, .xlsx).
- Experimenting with vector embeddings, retrieval-augmented generation (RAG), and LLM-based summarization and translation.
- Handling multilingual documents and structured data (tables/charts) with creative NLP techniques.
- Skills applied: Python, NLP, LLMs, embeddings, vector databases, text summarization, multilingual processing.

Project: Fraud Prediction Using Logistic Regression
- Used logistic regression to predict fraud; handled data preprocessing and feature selection
- Programming language: R

Project: Eigenvalue Problems and Their Application to the Theory of Vibrations
- Focused on eigenvalue problems and their relevance to vibration theory in mechanical systems.

Project: Extraction and Analysis of Opinions on COVID-19 Vaccines Using the 'Facebook' Platform
- Used Facepager to collect public Facebook data related to COVID-19 vaccines.
- Analyzed vaccine opinions.

Social Activities

IndabaX Tunisia Hackathon: SUP'COM 2024
- Participant – AI for Dental Diagnostics: Object Detection Challenge

CREMMA: School and Workshop on Biomathematics 2023
- Dynamic Population: Stochastic Analysis and Application Laboratories.

FST Hackathon 3.0 2022
- Participant – AI for Real Estate Price Prediction in Tunisia

Technical Skills

- **Statistical Analysis:** Inferential Statistics, Stochastic Calculus, Probability Theory
- **Financial & Actuarial Mathematics**: Risk Modeling, Pricing Theory, Time Series Analysis
- **Optimisation Techniques:** Linear and Non-linear Optimisation, Gradient-Based Methods
- **Programming Languages:** Python (SciPy, Scikit-learn, TensorFlow, yfinance, etc.), R
- **Data Visualization**: Power BI, Matplotlib, Seaborn
- **Machine Learning & AI**: Supervised and Unsupervised Learning, Deep Learning

Languages

- Arabic – *Native*
- French – *Intermediate*
- English – *Upper Intermediate*