Nossaiba Kheiri

(929) 684-8424 |*New York, NY*| **website :** https://nossaiba-kheiri.github.io/portfolio/ | nk3098@columbia.edu

EDUCATION

Columbia University - School of Engineering & Columbia Business School *New York, NY*

MS, Business Analytics (Concentration: *Analytics Algorithms and Methodology)* *Dec 2024*

IEOR Student Award 2024, IEOR Student Ambassador

Teaching Assistant: (Phd) Computing For Business Research, Machine learning in high-dimensional data.

Relevant Coursework: Reinforcement Learning in information systems (EECS), Fundamental Analysis, Model & Trade Derivatives Math, Term Structure & Credit models, Optimization Models/Methods, AI in Finance, Operations Strategy, Analytics in Action, Statistics/Simulation, M&A(CBS audit), Data Analytics

University Of California, Berkeley *Berkeley, CA*

Mathematics and Economics Academic Exchange *Aug 2022-Dec 2022*

Relevant Coursework: Stochastic Processes, Asset pricing/portfolio Management, Economic Research, Risk seminar

École Polytechnique *Paris, FR*

Bachelor of Science, Mathematics and Economics, Minor in Computational Mathematics *Jul 2023*

Relevant coursework: Measure and Integration, Convex Optimization Optimal Control, Probability Theory, Topology, Differential Calculus

SKILLS

Programming: Python, R, Azure Cloud functions, Pytorch, C++, Gurobi, Stata, JAX, SQL, CUDA, PQL (Celonis), GIT, TensorFlow, Scikit-learn, Keras, ArcGIS, Spark, Access, Bash, Excel VBA, OpenAI Gym

Languages: English, French, Arabic, Italian

EXPERIENCE

Bloomberg| Quantitative Research Student Analyst (AI Applications in Finance Bloomberg-Columbia Project) *Jan 2024-Dec 2024*

- Optimized the fine-tuning of the 11-billion-parameter T5 XXL model (DeepFloyd-IF's diffusion model) for illusion generation with Low-Rank Adaptation (LoRA), achieving an 86% reduction in trainable parameters per layer.
- Enhanced the illusion generation by applying Online Reinforcement Learning with an LLM reward model to address failure modes in diffusion architecture and illusion-pairing mechanisms.
- Trained and validated the model via multi-adapter techniques, producing 400 optical illusions across 183 diverse prompt pairs.
- Selected to present the **poster** at the **10th Bloomberg-Columbia ML in Finance Conference.**

Ryse | Quantitative Portfolio Analyst Intern *Boston, MA Jun 2024-Aug 2024*

- Deployed serverless RAG-LLM on Azure Cloud tested on a $1.6B sovereign bond portfolio.
- Designed and backtested a 10-year Monte Carlo simulation using Granger causality to forecast asset co-movements and volatility, improving portfolio risk assessment performance/speed by 2.6x for the trading strategies.

Soufflet Négoce by InVivo|Commodities trading/Model auditing Intern *(€3.9B in Trading Revenue)* *Paris, FR Jul 2022-Aug 2022*

- Engineered GARCH-based enhancements to Value at Risk (VaR) estimates, driving a +23% accuracy for commodities trading portfolios
- Integrated real-time predictive models with ArcGIS to visualize wheat hub dynamics, incorporating data via OpenWeatherMap API.
- Collaborated on auditing the consolidation of the Value at Risk (VaR) models (Parametric and Monte Carlo) in Excel and Murex for the Soufflet Négoce-InVivo M&A, presenting optimization proposals to senior leadership.

RESEARCH AND ACADEMIC PROJECTS

Celonis| Data Science Intern | Columbia MSBA Capstone Project *Jan 2024-May 2024*

- Deployed process mining techniques such as bottleneck identification and computationally optimal path, reducing loan approval process (CIP, risk assessment, CDD, ECDD) by 5 days for a Credit Union, translating into an extra profit of ~ $1.13M.

Kimmeridge Energy|Business Analyst/Engineering Team Lead ('Analytics in Action: Energy Arbitrage) *Aug 2023-Dec 2023*

- Implemented an Optimization model on Gurobi evaluating energy arbitrage opportunities for battery placement in the US grid for ~15000 nodes, resulting in +$1.3M revenue using dynamic programming.

Thesis: Index concentration using reinforced processes|UC Berkeley (with Prof Lisa Goldberg) *Jan 2023-Jul 2023*

- Generated hypothetical indexes matching empirical market cap-weighted indexes for stocks in the S&P 500 using Reinforced urn processes to model index concentration. The initial simulation of market entries/exits with the Barabasi model is extended using a Polya urn approach.

XOptimizer- Optimization software in C++ *Oct 2021*

- Collaboratively built optimization software in C++, integrates Christofides, Dijkstra's with Fibonacci Heap, K-means, Nearest Neighbors algorithms. Achieved a 35% reduction in route planning (computation time) for logistics companies to save 20% on operational costs.

ACHIEVEMENTS-ROLES AND POSITIONS

Mathematics Olympiad- Regional, **Global Shaper-World Economic Forum, YCP Scholar,** Finalist team**"EuroTeQaThon", Morocco's top 3 academic performance (Sc. Math), Awarded by the Ministry of Education and the Mayor of Casablanca**
UC Berkeley Datathon for Social Good|Team lead of the Environmental Justice track (2nd place)
***Columbia VC Society (Partnerships), Columbia AI Society*,** Partnership manager (**AlgoTrading** at L'X), **Presenter** Econ Reading Group