Sofian Othmane

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EDUCATION

University College London (UCL) ***London, United Kingdom***
MSc Data Science and Economics
Classification: Distinction (Predicted)
Thesis: Systemic Risk Prediction Using Deep Graph Neural Networks
Key Coursework: Machine Learning in Economics, Statistical Programming, Numerical Optimisation, Statistical Learning, Time-Series Econometrics, Data Science Theory, Econometrics

King's College London (KCL) ***London, United Kingdom***
BA Economics
Thesis: Vector Error Correction Model to quantify Brazil's long-term relationship between renewable energy uptake and productivity.

WORKEXPERIENCE

Bank of International Settlements (BIS) Innovation Hub **London, UK**
Machine Learning Researcher *02/2025 - Present*

- Collaborative thesis project using new deep learning methods to predict Systemic Risk in financial networks
- We modelled over 1000 financial institutions, using high dimensional data, within the UK-EU space in graph form
- Optimised a GNN fitted on the graph, then simulated shock propagation on the system to test macroprudential policies
- 15% increase in early warning risk detection compared to traditional statistical systemic risk metrics

Bank of Communications BBM **Rio de Janeiro, Brazil**
Quantitative Analyst *07/2023 – 10/2023*

- Enhanced 'Crystal Ball' macroeconomic predictive model providing trading signals through advanced feature engineering and regularization techniques (Lasso, Elastic Net)
- Implemented probabilistic programming for data simulation and sampling to improve model robustness and accuracy
- Automated data pipeline through API integration, reducing manual intervention from 3 steps to 1 and streamlining model predictions
- Reduced model's mean squared error (MSE) by 7% through optimization of feature selection and preprocessing techniques
- Collaborated with trading desk, economists, and quantitative analysts to refine model outputs and enhance trading signal accuracy
- Specialized in emerging markets analysis (Brazil, China) to improve macroeconomic forecasting precision for trading strategies

Manesolutions LTD **London, UK**
Co-founder & Data Science Consultant *06/2024 - Present*

- Co-founded a data science consulting company providing custom API-integrated solutions for small businesses
- Developed scalable software products, including decision support systems and automation tools, reducing manual workloads by 25%
- Designed and implemented RESTful APIs for data processing, predictive analytics, and business intelligence integration
- Managed and optimized client databases, ensuring data integrity, security, and efficient data pipeline implementation

Driven Tutors **London, UK**
Mathematics and Economics tutor *05/2024 - Present*

- Tutoring A-Level Mathematics and Economics students.
- Designed customized lesson plans and practice materials tailored to individual student needs, focusing on areas such as algebra, calculus, microeconomics, and macroeconomics.

PROJECTS

Q-Learning for Black-Scholes Hedging Project

- Implemented a Q-Learning approach to optimal hedging under the Black-Scholes framework, adapted from "Machine Learning in Finance" methodologies
- Developed Monte Carlo simulations for stock price paths using Geometric Brownian Motion (GBM) with Python, handling complex spline-based feature engineering
- Applied fitted Q-iteration with off-policy learning to determine optimal hedging strategies, using function approximation with B-spline basis functions
- Engineered a dynamic programming solution comparing Q-Learning results with traditional Black-Scholes delta hedging
- Created vectorized implementations for computational efficiency, reducing runtime by over 90% compared to loop-based approaches
- Visualized and analyzed the convergence of hedging strategies and Q-function approximations using matplotlib

AWARDS

University of Cambridge, Churchill College Economic Prize **2019**

SKILLS AND INTERESTS

- Technical: Python, R, SQL, MATLAB, Probability Theory | Interests: Semi-Professional Football Player