BRUCE LAU

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EDUCATION

M.Sc Risk Management and Financial Engineering, Imperial College London **09.2022 – 09.2023**
Predicted: Merit
Relevant modules: Machine Learning for Finance, Text Mining, Empirical Finance, Financial Engineering, Advanced Options Theory, Stochastic Calculus

B.Eng Hons Computer Science and Electronics, University of Bristol **09.2019 – 07.2022**
Achieved: Second-Class Honours (First Division)
Relevant modules: Algorithms, Data-Driven Computer Science, Discrete Mathematics, Engineering Mathematics, Computer Systems, Signals and Systems

WORK EXPERIENCE

TTM Technologies **Hong Kong, China**
Data Analyst Intern **06.2021 – 09.2021**

- Reduced PCB manufacturing costs by 60% by optimising production efficiency
- Developed a scalable supervised FNN model to forecast defect rates, minimising the required overproduction buffer
- Achieved a 43% reduction in scrap output by optimising machine's operational parameters with DoE and RSM
- Automated a data pipeline with Python and Shell scripting, generated Excel reports, saved ~35mins manual labour
- Published documentation and reports for new programmes, research and standard manufacturing procedures
- Led and coordinated cross-department meetings tackling manufacturing problems, reviews, and improvements

Bank of East Asia **Shanghai, China**
Fixed-Income Intern **03.2021 – 04.2021**

- Conducted market research on OTC fixed-income transactions >¥50m in China's manufacturing sector
- Leveraged Value-at-Risk and Expected Shortfall methodologies for risk assessment to identify and quantify tail risks
- Utilised K-Nearest-Neighbours algorithm with historical data to estimate probability of default
- Improved data pipeline speed by 34% via matrix computations for historical simulation and stress testing
- Produced concise reports of prior quarter trades featured on BEA's social media and distributed to clients

PROJECTS

Stochastic Process Fitting **09.2023 – 10.2023**

- Built module for fitting stochastic processes (GBM, OU, CIR, and Heston model) to time-series data for simulation
- Fitted models with Methods of Moments, Least Square calibration, and Maximum Likelihood Estimation

Exotic Options Pricing **08.2023 – 09.2023**

- Developed a numerical pricing module for exotic options including American, Asian, Barrier, and Look-back options
- Simulated Merton's and Kou's Jump diffusion models for pricing path dependent options
- Solved Black-Scholes PDE's with different Finite Difference Methods schemes - implicit, explicit and crank Nicolson

Market Neutral Trading Strategy **05.2023 – 08.2023**

- Obtained annual PnL of 72% and 1.16 Sharpe ratio (back-tested) through a robust delta-neutral short volatility strategy
- Forecasted volatility of SPX with GARCH model and linear stochastic factor model
- Executed option strategies such as short strangles, short straddles, long butterflies and long iron condors

NLP Sentiment Analysis **02.2023 – 03.2023**

- Led a 5-member team to develop an NLP model predicting changes in implied volatility of top tech stocks using tweets
- Achieved an AUC of 0.61 with an ensemble model consisting of LASSO, XGBoost and Google's BERT model
- Cleaned and processed 7GB of data with Ngrams and word2vec embedding for sentiment analysis of retail traders

ACHIEVEMENTS

Level 4 Diploma in Applied Finance (Amplify Trading) **12.2022**

- Selected from ~120 students to compete in Amplify Trading's 'Elite Traders Challenge", against top traders from ICL, Oxbridge, LSE, and LBS

IPC Asia Scholars Programme First-Class (TTM Technologies) **09.2021**

- Awarded scholarship for presenting new manufacturing processes to APAC general managers and board directors

ADDITIONAL SKILLS

Technical Skills: Python, R, C, Go, Java, SQL, git, TensorFlow, SciPy, Matplotlib, NLP (Word2Vec, GloVe, BERT), LaTeX, Probability and Statistics, Stochastic Calculus, PDE, Linear Algebra

Languages: English (native), Cantonese (native), Mandarin (native)

Visa: Awaiting Graduate Work Visa | Eligible for BNO visa (indefinite right to work in the UK)