# Kun Zhao

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## WORK EXPERIENCE

**Deutsche Bank** **London, UK**

*Vice President, Quantitative Strategist* *Nov 2021 - Present*

- Developed and continuously enhanced core components of the bank's valuation and risk framework inside the proprietary Kannon platform, streamlining analytics across rates, volatilities, and bonds
- Engineered portfolio replication and construction methods with capital risk efficiency as a primary objective, integrating portfolio optimization algorithms for strategic liquidity solutions
- Provided parameter-specific market data analysis, including exploration and initial feature extraction of large-scale vendor data and internal transaction-level trade data, uncovering persistent patterns and reducing noise
- Designed and implemented new functionalities actively in the risk platform in Linux environment, e.g. expanding the capabilities to include minor ccys in APAC/GEM desks
- Built the centralised Python interface for dynamic market data retrieval inside in-house Kannon platform, enabling data hierarchy enforced on the fly, and real-time risk metric computation
- Onboarded new risk parameters within rates (e.g. cross-currency swaps) under current cost calculation framework inside Kannon, leading to capital reduction of ~6 million
- Led production-level backtesting methodologies to monitor input and output data pipeline, exception reporting and visualisation across risk parameters
- Explored, built and tested novel methodology for risk calculation of concentrated positions by incorporating alternative dataset such as trading volume and bid offer data analysis into entire optimisation scheme, actively engaging cross-functionally with front office legacy methodology owners and internal model validation team
- Implemented in-house pre-trade analysing tools and performed scenario and impact analysis for desk quants and senior traders, to contribute to the trading strategies for rates
- Monitored regularly the performance of quantitative systems inside production environment, diagnosing and resolving production-level issues or adjustments in real-time, ranging from upstream market data update to end of day curve building and vol surface calibration
- Researched and implemented the linear programming and evolutionary genetic algorithm optimisation methodology across different risk metrics

**Lloyds Banking Group** **London, UK**

*Quantitative Researcher* *Oct 2017 - Nov 2021*

*Associate Director, Portfolio Analytics*

- Built pricing framework for structured credit products, including synthetic CDOs based on internal credit reference portfolio, providing continuous model development in C#
- Provided portfolio optimisation analysis in order to achieve maximal capital relief benefits subject to contractual, regulatory and capital constraints during credit portfolio construction and replenishment
- Performed large-scale analysis of dataset provided by 3rd party vendors (Markit/Bloomberg) to aid decision making in model development, by applying statistical and machine learning techniques to extract key features and benchmark against regression analysis
- Built end-to-end custom valuation tools for illiquid assets, from research/prototype to implementation and full-scale production/deployment using .NET development framework
- Implemented client server database APIs by collaborating with .NET C# developers, automating market data population across all valuation models accelerating end-to-end model updates
- Trained and functionally managed two junior members of the wider team

*Associate, Rates Trading*

- Developed pricing framework and risk metrics for interest rate exotics (Range Accruals, Bermudan Swaptions) in the core C++ quant library, and research into the relevant enhancement methodology
- Researched into the execution optimizers feeding into desk algo and engine to assist with flow rates business
- Implemented robust toolset for rates trading, including parametric curve construction for pricing, scenario analysis and risk visualisation, streamlining desk operations by automating workflows
- Provided desk-aligned analytics and advisory on model-specific logic, post-trade and client attributes

**Imperial College London** **London, UK**
*Graduate Teaching Assistant, Mathematics* *Sept 2014 - Sept 2015*

## EDUCATION

**Imperial College London**
*Ph.D. in Fluid Dynamics*

- **Research Project:** Mathematical modelling of dynamics of thin liquid film over a spinning disk, characterised by coupled partial differential equations, solved by implementation of numerical method (Finite Difference) using object-oriented C++
- **Core Focus:** PDE, ODE, Finite Difference, Monte Carlo, Neural Networks

**Imperial College London**
*MSc in Advanced Chemical Engineering*

**Lanzhou University**
*BSc in Chemistry*

## SKILLS

- **Quantitative Modelling:** Finite Difference Methods, Monte Carlo Simulation, Partial Differential Equations, Factor models
- **Programming**: Python, C++, C#, R, Matlab, SQL
- **Machine Learning**: Regression Analysis, Feature Extraction, Neural Networks
- **Optimisation**: Portfolio Construction, Linear Programming, Evolutionary Genetic Algorithms
- **Data & Visualisation:**: Pandas, NumPy, Scikit-learn, Plotly
- **Risk & Valuation:** Synthetic CDOs, Interest Rate Exotics, Credit Derivatives, Cross-Currency Swaps

## CERTIFICATIONS

- Machine Learning - University of Stanford, Coursera.
- Pricing Options with Mathematical Models – Caltech, edX
- Optimization Methods in Asset Management – Columbia University, Coursera
- C++20 Mastery – Coursera
- Machine Learning with Python, from Linear Models to Deep Learning – edX
- Data Structures and Management with MySQL - Coursera
- AZURE Data Science Associate
- Data Visualization using Plotly - Coursera

## LANGUAGES

Mandarin – Native | English - Bilingual

## INTERESTS

Skiing, climbing, tennis, cooking