

Xiaochuan Yang, Ph.D.

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Summary

Highly motivated and accomplished Data Science Lecturer and Researcher with a Ph.D. in Mathematics. Expert in probability theory, stochastic processes, machine learning, and statistical models. Published [21 papers](#) in reputable journals and conferences. Passionate about applying mathematical models to solve real-world problems in finance and technology sectors.

Work Experience

- **Researcher and Lecturer in Data Science** (2021-Present) Brunel University, London, UK
 - Teaching quantitative courses including Python programming, machine learning, deep learning, data analytics, time series analysis, stochastic calculus, statistical models
 - Supervising a Ph.D. student in the field of credit risk modelling with Hawkes processes
 - Publishing in the field of stochastic modelling, statistical analysis of stochastic processes
 - Organising industrial mathematics research seminars
 - Secured funding for research in the area of quantitative risk management
 - **EPSRC Postdoctoral Researcher** (2020-2021) University of Bath, UK
 - Published papers in the area of extreme value theory and central limit theorems
 - Conducted probability tail estimates for risk metrics such as VaR and shortfalls
 - **FNR Luxembourg-Singapore bilateral researcher** (2018-2020)
 - Published papers fundamental to risk modelling: high frequency statistics of Gaussian processes, point processes, extreme value theory, central limit theorems
 - Taught Partial Differential Equations (Master's course, University of Luxembourg), crucial for financial instruments pricing
 - **Assistant Professor** (2016-2018) Michigan State University, East Lansing, USA
 - Taught actuarial science fundamentals: probability and statistics
 - Published papers in statistics of Gaussian processes, Levy processes, and jump diffusions
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Professional Skills

- **Quantitative Risk Management Know-how:**
 - Stochastic Models: GARCH, EWMA, EVT, Point Processes, diffusions, factor model...
 - Dependency Modelling: Variance-Covariance, Mixture, Copula, Self-Excitement
 - Statistical Estimation of VaR, ES, EL, PD, LGD
 - Monte Carlo, Historical Simulation
 - Pricing: Stochastic Calculus, Semimartingales, PDE, QuantLib
 - Regulatory Approach: EBA guidelines, CRR, Basel III pillars, IRB, IFRS 9, IPEV guidelines
- **Technical Skills:**

- Advanced Python Programming; Git version control
- Proficient in R, SAS, Excel, SQL
- Mastery of Computing Libraries: `numpy`, `numba`, `scipy`, `jax`
- Analytics and Machine Learning: `pandas`, `scikit-learn`, `PyTorch`, `XGBoost`, `SHAP`, `matplotlib`, `seaborn`

- **Research Skills**

- Acquired a robust analytical mindset through 10 years of research in quantitative fields
 - Critical evaluation of existing methodologies and development of original ideas for new challenges
 - Ability to quickly learn *any* new field
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Consulting Experience

- **Defence Data Research Centre & Alan Turing Institute** (2023) Exeter, UK

- Topic: toxin diagnosis by cellular morphology; challenge posed by Defence Science and Technology Lab
- Managed the entire pipeline from data processing to model validation, using tools like `pandas`, `sklearn`, `XGBoost`, `PyTorch`; Explained model decision with `SHAP`

- **NHS Rheumatology** (2021) Bath, UK

- Topic: Machine Learning for damage detection in Psoriatic Arthritis
 - Proposed physiological-based networks and clustering framework; clustered patients with similar diseases using vectorized data representation; investigated disease progression over time
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Education

- **Ph.D. in Mathematics** (2016) Université Paris-Est, Paris, France

- Thesis: “Dimensional properties of regularities of jump diffusion processes”
- Received a PhD thesis prize of \$6000 (one of 13 recipients in France that year)
- Funded by the DIM Scholarship from the Île-de-France region
- Jump diffusions widely used in modelling risk factors and emerging generative AI

- **Master in Applied Mathematics** (2013) Université Paris-Est, Paris, France

- Courses: stochastic calculus, PDE, interest rate models, Levy processes, non-parametric statistics, limit theorems, stochastic models, signal and image processing with wavelets, Python
- Bezout Scholarship recipient

- **Bachelor in Applied Mathematics** (2009) Jilin University, China (top 6 in mathematics)

- Courses: statistics, algorithms, differential equations, numerical analysis, C programming

- **French Language Training** (2011) Caen, France. DALF Level C1.

Languages

- **Bilingual:** English, Chinese
 - **Level C1:** French
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