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 manangement
- **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 processe, point processes, extreme value theory, central limit theorems
  - Taught Partical Differential Equations (Master's course, Univeristy 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 guidlines
- **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**
  - Aquired a robust analytical mindset through 10 years of reseasrch in quantitative fields
  - Critical evaluation of existing methodologies and development of original ideas for new challenges
  - Ability to quickly learn *any* new field

Consulting Experience

- **Defence Data Research Centre & Alan Turing Institute** (2023) Exeter, UK
  - Topic: toxin diagonosis 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; investiaged 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 diffuions 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.

Langueges

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