Yanpei Cai

+44(0) 7983251199 • ac.mathsaholic@gmail.com • yanpei.cai@hertford.ox.ac.uk • linkedin.com/in/yanpei-c-982863134/

Education

Mathematical Institute & Hertford College, University of Oxford — Oxford, United Kingdom

Master of Science in Mathematical Sciences (OMMS/Part C) — *October 2022 - June 2023*

Classification: Distinction (Expected)

Core Courses: Stochastic Differential Equations, Stochastic Analysis & PDEs, Perturbation Methods, Probabilistic Combinatorics, Networks, Probability and Statistics for Network Analysis, Bayes Methods, Simulation Methods

School of Mathematical Sciences, Queen Mary University of London — London, United Kingdom

Bachelor of Science with Honours in Mathematics and Statistics — *September 2019 - June 2022*

Classification: First Class Honours (Degree Average Mark: 92/100, Top 1%)

Core Courses: Calculus, Linear Algebra, Probability and Statistics, Differential Equations, Complex Variables, Statistical Modelling, Bayesian Statistical Methods, Random Processes, Complex Networks, Introduction to Machine Learning

Awards: Westfield Trust Prize (College Prize, Awarded for Outstanding Academic Achievement), Institute of Mathematics and its Applications Prize (School Prize, Awarded to Top 2 Graduates of School of Mathematical Sciences)

Research Experience

Record Statistics for Stock Prices (BSc Dissertation) — MTH6138 Third Year Project

Stochastic Processes, Random Walk Model, Generating functions, Sparre Andersen Theorem, Green's Functions — *January 2022 - May 2022*

- This project mainly focused on investigating the statistical properties of extreme events in stochastic processes.
- The exact result and asymptotic approximation of record rate and mean number of records for three different cases of discrete time series (1. a discrete time series of i.i.d. random variables; 2. a random walk with symmetric and continuous jump distribution; 3. a biased Gaussian random walk) were performed and tested with details.
- By examining the real-world financial data collected from Yahoo Finance with Python, one conclusion was made such that the record statistics of historical stock prices can be well-approximated by a Gaussian random walk with specific drift speed 0.075.

Random Walkers with Extreme Value Memory: Modelling the Peak-End Rule — Summer Research Project

Random Walk Model, Peak-End Rule, Extreme Value Theory, Fixed Point Analysis, Monte Carlo Simulations — *June 2021 - September 2021*

- This project mainly focused on reviewing and reproducing the results published by Dr Rosemary J Harris in 'Random Walkers with Extreme Value Memory: Modelling the Peak-End Rule' with Python.
- We considered a random walk model inspired by the psychological heuristic on the "peak-end rule" for remembered experience, where the probability of moving left or right depends on the maximum value of a random variable associated to each time step and the noise level in the decision. In particular, we used this framework to investigate whether increased noise in the model always leads to more switching between decisions.
- We revisited possible finite-time effects as well as different classes of long-time behaviour depending on the distribution of past experience by employing the characteristic largest value of extreme value theory, and compare the predictions with simulations.

Work Experience

School of Mathematical Sciences, Queen Mary University of London — London, United Kingdom

Peer Mentor of Queen Mary Buddy Scheme — *August 2020 - March 2021*

- Provided peer mentoring support to new undergraduate students, facilitating their successful transition to university.
- Completed training in diversity and inclusivity, building a rapport and group facilitation.

Bright Network — London, United Kingdom

Participant of Internship Experience UK Programme — *July 2020 - August 2020*

- Gained valuable industry insights through a series of skills sessions on Investment Banking (Goldman Sachs and HSBC), Valuation Methodologies (Macquarie), Strategy Consulting (Bain & Company), Innovation in Consulting (Elixirr).
- Built upon transferable skills during seminars on Networking, Self-Management, Teamwork and Collaboration, whilst applying these learnings throughout the duration of the programme.
- Independently produced a 10+ page recommendation report for a world-leading airline company in the UK who wants to get into low-cost carrier market in East Europe. Assessed tracking of aviation industry and data gathered from Pandas and applied financial and valuation metrics such as EBITDA, dividend yield, gross profit margin, etc, evaluating developments and competitions of the carrier market and carrying out a analysis of two key competitors selected for the client for potential acquisition.
- Independently produced a 10+ page consulting proposal for a UK Chocolate & Confectionery company that dives into situation

analysis into the macroeconomic environment over all industries, product's marketing strategy, budget analysis and optimisation, as well as examining external factors.

Skills

Technical Skills Python, R Programming, C++, LaTeX, MS Office Suite

Languages Mandarin Chinese (Native), English (Full Professional)

Memberships

Institute of Mathematics and its Applications Associate Member (ANIMA)

Royal Statistical Society Graduate Statistician

London Mathematical Society Associate (Undergraduate) Member