Ben Shah

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Education

University of Dundee
BSc. Mathematics (hons), *2021*
Catastrophic Event Analysis for Vortex Systems

University of Leicester
PhD. Mathematics, *2028*
Metastability & Tipping Point Analysis for the Earth

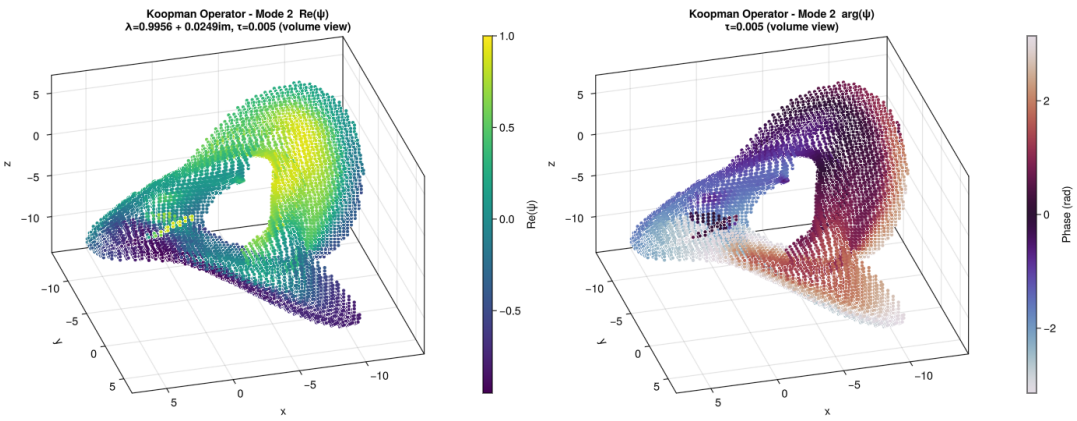
Kingsford School
GCSE, *2015*
Mandarin, Mathematics, Triple Science, Geography, Business

Wanstead High
A-Level, *2018*
Further Mathematics, Mathematics and Physics

Professional Experience

University of Leicester
Doctoral Researcher – Operator-Theoretic Modelling *Mar 2025 – Jan 2026*

- Developed an end-to-end operator-theoretic framework based on Perron–Frobenius and Koopman operators, using Ulam–Galerkin discretisation to quantify metastability, rare transitions, and tipping behaviour in stochastic dynamical systems.
- Validated stochastic simulations against Gibbs theory for gradient systems, confirming convergence of empirical invariant measures and correctness of SDE implementations.
- Identified metastable regimes, dominant transition pathways, and characteristic timescales via spectral analysis of finite-dimensional transfer operators.
- Designed FTLE (finite-time Lyapunov exponent) diagnostics and FTLE-guided seeding strategies to concentrate sampling along transport corridors, substantially improving statistical efficiency of operator estimates.
- Conducted large-scale ensemble experiments with up to 10^7 short trajectories, leveraging GPU acceleration and short-burst workflows to enable tractable high-fidelity sampling.
- Compared Gaussian (diffusive) and symmetric α-stable (heavy-tailed) stochastic forcing to characterise local versus nonlocal transport mechanisms and tail-event dynamics.
- Quantified uncertainty and discretisation bias using bootstrap resampling and systematic convergence studies over ensemble size, grid resolution, and lag time.
- Produced fully reproducible computational pipelines with documented configurations (domains, timesteps, noise amplitudes, grids, seeds), and communicated results through technical reports and presentations.



Halvorsen system: Koopman reveals coherent transport and invariant structure under symmetric α-stable noise ($\alpha = 1.5$, $\sigma = 0.71$).

Love Ventures **Westminster**

Data-Driven Fellow (Investment Team) *Oct 2024 – Mar 2025*

- Developed and deployed real-time deal evaluation applications in JavaScript integrating external data sources like Spectre and Beauhurst, reducing manual screening time by 40% and accelerating investment decision-making.
- Designed portfolio prediction models increasing fund forecasting accuracy by 30% and optimising capital allocation strategies to raise ROI.
- Engineered custom tech-stacks to scrape LinkedIn data tracking VC investment trends, identifying emerging sectors, and uncovering white space opportunities in the market.
- Built and automated deal-sourcing dashboards enriching deal data with external APIs, discovering country of origin, ensuring EIS eligibility, and improving deal relevance identification by 25%.
- Automated analysis on founder profiles and startup news to pinpoint high-potential early-stage companies providing insights into market fit and increasing competitive advantage.
- Leveraged alternative data sources to generate market forecasts and predict capital flows contributing to a projected 15% increase in fund returns.

University of West London **Ealing**

Admissions Analyst *Nov 2023 – Feb 2024*

- Spearheaded data-driven initiatives boosting application processing efficiency by 30% and enabling faster decision-making.
- Automated application workflows using Excel macros and VBA reducing processing time by 80% and allowing the team to focus on high-priority tasks.
- Managed SQL databases to ensure GDPR compliance streamlining data retrieval and improving retrieval speeds by 30%.
- Delivered 15+ automation training sessions elevating team efficiency by 50% and fostering a culture of continuous improvement.

Isio Pensions (formerly KPMG) **Edinburgh**

Actuarial Analyst *Sep 2022 – Jan 2023*

- Supported actuarial valuations and routine calculations for defined benefit pension schemes, including member options and transfer value analyses.
- Prepared, cleaned and analysed scheme data using Excel/Python to ensure accuracy ahead of model runs and reporting.
- Assisted in the development and testing of actuarial models for projections and scheme funding analysis, under guidance of senior actuaries.
- Produced clear documentation and summary outputs of analysis for review by colleagues and for inclusion in client reports.
- Collaborated with team members to deliver work to deadlines and contribute to ongoing process improvement initiatives.

Queen Mary University of London **Whitechapel**

Planning Analyst *Apr 2022 – Jun 2022*

- Optimised scheduling processes improving scheduling utility by 20% and reducing conflicts.
- Applied discernment techniques to resource planning cutting last-minute scheduling changes by 15% and improving operational efficiency.

University of East London **Newham**

Admissions Analyst (International Markets) *Nov 2021 – Mar 2022*

- Enhanced application processing accuracy by 20% through the development of advanced Excel models driving improved admissions outcomes.
- Streamlined admissions processes in collaboration with UCAS improving efficiency by 15% and shortening the overall application timeline.
- Trained 25+ staff on Paperless systems reducing training time by 40% and increasing system adoption across departments.

University of East London **Newham**

Junior Admissions Analyst *Jun 2021 – Nov 2021*

- Improved data accuracy by 30% through effective management of student records using SITS enhancing data integrity for future reporting.
- Reduced scheduling conflicts by 25% by optimising interview schedules contributing to smoother operations during peak periods.

PricewaterhouseCoopers **London**

Insights Analyst *Jul 2018 – Sep 2018*

- Supported actuarial and tax teams by applying data analysis techniques to large datasets, contributing to internal research and client-facing insights.
- Conducted structured research on competitor practices, focusing on associate retention and incentive strategies, and presented findings to the wider team.
- Assisted senior managers in reviewing and analysing client reports, developing an understanding of professional analytical standards and methodologies.
- Contributed to data-driven discussions on client engagement and retention strategies during internal workshops and team meetings.
- Designed and deployed a departmental feedback questionnaire using Google Forms, supporting initiatives to improve productivity and associate satisfaction.

Skills

Programming Languages: Python, R, Julia, SQL, MATLAB, Maple, VBA, JavaScript, HTML5

Frameworks & Tools: AWS S3, Babylon.js, Plotly.js, NumPy, Pandas, TensorFlow, Excel (Macros), Google App Script

Languages: English (native), Mandarin

Professional & Research Projects

Comprehensive Investment Analysis Using Python and JavaScript *Oct 2024 – Mar 2025*

- Built risk-adjusted scoring models reducing deal evaluation time by 20% and improving decision-making consistency by 35%.
- Integrated financial, market, and founder data from platforms like Sifted and Spectre enabling a comprehensive investment pipeline.
- Normalised data schemas across diverse sources enhancing model accuracy by 25% and ensuring seamless cross-system compatibility.
- Designed interactive dashboards mapping competitor VC activity identifying investment gaps and emerging opportunities.
- Automated deal evaluation processes cutting manual screening time by 40%, allowing investors to focus on strategic decisions.

BURS: Surveillance and Temporal Analysis Using Machine Learning *Jul 2024 – Oct 2024*

- Engineering advanced regime tracking algorithms for surveillance targeting a 25% accuracy improvement over state-of-the-art models.
- Extended tracking methodologies to latent high-dimensional data analysing schema patterns to enhance cross-domain adaptability.

JSON-Based Dynamic Database Integration Using Python and JavaScript *May 2024 – Oct 2024*

- Engineered a choreography visualisation platform in Babylon.js synchronising sprite animations with music beats at 90% accuracy, boosting user engagement by 40%.
- Developed Python scripts converting MIDI to JSON ensuring schema alignment and improving data processing efficiency by 50%.
- Implemented real-time camera movements and dynamic scene transitions maintaining smooth performance under high data loads.

Vortex Dynamics and Chaos Modelling Using Python and HTML5 *Apr 2024 – May 2024*

- Optimised large-scale simulations using vectorised operations enhancing computational efficiency and reducing processing time.
- Created interactive and static visualisations in Matplotlib and PlotlyJS showcasing chaotic behaviour in vortex dynamics.

Hobbies

Travelling: Travelled across 15+ countries, documenting cultural experiences and insights through online platforms.

Photography: Captured and edited 10,000+ images, receiving consistent positive feedback from online communities.

Cycling: Completed 120+ miles of urban cycling exploration, demonstrating endurance and route planning.

Music Production: Produced 30+ original music tracks and 4 short films, engaging an audience of 1,000+ viewers.

Events Management: Hosted and coordinated London-wide networking events over 4+ years, managing logistics, attendees, and stakeholder engagement.

Tutoring: Delivered one-to-one and small-group tutoring to 15+ students in GCSE English, Mathematics, and Science, supporting academic improvement.