Doungporn “Sam” Wiwatanapataphee

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Location	Perth, Western Australia (Permanent Resident)
Language	Thai (Native), English (Fluent)

Sessional academic in Mathematics and Statistics with a strong foundation in Data Science, Actuarial Science, and Applied Mathematics. Currently completing a PhD in financial modelling and energy optimisation, with research spanning fractional differential equations, space-time modelling, and blockchain-based smart grid systems. Skilled in data-driven optimisation using R, Python, and MATLAB. Research interests include Big Data Analytics for Smart Grids, Multifractal Models in Finance, and AI-based Risk Management under market uncertainty. Committed to interdisciplinary innovation at the intersection of mathematical modelling, simulation, and intelligent systems.

WORK EXPERIENCE

2023 – Sessional Academic

Curtin University – Mathematics & Statistics Discipline

I have taught eight undergraduate units in economics, mathematics, finance, and data science. My teaching integrates actuarial and statistical methods with real-world applications.

	Subject	Role
2024 –	**Economics** Designed and delivered curriculum for Economics, focusing on micro/macro concepts and policy modelling. Led lectures, coordinated assessments, and incorporated business strategy applications for international cohorts.	Lecturer-in-charge
2025 –	**Supply Chain Modelling and Optimisation** Coordinated and taught Supply Chain Modelling, integrating forecasting, logistics optimisation, and stochastic models with applications in industries.	Lecturer-in-charge
Semester 1 2025	**Introduction to Scientific Data Analysis** Delivered lab sessions and guided student projects in Scientific Data Analysis, using R and Excel to teach foundational statistical and data visualisation skills.	TA (Computer lab)
	Introduction to Probability and Data Analysis Facilitated practical sessions in Probability & Data Analysis, with emphasis on statistical inference and probability distributions.	TA (Computer lab)
Semester 2 2024	**Financial Engineering 1** Delivered tutorials for Financial Engineering 1, supporting students' understanding of asset pricing, stochastic models, portfolio construction, and risk-neutral valuation.	TA (Tutorial)
	Accelerated Mathematics for Engineers Conducted problem-solving workshops on calculus and linear algebra. Tailored teaching for engineering students with varied math backgrounds.	TA (Workshop)
	Calculus for Engineers Led MATLAB-based tutorials for Calculus for Engineers, guiding students through differential equations and optimisation techniques.	TA (Computer lab)
	Linear Algebra and Statistics for Engineers Facilitated R and MATLAB-based labs in Linear Algebra and Statistics, covering data analysis and statistical inference with engineering applications	TA (Computer lab)
Semester 2 2023	**Foundations of Calculus** Led interactive workshops in Foundations of Calculus, developing core knowledge in differentiation and integration, while mentoring 1st-year students through core math problems.	TA (Workshop)

Feb – Nov 2018 **Research Assistant** — **Curtin University – Mathematics & Statistics Discipline**

Conducted applied mathematical modelling using Finite Element Methods to assess bridge structural stability, contributing to a published paper in 2019.

Dec 18 – Feb 19 **Intern Researcher** — **Thanachart Insurance PCL**

- Applied statistical modelling techniques to analyse customer retention and renewal patterns in motor insurance. Conducted risk analysis and evaluated loss ratios, integrating actuarial principles to guide business decision-making.
- Created dynamic Tableau dashboards to visualise key performance indicators, supporting strategic insights for underwriting, claims analysis, and executive reporting.

EDUCATION

September 2025 **PhD in Mathematics and Statistics** — **Curtin University**
Research Training Program (RTP) Scholarship Recipient
Thesis title**:** Blockchain-based Renewable Energy Trading and Storage Optimisation

Jun 2021 **Master of Data Science with Distinction** — **The University of Western Australia**

Dec 2018 **Bachelor of Science (Actuarial Science)** — **Curtin University**

CERTIFICATIONS & QUALIFICATIONS

2018 - 2021 **Foundation program** — **Actuaries Institute Australia**
CT1 Financial Mathematics; Membership since 2018
CB1 Business Finance;
CS1 Actuarial Statistics;
CB2 Business Economics;
CM2 Financial Engineering and Loss Reserving

2025 **MATLAB Onramp** — **MathWorks**

2024 **AI Intensive Bootcamp** — **VP Akkodis Academy Australia**

2020 **Python Essential Training** — **LinkedIn**

2018 **Statistical Tools for Risk Modelling** — **Thammasat University**

SKILLS

Analytical Tools

- Mathematical & Statistical Modelling — ANSYS, MATLAB, Python, R
- Actuarial Modelling — Time series forecasting, stochastic processes, risk modelling
- Data Analytics — Tableau, Excel (VBA), SQL
- Insurance Analytics — Loss modelling, customer retention analysis, KPI dashboards
- Simulation & Optimisation — Monte Carlo simulation, supply chain modelling

Teaching & Educational Skills

- Curriculum Design — Developed and coordinated units in economics and optimisation
- Assessment & Student Engagement — Delivered tutorials and workshops; mentored students in applied projects
- Learning Platforms — LMS tools (Blackboard, Moodle)
- Education Theory — Familiar with contemporary pedagogy in quantitative and actuarial education

Web & Technical Development

- HTML, CSS, JavaScript
- Git, Shell, Unix/Linux environments
- LaTeX & Scientific Writing

RESEARCH INTEREST

- Finite Element Analysis for Real-world Problems
- Multifractal Models for Financial Time Series
- Optimisation of Battery Storage Systems using Big Data from Smart Grids
- AI-Based Financial Risk Management under Market Volatility

PUBLICATIONS

2019 Wiwatanapataphee, D., Khajohnsaksumeth, N. & Wu, Y.H. **Effect of beam joinery on bridge structural stability**. Adv Differ Equ 2019, 225 (2019). doi: 10.1186/s13662-019-2158-5

2025 Wiwatanapataphee, D., Wu, Y., Sawangtong, W. & Sawangtong, P. **Modeling Anomalous Diffusion and Volatility in the Australian National Electricity Market Using a Space-Fractional Black-Scholes Framework**[J]. AIMS Mathematics, 2025, 10(5): 12388-12420. doi: 10.3934/math.2025560

2025 (In press) Sawangtong, W., Wiwatanataphee, D. & Sawangtong, P. **Analytical Solution of Space-Fractional Black-Scholes Equation for European Put Option via Extended Caputo Derivative**.

CONFERENCES

2 - 6 Feb 2025 Gave a talk on the topic of "**Fractional Black-Scholes Model for Pricing Derivatives in the Australian Electricity Market**" at the ANZIAM 2025 Conference, Pacific Bay Resort, Coffs Harbour, NSW.

16 - 18 Dec 2018 Gave a talk on the topic of "**Effect of beam joinery on bridge structural stability**" at ICMA-MU 2018: The 2018 International Conference in Mathematics and Applications, The Century Park Hotel, Bangkok, Thailand.