ANGELOS DASSIOS

CONTACT

Address	Department of Statistics
	LSE
	Houghton St
	London WC2A 2AE
	UK
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JOB TITLE

Professor

EMPLOYMENT

1989-	Department of Statistics
	London School of Economics
1989	Department of Electrical Engineering
	Imperial College, London
1987-88	National Service
1987	Interamerican, S.A., Athens

QUALIFICATIONS

BA	Trinity College, Cambridge 1983
MSc	Imperial College, London 1984
PhD	Imperial College, London 1987

RESEARCH INTERESTS

Financial mathematics. Path dependent options. Quantile, Parisian and Asian options. Lévy models.

Stochastic calculus. Excursion theory.

Point processes. Doubly stochastic point processes. Hawkes processes. Dynamic contagion models. Applications in insurance.

Insurance mathematics. Ruin theory. Lévy models.

Stochastic simulation as appiled to financial and insurance mathematics. Exact simulation.

Non-parametric statistics. Tests of association.

A First Order Mixed Poisson Integer-Valued Autoregressive Model with Serially Dependent Innovations, 2022, to appear in the *Journal of Applied Statistics* (with Z. Chen and G. Tzougas)

Shot-noise Cojumps: Exact Simulation and Option Pricing, 2021, to appear in the *Journal of the Operational Research Society* (with Y. Qu and H. Zhao)

First Hitting Time of Brownian Motion on Simple Graph with Skew Semiaxes. 2021, to appear in *Methodology and Computing in Applied Probability* (with J. Zhang)

A Two-Phase Dynamic Contagion Model for COVID-19, 2021, to appear in *Results in Physics* (with Z. Chen, V. Kuan, J.W. Lim, Y.Qu, B. Surya and H. Zhao)

Random Variate Generation for Exponential and Gamma Tilted Stable Distributions, 2021, to appear in *Transactions on Modeling and Computer Simulation (TOMACS)* (with Y.Qu and H.Zhao)

Exact Simulation of Two-parameter Poisson-Dirichlet Random Variables, 2021, *Electronic Journal of Probability,* **26**,1-20 (with J. Zhang)

Exact Simulation of Ornstein-Uhlenbeck Tempered Stable Processes, 2021, to appear in the *Journal of Applied Probability* (with Y.Qu and H.Zhao)

Explicit Asymptotics on First Passage Times of Diffusion Processes, 2020, *Advances of Applied Probability* **52(2)**, 681-704 (with L. Li)

Parisian Time of Reflected Brownian Motion with Drift on Rays and its Application in Banking, 2020, *Risks,* **8(4),** 127 (with J. Zhang)

Exact Simulation of Truncated Lévy Subordinator, 2020, *Transactions on Modeling and Computer Simulation (TOMACS)* **30(3)**, (with J.W. Lim and Y.Qu), https://doi.org/10.1145/3368088

Azéma martingales for Bessel and CIR processes and the pricing of Parisian zero-coupon bonds , 2020, to appear in *Mathematical Finance* (with J.W. Lim and Y.Qu) https://doi.org/10.1111/mafi.12248

Exact Simulation of Gamma-driven Ornstein-Uhlenbeck Processes with Finite and Infinite Activity Jumps, 2020, *Journal of the Operational Research Society,* doi: 10.1080/01605682.2019.1657368 (with Y.Qu and H.Zhao)

Efficient Simulation of Lévy-driven Point Processes, 2019, *Advances of Applied Probability*, **51(4),** 927-966 (with Y.Qu and H.Zhao)

Exact Simulation of Generalised Vervaat Perpetuities, 2019, *Journal of Applied Probability,* **56(1),** 57-75, (with J.W.Lim and Y.Qu)

A Variation of the Azema Maringale and Drawdown Options, 2019, *Mathematical Finance,* **29(4)**, 1116-1130 (with J.W.Lim)

A Generalised CIR Process with Externally-Exicitng and Self-Exciting Jumps and its Applications in Insurance and Finance, 2019, *Risks,* **7(4),** 103 (with J.Jang and H.Zhao)

Exact Simulation for a Class of Tempered Stable and Related Distributions, 2018, *Transactions on Modeling and Computer Simulation (TOMACS),* **28(3)** (with Y.Qu and H.Zhao).

Moments of Renewal Shot-Noise Processes and Applications, 2018, *Scandinavian Actuarial Journal,* **8,** 727-752 (with J. Jang and H.Zhao)

Recursive formula for the double barrier Parisian stopping time, 2018, *Journal of Applied Probability,* **55(1),** 282-301 (with J.W. Lim)

Efficient Simulation of Clustering Jumps with CIR Intensity, 2017, *Operations Research,* **65(6),**(with H. Zhao).

Testing independence of covariates and errors in nonparametric regression, 2017, *Scandinavian Journal of Statistics,* **45(3)**, 421-443, *(with W. P. Bergsma and S.S. Dhar)*

An efficient algorithm for simulating the drawdown stopping time and the running maximum of a Brownian motion, 2017, *Methodology and Computing in Applied Probability,* **19(1),** 1-16, (with J.W.Lim)

A Generalised Contagion Process with An Application to Credit Risk 2017, *International Journal of Theoretical and Applied Finance,* **20(1),** 1-33, (with H. Zhao).

The joint distribution of Parisian and hitting times of Brownian motion with application to Parisian option pricing, 2016, *Finance and Stochastics*, **20(3)**, 773-804 (with Y. Zhang).

A study of the power and robustness of a new test for independence against contiguous alternatives, 2016, *Electronic Journal of Statistics,* **10 (1)**. pp. 330-351 (with W. P. Bergsma and S.S. Dhar).

An analytical solution for the two-sided Parisian stopping time, its asymptotics, and the pricing of Parisian options, 2015, *Mathematical Finance* doi:10.1111/mafi.12091 (with J.W.Lim).

A risk model with renewal shot-noise Cox process, 2015, *Insurance: Mathematics & Economics*, **65**, 55–65 (with J. Jang and H. Zhao).

A consistent test of independence based on a sign covariance related to Kendall's tau, 2014, *Bernoulli* , **20(2)**, 1006-1028 (with W. P. Bergsma).

A Markov chain model for contagion , *Risks* 2014, **2**, 434-455; doi:10.3390/risks2040434) (with H. Zhao).

Parisian option pricing: A recursive solution for the density of the Parisian stopping time, 2013, *SIAM J. Financial Mathematics*, **4(1)**, 599-615 (with J. W. Lim).

Stochastic boundary crossing probabilities for the Brownian motion, 2013, *Journal of Applied Probability*, **50(2)**, 419-429 (with X. Che).

Exact simulation of Hawkes process with exponential decaying Intensity, 2013, *Electronic Communications in Probability* , **18:0** http://ecp.ejpecp.org/article/view/2717 (with H. Zhao).

A risk model with delayed claims, 2013, *Journal of Applied Probability*, **50(3)**, 686-702 (with H. Zhao).

A bivariate shot noise process for insurance , 2013, *Insurance Mathematics and Economics*, **53(3)**, 524-532 (with J. Jang).

Ruin by Dynamic Contagion Claims, 2012, *Insurance Mathematics and Economics*, **51(1)**, 93-106 (with H.Zhao).

Double barrier Parisian options , 2011, *Journal of Applied Probability* , **48(1)**, 1-20 (with S. Wu).

A dynamic contagion process, 2011, *Advances in Applied Probability* , **43(3)**, 814-846 (with H. Zhao).

A double shot noise process and its application in insurance , 2011, J*ournal of Mathematics and System Science*. (with J. Jang).

Perturbed Brownian motion and its application to Parisian option pricing, 2010, *Finance and Stochastics* , **14,** 473-494 (with S. Wu).

On barrier strategy dividends with Parisian implementation delay for classical surplus processes, 2009, I*nsurance Mathematics and Economics*, **45**, 195-202 (with S. Wu).

The distribution of the interval between events of a Cox process with shot noise intensity, *Journal of Applied Mathematics and Stochastic Analysis*, 2008, Article ID 367170 (with J. Jang)

Bonds and options valuation using a conditioning factor approach , *Management Dynamics*, 2007, **7(2)**, 25-69 (with S. Basu).

The square root process and Asian options, *Quantitative Finance*, 2006, **6(4),** 337-347. (with J. Nagaradjasarma).

On the quantiles of the Brownian motion and their hitting times, 2005, *Bernoulli*, **11(1)**, 29-36.

Kalman-Bucy filtering for linear system driven by the Cox process with shot noise intensity and its application to the pricing of reinsurance contracts, 2005, *Journal of Applied Probability*, **42(1)**, 93-107 (with J. Jang).

Pricing of catastrophe reinsurance & derivatives using the Cox process with shot noise intensity, 2003, *Finance and Stochastics* , **7(1)**, 73-95 (with J. Jang).

Cox process with log-normal density, 2002, *Insurance, Mathematics and Economics*, **31(2)**, 297-302 (with S. Basu).

Interpreting the Beta-Geometric in comparative fecundability studies, 1998, *Biometrics*, **54(1**), 140-146 (with R. Crouchley).

Sample quantiles of additive renewal reward processes, 1996, *Journal of Applied Probability*, **33**, 1018-1032.

Sample quantiles of stochastic processes with stationary and independent increments and of sums of exchangeable random variables, 1996, *Annals of Applied Probability*, **6(3)**, 1041-1043.

The distribution of the quantiles of a Brownian motion with drift and the pricing of related path dependent options, 1995, *Annals of Applied Probability*, *5(2)*, 389-398.

Martingales and insurance risk, 1989, *Communications in Statistics, Stochastic Models*, **5(2)**, 181-217, (with P. Embrechts).

RECENT CONFERENCES

Parisian Option Pricing: A Recursive Solution for the Distribution of Parisian Stopping Times, Bachelier Finance Society, Seventh World Congress , Sydney, June 2012. (with J. W. Lim).

Dynamic Contagion Models: Applications in Finance and Insurance, Spring School in Financial and Actuarial Mathematics Liverpool 2013 - SSLAM 2013, April 2013, invited speaker.

Dynamic Contagion Models, 26th Greek Statistical Meeting "Statistics in Actuarial, Finance and Risk Management", Piraeus, May 2013, invited speaker.

Dynamic Contagion Models, 6th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2013), "Inference for counting processes", London, December 2013, invited speaker.

Brownian Excursions and Related Drawdown Options, Bachelier Finance Society, Eigth World Congress, Brussels, June 2014. (with Y. Zhang).

Diffusion Approximation of Bivariate Contagion Processes and Applications in Filtering, Bachelier Finance Society, Eigth World Congress , Brussels, June 2014. (with X. Dong).

Dynamic Contagion Models, 2nd European Actuarial Journal (EAJ) Conference, Vienna, September 2014.

Dynamic Contagion Models, Actuarial Teachers Meeting , Edinburgh, December 2014, invited speaker.

An Extension to the Azéma martingale and Drawdown Options, Bachelier Finance Society, Ninth World Congress , New York, July 2016. (with J. W. Lim).

Parisian Options, Truncated Levy Measures and Insurance mathematics, 21st International Congress on Insurance: Mathematics and Economics, Vienna, July 2017.

An Economic Bubble and Its First Hitting Time, Bachelier Finance Society, Tenth World Congress, Dublin, July 2018 (with L.Li).

A Two-phase Dynamic Contagion Model for Covid-19, University of Liverpool, Covid 19 and Insurance, October 2020, invited speaker.

The First order of Binomial Mixed Poisson Autoregressive Model, Virtual International Congress on Insurance, Mathematics and Economics, Illinois, July 2021 (with Z. Chen and G. Tzougas)

RESEARCH STUDENT SUPERVISION

PAST:

First supervisor unless otherwise indicated.

Ji-Wook Jang, 1998, *Doubly Stochastic Point Processes in Reinsurance and the Pricing of Catastrophe Insurance Derivatives*.

Sankarshan Basu, 1999, *Approximating Functions of Integrals of Log-Gaussian Processes: Applications in Finance*.

J Nagaradjasarma, 2003, *Path-dependent Functionals of Constant Elasticity of Variance and Related Processes: Distributional results and Applications in Finance.*

T H S Boafo-Yirenkyi, 2004, *Valuing Credit Spread Options Under Stochastic volatility / Interest Rates* (co-supervisor)

S. Nathan, 2005, *Derivative Pricing in a Markov-Chain Jump-Diffusion Setting*

C. Strom, 2007, *Pricing and Hedging in an Incomplete Interest Rate Market: Applications of the Laplace Transform*

S. Wu, 2009, *Excursions of Lévy Processes and its Applications in Mathematical Finance and Insurance*

A.Andrianova, 2009, Simulation of Temperature Time Series on the Long Term Scale with Application to Pricing Weather Derivatives (second supervisor)

D. Jimenez-Huerta, 2009, Stochastic Models and Methods for the Assessment of Earthquake Risk in Insurance (second supervisor)

T. Yamada, 2010, *Essays on Mathematical Finance: Applications of Moment Expansions and Filtering Theory (*co-supervisor)

X. Che, 2011, *Markov-type Models for Large-valued Inter-bank Payment Systems*

H. Zhao, 2012, *A Dynamic Contagion Process for Modelling Contagion Risk in Finance and Insurance.*

Filippo Riccardi, 2014, Stochastic Models for the Limit Order Book (MPhil) (co-supervisor)

J.W. Lim, 2014, *Parisian Excursions of Brownian motion and their Application in Mathematical Finance.*

Z. Chen, 2014, *Pricing and Hedging Exotic Options in Stochastic Volatility Models*. (co-supervisor)

Y. Zhang, 2015, *Brownian Excursions in Mathematical Finance.*

A. Habibnia, 2017, *Nonlinear forecasting using a large number of predictors.*

*S*hiju Liu, 2018, *Excursions of Risk Processes with Inverse Gaussian Processes and their Applications in Insurance*

T.Y. Ho, 2018, *On the Running Maximum of Brownian Motion and Associated Lookback Options*

L. Li, 2019, *First Passage Times of Diffusion Processes and Their Applications to Finance*

Y.Qu, 2019, *Simulation on Lévy subordinators and Lévy driven contagion models*.

X. Zhu, 2020, *Excursion Theory and Local Times for Bessel and Brownian Diffusions with Applications to Credit Risk*

J. Zhang, 2021, *Parisian Times, Bessel processes and Poisson-Dirichlet Random Variables*

PRESENT:

R.Blaser, Machine learning for high-dimensional data (second supervisor)

J. Tee, Multidimensional dynamic contagion.

Z. Chen, Dynamic Contagion models

IMPACT AND KNOWLEDGE EXCHANGE

The simulation model developed in my paper in the Electronic Communications in Probability has been featured by Wolfram MathWorld to raise awareness amongst practitioners.

An R package exists for the calculation of the Bergsma-Dassios taustar statistic so that it can be used by statisticians.

I have received many enquiries about the implementation of results in my paper on Asian options by quants in investment banks and hedge funds demonstrating it has an impact.

Several of my former PhD students are working in the financial sector influencing research.

TEACHING EXPERIENCE

Various undergraduate and postgraduate courses in probability, statistics, actuarial and fiancial mathematics. Most recent:

Actuarial Investigations: Financial.

Actuarial Mathematics: General.

Actuarial Mathematics: Life

Stochastic Simulation

Applied Stochastic Processes

An important aim of my teaching is to develop students' communication skills especially with other mathematically trained professionals that do not necessarily belong to the same field. Usually the term “communication skills” refers to communication with laymen; communication skills with other technically trained people is something often overlooked.

I have been the course director for the extremely successful Actuarial Science Programme for a long time and contributed to the design and revision of all courses in the proframme.

My teaching extends to PhD students as PhD programme director. In addition to many sessions to prepare them for and assist them with their research, I roffer them many tutorials enhancing their general education, making then acquainted with other research areas as well as general issues in insurance and finance. I also offer advice on how to hone their teaching and presentation skills. The success of this is evidenced by their successful careers subsequently in banking or academic institutions.

ADMINISTRATIVE DUTIES

Current:

2020-Today: Programme Dirstor Msc Quatitative Methods in Risk Management

2020-Today: Research Degrees Committee (Academic Board elected representative).

2020-Today: Graduate School Board of Examiners (Academic Board elected representative).

2015- Today: PhD Scholarships Panel, LSE (Academic Board elected representative).

2002- Today : Teaching committee, Department of Statistics, LSE.

Past service:

2014- 2019 : PhD Programme Director.

2014-2015: School working group on Appeals Procedures reporting to the Academic Board.

2007-2013 : External Programmes Board, LSE. (Academic Board elected representative).

2007-2008 : Representative to the Academic Board, Department of Statistics, LSE.

2007-2014 : IT representative, Department of Statistics, LSE.

1998- Today : Chair of examiners for Actuarial Science at LSE.

1997 - 2002: Departmental Representative to the Academic Studies Committee.

1997- 2005: Departmental Representative to the Admissions Committee.

1996-2005 and 2013-Today: Admissions Tutor Actuarial Science

1992-2019 : Programme Director for the BSc in Actuarial Science degree.

EXTERNAL EXAMINING EXPERIENCE

External examiner for M.Sc. In Financial Mathematics, University of Liverpool. (2015- 2017)

External examiner for M.Sc. In Actuarial Science, Cass Business School. (2015- 2019)

I have examined PhD theses at LSE (more than once), Imperial College, the University of Warwick, KU Leuven, the University of Cardiff, Cass Business School as well as the University of Cambridge (more than once).

I am an examiner for the course Statistics 2 of the University of London External Programme

OTHER ACTIVITIES

Editorial Board of RISKS

Editor of special issue on "Application of Stochastic Processes in Insurance", RISKS.

I have refereed papers for journals including Mathematical Finance , Finance and Stochastics, Insurance: Mathematics and Economics , Quantitative Finance , the International Journal of Theoretical and Applied Finance , the ASTIN Bulletin, the North American Actuarial Journal , the Scandinavian Actuarial Journal , the Annals of Applied Probability , the Applied Probability group of journals, Stochastic processes and their Applications , Statistics and Probability Letters , the Electronic Journal of Probability , the Journal of Optimization Theory and Applications and many others.

I have also been a regular reviewer of research papers and books for Mathematics Reviews.