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Leanne J Dong

Research Interest

Probabilistic and Theoretical Machine Learning, Theoretical Computer Sciences, Stochastic Dynamics, Deep Learning, Stochastic PDE with Lévy noise, Fluid Mechanics (theoretical and computational), Computational Social Science, Theoretical Quantum computing/AI, Scientific Computing, Functional Programming

Education

Jan,2016–Feb,2018 **Doctor of Philosophy**, *University of Sydney*, Sydney, Australia, Title: Stochastic Navier Stokes equations on 2D rotating sphere perturbed by stable Lévy noise.
Supervisor: Prof. Ben Goldys; Awarded in April, conferred on 7th November

Jan,2015–July,2015 **Doctor of Philosophy**, *University of New England*, Armidale,Australia, Study travelling Wave solutions for equations of Fisher KPP/porous medium type .
Supervisor: Prof. Yihong Du; Discontinued due to severe illness

2014–2014 **Doctor of Philosophy**, *University of South Australia*, Adelaide,Australia, Thesis title: Non-classical symmetry analysis of Bacterial Colony system .
Supervisor: Dr Browyn Hajek; Candidature transferred

2013–2014 **Doctor of Philosophy**, *University of South Australia*, Adelaide,Australia, Thesis title: Existence, Regularity and Ergodicity of stochastic Navier-Stokes equations purturbed by cylindrical Lévy noise .
Supervisor: Prof. John van der Hoek; Candidature transferred

August, 2012–Dec 2012 **Doctor of Philosophy**, *University of Technology Sydney*, The Pricing, Hedging and Calibration of VWAP options (CSIRO project), Supervisors: Prof. Alex Novikov, Prof. Pavel Shevchenko and A/Prof Juri Hinz; Candidature transferred.

March, 2008–Dec 2011; **Bachelor of Mathematics Hons I, awarded; WAM:88.4; Thesis: 91**, *University of Technology Sydney*, The pricing of VWAP options under geometric Lévy process framework, Supervisor: Prof. Alex Novikov.
Coursework: Linear Dynamical systems, Analysis and Multivariable Calculus, Intro to C, Optimisation I& II, Complex analysis, Linear Algebra, Stochastic Models, Stochastic Processes, Real analysis and Measure Theory, Differential Equations, Advanced Stochastic Processes, Advanced Data analysis, Derivative security Pricing, Interest rate Models

March, 2009–October, 2009 **Master of Actuarial Science, completed 4 subjects and discontinued for Mathematics studies**, *University of NSW*, Coursework: Probability and statistics for actuaries, Financial Mathematics for actuaries, Insurance Risk Models, Applied Regression analysis.

March, 2005–March, 2008 **GraDip Commerce, Master of Finance, awarded**, *University of NSW*, 14 subjects: Communication and Ethics, Investments and Porfolio selection, Financial Institution management, Applied Portfolio Management and Modelling, Alternative asset classes, Derivative and Risk Management Techniques, Financial Risk Management, Empirical Financial Theory, Financial Theory and Policy, Research Methods in Finance, Empirical Techniques and Applications in Finance, Business Analysis and Valuation, Fixed income securities and Interest Rate Derivatives, Service Marketing. Project: The VaR breakdown of LTCM.

July, 2003–March, 2005 **Bachelor of Accounting (with minor in Economics),awarded**, *Macquarie University*, 25 Accounting and Finance subjects, 5 Economics subjects .

Other certificates

2008 **Passed Level I of Chartered Financial Analyst Exam**.

2012 **Obtained a full cetificate of Object-Oriented C++** .

2018 **Numerous online certificates in Python, Git, Shell, SQL**.

Prizes and Awards

2012 **Dean Merit of Academic Excellence, UTS**.

2013-2015 **Australian Postgraduate Awards**.

2012-2015 **Industrial Doctoral Training Stipend**.

- Workshops: GPU computing with Artemis HPC (1st March, 2019, Sydney Informatics Hub)
- Conferences
  - MAGIC 2018 - Mentoring and guidance in careers workshop for early career female researchers in Mathematics and Physics (29th Oct - 2nd Nov 2018, ANU CANBERRA)
  - Analysis and PDE seminar (July, 2016, UNSW)
  - AMSI/AustMS 2014 Workshop in Harmonic Analysis and its Applications (21st-25th July 2014, Macquarie University)
  - Simon centre lectures in "Mathematical Aspects of Quantum Field Theory"
- Attended Hons/Master Pure Mathematics courses at Uni Adelaide:
  - Functional Analysis (S2, 2014)
  - Lie groups, Lie algebras (S2, 2014)
  - Algebraic Topology (S1, 2014)
  - Abstract Algebra (S1, 2014)
  - Groups and Rings (S1, 2014)
- AMSI Summer school January 5th-30th 2014
  - Differential Geometry (Attended for credit, Mark:81)
  - Conformal Field theory and string theory (Attended)
- Gave 2 talks in PDE seminar at UNE on the topic of travelling wave solutions,
- Gave a talk on PhD research proposal in the school of Petroleum, University of Adelaide,
- Attend regular research seminars given by peers HDR students, staff members and visiting scholars.

Professional memberships

- Australian Mathematical Society (AustMS).
- Australian and New Zealand Association of Mathematical Physics (ANZAMP).
- Women in Mathematics Special Interest Group

Academic Employment

May - December 2019 **Research Associate (Equiv. US Postdoctoral Fellow)**, *Faculty of IT and Engineering*, The University of Technology Sydney, Sydney, Driven projects: 1) Theoretical Development of Stochastic Information Diffusion models with partially observed/interval-censored processes for social media analytics. 2) Adaptative Skills Taxonomy - A spatio-temporal Machine Learning approach to Labor economics.

Jan - Current 2019 **Affiliate**, *Centre for Translational Data Science*, The University of Sydney, Sydney, Research focus: Bayesian Neural Network.

2018 **Lecturer in charge, Unit Coordinator (6-month contract)**, *Faculty of Education and Art*, Australian Catholic University.

Developed, coordinated and lectured the second year unit- Statistics and Probability using Rmarkdown; Developed presentations with RSlidy and Rmarkdown; Other duties included admin, Marking and tutoring; Help students learn statistical programming language R in a simple way

2019 **Sessional Academic**, *Discipline of Business Analytics*, University of Sydney.

Subjects taught/ongoing: QBUS6830 (Financial Time Series and Forecasting), QBUS3820 (Machine Learning and Data mining, 2019), QBUS5001 (Quantitative Business Analytics)

2016-2019 **Sessional Academic**, *School of Mathematics and Statistics*, University of Sydney, Subjects taught/ongoing: DATA1901 (Foundation Data Sciences Advanced, 2019), MATH2061/7 (Linear Mathematics and Vector Calculus, 2017, 2018 Summer and Semester 1, 2019 Summer), Math1015 (Biostatistics, 2018 Semester 1), DATA1001 (Foundation Data science, 2018 Semester 1), STAT3011 (Stochastic processes and time series), PHAR1811 (Statistics component, 2018 Semester 1), MATH1001 (Differential Calculus, 2017), MATH1003 (Integral Calculus, 2017), MATH2065 (PDE, 2017), MATH1011 (Applications of Calculus/Life Sciences Calculus, 2016), MATH1014 (Introduction to Linear Algebra, 2016), MATH3075/3975 (Financial Mathematics, 2016), PHAR1812 (Two sessions of Basic Pharmaceutical Sciences, Statistic component, 2018), MATH1005 (Statistical thinking with Data, 2018, 2019 Summer), MATH1021 (Calculus of one variable, 2018).

Duties: Prepare and deliver board style tutorials to first year student; Prepare and deliver mini lectures to 2nd-3rd year students; Mark first year assignments, quizzes and 3rd year final exams of analysis and stochastic processes; Provide feedback to unit coordinators

2011-2017 **Sessional Academic, workshop presenter, Exam invigilator and Marker, Mathematics Support Centre tutor**, *School of Mathematics and Physical Sciences*, University of Technology Sydney, Subjects tutored: 33190 (Mathematical Modelling for Science, 2011, 2017, 2018, 2019), 35010 (Foundation Mathematics, 2018) 33130 (Mathematical Modelling 1, 2011, 2016), 35102 (Introduction to Analysis and Multivariable Calculus, 2012), 33230 (Mathematical Modelling 2, 2016),33290 (Mathematics and Statistics for Sciences, 2016), 37132 (Introduction to Mathematical Analysis and Modelling, 2016, 2018), Introduction to Linear Dynamical system (2016, cover 6 classes), 37233 (Linear Algebra 2018), 68038 (Advanced Mathematics and Physics, 2016, 2017, 2018 cover all tutorials), 68413 (Quantum Physics, 2018) .

Duties: Compile and demonstrate tutorials to 2nd-3rd year students; Mark assignments, quizzes and final exams (1st, 2nd/3rd year classes); Provide feedback to subject coordinators/HoS

2018:Feburary-June **Private Tutor: Advanced Multivariable and Vector Calculus**, *Deliver one to one tutorial to a matured student over the weekend for his Master of Teaching degree*.

Professional Employment

November 2009-February 2010 **Assistant to Assistant Vice President**, *American International Assurance*, GuangZhou,GuangDong China , Duties include Performing macroeconomic analysis on insurance industry via report writing and presentations; Performing insurance product analysis via report writing and presentations; Making investment recommendation for life insurer via report writing, spreadsheet modelling and presentation;Preparing presentation on Insurance operations management.

Intern Analyst **November-December 2010**, *Citic securities*, GuangZhou, China.

Trainee Tax Accountant — **March 2005 to December 2005**, *ABL Accounting and Computing*, Sydney, Australia.

December 2005 to February 2006 — **Equity Research Assistant**, *SBI E2-Capital Asia-Equity Research (Sell-Side)*, Hong Kong, China.

Duties include, Supporting 3 Equity Analysts with administrative functions; Generating and distributing financial reports in MS Excel; Using main financial models, track stocks, and update valuation sheets and models; Research on worldwide stock market using Bloomberg database; Use independent judgments in completing tasks, establishing priorities, and meeting deadlines; Use financial knowledge to analyse financial reports and models

Technical skills

- Computer Programming: C, GNU C++, Python (2.7,3.6), SQL (Basic), Git, R/RStudio (Experienced), MatLab, Maple, Mathematica, VBA (Basic), LaTeX, Linux/Unix

Administration

- General computer skills, including Windows, MacOS, Unix environments, and a range of software packages, including Adobe creative software and Microsoft Office suite.

Volunteering

- Participants supervisor in the Simon Marais Mathematics Competition, Saturday, Sep 2017, at the School of Mathematics and Statistics, USYD

Nationality

Australian citizen (Born in China, speak fluent English, Cantonese, Mandarin)

Academic Referee

Dr Marian-Andrei Rizoiu
Position: Lecturer in Computer Science (e-mail: Marian-Andrei.Rizoiu@uts.edu.au; phone: +061-435247215; address: Building 11, 81 Broadway, Faculty of Engineering and IT, The University of Technology Sydney)
Dr Rohitash Chandra
Position: Chancellor Research Fellow (e-mail: rohitash.chandra@sydney.edu.au; phone: +061-293512976; address: The Centre for Translational Data Science (Madsen Building F09), The University of Sydney)
Prof. Beniamin Goldys
Position: Professor of Mathematical Finance (e-mail: beniamin.goldys@sydney.edu.au; phone: +061-293512976; address: School of Mathematics and Statistics Carslaw F07, The University of Sydney)
Prof. Yihong Du
Position: Professor of Mathematics (e-mail: ydu@une.edu.au; phone: +61-267733066; address: School of Science and Technology (C26) University of New England)
A/Prof. John van der Hoek
Position: Associate Professor of Mathematics (e-mail: John.VanderHoek@unisa.edu.au; phone: +61-883027196; address: School of IT and Mathematical sciences, City West Campus (Y3-73), University of South Australia)
Prof. Alex Novikov
Position: Professor in Probability (e-mail: Alex.Novikov@uts.edu.au; phone: +061-295142242; address: School of Mathematics and Physical Sciences, The University of Technology Sydney)
Dr. Bronwyn Hajek
Position: Senior Lecturer in Mathematics (e-mail: Bronwyn.Hajek@unisa.edu.au; phone: +61-883023084; address: School of IT and Mathematical sciences, Mawson Lakes Campus (OC1-46), University of South

Australia)

Teaching Referee

Dr. Ray Kawai
Position: Senior Lecturer in Statistics/Postgraduate Director (e-mail: reiichiro.kawai@sydney.edu.au; phone: +61-293513376; address: School of Mathematics and Statistics Carslaw 816, The University of Sydney)
Dr. Martin Bell
Position: Lecturer in Physics (e-mail: Martin.Bell@uts.edu.au; phone: +61-295142243; address: School of Mathematics and Physical Sciences Room 07.05.025, The University of Technology Sydney)

Research Experience

- Strong mathematical background specialising in Stochastic Analysis, Mathematical Finance, nonlinear PDE, Stochastic Processes and Stochastic PDE
- Made important contribution to stochastic hydrodynamics and turbulence.
- Knowledge in Machine Learning and Deep Learning
- Genuine interests in software engineering and proven programming capability through continuous education (via online certification)

Publications

Dong, J, Leanne: *Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*; in Bulletin of the Australian Mathematical Society 1-2; DOI: 10.1017/S0004972718001351
Dong, J, Leanne: *Strong solutions for the Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*; Available at `https://arxiv.org/abs/1811.07885`; Submitted for publication
Dong, J, Leanne: *Random Attractors for Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*;Available at `https://arxiv.org/abs/1811.10532`; Submitting for publication
Dong, J, Leanne: *Invariant Measures for the Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*; Available at `https://arxiv.org/abs/1812.05513`.

The second research article above has been submitted to the Journal of Mathematical Analysis and Applications. The 3rd article will be submitted to the Journal of Mathematical Fluid Mechanics.

To be published soon

Dong, J, Leanne and Li, Shidi, Rizoiu and Rizoiu, Marian-Andrei and Menon, Aditya Krishna and Xie, Lexing: *A HIPPer approach to interval-censored Hawkes processes*; To be submitted to IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS, Special Issue on Robust Learning of Spatio-Temporal Point Processes: Modeling, Algorithm, and Applications, 2019

To be archived

Dong, J, Leanne and Van der Hoek, John.: *A semi-analytical approach to the Volterra equation of 2nd Kind*; to be appeared on Arxiv preprint, 2019

Unpublished

Dong, J, Leanne: *Functional Analysis and Distribution theory: From Quantum Mechanic to Machine Learning*; 2019