1188 Rue Saint-Antoine, Montréal
H3C1B4
Canada
+1-438-9260545
leanne.dong@concordia.ca
leannejdong.github.io
leanne-j-dong

Leanne J Dong

Topics of Interest

Scientific Computing, Deep Learning interpretability, Interpretable Machine Learning, Robust software Development with C++, Maths/ML libraries development

Education

April,2018 **Doctor of Philosophy: PhD in Mathematics**, *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: PhD in Mathematics**, *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: PhD in Mathematics**, *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: PhD in Mathematics**, *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: PhD in Mathematics**, *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, C Programming, 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**, *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 **Completed Level I of Chartered Financial Analyst Exam**.

2012 **Obtained a full certificate of Object-Oriented C++** , *PhD coursework funded by UTS Faculty of Science*.

2018-2019 **Completed 10 programming certificates on Object-Oriented Programming in C++, Machine Learning in Python**, *See LinkedIn page*.

Prizes, Awards and Grant

2012 **Dean Merit of Academic Excellence, UTS**, *Rank 1st in honour year*.

2013-2015 **Australian Postgraduate Awards**.

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

2018 **MAGIC ECR travel grant**, *https://www.science.org.au/news-and-events/events/mentoring-and-guidance-careers-magic-workshop*.

2019 **Postdoctoral Fellowship at UTS (Sydney)**, *Institute for Data Science*.

2019 **Postdoctoral Fellowship at Concordia (Montreal)**, *Gina Cody School of Engineering and Computer Science*.

- Workshops: GPU computing with Artemis HPC (1st March, 2019, Sydney Informatics Hub)
- Conferences
  - CppCon2020 (Volunteer)
  - CppEurope (23rd June 2020, Scholarship recipient)
  - Quantum Computer Science Summer School (14th - 16th Jan 2020, UTS)
  - Stochastic PDE workshop (26th-28th August 2019, The University of Sydney)
  - MAGIC 2018 – Mentoring and guidance in careers workshop for early career female researchers in Mathematics and Physics (29th Oct – 2nd Nov 2018, Australian National University, 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 PhD talk in the school of Petroleum, University of Adelaide,
- Attend regular research seminars given by peers doctoral 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

Feburary - **Research Fellow (Postdoctoral)**, *Gina Cody School of Engineering and Computer Science, Concordia University*, Sponsored by NSERC, CERC and Thales, Tasks: 1) Software development of INSEL C++/C Engine, detect undirected graph elements in INSEL, convert graphical description into an equation system and solve it; 2) Explainable AI, ML/DL interpretability.
Lecturing and co-supervision of Graduate students

December 2nd - Sept, 2020 **Honorary Research Associate**, *Faculty of IT and Engineering*, The University of Technology Sydney, Sydney, collaborating with earlier Postdoc research group on finishing the theoretical framework of HIPPER, a tool that allows fitting information diffusion models based on observed counts of events.
Tasks: 1) Implement an explicit numerical approximation of the intensity function in C++; 2) Compute the conditional expectation of the future intensity having observed past counts.

May - December 1st, 2019 **Research Associate**, *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 analytic. 2) Adaptative Skills Taxonomy - A spatio-temporal Machine Learning approach to Labor economics.
Full time

Jan - May 2019 **Internship**, *Centre for Translational Data Science*, The University of Sydney, Sydney, Learn fundamentals of Neural Networks; Implement Neural Network from scratch using Python and C++ (include Bayesian and RNN.

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 **Teaching Associate**, *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 **Teaching Associate**, *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

2011-2019, June **Teaching Associate**, *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:February-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, GuangDong, 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

- Programming: C/C++, Python 3, Git, R, Markdown, MatLab, Maple, Mathematica

- Tools: Git/Version Control, CMake, Linux/Unix, LaTeX, HPC
- Libraries: Eigen, Boost, BGL, gsl

Administration

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

Volunteering and Community engagement

- Cppcon2020 Ambassador and Volunteer
- Participants supervisor in the Simon Marais Mathematics Competition, Saturday, Sep 2017, at the School of Mathematics and Statistics, University of Sydney
- Machine Learning C++ Community SG19
- Sydney C++ Meetup Member
- Montreal C++ Meetup Member

Nationality

Australian citizen

Dissertations

Dong, J, Leanne: *Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*; PhD thesis, School of Mathematics and Statistics, The University of Sydney; `http://hdl.handle.net/2123/18119`, April, 2018 (Download)
Dong, J, Leanne: *The Pricing of VWAP Options under Lévy process framework*; Honour thesis, School of Mathematical and Physical Sciences, The University of Technology Sydney; , February, 2012 (Download)

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, January, 2019
Dong, J, Leanne: *Strong solutions for the Stochastic Navier-Stokes equation on a 2D rotating sphere with stable Lévy noise*; Volume 489 (2); **Journal of Mathematical Analysis and Applications** T `https://doi.org/10.1016/j.jmaa.2020.124182`, May, 2020
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`; **Submitted 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`, December, 2018.
Dong, J, Leanne and Van der Hoek, John: *An Explicit Numerical Algorithm to the Solution of Volterra Integral Equation of the 2nd Kind*; Available at `https://arxiv.org/abs/1908.02862`, August, 2019
Dong, J, Leanne and Van der Hoek, John: *Generalised Solution of the Volterra Integral Equation of the Second Kind*; Available at arXiv preprint, September, 2019

To be submitted

Li, Shidi and Rizoiu, Marian-Andrei and Dong, J, Leanne and Menon, Aditya Krishna and Xie, Lexing: *A HIPPer approach to interval-censored Hawkes processes*; To be submitted to the Journal of Machine Learning , 2019

Technical Report

Dong, J, Leanne: *Temporal Modelling Of Job Counts Data: Regression Analysis with Copulas*; September, 2019; Demo

Technical Note

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