Jackie Lok

Curriculum vitae | Last updated October 2023

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Address: Princeton University, 98 Charlton Street
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Education

Princeton University, *Princeton, NJ, USA*
Ph.D. in Operations Research and Financial Engineering — 2021–Present
Adviser: Elizaveta Rebrova

M.A. in Operations Research and Financial Engineering — 2023

UNSW Sydney, *Sydney, Australia*
Bachelor of Science (Honours) in Pure Mathematics — 2020
with First Class Honours and the University Medal
Supervisor: Catherine Greenhill
WAM: 97.16/100

Bachelor of Actuarial Studies (Co-op) in Mathematics with Distinction — 2016–2019
WAM: 95.65/100

Wharton School, University of Pennsylvania, *Philadelphia, PA, USA*
International Exchange Semester, GPA: 4.00/4.00 — 2017

Research Interests

My research lies broadly at the interface of mathematics and data science. I study the properties and behaviour of random mathematical structures and algorithms, and use these insights to develop tools and models that are supported by theoretical guarantees and allow us to better work with and understand large-scale, complex data.

My research interests include high-dimensional and discrete probability, random matrices, randomised algorithms, and numerical linear algebra. I am also interested in the applications of these areas to statistics, computer science, and machine learning.

Awards & Honours

- Quad Fellowship, Schmidt Futures — 2023
- Richard Stillwell '21 *24 and Agnes Newhall Stillwell Fellowship, Princeton University — 2021
- University Medal in Pure Mathematics, UNSW Sydney — 2020
- H.C. & M.E. Porter Memorial Scholarship, UNSW Sydney — 2020
- The Faculty of Science Prize for Honours Year Science, UNSW Sydney — 2020
- The George Szekeres Prize, UNSW Sydney — 2019
- The Head of School's Prize, UNSW Sydney — 2019
- UNSW Co-op Scholarship in Actuarial Studies — 2016–2019
- UNSW Scientia Scholarship — 2016–2019
- Harry Manson International Exchange Scholarship, UNSW Sydney — 2017

Publications

Preprints

[1] Jackie Lok and Elizaveta Rebrova. *A subspace constrained randomized Kaczmarz method for structure or external knowledge exploitation*. 2023. arXiv: 2309.04889 [math.NA].

Miscellaneous

- Jackie Lok. *Markov chains, mixing times, and cutoff*. Honours thesis. 2020.

Talks and Presentations

Expository talks

– Graduate student probability reading group, Princeton University: "Matrix Concentration Inequalities via the Method of Exchangeable Pairs" (November 2022), "Concentration for Random Matrix Products" (October 2023)

Teaching Experience

Princeton University, *Princeton, NJ, USA*

Assistant in Instruction, ORFE Department

Responsible for delivering weekly precepts, holding office hours, grading problem sets and exams, and general course admin.

– ORF 363: Computing and Optimization — Fall 2023
– ORF 350: Analysis of Big Data — Spring 2023
– ORF 387: Networks — Fall 2022

University of Melbourne, *Melbourne, Australia*

Academic Tutor, School of Mathematics and Statistics

Responsible for delivering weekly tutorials and marking assessments.

– MAST20004: Probability — Semester 1 2021

UNSW Sydney, *Sydney, Australia*

Academic Tutor, School of Risk and Actuarial Studies

Responsible for delivering weekly tutorials, marking exams and assessments, developing course materials, holding student consultations, and providing general course support.

– ACTL3162: General Insurance Techniques — Term 3 2020
– ACTL2102: Foundations of Actuarial Models — Term 2 2020
– ACTL2111: Financial Mathematics for Actuaries — Term 1 2020
– ACTL1101: Introduction to Actuarial Studies — Term 3 2019
– ACTL2102: Foundations of Actuarial Models — Term 2 2019
– ACTL3141: Actuarial Models and Statistics — Term 1 2019

Other Activities

Mentoring

– ReMatch mentor, *Princeton University* — 2023

– ORFE Senior Thesis Writer's Group co-leader, *Princeton University* — 2022–2023

– Drop-in Centre tutor, *School of Mathematics and Statistics, UNSW Sydney* — 2020

Work Experience

icare, Actuarial Services Intern, *Sydney, Australia* Aug 2018–Feb 2019

Supported the provision of actuarial advice and analysis for the NSW state insurer. Assisted with the reporting and valuation of outstanding claims liabilities, scenario analysis, preparation of financial budgets, claims experience monitoring, and the assessment of data quality and integrity.

Suncorp Group, Natural Perils Pricing Intern, *Sydney, Australia* Feb 2018–Aug 2018

Collaborated in the research and development of a new natural peril pricing model in Python using analytical and machine learning techniques with insurance and geospatial datasets. Developed interactive tool using SAS and Python to identify and visualise exposure concentration risks as part of an automated monitoring pipeline.

MetLife Australia, Capital and Valuation Intern, *Sydney, Australia* Nov 2016–Feb 2017

Assisted with financial reporting, reserving and scenario analysis for group life insurance.

Languages and skills

Languages

- English (native), Cantonese (fluent), Mandarin (beginner), German (beginner)

Computing

- Proficient with Python. Experience with other programming languages including Julia, R, Java, MATLAB, SQL, and SAS.
- Competent with LaTeX.
- Experience with Microsoft Excel, Word, and PowerPoint.

Online courses

- Probabilistic Graphical Models Specialization (Coursera, Stanford University), 2021
- Deep Learning Specialization (Coursera, DeepLearning.AI), 2021
- Machine Learning (Coursera, Stanford University), 2018