

Jackie Lok

CURRICULUM VITAE

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Address: Princeton University
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EDUCATION

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| Princeton University , <i>Princeton, NJ, USA</i> PhD in Operations Research and Financial Engineering Adviser: Elizaveta Rebrova | 2021–Present |
| UNSW Sydney , <i>Sydney, Australia</i> Bachelor of Science (Honours) in Pure Mathematics with First Class Honours and the University Medal Supervisor: Catherine Greenhill Honours thesis: <i>Markov chains, mixing times, and cutoff</i> WAM: 97.16/100 | 2020 |
| UNSW Sydney , <i>Sydney, Australia</i> Bachelor of Actuarial Studies (Co-op) in Mathematics with Distinction WAM: 95.65/100 | 2016–2019 |
| Wharton School, University of Pennsylvania , <i>Philadelphia, PA, USA</i> International Exchange Semester, GPA: 4.00/4.00 | 2017 |

RESEARCH INTERESTS

My main interests are broadly in probability and mathematical data science. More specifically, I am interested in 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.

In my research, I study the properties and behaviour of random mathematical structures and algorithms. I 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.

AWARDS & HONOURS

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| – Quad Fellowship, Schmidt Futures | 2023 |
| – Richard Stillwell '21 *24 and Agnes Newhall Stillwell Fellowship, Princeton University | 2021–2022 |
| – 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](#)].

TALKS AND PRESENTATIONS

- November 2022, graduate student probability reading group, Princeton University: “Matrix Concentration Inequalities via the Method of Exchangeable Pairs”.
- November 2020, Honours presentation, UNSW Sydney: “Mixing times of Markov chains and the cutoff phenomenon”.

TEACHING EXPERIENCE

Princeton University, Princeton, NJ, USA

Assistant in Instruction, ORFE Department

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

- [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 the delivery of weekly tutorials and assessment marking.

- MAST20004: Probability Semester 1 2021

UNSW Sydney, Sydney, Australia

Academic Tutor, School of Risk and Actuarial Studies

Responsible for the delivery of weekly tutorials, examination and assessment marking, development of course materials, 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

- 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 and R. Experience with other programming languages and statistical software including Julia, 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