

Jackie Lok

CURRICULUM VITAE

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Address: ORFE Department
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Princeton, NJ 08544, USA

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 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 allow us to better work with and understand large-scale, complex data.

More specifically, my research interests include high-dimensional probability, random matrices, randomised algorithms, and numerical linear algebra. I am also interested in the intersections of these areas with 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

- Roxanne He and Jackie Lok. “On Approximating the Potts Model with Contracting Glauber Dynamics” (2024). arXiv: [2404.18778](#).
- Jackie Lok and Elizaveta Rebrova. “A subspace constrained randomized Kaczmarz method for structure or external knowledge exploitation” (2023). arXiv: [2309.04889](#).

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.

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|---|-------------|
| – ORF 387: Networks | Spring 2024 |
| – 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.

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|--------------------------|-----------------|
| – MAST20004: Probability | Semester 1 2021 |
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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.

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| – 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

Reviewing

Linear Algebra and its Applications (LAA)

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