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# Chun Hei (Samuel) Lam

## Applied Mathematician

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I am a first year postgraduate at University of Oxford, joining the CDT Mathematics of Random Systems. Prior to my postgraduate studies, I was an undergraduate at Imperial College London, selected as a candidate for the MIT-Imperial exchange programme. My research focus on theory of deep learning. In my spare time, I also research on random matrices, dynamical systems and stochastic analysis.

### EDUCATION

#### EPSC CDT Mathematics of Random Systems

September 2022 — Present

University of Oxford, UK

- To be transferred to DPhil programme in December 2023.

#### MSci Mathematics with a Year Abroad

October 2018 — July 2022

Imperial College London, London, UK

Overall: 88.55/100

- Thesis: *An exposition to the asymptotic equivalence of several nonparametric regression problems*
- Indicative course content: analysis, PDE, stochastic analysis and statistical theory.

#### MIT-Imperial Exchange Programme

September 2020 — June 2021

Massachusetts Institute of Technology, Cambridge, MA

Year 3: GPA 5.0/5.0

- As part of MSci Mathematics with a Year Abroad
- Indicative course content: Random Matrices, Non-Asymptotic Statistics, Stochastic Analysis, Bayesian Inference

#### A Level, General Certificate of Education

September 2016 — June 2018

HKCCCU Logos Academy, Hong Kong

GCE A Level: A\*, A\*, A\*, A

- A\* in Mathematics, Further Mathematics, Further Mathematics (Additional) and Chinese, A in Physics

### RESEARCH EXPERIENCE

#### Professor Alastair Young's Group

October 2021 — June 2022

Imperial College London, London, UK

- Project: An exposition to the asymptotic equivalence of several nonparametric regression problems
- *Master Thesis* for MSci Mathematics with a Year Abroad
- The project studies the Le Cam's characterisation of equivalence between density estimation and nonparametric regression. We study the meaning of equivalence for the estimation problems.

#### Muller Lab

July 2021 — September 2021

Western University, Ontario, Canada

- Part of the *Fields Undergraduate Summer Research Programme (FUSRP)*
- Project: Spectrum of Almost Complete Graph
- We studied the spectra of Almost Complete Graphs (ACG), which are complete graphs with a small number of edges removed. Further applications on Echo-State Networks have also been studied.
- Journal paper under preparation.

#### Professor Leonid Kogan's Group

January 2021 — June 2021

Massachusetts Institute of Technology, Cambridge, MA

- Part of the *Undergraduate Research Opportunities Programme (UROP)*
- Project: Classification of Financial Time Series
- We developed some methods of simulating financial time series simulation compared algorithms of distinguishing simulated time series from real-life data.

## Dr. Michele Coti-Zelati's Group

June 2020 — September 2020

Imperial College London, London, UK

- Part of the *Undergraduate Research Opportunities Programme (UROP)*
- Project: Enhanced Diffusion Equation
- We studied how the  $\ell^2$  energy of solutions of enhanced diffusion equations decay with time using mathematical analysis and numerical simulation in Python. A directed reading on stochastic analysis then followed.

## Dr. Andrew Duncan's Group

June 2019

Imperial College London, London, UK

- Part of *Year 2 Mathematics Group Project*
- Project: A Retrospective Analysis of Governmental Interventions to Covid-19
- We developed new Bayesian models on the reproduction numbers of Covid-19 and used them to evaluate the effectiveness of various governmental interventions with R and STAN.

## Dr. Andrew Duncan's Group

June 2018

Imperial College London, London, UK

- Part of first-year *Mathematics Individual Poster Project*
- Project: Simple Application of Approximate Bayesian Computation in Modelling Tumor Growth
- We investigated the application of rejection sampling and the Metropolis-Hasting algorithm in estimating the growth rate of tumours in an experiment using Matlab.
- Outstanding poster project (scored 98/100)

## ACTIVITIES

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### Webmaster

August 2021 — Present

Imperial College Mathematics Society

- Redesigned the promotional website of the society: <https://rcsu.gitlab.io/icl-mathsoc/newsite/>
- Currently initiating a repository of student-written course materials and expository writings to facilitate discussions and revisions.

### Peer Tutor

October 2020 — April 2021

Imperial College London

- Hosting weekly tutorials to facilitate first-year students' studies and provide them with overviews of more advanced topics in mathematics and statistics.
- Syllabus available on my personal website.

## AWARDS

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### Oxford-Radcliffe Graduate Scholarship

September 2022 - September 2026

Stipend for the ongoing PhD studies.

### EPRSC CDT in Mathematics of Random Systems

September 2022 - September 2026

Grant for the ongoing PhD studies.

### Institute of Mathematics and its Applications (IMA) Prize

2022

Membership of the Society awarded to students with outstanding final examination results.

### Dean's List

2019, 2020, 2022

Top 10% of years 1, 2 and 4.

### Selected as the candidate for MIT-Imperial Exchange Programme

2020

Only one position available in cohort.

## SKILLS

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### Scientific Computation

Python, Julia, Matlab, R, STAN, Git

### Webpage Development

Javascript (with React.js and Node.js), HTML5/CSS3

### Communication

English, Cantonese (Native), Chinese (Native, reading and writing)