

LUKE HARDCASTLE

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ACADEMIC BACKGROUND

University College London

September 2021 - Present

PhD in Statistical Science (Expected submission: September 2025)

Supervisors: Dr Samuel Livingstone & Prof. Gianluca Baio

Title: *Posterior sampling using piecewise deterministic Markov processes for flexible Bayesian survival models*

Project Description: *Developing Bayesian models and computational methods for analysing administratively censored survival data. In particular I have focused on two classes of models; polyhazard models and piecewise exponential models, that provide flexibility and can incorporate expert information to guide long-term inferences. Both face a challenging model selection problem that I have addressed through Bayesian model averaging. I have used and developed Markov Chain Monte Carlo methods based on Piecewise Deterministic Markov Processes to sample from the resulting posteriors.*

University College London

September 2020 - 2021

MSc in Statistics, Distinction

Sessional prize on the basis of excellent overall performance

Project prize on the basis of excellent performance

Msc Project description: *Development of a Bayesian hierarchical model to project rates of oxygen consumption in mechanically ventilated Intensive Care patients.*

University of Warwick

September 2015 - 2018

BSc (Hons) in Mathematics and Statistics, First Class

PUBLICATIONS

Hardcastle, L., Livingstone, S., & Baio, G. (2024+). Piecewise exponential models, discretised diffusion priors and Piecewise Deterministic Markov Processes. (*Under preparation for submission to Bayesian Analysis*)

Hardcastle, L., Livingstone, S., & Baio, G. (2024). Averaging polyhazard models using Piecewise deterministic Monte Carlo with applications to data with long-term survivors. arXiv preprint arXiv:2406.14182. (*Major revisions - Annals of Applied Statistics*)

Hardcastle, L., Livingstone, S., Black, C., Ricciardi, F., & Baio, G. (2024). A Bayesian hierarchical model for predicting rates of oxygen consumption in mechanically ventilated intensive care patients. Statistical Modelling, 1471082X241238810.

RELEVANT EXPERIENCE

Isaac Newton Institute - Stochastic Systems for Anomalous Diffusion

August 2024 - December 2024

Programme participant

Alan Turing Institute - Enrichment Scheme

September 2023 - July 2024

Visiting PhD student

Parexel

December 2022 - September 2023

Advanced Analytics Associate - Intern

University College London

January 2022 - present

Teaching Assistant

University of Warwick

July 2017 - August 2017

Research Assistant, Hebenstreit Lab

AWARDS & SCHOLARSHIPS

Deepti Jayawardena Wilkinson Award, UCL Statistical Science	<i>September 2024</i>
Enrichment Scheme award, Alan Turing Institute	<i>September 2023</i>
Poster prize winner, Bayescomp 2023	<i>March 2023</i>
Book prize winner, UCL Departmental poster session	<i>October 2022</i>
PhD Studentship, UCL/EPSRC IMSS Doctoral Training Programme	<i>September 2021</i>
Sessional prize for excellent overall performance (MSc), UCL Statistical Science	<i>September 2021</i>
Project prize for excellent performance (MSc), UCL Statistical Science	<i>September 2021</i>
MIBTP, BBSRC - Research Experience Placement, University of Warwick	<i>July 2017</i>

PRESENTATIONS

Invited talk: Programme: <i>Stochastic systems for anomalous diffusions</i> , Isaac Newton Institute, University of Cambridge, UK,	<i>December 2024</i>
Poster: Workshop: <i>Monte Carlo sampling: beyond the diffusive regime</i> , Isaac Newton Institute, Cambridge, UK,	<i>November 2024</i>
Invited talk: <i>Warwick Algorithms & Computationally Intensive Inference seminars</i> , University of Warwick, UK,	<i>October 2024</i>
Poster: <i>Greek Stochastics ξ'</i> , Folegandros, Greece,	<i>July 2024</i>
Poster: <i>2024 ISBA world meeting</i> , Venice, Italy	<i>July 2024</i>
Talk: <i>London meeting on Computational Statistics</i> , London, UK,	<i>June 2024</i>
Poster: <i>London meeting on Computational Statistics</i> , London, UK,	<i>June 2024</i>
Talk: UCL PRIMENT seminar, London, UK	<i>March 2024</i>
Talk: <i>UCL Statistical Science PhD seminar</i> , London, UK	<i>January 2024</i>
Long talk: <i>Bayesian Young Statisticians Meeting (j-ISBA)</i> , Online	<i>November 2023</i>
Contributed talk: <i>Greek Stochastics ν'</i> , Naxos, Greece	<i>July 2023</i>
Poster: EPSRC visit to UCL Mathematical and Statistical Sciences	<i>May 2023</i>
Poster: <i>Bayescomp 2023</i> , Levi, Finland, Poster prize winner	<i>March 2023</i>
Poster: <i>UCL Statistical Science Departmental Poster session</i> , Book prize winner	<i>October 2022</i>
Poster: <i>International Workshop on Statistical Modelling (IWSM) 2022</i> , Trieste, Italy	<i>July 2022</i>
Talk: UCL CHIMERA regular meetings, Online	<i>November 2021</i>

TEACHING

Tutorials & Demonstrating: STAT0002 (<i>Introduction to Probability and Statistics</i>), STAT0023 (<i>Computing for Practical Statistics</i>),
Marking: STAT0002, STAT0006, STAT0025, STAT0030

ADDITIONAL ACTIVITIES & RESPONSIBILITIES

UCL Statistical Science PhD seminar, organiser	<i>November 2023 - present</i>
Bayesian methods reading group, Alan Turing institute, organiser	<i>October 2023 - June 2024</i>
UCL Data Detectives outreach activity, mentor	<i>July 2022</i>