

# Daniel Fryer

STATISTICS PHD | DATA SCIENTIST | LECTURER

School of Mathematics and Physics, The University of Queensland

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*I'm an early career PhD data scientist, and I'm in the rare position of having combined a rigorous understanding of applied statistics with strong skills in computer science, software engineering, and collaboration on technical projects. I have worked independently, as a researcher, project leader, and software developer, on multiple large exploratory and confirmatory analysis projects, and on research software development projects. I am great at working in messy unprocessed "big" data scenarios, involving local and cloud based SQL database management systems. I liaise with statisticians, scientists, medical professionals, and executives, and I work with local and international partners, to deliver analysis and preprocessing pipelines that deliver security, confidentiality, interactivity / usability, modularity / reusability, documentation, collaboration, and machine learning / statistical rigour. I have written many private and open source R packages, two of which are currently on CRAN. I teach meta-analysis to Master's students, and I teach database design and SQL programming to professional statisticians and social scientists. I also currently serve as the executive privacy officer and database administrator at the Statistical Society of Australia, as well as technical sub-editor at the Australian & New Zealand Journal of Statistics. In my spare time I enjoy camping, video games, exercise, tasty food, and good conversation.*

## Education

### The University of Queensland

PHD | STATISTICS AND MATHEMATICS

- Explaining, exploring and clustering with non-linear and complex data

Saint Lucia, QLD, AU

2019–Current

### La Trobe University

BACHELOR OF SCIENCE | MATHEMATICS AND STATISTICS WITH FIRST CLASS HONOURS (WEIGHTED AVERAGE MARK: 97)

- Random fields: Long memory, and R for cosmology

Melbourne, VIC, AU

2014–2018

## Experience

### Social Research Centre

DATA SCIENTIST

- Machine learning, data engineering, database management

Melbourne, Victoria, AU

2021–Current

### University of Auckland

COURSE AUTHOR AND INSTRUCTOR | NEW ZEALAND SOCIAL STATISTICS NETWORK

- Introduction to SQL for academics and professionals

Auckland, Auckland Region, NZ

2018–Current

### La Trobe University

SESSIONAL LECTURER | DEPARTMENT OF MATHEMATICS AND STATISTICS

- Master's level meta-analysis | Master's level database fundamentals

Melbourne, VIC, AU

2018–Current

### Monash University

RESEARCH ASSISTANT | DEPARTMENT OF MATHEMATICS AND PHYSICS

- AI for Pandemics and IDDO/ISARIC partner program

Melbourne, Victoria, AU

2021–2022

### The University of Queensland

CASUAL INSTRUCTOR | DEPARTMENT OF MATHEMATICS AND PHYSICS

- Master's of Data Science project support

Saint Lucia, QLD, AU

2020–2022

### Monash University

RESEARCH ASSISTANT

- Politics & International Relations

Melbourne, Victoria, AU

2020–2021

### The University of Queensland

RESEARCH ASSISTANT | DEPARTMENT OF MATHEMATICS AND PHYSICS

- Digital phenotyping for transdiagnostic clustering and psychiatric prognosis

Saint Lucia, QLD, AU

2019–2019

### La Trobe University

RESEARCH SOFTWARE DEVELOPER | DEPARTMENT OF MATHEMATICS AND PHYSICS

- Spherical data analysis in R on the HEALPix grid

Melbourne, VIC, AU

2018–2019

## Service

<b>Statistical Society of Australia</b> EXECUTIVE PRIVACY OFFICER   DATABASE ADMINISTRATOR	Belconnen, ACT, AU 2022–Current
<b>Australian &amp; New Zealand Journal of Statistics</b> TECHNICAL SUB-EDITOR	Melbourne, Victoria, AU 2020–Current
<b>Statistical Society of Australia</b> COUNCIL MEMBER   COMMUNICATIONS OFFICER	Melbourne, VIC, AU 2020–2022
<b>Campus Consultancy</b> SENIOR MENTOR AND FOUNDING MEMBER	Melbourne, VIC, AU 2017–2019
<b>Research School on Statistics and Data Science</b> PEER REVIEWER (3 ARTICLES)	Melbourne, VIC, AU 2019–2019
<b>Journal of Open Source Software</b> PEER REVIEWER (1 ARTICLE)	Melbourne, VIC, AU 2019–2019
<b>Dimension Reduction and Meta Analysis Research Group</b> MEMBER   WEBSITE MAINTAINER	Melbourne, VIC, AU 2017–2019
<b>Victorian State Emergency Services</b> EMERGENCY FIRST RESPONDER	Melbourne, VIC, AU 2017–2018
<b>La Trobe University Mathematics and Statistics Society</b> VICE PRESIDENT   NEWSLETTER EDITOR	Melbourne, VIC, AU 2016–2016
<b>In2Science</b> MENTOR   MATHEMATICS SCHOOL OUTREACH	Melbourne, VIC, AU 2015–2015

Awards

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<b>SSA President’s Award for Leadership in Statistics</b> STATISTICAL SOCIETY OF AUSTRALIA, NA	Belconnen, ACT, AU 2022
<b>Future Superstars Award</b> THE UNIVERSITY OF QUEENSLAND, FACULTY OF SCIENCE	Saint Lucia, QLD, AU 2021
<b>Vice Chancellor’s Sessional Teaching Award</b> LA TROBE UNIVERSITY, NA	Melbourne, VIC, AU 2020
<b>Three Minute Thesis   People’s Choice</b> THE UNIVERSITY OF QUEENSLAND, SCHOOL OF MATHEMATICS AND PHYSICS	Saint Lucia, QLD, AU 2020
<b>Pitching Research Competition   Best Written and Oral Pitch University-Wide</b> THE UNIVERSITY OF QUEENSLAND, BUSINESS SCHOOL	Saint Lucia, QLD, AU 2019
<b>Pro Vice Chancellor’s Commendation (awarded four times)</b> LA TROBE UNIVERSITY, UNIVERSITY-WIDE	Melbourne, VIC, AU 2018
<b>Department Prize in Fourth Year Statistics   Best Performing Student</b> LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS	Melbourne, VIC, AU 2018
<b>David Myer’s Medallion   La Trobe’s most prestigious undergraduate award</b> LA TROBE UNIVERSITY, COLLEGE OF SCIENCE, HEALTH AND ENGINEERING	Melbourne, VIC, AU 2018
<b>Silver Scholarship   Community Involvement and Dedication to Mathematics</b> LA TROBE UNIVERSITY STUDENT UNION, UNIVERSITY-WIDE	Melbourne, VIC, AU 2017
<b>Department Prize in Third Year Statistics   Best Performing Student</b> LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS	Melbourne, VIC, AU 2016
<b>Prof CJ Eliezer Prize in Second Year Mathematics  Best Performing Student</b> LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS	Melbourne, VIC, AU 2015
<b>Prof Jim Morrison Prize in Chemistry   Best Performing Student (awarded twice)</b> LA TROBE UNIVERSITY, SCHOOL OF MOLECULAR SCIENCES	Melbourne, VIC, AU 2014
<b>La Trobe Award in Community Engagement   Volunteer Efforts</b> LA TROBE UNIVERSITY, UNIVERSITY-WIDE	Melbourne, VIC, AU 2014

Publications

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## Pipeline

### HD Nguyen, D Fryer, G McLachlan

ORDER SELECTION WITH CONFIDENCE FOR FINITE MIXTURE MODELS

arXiv

2021

### M Terrett, D Fryer, T Doody, H Nguyen, P Castellazzi

SARGDV: EFFICIENT IDENTIFICATION OF GROUNDWATER-DEPENDENT VEGETATION USING SYNTHETIC APERTURE RADAR

arXiv

2020

### HD Nguyen, D Fryer

A BINARY-RESPONSE REGRESSION MODEL BASED ON SUPPORT VECTOR MACHINES

arXiv

2020

## Published

### D Fryer, I Strümke, H Nguyen

SHAPLEY VALUES FOR FEATURE SELECTION: THE GOOD, THE BAD, AND THE AXIOMS

IEEE Access

2021

### D Fryer, M Li, A Olenko

RCOSMO: COSMIC MICROWAVE BACKGROUND DATA ANALYSIS

Astrophysics Source Code Library,

ascl:

2020

### D Fryer, I Strümke, H Nguyen

SHAPLEY VALUE CONFIDENCE INTERVALS FOR ATTRIBUTING VARIANCE EXPLAINED

Frontiers in Applied Mathematics

and Statistics

2020

### D Fryer, M Li, A Olenko

RCOSMO: R PACKAGE FOR ANALYSIS OF SPHERICAL, HEALPIX AND COSMOLOGICAL DATA

The R Journal

2020

### D Fryer, H Nguyen, P Castellazzi

K-MEANS ON POSITIVE DEFINITE MATRICES, AND AN APPLICATION TO CLUSTERING IN RADAR IMAGE SEQUENCES

2020

### D Fryer, A Olenko

SPHERICAL DATA HANDLING AND ANALYSIS WITH R PACKAGE RCOSMO

Research School on Statistics and

Data Science

2019

### D Fryer, H Nguyen, P Orban

STUDENTLIFE: TIDY HANDLING AND NAVIGATION OF A VALUABLE MOBILE-HEALTH DATASET

Journal of Open Source Software

2019

### E Garcia-Gallo, L Merson, K Kennon, S Kelly, BW Citarella, DV Fryer, ...

ISARIC-COVID-19 DATASET: A PROSPECTIVE, STANDARDIZED, GLOBAL DATASET OF PATIENTS HOSPITALIZED WITH COVID-19

Scientific data

2022

### M Wainstein, S MacDonald, D Fryer, K Young, V Balan, H Begum, ...

USE OF AN EXTENDED KDIGO DEFINITION TO DIAGNOSE ACUTE KIDNEY INJURY IN PATIENTS WITH COVID-19: A MULTINATIONAL

PLoS medicine

STUDY USING THE ISARIC-WHO CLINICAL CHARACTERISATION PROTOCOL

2022

### M Wainstein, S MacDonald, D Fryer, K Young, P Rossingnol, ...

POS-880 ACUTE KIDNEY INJURY IN PATIENTS WITH COVID-19 USING AN EXTENDED KDIGO DEFINITION: RESULTS FROM

Kidney International Reports

THE ISARIC PROSPECTIVE, MULTINATIONAL, MULTICENTRE, OBSERVATIONAL STUDY

2022

### DV Fryer, I Strumke, H Nguyen

MODEL INDEPENDENT FEATURE ATTRIBUTIONS: SHAPLEY VALUES THAT UNCOVER NON-LINEAR DEPENDENCIES

PeerJ Computer Science

2021

## Presentations and events

### IEEE Symposium Series on Computational Intelligence

K-MEANS ON POSITIVE DEFINITE MATRICES, AND AN APPLICATION TO CLUSTERING IN RADAR IMAGE SEQUENCES

Brisbane

2020

- Talk and conference publication

### Statistical Society of Australia

EARLY CAREER INDUSTRY SHOWCASE, CHIEF EVENT ORGANISER

Melbourne

2020

- 6 panelists, 180 attendees <https://vimeo.com/ssavic/20200922-showcase>

### Victorian Research Students Meeting in Probability and Statistics

EXPLAINING, EXPLORING AND CLUSTERING WITH NON-LINEAR AND COMPLEX DATA

Melbourne

2020

- Building the Melbourne research student community

## **UQ Research Video Pitch**

FORECASTING PSYCHIATRIC SYMPTOMS WITH DIGITAL PHENOTYPING

- First prize. [youtu.be/h-m8QwLq29Y](https://youtu.be/h-m8QwLq29Y)

*St Lucia*

*2020*

## **UQ Three Minute Thesis Presentation**

MACHINE LEARNING: THE BIG BLACK BOX

- People's choice award. [vimeo.com/434959101](https://vimeo.com/434959101)

*St Lucia*

*2020*

## **RSSDS2019 Poster Presentation**

SPHERICAL DATA HANDLING AND ANALYSIS WITH R PACKAGE RCOSMO

- Poster and Springer book chapter

*Melbourne*

*2019*

## **UseR!2018 Conference**

COSMIC MICROWAVE BACKGROUND DATA ANALYSIS WITH R

- R package published on CRAN. <https://youtu.be/7KBsguOIEHs>

*Brisbane*

*2018*

## **Australian Mathematical Sciences Institute Summer Research School**

FUNCTIONALS OF LONG-RANGE DEPENDENT FIELDS AND HERMITE DISTRIBUTIONS

- Summer Research Scholarship recipient. [vrs.amsi.org.au/daniel-vidali-fryer-2017/](https://vrs.amsi.org.au/daniel-vidali-fryer-2017/)

*Melbourne*

*2017*

## **UNSW Statistical Challenges in Astronomy**

LIGHTING TALK: A NEW R PACKAGE FOR COSMOLOGY

- Fostering new collaborations in statistics and astronomy

*Sydney*

*2017*