

# Daniel Fryer

PHD CANDIDATE | SESSIONAL LECTURER | RESEARCH SOFTWARE ENGINEER

School of Mathematics and Physics, The University of Queensland

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*I'm in love with statistics, programming and science, but the four of us have complicated relationship issues. Complex data analyses are used in every industry and scientific field, but so many of the results are unintuitive and difficult to interpret. I aim to make complex models more transparent, understandable and explainable. To make this research accessible, I write software packages and libraries in R, Python and Julia. My aim is not just to work theoretically, but also to apply these methods to impactful real world problems. Aside from research, I'm a passionate teacher, and I serve as a council member and Early Career and Student Statisticians' Representative at the Statistical Society of Australia.*

## 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

### Monash University

RESEARCH ASSISTANT

- Politics & International Relations

Melbourne, Victoria, AU

2020–Current

### The University of Queensland

CASUAL INSTRUCTOR | DEPARTMENT OF MATHEMATICS AND PHYSICS

- Master's of Data Science project support

Saint Lucia, QLD, AU

2020–Current

### University of Auckland

COURSE 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

2020–Current

### 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

### Statistical Society of Australia

COUNCIL MEMBER | EARLY CAREER AND STUDENT STATISTICIANS' REPRESENTATIVE

Melbourne, VIC, AU

2020–Current

### Dimension Reduction and Meta Analysis Research Group

MEMBER | WEBSITE MAINTAINER

Melbourne, VIC, AU

2017–Current

### Campus Consultancy

SENIOR MENTOR AND FOUNDING MEMBER

Melbourne, VIC, AU

2017–2019

### Research School on Statistics and Data Science

PEER REVIEWER (3 ARTICLES)

Melbourne, VIC, AU

2019–2019

## Journal of Open Source Software

PEER REVIEWER (1 ARTICLE)

Melbourne, VIC, AU

2019–2019

## Victorian State Emergency Services

EMERGENCY FIRST RESPONDER

Melbourne, VIC, AU

2017–2018

## La Trobe University Mathematics and Statistics Society

VICE PRESIDENT | NEWSLETTER EDITOR

Melbourne, VIC, AU

2016–2016

## In2Science

MENTOR | MATHEMATICS SCHOOL OUTREACH

Melbourne, VIC, AU

2015–2015

## Awards

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### Vice Chancellor's Sessional Teaching Award

LA TROBE UNIVERSITY, NA

Melbourne, VIC, AU

2020

### Three Minute Thesis | People's Choice

THE UNIVERSITY OF QUEENSLAND, SCHOOL OF MATHEMATICS AND PHYSICS

Saint Lucia, QLD, AU

2020

### Pitching Research Competition | Best Written and Oral Pitch University-Wide

THE UNIVERSITY OF QUEENSLAND, BUSINESS SCHOOL

Saint Lucia, QLD, AU

2019

### Pro Vice Chancellor's Commendation (awarded four times)

LA TROBE UNIVERSITY, UNIVERSITY-WIDE

Melbourne, VIC, AU

2018

### Department Prize in Fourth Year Statistics | Best Performing Student

LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS

Melbourne, VIC, AU

2018

### David Myer's Medallion | La Trobe's most prestigious undergraduate award

LA TROBE UNIVERSITY, COLLEGE OF SCIENCE, HEALTH AND ENGINEERING

Melbourne, VIC, AU

2018

### Silver Scholarship | Community Involvement and Dedication to Mathematics

LA TROBE UNIVERSITY STUDENT UNION, UNIVERSITY-WIDE

Melbourne, VIC, AU

2017

### Department Prize in Third Year Statistics | Best Performing Student

LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS

Melbourne, VIC, AU

2016

### Prof CJ Eliezer Prize in Second Year Mathematics | Best Performing Student

LA TROBE UNIVERSITY, DEPARTMENT OF MATHEMATICS AND STATISTICS

Melbourne, VIC, AU

2015

### Prof Jim Morrison Prize in Chemistry | Best Performing Student (awarded twice)

LA TROBE UNIVERSITY, SCHOOL OF MOLECULAR SCIENCES

Melbourne, VIC, AU

2014

### La Trobe Award in Community Engagement | Volunteer Efforts

LA TROBE UNIVERSITY, UNIVERSITY-WIDE

Melbourne, VIC, AU

2014

## Publications

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### Pipeline

#### D Fryer, H Nguyen, P Castellazzi

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

arXiv

2020

#### D Fryer, I Strümke, H Nguyen

EXPLAINING THE DATA OR EXPLAINING A MODEL? SHAPLEY VALUES THAT UNCOVER NON-LINEAR DEPENDENCIES

arXiv

2020

#### 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, DV Fryer

A BINARY-RESPONSE REGRESSION MODEL BASED ON SUPPORT VECTOR MACHINES

arXiv

2020

### Published

#### D Fryer, M Li, A Olenko

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

The R Journal

2020

## 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, 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

# Presentations and events

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## Statistical Society of Australia

EARLY CAREER INDUSTRY SHOWCASE, CHIEF EVENT ORGANISER

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

*Melbourne*

2020

## Victorian Research Students Meeting in Probability and Statistics

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

- Building the Melbourne research student community

*Melbourne*

2020

## 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