

# Mitchell O'Hara-Wild

DATA SCIENTIST

Melbourne, Australia

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## Current work

### Monash University

Clayton, Australia

PHD CANDIDATE

Feb. 2023 - Present

- Research in statistical software for time series analysis and probabilistic forecasting at scale.
- Key research topics include graph-based forecast reconciliation, coherent pruning of aggregation structures, and time-series visualisation
- Underpinning this research are the R packages *distributional*, *graphvec*, and *mixtime* which provide vector-based data structures for distributions, graphs, and time.

### Nectric

Melbourne, Australia

FOUNDER & DATA SCIENTIST

Jan. 2019 - Present

- Data science consulting projects including spatio-temporal modelling, and large scale forecasting.
- Development of interactive web applications using Shiny for R.
- Hosting workshops improving data literacy, development, analysis and modelling capabilities.

### Australia-Aotearoa Consortium for Epidemic Forecasting & Analytics (ACEFA)

Australia

STATISTICIAN

Aug. 2020 - Present

- ACEFA provides situational assessment for public health officials in Australia and New Zealand about epidemic diseases.
- I lead the evaluation and ensembling of component forecasts of Influenza, RSV, and COVID-19.
- Recently I have been developing new interactive platforms for stakeholders to engage with and better understand the forecasts.

### R Journal

Online

TECHNICAL EDITOR

Jan. 2024 - Present

- The publishing and deployment of articles and issues for the R Journal.
- Maintenance and development of R Journal software, including *rjtools*, *rjdistill*, and *rj*.
- Created software for managing submitted articles and publishing them in both interactive HTML and static PDF.

### Monash University

Clayton, Australia

RESEARCH ASSISTANT

Oct. 2015 - Present

- Primarily working as a research software engineer creating R packages for time series forecasting techniques.
- Other work involves consulting on large scale time series forecasting and cross-sectional modelling.
- Consulting project clients include: Doherty Institute, Huawei, Monash University, R Consortium, and the NSW Chief Scientist office.

### Monash University

Clayton, Australia

TEACHING ASSOCIATE

Mar. 2016 - Present

- Sessional teaching of university students undertaking Bachelor's and Master's degrees.

## Qualifications

### Monash University

Clayton, Australia

BCom (Hons) in Econometrics

Mar. 2017 - Nov. 2017

- Recipient of the Econometrics Honours Memorial Scholarship, Dean's Honour, Dean's Commendation, and best in class for 5 units.
- Honours research project was to develop a state space model for quickly forecasting time series with multiple seasonalities.
- Studied units include Bayesian and frequentist econometrics, advanced statistical modelling and computational science.

### Monash University

Clayton, Australia

BCom & BSc (Majoring in Econometrics, Mathematical Statistics, and Computational Science)

Mar. 2013 - Nov. 2016

- Recipient of the Monash Community Leaders Scholarship, International Institute of Forecasters Award, and best in class for 4 units.
- Mentor for the Access Monash Ambassador Program (2015 and 2016)
- Participant of the Vice-Chancellor's Ancora Imparo Student Leadership Program (2014)
- Each of the three disciplines I majored in provided different perspectives for working with data.

# Academic contributions

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## CURRENT RESEARCH AREAS

The primary research area of my PhD relates to tools and techniques for large-scale time series analysis and forecasting. Large collections of time series are usually structurally related, whereby series of interest are constructed by aggregating other time series. Independent forecasts of these series are adjusted using forecast reconciliation to maintain the aggregation structure. My research extends time series aggregation and forecast reconciliation methods to support arbitrary aggregations using graphs. This work enables non-linear aggregation constraints, cross-temporal reconciliation of sub-daily data, and pruning noisy time series from large coherent time series.

A substantial element in this research is the design of statistical software. Large-scale forecasting involves many different data types beyond time itself. My recent research has focused on developing vectorised data structures for these data types, including distributional (for forecast distributions), mixtime (for temporal aggregation), and graphvec (for representing aggregation relationships). To improve exploratory time series analysis tools, I have also been working on the grammar of temporal graphics and ggtime, which leverages mixtime for better time-series visualisation.

Unrelated to my PhD, I have also been developing scalable teaching tools for self-paced e-learning. This includes moodlequiz for creating Moodle quizzes with literature programming, and online learning modules with programming exercises using webr and qlcheckr. I have also recently been experimenting with using LLMs for exploring and cleaning unstructured data.

## SOFTWARE

My primary research output is the translation of academic research into open source software packages. The software primarily relates to time series forecasting, literate programming, and data visualisation. Some more notable software packages are listed below.

- 2025 **ggtime**: Lead developer  
Extends ggplot2 with a grammar of temporal graphics.
- 2025 **mixtime**: Lead developer  
Vectorised and extensible time classes.
- 2025 **graphvec**: Lead developer  
Vectorised graph nodes and edges.
- 2025 **vecvec**: Lead developer  
Vectors of vctrs for efficient storage of mixed vector types.
- 2025 **fromhere**: Lead developer  
Relative file paths from different places, a declarative version of the here package.
- 2022 **rjtools**: Lead developer  
Tools and templates for publishing articles to the R Journal.
- 2022 **gghdr**: Author  
Extends ggplot2 with plot types for visualising highest density regions.
- 2020 **distributional**: Lead developer  
Vectorised distribution objects with methods for manipulating and computing on probability distributions.
- 2019 **fable**: Lead developer  
A collection of time series models for use in a tidyverse workflow.
- 2019 **feasts**: Lead developer  
A collection of features, decompositions, statistics and graphics tools for the analysing tidy time series data.
- 2019 **fabletools**: Lead developer  
Provides common utilities for the fable forecasting framework, allows users to extend fable with new models.
- 2019 **tsibbledata**: Lead developer  
Diverse datasets in a tidy time series data structure (tsibble). Useful in examples of tidy time series analysis.
- 2018 **tsibble**: Contributor  
Tidy temporal data structures and tools. The data for the tidy time series collection of packages.
- 2018 **vitae**: Lead developer  
Dynamically generate a Résumé or CV using R Markdown. This CV is created using code with that package!
- 2018 **taipan**: Lead developer  
Generates shiny apps for annotating image data, which is useful for training machine learning models.
- 2017 **fasster**: Lead developer  
Implementation of the FASSTER model for forecasting complex multiple seasonal patterns.
- 2017 **icons**: Lead developer  
Embed SVG icons in R documents such as slides, reports and apps.
- 2017 **ggquiver**: Lead developer  
Extends ggplot2 for displaying vector fields on plots.
- 2015 **forecast**: Author  
Methods and tools analysing univariate time series data and producing model-based forecasts.

## PRESENTATIONS

- 2025 **Vectorised Statistics with Composite Data Types:** Mixed-type semantic vectors and statistics.  
<https://slides.mitchelloharawild.com/asc2025/>
- 2025 **Visualizing time with ggtime's grammar of temporal graphics:** Better time series visualisation tools.  
<https://slides.mitchelloharawild.com/user2025/>
- 2025 **ggtime: Visualizing time with a grammar of temporal graphics:** Extending ggplot2 with ggtime.  
<https://slides.mitchelloharawild.com/jsm2025/>
- 2025 **Calendar-based exploratory time series analysis:** Composable time vectors and visualisation tools.  
<https://slides.mitchelloharawild.com/isf2025/>
- 2025 **Designing extensible forecasting frameworks:** Creating tidy forecasting systems and tools.  
<https://slides.mitchelloharawild.com/iif-osf/>
- 2025 **Probabilistic forecast combinations:** Introduction to ensemble, decomposition, and coherent forecasting.  
<https://slides.mitchelloharawild.com/acefa-launch/>
- 2025 **Designing ggtime: A grammar of temporal graphics:** A discussion about ggplot2 extension design.  
<https://slides.mitchelloharawild.com/ggextenders-ggtime/>
- 2024 **Scalable self-paced e-learning with automated feedback:** Using e-learning for teaching at scale.  
<https://slides.mitchelloharawild.com/wombat2024/>
- 2024 **Statistical computing with vectorised operations on distributions:** Introducing distributional for R.  
<https://slides.mitchelloharawild.com/user2024/>
- 2024 **Feature based graph pruning for improved forecast reconciliation:** Coherent large scale forecasting.  
<https://slides.mitchelloharawild.com/pruning-graphs/>
- 2023 **Creating flexible e-learning quizzes with literate programming:** Literate programming Moodle quizzes.  
<https://slides.mitchelloharawild.com/moodlequiz/>
- 2023 **From forecast to fable, design decisions for statistical software:** Design changes from forecast to fable.  
<https://slides.mitchelloharawild.com/nyr2023/>
- 2023 **Reconciliation of structured time series forecasts with graphs:** Coherent forecasting with graphs.  
<https://slides.mitchelloharawild.com/reconciling-graphs/>
- 2020 **Forecasting with multiple seasonality:** Methods and techniques to multiple seasonal forecasting in R  
<https://slides.mitchelloharawild.com/nhs2020/>
- 2020 **Probabilistic cross-temporal hierarchies:** Recent developments of temporal reconciliation in fable.  
<https://slides.mitchelloharawild.com/isf2020/>
- 2019 **Flexible futures for fable functionality:** Reconciled forecasting of time series with model combinations.  
<https://slides.mitchelloharawild.com/isf2019/>
- 2018 **Forecasting multiple seasonality with state switching:** The FASSTER model with the fable framework.  
<https://slides.mitchelloharawild.com/user2018>
- 2017 **Models for forecasting multiple seasonality:** An introduction to the FASSTER model.  
<https://slides.mitchelloharawild.com/melburn17/>

## PUBLICATIONS

1. Athanasopoulos, G., Hyndman, R. J., Kourentzes, N., & O'Hara-Wild, M. (2022). Probabilistic forecasts using expert judgment: The road to recovery from COVID-19. *Journal of Travel Research*. <https://doi.org/10.1177/00472875211059240>
2. Ulayil, A., Cook, D., Turner, H., O'Hara-Wild, M., & Dervieux, C. (2025). Converting LaTeX legacy r journal articles into r markdown articles using texor and rebib. *The R Journal*, 17, 30–42. <https://doi.org/10.32614/RJ-2025-022>
3. Shearer, F., Adeshina, A., Dawson, P., Golding, N., Hao, T., Hyndman, R. J., Moss, R., O'Hara-Wild, M., Price, D., Ryan, G., Senior, K., Tobin, R., Wood, J., & McCaw, J. (2023). *Series of weekly COVID-19 epidemic situational assessment reports submitted to the Australian Government Department of Health Office of Health Protection from April 2020 to December 2023*. <https://doi.org/10.26188/24845328.v3>

# Teaching experience

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## UNIVERSITY TEACHING

I have 10 years of teaching experience at Monash University, mostly teaching applied forecasting, statistical modelling, and data analysis skills. My teaching has been consistently recognised with positive student evaluations and individual praise from my students, with 13 congratulatory letters for outstanding student evaluations (units in top 5%). I am currently co-lecturing Applied Forecasting and Advanced R Programming.

2024-2025 **ETC4500/ETC5450**: Advanced R Programming (Monash Clayton)

2019-2025 **ETC3550/ETC5550**: Applied Forecasting (Monash Clayton)

2020-2021 **ETC5523**: Communicating with Data (Monash Clayton)

2018-2019 **ETC3580**: Advanced Statistical Modelling (Monash Clayton)

2017-2019 **ETC1010**: Data Modelling and Computing (Monash Clayton)

2016 **ETF2700**: Mathematics for Business (Monash Caulfield)

2016-2018 **ETF3231/ETF5231**: Business Forecasting (Monash Caulfield)

## WORKSHOPS AND TRAININGS

In addition to on-campus teaching, I also teach data analysis workshops to people of all backgrounds around the world.

June 2025 **Exploratory time series analysis**: Instructor (ISF, Online)

Half-day workshop on visually exploring tidy time series data.

May 2025 **Tidy time series analysis and forecasting**: Instructor (SSA, Online)

Half-day workshop on time series forecasting with the fable package.

Oct. 2024 **Advanced R Tips and Tricks**: Instructor (WOMBAT, Australia)

Half-day workshop on advanced R programming.

Oct. 2024 **Interactive web applications with Shiny for R**: Instructor (WOMBAT, Australia)

Half-day workshop on creating interactive web applications in R using Shiny.

Oct. 2023 **Tidy Time Series and Forecasting in R**: Instructor (Dept. Edu, Australia)

Two day workshop on forecasting using tidy forecasting tools in R.

Sept. 2024 **AFRICAST: Tidy forecasting for social good**: Instructor (F4SG, Online)

Five day workshop on forecasting for 181 students from 32 Sub-Saharan African countries.

July 2024 **Tidy time series analysis and forecasting**: Instructor (useR!, Austria)

Quick-start workshop for tidy forecasting in R.

June 2024 **Tidy time series & forecasting in R**: Instructor (UM6P, Morocco)

Two day workshop on forecasting using tidy forecasting tools in R.

Jun. 2024 **Tidy time series analysis and forecasting**: Instructor (R/Medicine, Online)

Quick-start workshop for tidy forecasting in R.

Dec. 2023 **Interactive web applications with Shiny for R**: Instructor (SSA, Online)

3-hour online quick-start workshop for the basics of Shiny.

Oct. 2023 **AFRICAST: Tidy forecasting for social good**: Instructor (F4SG, Online)

Five day workshop on forecasting for 62 students from 9 Sub-Saharan African countries.

July 2023 **Tidy Time Series and Forecasting in R**: Instructor (NYR, USA)

Two day workshop on forecasting using tidy forecasting tools in R.

Dec. 2022 **Interactive web applications with Shiny**: Instructor (WOMBAT, Australia)

Half-day workshop on the basics of shiny applications.

Jan. 2020 **Tidy Time Series and Forecasting in R**: Teaching assistant (rstudio::conf, USA)

Two day workshop with Rob Hyndman on forecasting using tidyverse workflows.

Nov. 2019 **Interactive documents with Shiny**: Instructor (CSIRO, Australia)

Two day intermediate workshop on developing of shiny applications.

Sep. 2019 **Data Wrangling**: Instructor (Monash University, Australia)

A short workshop in the 'R Workshops for Beginners' series on using tidyr and dplyr to wrangle data.

July 2019 **Tidyverse developer day**: Helper (RStudio, France)

A one day developer day where I helped R users resolve issues on tidyverse packages.

Aug. 2019 **High-dimensional time series analysis**: Teaching assistant (ISI WSC, Malaysia)

One day short course with Rob Hyndman for analysing and forecasting large collections of time series.

Mar. 2019 **The grammar of animation**: Instructor (Monash University, Australia)

A short workshop for NUMBAT group on creating animated graphics in R with the gganimate package.

Dec. 2016 **Master R Developer Workshop**: Teaching assistant (RStudio, Australia)

A two day workshop with Hadley Wicham on programming with R and developing R packages.

SUPERVISION AND MENTORING

- 2025

**Monash Business Analytics:** Co-supervisor  
Supervised a research project on data cleaning unvalidated values with LLMs.
- 2022-2023

**Google Summer of Code:** Co-supervisor  
Supervised the development of the 'texor' R package for converting LaTeX articles to R Markdown.
- 2022

**Monash Business Analytics:** Co-supervisor  
Supervised research into hexagonal binning of spatial geometries (common in election visualisation).
- 2015-2016

**Access Monash:** Mentor  
Mentored underprivileged high-school students to support their studies and pursuit of career goals.

Awards & achievements

AWARDS

- 2025

Pitman Prize Honourable Mention

SSA
- 2023

Student Presentation Award

ISF
- 2021

Dean's Citation for Outstanding Contribution to Student Learning as a Teaching Associate

Monash
- 2017

Commerce Dean's Honour

Monash
- 2016

Commerce Dean's Commendation

Monash
- 2014-2016

Science Dean's List

Monash
- 2014

International Institute of Forecasters Award

IIF
- 2013

Rotary Youth Leadership Award

Rotary

SCHOLARSHIPS

- 2023-2026

Monash Graduate Excellence Scholarship

Monash
- 2023-2026

Monash Faculty Scholarship

Monash
- 2023-2026

Monash Departmental Scholarship

Monash
- 2017

Econometrics Honours Memorial Scholarship

Monash
- 2015 & 2016

Monash Community Leaders Scholarship

Monash
- 2011 & 2012

Mitcham Rotary Scholarship

Rotary