



# Timothy Hyndman

DATA SCIENTIST

Melbourne, Australia

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## Education

### University of Melbourne

Melbourne, Australia

PH.D.

2015 – 2019

- Thesis: 'The coupling time for the Ising heat-bath dynamics & efficient optimization for statistical inference'.
- Completed under the supervision of Prof. Peter Taylor, Prof. Aurore Delaigle, and Assoc. Prof. Tim Garoni.

### Monash University

Clayton, Australia

B.Sc.(HONS)

2011 – 2014

- Honours thesis: proved that a Markov chain with close ties to the Ising model (the 'worm chain') was rapidly mixing.
- GPA of 3.957, H1 honours result with an average mark of 93.

### Australian Music Examinations Board

Melbourne, Australia

A.Mus.A (PIANO)

2011

## Employment History

### Predictive Analytics Group

WFH

SENIOR STATISTICIAN

Jan. 2021 - Present

- Lead developer, mathematician, and architect for a generalised sports schedule optimiser. Starting with a legacy codebase created for a specific client problem, I generalised the optimiser to work for a large variety of sports scheduling problems, while improving the speed by a factor of over 500. I worked with backend, frontend, and design teams to build a web-app around the application. I independently designed and implemented creative solutions to allow for non-technical users to specify hugely varied constraints for highly diverse sports schedules. I implemented novel generalisations of methods from the academic literature and provided overall direction for new feature development to senior management.
- Supervised, trained, and mentored junior staff on a project implementing new data structures in our sports scheduler which resulted in a cleaner and more efficient codebase. My teaching resulted in the junior staff producing a higher code quality and acting with greater independence.
- Researched and orchestrated a collection of AWS services to automatically process registration data for a large sports organisation and use it to update a live dashboard. I used AWS SAM to define the infrastructure as code, and migrated old manually managed services to use this new structure.

### Biarri

Windsor, Australia

DATA SCIENTIST

May. 2019 - Dec. 2020

- Technical lead on a project with one of Australia's major fuel retailers to recommend real-time fuel prices at over 500 stores. Starting with over 100 GB of raw transaction data, I developed predictive models for short term fuel volume forecasts at candidate prices, as well as predictive models for in-store purchases and long term effects of difference pricing strategies. I was one of two developers for the final software, and helped deploy the solution to the client's Azure infrastructure. The solution is being used Australia wide.
- Developed tool to suggest 'optimal' markdown prices for a group of sports and outdoor retailers. The challenge was to recommend a price that would allow them to sell stock within an allocated time while maximising profit. After two trial implementations, the net increase in margin was measured at approximately \$200k or 20%.
- Received feedback that we were 'the best value client we have ever had' by a large government organisation for my analytics work on one of their processing pipelines.
- I have also developed ranking algorithms for a competitive form of Poker, produced a performance analysis on a 3rd party's electricity forecasting algorithms, and determined factors that correlated with poor sales growth for an outdoor activities retailer.

### Monash University

Clayton, Australia

RESEARCH ASSISTANT

2019

- Worked with Assoc. Prof. Tim Garoni on improving the results proved in my thesis. The outcome of this work, combined with the relevant parts from my thesis, is a working paper (detailed below).

### Monash University/University of Melbourne

Melbourne, Australia

TUTOR

2013 – 2018

- Tutored linear algebra (MAST10007), analysis of change (MTH1020) and differential geometry (MTH3110). Mentioned in student evaluations as one of the best parts of the differential geometry unit.

## Relevant Skills

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### Programming

PYTHON, R, MATLAB, SQL, BASH, JAVASCRIPT, HTML, CSS, C++

### Libraries

PANDAS, NUMPY, SCIPY, NUMBA, TENSORFLOW, OPENCV, SCIKIT-LEARN

### Tools

GIT, DOCKER, LATEX

### AWS

S3, ATHENA, LAMBDA, QUICKSIGHT, SAM, SECRETS, SAGEMAKER

## Software (R Packages)

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2022	<b>fable:</b> Contributor Tidy time series forecasting
2022	<b>cricketdata:</b> Author International cricket data for men and women, Tests, ODIs, and T20s.
2021	<b>icons:</b> Contributor Embed SVG icons in R documents such as slides, reports and apps.
2018	<b>deconvolve:</b> Lead developer Provides tools for performing non-parametric deconvolution of measurement error problems

## Awards & Achievements

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### AWARDS

2020	Winner of the annual 'Power of Mathematics' award	<i>Biarri Optimisation</i>
2012 – 2014	Science Dean's list Fellowship	<i>Monash University</i>
2011	Premier's VCE award for mathematics	<i>VCAA</i>
2010	Australian Student Prize	<i>VCAA</i>
2010	Australian Defence Force Long Tan Leadership and Teamwork award	<i>ADF</i>

### SCHOLARSHIPS

2015	ACEMS top-up scholarship	<i>ACEMS</i>
2015	Australian Postgraduate Award	<i>Australian Government</i>
2014	Monash jubilee honours scholarship	<i>Monash University</i>
2011	Science merit scholarship	<i>Monash University</i>

### COMPETITIONS

2017	Winner 'Advanced sampling & exploration competition'	<i>ACEMS</i>
2016	Special mention 'Advanced sampling & exploration competition'	<i>ACEMS</i>
2015	Winner 'Advanced sampling & exploration competition'	<i>ACEMS</i>

## Publications

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### RESEARCH PAPERS

1. Delaigle, A., Hyndman, T., & Wang, T. (2019). *Deconvolve-package: Deconvolution tools for measurement error problems* [Working Paper].
2. Collevocchio, A., Garoni, T. M., Hyndman, T., & Zhou, E. (2018). *The coupling time for the ising heat-bath dynamics* [Working Paper].
3. Collevocchio, A., Garoni, T. M., Hyndman, T., & Tokarev, D. (2016). The worm process for the ising model is rapidly mixing. *J. Stat. Phys.*, 164(5), 1082–1102.