



# Timothy Hyndman

DATA SCIENTIST

Melbourne, Australia

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## Education

### University of Melbourne

Melbourne, Australia

PH.D. 2015-2019

- Thesis titled '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 research project 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

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## Employment history

### Biarri

Windsor, Australia

DATA SCIENTIST

May. 2019 - Present

- Technical lead on a project with one of Australia's major fuel retailers to suggest real-time fuel prices at over 500 stores. Starting with over 100GB 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 currently in a trial phase and being used at approximately 80 stores Australia wide.
- Developed tool to suggest 'optimal' markdown prices for a group of sport and outdoor retailers. The challenge was to suggest a price that would allow them to get rid of 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 competitor form of Poker, performed 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).

### University of Melbourne

Melbourne, Australia

TUTOR

2016 - 2018

- Tutored Linear Algebra (MAST10007)

### Monash University

Clayton, Australia

TEACHING ASSOCIATE

2013 - 2014

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

### Monash University

Clayton, Australia

AMSI SUMMER RESEARCH SCHOLARSHIP

2012-2013

- Supervised by Prof. Kate Smith-Miles and Dr Davaatseren Baatar. Worked on optimising an instrument scheduler for Leica Microsystems.

## Relevant Skills

- Proficient in Python, R, MATLAB, SQL, and TeX.
- Familiar with C++

- Experience using Docker, Docker Compose, AWS (S3 and Athena)

## Software

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TODO: Put links in

- 2018 **deconvolve**: Lead developer  
Provides tools for performing non-parametric deconvolution of measurement error problems
- 2017 **icon**: Author  
Embed SVG icons in R documents such as slides, reports and apps.
- 2017 **cricketdata**: Author  
International cricket data for men and women, Tests, ODIs, and T20s.

## Other awards

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### AWARDS

- 2020 Winner of the annual 'power of mathematics' award *Biarri Optimisation*
- 2012-2014 Science dean's list fellowship award *Monash University*
- 2011 Premier's VCE award for mathematics *VCAA*
- 2010 Australian Student Prize *VCAA*
- 2010 Australian Defence Force Long Tan Leadership and Teamwork award *ADF*

### SCHOLARSHIPS

- 2015 ACEMS top-up scholarship *ACEMS*
- 2015 Australian Postgraduate Award *Australian Government*
- 2014 Monash jubilee honours scholarship *Monash University*
- 2011 Science merit scholarship *Monash University*

### COMPETITIONS

- 2017 Winner 'Advanced sampling & exploration competition' *ACEMS*
- 2016 Special mention 'Advanced sampling & exploration competition' *ACEMS*
- 2015 Winner 'Advanced sampling & exploration competition' *ACEMS*

## Publications

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### RESEARCH PAPERS

#### A Collevocchio, TM Garoni, T Hyndman, D Tokarev

*Journal of Statistical Physics* 164,  
1082-1102

THE WORM PROCESS FOR THE ISING MODEL IS RAPIDLY MIXING

2016

#### A Delaigle, T Hyndman, T Wang

*working paper intended for the  
Journal of Statistical Software*

DECONVOLVE-PACKAGE: DECONVOLUTION TOOLS FOR MEASUREMENT ERROR PROBLEMS

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#### A Collevocchio, TM Garoni, T Hyndman, E Zhou

*working paper*

THE COUPLING TIME FOR THE ISING HEAT-BATH DYNAMICS

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### TALKS

#### Using information percolation to find the coupling time for the 1D Ising.

*Monash University*

ACEMS MULTISCALE MODELS WORKSHOP

2018

#### How many point masses do we need for non-parametric deconvolution and maximum likelihood mixture densities?

*University of London*

COMPUTATIONAL AND METHODOLOGICAL STATISTICS

2017

**How many probability masses do we need for maximum likelihood mixture densities?**

ANZIAM CONFERENCE

*Australian National University*

2016

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**3 minute talk + poster - ‘How many components do we need for location mixtures?’**

ACEMS RETREAT

*Sydney*

2016

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