

# Yangzhuoran Fin Yang

PHD STUDENT IN MATHEMATICS AND STATISTICS

Monash University, Australia

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## Education

### Doctor of Philosophy in Mathematics and Statistics

MONASH UNIVERSITY

- Supervisors: Professor Rob J Hyndman, Professor George Athanasopoulos, Associate Professor Anastasios Panagiotelis
- Thesis: Component-Based Methods in Multivariate and Hierarchical Time Series Forecasting
- Submitted July 2024 (Intermission from May 2021 to Feb 2022 due to COVID-19)

Clayton, Australia

Apr. 2020 - Present

### Bachelor of Commerce (Hons) in Econometrics

MONASH UNIVERSITY

- Thesis: Optimal Portfolio Selection via Dimensional Reduction in a Stochastic Optimal Control Setting
- GPA: 3.875; GRADE H1

Clayton, Australia

Mar. 2019 - Dec. 2019

### Bachelor of Actuarial Science

MONASH UNIVERSITY

- GPA: 4; WAM: 90.323

Clayton, Australia

Jul. 2016 - Oct. 2018

## Experience

### Teaching Associate

MONASH UNIVERSITY

- Econometrics, Statistics and Business Analytics

Clayton, Australia

2017, 2019 - 2020, 2022 - Present

### Research Assistant

MONASH UNIVERSITY

- Developments of R packages and data wrangling

Clayton, Australia

2017 - 2020, 2022 - Present

### Data Mining Engineer (Applied Economist)

HUOHUA SIWEI (ONLINE EDUCATION)

- Experimental design and evaluation, data mining and R web app development

Beijing, China

Apr. 2021 - Jan. 2022

### Adjunct Lecturer

MONASH UNIVERSITY

- Suzhou Industrial Park Monash Research Institute of Science and Technology

Suzhou, China

Oct. 2020 - Jun. 2021

### Visiting Student

SHANGHAI TECH UNIVERSITY SIST

- Supervisor: Assistant Professor Ziping Zhao

Shanghai, China

Dec. 2019 - Aug. 2020

## Teaching

### Applied Forecasting

HIGHEST STUDENT SATISFACTION BAND; ONE OF THE TOP PERFORMING UNITS IN THE STUDENT EVALUATION

Undergraduate and postgraduate

Sem 1 2022, Sem 1 2023

### Advanced Statistical Modelling

HIGHEST STUDENT SATISFACTION BAND

Undergraduate and postgraduate

Sem 2 2022, Sem 1 2023

### Principles of Econometrics

HIGHEST STUDENT SATISFACTION BAND

Undergraduate and postgraduate

Sem 2 2023, Sem 2 2024

### Business and Economic Statistics

HIGHEST STUDENT SATISFACTION BAND; ONE OF THE TOP PERFORMING UNITS IN THE STUDENT EVALUATION

Undergraduate and postgraduate

2019, NOV12 2020, Sem 1 2021, 2024

### Introductory Econometrics

Undergraduate and postgraduate

Sem 2 2024

## Job Market Paper

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“Forecast Linear Augmented Projection (FLAP): A free lunch to reduce forecast error variance” by Yangzhuoran Fin Yang, George Athanasopoulos, Rob J. Hyndman and Anastasios Panagiotelis

*Abstract:* We propose a novel forecast linear augmented projection (FLAP) method that can reduce the forecast error variance of any multivariate forecast. The method first constructs new component series which are linear combinations of the original series. Forecasts are then generated for both the original and component series. Finally, the full vector of forecasts is projected onto a linear subspace where the constraints implied by the combination weights hold. We show that the projection using the original forecast error covariance matrix will result in improved forecasts. Notably, the new forecast error variance of each series is non-increasing with the number of components, and mild conditions are established for which it is strictly decreasing. It is also shown that the proposed method achieves maximum forecast error variance reduction among linear projection methods. We demonstrate our proposed method with an estimated covariance matrix using simulations and two empirical applications based on Australian tourism and FRED-MD data. In all cases, forecasts are improved. Notably, using FLAP with Principal Component Analysis (PCA) to construct the new series leads to substantial forecast error variance reduction.

## Publications

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1. Seo, M. H., Koo, B., & Yang, Y. F. (2024). Nonlinear dynamics of Kimchi premium. *Economic Modelling*, 135, 106726.
2. Yang, Y. F., and Zhao, Z. (2020), “Online Robust Reduced-Rank Regression,” in 2020 IEEE 11th Sensor Array and Multichannel Signal Processing Workshop (SAM), pp. 1–5.

## Working Papers

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1. “ycevo: An R Package for Nonparametric Yield Curve Estimation, Analyses and Prediction” by Yangzhuoran Fin Yang, Bonsoo Koo, Wenying Yao and Nico Purnomo
2. “Forecast Multivariate Time Series using Lower Dimensional Components” by Yangzhuoran Fin Yang, Rob J. Hyndman, George Athanasopoulos and Anastasios Panagiotelis
3. “Forecast Linear Augmented Projection in Hierarchical Forecast Reconciliation”
4. “Forecasting Multiple Time Series with One-Sided Dynamic Autoregressive Principal Components”

## Conferences and Talks

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Jul. 2024	<b>Annual useR! conference</b>	Salzburg, Austria
Jul. 2024	<b>44th International Symposium on Forecasting</b>	Dijon, France
Jun. 2024	<b>Annual Conference of the International Association for Applied Econometrics</b>	Thessaloniki, Greece & Xiamen, China
Apr. 2024	<b>Monash NUMBATs Seminar</b>	Melbourne, Australia
Jun. 2023	<b>43rd International Symposium on Forecasting</b>	Charlottesville, USA
Jun. 2020	<b>11th IEEE Sensor Array and Multichannel Signal Processing Workshop</b>	Virtual

## Awards, Grants and Scholarships

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- 2024 Monash Business School Prestigious International Conference Award
- 2023 International Symposium on Forecasting Travel Grant
- 2023 Monash Graduate Research Travel Grant
- 2020 - 2024 Monash Business School Co-funded Graduate Research Scholarship
- 2020 - 2024 Monash Graduate Scholarship
- 2020 IEEE Sensor Array and Multichannel Signal Processing Workshop Best Student Paper Award Finalist
- 2019 Monash Business School Dean’s Honour
- 2019 Monash University Econometrics Honours Memorial Scholarship
- 2018 Monash Business School Prize for the Top Achieving Student in Actuarial Science (Undergraduate)
- 2018 Monash University Medal for Undergraduate Academic Excellence
- 2018 Monash Business School Dean’s Honour
- 2018 Monash Business School Student Excellence Award in recognition of exceptional academic excellence (Business analytics, Modelling in finance and insurance, Applied forecasting for business and economics)
- 2018 The International Institute of Forecasters Student Forecasting Award offered by Monash University Applied Forecasting for Business and Economics
- 2017 Monash Business School Student Excellence Award in recognition of exceptional academic excellence (Statistical Thinking, Principles of Econometrics, Contingencies in insurance and pensions)

## Softwares

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1. Hyndman, R. J., Akram, M., Bergmeir, C., & O'Hara-Wild, M. (2018). *Mcomp: Data from the m-competitions* (Version 2.8) [Computer software]. <https://CRAN.R-project.org/package=Mcomp>
2. Yang, Y. F., & Zhao, Z. (2020). *RRRR: Online robust reduced-rank regression estimation* (Version 1.1.0) [Computer software]. <https://CRAN.R-project.org/package=RRRR>
3. Hyndman, R. J., & Yang, Y. F. (2019). *compenginets: Time series from http://www.comp-engine.org/timeseries/* (Version 0.1) [Computer software]. <https://github.com/robjhyndman/compenginets>
4. Hyndman, R. J. (2019). *demography: Forecasting mortality, fertility, migration and population data* (Version 1.22) [Computer software]. <https://CRAN.R-project.org/package=demography>
5. Yang, Y. F. (2024). *flap: Forecast linear augmented projection* (Version 0.2.0) [Computer software]. <https://cran.r-project.org/package=flap>
6. Yang, Y. F. (2020). *lazybar: Progress bar with remaining time forecast method* (Version 0.1.0) [Computer software]. <https://CRAN.R-project.org/package=lazybar>
7. Yang, Y. F. (2024). *lazyparser: Command line r-flavored argument parser* (Version 0.1.0) [Computer software]. <https://github.com/FinYang/lazyparser>
8. Yang, Y. F. (2020). *lazytype: Functions and addins to save keystrokes and clicks* (Version 0.0.0.9000) [Computer software]. <https://pkg.yangzhuoranyang.com/lazytype/>
9. O'Hara-Wild, M., & Yang, Y. F. (2024). *roam: Remote objects with active-binding magic* (Version 0.0.0.9000) [Computer software].
10. Hyndman, R. J. (2018). *tscompdata: Time series data from various forecasting competitions* (Version 0.0.1) [Computer software]. <https://github.com/robjhyndman/tscompdata>
11. Hyndman, R. J., & Yang, Y. F. (2020). *tsdl: Time series data library* (Version 0.1.0) [Computer software]. <https://finyang.github.io/tsdl/>
12. Hyndman, R. J., Kang, Y., Montero-Manso, P., Talagala, T., Wang, E., Yang, Y. F., O'Hara-Wild, M., Taieb, S. B., Hanqing, C., Lake, D. K., Laptev, N., & Moorman, J. R. (2020). *tsfeatures: Time series feature extraction* (Version 1.0.2) [Computer software]. <https://CRAN.R-project.org/package=tsfeatures>
13. Koo, B., & Yang, Y. F. (2024). *ycevo: Nonparametric estimation of the yield curve evolution* (Version 0.2.1) [Computer software]. <https://CRAN.R-project.org/package=ycevo>

## Referees

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### Professor Rob J Hyndman

DEPARTMENT OF ECONOMETRICS & BUSINESS STATISTICS

- Email: Rob.Hyndman@monash.edu

Monash University

Clayton, Australia

### Professor George Athanasopoulos

DEPARTMENT OF ECONOMETRICS & BUSINESS STATISTICS

- Email: George.Athanasopoulos@monash.edu

Monash University

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### Associate Professor Anastasios Panagiotelis

DISCIPLINE OF BUSINESS ANALYTICS

- Email: Anastasios.Panagiotelis@sydney.edu.au

University of Sydney Business School

Darlington, Australia