Nuwani Kodikara Palihawadana

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EDUCATION

Doctor of Philosophy – Mathematics and Statistics
Monash University, Australia — Mar. 2021 — Present

- Thesis: Optimal Predictor Selection for High-dimensional Nonparametric Forecasting
- Status: Examination successfully completed; awaiting formal conferral of degree.

Bachelor of Science (Honours) – Industrial Statistics
University of Colombo, Sri Lanka — Feb. 2016 — Feb. 2019

- Graduated with First Class Honours (GPA – 3.95/4.00 (Batch Top))
- Thesis: Generalising Vector Autoregressive (VAR) Model for Functional Time Series

CIMA Exam Completed Student
Chartered Institute of Management Accountants (CIMA), United Kingdom Oct. 2013 — Aug. 2017

General Certificate of Education - Advanced Level
St.Paul's Girls' School, Milagiriya, Colombo 05, Sri Lanka — Jun. 2011 — Aug. 2013

- University Entrance Score (z-score): 1.65

EXPERIENCE

Teaching Associate
Department of Econometrics and Business Statistics, Monash University, Australia
Jun. 2022 – Present

- ETC3550/ETC5550 Applied Forecasting (Undergraduate and postgraduate levels)
- ETC2410/ETC5241/BEX2410 Introductory Econometrics (Undergraduate and postgraduate levels)
- ETX2250/ETF5922 Data Visualisation and Analytics (Undergraduate and postgraduate levels)
- ETC3400/ETC5340 Principles of Econometrics (Undergraduate and postgraduate levels)

Research Assistant
Department of Econometrics and Business Statistics, Monash University, Australia
Jun. 2022 – Mar. 2025

- Data pre-processing and wrangling, report editing
- Supervisors: Professor Bonsoo Koo, Professor Rob J. Hyndman

Temporary Assistant Lecturer
Department of Statistics, University of Colombo, Sri Lanka — Feb. 2019 – Feb. 2021

- MS 3009 Operational Research II – Conducted lectures, set exam paper
- ST 2007 Applications in Statistical Inference – Conducted lectures, set assignments

- IS 1006 Fundamentals in Statistics – Conducted practical sessions
- SCS 2211 Laboratory II: Statistical Methods using R – Conducted lectures
- ST 1012 Basic Statistical Computing – Conducted practical sessions
- IS 3053 Data Mining – Teaching assistant
- ST 2008 Statistical Methods in Quality Control – Conducted lectures, set exam paper
- MS 2001 Statistical Quality Control – Conducted lectures, set exam paper

Intern - Analyst
MAS Pixel of MAS Capital (Pvt) Ltd., MAS Holdings, Sri Lanka Aug. 2018 – Feb. 2019

- Data mapping and collection
- Data wrangling
- Business insight generation through data visualisation
- Predictive modelling

RESEARCH

PhD Thesis: Optimal Predictor Selection for High-dimensional Nonparametric Forecasting

Summary: This thesis investigates nonparametric additive index models as a forecasting framework, with a focus on automating predictor selection, predictor grouping, and model estimation — thereby reducing reliance on prior knowledge or domain expertise. To this end, it proposes the Sparse Multiple Index (SMI) Modelling algorithm, which estimates such models through an L0- and L2-regularised non-linear least squares optimisation problem with linear constraints, solved via mixed-integer programming. The algorithm simultaneously performs predictor selection and grouping with minimal user input. Empirical applications to forecasting heat exposure-related daily mortality and daily solar intensity demonstrate the method's competitive forecasting performance. The thesis further investigates methods for generating prediction intervals to quantify forecast uncertainty in nonparametric additive models. It evaluates the standard block bootstrap approach and three established conformal prediction methods. In addition, it proposes a novel method — Conformal Bootstrap (CB) — which integrates block bootstrap resampling and split conformal prediction into a unified procedure for constructing prediction intervals. Finally, the thesis presents an open-source R package, smimodel, to facilitate the practical application of the proposed methodologies.

Undergraduate Thesis: Generalising Vector Autoregressive (VAR) Model for Functional Time Series

Summary: This study generalises the Vector Autoregressive (VAR) model — a widely used multivariate time series model in classical time series analysis — to the context of functional time series. For theoretical simplicity, it introduces the Functional Vector Autoregressive model of order one (FVAR(1)), focusing on two functional time series, as higher-order FVAR models can be readily converted to an FVAR(1) form. The proposed model naturally extends the univariate Functional Autoregressive model of order one (FAR(1)), since FVAR(1) can be expressed in an equivalent FAR(1) form. Under the assumption of stationary time series and another key assumption, the model is shown to have a unique, stationary and convergent solution. The practical application of the FVAR(1) model is demonstrated using daily temperature data for Colombo from 2007 to 2012, obtained from the Department of Meteorology, Sri Lanka.

WORKING PAPERS

- Palihawadana, NK, RJ Hyndman, and X Wang (2024). Sparse Multiple Index Models for High-dimensional Nonparametric Forecasting. Working paper 16/24. Department of Econometrics & Business Statistics, Monash University. https://www.monash.edu/business/ebs/research/publications/ebs/2024/wp16-2024.pdf.

SOFTWARE

- Palihawadana, N, and X Wang (2025). smimodel: Sparse Multiple Index (SMI) Models for High-dimensional Nonparametric Forecasting. Version 0.0.1. https://github.com/nuwani-palihawadana/smimodel.
- Hyndman, RJ, G Athanasopoulos, M O'Hara-Wild, N Palihawadana, S Wickramasuriya, and RStudio (2024). fpp3: Data for "Forecasting: Principles and Practice" (3rd Edition). Version 1.0.0. https://pkg.robjhyndman.com/fpp3package/.
- Zhang H, X Wang, N Palihawadana, and J Lakshika (2023). olympics: Olympic data from olympic.com. Version 0.0.1. https://numbats.github.io/olympics/index.html.

CONFERENCES AND TALKS

Uncertainty Estimation for High-dimensional Nonparametric Forecasting
45th International Symposium on Forecasting, Beijing, China — Jul. 2025

Optimal Predictor Selection for High-dimensional Nonparametric Forecasting
Monash NUMBATs Seminar, Melbourne, Australia — Sep. 2024

Sparse Multiple Index (SMI) Models for High-dimensional Nonparametric Forecasting
44th International Symposium on Forecasting, Dijon, France — Jul. 2024

Better Forecasts through Better Choices: Optimal Predictor Selection for High-dimensional Nonparametric Forecasting
Monash Business School Three Minute Thesis (3MT) Heat, Melbourne, Australia — Jun. 2024

- Runner-up (Also competed as a Wildcard in the 2024 Monash University 3MT Competition)

AWARDS, GRANTS, AND SCHOLARSHIPS

Co-funded Monash Graduate Scholarship
Monash University, Australia — 2022 – 2025

Monash Business School Co-funded Graduate Research Scholarship
Monash University, Australia — 2022 – 2025

International Symposium on Forecasting Travel Grant
International Institute of Forecasters, USA — 2024

Monash Graduate Research Travel Grant
Monash University, Australia — 2024

Monash Business School Student Excellence Award
Monash University, Australia — 2021

- In recognition of exceptional academic excellence in BEX6510 Foundations of Econometrics

Physical Science Award - Statistics
Sri Lanka Association for the Advancement of Science (SLAAS) — 2019

- Awarded for the best undergraduate research project in Statistics completed as part of a B.Sc. degree at a Sri Lankan university

C. R. and Bhargavi Rao Gold Medal for Statistics
University of Colombo, Sri Lanka 2018

- Established by Professor C. R. Rao
- Awarded to the top First Class Honours graduate from the Department of Statistics who meets a special criterion

Gold Medal for Industrial Statistics
University of Colombo, Sri Lanka 2018

- Awarded for achieving the highest GPA in the Industrial Statistics Honours degree programme

Gold Medal for the Best Final Year Research Project in Industrial Statistics
University of Colombo, Sri Lanka 2018

- Awarded for achieving the highest mark in the final year research project in the Industrial Statistics Honours degree programme

Joseph Nalliah Arumugam Memorial Award
University of Colombo, Sri Lanka 2018

- Awarded to the student demonstrating the highest competence in the final examination of the Faculty of Science

Award for the Best All Rounder
St.Paul's Girls' School, Milagiriya, Colombo 05, Sri Lanka 2013

LEADERSHIP AND COMMUNITY OUTREACH

Vice-captain – Table Tennis (Women's) Team
University of Colombo, Sri Lanka 2018

Assistant Secretary – Students' Association for Industrial and Financial Analysis (SAIFA)
University of Colombo, Sri Lanka 2016

Head Prefect
St.Paul's Girls' School, Milagiriya, Colombo 05, Sri Lanka 2012

REFERENCES

Available upon request