

# Danyang Dai

RESEARCH AND TEACHING ASSISTANT

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## 🎓 Education

### Master of Applied Econometrics - WAM 80.5

*University of Melbourne*

PARKVILLE, VIC

*2019-2020 Dec*

- Two year full-time program including research project.
- First Class Honours Thesis (83): Official and online inflation spillover analysis of the euro area.
- Supervision: Professor Kalvinder Shields and Dr. Andrew Clarke.
- This study examines the Forecast Error Variance Decomposition (FEVD) and spillover of inflation in the selected euro area countries using both official inflation data published by the National Statistics Office and online inflation.
- Methods including time series analysis using vector autoregressive model and Bayesian statistics.

### Bachelor of Commerce

*Monash University*

CLAYTON, VIC

*2015-2018*

## 🔍 Research Experience

### Research Assistant to Dr. Sally Shrapnel

*University of Queensland*

SCHOOL OF MATHEMATICS AND PHYSICS

*2022 Aug - Present*

- Project with the International Severe Acute Respiratory and emerging Infections Consortium (ISARIC).
- This study investigates how different COVID-19 variants such as Alpha, Beta, Delta and Omicron cause Acute Kidney Injury (AKI) in patients admitted to the hospital.
- Conduct analyses using COVID-19 patient data across 67 countries provided by University of Oxford's Centre for Tropical Medicine and Global Health.
- Develop an algorithm that identifies AKI from Kidney Disease Improving Global Outcomes (KDIGO) measurements.
- Build and maintain a local database that contains all medical records for patients.
- Produce data visualisation and data analysis for the research paper.

### Research Assistant to Associate professor Ben Beck

*Monash University*

SCHOOL OF PUBLIC HEALTH AND PREVENTIVE MEDICINE

*2021 Oct - 2022 Sep*

- Conduct research activities for Sustainable Mobility: city-wide exposure modelling to advance bicycling" (DP210102089) study under the supervision of Assoc Prof. Ben Beck.
- This project aims to develop a platform that models the number of cyclists on each road in greater Melbourne. This research evaluates the effectiveness of existing infrastructure and identifies areas where enhanced cycling infrastructure is most needed.
- Managing and monitoring the entire 6-month data collection period using data visualisations.
- Design and implement algorithms that calculate trip information including trip distance, duration, speed and acceleration. These measurements are then collated to quantify the pathing and nature of each journey.
- Assist in preparing scientific reports and other documentation, including undertaking literature reviews and data analysis.
- Use cloud computing to clean and process all participant data into demographic and spatio-temporal datasets (>105GB) using R and Python.
- Recruit over 900 participants for the study and distribution of GPS monitoring equipment. Overseeing participant management and providing support when required.

### Research Assistant to Econometrics and Business Statistics Department

*Monash University*

ECONOMETRICS AND BUSINESS STATISTICS

*2021 Oct - 2022 March*

- Helped develop self-guided interactive online learning materials for students learning R.
- This short course provides the necessary skills to use R when learning more advanced and specialised topics at Monash.
- The topics covered include: RStudio IDE, basic R programming, troubleshooting, project management, data analysis, modelling, visualisation and communication with data.
- This resource is used by hundreds of students from Monash University and it is publicly available online at <https://learnr.numbat.space>.

## Research Assistant to Dr. Emi Tanaka

Monash University

ECONOMETRICS AND BUSINESS STATISTICS

2021 Jun - 2021 Oct

- This research project looks into how the development of open source software can be quantified as academic achievements.
- Developing an R package (cranscrub) which provide processed data of the number of unique user R package downloads.
- Developed advanced data management skills by processing a large dataset (65GB) on a server using R.

## 📖 Teaching Experience

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### Teaching Assistant

Monash University

ECONOMETRICS AND BUSINESS STATISTICS

2021 Jan - Present

- Data visualisation and analytics (ETF5922), Statistical Thinking (ETC2420), Introductory econometrics (ETC2410) and Introduction to data analysis (ETC5510).

## 📄 Working paper Under preparation

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**GPS data collection for modelling bicycling activity across Greater Melbourne** - Authors: Debjit Bhowmick, Danyang Dai and Ben Beck - Intended Journal: Travel Behaviour and Society

**R package downloads: what does it mean?** - Authors: Danyang Dai, Emi Tanaka - Intended Journal: R Journal

## 🔧 Skills

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### R:

- Data visualisation skills and exploratory data analysis skills. Worked with [Professor Di Cook](#) and [Dr. Emi Tanaka](#) on [Data visualisation with R Workshop](#). Teaching business analysts students [Data visualisation and analytics](#) at Monash University.
- Statistical modelling skills including both Frequentist and Bayesian approaches. Teaching econometrics and actuarial students [Statistical Thinking](#) and [Introductory econometrics](#).
- Forecasting skills developed through Masters' thesis using vector autoregressive models (VARs) and structural VARs to analyse spillover effect among European inflation.
- Data communication skill: presented a workshop on reproducible data analysis reports with data visualization in R Markdown using COVID-19 data ([R Markdown - A Better Way of Communicating with Data](#)).
- Website development: presented a workshop on developing website using R ([Building website with Blogdown](#))

### Python:

- Processing and cleaning large spatio-temporal datasets.
- Implementation on trips segmentation based on spatio-temporal data.

### Stata:

- Undertake deep-dive analysis in large survey dataset such as Current Population Survey and National Longitudinal Survey.
- Regression analysis with large survey data and provide insights with statistical modelling.

## 👤 Leadership

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### Vice President

Melbourne

R-LADIES MELBOURNE

2020 March - Present

- Giving Public Workshop: R Markdown - A Better Way of Communicating with Data.
- Workshop on website development using Blogdown
- Host public events including TidyTuesdays
- In charge of the Github account and maintaining repositories.