Humphrey Yang

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Education

Australian National University — Canberra, ACT

Ph.D. in Economics	February 2024 – Now
Bachelor of Applied Data Analytics	July 2019 – June 2023
Bachelor of Politics, Philosophy, and Economics	July 2018 – July 2021

Rewards:

- Chancellor's Letter of Commendation — 2020-22 Academic Year
- Smarterknowledge Prize for Data Wrangling

Employment History

Research Assistant | QuantEcon — July 2022 – Now

- Contributed to the lectures and workshops on scientific computing and modeling in quantitative economics and specialized lectures using scientific and high-performance computing libraries (i.e., **Google JAX**) in Python. A list of works I contributed to can be found here.
- Contributed to projects such as QuantEcon.py library for quantitative economics and finance and application of Dynamic Mode Decomposition in income distribution.

Research Assistant | RSFAS, ANU — July 2023 – June 2024

- Assisting Professor Yanrong Yang in conducting research and experiments on the topic of **Benign Overfitting for Complicated Data Inference** under the ARC Discovery Project (DP230102250).
- Conducting large-scale simulations to investigate the model behavior when applied to high-dimensional data using high-performance computing packages.

Research Affiliate | Data 61, CSIRO — March 2023 – July 2023

- Conducted research to design attacks to produce responsible generative AI, especially in Large Language Models (LLMs) using **reinforcement learning and adversarial training**.
- Researched and designed reinforcement learning models for LLMs to induce undesirable behaviors from LLMs, and employed appropriate metrics and framework to define action, state, and reward.

Summer Research Internship | Data 61, CSIRO — November 2022 – February 2023

- Researched to explore the landscape of **copyright protection in generative AI** and published a research poster to the **ACM Web Conference**.
- Implemented and measured **GAN and diffusion models** using CSIRO Bracewell HPC and improved their methodologies based on the results.

Publications and Research Projects

Published

QuantEcon.py: A community-based Python library for quantitative economics

with Quentin Batista, et al. *Journal of Open Source Software, 2024*

Copyright Protection and Accountability of Generative AI: Attack, watermarking and attribution

with Haonan Zhong, et al. *Companion Proceedings of the ACM Web Conference, 2023*

Previous Projects

Benign Overfitting in Linear Regression with Separable Variance–Covariance Structure

with Yanrong Yang and Hanlin Shang

Privacy-preserving Record Linkage in the Presence of Missing Data using Graph Learning

with Anushka Vidanage and Thilina Ranbaduge

Teaching

RSFAS, Australian National University

Principles of Mathematical Statistics for Actuarial Studies (STAT6013) – Tutor Semester 1, 2023

- Graduate course in mathematical statistics covering **Probability, Discrete and Continuous Probability Distributions, Multivariate Probability Distributions, Estimation, and Credibility Theory**.

Statistical Learning (STAT6040) – Tutor Semester 1, 2023

- Graduate course in mathematical statistics covering research and developments in statistical concepts and high-performance statistical computing on topics including **Fundamental Theories in Statistical Learning and various parametric and non-parametric methods and model evaluation methods**.

Graphical Data Analysis (STAT3011/STAT4026/STAT7026) - Marking Assistant Semester 2, 2022

- Graduate course in principles of data presentation and statistical graphics covering techniques for constructing **scientific visualizations**.

Quantitative Research Methods (STAT1008) – Tutor Semester 2, 2022

- Undergraduate course in introductory mathematical statistics and statistical computing in R.

Additional Information

Technical skills:

- Proficient in Python, SQL, R, PyTorch, Bash, LaTeX, and Markdown.
- Familiar with C, Java, Julia, high-performance computing, and Sphinx.

Languages:

- English (Proficient; IELTS 8.5), Mandarin Chinese (Native).