

# Yurou Gao

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## EDUCATION

### Duke University

09/2023 – 12/2024 (Expected)

Master of Arts in Economics

Honors: Duke Economics Master's Scholar Award (2023)

GPA: 3.827/ 4

- Economics/Political Science: Macroeconomic Policy, Microeconomic Theory, Development Economics, Economic Growth, China S&T Policy and Innovation Strategy
- Mathematics/Econometrics: Real Analysis, Ordinary and Partial Differential Equations, Econometrics (PhD level), Applied Econometrics, Causal Inference, Calculus & Probability

### Australian National University

07/2018 – 12/2022

Bachelor of Economics / Bachelor of Statistics (Major in **Statistical Data Analytics**)

GPA: 6.63 / 7 | WES verified 4.0 / 4.0 | Average Mark: 82 (High Distinction)

- Economics/Econometrics: Macroeconomics, Microeconomics, Labor Economics, Behavioral Economics, Game Theory, Econometrics, Optimisation for Economics and Financial Economics
- Mathematics: Advanced Mathematics and Application, Applied Mathematics, Scientific Computing
- Computer Science: Programming for Scientists, Relational Databases, Data Management, Analysis and Security
- Statistics: Advance Statistical Learning, Big Data Statistics, Bayesian Data Analysis, Mathematical Statistics, Stochastic Process, Regression Modelling, Graphical Data Analysis, General Linear Models

### Shanghai Jiao Tong University (Summer Research Program)

12/2019 – 01/2020

- Time Series & Random Processes in Linear Systems | Score: 99 / 100

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## RESEARCH ASSISTANT EXPERIENCE

### Science and Technology Cooperation Studies

09/2024 – Present

Research Assistant

Led by Prof. Denis Simon at Duke University

- Conducted qualitative analysis of China's international S&T cooperation (1949-present); developed a comprehensive framework for evaluating collaboration based on historical and contextual factors.
- Produced weekly summaries (10,000+ words) of bilateral Sino-foreign S&T agreements across multiple countries by synthesizing information from academic publications, government databases and news media to examine agreements, historical trends, drivers of collaboration and cooperation platforms. Contributed to forthcoming book manuscript.

### Machine Learning in Asset Pricing Models (Use R and Python)

04/2024 – 09/2024

Research Assistant

Led by Prof. Zongwu Cai at the University of Kansas

- Investigated the potential of AI and machine learning techniques (XGBoost, LSTM, and transformer models) to enhance traditional asset pricing models for the identification and validation of patterns in the stock return mechanism.
- Applied machine learning methods to nearly 100 years of financial market data (1926–2024) spanning 100 stocks. Developed and validated statistical inference procedures using hypothesis testing and cross-validation to enhance model accuracy and assess parameter stability; contributed to nonparametric estimation in asset pricing through a detailed essay.

### Machine Learning Applications in Macro Forecasting during the Pandemic (using R and Python)

06/2022 – 12/2022

Research Assistant

Led by Dr. Sibor Yan at Johns Hopkins University

- Developed a forecasting framework combining classical time series models and machine learning techniques with a focus on deriving convergence properties and estimating asymptotic error bounds for improved predictions during economic disruptions.
- Conducted comprehensive analysis of U.S. economic dynamics based on 20 years of macroeconomic data across 13 key macro indicators using LSTM networks, Bayesian VAR, random forest, boosting, KNN, Bayesian-VAR and ARIMA.
- Extended the methodology to Italian macroeconomic data, utilizing rolling-window forecasting to confirm LSTM's superior performance under structural breaks, demonstrating its cross-regional robustness.

### Chinese Macroeconomic and Policy Research

06/2022 – 08/2022

Research Assistant

Led by the Group of Macroeconomy and Policy at Bank of China Research Institute (China)

- Designed and implemented a systematic framework for analyzing commodity markets across 8 sectors, synthesizing

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interdisciplinary interrelations from both demand and supply perspectives in domestic and foreign markets. Delivered weekly commodity price trend analysis briefings. Took charge of part of “*A review of the global and Chinese macro-economy in the first half of 2022*” and “*Macroeconomic Outlook of the World and China in the Second Half of 2022*”.

- Actively participated in the selection and compilation of hot topics in macroeconomics and policy trends. Conducted two “*Quick Review of Economic and Financial Hot Issues*” reports and data collection for the research paper “*Lessons from the Transformation and Upgrading of Japan’s Industrial Chain*”.

### Regional Economic Capacity Layout Analysis

07/2021 – 10/2021

*Research Assistant*    **Led by Dr. Jiaqi Wei in State Information Center-Department of Economic Forecasting (China)**

- Conducted quantitative measurements of regional productivity distribution using provincial data from input-output tables in national, provincial and municipal statistical yearbooks.
- Analyzed and identified leading industries for each region using influence and inductance indices, aligning findings with the '14th Five-Year Plan' to assess the rationality of productive force distribution across six manufacturing sectors.
- Co-authored a paper with Dr. Jiaqi Wei on manufacturing industry transformation strategies titled “*Several Conceptual Issues to be Clarified in Promoting the Transformation and Upgrading of the Manufacturing Industry*” published in *Economic Highlights*, No. 26, 2022 as an internal report.

## INDIVIDUAL RESEARCH EXPERIENCES

### Digitization and Economic Growth (using STATA)

02/2024-05/2024

*Individual*

**Capstone Course Project on Development Economics at Duke University**

- Conceptualized and justified an innovative theoretical framework that treats data as a fourth production factor alongside traditional factors in the growth model to capture the digitization progress.
- Constructed comprehensive panel dataset spanning 141 countries (2010-2022) by applying advanced econometric techniques including two-way fixed effects panel regression. Conducted robustness checks using synthetic control methods and found potential nonlinear effects between data factors and economic growth.
- Paper titled "Rethinking of Economic Growth by Solow Growth Model in Data Traffic Perspective" earned an A+ in recognition of successfully bridging economic theory with empirical evidence.

### Exchange Rate Dynamics Analysis: RMB Historical Patterns

01/2022 – 05/2022

*Individual*

**Project under Department of Economic Forecasting, State Information Center in China**

- Analyzed 73 years (1949-2022) of RMB exchange rate trends by identifying and characterizing four distinct development stages through a systematic review of policy changes and market dynamics from authentic sources.
- Estimated double logit model to quantify RMB/USD exchange rate elasticity (0.4143% depreciation per 1% USD index increase post-2015); provided statistical evidence for exchange rate predictions and policy recommendations.
- Published solo-authored research paper titled “*Historical Evolution and Insights of RMB Exchange Rate Reform*,” in *Macro Policy Trends*, No. 25, 2022 as an internal report.

### Time Series Analysis of the Effectiveness of the Two-Child Policy in China (using JMP)

12/2019 – 01/2020

*Individual*

**Shanghai Jiao Tong University Summer Research Course Project**

- Evaluated the effectiveness of China's transition from a one- to a two-child policy through a comprehensive analysis of historical demographic trends and policy implementation patterns. Developed innovative analytical framework incorporating regional variations using time series methods to capture distinct demographic dynamics between rural and urban populations: implemented I(2) process for rural areas and ARI(1,1) for urban regions.
- Performed rigorous statistical inference through confidence interval estimation and hypothesis testing, demonstrating the statistical nonsignificance of two-child policy effects across regional variations.

## SKILLS

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Software: R (expert), Python (expert), STATA (medium), SQL (medium), Excel (medium), JMP (basic)

Language: Chinese (native), English (fluent), German (basic)