Ruey-An Shiu

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https://shiurueyan.github.io/academic-site/

EDUCATION

National Taiwan University, Taipei, Taiwan　　　　　Sep. 2021 – (Expected) Jun. 2026

B.S. in Mathematics, B.A. in Economics (Honor), Minor in Computer Science　　　　*GPA:* 4.09/4.30

- *Advisor:* Prof. Chun-Hsiung Hsia
- *Thesis:* On the Synchronization of ReLU Version of Dense Networks

University of California San Diego, California, USA　　　　　Fall 2024

University of California Education Abroad Program　　　　*GPA:* 4.00/4.00 (Provost Honors)

2025 SLMath Summer Graduate School, California, USA　Jun 9th. 2025 - Jun 20th. 2025

Statistical Optimal Transport (SLMath)

RESEARCH EXPERIENCE

Part-Time Research Assistant, Department of Economics, NTU　　　　Sep. 2025 – Now

- *Advisor:* Prof. Hung-Jen Wang
- Extended the stochastic frontier model by incorporating flexible distributional assumptions and model averaging techniques, providing more robust efficiency estimation in empirical applications.

Part-Time Research Assistant, Institute of Sociology, Academia Sinica　Mar. 2024 – Aug. 2024

Part-Time Research Assistant, College of Health, Lehigh University　　Aug.2024 – Now

- *Advisor:* Prof. Hsuan-Wei "Wayne" Lee
- Topics: Complex systems, Computational Sociology, Game Theory, Mathematical Epidemiology.

Part-Time Research Assistant, Financial Engineering Research Lab, NTUST　Aug. 2023 – Now

- *Advisor:* Prof. Daniel Wei-Chung Miao
- Topic: Variants of the Jump Diffusion Model.

2025 Student Summer Research Fellowship Program, University of Chicago　　Summer 2025

- *Advisor:* Prof. Haifeng Xu
- Developed a generalized principal–agent framework grounded in approximate best-response dynamics, systematically capturing strategic interactions under information asymmetry.

Independent Study, UCSD (Remote)　　　　　Jan. 2025 – Sep. 2025

- *Advisor:* Prof. Morris Ang
- Explored random conformal geometry, focusing on topics such as Schramm-Loewner Evolution (SLE), conformal maps, and conformally invariant random structures.

Member of the Multi-agent Intelligence and Decision Systems Lab, UCSD　　Fall 2024

- *Advisor:* Prof. Parinaz Naghizadeh
- Formulated a multiplex opinion-dynamics model with alternating layers, proving timing-driven consensus emergence or breakdown and providing spectral conditions and convergence-rate bounds.

2024 Undergraduate Research Project Scholarship, NSTC　　　Jul. 2024 – Feb. 2025

- *Advisor:* Prof. Daniel Wei-Chung Miao
- Enhance the Double Exponential Jump Diffusion Model with time-heterogeneous parameters to capture evolving jump characteristics and risk dynamics across different time periods.

2023 NCTS Undergraduate Research Program, NCTS　　　Oct. 2023 – Jun. 2024

- *Advisor:* Prof. Chun-Hsiung Hsia
- Derived sufficient conditions for synchronization equilibria in the ReLU-modified Kuramoto model on dense networks.

2023 Undergraduate Summer Research Program, NCTS   Summer 2023

- *Advisors:* Prof. Gi-Ren Liu, Prof. Yuan-Chung Sheu
- Leveraged Stein's method to reinforce the classical central limit theorem and its extensions, broadening the framework to cover non-Gaussian approximations.

CONFERENCE

- **Ruey-An Shiu** and Parinaz Naghizadeh. "Opinion Dynamics in Multi-Layer Social Networks: Consensus and Convergence in Coordination Games." *The 61st Annual Allerton Conference on Communication, Control and Computing (Allerton'25),* accepted (2025).
- Daniel Wei-Chung Miao, Xenos Chang-Shuo Lin, **Ruey-An Shiu**. "Exact Analytical Option Pricing Formula Under a Jump-Diffusion Model with Hawkes Intensity." *Association of Asia-Pacific Operational Research Societies (APORS) Youth Forum,* accepted (2025).

PUBLICATION

- **Ruey-An Shiu** and Hsuan-Wei Lee. "Shaping network structures in evolutionary games for stronger cooperation." *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences,* 481(2322), 20250346 (2025).
- **Ruey-An Shiu** and Chun-Hsiung Hsia. "On the Synchronization of ReLU Version of Dense Networks." *Chaos, Solitons and Fractals: the Interdisciplinary Journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena,* Volume 202, Part 1, 117444 (2026).

AWARDS

- International Federation of Operational Research Societies (IFORS) Travelling Fellowship   2025
- NSTC College Student Research Creativity Award   2025
- National Taiwan University Bachelor's Thesis Award   2025
- Shih Kung-Sing Outstanding Thesis Award   2025
- National Taiwan University Overseas Internship Scholarship   2025
- Taiwan Mathematical Society Outstanding Students Prize   2024
- Chow Hung-Ching Scholarship   2024
- Academic Achievement Award (Top 5%)   Spring 2025, Spring 2024, Fall 2023
- Finance and Mathematics Joint Scholarship   2023
- National Taiwan University Voyage of Aspirations Scholarship for Exchange Students   2023
- Asian Pacific Mathematics Olympiad (APMO) Bronze Award   2019

TEACHING EXPERIENCE

- **Teaching Assistant,** Stochastic Processes (FIN7050)   Fall 2025, Fall 2024, Fall 2023
- **Teaching Assistant,** Introduction to Ordinary Differential Equations (MATH2217)   Fall 2023
- **Teaching Assistant,** Introduction to Partial Differential Equations (MATH2218)   Spring 2024

COMPUTATIONAL SKILLS / OTHER

- **Programming Languages:** R, Python, C++, MATLAB, Julia
- **Languages**: Mandarin (native), English (fluent)