Chia-Min Wei
b07303025@ntu.edu.tw

Education

National Taiwan University, Taipei, Taiwan   September 2018 — June 2023

B.A. in Economics

B.S. in Mathematics

- Graduate-Level Courses:

  Real Analysis (I), Econometric Theory (I), Microeconomic Theory (II),
  Games with Incomplete Information

- Undergraduate Mathematics and Statistics courses:

  Introduction to Probability Theory, Statistics with Recitation, Econometrics (I),
  Introduction to ODE & PDE, Introduction to Mathematical Analysis (I) & (II), Linear Algebra (I) & (II)

- Honors:
  - Dean's List Award (top 5%) × 2
  - Harold H.C. Han Memorial Scholarship (3 out of 120 students)

Research Interest

Bayesian Modeling, Statistical Inference in Social Sciences, Information Economics

Research Experience

Working Paper

"A Bayesian Approach to Adaptive Testing"

Co-authored with Hau-Hung Yang and Prof. Yu-Chang Chen

- We designed an algorithm for testing individuals' cognitive abilities. In a cognitive test, based on the individual's responses to previous questions, the algorithm chooses the difficulty of the next question that minimizes Bayes risk. The algorithm depends on the loss function of concern.
- At the end of the cognitive test, the algorithm calculates the Bayes estimator of the individual's cognitive ability.
- Proved that the estimator generated by our algorithm converges to the individual's true ability in probability when the number of questions approaches infinity. This holds true when the loss function of concern is squared loss or absolute error loss and the prior distribution admits a strictly positive p.d.f. near the true ability with the parameter space being bounded.
- Currently exploring the asymptotic normality and efficiency of our estimator.

Undergraduate Thesis

"Information Choice and Acquisition for Investment Assets"

Advisor: Prof. Melody Pei-Yu Lo

- A thesis in game theory. Studied agents' optimal allocation of effort expended in acquiring information about *the objective quality of the asset* and *their personal preference for the asset* when the asset is not only for self-usage but also for investment. An agent's optimal allocation depends on other agents' allocations, and the relevant solution concept is Bayesian Nash equilibrium.
- Modeled the uncertainty and information available to agents with a Bayesian hierarchical model and used conjugate normal priors for tractability.
- Applied techniques from mulitvariate statistics such as whitening transformations and the multi-dimensional Gaussian integral formula along with results in linear algebra like the Spectral Theorem to obtain a closed-form solution for agents' optimal allocations. Computers can then easily compute the symmetric Bayesian Nash equilibrium without having to deal with high-dimensional integrals.

"Approval Ratings and Information Spillovers in Elections"
Advisor: Prof. Tsung-Sheng Tsai

- A thesis in game theory. Studied how voters update their beliefs about the approval ratings of political parties after seeing the electoral results of nearby localities under the framework of Pivotal Voter Theory.
- Used concepts in Bayesian statistics and measure theory to characterize how two pieces of information from the electoral outcomes — the vote margin and turnout rate — influence voters' posterior beliefs.

RESEARCH ASSISTANT

Research Assistant to Prof. Yu-Chang Chen July 2023 — Present
National Taiwan University

- Currently collaborating with Prof. Yu-Chang Chen on the paper *"A Bayesian Approach to Adaptive Testing."*
- To be listed as the 2nd author of the paper.

Research Assistant to Prof. Tsung-Sheng Tsai September 2022 — June 2023
National Taiwan University

- Assisted with proofs and theorems in Prof. Tsung-Sheng Tsai's paper *"Ties"* and provided several economic intuitions behind the results. The paper was later accepted by the journal *Social Choice and Welfare*.
- Acknowledged by Prof. Tsung-Sheng Tsai in the paper for my assistance.

TEACHING EXPERIENCE

Tools not Taught June 2023 – Present
National Taiwan University

- Initiated a workshop named "Tools not Taught" with a friend for first- and second-year students.
- Our workshop provides a smooth introduction to LaTeX and R.

Teaching Assistant for Microeconomics (I) and (II) September 2022 – June 2023
National Taiwan University

- Recorded videos to help clarify economics ideas.
- Used Python to visualize economic concepts, such as 3D graphs of utility functions and indifference curves.

EXTRACURRICULAR ACTIVITIES

Game Designer of Econ Camp May 2023 – June 2023
Department of Economics at National Taiwan University

- Summer camp for high school students.
- Designed an auction game in which students are required to apply fundamental statistical concepts to maximize their profits. The game helped students gain knowledge in both statistics and game theory.

Rock Band Lead Singer September 2019 – June 2023
National Taiwan University Rock Club

SKILLS

- Programming: Python, R, C++, LaTeX.
- Languages: English (Fluent), Mandarin (Native).