

EDUCATION

Ph.D. in Statistics

GPA 4.0, Arizona State University, 2026 (Expected)

- Dissertation: Learning Under Constraints for AI Decision Making
- Research Interest: Applied Machine Learning, Adaptive Decision-Making, Artificial Intelligence
- Methodologies: Machine Learning, Mathematical Modelling, Simulation

M.A. in Statistics

GPA 4.0 with Distinction, Arizona State University, May 2023

B.S. in Economics

GPA 4.0, Arizona State University, May 2020

PROGRAMMING SKILLS

R, Python, SQL, MATLAB, SAS, Stata, SAS JMP, Java, C/C++

WORK IN PROGRESS

Adaptive Decision-Making Framework for AI-Enabled Platforms

- Co-authored with Shuang Zhou
- To be presented at INFORMS Workshop on Data Science, Atlanta, USA, 2025. ([SSRN Link](#))

Abstract: AI-enabled products like recommenders and chatbots must decide when to request reviews or ratings without over-contacting users. This paper introduces a planning method that uses prior-user data to select a small set of future measurement times for the next user, capturing within-user time patterns and cross-user similarities. The resulting schedules target the most informative times, reduce unnecessary prompts, and improve predictions with fewer observations.

Product Ranking for Cold-Start Recommendations under Uncertainty

- Co-authored with Sanghak Lee

Abstract: On product pages like Amazon's, the recommender selects the small list of items shown under a focal product. With scarce data for new users or products, preference estimates have high variance, yielding rankings that may not reflect customer preferences. This paper proposes uncertainty-aware ranking that prioritizes options with more certain estimates, defers high-uncertainty items until additional data accumulate, and steadies early recommendations in cold-start and long-tail settings to improve conversion, user trust, and learning efficiency.

MANUSCRIPT UNDER REVIEW

New Pilot-Study Design in Functional Data Analysis

- Co-authored with Ming-Hung Kao
- Under revision for second-round review at Journal of Royal Statistical Society Series C (Applied Statistics). ([SSRN Link](#))

Abstract: New AI deployments in platforms and patient monitoring often start with no history and must learn from first interactions. This paper designs early-stage data plans that preselect a small set of initial time points under cost and user-burden limits to reveal patterns quickly. By replacing ad hoc logging with planned early observations, the approach accelerates learning, reduces waste, and readies evaluation. The result is safer rollouts, faster personalization, and more reliable monitoring for AI-enabled services.

PEER-REVIEWED PUBLICATIONS

Kao, M.-H. & Huang, P.-H. (2025). Optimal Designs for Functional Principal and Empirical Component Scores. *Statistica Sinica*, 35, 1-24. <https://doi.org/10.5705/ss.202023.0051>

Kao, M.-H., & Huang, P.-H. (2024). Hybrid Exact-approximate Design Approach for Sparse Functional Data. *Computational Statistics & Data Analysis*, 190, 107850. <https://doi.org/10.1016/j.csda.2023.107850>

APPLIED PROJECTS

Bitcoin Price Forecasting Using Neural Networks and NLP

Arizona State University, Jan 2023 – May 2023

- Supervised by Rob McCulloch

Overview: Addresses short-horizon cryptocurrency prediction by fusing structured market data with Twitter-based sentiment. LSTM, RNN, and CNN architectures are designed and compared, with text-price feature fusion to capture temporal and lexical cues. An offline evaluation framework benchmarks predictive accuracy and stability across horizons.

Tree Feature Engineering

Arizona State University, June 2022 – Aug 2022

- Joint work with Qiyun Zhu

Overview: Targets disease classification from high-dimensional microbiome profiles using phylogeny-aware representations. Beta-diversity distance matrices are constructed and PERMANOVA applied to compare adaptive tree formulations, guiding feature design. Tree-derived features feed supervised learning pipelines, improving interpretability by linking microbial community structure to predictive signals.

Human-Autonomy Teaming

Arizona State University, Dec 2021 – May 2022

- Joint work with Yun Kang

Overview: Examines coordination between humans and autonomous driving cars under uncertainty using electrophysiological evidence. Large biosignal datasets are cleaned, standardized, and transformed into robust physiological markers. Dynamic systems models and machine-learning predictors characterize behavioral decision-making, identifying signal features and regimes associated with effective collaboration.

TEACHING EXPERIENCE

Guest Lecturer

Arizona State University, Fall 2022, 2024

- Course: Analysis of Longitudinal Data
- Content: Conducting linear mixed modelling and functional data analysis in R on complex longitudinal datasets such as patient clinical data.

Teaching Assistant

Arizona State University, Aug 2022 – May 2023, Aug 2024 – Present

- **Probability** (core in undergraduate Statistics program)
 - Content: Modelling randomness and supporting data-driven analysis in predictive and statistical workflows with real-world data.
 - Applied Business Contexts: Data Science and Predictive Analytics, Decision Models and Analytics, Data Science for Business.

TEACHING EXPERIENCE (Cont'd)

- **Theory of Statistics I, II** (core in postgraduate Statistics programs)
 - Content: Conducting statistical inference, hypothesis testing for analyzing uncertainty in data.
 - Applied Business Contexts: Data-Driven Decision Making, Managerial Statistics, Quantitative Business Analysis, and Business Analytics Foundations.
- **Bayesian Statistics** (elective in postgraduate Statistics program)
 - Content: Prior, conjugate and nonconjugate models, posterior inference, hierarchical models and generalized linear models, predictive inference and decision-theoretic principles.
 - Applied Business Contexts: Demand forecasting, marketing analytics, customer analytics, decision-making under uncertainty with hierarchical, multi-market data.

FELLOWSHIP AND AWARDS

Joint Mathematics Meetings Travel Grant, American Mathematical Society, 2024. Nationally competitive, merit-based award recognizing exceptional doctoral scholars in mathematics for research excellence and impact.

Block Summer Research Grant Award, Graduate College, Arizona State University, 2022. Highly competitive, university-wide fellowship awarded to a limited number of top PhD candidates after rigorous review, supporting cutting-edge research projects by the most promising scholars.

Dennis Young Graduate and Early Scholar Statistics Award, College of Liberal Arts and Sciences, Arizona State University, 2022. Prestigious departmental honor recognizing emerging statisticians with exceptional academic achievement and demonstrated research potential.

SERVICE AND VOLUNTEERING ACTIVITIES

Reviewer for International Conference on Artificial Intelligence and Statistics (AISTATS 2026), 2025. Conducted double-blind reviews, evaluated rigor, novelty, and reproducibility of work.

Reviewer for Workshop on Information Technologies and Systems (WITS), 2025. Assessed rigor of submissions, evaluated theoretical and practical contributions, and provided constructive feedback.

Reviewer for Journal of the Korean Statistical Society, 2024. Evaluated manuscript rigor and clarity, assessed novelty and significance, and ensured adherence to high scientific standards.

Judge, Statistics Project Competition, 2023 – 2025. Evaluated research rigor, statistical methods, and creativity in high school student submissions; provided constructive feedback to support learning and development.

Senior-division judge, Arizona Science and Engineering Fair, 2024 – 2025. Evaluated top statewide high school projects; assessed motivation, analytical methods, and impact, and collaborated with judges to score entries and select winners. Winners advance to the International Science and Engineering Fair (ISEF).

Head Judge, Technovation Girls, 2024. Served for a global competition empowering girls aged 8–18 to address community challenges through mobile app or AI solutions; evaluated problem statements, pitch videos, and project impact on users, communities, and the environment.

Judge, The Global Undergraduate Awards, 2024. Served for the world's largest undergraduate academic awards, assessing submissions across disciplines and universities worldwide; evaluated articulation, originality, structure, and presentation to help select final winners.