HAOSHENG ZHOU

(332)-248-7535 | hzhou593@ucsb.edu | Personal Website | Google Scholar

EDUCATION

University of California, Santa Barbara (UCSB), PSTAT Department
Ph.D., Applied Probability and Statistics (Math Finance), expected May 2026; Sept. 2022 - Present
Dissertation: *Stochastic Differential Games: Theory, Adversarial Interactions, and Learning Methods*
Advisor: Prof. Ruimeng Hu

New York University (NYU), CIMS (Courant Institute)
Master in Mathematics; Sept. 2020 - May 2022

Peking University (PKU), EECS Department
Bachelor in Data Science and Big Data Technology (IT Finance); Sept. 2016 - July 2020

RESEARCH INTERESTS

- Stochastic control, stochastic differential games, and mean-field control/games.
- Stochastic modeling of adversarial interactions (e.g., deception & counter-deception).
- Deep learning & reinforcement learning architectures/algorithms for solving multi-agent games.
- Mathematical modeling and analysis in finance, biology, and social science.

PUBLICATIONS & PREPRINTS

[8] R. Hu, D. Ralston, X. Yang, H. Zhou: *Strategic Inference in Stackelberg Games: Optimal Control for Revealing Adversary Intent.* arXiv:2510.05641, 2025.

[7] M. Zhou, H. Zhou, R. Hu: *Learning Mean-Field Games through Mean-Field Actor-Critic Flow.* arXiv:2510.12180, 2025.

[6] R. Hu, J. Long, H. Zhou: *Finite-Agent Stochastic Differential Games on Large Graphs: II. Graph-Based Architectures.* arXiv:2509.12484, 2025.

[5] H. Zhou, D. Ralston, X. Yang, R. Hu: *Adversarial Decision-Making in Partially Observable Multi-Agent Systems: A Sequential Hypothesis Testing Approach.* arXiv:2509.03727, 2025.

[4] H. Zhou, D. Ralston, X. Yang, R. Hu: *Integrating Sequential Hypothesis Testing into Adversarial Games: A Sun Zi-Inspired Framework.* To appear in **IEEE Conference on Decision and Control**, 2025.

[3] R. Hu, J. Long, H. Zhou: *Finite-Agent Stochastic Differential Games on Large Graphs: I. The Linear-Quadratic Case.* **Applied Mathematics and Optimization (AMO)**, 92(2), 1–50, 2025.

[2] H. Zhou, W. Lin, S.R. Labra, S.A. Lipton, J.A. Elman, N.J. Schork, A.V. Rangan: *Detecting Boolean Asymmetric Relationships with a Loop Counting Technique and its Implications for Analyzing Heterogeneity within Gene Expression Datasets.* **IEEE ACM Transactions on Computational Biology and Bioinformatics**, 22(1), 27–38, 2024.

[1] H. Zhou, J. Tu, Y. Kong: *Approximation Algorithms and PTAS of the Minimum Dominating Set and the 3-Path Vertex Cover Problem on Unit Disk Graph.* Bachelor Thesis, 2020.

HONORS & AWARDS

Oct. 2025: UCSB Doctoral Student Travel Grant.

July 2025: SIAM Student Travel Awards (SIAM FM 25).

Apr. 2025: UCSB Graduate Division Dissertation Fellowship.

Jan. 2024: UCSB Abraham Wald Memorial Prize (ranking first in qualification exam).

Sept. 2022: UCSB Amazon Fellowship.

Sept. 2021: NYU GSAS Students for the Pathways to the PhD Program.

May 2019: Dean's Undergraduate Research Fund (DURF), New York University Shanghai.

May 2018 & 2019: PKU Academic Excellence Award.

May 2018: PKU Scholarship for Outstanding Undergraduates.

INVITED TALKS & LECTURES

Jan. 2026: Joint Mathematics Meeting, *Financial Mathematics: Theory and Practice*, Washington, D.C., USA.

Oct. 2025: DECODE AI Annual Project Meeting, University of Texas at Austin, Austin, Texas, USA.

July 2025: *Optimal Transport and Applications*, University of California Santa Barbara, California, USA.

July 2025: SIAM Conference on Financial Mathematics and Engineering (FM 25), Miami, Florida, USA.

Mar. 2025: Western Conference on Mathematical Finance (WCMF 12), University of Southern California, Los Angeles, California, USA.

Feb. 2025: Center for Financial Mathematics and Actuarial Research (CFMAR) Graduate Student Research Lightning Talk, University of California Santa Barbara, California, USA.

Jan. 2025: Guest lecture on PyTorch, MATH 260L, University of California Santa Barbara, California, USA.

Nov. 2024: Banff International Research Station (BIRS) Workshop: *Modeling, Learning and Understanding: Modern Challenges between Financial Mathematics, Financial Technology and Financial Economics*, Banff, Alberta, Canada.

Oct. 2024: INFORMS Annual Meeting 2024, Seattle, Washington, USA.

July 2024: *Optimal Transport through Midwest*, University of Wisconsin-Madison, Wisconsin, USA.

Nov. 2023: Center for Financial Mathematics and Actuarial Research (CFMAR) Graduate Student Research Lightning Talk, University of California Santa Barbara, California, USA.

MEMBERSHIP & SERVICE

Referee for Peer-Reviewed Journals: *Digital Finance*, *IEEE Control Systems Letters (L-CSS)*.

Referee for Conferences: *IEEE Conference on Decision and Control (CDC) 2025, American Control Conference (ACC) 2026*.

Organizer of Center for Financial Mathematics and Actuarial Research (CFMAR) Graduate Student Research Lightning Talk, University of California Santa Barbara, California, USA (Feb. 2025).

Organizer of Reinforcement Learning Student Seminar, University of California Santa Barbara, California, USA (Jan. 2024 - June 2024).

TEACHING & MENTORING

Mentor for Center for Financial Mathematics and Actuarial Research (CFMAR) Undergraduate Lab, *Topic: Financial Data Generation with Score-Based Diffusion Models*, University of California Santa Barbara, California, USA (Sept. 2024 - Mar. 2025).

Teaching Assistant, UCSB: PSTAT 213ABC (graduate level Stochastic Processes) in Year 2024 & 2025, PSTAT 120AB (Probability and Statistical Theory), PSTAT 170 (Introduction to Mathematical Finance).

Teaching Assistant, NYU: MATH-UA 009 (pre-calculus).

WORKSHOPS & SUMMER SCHOOLS ATTENDED

Feb. 2024: Institute for Mathematical and Statistical Innovation (IMSI) Workshop: *Decision Making and Uncertainty*, Chicago, Illinois, USA.

May 2022: Pacific Institute for the Mathematical Sciences-Centre de Recherches Mathématiques (PIMS-CRM) Probability Summer School, University of British Columbia (UBC), Vancouver, British Columbia, Canada.

ADDITIONAL SKILLS & ACTIVITIES

Languages: Chinese (native), English (fluent), Japanese (conversational), French (conversational).