

YICHI ZHANG

Github | Personal Website | E-mail | Phone

RESEARCH INTEREST

Neural Network, Optimization, Applied Machine Learning

EDUCATION

Fudan University

B.S in Mathematics, Talent Program

Sep.2021–Jun.2025 (expected)

GPA: 3.65/4.0(overall)

Key courses: (major GPA:3.80/4.0)

- Mathematical Analysis
- Advanced Algebra
- Classical Mathematical Thoughts
- Mathematical Statistics
- Real Analysis (H)
- Functional Analysis (H)
- Equations of Mathematical Physics
- Stochastic Processes
- Ordinary Differential Equations
- Mathematical Modeling
- Optimization
- Stochastic Calculus for Finance

University of California, Irvine

Mathematics, Exchange Program

Sep.2023–Dec.2023

GPA: 3.90/4.0, Dean's Honor List

Key courses:

- Numerical Analysis
- Probability Theory
- Partial Differential Equations

RESEARCH EXPERIENCES

Dynamics-Based Generative Modeling for Oscillatory Systems Control

Co-first author, Instructed by Qunxi Zhu and Wei Lin, Fudan University

Jul.2024–Dec.2024

- Established a **theoretical framework** linking macroscopic oscillatory behaviors to microscopic parameters in dynamical systems, proving the existence and learnability of explicit mappings between the system characteristics.
- Developed an innovative **generative model** with integrated dynamical constraints, demonstrating significant improvements in parameter generation accuracy and stability for complex biological systems.
- Designed comprehensive **dynamics-aware loss functions** that effectively capture temporal system evolution information, enabling unprecedented precise control of oscillatory patterns through systematic parameter tuning.
- Demonstrated framework effectiveness through extensive experiments on several biological and neural networks.
- Wrote a paper and **submitted to Nature Communications**.

TimePhiBE: A Time-dependent PDE-Based Bellman Equation for Continuous-Time Policy Evaluation

Co-first author, Instructed by Yuhua Zhu, University of California, Los Angeles

Apr.2024–Nov.2024

- Developed a **time-dependent PDE-based framework** that generalizes existing policy evaluation methods to handle dynamic, time-varying systems in reinforcement learning, including scenarios with discount factors.
- Established the **first known** theoretical results on error bounds for time-varying continuous-time policy evaluation, providing rigorous guarantees for both first-order and high-order approximations in dynamic systems.
- Extended the framework to handle **time-varying dynamics** while maintaining its theoretical guarantees, significantly improving the applicability to real-world time-dependent control problems.
- Wrote a paper and currently finalizing results for **submission to NeurIPS 2025**.

DetGNN: A Deterministic Feature-Enhanced Graph Neural Network for Modeling Higher-order Interactions

First Author, Instructed by Wei Lin, Fudan University

Aug.2023–Mar.2024

- Proposed a novel **deterministic feature enhancement mechanism** that significantly improves prediction accuracy, establishing a new paradigm for modeling complex dynamical systems and higher-order interactions.
- Developed a breakthrough **information passing mechanism** that enables multi-scale node and edge interactions simultaneously, capturing higher-order network dependencies beyond traditional adjacency limitations.
- Demonstrated **superior prediction capabilities** across multiple complex systems including urban rail networks.
- Wrote a paper and currently implementing more experiments for **submission to ICML 2025**.

PAPERS

Dynamics-Based Generative Modeling for Oscillatory Systems Control

Collaborated with He Ma, Qunxi Zhu and Wei Lin, all from Fudan University

Under the review of Nature Communications

TimePhiBE: A Time-dependent PDE-Based Bellman Equation for Continuous-Time Policy Evaluation

Collaborated with Xingjian Ma, Fudan University, Yuhua Zhu, University of California, Los Angeles

Planned submission to NeurIPS in 2025

WORK EXPERIENCES

- Shanghai Socializing Consulting Co., Ltd.Apr.2023-Present
Founder and Chief Executive Officer
 - **Founded and led** a team of 13 to provide tutoring services for high school students, focusing on both curriculum and competition preparation, as well as offering career planning and major selection guidance.
 - Organized lectures and experience-sharing sessions by leading industry and academic experts to bridge the information gap.
 - Currently exploring the integration of **AI+Education**, with plans to develop a **GPT-like platform** for fine-tuning, tailored to answer high school students' academic queries.
- Research Institute of Intelligent Complex SystemsOct.2022-Present
Research Assistant
 - Supervised by Professor Wei Lin on applying graph neural networks to model **higher-order interactions** in complex systems, focusing on biological networks, electrical networks and urban transportation networks.
 - Responsible for data preprocessing, feature engineering, and developing several novel neural network structures.
 - Participated in group discussions and contributed to advancing the understanding of intelligent complex systems.
- Lingjun InvestmentApr.2023-Jul.2023
Quantitative Researcher
 - Designed **momentum-based trading strategies** utilizing deep learning for pattern recognition in high-frequency market.
 - Developed neural network integrating technical indicators and microstructure features to identify **optimal trading signals**.
 - Achieved **20% annualized returns** with 0.7 Sharpe ratio through robust risk management.

AWARDS AND GRANTS

The ACM Mathematical Modeling Competition, First Prize	2024
The Fudan University's Top Student Award	2024
The National Innovation Challenge Cup, Silver Award	2024
The National Mathematical Competition, Third Prize	2022
The National Innovation and Entrepreneurship Competition, Bronze Award	2024
The Fudan University's First Excellence Cup, First Prize	2024
The Fudan University's First Undergraduate Research Cup, Second Prize	2024
The National Natural Science Foundation Research Grant(180 nationwide), PI, ¥100,000	2024
FDUROP (Fudan's Undergraduate Research Opportunities Program) Grant, PI, ¥20,000	2023

TEACHING EXPERIENCE

- Volunteer Service TeamSep.2022-Jun.2025(expected)
Leader
 - Led a team of 40 undergraduates in organizing and executing a **college-wide** mathematics tutoring initiative.
 - Solved mathematical problems and designed targeted learning materials, accumulating over **200 hours** of service.
 - Organized midterm and final review lectures to help students effectively prepare for exams.
- Advanced CalculusSep.2024-Jun.2025(expected)
Head of TAs
 - Led a TA team for the advanced calculus hybrid class of 240 in total, including latest topics to enhance teaching.
 - Established an **online QA platform**, receiving positive feedback from both students and faculty.
- Mathematics Teaching OfficeSep.2024-Jun.2025(expected)
Member
 - Provided suggestions to improve teaching practices and enhance learning experiences as **the only student member**.
 - Collaborated with senior faculty to introduce **digital teaching tools** and optimize course structures, improving flexibility and effectiveness for students.

TECHNICAL SKILLS

Languages: English(fluent, with 104 for TOEFL), Chinese (native)
Programming Skills: Python(Proficient), Overleaf(Proficient), Matlab, C