YIFENG XIAO

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RESEARCH INTERESTS

Cyber-Physical Systems, Design Automation, Agentic AI, Formal Methods, Reinforcement Learning, Game Theory

EDUCATION

University of California, Berkeley (UCB), Berkeley, CA, U.S. Jan. 2025 - Present
Ph.D. in Electrical Engineering and Computer Sciences
- GPA: 3.89/4.00; work with Prof. Pierluigi Nuzzo.

University of Southern California (USC), Los Angeles, CA, U.S. Jan. 2021 - Dec. 2024
Ph.D. in Ming Hsieh Department of Electrical and Computer Engineering
- GPA: 3.90/4.00; worked with Prof. Pierluigi Nuzzo.

Fudan University (FDU), Shanghai, China Aug. 2016 - Jul. 2020
B.E. in Microelectronic Science and Engineering
- GPA: 3.64/4.00; worked with Prof. Jianli Chen and Prof. Bei Yu on electronic design automation (EDA).

University of Sudney (USYD), Sydney, Australia Feb. 2019 - Jun. 2019
Exchange Student in the Department of Information and Computer Engineering

EMPLOYMENT

Graduate Student Researcher, University of California, Berkeley Jan. 2025 - Present

Applied Scientist Intern, Amazon Web Services May. 2025 - Aug. 2025
Developed an LLM-based iterative framework that generates and refines Infrastructure-as-Code using formal verification feedback to reduce hallucinations.

Machine Learning Research Intern, Futurewei Technologies Jun. 2024 - Sep. 2024
Proposed a framework for hardware and mapping strategies co-optimization using single-step reinforcement learning for DNN acceleration.

Machine Learning Intern, Micron Technology May. 2023 - Aug. 2023
Designed an image segmentation model to identify functional circuit blocks on layout images for comparative analysis, achieving 90% accuracy.

Graduate Student Researcher, University of Southern California Jan. 2021 - Dec. 2024

PUBLICATIONS

Conference Papers

1. **Xiao, Y.**, & Nuzzo, P. (2025, Nov.), "Contract-Based Architecture Exploration of Cyber-Physical Systems via Satisfiability Modulo Convex Programming", Accepted at IEEE Design, Automation and Test in Europe Conference (DATE).
2. **Xiao, Y.**, Certorio, J., Nuzzo, P., & Martins, N. (2025), " Incentive Design for Safe Nash Equilibrium Learning in Large Populations via Control Barrier Functions", IEEE Conference on Decision and Control (CDC). [LINK]
3. Fayyazi, A., **Xiao, Y.**, Nuzzo, P., & Pedram, M. (2025, Aug.), "Efficient Counterexample-Guided Fairness Verification and Repair of Neural Networks Using Satisfiability Modulo Convex Programming", International Joint Conference on Artificial Intelligence (IJCAI). [LINK]
4. **Xiao, Y.**, Xu, Y., Yan, N., Mortazavi, M., & Nuzzo, P. (2024, Sep.), "CORE: Constraint-Aware One-Step Reinforcement Learning for Simulation-Guided Neural Network Accelerator Design.", arXiv preprint. [LINK]

5. **Xiao, Y.**, Oh, C., Lora, M., & Nuzzo, P. (2023, Sep.), "Efficient Exploration of Cyber-Physical System Architectures Using Contracts and Subgraph Isomorphism", IEEE Design, Automation and Test in Europe Conference (DATE) (Best Paper Award). [LINK]
6. Su, M., **Xiao, Y.**, Zhang, S., Su, H., Xu, J., He, H., ... & Chang, Y. W. (2022), "Late Breaking Results: Subgraph Matching Based Reference Placement for PCB Designs", IEEE Design Automation Conference (DAC). [LINK]
7. **Xiao, Y.**, Su, M., Yang, H., Chen, J., Yu, J., & Yu, B. (2021, Dec.), "Low-Cost Lithography Hotspot Detection with Active Entropy Sampling and Model Calibration", IEEE Design Automation Conference (DAC). [LINK]
8. Ma, C., **Xiao, Y.**, Wang, S., Yu, J., & Chen, J. (2021, Oct.), "CongestNN: A Bi-Directional Congestion Prediction Framework for Large-Scale Heterogeneous FPGAs", IEEE International Conference on ASIC (ASICON). [LINK]

Journal Articles

1. Zhu, Z., Li, Y., Su, M., Zhang, S., Su, H., **Xiao, Y.**, ... & Chang, Y. W. (2024), "Subgraph Matching-Based Reference Placement for Printed Circuit Board Designs", The Journal of Supercomputing. [LINK]

HONORS AND AWARDS

2024 Best Paper Award, Design Automation and Test Conference in Europe 2024 (4/996)
2023 DAC Young Fellowship
2020 Outstanding Graduates of Shanghai (2nd place of 122)
2019 National IC Design Competition - First Prize for Undergraduate Group
2018 SCSK Corporation Scholarship (1/122)
2018 Undergraduate Excellence Scholarship of FDU

SELECTED INVITED TALKS

1. IEEE Conference on Decision and Control (CDC), "Incentive Design for Safe Nash Equilibrium Learning in Large Populations via Control Barrier Functions," 2025.
2. International Joint Conference on Artificial Intelligence (IJCAI), "Efficient Counterexample-Guided Fairness Verification and Repair of Neural Networks Using Satisfiability Modulo Convex Programming," 2025.
3. IJCAI 2025 Workshop on User-Aligned Assessment of Adaptive AI Systems, Montreal, Canada, Aug. 2025.
4. IEEE Design, Automation and Test in Europe Conference (DATE), "Efficient Exploration of Cyber-Physical System Architectures Using Contracts and Subgraph Isomorphism," 2024.
5. IEEE Design Automation Conference (DAC), "Low-Cost Lithography Hotspot Detection with Active Entropy Sampling and Model Calibration," 2021.

TEACHING EXPERIENCE

Graduate Student Instructor, EECS 249B: Introduction to Embedded Systems, UCB — Sep. 2025 - Dec. 2025

Graduate Student Instructor, EE581: Mathematical Foundations for System Design, USC — Jan. 2024 - Apr. 2024

PROFESSIONAL SERVICE

Committees and Advisory Roles

- CS Faculty Hiring Committee, Interview for faculty candidates in computer science — Apr. 2025
- Undergraduate Mentor for USC Viterbi CURVE Program — Sep. 2021 - Aug. 2023
- High School Mentor for 2022 USC Viterbi SHINE Program — Jun. 2022 - Jul. 2022
- USC Viterbi Graduate Mentorship Program — Aug. 2022 - Nov. 2022

External Reviewer

- AAAI, CDC, DAC, DASC, DESITION, MEMOCODE, RFIC, UAI — Sep. 2021 - Present

TECHNICAL SKILLS

Languages: English (Proficient), Chinese (Native)
Programming: Python, C/C++, Verilog, Java, Perl
Software & Platforms: Pytorch, Robot Operating System (ROS), MATLAB, Tensorflow, Gurobi, Z3, NuXMV, Simulink, LaTeX