YIFENG XIAO

3740 McClintock Ave, Los Angeles, CA, USA, 90007
yifengx@usc.edu +1 (213)-271-8231

EDUCATION

University of Southern California (USC), Los Angeles, CA, U.S. Jan. 2021 - Present
Ph.D. in Ming Hsieh Department of Electrical and Computer Engineering
GPA: 3.9/4.0

Fudan University (FDU), Shanghai, China Aug. 2016 - Jul. 2020
B.E. in Microelectronic Science and Engineering

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

RESEARCH EXPERIENCE

Enhancing Vision-Based Controllers via Hamilton-Jacobi Reachability Analysis Feb. 2023 - May. 2023
Advisor: Prof. Somil Bansal, Viterbi School of Engineering, USC
- Generated state-action dataset from the Flightmare simulator with a forest environment for the agile drone.
- Trained a learning-based model in DeepReach to compute the backward reachable tube (BRT) with Hamilton-Jacobi equation loss and boundary loss.

Contract-based Optimized Construction of Satisfiable Safety-Critical System Architectures Oct. 2021 - Present
Advisor: Prof. Pierluigi Nuzzo, Viterbi School of Engineering, USC
- Utilized Assume-Guarantee contracts to model diverse design viewpoints of a manufacturing system.
- Implemented requirements verification and design space exploration via refinement checking using Gurobi.
- Employed optimized selection techniques to construct architectures for a power distribution network.

Robustness Verification of Neural Network-Enabled Cyber-Physical System Apr. 2021 - Sep. 2021
Advisor: Prof. Pierluigi Nuzzo, Viterbi School of Engineering, USC
- Developed a SMC-based framework for robustness verification of neural networks.
- Conducted robustness verification for neural network-based perception on the MNIST dataset.
- Conducted compositional verification and sensitivity analysis in a reinforcement learning-enabled mountain car system.

Graph-based Automated Reference Placecment for Printed Circuit Board (PCB) Design Aug. 2020 - Mar. 2021
Advisor: Jianli Chen, School of Microelectronics, FDU
- Designed a graph-based data structure for PCB netlist information.
- Utilized graph isomorphism algorithems to detect similar designs in the netlist.
- Developed a subgraph matching technique for automated reference placement.

Low-Cost Hotspot Detection with Active Entropy Sampling Dec. 2019 - Apr. 2020
Advisor: Bei Yu, Department of Computer Science and Engineering, The Chinese University of Hong Kong (CUHK)
- Processed layout data into clips and performed feature extraction using principal component analysis.
- Developed an entropy-based technique that considered model uncertainty and data diversity.
- Applied an active learning framework for hotspot detection, resulting in higher accuracy and less time consumption.

TEACHING AND INTERNSHIPS

Micron Technology May 2023 - Aug 2023
Machine Learning Intern
- Developed deep neural network framework for circuit block identification.

USC AutoDrive Lab Sep. 2021 - Present
Mentor for USC Viterbi Center for Undergraduate Research in Viterbi Engineering (CURVE) Program
- Build simulation-based and experimental testbeds to emulate realistic scenarios for self-driving vehicles.

DesCyPhy Lab Jun. 2022 - Jul. 2022

Mentor for 2022 USC Viterbi Summer High School Intensive in Next-Generation Engineering (SHINE) Program
- Conduct robustness verification for traffic sign classification system.

USC Viterbi Graduate Mentorship Program Aug. 2022 - Nov. 2022

PUBLICATION

Conference Papers

- 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. DAC 2022.
- Xiao, Y., Su, M., Yang, H., Chen, J., Yu, J., & Yu, B. (2021, December). Low-Cost Lithography Hotspot Detection with Active Entropy Sampling and Model Calibration. DAC 2021.
- Ma, C., Xiao, Y., Wang, S., Yu, J., & Chen, J. (2021, October). CongestNN: A Bi-Directional Congestion Prediction Framework for Large-Scale Heterogeneous FPGAs. ASICON 2021.

AWARD

2023 DAC young fellowship
2020 Outstanding Graduates of Shanghai (5/122)
2019 National IC Design Competition - First Prize for Undergraduate Group
2018 SCSK Corporation Scholarship (1/122)
2018 Undergraduate Excellence Scholarship of FDU

TECHNICAL SKILLS

Languages:	Chinese (Native), English (Proficient)
Programming:	Python, C/C++, Verilog, Java, Perl
Software & Platforms:	Robot Operationg System (ROS), MATLAB, Tensorflow, Pytorch, Gurobi, Z3, Latex, Cadence, Vivado