

Yu-Wei Fan

Contact Email: yf9172@princeton.edu

Research Interests Formal verification, hardware security, and automated reasoning.

Education **Princeton University**, USA

Ph.D., Electronics and Computer Engineering, 2024 – Present

Advisor: Prof. Sharad Malik

National Taiwan University, Taiwan

M.S., Electronics Engineering, 2024

Thesis: “Strategy Synthesis and Threshold Quantification in Stochastic Boolean Satisfiability”

Advisor: Prof. Jie-Hong Roland Jiang

Committee: Prof. Hiroshi Unno, Dr. Tony Tan, and Dr. Bow-Yaw Wang

National Taiwan University, Taiwan

B.S., Electrical Engineering, 2022

Research Experiences

2020 – 2024

National Taiwan University, Applied Logic and Computation Lab

Research Assistant

Advisor: Prof. Jie-Hong Roland Jiang

Researching stochastic Boolean satisfiability (SSAT) solving and its extension

Researching reverse engineering of gate-level (arithmetic) circuits

2022 – 2023

Institute of Information Science, Academia Sinica

Adjunct Research Assistant

Advisor: Dr. Yu-Fang Chen

Applying software testing techniques (concolic testing) on DNN models

Teaching Experiences

Spring 2023, 2024

Introduction to Electronic Design Automation, National Taiwan University

Teaching Assistant

Fall 2022

Switching Circuits and Logic Design, National Taiwan University

Teaching Assistant

Awards and Honors

2024

Institute of Information and Computing Machinery Master Thesis Award Honorable Mention

| | |
|------------|----------------------------------------------------------------------------------------|
| 2024 | IEEE Taipei Section Master Thesis Award |
| 2024 | Taiwanese Association of Artificial Intelligence Master Thesis Award Honorable Mention |
| 2024 | NTU Graduate Institute of Electronics Engineering Master Thesis Award |
| 2023, 2024 | Conference Travel Grant, Foundation for the Advancement of Outstanding Scholarship |
| 2023 | Conference Travel Grant, National Science and Technology Council |
| 2021 | Research Grant for Undergraduate Students, Ministry of Science and Technology |

Publications

Conference Papers

Fung Long-Hin, Che Cheng, Yu-Wei Fan, Tony Tan, Jie-Hong Roland Jiang. “2-DQBF Solving and Certification via Property-Directed Reachability Analysis”, *Formal Methods in Computer-Aided Design (FMCAD)*, 2024. **[Best Paper Award]**

Yu-Wei Fan, Jie-Hong Roland Jiang. “Unifying Decision and Function Queries in Stochastic Boolean Satisfiability”, *AAAI Conference on Artificial Intelligence (AAAI)*, 2024.

Yu-Wei Fan, Jie-Hong Roland Jiang. “SharpSSAT: A Witness-Generating Stochastic Boolean Satisfiability Solver”, *AAAI Conference on Artificial Intelligence (AAAI)*, 2023.

Kuo-Wei Ho, Shao-Ting Chung, Tian-Fu Chen, Yu-Wei Fan, Che Cheng, Cheng-Han Liu, Jie-Hong Roland Jiang. “WolfEx: Word-Level Function Extraction and Simplification from Gate-Level Arithmetic Circuits”, *International Conference on Computer-Aided Design (ICCAD)*, 2023.

Workshop Papers

Kuo-Wei Ho, Yu-Wei Fan, Jie-Hong Roland Jiang, Alan Mishchenko, Robert K. Brayton, Sean A. Weaver. “Recovering Hierarchical Boundaries in a Flat Netlist”, *International Workshop on Logic and Synthesis (IWLS)*, 2024. **[Best Paper Nomination]**