Yu-Wei Fan

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Research Interests

Constraint satisfaction (QBF/SAT solving), formal verification, model checking, and electronic design automation (EDA)

Education

National Taiwan University (NTU) — Taipei, Taiwan
BS in Electrical Engineering; GPA: 4.03/4.3 — *Sep 2018 – Jun 2022*
MS in Electronics Engineering; GPA: 4/4.3 — *Sep 2022 – Jun 2024 (Expected)*

Publications

1. **Yu-Wei Fan**, Jie-Hong Roland Jiang. "Unifying Decision and Function Queries in Stochastic Boolean Satisfiability" in *Proc. of the AAAI Conference on Artificial Intelligence* (AAAI-24) (To appear)
2. **Yu-Wei Fan**, Jie-Hong Roland Jiang. "SharpSSAT: A Witness-Generating Stochastic Boolean Satisfiability Solver" in *Proc. of the AAAI Conference on Artificial Intelligence* (AAAI-23)
3. 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" in *Proc. of the International Conference on Computer-Aided Design* (ICCAD-23)

Research Experiences

Applied Logic and Computation Lab — Taipei, Taiwan
Research Assistant — *Jun 2020 – Present*

- Developed a **state-of-the-art stochastic Boolean satisfiability (SSAT) solver** `SharpSSAT` with strategy-generation capability.
- Proposed **polynomial-rewriting and symbolic regression approaches** to tackle the problem of **retrieving high-level arithmetic information from gate-level netlist**.
- Proposed a **new logical formalism SSAT(Θ)**. Demonstrated its potential applicability through developing **an SSAT(Θ) solver** and formulating **the encodings of probabilistic model-checking** problems.

Institute of Information Science, Academia Sinica — Taipei, Taiwan
Adjunct Research Assistant — *Feb. 2022 – Feb. 2023*

- Explored formally verifying flash-translation-layer using `Frama-C`.
- Implemented neural network testing with software testing approach (concolic testing).

Honors & Awards

- Research Grant for University Students, Ministry of Science and Technology
- International Conference Travel Grant for Graduate Students, National Science and Technology Council
- Outstanding Students Conference Travel Grant, Foundation for the Advancement of Outstanding Scholarship

Teaching Experience

Switching Circuits and Logic Design, NTU — Taipei, Taiwan
Teaching Assistant — *Sep. 2022 – Feb. 2023*
Introduction to Electronic Design Automation, NTU — Taipei, Taiwan
Teaching Assistant — *March. 2023 – June. 2023*

Skills

Programming: `C/C++`, `Python`, `Verilog`, LaTeX
Languages: GRE: 161/168/3.5 (329/3.5); TOEFL: 29/27/25/23 (104)