

Wen Fan

fan372@purdue.edu | [Homepage](#) | [Google Scholar](#) | [Github](#) | [Linkedin](#)

RESEARCH SUMMARY

Ph.D. researcher in software verification. I combine separation-logic-based verification and LLM-assisted specification generation for heap-manipulating programs. I am looking for an internship to apply formal methods to security-critical and distributed systems.

EDUCATION

Ph.D., Electrical and Computer Engineering, Purdue University

West Lafayette, Indiana, USA

- Advisor: Prof. Jenna DiVincenzo

Aug. 2022 – Aug. 2028 (Expected)

B.S., Computer Science, University of Science and Technology of China (USTC)

Hefei, Anhui, China

- GPA: 3.75/4.3

Sept. 2018 – Jun. 2022

PUBLICATIONS

- **Wen Fan**, Minh Tran, Sanya Dod, Xin Hu, Marilyn Rego, Danning Xie, Jenna DiVincenzo, Lin Tan
An Empirical Study of LLM-Generated Specifications for VeriFast
ISSRE 2026
- Marilyn Rego*, **Wen Fan***, Xin Hu, Sanya Dod, Zhaorui Ni, Danning Xie, Jenna DiVincenzo, Lin Tan
Evaluating the Ability of Large Language Models to Generate Verifiable Specifications in VeriFast
FORGE @ ICSE 2025 [[paper](#)][[code](#)]

RESEARCH PROJECTS

Evaluating and Enhancing LLMs on Generating Specifications for Verifying Heap-manipulating programs

Purdue University

Advisor: Prof. Jenna DiVincenzo

Sept. 2024 – Now

- Built a benchmark based on 60 programs specified in VeriFast verifier
- Developed automated Python pipeline to evaluate 10 LLMs on 2700+ outputs
- Led our team of 4 to inspect and categorize 1648 VeriFast errors from 450 sampled output functions
- Identified only 31.7% verification success; over 87% functional behavior preserved; 71% of errors caused by tool-specific knowledge gaps (e.g., missing open/close); 47% of errors can be fixed by modifying simple auxiliary specifications
- Building the tool to improve the performance based on the empirical findings

Optimizing Gradual Program Verifier with Parallel Symbolic Execution

Purdue University

Advisor: Prof. Jenna DiVincenzo

Jun. – Aug. 2024

- Discovered the performance bottleneck in sequential execution by analyzing a program of 571 branches
- Designed and implemented parallel execution of branches, reducing static verification time by 41%

Consensus Protocol Performance Optimization under Different Fault Models

Purdue University

Advisor: Prof. Yongle Zhang

May. 2023 – Mar. 2024

- Investigated 40+ consensus protocols in different fault models (e.g., ordered network, reduced node failures)
- Conducted a survey about 5+ synthesis techniques on distributed systems/protocols with 3 other team members
- Identified 8+ examples of improving the performance of Paxos under different fault models

Static Analysis For Failure Detection in Distributed Systems

Purdue University

Advisor: Prof. Yongle Zhang

Jun. 2022 – Apr. 2023

- Examined 100+ failure cases on Apache Jira to characterize cascading failures
- Implemented a static analyzer using the Soot framework to recognize 7 cases of retry in HBase

AWARDS

Huawei Scholarship

Nov. 2020

Huaxia Talent Program, USTC

Jun. 2022

SKILLS

Programming Languages: C, C++, Python, Java, Scala, Go, Rust, OCaml, Verilog, SQL, MATLAB

Verification/Analysis: VeriFast, Dafny, Verus, Rocq, Soot, LLVM

Systems/Tools: Linux, Git, Docker, Makefile, LaTeX, Django, Wireshark

Languages: English (fluent), Chinese (native)