

SHANGYIN TAN

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EDUCATION

Purdue University

Bachelor of Science in Computer Science Honors

2018 - 2022

West Lafayette, US

- GPA: 3.98/4.0, Major GPA: 4.0
- Corporate Partner Scholarship
- PurPL Undergraduate Researcher
- Graduate Courses: *Algorithms, Programming Languages, Program Reasoning*

RECENT PROJECTS

Compiling Symbolic Execution

Undergraduate Research (advised by Guannan Wei and Tiark Rompf)

May 2020 - Present

West Lafayette, US

- <https://github.com/Kraks/sai>
- Compile efficient symbolic executions via multi-stage programming
- Build backend to generate SMT solver calls
- Lead the development of multiple *LLVM* symbolic execution compilers
- Publications: [OOPSLA 20], [ESEC/FSE 21], [PEPM 22]
- Submissions under review: [USENIX Security 22]

Data-driven Inductive Invariants Inference

Honors Research (advised by Benjamin Delaware)

Sep 2021 - Present

West Lafayette, US

- Infer inductive invariants for recursive client programs

Interactive Program Synthesis for TensorFlow

Undergraduate Research (advised by Tianyi Zhang)

July 2021 - Present

West Lafayette, US

- Design interactive interface for TensorFlow operation synthesis
- Create tutorial and conduct user-studies

W²: Synthesising Responsive Webpage from Wireframe

Course Project (advised by Roopsha Samanta)

March 2020 - Aug 2020

West Lafayette, US

- <https://github.com/TigerHix/W2>
- Design an algorithm to infer hierarchical layout from static structure
- Transform static graph to responsive webpage (HTML)

MiniScala: a Small Scala Compiler

Course Project

Jan 2020 - May 2020

West Lafayette, US

- Parse and compile *Scala* source code to X86-64 assembly
- Infer and check types of the input program
- Optimize via Dead Code Elimination, Constant Folding, CPS Transformation, etc

PAPERS UNDER REVIEW

1. [USENIX Security 22] Shangyin Tan, Guannan Wei, and Tiark Rompf. The essence of compiling symbolic execution. In *USENIX Security Symposium*. USENIX Association, 2022

PUBLICATIONS

1. [PEPM 22] **Shangyin Tan**, Guannan Wei, and Tiark Rompf. Towards partially evaluating symbolic interpreters for all (short paper). In *PEPM@POPL*. ACM, 2022
2. [ESEC/FSE 21] Guannan Wei, **Shangyin Tan**, Oliver Bracevac, and Tiark Rompf. LLSC: a parallel symbolic execution compiler for LLVM IR. In *ESEC/SIGSOFT FSE*, pages 1495–1499. ACM, 2021
3. [OOPSLA 20] Guannan Wei, Oliver Bracevac, **Shangyin Tan**, and Tiark Rompf. Compiling symbolic execution with staging and algebraic effects. *Proc. ACM Program. Lang.*, 4(OOPSLA):164:1–164:33, 2020

PRESENTATIONS

1. **SPLASH 2021 SIGPLAN Papers Track**
Compiling Symbolic Execution with Staging and Algebraic Effects Oct 2021
2. **PurPL Reading Group**
Data types a la carte Aug 2020

EXPERIENCES

Student Volunteer

- SPLASH 2020: Review talk videos. Monitor Q&A sessions.
- SPLASH 2021: Coordinate hybrid video and streaming devices

Undergraduate Teaching Assistant

Discrete Math, System Programming, Algorithms Analysis, ...

Jan 2019 - Jan 2021

West Lafayette, US

- Conduct recitations to help students with problem solving
- Advise students in lab debugging
- Monitor online Q&A forums like Piazza

Selected Coding Contests

Higher Ranked Participant

2018 - 2020

Midwest, US

- 3rd in Tech Challenge Google 2019, Chicago
- 2nd in Sandia Coding Challenge 2018, West Lafayette

SKILLS

Familiar with

C, Scala, Python, C++

Have worked with

Haskell, Coq, X86-64, Java, Javascript, Scheme, L^AT_EX, LLVM, MatLab

Tools

GDB, Git, QuickCheck, SAT/SMT solvers (Minisat, STP, Z3)

(Skills in the same row are in random order)