SHANGYIN TAN

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EDUCATION

Purdue University 2018 - 2022
Bachelor of Science in Computer Science Honors *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 May 2020 - Present
Undergraduate Research (advised by `Guannan Wei` and `Tiark Rompf`) *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 Sep 2021 - Present
Honors Research (advised by `Benjamin Delaware`) *West Lafayette, US*

- Infer inductive invariants for recursive client programs

Interactive Program Synthesis for TensorFlow July 2021 - Present
Undergraduate Research (advised by `Tianyi Zhang`) *West Lafayette, US*

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

W^2: Synthesising Responsive Webpage from Wireframe March 2020 - Aug 2020
Course Project (advised by `Roopsha Samanta`) *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 Jan 2020 - May 2020
Course Project *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 Jan 2019 - Jan 2021
Discrete Math, System Programming, Algorithms Analysis, ... *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 2018 - 2020
Higher Ranked Participant *Midwest, US*

· 3^{rd} in Tech Challenge Google 2019, Chicago
· 2^{nd} in Sandia Coding Challenge 2018, West Lafayette

SKILLS

Familiar with	C, Scala, Python, C++
Have worked with	Haskell, Coq, X86-64, Java, Javascript, Scheme, LaTeX, LLVM, MatLab
Tools	GDB, Git, QuickCheck, SAT/SMT solvers (Minisat, STP, Z3)

(Skills in the same row are in random order)