Yanze Li

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RESEARCH INTERESTS

I'm currently a Ph.D. student at University of British Columbia (since Fall 2021), advised by Alexander J. Summers and Ivan Beschastnikh. My research interests lie in programming languages, program verification, and type theory. I'm particularly interested in how we can specify program properties and prove their correctness.

EDUCATION

Ph.D. Computer Science, University of British Columbia, 2021 - Now
Advisor: Alexander J. Summers, Ivan Beschastnikh
GPA: 4.0/4.0

M.S. Computer Science, Texas A&M University, 2020
Thesis: Efficient and Scalable Whole Program Race Detection for Java and Android Programs
Advisor: Jeff Huang
GPA: 4.0/4.0

B.Eng. Electrical Engineering, Huazhong University of Science and Technology, 2017
GPA: 3.67/4.0 Major GPA: 3.81/4.0

PUBLICATIONS

ICSE'22 *"PUS: A Fast and Highly Efficient Solver for Inclusion-based Pointer Analysis"*
Peiming Liu, **Yanze Li**, Bradley Swain, Jeff Huang
International Conference on Software Engineering (ICSE'22). 2022.
ACM SIGSOFT Distinguished Paper Award

Correctness'21 *"OpenRace: An Open Source Framework for Statically Detecting Data Races"*
Bradley Swain, Jeff Huang, Bozhen Liu, Peiming Liu, **Yanze Li**, Addison Crump, Rohan Khera
2021 IEEE/ACM 5th International Workshop on Software Correctness for HPC Applications (Correctness). IEEE, 2021.

PLDI'21 *"When Threads Meet Events: Efficient and Precise Static Race Detection with Origins"*
Bozhen Liu, Peiming Liu, **Yanze Li**, Chia-Che Tsai, Dilma Da Silva, Jeff Huang
42nd ACM SIGPLAN International Conference on Programming Language Design and Implementation. 2021.

SC'20 *"OMPRacer: A Scalable and Precise Static Race Detector for OpenMP Programs"*

Bradley Swain, **Yanze Li**, Peiming Liu, Ignacio Laguna, Giorgis Georgakoudis, Jeff Huang
International Conference for High Performance Computing, Networking, Storage and Analysis. IEEE, 2020.

ICSE'19 (Demo Track) *"SWORD: A Scalable Whole Program Race Detector for Java"*
Yanze Li, Bozhen Liu, Jeff Huang
2019 IEEE/ACM 41st International Conference on Software Engineering: Companion Proceedings (ICSE-Companion). IEEE, 2019.

RESEARCH EXPERIENCE

2021.9-Now **Research Assistant, University of British Columbia, Canada**
Working on automated verification of liveness guarantees in async runtime systems. Currently I'm focusing on formally verifying certain liveness properties in different Rust async runtime implementations and automating such verification using static analysis.

2020.8-2021.6 **Research Intern (Remote), Utrecht University, Netherland**
Worked with Dr. Jurriaan Hage on the LLVM backend and FFI of a Haskell compiler called Helium.

2018.6-2020.6 **Research Assistant, Texas A&M University, USA**
Worked on static analysis for concurrent programs. Developed tools that scale to million lines of Java/C++/Android code and efficiently detect potential data races and deadlocks.

WORK EXPERIENCE

2019.7-2021.5 **Software Engineer, Coderrect Inc., USA**
Worked as the main developer of an LLVM-based program analysis tool for detecting concurrency bugs and anti-patterns in C/C++/Fortran/CUDA code. I designed a highly efficient static happens-before graph, lock tracking algorithm and race detection algorithm which enable the tool to analyze million lines of code in minutes accurately.

2015.11-2017.4 **Software Engineer, Nightingale Technology, China**
Worked on a second-hand commodities trading platform for college students and an integrated web application for editing and publishing news articles as well as managing and visualizing their statistics.

TEACHING EXPERIENCE

2023Fall CPSC 539S: Program Verifiers and Program Verification, Teaching Assistant

2022Fall CPSC 410: Advanced Software Engineering, Teaching Assistant

2022Spring CPSC 416: Distributed Systems, Teaching Assistant

2021Fall CPSC 410: Advanced Software Engineering, Teaching Assistant

PROJECTS

LTLSpec A proof-of-concept Haskell framework for modelling, specifying, and verifying distributed system traces in linear temporal logic. [GitHub]

Helium A compiler for a subset of Haskell that aims at delivering high quality type error messages particularly for beginner programmers. It also includes facilities for specializing type error diagnosis for embedded domain specific languages. [GitHub]

Coderrect An LLVM-based static analyzer, specialize in detecting concurrency related bugs and anti-patterns, found several previously unkown bugs in Linux kernel, Redis, memcached, and GraphBLAS. [Website] [GitHub]

OMPRacer An LLVM-based race detector for OpenMP programs, using inter-procedure value-flow analysis to reason about array accesses. Found several previously unknown bugs in ECP proxy applications and a major simulator for COVID-19. [GitHub]

Crappie An incremental race detection engine that scales to distributed systems and Android apps and has been implemented as an Intellij IDEA plugin.

SWORD A whole program race detector for Java (source code/bytecode) and has been implemented as an Eclipse plugin. [GitHub]

HONOR AND AWARDS

2022 ACM SIGSOFT Distinguished Paper Award

2022 OPLSS Fellowship Grant

2019 ACM SIGSOFT CAPS Award

2017 Excellent Graduated Student at HUST

2015 Scientific Research Innovation Scholarship

2014 3rd place, China University Cloud Computing Innovation Competition

SERVICE

2020.8-2022.11 SIGPLAN Long-Term Mentoring Program (SIGPLAN-M), Operations Team

SUB-REVIEWER

2023 ICSE

2022 ASE

2020 OOPSLA

2019 PLDI, ICSE, FSE, OOPSLA

2018 TSE