Ziteng Yang

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Education

Georgia Institute of Technology, Atlanta, GA, USA Aug. 2021 – Present

Ph.D. student in Computer Science, School of Computer Science

- Advised by Vivek Sarkar
- Research Interests: program verification, formal methods, parallel program

Shanghai Jiao Tong University (SJTU), Shanghai, China Sept. 2017 – Jul. 2021

B.E. in Computer Science and Technology, Department of Computer Science and Engineering

Publications

- **Z. Yang**, X. Yin and S. Li. "Maximally permissive supervisor control of timed discrete-event systems under partial observation," in 21st IFAC World Congress, 2020

Submitted

- **[*Co-first author, dictionary order]** Verification-aided Compiler Optimization

Research Projects

Verification-aided Compiler Optimization in the CompCert Compiler Apr. 2020 – Jun. 2021

Research Assistant Advisor: *Qinxiang Cao*, John Hopcroft Center for Computer Science, SJTU.

An expedition to implement compiler optimization using verification code of a program:

- Designed a semantics framework based on small step semantics in CompCert Certified Compiler, aiming for verifying new compiler optimization methods for certified program using hints of Hoare Logic assertions
- Designed and proved the correctness of the verification routine of backward simulation relation as well as the preservation of annotation's consistency between source and compiled program for the newly proposed optimization method

Finite Canonical Model for Completeness Theory in Coq Nov. 2019 – Apr. 2020

Research Assistant Advisor: *Qinxiang Cao*, John Hopcroft Center for Computer Science, SJTU.

A work for extension of a logic library in Coq from infinite method to finite method:

- Formally proved Formalized Propositional Dynamic Logic (PDL)'s completeness theories in Coq using the method of finite canonical model which is distinctive from any previously formalized logics in this library

Supervisor Control Theory of Timed Discrete-Event Systems Aug. 2018 – Oct. 2019

Research Assistant Advisor: *Xiang Yin*, Department of Automation, SJTU.

Field: Formal methods in Automata & Control Theory

- Proposed a method for synthesizing a safe and maximally-permissive supervisor for Timed Discrete Event System (TDES, a finite-automata-style model) which models time into conventional automata;
- Formally proved the correctness of such method, i.e. the closed-loop language which depicts the behavior of the system under the synthesized supervisor is within a safe specification language

Teaching Experience

Teaching Assistant, MA208: Discrete Mathematics, SJTU, lectured by *Qinxiang Cao* Fall 2020
Teaching Assistant, MA239: Discrete Mathematics (Honor), SJTU, lectured by *Xiang Yin* Fall 2020

Courses and Projects

Graduate Courses: 2021 - Present, Georgia Tech

- Compiler Design: topics around middle-end optimization of modern compiler with projects in dynamic array bound checking
- Software Analysis and Testing

Selected Undergraduate Courses: 2017 - 2021, SJTU

- Programming Languages (98), Computing Theory (91), Project Workshop of Operating System (100), Linux Kernel (91)

Project: Interpreter for "SimPL" Programming Language Spring 2020

- Implemented an interpreter in Java following given semantic specification of simplified dialect of ML
- Implemented type checking and evaluation

Project: Naive Airdrop Fall 2019

- Designed a file synchronizing application from Android phone to PC within local area network with encryption in transfer, auto connection, changes detecting etc.

Project: Re-implementation of deque and map in STL Fall 2018

- Re-implemented the *deque* and *map* template class in C++ Standard Template Library w.r.t. the interface

Skills

Programming Experiences:

- **Coq**: long-term research projects on CompCert compiler
- **C/C++**: course projects (LLVM IR, Linux kernel, C++ STL implementation, algorithm design)
- **Java**: Android & Windows applications
- **Python**: course projects (machine learning)

Familiar Tools/Libraries:

- **LLVM IR**
- **VST**: Verified Software Tool-chian in Coq, a separation logic based tool to verify correctness of C programs

Languages:

- Native: Standard Mandarin, Sichuanese Mandarin
- Fluent: English

Honors and Awards

- Rongchang Scholarship for Science and Technology Innovation, Finalist, 10,000 CNY (10 finalists wining 10,000, 10 winners winning 30,000, university-wide per year) 2020
- Undergraduate Excellent Scholarship, 500 CNY Third-class 2018
- 1st Prize in National High School Mathematics League in Provinces 2016