

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, College of Computing

- Co-advised by Vivek Sarkar and Qirun Zhang

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

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

- Selected Courses: , Programming Languages (98), Computing Theory (91), Project Workshop of Operating System (100), Linux Kernel (91), Discrete Mathematics (92), Linear Algebra (90)

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

RESEARCH PROJECTS

Verification-aided Compiler Optimization Jul. 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 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
- Implemented the routine as a framework on CompCert’s Clight intermediate program.

Modal Logic’s 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:

- Formalized Propositional Dynamic Logic (PDL), a variant of modal logic which has finite model property for the framework of mathematical logic library *UnifySL* in proof assistant *Coq* with efficient code reuse
- Formally proved 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 – Aug. 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* 2020 Fall

- Courses for the *IEEE Honor Class* (for top 20% students selected from EECS)

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

- Courses for the *Zhiyuan Honor Program* (only for top 5% students selected from Engineering majors)

COURSE PROJECTS (SELECTED)

Interpreter for “SimPL” Programming Language

2020 Spring

- Implemented an interpreter in Java following given semantic specification of simplified dialect of ML
- Realized type checking (including let-polymorphism) and evaluation

Naive Airdrop

2019 Fall

- Designed a file synchronizing application from Android phone to PC within local area network
- Implemented auto connection, changes detecting of the observed files on client devices, encryption in transfer, both auto and manual transmission etc.

Linux (Android) Memory Management

2019 Spring

- Implemented a system call for page table remapping
- Replaced the original page replacement algorithm by a specific one in a given specification

Re-implementation of deque and map in STL

2018 Fall

- Re-implemented the *deque* and *map* template class in C++ Standard Template Library (STL) using Block List and AVL Tree and passed several heavy load benchmark tests through *SJTU Online Judge System*
- Enabled the two type class to be used in the same way as the original ones in STL

HONORS AND AWARDS

- Rongchang Scholarship for Science and Technology Innovation, Finalist, 10,000 CNY (30 persons school-wide including 10 winning 30,000 CNY per year;) 2020
- Undergraduate Excellent Scholarship, 500 CNY Third-class Oct. 2018
- 1st Prize in National High School Mathematics League in Provinces Sep. 2016

SKILLS

Programming Experiences:

- **Coq**: long-term research projects
- **C/C++**: course projects (OS kernel, standard template library, algorithm)
- **Java**: android applications
- **Python**: course projects (machine learning)

Familiar Tools/Libraries:

- **VST**: Verified Software Tool-chain in Coq, a separation logic based tool to verify correctness of C programs
- **SVF**: static tools with scalable and precise interprocedural dependence analysis for C/C++;
- **Keras**: the Python deep learning API;

Languages:

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