Xie Li (李勰)

Master Student in CS

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Personal Information

Gender: Male
Day of Birth: July 7, 1997
Nationality: The People's Republic of China

Research Interests

Verification and Program Analysis
Interested in

- Proving functional correctness of a given program via inference and model checking. Including research on synthesizing invariant for programs, exploring semantics for different programs and new computation models and logic in model checking, etc. Proving termination of loop programs via techniques like ranking function and ranking supermartingale.
- Program analysis techniques such as symbolic execution, and the possible application on program verification.
- Integrating existing toolchain and techniques to build tools that encode and solve the problems mentioned above.

Education

University of China Academy of Sciences *Sep. 2019 – now*
Master Student of Science in Computer Software and Theory
Supervisor: Lijun Zhang

University of China Academy of Sciences *Sep. 2015 – Jun. 2019*
Bachelor of Science in Computer Science and Technology
GPA: 3.69/4
Supervisor: Lijun Zhang

Expertise and Technical Strengths

Programming: Java, C/C++, Python, LaTeX
Skills: Familiar with development based on SMT solving tools like Z3.
Familiar with network programming (Network Layer, Data Link Layer).
Currently investigating intermediate language: LLVM IR and Boogie.
Language: Chinese (Native), English

Service

TACAS 2021: Subreviewer

Research Experience

Research Project: Memory Safety Analysis (Ongoing...)

Mar. 2021 – now @ ISCAS, Beijing, P.R.China

This project is targeting on building a prototype tool and attending the memory safety track of SV-COMP. Current idea of this project is to do survey on existing techniques separation logic, symbolic execution and memory safety analysis to see whether a novel technique can be produced. Investigation on different tools such as SMACK and Symbiotic is also ongoing.

Research Project: POMDP Modelling and Policy Synthesis (Ongoing...)

Dec. 2020 – now @ ISCAS, Beijing, P.R.China

This is the POMDP project that intends to model the collision avoidance system and synthesize policy. Participating in the project and helping with surveying on EPMC, paper writing and reviewing.

Engineering Project: Tool for Constructing Safe and Secure Protocols

Dec. 2019 – Nov. 2020 @ ISCAS, Beijing, P.R.China

The target of this project is building a closed cycle verification tool, which provides a platform for modelling, verification and code generation of network transmission protocols. Responsible for the investigation and implementation of code generation module of the tool.

Research Project: An Extension on SVMRanker

May. 2020 – July. 2020 @ ISCAS, Beijing, P.R.China

This is a project on synthesizing ranking function to prove termination of loop program. Extended the existing SVM-based algorithm on synthesis of nested ranking functions to the synthesis of multi-phase ranking functions. Implemented the extended algorithm in prototype tool SVMRanker. The implementation is available at Github website.

Research Project: Bachelor thesis

Apr. 2019 – Oct. 2020 @ UCAS, Beijing, P.R.China

A research project on computing the reachability relation of one-counter automata. Helped constructing the algorithm and implemented the algorithm for the computation in prototype tool OCAReach. Implementation is available in Github repository.

Unpublished Papers

2021

Yi Li, **Xie Li**, Yong Li, Xuechao Sun, Andrea Turrini and Lijun Zhang; *Synthesizing Ranking Functions for Loop Programs via SVM*; (Submitted to TCS-B, under the reviewing process).

Publications

2020

Xie Li, Taolue Chen, Zhilin Wu, and Mingji Xia; *Computing Linear Arithmetic Representation of Reachability Relation of One-counter Automata*; SETTA 2020.

Xie Li, Yi Li, Yong Li, Xuechao Sun, Andrea Turrini, Lijun Zhang; *SVMRanker: A General Termination Analysis Framework of Loop Programs via SVM*; ESEC/FSE 2020 Tool Demos.

Activites

Nov. 24 – Nov. 28, Beijing, SETTA 2020 conference.
Nov. 6 – Nov.16, Online, ESEC/FSE 2020 conference.
Nov. 5 – Nov.9, Shenzhen, ICFEM 2019 conference.

Updated April 2021