

EDUCATION BACKGROUND

Shanghai Jiao Tong University

Sep. 2018 – Now

Bachelor of Science in Computer Science, GPA: 3.9/4.3, Rank: 5/109.

Relevant Courses: Algorithm Analysis (100/100), Programming Language (100/100), Data Structures (99/100), Computer Network (93/100), Computer Organization (92/100), Database (90/100), Operating Systems (89/100).

Research Fields: Theoretical computer science (fair division, influence maximization), programming languages (static analysis, program verification), compiler.

EXPERIENCE

Intern, MSRA | Cuda

Sep 2022 – Jan. 2023

- Developed a static analysis tool to automatically perform dataflow analysis on the given code written in C in order to identify common potential bugs about memory safety, such as memory leak, double free, etc.
- Learned from Rust Borrow Checker's memory protection measures and defined our own rules of transfer functions in the dataflow analysis using tags that are automatically given to each variable during checking.
- Improved the procedure to adapt for global variable, function call, etc and designed error checking rules.
- Collaborated with team members to finish a patent about the transfer functions and automatic analysis.

Research Intern, Shanghai Naive Systems | C, Rust

May 2021 – Oct. 2021

- Developed a static analysis tool to automatically perform dataflow analysis on the given code written in C in order to identify common potential bugs about memory safety, such as memory leak, double free, etc.
- Learned from Rust Borrow Checker's memory protection measures and defined our own rules of transfer functions in the dataflow analysis using tags that are automatically given to each variable during checking.
- Improved the procedure to adapt for global variable, function call, etc and designed error checking rules.
- Collaborated with team members to finish a patent about the transfer functions and automatic analysis.

PROJECTS

Researcher, Fair Division Project

Feb. 2022 - Now

- Tackled with the constraint optimization problem of maximizing social welfare subject to envy-freeness-up-to-one constraint based on the traditional fair division model.
- Proved NP-hardness and inapproximability results when the number of agents is two, constant and infinity.
- Designed an FPTAS (Fully polynomial time approximation scheme) algorithm with two agents and a bi-criteria FPTAS algorithm with constant number of agents respectively.
- Researched on relative problems such as EFX and truthful allocation, and designed new models.
- Collaborated with team members to finish a paper, which is currently submitted to NeurIPS'22.

Concurrent Semantics Prover | Coq

Apr. 2021 - Sep. 2021

- Formalized two kinds of denotational semantics (Brookes semantics and local-environment semantics) about concurrent programs in Coq and modified them to support conflict behaviour and non-terminating programs.
- Proved some properties of the two semantics respectively, such as associative and commutative property, and further prove the equivalence between the two semantics.
- Collaborated with other members to apply the properties into compiler verification.

PUBLICATIONS

Division with Prioritized Agents, Xiaolin Bu, Zihao Li, Shengxin Liu, Jiaxin Song, Biaoshuai Tao. Accepted by AAAI 2023.

UNDER PREPARATION

On the Complexity of Maximizing Social Welfare within Fair Allocations of Indivisible Goods, Xiaolin Bu, Zihao Li, Shengxin Liu, Jiaxin Song, Biaoshuai Tao. Submitted to NeurIPS 2022.

LANGUAGES AND SKILLS

Technical Skills: Python, C, C++, Rust, Coq

Tools and Platforms: Linux, Git, Docker, Visual Studio Code

Languages: Mandarin (Native), English (CET-6: 585)

Hobbies: Piano, guitar, tennis, reading, Genshin, VR games

Activities: Teaching assistant for Algorithm (Lecturer: Biaoshuai Tao, Spring 2022, SJTU)