Chencheng Mao

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Education

University of Science and Technology of China — Anhui, China

B.Sc. in Computer Science; — *Sep 2020– Jul 2024*

- **GPA**: 3.50/4.30
- **Relevant coursework:** Syllabus of Digital Logic Lab (94/100), Function of Complex Variable B (92/100), Data Structure (91/100), Principles and Techniques of Compiler (90/100), Foundations of Algorithms (89/100)

Research Experience

Optimize ThreadSanitizer in Link Time(on going) — July 2023 – Present

Research Assistant, Instructor: Prof.Chenxiong Qian — *The University of Hong Kong (HKU)*

- Developed effective run-time algorithms to detect data races with less false positives,less overheads and more precise synchronization analysis.
- Optimized ThreadSanitizer in LLVM by executing compiler instrumentation module in link time and eliminated unnecessary instrumentation in the whole-program optimization.
- Designed Thread Sanitizer in the context of ThinLTO and FullLTO seperately and evaluated and compared the number of detected bugs and runtime overhead.

Performance Analysis and Characterization of Homomorphic Encryption — Jan 2023 – Feb 2023

Research Internship,Instructor: Prof.Huiyang Zhou — *Remote/NC State University*

- Studied the code of open-source homomorphic encryption library HElib and perform experiments to evaluate the performance overheads.
- Learned database searching algorithms on homomorphically encrypted data.
- Designed SIMD operations to reduce the overhead of homomorphic encryption and optimized the performance overheads by adjusting the depth of the circuit

Cminus-f Compiler Design and Optimization — Sept 2022 – Dec 2022

Course Project, Instructor: Prof.Cheng Li — *USTC*

- Completed a Cminus-f parser, including a flex-based lexer and a bison-based parser.
- Implemented the rudimentary Cminus-f compiler to automatically generate LLVM IR for the Cminus-f language.
- Adopted Global Value Numbering for optimization of redundancy elimination.

Projects

Cminus-f Compiler [Link]

- Implemented various optimization methods, including SSA, global value numbering, and dead code elimination.
- Achieved a performance improvement of up to 20% compared to the baseline program.

Movie Recommendation System [Link]

- Crawled movie and book information from Douban website.
- Implemented a personalized movie recommendation system based on user evaluation information and social relationships between users using KNN.
- Evaluated the system's effectiveness through NDCG.

Skills

Programming: C, C++, Python, MySQL, C#, TeX

Technologies: Git, Docker, Vscode, Vivado

Frameworks: LLVM

Languages: Bilingual in English(TOFEL:105), Chinese