Jia Sun

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Education

Kyoto University 2021/04 – 2025/03

Undergraduate In Informatics and Mathematical Science (GPA: 3.89/4.3)

- **CS Courses**: Algorithm, Programming Language, Compiler, Architecture, Artificial Intelligence, Network
- **Applied Math Courses**: Graph Theory, Abstract Algebra, Optimization, Numerical Analysis

Work Experience

Software Engineer Internship @ Fixstars Solutions 2023/09 – 2024/06

Modern C++, Performance Optimization, Compiler, GPU, LLVM Remote, Japan

- Investigating the memory access performance model of **NUMA** architecture processors through **libnuma** and **STREAM** benchmark.
- Profiling and accelerating a software **DSM** (Distributed shared memory) system
- Engaging in the development of a toolchain for developing **SYCL** on **ARM** processors with **OpenCL** devices.

Student Engineer @ TIER IV 2022/12 – 2024/3

Rust, Embedded Software, Operating System Remote, Japan

- Developing a Operating System to better support *Autoware*, an autonomous driving system.
- Implementing the **virtual memory system**, **PCIe driver**, **network driver**, and **UDP**.
- Investigating several **Dynamic Memory Allocation Algorithms**.

OSS

LLVM Project (Committer) | PRs

Compiler (Middle | Back) End Optimization, C++

- Backend support and optimization for **RISC-V** Architecture, especially on its **Vector Extension**.
- **Peephole Optimization** on **LLVM IR**.
- Bug Fixing for Clang Frontend for **OpenMP**.
- Reviewing other contributors' patches.

CPAchecker (Google Summer of Code 2023 Mentee) | [POST, FINAL REPORT]

Software verification, Program Analysis

- Contributed to the *CPAchecker*, a software verification platform created by the Software and Computational Systems Lab at LMU Munich
- Designed and implemented a transform pass for the internal data structure used to represent program semantics, aiming to enhance the overall performance of CPAchecker.
- Specifically, the transformer approximates the reversal of program execution statically aiming to reduce the size of the generated SMT formulation.

Highlighted Side Projects

- **OS**: xv6-like OS in Rust on RISC-V | rxv6
- **Compiler** : x86-64 target Toy C compiler in Rust | tcr

Skills

- **LLVM/MLIR**, Compiler Construction/Optimization, Performance Optimization, Program Analysis
- Programming Languages: **Modern C++**, **Python(Pytorch)**, C, Rust, CUDA, SYCL, OCaml/Coq, Java