Jia Sun

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Education

Kyoto University 2021/04 – 2025/03 (Expected)
Undergraduate In Informatics and Mathematical Science | GPA: 3.89/4.3 Kyoto, Japan

- **Math Courses**: Logic, Graph Theory, Abstract Algebra, Numerical Analysis, Statistics, Optimization
- **CS Courses**: Software Foundations, Functional Programming, Compiler, Architecture, Theory of computation, Artificial Intelligence, Network, Algorithms and Data Structures

Research

Student Summer Research Fellowship @ PLF Lab, ETH Zurich 2024/07 – 2024/08
Operational Semantics, Memory Model, Rust | Supervisor: *Dr. Ralf Jung* Zurich, Swiss

- Integrated and translated a new aliasing model, *Tree Borrows*, into Mini Rust, a precise specification for Rust.
- *Tree Borrows* reduces the complexity for alias analysis and enable more compiler optimizations for **Unsafe Rust**.
- Specifically, the project was focused on creating a **readable** and **precise** specification for *Tree Borrows*.

Google Summer of Code Student @ SoSy-Lab, LMU Munich 2023/05 – 2023/09
Model Checking, Program Analysis | Mentor: *Po-Chun Chien* Remote, Japan

- Contributed to the *CPAchecker*, a software verification platform
- Designed and implemented a transform pass for the Control Flow Automata (CFA).
- Specifically, the pass reverses the CFA by approximating the reversal of program execution statically.

OSS

The LLVM Project (Committer)
Compiler Optimization/Construction, RISC-V

- 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.

Industry

Software Engineer Internship @ TIER IV 2022/12 – 2024/3
Rust, Operating System | Mentor: *Dr. Yuuki Takano* Remote, Japan

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

Software Engineer Internship @ Fixstars Solutions 2023/10 – 2024/06
LLVM, Compiler, Linux Kernel, Performance Optimization, Modern C++, GPU Remote, Japan

- Developed a LLVM-based toolchain for developing **SYCL** on **ARM** processors with **OpenCL** devices.
- Investigated the memory access performance model of a **NUMA** architecture processor.
- Optimized the sequential access performance of a software Distributed Shared Memory system

Awards & Honors

- **Student Summer Research Fellowship** *ETH Zurich*, 4000 CHF 2024
- **General Scholarship** *Hirose International Scholarship Foundation*, 180K JPY/month 2020 – 2024

Skills

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