Jia Sun

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Education

Kyoto University   2021/04 – 2025/03

Bachelor In Informatics and Mathematical Science | GPA: 3.89/4.3 (Rank: 3/40)   Kyoto

- Bachelor Thesis: *Improving the Conditional Semantic Textual Similarity through Cross-Attention*
- **Math Courses**: Logic, Graph Theory, Abstract Algebra, Numerical Analysis, Probability and Statistics, Optimization
- **CS Courses**: Software Foundations, Programming Languages (Functional Programming), Programming Language Implementation, Computer Architecture, Theory of Computation, Artificial Intelligence, Computer Networks, Algorithms and Data Structures

Research

Student Summer Research Fellowship @ PLF Lab, ETH Zurich   2024/07 – 2024/08

Rust, Operational Semantics, Memory Model | Supervisor: *Prof. Dr. Ralf Jung* | **Project Details**   Zurich

Project: *Tree Borrows in MiniRust*

- Integrated and translated a new aliasing model, *Tree Borrows*, into *Mini Rust*, a **definitional interpreter** for Rust.
- *Tree Borrows* reduces the complexity for alias analysis and enables 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

Java, Model Checking | Mentor: *Mr. Po-Chun Chien* | **Project Details**   Remote

Project: *Reverse Program Synthesis for Backward Reachability Analysis in CPAchecker*

- Contributed to the *CPAchecker*, a SMT-based software verification platform.
- Designed and implemented a transform pass for the Control Flow Automata (CFA).
- The pass creates a reverse CFA for each CFA so that existing analysis can be applied to verify the reverse CFA.

OSS

The LLVM Project (Committer)

C++, Compiler Optimization/Construction, RISC-V, SIMD

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

Industry

Software Engineer @ Pony.ai   2025/02 – 2025/11

C++, CUDA, Performance Optimization   Beijing

- Developed C++ features for model deployment (pre-/post-processing), data export, and offline simulation/analysis.
- Profiled and optimized the onboard latency via CPU/GPU parallelization.

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

Rust, System Software, Device Drivers   Remote

- Worked on **Awkernel**, a Real-time OS written in Rust designed for autonomous driving.
- Implemented the **virtual memory system**, **PCIe driver**, **network driver**, and **UDP**.
- Investigated several **Dynamic Memory Allocation Algorithms**.

Software Engineer Internship/Part-time @ Fixstars Corporation   2023/10 – 2024/06

Compilers, Modern C++, LLVM, Linux Kernel, Performance Optimization, GPU   Remote/Tokyo

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

Awards & Honors

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

Skills

- Programming Languages: **Rust**, **Modern C++**, **OCaml/Coq**, CUDA, SYCL, C, Python (PyTorch), Java, Zig, Swift