

# roife

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## Education

### Nanjing University

2023.09 - 2026.06 (expected)

Master's Degree in *Computer Science and Technology* | Pascal Lab. Tutor: [REDACTED] Li | Focus on PL, program analysis and HDL

### Beihang University

2019.09 - 2023.06

Bachelor's Degree in *Computer Science and Technology* | GPA 3.84/4.00

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## Work Experience

### Rust Foundation Fellowship Program

2024.09 - 2025.06 (expected)

- **Contributing to rust-analyzer** (the official Rust IDE)
    - ▶ Ranked **21/970** in contributors; resolved **over 50 issues** and contributing to multiple modules (e.g. **semantic analysis**, etc.); improving robustness of the project. Also introduced several new features (e.g. **control flow navigation**, etc.);
    - ▶ Implemented a **SIMD** version of the line-breaking algorithm, leading to a **6.5x** speedup for this module on ARM;
    - ▶ **Resolved a P0 incident in v0.3.1992**. 4 hours after the release, the community encountered a critical bug that drained resources and blocked processes. I identified the issue in **3 hours** and designed a new algorithm as fix. This emergency fix mitigated the incident, preventing widespread disruptions for Rust users and improving project stability.
  - **Open-source community maintenance**: Including meeting discussions, bug fixes, PR reviews, and more.
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## Awards

- 2022 **National Scholarship** (ranked 1/195 in the major), **Outstanding Graduate** of Beihang University
  - **First Prize** in the NSCSCC Compilation System Design Competition (Huawei Bisheng Cup) 2021, ranking 2nd overall.
  - Additionally awarded over ten provincial and university-level awards and scholarships
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## Projects

**Vizsla** · , a modern Verilog/SV IDE for hardware development (Rust / SystemVerilog)

(In development)

- **(Independently Developed)** Designed the core architecture of the IDE, the incremental computation processes, intermediate representation, semantic analysis module, etc. Also implemented most of the IDE functionalities.
- Aimed to equip chip design with modern IDE features (e.g. **code navigation**, **completion**, etc.) to enhance productivity.
- Based on the LSP, built an **incremental semantic analysis framework**.

**LLVM-Lite** · , a lightweight edge-side compiler for neural network operators (C++ / LLVM / ARM)

🌐 roife/llvm-lite

- **(Independently Developed)** Huawei research project, received an excellent evaluation as my undergraduate thesis.
- Utilizing shape information of neural networks to perform optimizations on operators, reducing its runtime cost.
- Successfully **reduced runtime by 6%** and **target file size by 38%** of the neural network operators in test cases.

**Ayame** · , project of the Huawei Bisheng Cup, a compiler of a C-subset (Java / LLVM / ARM)

🌐 No-SF-Work/ayame

- **(Co-author)** Implemented the graph-coloring register-allocation, arch-specific optimizations, the local evaluator and CI;
- The project ranked **1st in nearly half of the testcases** and outperformed gcc -O3 and clang -O3 on 1/3 of the examples.

## Open-source contributions

- **Rust-lang Member**, rust-analyzer contributors team. Mainly worked on rust-lang/rust-analyzer. Also contributed to rust-lang/rust-clippy, rust-lang/rustup, rust-lang/rust-mode
  - llvm/llvm-project, clangd/vscode-clangd, google/autocxx, yuin/goldmark and more on my GitHub.
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## Skills

- *Programming Languages*: Not limited to specific language. Especially proficient in C, C++, Java, Rust, Python, Verilog/SystemVerilog. Comfortable with Ruby, Swift, JavaScript, OCaml, Coq, Haskell, etc.
  - *PL Theory*: Familiar with **type systems**, formal semantics, formal verification and theory of computation.
  - *Compilers / IDE*: **4 YoE**. Proficient in compilation optimizations and various IR (like SSA, CPS, etc.). Knowledgeable about LLVM. Familiar with IDE based on LSP and **incremental computation**.
  - *Program Analysis*: **2 YoE**. Familiar with static analysis algorithms (e.g. dataflow analysis, pointer analysis, etc.).
  - *System Programming*: Familiar with Arch and OS, capable of low-level development and debugging.
  - *Tools*: Proficient in Emacs; comfortable working in macOS and Linux; skilled in leveraging AI.
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## Misc

- **Languages**: Chinese (native), English (fluent)

- **Teaching Assistant:** *Programming in Practice* (Fall 2020), *Object-oriented Design and Construction* (Fall 2021, Spring 2022), *Principles and Techniques of Compilers* (Spring 2024).