

# Ryang Sohn (손량)

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## Education

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### POSTECH (Pohang University of Science and Technology)

Feb 2022 – Ongoing

Majoring in Computer Science and Engineering, double major in Mathematics (GPA: 4.16/4.30)

- Activities and Societies:
  - PLUS (POSTECH Laboratory for UNIX Security): Hacking Club.
  - MARCUS: Math & Academic Presentation Club.

## Skills

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Programming Languages	Python, Rust, C/C++, JavaScript, Java, Go.
Tooling	Git/GitHub, Docker, Linux, CMake.
Natural Languages	Korean (native), English (working proficiency).

## Work Experience

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### Seoul National University, Graduate School of Data Science

Sep 2024 – Apr 2025

Internship at Computing Optimization and Data-driven Exploration lab

- Skills used: C++, LLVM, RISC-V
- Worked on.
  - LLVM auto-vectorization for scalable vector architectures. (RISC-V V extension, ARM SVE)
  - Enhancements for LLVM loop vectorization. (up to 15x speedups in synthetic benchmarks)

### Theori

Jan 2024 – Jul 2024

ChainLight WARD (Web3 Automated Risk Detection) Intern Researcher

- Skills used: Rust, Static Program Analysis, Solidity
- Worked on security-focused static analysis engine for web3 applications.
- Areas of interest:
  - Translating Solidity code to intermediate representation suitable for data-flow analysis.
  - Simplified memory model of Ethereum Virtual Machine.
  - Vulnerability detection of smart contracts using data-flow analysis.

### PoApper Inc.

Jan 2022 – Mar 2023

Part-time Backend Engineer

- Skills used: Python, Go
- Developed `fight.ai`, an environment for competitive game-playing agents.
- Areas of interest:
  - Developer-friendly Python API for game-playing agents.
  - Server infrastructure based on message queue for competitive gameplay.
  - Isolated per-agent environment for multiplayer games.

## Awards and Honors

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### National Science & Technology Scholarship

May 2024

Endorsed by the university in the 3rd year.

### POSTECH CSE Global Leadership Program 2024 Spring

Mar 2024

A scholarship program for high-performing POSTECH CSE students.

## POSTECH CSE Global Leadership Program 2023 Fall

Sep 2023

A scholarship program for high-performing POSTECH CSE students.

## Crypto Contest 2022, 2nd Prize

Oct 2022

Cryptanalysis competition hosted by South Korean Ministry of Defense.

- Contributions:
  - Multi-threaded PoC code for attacking weak Bitcoin-like wallet scheme.
  - Security analysis of Sponge-based hash function.

## POSTECH Programming Contest 2022, Freshman Prize

Sep 2022

Coding competition for POSTECH students.

- Participated as Team 대궐패, ranked first among freshman students.

## Artificial Intelligence Accelerator Design Competition, Encouragement Prize

Jun 2022

Competition to design FPGA-based accelerator for neural networks.

- Worked on: 8-bit quantization algorithm of YOLOv3 neural network.

## Certifications

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### Craftsman Information Processing

Apr 2024

Issued by HRD Korea.

### TOEFL

Jul 2023

Scored 109/120. Issued by ETS.

## Personal Projects

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### stap1 – Simple, Type-Annotated Programming Language

A compiler for imperative programming language with type annotations.

- Written in C++ and based on LLVM.
- Striving to follow best practices of modern C++ and software development:
  - Modularity, unit testing, documentation, etc.

### GPU-accelerated Ray Tracer

Developed a ray tracer that can simulate various materials.

- Started as a term-project for Computer Graphics course.
- Written in Vulkan compute shader, more than 10x speedup compared to CPU based ray tracer.
- Learned internals and low-level details of modern graphics pipeline.
- Notable features:
  - Support for metallic, dielectric, and diffuse materials.
  - Simulation for hypothetical portal materials.
  - Utilization of modern technology stack, such as Vulkan and dynamic rendering.

### TML (Tiny ML) Compiler

The final programming assignment of Programming Language course.

- Compiles Tiny ML, a subset of Standard ML, into machine code for virtual machine Mach.
- Written in OCaml.
- Learned internals of compilers for functional languages, and various implementation strategies.
- Notable features:
  - SSA-like intermediate representation.
  - Support for closures, higher-order functions, recursive datatypes and pattern matching.

### PintOS Implementation

Implementing PiñtOS, an educational operating system.

- Written in C and x86 assembly.
- Worked on threading, userspace programs, and virtual memory system.
- Notable features:
  - Virtual memory system similar to object-based reverse mapping of Linux.
  - Reduced memory usage by reusing already-loaded code sections.