Ryang Sohn (손량)

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Education

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)

Skills

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

Work Experience

Theori *Jan 2024 – Ongoing*
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 `fights.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

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 대줘패, 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

Craftsman Information Processing *Apr 2024*
Issued by HRD Korea.

TOEFL *Jul 2023*
Scored 109/120. Issued by ETS.

Personal Projects

`stapl` – 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 PintOS, 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.