

Seunghyun An

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EDUCATION

University of Wisconsin - Madison

Ph.D. in Computer Science

- GPA: 4.0/4.0
- Doctoral Minor in Astronomy

Madison, WI, USA

Aug. 2024 – Present

Korea Advanced Institute of Science and Technology (KAIST)

B.S. Double Major in Computer Science and Electrical Engineering

- GPA: 3.88/4.3, Magna Cum Laude
- Honor Student

Daejeon, South Korea

Mar. 2018 – Aug. 2024

PUBLICATIONS

cSwitch: Scheduling Linux Threads under the I/O Chiplet Wall

SOSP 2026

Seunghyun An, Joontaek Oh, Ming Liu

- Designed cSwitch, a Linux scheduling framework that models the I/O chiplet as a software switch
- Improved performance by up to $2.7\times$ by mitigating chiplet-level contention with traffic-aware thread scheduling

Server Chiplet Networking

HotNets 2025

Seunghyun An, Joontaek Oh, Ming Liu

- Characterized the chiplet network of two generations of AMD EPYC CPUs
- Proposed future directions with chiplet networking

RESEARCH EXPERIENCE

Chiplet-Aware Systems

Madison, WI

NetLab, UW-Madison (Advisor: Prof. Ming Liu)

Aug. 2024 – Present

- Diagnosed **up to 20% tail-latency degradation** in multi-tenant workloads (e.g., Redis, GAPBS) on **AMD EPYC** due to scheduler chiplet-topology blindness and interconnect contention.
- Built a chiplet-aware profiling pipeline (microbenchmarks + perf/PMU + **eBPF**) linking performance “hockey-stick” slowdowns to **Infinity Fabric** saturation.
- Developed an **SCX (sched_ext)** scheduler that classifies threads (sync-heavy vs. BW-heavy) and optimizes placement using real-time interconnect telemetry.

Kernel-Level RPC for SmartSSD

Daejeon, South Korea

CASYS, KAIST (Advisor: Prof. Youngjin Kwon)

Jul. 2023 – Feb. 2024

- Implemented a Linux kernel module enabling **kernel-resident RPC over RDMA** for SmartSSDs by porting a user-space RPC library into the kernel networking stack.
- Replaced user-space memory/synchronization with kernel primitives (**kmalloc**, **spin_lock**) and validated under concurrent RPC stress tests.

Safe Concurrency and Storage in Rust

Lausanne, Switzerland

RS3Lab, EPFL (Advisor: Prof. Sanidhya Kashyap)

Jan. 2023 – Feb. 2024

- Ported **MV-RLU** to Rust, mapping complex concurrency primitives while minimizing **unsafe** code.
- Re-architected a userspace filesystem (**ArckFS/TRIO**) in Rust using fine-grained synchronization and **mmap** to reduce kernel mediation overhead.

Coffer: Secure Runtime Isolation

Daejeon, South Korea

CASYS, KAIST (Advisor: Prof. Youngjin Kwon)

Jul. 2022 – Dec. 2022

- Profiled a **50K LOC** Rust runtime and identified allocator merge/split overhead as the main bottleneck.
- Implemented an asynchronous coalescing daemon to move merge/split work off the allocation critical path.

HONORS

Dean’s List in School of Engineering

Spring 2021

Presidential Science Scholarship

2018 – 2024

Reached the Best Result in 22nd International Astronomy Olympiad (IAO)

2017

TECHNICAL SKILLS

Programming Languages

- C/C++, Rust, Python

Languages

- Korean(Native), English(Proficient)

TEACHING EXPERIENCE

Teaching Assistance at UW-Madison

CS354 Machine Organization and Programming

Spring 2026

CS537 Introduction to Operating System

Fall 2024, Spring/Fall 2025

Teaching Experience at KAIST

Humanity/Leadership III: Hacking Class

Fall 2023

Python Tutoring at Daeduk High School

2022

Freshman Tutoring: Introduction to Programming

Spring 2022

Freshman Tutoring: General Physics II

Fall 2021

PROFESSIONAL EXPERIENCE

Military Service

Pyeongtaek, South Korea

Served as KATUSA in Eighth Army Public Affairs

2019 – 2020

- Awarded Army Commendation Medal(ARCOM) from the U.S. Army