Sujin Park

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Research Interests

Operating Systems, Performance Monitoring & Optimization, and Trusted Execution Environment

Education

Georgia Institute of Technology — Atlanta, GA
Ph.D. Candidate in Computer Science — 2019 - 2025
- Advisor: Prof. Taesoo Kim
- Thesis: Customizing System Software for Performance, Flexibility, and Isolation

Sungkyunkwan University (SKKU) — Suwon, South Korea
B.S. in Computer Science and Engineering — 2014 - 2019

Experience

Systems Software & Security Lab, Georgia Tech — Atlanta, GA
Research Assistant — Aug. 2019 - present
- Proposed a systematic framework and LLM-based assistant for optimizing system performance [1].
- Built a TEE-enabled OS, firmware, and secure runtime for robotics using RISC-V WorldGuard to support secure and scalable enclave execution.

Microsoft Research — Redmond, WA
Research Intern — May. 2024 - Aug. 2024
- Worked in security research group.
- Designed and built a sandboxing prototype to safely execute AI-generated code.

Meta — Menlo Park, CA
Visiting Researcher (*full-time*) — Jun. 2022 - Dec. 2022
- Worked in capacity engineering & analysis team.
- Contributed to performance tracing and analysis tool (Dynalog) using Intel PT and LLVM project.

Samsung Research — Seoul, South Korea
Research Intern — Jan. 2022 - May. 2022
- Worked in system security team.
- Designed and implemented secure hypervisor for Arm-based confidential computing architecture (Islet).

Robust Scalable Systems Software Lab, EPFL — Lausanne, Switzerland
Visiting Ph.D. Student — May. 2021 - Dec. 2021
- Advisor: Prof. Sanidhya Kashyap
- Developed framework to safely modify kernel locks on the fly without requiring kernel install or reboot. The framework allows users to customize locks in Linux kernel for performance optimization [2, 3].

UCARE Lab, University of Chicago — Chicago, IL
External Collaborator — Mar. 2019 - Aug. 2019
- Advisor: Prof. Haryadi Gunawi
- Contributed to host/SSD co-designed flash array project providing strong predictability without sacrificing performance. Implemented write buffer cache and flush mechanism in flash emulator.
- Acknowledged in the paper (SOSP 2021) for initial contribution.

Distributed Computing Lab, SKKU — Suwon, South Korea
Research Assistant — Mar. 2017 - Feb. 2019
- Advisor: Prof. Young Ik Eom
- Developed virtual machine monitoring tool to classify different types of shared memory [4, 5].
- Analyze performance characteristics of flash translation layer (FTL) and I/O using OpenSSD [7].

Parallel Systems Architecture Lab, EPFL — Lausanne, Switzerland
Summer Intern — Jun. 2018 - Aug. 2018

- Advisor: Prof. Babak Falsafi
- Developed debugger for QFlex, computer architecture simulation of multi-node system. Developed log parser, built database and systematized them to enable process tracking and error detection.

Machine to Machine Lab, Purdue University — West Lafayette, IN
Capstone Project — Sep. 2017 - Dec. 2017

- Advisor: Prof. Eric Matson
- Introduced a new goal distribution strategy for distributed multi agent systems [6]. The approach was tested and verified using StarCraft II API and broker communication model.

Publications

[1] Principles and Methodologies for System Performance Optimization.
Sujin Park, Mingyu Guan, Xiang Cheng, and Taesoo Kim.
The 19th USENIX Symposium on Operating Systems Design and Implementation (OSDI), 2025.

[2] Application-Informed Kernel Synchronization Primitives.
Sujin Park, Diyu Zhou, Yuchen Qian, Irina Calciu, Taesoo Kim and Sanidhya Kashyap.
The 16th USENIX Symposium on Operating Systems Design and Implementation (OSDI), 2022.

[3] Contextual Concurrency Control.
Sujin Park, Irina Calciu, Taesoo Kim and Sanidhya Kashyap.
The 18th Workshop on Hot Topics in Operating Systems (HotOS), 2021.

[4] Introspection of Virtual Machine Memory Resource in the Virtualized Systems.
Minho Lee, **Sujin Park**, Yongju Song, and Young Ik Eom.
The IEEE International Conference on Big Data and Smart Computing (BigComp), 2019.

[5] Real-time Memory Share Monitoring for Memory Efficiency in Virtualized Systems.
Sujin Park, Yongju Song, and Young Ik Eom.
The Korea Computer Congress (KCC), 2018.

[6] Collaborative Goal Distribution in Distributed Multiagent Systems.
Sujin Park, Sanguk Park, Hyeonggun Lee, Minji Hyun, Eunsuh Lee, Jeonghyeon Ahn, Lauren Featherstun, Yongho Kim and Eric Matson.
The Second IEEE International Conference on Robotic Computing (IRC), 2018.

[7] I/O Performance Analysis by Page Size in SSD Devices.
Sujin Park, Yongju Song, and Young Ik Eom.
The Korea Computer Congress (KCC), 2017.

Teaching

CS6220: High Performance Computing — Spring 2024
Teaching Assistant, Georgia Tech

CS3210: Designing Operating System — Spring 2020
Teaching Assistant, Georgia Tech

- This course builds a toy operating system in Rust on bare-metal Raspberry Pi 3.
- Designed initial course materials and labs.

Problem Solving and Algorithm course — Fall 2018
Teaching Assistant, SKKU

- Lead lab sessions for data structures and algorithms course.

Honors and Awards

Grace Hopper Conference Travel Grant 2019

Graduate Study Fellowship, Chungnam State Government, South Korea 2019 - 2021

Women Techmakers Scholars (Anita Borg Scholars), Google 2018
- acceptance rate: 0.3% = 73/25,000

Summer@EPFL 2018
- acceptance rate: 2-3%

Dean's List, SKKU 2016 - 2018
- awarded four consecutive semesters

Academic Scholarship, SKKU 2014 - 2018
- full tuition for 4 years

K-SW Purdue Fellowship, South Korean Government (IITP) 2017

Best Paper, Korea Computer Congress (KCC) 2017

Impact Award, Develop with Google 2017

Finalist, Samsung Collegiate Programming Cup (SCPC) 2016

1st Place, Information Security Contest, SKKU 2015

Patents

Young Ik Eom, Yongju Song, **Sujin Park**. Real-time Memory Share Monitoring for Virtualized Systems. KR-Patent 10-2018-0164420

Selected Talks

Contextual Concurrency Control, eBPF Summit Aug. 2021

Technical Skills

Languages
- **C/C++, Rust**, Python, Shell script and Assembly

Software Skills
- Operating System - Linux Kernel Development
- Virtualization - KVM, QEMU, Docker
- Confidential Computing - RISC-V PMP/WorldGuard, Arm TrustZone/CCA, Intel SGX/TDX, AMD SEV
- Database - MySQL, Neo4j
- Performance Test - Various benchmarks for system performance measurement