Sujin Park

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INTERESTS

Operating Systems, Confidential Computing, Performance Monitoring and Optimization.

EDUCATION

Georgia Institute of Technology — Atlanta, GA
Ph.D. in Computer Science *(Advisor: Prof. Taesoo Kim)* — Aug. 2019 – present

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

RESEARCH EXPERIENCE

Systems Software & Security Lab, Georgia Tech — Atlanta, GA
Research Assistant (Advisor: Prof. Taesoo Kim) — Aug. 2019 – present

- Conducted research focused on building fast and secure system software.

Microsoft Research — Redmond, WA
Research Intern — May. 2024 – Aug. 2024

- Worked in security research group.

Meta — Menlo Park, CA
Visiting Researcher — Jun. 2022 – Dec. 2022

- Worked in capacity engineering&analysis (CEA) team. Contributed to performance tracing and analysis tool 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.

Robust Scalable Systems Software Lab, EPFL — Lausanne, Switzerland
Visiting Ph.D. Student (Advisor: Prof. Sanidhya Kashyap) — May. 2021 – Dec. 2021

- Developed framework to dynamically customize underlying OS kernel without rebooting, optimizing system performance and fairness for varying application workloads [1, 2].

UCARE Lab, University of Chicago — Chicago, IL
External Collaborator (Advisor: Prof. Haryadi Gunawi) — Mar. 2019 – Aug. 2019

- 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.

Distributed Computing Lab, SKKU — Suwon, South Korea
Full-time Research Intern (Advisor: Prof. Young Ik Eom) — Mar. 2017 – Feb. 2019

- Developed virtual machine monitoring tool to classify different types of shared memory [3, 4].
- Analyze performance characteristics of flash translation layer (FTL) and I/O using OpenSSD [6].

Parallel Systems Architecture Lab, EPFL — Lausanne, Switzerland
Summer Intern (Advisor: Prof. Babak Falsafi) — Jun. 2018 - Aug. 2018

- 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 Design Project (Advisor: Prof. Eric Matson) — Sep. 2017 - Dec. 2017

- Introduced a new goal distribution strategy for distributed multi agent systems [5]. The approach was tested and verified using StarCraft II API and broker communication model.

PUBLICATIONS

[1] **Application-Informed Kernel Synchronization Primitives.**
Sujin Park, Diyu Zhou, Yuchen Qian, Irina Calciu, Taesoo Kim and Sanidhya Kashyap.
In *Proceedings of the 16th USENIX Symposium on Operating Systems Design and Implementation (OSDI'22)*, Carlsbad, CA, Jun. 2022

[2] **Contextual Concurrency Control.**
Sujin Park, Irina Calciu, Taesoo Kim and Sanidhya Kashyap.
In *Proceedings of the 18th Workshop on Hot Topics in Operating Systems (HotOS XVIII)*, virtual, Jun. 2021

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

[4] **Real-time Memory Share Monitoring for Memory Efficiency in Virtualized Systems.**
Sujin Park, Yongju Song, and Young Ik Eom.
In *Proceedings of the Korea Computer Congress (KCC 2018)*, Jeju, South Korea, Jun. 2018

[5] **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.
In *Proceedings of the Second IEEE International Conference on Robotic Computing (IRC 2018)*, Laguna Hills, CA, Feb. 2018

[6] **I/O Performance Analysis by Page Size in SSD Devices.**
Sujin Park, Yongju Song, and Young Ik Eom.
In *Proceedings of the Korea Computer Congress (KCC 2017)*, Jeju, South Korea, Jun. 2017

TEACHING

Teaching Assistant, Georgia Tech — Spring 2020
CS3210 – Designing Operating System
• Building an operating system in Rust on bare-metal Raspberry Pi 3.

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

Teaching Assistant, SKKU — Fall 2018
Problem Solving and Algorithm 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%=73/25000)
Summer scholarship and Travel Grant, EPFL *(acceptance rate: 2-3%)* — 2018
Dean's List, Sungkyunkwan University *(awarded four consecutive semesters)* — 2016-2018
Honor Scholarship, Sungkyunkwan University *(full tuition for 4 years)* — **2014-2018**
K-SW Purdue Scholarship, South Korean Government (IITP) — 2017
Best Paper, Korea Computer Congress (KCC) — 2017
Impact Award in Develop with Google Final Contest — 2017
Finalist of Samsung Collegiate Programming Cup — 2016
1st place in Information Security Idea Contest, Sungkyunkwan University — 2015

PATENTS

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

TALKS

Contextual Concurrency Control, eBPF Summit — Aug. 2021

PROJECTS

Develop with Google — Jan. 2018 - Feb. 2018
Student Software Engineer — Google, South Korea
• Engaged in weekly seminars covering a range of software topics and skills, including Android Things, static/dynamic linking, Firebase, and technical interview preparation.

Develop with Google — Jan. 2017 - Feb. 2017
Student Software Engineer — Google, South Korea
• Developed a Chrome extension utilizing HTML, JavaScript, CSS, jQuery, and the Chrome Extension API to improve multi-tab management. Proposed and implemented key features, including a 'tab directory' and 'tab suspending' functionality.

TECHNICAL SKILLS

Languages

- Advanced – **C/C++, Rust**, Python, Shell script, Assembly
- Moderate – Java, HTML, CSS, JavaScript

Software Skills

- Operating System – **Linux Kernel Development**
- Virtualization – KVM, QEMU, Docker
- Confidential computing – Arm CCA, AMD SEV, Intel TDX, RISC-V WorldGuard
- Database – MySQL, Neo4j
- Performance Test – Various benchmarks for system performance measurement