(203) 300-9151
La Jolla, CA
juno@eng.ucsd.edu

Juno Kim

CS Ph.D. student

GitHub: juno-kim
LinkedIn: junokim8

As IO becomes fast with modern memory/storage technologies, the bottleneck shifts from IO to CPU in various software stacks. My research focuses on identifying and fixing such problems by introducing new data processing mechanisms or algorithms tailored for fast IO.

To this end, I worked on performance optimization of legacy applications and file systems for PMEM (ASPLOS 2019), performance characterization of the commercial persistent memory device (FAST 2020), and new PMEM-based file IO mechanism (APSys 2020). Also, I worked on supporting fast graph analytics by leveraging ultra-low-latency SSDs like Intel Optane SSD (SC 2022). Currently, I am working on optimizing the performance and cost of serverless computing by leveraging tiered memory hierarchy.

Before joining UCSD, I spent a year at Yale where I worked on building a highly scalable distributed storage called FuzzyLog (OSDI 2018).

Education

Ph.D. in Computer Science, *University of California, San Diego* — Dec 2022 (Expected)
Advisor: Dr. Steven Swanson

M.S. in Computer Science, *University of California, San Diego* — Jun 2020
Advisor: Dr. Steven Swanson

B.S. in Electrical & Computer Engineering, *Seoul National University, Korea* — Feb 2012
- The period includes 3 years of military service mandatory in Korea.

Publication

Blaze: Fast Graph Analytics on Fast SSDs — **SC 2022 (to appear)**
***Juno Kim**, Steven Swanson*

Ayudante: A Deep Reinforcement Learning Approach to Assist Persistent Memory Programming — **ATC 2021**
*Hanxian Huang, Zixuan Wang, **Juno Kim**, Steven Swanson, and Jishen Zhao*

Sub-Zero: Zero-copy IO for Persistent Main Memory File Systems — **APSys 2020**
***Juno Kim**, Yun Joon Soh, Joseph Izraelevitz, Jishen Zhao, Steven Swanson* — *Best Paper*

An Empirical Guide to the Behavior and Use of Scalable Persistent Memory — **FAST 2020**
*Jian Yang, **Juno Kim**, Morteza Hoseinzadeh, Joseph Izraelevitz, Steven Swanson*

Basic Performance Measurements of the Intel Optane DC Persistent Memory Module — **arXiv 2019**
*J. Izraelevitz, J. Yang, L. Zhang, **J. Kim**, X. Liu, A. Memaripour, Y. Soh, Z. Wang, Y. Xu, S. Dulloor, J. Zhao, S. Swanson*

Finding and Fixing Performance Pathologies in Persistent Memory Software Stacks — **ASPLOS 2019**
Jian Xu, **Juno Kim***, Amirsaman Memaripour, Steven Swanson (*co-first authors)*

The FuzzyLog: A Partially Ordered Shared Log — **OSDI 2018**
*Joshua Lockerman, Jose Faleiro, **Juno Kim**, Soham Sankaran, Daniel Abadi, James Aspnes, Siddhartha Sen, Mahesh Balakrishnan*

Technical Experience

Software Engineering Intern — **Jun 2021 — Sep 2021**
Intel Optane Group (Mentor: Andy Rudoff, Piotr Balcer) — *Virtual*
- Worked on prototyping a software library that leverages Intel's Data Streaming Accelerator (DSA) technology for efficient persistent memory access.

Research Intern — **Jun 2019 — Sep 2019**
IBM Research Storage Group (Mentor: Deepavali Bhagwat, Scott Guthridge) — *San Jose, CA*
- Worked on building a testing tool for checking crash-consistency of persistent memory-aware programs.

Software Engineer — **Dec 2011 — Jul 2014**
SAP Labs — *Seoul, Korea*
- Worked on building in-memory database engine with the focus on efficient database metadata access in distributed environment.

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Talks

Sub-Zero: Zero-copy IO for Persistent Main Memory File Systems — APSys 2020, Virtual

Finding and Fixing Performance Pathologies in Persistent Memory Software Stacks — ASPLOS 2019, Providence, RI

Service

External reviewer at DISC 2020
External reviewer at IEEE MASCOTS 2019

Teaching Experience

Modern Storage Systems (UCSD CSE291A), Fall 2019
Instructor: Dr. Steven Swanson

Skills

Technical	C/C++, Python, Go, Shell, SQL
Communication	English, Korean, Japanese