https://seahk.github.io

Seah Kim

Contact: seah@berkeley.edu

< Education >

University of California, Berkeley Aug 2019 –
Degree: Ph.D. in Electrical Engineering and Computer Sciences
Advisor: Yakun Sophia Shao, Borivoje Nikolic

Seoul National University Mar 2014 – Feb 2019
Degree: B.S. in Electrical and Computer Engineering

< Research Interest >

Computer Architecture and VLSI, SoC Design, Systems for ML, Design Methodology

< Publication >

Excluding Workshops

SuperNoVA: Algorithm-Hardware Co-Design for Resource-Aware SLAM
Seah Kim, Roger Hsiao, Borivoje Nikolic, James Demmel, Yakun Sophia Shao
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), April 2025 (To appear).

AuRORA: A Full-Stack Solution for Scalable and Virtualized Accelerator Integration
Seah Kim, Jerry Zhao, Krste Asanovic, Borivoje Nikolic, Yakun Sophia Shao
IEEE Micro (Top Picks 2023 Issue), July-August 2024.

DREAM: A Dynamic Scheduler for Dynamic Real-time, Multi-model ML Workloads
Seah Kim, Hyoukjun Kwon, Jinook Song, Jihyuck Jo, Yu-Hsin Chen, Liangzhen Lai, Vikas Chandra
International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), March 2023 (presented at ASPLOS 2024).

AuRORA: Virtualized Accelerator Orchestration for Multi-Tenant Workloads
Seah Kim, Jerry Zhao, Krste Asanovic, Borivoje Nikolic, Yakun Sophia Shao
International Symposium on Microarchitecture (MICRO), October 2023.
Selected as IEEE Micro Top Picks (2023)

RoSÉ: A Hardware-Software Co-Simulation Infrastructure Enabling Pre-Silicon Full-Stack Robotics SoC Evaluation
Dima Nikiforov, Shengjun Chris Dong, Chengyi Lux Zhang, Seah Kim, Borivoje Nikolic, Yakun Sophia Shao
International Symposium on Computer Architecture (ISCA), 2023.
ISCA Distinguished Artifact Award

MoCA: Memory-Centric, Adaptive Execution for Multi-Tenant Deep Neural Networks
Seah Kim, Hasan Genc, Vadim Nikiforov, Krste Asanovic, Borivoje Nikolic, Yakun Sophia Shao
IEEE International Symposium on High-Performance Computer Architecture (HPCA), March 2023.

Gemmini: Enabling Systematic Deep-Learning Architecture Evaluation via Full-Stack Integration

Hasan Genc, Seah Kim, Alon Amid, Ameer Haj-Ali, Vighnesh Iyer, Pranav Prakash, Jerry Zhao, Daniel Grubb, Harrison Liew, Howard Mao, Albert Ou, Colin Schmidt, Samuel Steffl, John Wright, Ion Stoica, Jonathan Ragan-Kelley, Krste Asanovic, Borivoje Nikolic, Yakun Sophia Shao
Design Automation Conference (DAC), December 2021.
DAC Best Paper Award

< Experience >

[UC Berkeley]

Present — Graduate student researcher @ Berkeley Architecture Research
- Led 4x4mm^2 real-time ML chip tape-out (design submitted on December 2023, paper *under submission*)

[Meta Reality Labs]

May 2022 – Aug 2022 — AI Research Intern
- Worked on scheduler for AR/VR application
- Paper accepted (ASPLOS 2023)

[Apple]

May 2021 – Aug 2021 — SPG intern
- Design an accelerator architecture for sparse data structure
- Performance modeling for cycle-accurate simulation

[Seoul National University]

Jan 2018 – July 2019 — Undergraduate Researcher @ Integrated Systems Design Lab (ISDL)
Research Advisor: Prof. Deog-Kyoon Jeong
- Designed transmitter for automotive imaging sensor
- Participated in Samsung 28nm and TSMC 40nm CMOS tape-out of fractional digital phase locked loop using Injection Locking Oscillator

< Tutorial >

Full-System, Full-Stack ML SoC Architecture Research with FireSim, Chipyard, Gemmini and AuRORA
Seah Kim, Abraham Gonzalez, Jerry Zhao, Joonho Whangbo, Vikram Jain
International Symposium on Microarchitecture (MICRO), November 2024.

Gemmini: Generate Custom DNN Accelerators with Full-System Full-Stack Evaluation
Hasan Genc, Simon Guo, Seah Kim, Vadim Nikiforov
Machine Learning and Systems (MLSys), August 2022.

< Teaching Experience & Extracurricular Activity >

[UC Berkeley]

Fall 2022 — GSI for Introduction to Digital Design and Integrated Circuits (EECS 151/251A)

Fall 2020 — GSI for Great Ideas in Computer Architecture (CS 61C)

[Seoul National University]

2018 — Tutor for major courses (Integrated Circuits)

2014 — Class representative (Lullu, Department of ECE)

2014 Campus Mentoring Program

< Award & Fellowship >

2024 MICRO PhD Forum
2024 Rising Stars in EECS
2024 AuRORA selected as IEEE Micro's Top Pick in Computer Architecture
2023 Selected as a Machine Learning and Systems Rising Star
2023, 2024 Qualcomm Innovation Fellowship Finalist
2023 ISCA Distinguished Artifact Award
2021 Paper selected as a DAC Best Paper
2020 AI Compute Symposium Top Poster Award
IBM and IEEE CAS/EDS
2019 fall EECS departmental fellowship
UC Berkeley
2019 - 2022 Study Abroad Scholarship
Kwanjeong Educational Foundation
2016 - 2018 National Scholarship for Science and Engineering
Korea Student Aid Foundation

< Service >

2024 IISWC Artifact Evaluation Committee
2024 EECS Visit Day Area Student Lead Organizer