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**

**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
*ACM 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***

**SuperNoVA: Algorithm-Hardware Co-Design for Resource-Aware SLAM**
Seah Kim, Roger Hsiao, Borivoje Nikolic, James Demmel, Yakun Sophia Shao
*Under Submission*

## < 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** *at MICRO 2024*
Seah Kim, Abraham Gonzalez, Jerry Zhao, Joonho Whangbo, Vikram Jain
International Symposium on Microarchitecture (MICRO), October 2024.

**Gemmini: Generate Custom DNN Accelerators with Full-System Full-Stack Evaluation** *at MLSys 2024*
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 >

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| 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<br>*IBM and IEEE CAS/EDS* |
| 2019 fall | EECS departmental fellowship<br>*UC Berkeley* |
| 2019 - 2022 | Study Abroad Scholarship<br>*Kwanjeong Educational Foundation* |
| 2016 - 2018 | National Scholarship for Science and Engineering<br>*Korea Student Aid Foundation* |

## < Service >

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