Sunwoo Kim

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Education

Cornell University, PhD in Computer Engineering — Aug 2025 – present
Advisor: **Prof. Zhiru Zhang**
Research Interests: Heterogeneous computing systems and AI

Seoul National University, BS in Electrical and Computer Engineering, cum laude — Mar 2019 – Feb 2025

Publications

G³SA: A GPU-Accelerated Gold Standard Genomics Library for End-to-End Sequence Alignment
Yeejoo Han*, **Sunwoo Kim***, Seongyeon Park, Jinho Lee (*equal contribution)
ACM International Conference on Supercomputing (ICS), 2025

Selected Projects

Modeling Stateful Accelerators with Allo-HLS Flow — Oct 2025 – present
- Enhancing Allo types and Vitis HLS backend to cover states; preparing for open-source contribution.

Accelerating Genomics Software with GPUs — Jan 2024 – Mar 2025
- Implementing BWA-MEM in CUDA then improve alingment throughput with algorithmic enhancements.

Hacking xv6 — Sept 2024 – Dec 2024
- Extending the xv6 OS kernel with ULE scheduler, Linux ZSwap, and full path-indexed file systems.

Work Experiences

Cornell University, Computer Systems Lab — Sept 2025 – present
Research Assistant, Advisor: Prof. Zhiru Zhang
- Leading projects in composable computing and accelerator modeling.

Seoul National University, Accelerated Intelligent Systems Lab — Jan 2024 – Mar 2025
Research Assistant, Advisor: Prof. Jinho Lee
- Co-led the G³SA project leading to a publication and an open-source.

Seoul National University, Networked Computing Lab — Apr 2022 – Oct 2022
Research Intern, Advisor: Prof. Kyunghan Lee
- Surveyed techniques on running DNN algorithms over datacenter and mobile networks.

Awards & Honors

Fulbright Award for Graduate Studies in STEM (declined), $40k – US and ROK govs — Sept 2024

Semiconductor Specialization Scholarship, $11k – SNU Engineering — Sept 2023

Presidential Science Scholarship, Full tuition and stipend – ROK gov — Mar 2019

Teaching & Mentoring

SmallTPU Project TA — Sept 2025 – present
- Mentored Cornell ECE undergraduates to build TPU-like architecture and software stack.

Undergraduate Tutor — Mar 2022 – June 2024
- Algorithms and Calculus; held weekly office hours for ECE and STEM major students.

Outreach

Arusha, Tanzania, SNU Solar Volunteer Corps Jan 2023 – Feb 2023

Engineering Volunteer, Advisor: Prof. Sunghoon Ahn

- Lead 13 multicultural engineers to fix solar grid monitoring systems across 100 rural households.

Skills & Languages

Programming Languages, Frameworks & Tools: C/C++, Python, CUDA, PyTorch, LLVM, Make, gdb

Hardware: Verilog, Vitis HLS, Vivado, cocotb, SPICE

Natural Languages: English (Fluent), Korean (Native)