Ha Neul Park

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Research Interests

My research interest lies in computer systems and architecture. In particular, I am interested in various performance metrics with a special focus on memory and network subsystems.

Education

University of Illinois Urbana-Champaign *Urbana-Champaign, IL, USA*
Ph.D. Student in Electrical and Computer Engineering *Aug 2023 - Current*
- Advisor: Nam Sung Kim

Seoul National University (SNU) *Seoul, Korea*
B.S. in Electrical and Computer Engineering *Mar 2018 - Aug 2023*
- GPA: 4.17/4.3, Summa Cum Laude

Publications

[1] **DRAM Translation Layer: Software-Transparent DRAM Power Savings for Disaggregated Memory**, Jin, W., Jang, W., **Park, H.**, Lee, J., Kim, S., & Lee, J. W., In Proceedings of the 50th Annual International Symposium on Computer Architecture **(ISCA)**, 2023, June.

Research Experience

Interference-Aware LLC Orchestration in Datacenter Servers *FAST Lab, UIUC, USA*
Advised by Professor Nam Sung Kim *Aug 2023 - Current*
- Analyzing various LLC interference patterns with the presence of multiple I/O devices in the real system
- Reverse-engineering Intel SkyLake cache hierarchy, focused on the non-inclusiveness and the directory structure
- Implemented the DMA leakage & QoS aware LLC management system
- **Manuscript in progress** to IEEE/ACM International Symposium on Microarchitecture **(MICRO)** , 2025

OS Transparent DRAM Power Management *ARC Lab, SNU, Korea*
Undergraduate Researcher, Advised by Professor Jae W. Lee *Jul 2022 - Nov 2022*
- Conducted experiment scheduling virtual machines running Cloudsuite 4.0 on an actual machine configuration that can sufficiently represent the major features of the suggested non-configurable system
- Proposed estimation methodology for performance and DRAM power metrics of suggested system, where metrics are obtained using PCM(Performance Counter Monitor)
- Fine-tuned Cloudsuite 4.0 workloads to work correctly on trace generation using binary instrumentation, INTEL PIN
- **Accepted** to the 50th ACM/IEEE International Symposium on Computer Architecture **(ISCA)**, June 2023

Enabling Multi-GPU Support in Gem5 GPU Simulator *HPCS Lab, SNU, Korea*
Senior Project, Advised by Professor Jangwoo Kim *Jan 2022 - Jul 2022*
- Extended existing gem5 GPU model by duplicating GPUs and rearranging Ruby memory interface
- Modified emulated kernel driver to distinguish GPU ID and doorbell region of each GPU from others

2022 Deep Learning Hardware Design Competition *Polaris, Korea*

2nd Place, Nationwide Competition *Feb 2022 - Jul 2022*

- Designed and implemented high-performance and power-efficient FPGA accelerator for CNN inference
- Designed an adder-tree-based computational unit and datapath tailored to Tiny-YOLO v3 model
- **Organized presentation**, IEEE International Conference on Artificial Intelligence Circuits and Systems **(AICAS)**, 2022

Honors & Awards

2022	**2/111**, 2022 Deep Learning Hardware Design Competition, won $2,000	*Polaris*
2019	**OK Bae & Jung Scholarship**, $20,000 over two years	*OK Foundation*
2018	**Presidential Science Scholarship**, $40,000 for undergraduate course	*Korea Student Aid Foundation*
2017	**Bronze Medalist**, 2017 Korean Young Physicists' Tournament	*Korean Physical Society*
2015, 2016	**Completion**, Winter Program for Korea Physics Olympiad	*Korean Physical Society*

Teaching Experience

Calculus 1	Peer tutor, Provided 30 hours of lecture for freshman (Spring 2019, Spring 2022)
Engineering Mathematics 1	Peer tutor, Provided 30 hours of lecture for sophomore/junior (Fall 2019)

Extracurricular Activities

Auxiliary Police	Network Maintenance Engineer, Seoul Mobile Police Headquarters (Feb 2019 - Aug 2021) Completed South Korea's mandatory military service taking a leave of absence from university
Volunteer Activity	Total 338 hours, consists mostly of teaching activities

Skills

Language & Tool	C/C++, Python, Bash, Verilog/Vivado, HTML/CSS/JavaScript, Lex/Yacc, LaTex, Docker, MATLAB
English Proficiency	TOEFL (105/120), TOEIC (985/990)