Euijun Chung

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Introduction

Euijun Chung is a **first-year CS PhD student at Georgia Tech**, focusing on **GPU architecture and simulations**. His research interests lie on cycle-level GPU simulation and performance modeling, GPU memory safety, GPU + SSD architecture co-design, and distributed workloads on Multi-GPU systems.

Education

Georgia Institute of Technology — Atlanta, GA, USA
Ph.D. in Computer Science — Jan. 2024 – Present
Advisor: Hyesoon Kim

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
B.S. Major in Electrical Engineering, Minor in Mathematical Sciences — Feb. 2018 – Feb. 2024
GPA: 4.05/4.30 (*Summa Cum Laude*)

Georgia Institute of Technology — Atlanta, GA, USA
Student Exchange Program in Electrical and Computer Engineering — Jan. 2023 – Aug. 2023
GPA: 4.0/4.0

Research Experience

Georgia Tech HPArch Lab — Atlanta, GA, USA
Graduate Research Assistant (Advisor: Hyesoon Kim) — Jan. 2023 – Present

– **GPU Simulation and Performance Modeling**: Proposed novel methodologies for accelerating cycle-level GPU simulations with statistical error bounds: STEM [1] and Allegro [2].

– **GPU Memory Safety**: Designed and evaluated LMI [3], a novel fine-grained hardware bounds-checking solution for GPUs, along with under 1% performance overhead in most GPU benchmarks.

– **GPU-SSD architecture co-design**: Developed a GPU-SSD integrated simulator [link] for evaluating co-designed architectures [4] such as adaptive GPU block scheduling and address mapping policies.

– **Open-source Cycle-level GPU Simulator project**: Added SASS-assembly trace support for Macsim to run latest CUDA workloads [link], utilized NVBit and CUDA Runtime APIs for the implementation.

– **Vortex 2.0**: Participated in designing and evaluating the next generation of Vortex: an open-source hardware and software project to support GPGPU based on RISC-V.

KAIST INALab — Daejeon, Korea
Undergraduate Research Assistant (Advisor: Dongsu Han) — Jul. 2021 – Aug. 2022

– **Scene-clustered Superresolution network Training**: Developed and evaluated SR-Net, a content-aware video delivery algorithm using video scene clustering, achieving a +5.8dB PSNR gain over prior methods with the same resource usage.

– **4K support for LiveNAS**: Adapted LiveNAS system [link] for 4K videos by utilizing ONNX and TensorRT, achieved 3x speedup in end-to-end 4K video processing.

Publications

[1] **Euijun Chung**, Seonjin Na, Sung Ha Kang, and Hyesoon Kim, "STEM: Swift and trustworthy large-scale GPU simulation with fine-grained error modeling and sampling", in *Under review at 2025 IEEE International Parallel & Distributed Processing Symposium (IPDPS)*.

[2] **Euijun Chung**, Seonjin Na, and Hyesoon Kim, "Allegro: GPU simulation acceleration for machine learning workloads", in *Machine Learning for Computer Architecture and Systems 2024 (MLArchSys, co-located with ISCA)*.

[3] Jaewon Lee, **Euijun Chung**, Saurabh Singh, Seonjin Na, Yonghae Kim, Jaekyu Lee, and Hyesoon Kim, "Let-me-in: (still) employing in-pointer bounds metadata for fine-grained GPU memory safety", in *2025 IEEE International Symposium on High-Performance Computer Architecture (HPCA)*.

[4] Xueyang Liu, Seonjin Na, Jiashen Cao, **Euijun Chung**, Jing Yang, and Hyesoon Kim, "Contention-aware GPU thread block scheduler for efficient GPU-initiated SSD accesses", in *Under review at 2025 Design, Automation and Test in Europe (DATE)*.

[5] Myoung Jae Lee and **Euijun Chung**, "Experimental analysis on the 0 dimensional plasma model in an inductively coupled plasma (ICP)", in *2016 New Physics: Sae Mulli*, 66:1183–1189.

Teaching

- **Teaching Assistant for CS 8803 - GPU Hardware & Software** Summer 2024
  Developed a light-weight GPU architecture simulator used in two course programming assignments.
- **Tutor in Freshman Tutoring Program** Fall 2021, Spring 2022, Fall 2022, Fall 2023
  Tutored Calculus II (Vector Calculus) to KAIST freshmen through weekly lectures and office hours.

Skills

- **Programming**: C/C++, CUDA, Python, C#
- **Architecture Simulators and HDL**: Macsim, ASTRA-Sim, gem5, MQSim, Verilator, SystemVerilog
- **Machine Learning & Data Science**: cuDNN, cuBLAS, Pytorch, Tensorflow, Pandas
- **Tools**: NVBit, MATLAB, ARM Mbed, Unity, GameMaker Studio, LabWindows/CVI, LaTeX
- **Languages**: English (Proficient), Korean (Native), Japanese (Proficient)

Scholarships and Honors

- **Gem5 Bootcamp** Attendee (Full Travel Grant) Jul.–Aug. 2024
  Attended the gem5 Bootcamp at UC Davis as a recipient of a full travel grant.
- **ISCA 2023 uArch Workshop** Full Grant Recipient Jun. 2023
  Accepted as a full travel grant recipient for the 5th Undergrad Architecture Mentoring Workshop at ISCA 2023.
- **KOSAF** (Korea Student Aid Foundation) National Science & Technology Scholarship 2022 – 2024
  Awarded scholarship for being an outstanding undergraduate student in engineering.
- **Dean's List** for KAIST EE Fall 2022
  Awarded academic honor to students who have achieved exceptional academic performance (top 3%).

Extracurricular Activities & Experiences

- **AI Competition for Agricultural Commodity Price Prediction** Fall 2022
  Participated in Nongnet AI price prediction competition utilizing a comprehensive 10-year agricultural transaction database. Achieved a top 13% ranking out of 69 participating teams.
- **Republic of Korea Air Force (ROKAF)** Aug. 2019 – May 2021