Euijun Chung

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Research Interests

- **Computer Architecture**: Multi-GPU systems, GPU memory safety and GPU-SSD architecture co-design.

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. 2024 – Present

- **Multi-GPU Systems**: Investigating new GPU architectures to achieve efficient communication and resource utilization in multi-GPU systems.

Georgia Tech HPArch Lab — Atlanta, GA, USA
Undergraduate Research Assistant (Advisor: Hyesoon Kim) — Jan. 2023 – Jan. 2024

- **GPU memory safety**: Evaluated BNPL, a novel fine-grained hardware bounds-checking solution for GPUs, demonstrating under 1% performance overhead in common GPGPU and ML benchmarks.
- **GPU-SSD co-design**: Developed a novel GPU-SSD co-designed architecture leveraging on-chip memory address prediction and adaptive CUDA block scheduling.
- **NVBit - Macsim Adaptation and MQSim - Macsim Integration**: Upgraded Macsim with SASS trace support leveraging NVBit and CUDA APIs, enabling the execution of GPGPU and ML workloads like Rodinia, GraphBig, Tango, and FasterTransformer. This facilitated the integration of Macsim with MQSim to evaluate a GPU-SSD co-designed architecture.
- **Vortex 2.0**: Participated in designing and evaluating the next generation of Vortex Project. Vortex is an open-source hardware and software project to support GPGPU based on RISC-V.

KAIST ICLab — Daejeon, Korea
Undergraduate Research Assistant (Advisor: Junil Choi) — Sept. 2022 – Dec. 2022

- **MIMO communication system**: Implemented MIMO communication system simulator with OFDM.

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

- **Scene-clustered SR 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 resources.
- **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] M. J. Lee and **Euijun Chung**, "Experimental Analysis on the 0 Dimensional Plasma Model in an Inductively Coupled Plasma (ICP)", in *2016 New Physics: Sae Mulli*, Aug. 2016, 66:1183–1189.

Scholarships and Honors

- **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%).

Teaching

- **Tutor in Freshman Tutoring Program** — Fall 2021, Spring 2022, Fall 2022, Fall 2023
  MAS 102 Calculus II (Vector Calculus)
  Tutored Calculus II to freshmen through weekly lectures and office hours, fostering their understanding of the course.

Skills

- **Programming**: C/C++, CUDA, Python, LLVM, C#, Java
- **Architecture Simulators and HDL**: SystemVerilog, MQSim, Macsim, Verilator (RTL Simulation)
- **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), Mandarin Chinese (Intermediate)

Extracurricular Activities & Experiences

Nongnet Agricultural Commodity Price Prediction AI Competition — Seoul, Korea
Achieved a top 13% ranking out of 69 participating teams. — Fall 2022

- Participated in an AI competition for price prediction utilizing a comprehensive 10-year agricultural transaction database. Developed a Transformer model for accurate agricultural product price forecasting using Pytorch, Pandas, and other data analysis tools.

Republic of Korea Air Force (ROKAF) — Gwangju, Korea
Air Base Systems Operator — Aug. 2019 – May 2021

- *Compulsory military service.* Served as a 24/7 TACAN (TACtical Air Navigation) Operator at an Air Base, responsible for the continuous operation, monitoring, and troubleshooting of the crucial radar-like machine used by fighter aircraft to navigate and locate airports.