Chanyoung Jung

RESEARCH ASSISTANT

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Summary

Highly motivated Master's student in Computer Science, **recipient of the MobiSys 2025 Best Paper Award**, specializing in on-device AI systems optimized for mobile/edge platforms. Expertise spans ML inference optimization through heterogeneous/parallel computing and efficient utilization of mobile processors for Vision Foundation Models and 3D object detection on mobile/edge devices. Seeking to leverage advanced skills in optimizing complex applications for resource-constrained environments.

Research Areas and Interests

Mobile & Edge Systems	Real-time Systems, Heterogeneous Computing, Energy-efficient Systems
On-device AI	Neural Processing Units (NPUs) Optimization, DNN Inference Optimization, HW-SW Co-design
Artificial Intelligence	Vision Transformer, Vision Foundation Models, Efficient AI
Computer Vision	Depth Estimation, Semantic Segmentation, 3D Object Detection, Gaussian Splatting

Experience

Mobile Embedded Systems Lab.   *Seoul, South Korea*
Research Assistant   *Jan. 2024 - Present*

- Participated in 3 projects that were accepted at top-tier mobile systems conferences, with 1 ongoing project
  - Designed and co-developed a heterogeneous computing system (ARIA) for real-time vision AI on Qualcomm Snapdragon SoCs, sustaining 30 FPS while boosting model accuracy up to +72%
  - Designed and developed a high-performance, multi-view 3D object detection pipeline (Panopticus) for autonomous systems on NVIDIA Jetson SoCs, achieving a 2.1× speedup and +62% mAP
- Awarded **Best Paper Award** at MobiSys 2025 by ARIA
- Authored 3 top-tier mobile systems papers, including 1 first-author paper (MobiSys '25) and 2 co-authored papers (MobiCom '24, MobiCom '25)
- Awarded a government fellowship, receiving approximately $9,000 for one year
- Served as a teaching assistant for Operating Systems and Systems Programming courses

Mobile Embedded Systems Lab.   *Seoul, South Korea*
Undergraduate Research Assistant   *Dec. 2022 - Dec. 2023*

- Conducted two semesters of graduation research on "Real-time Omnidirectional 3D Object Detection on Edge Devices"
  - Developed an end-to-end baseline system for real-time omnidirectional 3D object detection during the first semester
  - Optimized critical bottleneck in image preprocessing using CUDA, achieving a 37.0x reduction in processing time (vs. naive Python baseline) and an inference rate of 17 FPS (57% of 30 FPS target)
  - Enhanced system performance by 47% to reach 25 FPS in the second semester, integrating additional CUDA-accelerated modules and adaptive logic
  - Contributed foundational work that was subsequently expanded into the Panopticus project, accepted at MobiCom 2024

Education

Yonsei University   *Seoul, South Korea*
M.S. in Computer Science and Engineering   *Mar. 2024 - Now*

- Mobile Embedded Systems Group, Advised by Prof. Hojung Cha
- Expected graduation: Feb. 2026

Yonsei University   *Seoul, South Korea*
B.S. in Computer Science and Engineering   *Mar. 2018 - Feb. 2024*

- GPA: 4.24/4.50, Rank, 6/106, Graduated with High Honors

Skills

Programming	Python, C/C++, Java	**GPU Frameworks**	CUDA, OpenCL, OpenGL
ML Inference Frameworks	ONNX, LiteRT(Tensorflow Lite), TensorRT	**NPU Frameworks**	Qualcomm AI Engine Direct (QNN) SDK
ML Model Frameworks	PyTorch, LibTorch, MMDetection3D	**Edge Devices**	Nvidia Jetson Series (Orin, Xavier, Nano)
Build tools	Bazel, CMake, Gradle	**Mobile Devices**	Qualcomm Snapdragon SoCs

Projects

ARIA   *2024*

Project Leader

- Skills: Android, Qualcomm AI Engine Direct (QNN) SDK, LiteRT, ONNX
- Designed a heterogeneous computing pipeline that distributes Vision Foundation Model (VFM) inference workloads across GPU and NPU based on processors' performance characteristics.
- Developed an inference engine for Snapdragon SoCs that schedules VFM inference based on scene dynamics, device motion, and GPU performance variations due to thermal throttling.
- Achieved sustained performance of 30 FPS with up to 72% improvement of prediction accuracy compared to baselines.

Panopticus   *2024*

Project Member

- Skills: Linux, PyTorch, LibTorch, TensorRT, CUDA
- Developed a BEV 3D object detection system featuring dynamic selection of optimal inference paths per camera view, deployed on Jetson edge GPUs.
- Acheived 2.1x speed up with up to 62% improvement of prediction accuracy compared to baselines.

Honors & Awards

2025	**Best Paper Award**, MobiSys 2025	*Anaheim, California, US*
2024	**Academic Prize**, Graduated with High Honors, Yonsei University	*Seoul, South Korea*
2023	**Grand Prize**, Software Capstone Design, Yonsei University	*Seoul, South Korea*
2023	**Academic Prize**, Honors, Yonsei University	*Seoul, South Korea*
2019	**Academic Prize**, Honors, Yonsei University	*Seoul, South Korea*
2019	**Academic Prize**, High Honors, Yonsei University	*Seoul, South Korea*
2018	**Academic Prize**, Highest Honors, Yonsei University	*Seoul, South Korea*

Publications

ARIA: Optimizing Vision Foundation Model Inference on Heterogeneous Mobile Processors for Augmented Reality   *MobiSys '25*

Chanyoung Jung*, Jeho Lee*, Gunjoong Kim, Jiwon Kim, Seonghoon Park, and Hojung Cha

- ACM Annual International Conference on Mobile Systems, Applications, and Services
- Awarded **Best Paper Award**

Panopticus: Omnidirectional 3D Object Detection on Resource-constrained Edge Devices   *MobiCom '24*

Jeho Lee, Chanyoung Jung, Jiwon Kim, and Hojung Cha

- ACM Annual International Conference on Mobile Computing and Networking