

## RESEARCH INTEREST

Computer architecture and systems, operating systems, memory systems, and machine learning for systems

## EDUCATION

Seoul National University (SNU)

Seoul, Republic of Korea

B.S. in Computer Science and Engineering

2021.03 - 2026.08 (expected)

- GPA: 4.16/4.30
- Including 18 months of mandatory military service at Republic of Korea Army (2024.07 - 2026.01).

## PUBLICATIONS

1. **Juneseo Chang**, Wanju Doh, Yaebin Moon, Eojin Lee, and Jung Ho Ahn, “IDT: Intelligent Data Placement for Multi-tiered Main Memory with Reinforcement Learning”, *International Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, 2024
2. **Juneseo Chang** and Daejin Park, “Searching Optimal Compiler Optimization Passes Sequence for Reducing Runtime Memory Profile using Ensemble Reinforcement Learning”, *International Conference on Embedded Software (EMSOFT) Work-in-Progress Track*, 2023
3. **Juneseo Chang**, Sejong Oh, and Daejin Park, “Accuracy-Area Efficient Online Fault Detection for Robust Neural Network Software-Embedded Microcontrollers”, *International Conference on Embedded Software (EMSOFT) Work-in-Progress Track*, 2022
4. **Juneseo Chang**, Myeongjin Kang, and Daejin Park, “Low-Power On-Chip Implementation of Enhanced SVM Algorithm for Sensors Fusion-Based Activity Classification in Lightweighted Edge Devices”, *Electronics*, 2022

## RESEARCH EXPERIENCE

Scalable Computer Architecture Lab, SNU

2023.01 - 2024.06

- Advisor: Jung Ho Ahn
- **First author** paper accepted to **HPDC 2024 (Acceptance rate: 17%)**, a top-tier system conference.
  - Proposed an **RL-based OS-level multi-tiered memory management** solution.
  - Designed an RL model that adjusts demotion policies at runtime with low overhead.
  - Developed an OS-level region-granularity memory access monitoring technique with statistical region reconfiguration.
  - Achieved a 2.08× speedup over the default Linux kernel and 11.2% performance improvement over the state-of-the-art solution.

AI-SoC Lab, Kyungpook National University

2019.03 - 2022.10

- Advisor: Daejin Park
- First author paper accepted to EMSOFT 2023 Work-in-Progress.
  - Proposed ensemble RL model for LLVM transform passes sequence optimization for runtime memory profile reduction.
  - Developed an LLVM IR analysis pass to extract static program features at compile time.
- First author paper accepted to EMSOFT 2022 Work-in-Progress.
  - Proposed data-analysis-based online soft errors and control flow errors detection model for deep learning applications.
  - Implemented LLVM IR-level data assertion code injection and a hybrid detection mechanism combining rule-based checks and a sliding-window SVM.

## RELEVANT COURSEWORK

Hardware System Design, Scalable High Performance Computing, Mobile Computing and Applications, Mathematical Foundations of Deep Neural Networks, Advanced Computer Architecture (Graduate), Advanced Compilers (Graduate), Data Communications, Abstract Algebra

## ACADEMIC PROJECTS

### Linux/Android Porting on ARM Cortex-A53 SoC

Spring 2024

*Coursework Project for SNU M1522.000300 (Creative Integrated Design 2)*

Ported mainline U-Boot bootloader, Linux kernel, and Android AOSP on custom ARM Cortex-A53 SoC. Supported custom peripherals and display panels by configuring device tree source files and kernel modules. Implemented Mobilenet v1 with GStreamer and NNStreamer.

### CNN Accelerator

Spring 2024

*Coursework Project for SNU 4190.309A (Hardware System Design)*

Implemented convolution module and compiler for a CNN accelerator using Amaranth. Optimized performance using zero-skipping 2D systolic array, quantization, and pruning for the convolution module.

### WalkGuard: Protecting Child Pedestrians from Distraction

Fall 2023

*Coursework Project for SNU 4190.406B (Mobile Computing and Its Applications)*

Developed an Android application for protecting child pedestrians from distractions. Designed and implemented deep learning models for outdoor activity detection with accelerometer, RSSI, and sound data. Optimized models with quantization, pruning, and neural architecture search. (<https://bit.ly/4hv7beG>)

### Accelerating Sequence-to-Sequence Machine Translation Model

Spring 2023

*Coursework Project for SNU M1522.006700 (Scalable High Performance Computing)*

Accelerated Sequence-to-Sequence machine translation model throughput on multiple NVIDIA GPUs using CUDA and MPI.

## SKILLS

**Programming:** C++, C, Python, Verilog, Java, PyTorch, TensorFlow, Bash, CUDA, RLLib, Amaranth, TFLite, Linux kernel, DAMON, LLVM

**Languages:** English (TOEFL 109/120), Korean

## SCHOLARSHIPS AND AWARDS

### Semiconductor Specialized University Scholarship, SNU

2024.03 - 2026.08

\$8,000 over three semesters.

### Presidential Science Scholarship, Korea Student Aid Foundation

2021.03 - 2026.08

Full tuition and stipend for eight semesters, total \$34,000.

### Hansung Scholarship, Hansung Son Jae Han Foundation

2019.03 - 2021.02

\$8,000 over two years.

### Alumni Association Award, Daegu Science High School

2021.02

Graduated with the highest honors.

## TALKS

1. "IDT: Intelligent Data Placement for Multi-tiered Main Memory with Reinforcement Learning", **Oral Presentation**, HPDC, Pisa, Italy, 2024
2. "Searching Optimal Compiler Optimization Passes Sequence for Reducing Runtime Memory Profile using Ensemble Reinforcement Learning", Short Talk (Work-in-Progress Track), EMSOFT, Hamburg, Germany, 2023
3. "Accuracy-Area Efficient Online Fault Detection for Robust Neural Network Software-Embedded Micro-controllers", Short Talk (Work-in-Progress Track), EMSOFT, Shanghai, China (Virtual), 2022

## MANDATORY MILITARY SERVICE

### Defense Communication Command, Republic of Korea Army

2024.07 - 2026.01

Operated the military microwave wireless communication system in an isolated post. Served as a squad leader and was awarded as an exemplary soldier of the command.