Gungyu Lee

📱 +82-10-6376-4219 | ✉ james98kr@kaist.ac.kr | 🔲 github.com/james98kr

Personal Profile

An undergraduate student at the Korea Advanced Institute of Science and Technology(KAIST), enrolled in the School of Electrical Engineering. Pursuing a career in the field of computer architecture, AI accelerators, digital circuit analysis, and full-stack processor design. Also interested in the field of computer vision, deep learning, and software development. Searching for a role as a hardware engineer or computer architect.

Education

Korea Advanced Institute of Science and Technology(KAIST)   *Daejeon, Republic of Korea*
B.S. in Electrical Engineering (3.76 GPA)   *Sep 2017 - Current*

- Minor in Computer Science
- **Courses:** Linear Algebra, Electronic Circuits, Digital Systems, Data Structure, Algorithms, Programming Languages, System Programming, Computer Organization, Probability and Statistics, Machine Learning, Big Data, Reinforcement Learning

Raha International School   *Abu Dhabi, United Arab Emirates*
IB Diploma   *Sep 2015 - May 2017*

- International Baccalaureate, Diploma Program - Final 42 Points
- High Level: Mathematics, Physics, Economics
- Standard Level: Chemistry, Language & Literature, Spanish ab initio

Work Experience

Samsung Electronics Co., System LSI Business, Advanced AP Development Team   *Hwaseong, Republic of Korea*
KAIST EE Co-op Internship   *Mar 2023 - Aug 2023*

- Conducted circuit development internship within the GPU hardware group of the Advanced AP Development Team.
- Studied computer graphics pipeline and GPU architecture for parallel computing, and implemented instruction prefetching for new waves on the GPU Architecture Model(AM).

Vertically Integrated Architecture Lab, KAIST   *Daejeon, KAIST*
Research Internship 🔲 📄   *Sep 2022 - Feb 2023*

- Under the supervision of professor Minsoo Rhu, conducted research in the field of convolutional neural network acceleration, primarily based on the paper *SCNN: An Accelerator for Compressed-sparse Convolutional Neural Networks*(Parashar et al.).
- Implementing a configurable SCNN cycle-level simulator using C++, following the microarchitecture described in the original paper.
- Paper study on AI accelerator and GPU architecture

Intelligent Network and Architecture Lab, KAIST   *Daejeon, KAIST*
Research Internship 🔲 📄   *Jul 2022 - Oct 2022*

- Under the supervision of Professor Dongsu Han, conducted research in the field of video super-resolution, primarily based on the paper *Efficient Video Compression via Content-Adaptive Super-Resolution*(Khani et al.).
- Fully implemented the model as described in the original paper using PyTorch, and performed various experiments for performance checking and hyperparameter tuning.

Samsung Electronics Co., Visual Display Business, Intelligent Solutions Lab   *Suwon, Republic of Korea*
Software Development Internship 🔲   *Jan 2022 - Feb 2022*

- Developed a TV Bixby Capsule (an application for the Bixby, the Samsung voice assistant) for delivering poll result statistics related to the Korean presidential election (candidate approval rating, etc.).
- Designed and implemented the basic structure and business logic of the capsule in JavaScript.
- Developed UI/UX for visual and oral interaction with the user, such as response to continual utterance. Also, trained the model with real example inputs with manual tagging procedure.

University Projects

CS492(A): SoftGroup for 3D Instance Segmentation on Point Clouds 🔲 📄   *Daejeon, Republic of Korea*
Korea Advanced Institute of Science and Technology   *Mar 2022 - Jun 2022*

- Course Project for CS492(A): Machine Learning for 3D Data
- Read and implemented the deep learning model introduced in the paper *SoftGroup for 3D Instance Segmentation on Point Clouds*(Vu et al.) using PyTorch, and reproduced experimental data as introduced in the original paper.

EE488: Reinforcement Learning Agent for SuperMarioBros using Stable Baseline 3

Daejeon, Republic of Korea

Korea Advanced Institute of Science and Technology

Mar 2022 - Jun 2022

- Course project for EE488: AI Capstone Design
- Using PyTorch-based reinforcement learning libraries such as Stable Baseline 3, implemented a RL agent that plays SuperMarioBros, based on models such as DQN and PPO.
- Performed training through tasks such as preprocessing of environment observations and policy neural network customizing with ResNets.

Single-Cycle, Multi-Cycle, Pipeline CPU Implementation & Simulation using Verilog

Daejeon, Republic of Korea

Korea Advanced Institute of Science and Technology

Mar 2020 - Jun 2020

- Course project for EE312: Introduction to Computer Architecture
- Throughout the course, I have implemented three 32-bit processors in Verilog - the single-cycle, multi-cycle, and pipeline CPU, each with its own microarchitecture, but all based on the RISC-V ISA.
- The processors were designed so that it supports basic instructions in machine language such as jump, store, move, arithmetic and logical operations within a limited number of clock cycles.

ButterflyD: Bipartite Graph Anomaly Detection using 4-node Clique Approximation

Daejeon, Republic of Korea

Data Mining Lab, KAIST Graduate School of AI

Dec 2019 - Jun 2020

- A data mining project under the supervision of Professor Kijung Shin, focused on anomaly detection in large-scale bipartite graphs within specific memory and time limitations.
- Devised algorithms for quickly approximating the number of 4-node cliques within the graph, and thus ensuring real-time detection of anomalous behavior in the graph.

Extracurricular Activities

Kyowon Co. AI Challenge

Seoul, Republic of Korea

1st Place Award

Dec 2022 - Feb 2023

- Participated as a team in the AI Challenge hosted by Kyowon Co. Ltd.
- Achieved 1st place by creating a lightweight but effective handwriting recognition deep learning model.

JUNCTION ASIA 2022 ⭘

Busan, Republic of Korea

Team *Chain Rule* of Track *Chainapsis*

Aug 2022

- Participated in the global hackathon JUNCTION ASIA 2022.
- Developed a simple blockchain-based platform for safe real estate transactions using Ignite CLI and Cosmos SDK.

2071 - Dreaming a World where Technology is Toward Humans 📄

Daejeon, Republic of Korea

KAIST CVC Chairman's Award

Sep 2021 - Oct 2021

- Participated in a competition for envisioning the future of KAIST and our society, and wrote an article about the impact of artificial intelligence, metaverse, and blockchain.
- Second place in the teams' category.

Teaching Assistant Experiences

Daejeon, Republic of Korea

Undergraduate Teaching Assistant Roles

Dec 2018 - Jun 2022

- Tutor for CS101: Introduction to Programming - *Mar 2022 - Jun 2022*
- Teaching assistant for 2019, 2020 Academic English Camp at KAIST - *Dec 2018, Dec 2019*

ICISTS (KAIST International Conference Organizing Committee)

Daejeon, Republic of Korea

Head of Global Partnership

Sep 2017 - Aug 2019

- Organize and operate the largest undergraduate conference in Asia, based on the theme of the integration of Science, Technology, and Society.
- Fundraise from KAIST, Microsoft, Amazon, IEEE, and Other Institutions.
- Mainly in charge of international promotion as well as participant management and general logistics of the event.

Skills

Programming Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), C/C++, Verilog, JavaScript, MySQL

Miscellaneous Linux, Shell (Bash/Zsh), LaTeX(Overleaf), Microsoft Office, Git

Languages

Korean Native fluency

English Bilingual fluency