SEONYOUNG KIM

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Education

Korea Advanced Institute of Science and Technology (KAIST) Sep. 2019 - Feb. 2022
Daejeon, South Korea
M.S. in Computer Science
- Thesis: Generating Small Anomaly Detection Models through Distillation of Long-Term Dependency.

Hongik University Mar. 2015 - Aug. 2019
Seoul, South Korea
B.S.E. in Computer Engineering
- GPA: 4.24/4.50 (Ranked 3rd out of 173 students)

Research Experience

SoC Architecture Team | Samsung Research Aug. 2022 - Present
AI Researcher
Advisor: Dr. Heonjae Ha
- Research on HW-SW Co-Design for AI, Model Compression, and On-Device AI
- Commercial Deployment of AI Models on Neural Processing Unit (NPU)
- NPU Model Validation

Database Lab | KAIST Sep. 2019 - Feb. 2022
Research Assistant
Advisor: Professor Myoungho Kim
- Model Compression
- Knowledge Distillation
- Time-Series Anomaly Detection

Research Lab for Distributed Intelligence and Autonomy | Hongik University Nov. 2018 - Aug. 2019
Undergraduate Research Assistant
Advisor: Professor Young Yoon
- Deep Learning
- Data Analysis

Publications

Under Review
- **Seonyoung Kim***, Jooeun Kim*, Hayoung Yun, Meejeong Park, Sangjeong Lee, Hanjoo Cho, and Heonjae Ha. "Bespoke LUT: Non-Linear Approximation for Integer-only Transformer Inference on NPUs." *Under review at IEEE Transactions on Emerging Topics in Computing (IEEE TETC)*, 2025. (* equal contribution)
- Youngcheon Yoo, Banseok Lee, Minseop Choi, **Seonyoung Kim**, Hyochan Chong, Changdong Kim, Youngmin Kim, and Dongkyu Kim. "RaBiT: Residual-Aware Binarization Training for Accurate and Efficient LLMs." *Under review at International Conference on Learning Representations (ICLR)*, 2025.

Thesis
- **Seonyoung Kim**. "Generating Small Anomaly Detection Models through Distillation of Long-Term Dependency." *Master's Thesis*, School of Computing, KAIST, 2022.

Published
- **Seonyoung Kim** and Myoungho Kim. "Knowledge Distillation for Anomaly Detection in Multivariate Time Series Data." *Korea Computer Congress (KCC)*, 2021.

Patent

- Youngcheon Yoo, Banseok Lee, Minseop Choi, **Seonyoung Kim**, Hyochan Chong, Changdong Kim, Dongkyu Kim, Youngmin Kim. "Residual-Aware Binarization Training Method." Patent Pending (KR Patent 10-2025-0133039), 2025.

Projects

1. **Efficient AI Deployment on NPUs | Samsung Research** Aug. 2022 – Present
   - Developing hardware-aware model compression techniques for LLMs, focusing on ultra-low-bit quantization and hw-sw co-design for AI.

2. **Edge Computing–Based Anomaly Detection in Memory Semiconductor Processes | KAIST** Sep. 2020 – Sep. 2021
   - Developed an autoencoder–LSTM model for life prediction of memory semiconductors.

3. **Chemical Mechanical Planarization (CMP) Wafer Defect Detection Project | KAIST** Dec. 2019 – Jun. 2020
   - Implemented a wafer defect detection system using vision models on CMP wafer surface images.

4. **Neouly Security Project | Hongik University** Dec. 2018 – Jun. 2019
   - Developed a malware detection system using DNNs, achieving 97.8% accuracy.

5. **AI-based Restaurant Recommendation System | Hongik University** Jan. 2018 – Nov. 2018
   - Built a restaurant recommendation system using Bi-LSTM with Word2Vec.

Talks and Presentations

Internal Seminar (Journal Club) | Samsung Research Feb. 2023 - Present
- Presented 8 papers on model compression and LLMs as part of a rotating paper review seminar.

Graduate Seminar | KAIST Jan. 2019 – May. 2021
- Presented 6 talks on recent research papers, advanced methods, and my own thesis work.

Honors and Scholarship

Outstanding Teaching Assistant Award | KAIST Jun. 2020
- Recognized as an Outstanding Teaching Assistant based on top-tier student evaluations.

The Hongik Scholarship | Hongik University Aug. 2015 - Sep. 2018
- Awarded $15,900 in total, covering approximately four semesters.

Korea Open Source Software Developers Hackathon | Korea IT Business Promotion Association Oct. 2016
- Contributed to the Linux perf open-source project and awarded 2nd place.

Teaching Assistant

Database System, Graduate Course | KAIST Mar. 2021 – Jun. 2021
System Programming, Undergraduate Course | KAIST Sep. 2020 – Dec. 2020
Data Structure, Undergraduate Course | KAIST Mar. 2020 - Jun. 2020

Extracurricular Activities

Vice President, Graduate Student Association | School of Computing, KAIST Mar. 2020 – Feb. 2021