DONGKWAN KIM

Curriculum Vitae

Seoul, Republic of Korea | dongkwan@yonsei.ac.kr | linkedin.com/in/mynameisdongkwan/ | https://dongkwan.kim

Education

Yonsei University — Seoul, Republic of Korea
Integrated M.S./Ph.D. in Electrical and Electronic Engineering — *March 2020 - Present*
- **Advisor**: Prof. Hanjun Kim

Yonsei University — Seoul, Republic of Korea
Bachelor of Engineering in Electrical and Electronic Engineering — *March 2014 - February 2020*

Experience

Compiler Research Laboratory (Corelab), Yonsei University — Seoul, Republic of Korea
Research Assistant — *March 2020 - Present*
- Designed and implemented compiler and runtime systems for machine learning and privacy-preserving computation, with a focus on optimization, scheduling, and end-to-end execution
- Developed sensor fault detection module for the Apollo autonomous driving platform to enhance system reliability

Compiler Research Laboratory (Corelab), Yonsei University — Seoul, Republic of Korea
Undergraduate Research Assistant — *January 2019 - February 2020*
- Developed a dynamic CPU/GPU job scheduler with temperature prediction and integrated multiscale object detection for performance validation

Recognitions

ASPLOS/EuroSys 2025 Contest Track
3rd Place Winner, Amazon Web Services — *April 2025*

The 30th Humantech Paper Awards
Silver Prize, Samsung Electronics Co., Ltd. — *February 2024*

ICT Challenge 2023
Minister Award (2nd Place), Ministry of Science and ICT — *September 2023*

Academic Excellence Award
High Honors, Yonsei University — *June 2019*

Publications

Selene: Cross-Level Barrier-Free Pipelining for Irregular Nested Loops in High-Level Synthesis
*Sungwoo Yun, Seonyoung Cheon, **Dongkwan Kim**, Heelim Choi, Kunmo Jeong, Chan Lee, Yongwoo Lee, and Hanjun Kim in Proceedings of the 2026 International Symposium on Code Generation and Optimization (CGO)* — *January 2026*

HALO: Loop-aware Bootstrapping Management for Fully Homomorphic Encryption
*Seonyoung Cheon, Yongwoo Lee, Hoyun Youm, **Dongkwan Kim**, Sungwoo Yun, Kunmo Jeong, Dongyoon Lee, and Hanjun Kim in Proceedings of the 30th ACM International Conference on Architectural Support for Programming Languages and Operating Systems 2025 (ASPLOS)* — *April 2025*

Privacy Set: Privacy Authority-Aware Compiler for Homomorphic Encryption on Edge-Cloud System
***Dongkwan Kim**, Yongwoo Lee, Seonyoung Cheon, Heelim Choi, Jaeho Lee, Hoyun Youm, Dongyoon Lee, and Hanjun Kim in IEEE Internet of Things Journal* — *August 2024*

DaCapo: Automatic Bootstrapping Management for Efficient Fully Homomorphic Encryption
*Seonyoung Cheon, Yongwoo Lee, **Dongkwan Kim**, Ju Min Lee, Sunchul Jung, Taekyung Kim, Dongyoon Lee, and Hanjun Kim in 33rd USENIX Security Symposium (USENIX Security)* — *August 2024*

Performance-aware Scale Analysis with Reserve for Homomorphic Encryption
*Yongwoo Lee, Seonyoung Cheon, **Dongkwan Kim**, Dongyoon Lee, and Hanjun Kim in Proceedings of the 29th ACM International Conference on Architectural Support for Programming Languages and Operating Systems 2024 (ASPLOS)* — *April 2024*

ELASM: Error-Latency-Aware Scale Management for Fully Homomorphic Encryption
*Yongwoo Lee, Seonyoung Cheon, **Dongkwan Kim**, Dongyoon Lee, and Hanjun Kim in 32nd USENIX Security Symposium (USENIX Security)* — *August 2023*

Activities

International Conference Organizing Assistant
Student Volunteer, coordinated remote presentations at The 58th IEEE/ACM International Symposium on Microarchitecture (MICRO) — *October 2025*

International Conference Organizing Assistant
Student Volunteer, supported the DrCCTProf Workshop at The 20th ACM/IEEE International Symposium on Code Generation and Optimization (CGO) — *April 2022*

Domestic Conference Organizing Assistant
Local Arrangements Assistant, KIISE Computer Systems Society Winter Workshop — *February 2021*

Teaching

EEE2020: Datastructures, Yonsei University — Seoul, Republic of Korea
Teaching Assistant — *March 2023 - June 2023*
- Led weekly lab sessions for Data structures programming assignments

EEE3540: Microprocessors, Yonsei University — Seoul, Republic of Korea
Teaching Assistant — *September 2022 - December 2022*
- Led weekly lab sessions for CS:APP-based programming assignments

ENG1108: Engineering Information Processing, Yonsei University — Seoul, Republic of Korea
Teaching Assistant — *September 2018 - December 2018*
- Led weekly lab sessions on C programming fundamentals

Patents

Method and Apparatus for Executing a High-Level Synthesis (HLS) Pipeline
*Hanjun Kim, Sungwoo Yun, Seonyoung Cheon, **Dongkwan Kim**, Heelim Choi, Kunmo Jeong, Chan Lee, and Yongwoo Lee*
KR Patent App. 10-2026-0035372. — *February 2026*

Electronic Apparatus for Controlling Placement of Bootstrapping Operations in Fully Homomorphic Encryption Based on Range Analysis, and Method Thereof
*Hanjun Kim, Hoyun Youm, Seonyoung Cheon, **Dongkwan Kim**, Sungwoo Yun, Chan Lee, Seongho Kim, and Yongwoo Lee*
KR Patent App. 10-2026-0024507. — *February 2026*

Method of Executing Kernel Using PIM Device and Method of Setting Kernel Execution Using PIM Device
*Hanjun Kim, Heelim Choi, Chan Lee, Ju Min Lee, Jaeho Lee, Yongwoo Lee, Sungwoo Yun, and **Dongkwan Kim***
KR Patent App. 10-2025-0180869. — *November 2025*

Bootstrapping Operation Based Homomorphic Encryption Iteration Optimization Method and System Thereof
*Hanjun Kim, Seonyoung Cheon, Yongwoo Lee, Hoyun Youm, **Dongkwan Kim**, Sungwoo Yun, and Kunmo Jeong*
KR Patent App. 10-2024-0177483. — *December 2024*

Electronic device for compiling and methods thereof background
*Hanjun Kim, Seonyoung Cheon, Yongwoo Lee, **Dongkwan Kim**, and Jumin Lee*
KR Patent App. 10-2024-0156997; US Patent App. 18/942,995. — *November 2024*

Method and Apparatus for Optimizing Performance of Homomorphic Encryption Program

Hanjun Kim, Yongwoo Lee, Seonyoung Cheon, and ***Dongkwan Kim*** *November 2024*

KR Patent App. 10-2024-0173719.

System and Method of Homomorphic Encryption Based on Scale Optimization

Hanjun Kim, Yongwoo Lee, Seonyoung Cheon, and ***Dongkwan Kim*** *January 2024*

KR Patent App. 10-2024-0008916.

Multiscale Object Detection Device and Method

Hanjun Kim, Seonyeong Heo, and ***Dongkwan Kim*** *March 2022*

KR Patent Number 10-2829715-0000; EPO Patent App. EP22216491.5;
JP Patent Number 7517733; US Patent Number US 12,524,987 B2.