

Se-Min Ryan Lim

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Professional Experience

Kookmin University

ASSISTANT PROFESSOR

Seoul, S.Korea

Sep. 2025 - Current

- Pioneering application-driven system architectures that sustain lasting performance improvement in the post-Moore's Law era through cross-layer optimization and heterogeneous computing innovations.

Semiconductor Research Corporation (SRC)

RESEARCH SCHOLAR

Irvine, CA, U.S.A

Jan. 2023 - Jun. 2025

- Implemented prototype CPU-FPGA heterogeneous systems with novel system architectural solutions for various applications, including clustering and bioinformatics.

University of California, Irvine

GRADUATE STUDENT RESEARCHER

Irvine, CA, U.S.A

Sep. 2020 - Jun. 2025

- Implemented prototype CPU-FPGA heterogeneous systems with novel system architectural solutions for various applications, including neural networks, cloud platforms, floating-point compression, and boolean satisfiability problem solver.

Korea University

VISITING RESEARCHER

Seoul, S.Korea

Nov. 2019 - Aug. 2020

- Implemented specialized neural networks for human activity recognition.

Korea University Research & Business Foundation

RESEARCHER

Seoul, S.Korea

Apr. 2019 - Oct. 2019

- Implemented FPGA-based end-to-end hardware accelerators for neural network inference.

Korea University

GRADUATE RESEARCH ASSISTANT

Seoul, S.Korea

Mar. 2017 - Feb. 2019

- Implemented efficient digital ALU logic.
- Implemented FPGA-based end-to-end hardware accelerators for neural network inference.
- Implemented specialized neural networks for human activity recognition.

Korea University

UNDERGRADUATE RESEARCH ASSISTANT

Seoul, S.Korea

Mar. 2015 - Feb. 2017

- Implemented special-purpose embedded systems and IoT devices.

Research Interests

“Application-driven, cross-layer system architectural innovations considering emerging accelerators and their real-world implementations”

System Architecture

Hardware Accelerators

Disaggregated Systems

Software-Hardware Co-Design

Memory or Storage-Centric Processing

Education

University of California, Irvine

DOCTOR OF PHILOSOPHY IN COMPUTER SCIENCE

Sep. 2020 - May. 2025

- Advisor: Prof. Sang-Woo Jun
- Committee: Prof. Sang-Woo Jun, Prof. Nikil Dutt, and Prof. Hyoukjun Kwon
- Thesis Title: Application-Driven Cross-Layer Optimizations for CPU-FPGA Heterogeneous Systems

Korea University

MASTER OF ENGINEERING IN ELECTRONICS ENGINEERING

Mar. 2017 - Feb. 2019

Korea University

BACHELOR OF ENGINEERING IN ELECTRONICS ENGINEERING

Mar. 2011 - Feb. 2017

Publications

- [1] Hunjune Choo, Sang-Woo Jun, and **Se-Min Lim**, "Sinister: An Appliance for Scalable Motif Discovery," *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, 2026. [Preparing submission]
- [2] Sion Lee, Sang-Woo Jun, and **Se-Min Lim**, "Jarvis: CPU-FPGA Heterogeneous Platform for Boolean Satisfiability Problem Solver," *International Conference on Field-Programmable Logic and Applications (FPL)*, 2026. [Preparing submission]
- [3] Seongyoung Kang, **Se-Min Lim**, and Sang-Woo Jun, "Lembas: An Appliance for Scalable Genome Alignment," *International Symposium on Computer Architecture (ISCA)*, 2026. [Under Review]
- [4] **Se-Min Lim**, Seongyoung Kang, and Sang-Woo Jun, "Bancroft: Genomics Acceleration Beyond On-Device Memory," *International Conference on Parallel Architecture and Compilation Techniques (PACT)*, 2025.
- [5] Gongjin Sun, Seongyoung Kang, Jane He, **Se-Min Lim**, and Sang-Woo Jun, "Labidus: RISC-V Overlay with Streaming Asynchronous Custom Instructions," *IEEE International Conference on Application-specific Systems, Architectures, and Processors (ASAP)*, 2025.
- [6] **Se-Min Lim**, "Application-Driven Cross-Layer Optimizations for CPU-FPGA Heterogeneous Systems," *PhD Dissertation*, University of California, Irvine, 2025.
- [7] **Se-Min Lim**, Esmerald Aliaj, and Sang-Woo Jun, "Durin: CPU-FPGA Heterogeneous Platform for Scalable Low-Dimensional Data Clustering," *IEEE International Conference on Big Data (BigData)*, 2024.
- [8] **Se-Min Lim**, Esmerald Aliaj, and Sang-Woo Jun, "Morbis: Platform-Adaptive Hardware Accelerator for Scalable Sequence Motif Discovery," *IEEE International Conference on e-Science (e-Science)*, 2024.
- [9] **Se-Min Lim** and Sang-Woo Jun, "FlexForge: Efficient Reconfigurable Cloud Acceleration via Peripheral Resource Disaggregation," *Design, Automation, and Test in Europe Conference (DATE)*, 2024.
- [10] **Se-Min Lim** and Sang-Woo Jun, "MobileNets Can Be Lossily Compressed: Neural Network Compression for Embedded Accelerators," *Electronics*, 2022.
- [11] **Se-Min Lim**, Jooyoung Park, and Hyeong-Cheol Oh, "Low-Cost Method for Recognizing Table Tennis Activity," *IEICE Transactions on Information and Systems*, 2019.
- [12] **Se-Min Lim**, "AI-Based Coaching Assistant System for Sports Practice," *Master's Thesis*, Korea University, 2018.
- [13] **Se-Min Lim**, Hyeong-Cheol Oh, Jaein Kim, Juwon Lee, and Jooyoung Park, "LSTM-Guided Coaching Assistant for Table Tennis Practice," *Sensors*, 2018.

Patents

- [1] Hyeong-Cheol Oh, **Se-Min Lim**, and Seongjin Choi, "Pipelined Squarer for Unsigned Integers of up to 16 Bits," KR101974779, filed Apr. 25, 2019.

Research Grant

- [1] **Co-Principal Investigator**, "Development of Advanced Technologies on SmartNICs" WINSTECHNET, 2025.12 - 2026.05.

Services

2025 **Session Chair** *PACT*
2025 **Reviewer** *Journal of Big Data*
2024 **External Review Committee** *USENIX ATC*
2022 **Reviewer** *IEEE Systems Journal*
2021 **Reviewer** *IEEE Systems Journal*

Talks

2026 **"Addressing the Data Movement Overhead in Genomic Accelerators"** *Computer System Society Conference*
2025 **"Addressing the Data Movement Overhead in Genomic Accelerators"** *Korea Software Congress*

Teaching Experience

Kookmin University

ASSISTANT PROFESSOR

Seoul, S.Korea
Sep. 2025 - Current

- Computer Architecture
- Practices in Software Convergence
- C++ Programming
- Software Project I

University of California, Irvine

TEACHING ASSISTANT

Irvine, CA, U.S.A
Sep. 2020 - Mar. 2025

- Principles of Operating System
- Computer Systems Architecture

Korea University

TEACHING ASSISTANT

Seoul, S.Korea
Mar. 2017 - Dec. 2018

- Computer Architecture, Digital System Laboratory
- Electronic Circuit II, Electric Circuits II, Signals and Systems I
- Introduction to Applied Mathematics, Discrete Mathematics
- Pre-Calculus, Calculus

Honors & Awards

2018 **Best Poster Award** *Korea Computer Congress (KCC)*
2016 **Best Research of Undergraduate Student Award** *Korea University*

Fellowships

University of California, Irvine

FELLOWSHIPS OF GRADUATE STUDENT RESEARCHER & TEACHING ASSISTANT

Sep. 2020 - Jun. 2025

Korea University

FELLOWSHIPS OF GRADUATE RESEARCH ASSISTANT & TEACHING ASSISTANT

Mar. 2017 - Feb. 2019

Korea Student Aid Foundaion

NATIONAL GRANT

Jun. 2015 - Dec. 2016

Korea University

SCHOLARSHIP FOR UNDERGRADUATE RESEARCH ASSISTANT

Sep. 2016

Korea University

SCHOLARSHIP OF KOREA UNIVERSITY ALUMNI ASSOCIATION

Dec. 2015

Skills

Programming Language Skills

- Bluespec, Verilog, VHDL, Bare-Metal
- C++, C, Python
- Linux, OpenCL, PyTorch, Keras, Tensorflow, CUDA, MATLAB, HTML

Software & Program Skills

- Xilinx Vivado, Xilinx Vitis, Intel Quartus Prime
- Kubernetes, Docker, Multisim
- Visual Studio, PyCharm, Jupyter, Spider

Languages

English

- Professional working proficiency

Korean

- Native proficiency