

# Seong Hoon Seo

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## CONTACT INFORMATION

Building 944, NPRC Center  
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## RESEARCH INTERESTS

Computer architecture and systems for high-performance computing and deep learning, hardware-software co-design, heterogeneous computing, sparsity

## EDUCATION

**Seoul National University** Mar. 2020 - Present  
*Ph.D. Candidate, Department of Computer Science and Engineering*

- Advisor: Prof. Jae W. Lee

**Seoul National University** Mar. 2015 - Feb. 2020  
*College of Liberal Studies*

- Bachelor of Science in Computer Science and Engineering
- Bachelor of Arts in Economics

**Daewon Foreign Language High School** Mar. 2012 - Feb. 2015

- Majored in English and Spanish

## PUBLICATIONS

**A 40nm 5.6TOPS/W 239GOPS/mm<sup>2</sup> Self-Attention Processor with Sign Random Projection-based Approximation**

Seong Hoon Seo\*, Soosung Kim\*, Sung Jun Jung, Sangwoo Kwon, Hyunseung Lee, and Jae W. Lee, The 48th IEEE European Solid-State Circuits Conference (**ESSCIRC**), September 2022.

**ELSA: Hardware-Software Co-design for Efficient, Lightweight Self-Attention Mechanism in Neural Networks**

Tae Jun Ham\*, Yejin Lee\*, Seong Hoon Seo, Soosung Kim, Hyunji Choi, Sung Jun Jung, and Jae W. Lee, The 48th ACM/IEEE International Symposium on Computer Architecture (**ISCA**), June 2021.

**Accelerating Genomic Data Analytics With Composable Hardware Acceleration Framework**

Tae Jun Ham, David Bruns-Smith, Brendan Sweeney, Yejin Lee, Seong Hoon Seo, U Gyeong Song, Young H. Oh, Krste Asanovic, Jae W. Lee, and Lisa Wu Wills, IEEE Micro, vol. 41, no. 3, pp. 42-49, 1 May-June 2021.

*Special Issue on Top Picks from the 2021 Computer Architecture Conferences*

**MERCI: Efficient Embedding Reduction on Commodity Hardware via Sub-Query Memoization**

Yejin Lee, Seong Hoon Seo, Hyunji Choi, Hyoung Uk Sul, Soosung Kim, Jae W. Lee, and Tae Jun Ham, The 26th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**), April 2021.

**Genesis: A Hardware Acceleration Framework for Genomic Data Analysis**

Tae Jun Ham, David Bruns-Smith, Brendan Sweeney, Yejin Lee, Seong Hoon Seo, U Gyeong Song, Young H. Oh, Krste Asanovic, Jae W. Lee, and Lisa Wu Wills, The 47th ACM/IEEE International Symposium on Computer Architecture (**ISCA**), June 2020.

\*denotes equal contributions

TEACHING  
EXPERIENCE

**Logic Design (Instructor: Prof. Jae W. Lee)**, Seoul National University Mar. - Jun. 2020  
*Teaching Assistant*

- Undergraduate course taught in English, including weekly lab sessions held by the TAs

COMMUNITY  
SERVICE

- **Student Volunteer**, International Symposium on Code Generation and Optimization 2022
- **Student Volunteer**, IEEE Micro Special Issue on Top Picks from the 2022 Computer Architecture Conferences

INTERNSHIPS

**Architecture and Code Optimization Lab** Jul. 2018 - Feb. 2020  
*Seoul National University*

- Jul.-Aug. 2018: Put together a framework for neural network computation that offloads neural network computation from host to PCIe-attached FPGA
- Jan.-Feb. 2019: Setup and experimented with FPGA-emulated NVIDIA Deep Learning Accelerator (NVDLA) and Versatile Tensor Accelerator (VTA)
- Jul.-Nov. 2019: Contributed to Genesis (accepted at ISCA'20)
- Dec.-Feb. 2020: Contributed to ELSA (accepted at ISCA'21)

**Machine Intelligence and Pattern Analysis Lab** Jan. 2018 - Feb. 2018  
*Seoul National University*

- Experimented with input resolution and preprocessing methods to better train KITTI Vision Benchmark images for 2D object detection

COMPUTER SKILLS

- **Languages:** Python, C/C++, Verilog, Chisel
- **Frameworks:** PyTorch, TensorFlow
- **Tools:** Git, Docker
- **Platforms:** Linux, AWS F1, GCP TPU, NVIDIA Jetson

LANGUAGE  
PROFICIENCY

Fluent in **English**, Intermediate in **Spanish**, and Native in **Korean**

- TEPS: 551/600  
*Seoul National University* Acquired: Feb. 2018
- Curso Intensivo II: B2  
*Centro Complutense para la Enseñanza del Español* Acquired: Jul. 2016
- TOEIC: 990/990  
*Educational Testing Service (ETS)* Acquired: Aug. 2015
- iBT TOEFL: 118/120  
*Educational Testing Service (ETS)* Acquired: Mar. 2013
- Diplomas de Español como Lengua Extranjera (DELE): B1  
*Instituto Cervantes* Acquired: Nov. 2012

Last Updated: July 5th, 2023