

# Yejin Lee

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EDUCATION	<b>Seoul National University</b> , Seoul, Republic of Korea <i>College of Engineering</i> M.S. /Ph.D. Student in Computer Science and Engineering Advisor: Professor Jae W. Lee Research Area: Hardware-Software Codesign for Emerging Applications <b>Sogang University</b> , Seoul, Republic of Korea <i>Department of Computer Science &amp; Engineering</i> Bachelor of Science in Computer Science and Engineering <i>Summa Cum Laude</i>	<b>Feb. 2018 - Present</b>       <b>Mar. 2014 - Feb. 2018</b>
PUBLICATIONS	<b>[ISCA '21] ELSA: Hardware-Software Co-design for Efficient, Lightweight Self-Attention Mechanism in Neural Networks</b> Tae Jun Ham*, <u>Yejin Lee</u> *, Seong Hoon Seo, Soosung Kim, Hyunji Choi, Sung Jun Jung, Jae W. Lee The 47th ACM/IEEE International Symposium on Computer Architecture (ISCA), 2021 Acceptance Rate : 76/406 $\approx$ 19% <ul style="list-style-type: none"><li>• *These authors contributed equally.</li><li>• ISCA Talk (Youtube): <a href="https://www.youtube.com/watch?v=JDH_HeTsECM">https://www.youtube.com/watch?v=JDH_HeTsECM</a></li></ul> <b>[IEEE Micro] Accelerating Genomic Data Analytics with Composable Hardware Acceleration Framework</b> Tae Jun Ham, David Bruns-Smith, Brendan Sweeney, <u>Yejin Lee</u> , Seong Hoon Seo, U Gyeong Song, Young H. Oh, Krste Asanovic, Jae W. Lee, Lisa Wu IEEE Micro, May/June 2021 Special Issue on Top Picks from the 2020 Computer Architecture Conferences <b>[ASPLOS '21] MERCI: Efficient Embedding Reduction on Commodity Hardware via Sub-Query Memoization</b> <u>Yejin Lee</u> , Seong Hoon Seo, Hyunji Choi, Hyoung Uk Sul, Soosung Kim, Jae W. Lee, Tae Jun Ham The 26th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2021 Acceptance rate: 75/398 $\approx$ 19% <ul style="list-style-type: none"><li>• ASPLOS Talk (Youtube): <a href="https://www.youtube.com/watch?v=5xRIuoPU60M">https://www.youtube.com/watch?v=5xRIuoPU60M</a></li><li>• Open-source: <a href="https://github.com/SNU-ARC/MERCI">https://github.com/SNU-ARC/MERCI</a></li></ul> <i>Invited for presentation at PeRSONAl workshop @ MLSys</i> <b>[ISCA '20] Genesis: A Hardware Acceleration Framework for Genomic Data Analysis</b> Tae Jun Ham, David Bruns-Smith, Brendan Sweeney, <u>Yejin Lee</u> , Seong Hoon Seo, U Gyeong Song, Young H. Oh, Krste Asanovic, Jae W. Lee, Lisa Wu The 47th ACM/IEEE International Symposium on Computer Architecture (ISCA), 2020 Acceptance Rate : 77/428 $\approx$ 18% <ul style="list-style-type: none"><li>• IEEE Micro Top Picks</li></ul> <b>[ASPLOS '20] IIU: Specialized Architecture for Inverted Index Search</b> Jun Heo, Jaeyeon Won, <u>Yejin Lee</u> , Shivam Bharuka, Jaeyoung Jang, Tae Jun Ham, Jae W. Lee The 25th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2020 Acceptance Rate : 86/476 $\approx$ 18% <b>[MICRO '19] Charon: Specialized Near-Memory Processing Architecture for Clearing Dead Objects in Memory</b>	

Jaeyoung Jang, Jun Heo, Yejin Lee, Jaeyeon Won, Seonghak Kim, Sung Jun Jung, Hakbeom Jang, Tae Jun Ham, Jae W. Lee

The 52nd *IEEE/ACM International Symposium on Microarchitecture (MICRO)*, 2019

Acceptance Rate : 79/343  $\approx$  23%

**[ITC-CSCC '19] Performance Analysis of Convolutional Neural Networks on Manycore Platforms**

Jaeyoung Jang, Yejin Lee, Jae W. Lee

The 34th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC), 2019

**[KCC '18] Trends in HW and SW based Memory Management for High-Performance Data Analysis**

Yejin Lee, Jun Heo, Jaeyoung Jang, Jae W. Lee

Communications of the Korean Institute of Information Scientists and Engineers 36(10), 45-54(10 pages), Korea Information Science Society

**[KCC '17] The development of a spoken lecture summary Application Software using TextRank on Android platform**

HeeWoong Jang, Yong June Kim, Yejin Lee, Myoung-Wan Koo

Communications of the Korean Institute of Information Scientists and Engineers 44(02), 1783-1785(3 pages), Korea Information Science Society

HONORS AND  
AWARDS

- **Google PhD Fellowship Recipient (2021)** - Recipient of Google PhD Fellowship Program that recognize and support outstanding PhD candidates who are doing exceptional and innovative research in computer science
- **IEEE MICRO Top Picks (2021)** - One of my research work is selected as Top 12 computer architecture articles published in 2020  
Accelerating Genomic Data Analytics with Composible Hardware Acceleration Framework (ISCA 2020)
- **Summa Cum Laude, Sogang university (2018)**
- **Academic Achievement Scholarship, Sogang university (2016, 2017)**

SKILLS

- **Languages:** Python, C, C++, Chisel, JavaScript, SQL, JAVA
- **Frameworks:** TensorFlow/Keras, Pytorch
- **Tools:** Docker, GIT, PostgreSQL, MySQL, SQLite
- **Platforms:** Linux, Windows, AWS, Google Cloud, GPU, TPU

TALKS

- **PeRSONAl workshop @ MLSys - Virtual** (April 2021)  
MERCI: Efficient Embedding Reduction on Commodity Hardware via Sub-Query Memoization
- **SNU Artificial Intelligence Institute Workshop - Seoul, South Korea** (April 2021)  
MERCI: Efficient Embedding Reduction on Commodity Hardware via Sub-Query Memoization

PATENTS

- **Hardware Accelerator Performing Search using Inverted Index Structure and Search System Including the Hardware Accelerator (Pending - Application No. 17/118.085)**  
with Jae W. Lee, Jun Heo, Jaeyeon Won, Tae Jun Ham
- **Garbage Collection Device having Subunit and Memory System having the Same (Pending - Application No. 1020200125740)**  
with Jae W. Lee, Jaeyoung Jang, Jun Heo

SERVICES

- **Student Volunteer**, International Symposium on Code Generation and Optimization (CGO 2021)

OPEN-SOURCE

- **MERCI**, <https://github.com/SNU-ARC/MERCI>

TEACHING  
EXPERIENCE

**Computer Architecture Course (Instructor: Prof. Jae W. Lee)**, Seoul National University

*Teaching Assistant*

**Sep - Dec, 2018**

**Course Summary:** Learning computer architecture including ISA, CPU, Pipeline, Memory hierarchy, I/O devices.

**Hardware System Design (Instructor: Prof. Jae W. Lee)**, Seoul National University

*Teaching Assistant*

**Mar - Jun, 2018**

**Course Summary:** Learning the basic concepts of hardware system design and practicing how to implement hardware systems using Verilog by weekly practice labs.

**Basic Engineering Design (Instructor: Prof. Myungwhan Choi),** Sogang University

*Undergraduate Mentor*

**Mar - Jun, 2017**

**Course Summary:** Learning the basic concepts and grammar of C language and fostering the ability to develop and design algorithm through weekly programming practices.

**C programming (Instructor: Prof. Ji-Hwan Kim),** Sogang University

*Undergraduate Mentor*

**Sep - Dec, 2016**

**Course Summary:** Learning the advanced concepts and grammar of C language and fostering the ability to develop and design algorithm through weekly programming practices.

**Computational Thinking (Instructor: Prof. Jungyun Seo),** Sogang University

*Undergraduate Mentor*

**Mar - Jun, 2016**

**Course Summary:** Learning C++ and Python and problem solving skills with computational thinking by solving various kinds of problems.

RELEVANT  
COURSEWORKS

Basic/Advanced Computer Architecture

Embedded Computer Architecture

Operating Systems

Database Systems

Computer Networks

Digital System Design

Programming Languages

Basic/Advanced Compiler

Artificial Intelligence

Artificial Neural Network

Data Mining

Recommender Systems

Speech Recognition