

IPOOM JEONG | RESUME

- **Status:** Assistant Professor at Yonsei University
- **Interests:** High-Performance and Energy-Efficient CPU/GPU Microarchitectures and Memory/Storage System Designs
- **Profile:** Accomplished and highly self-motivated Ph.D. with 10+ years of experience in computer system engineering. Rich experience in the design and verification of computer systems.
- **Website:** <https://ipoom-jeong.com/>



»»» Experience

- | | | |
|--|---|--|
| 2024.03 - Present | Assistant Professor | Yonsei University, Korea |
| <ul style="list-style-type: none">➤ Department of System Semiconductor Engineering➤ School of Electrical and Electronic Engineering | | |
| 2022.09 - 2024.02 | Postdoctoral Research Associate | University of Illinois Urbana-Champaign, USA |
| <ul style="list-style-type: none">➤ Coordinated Science Lab (CSL)➤ Principal Investigator (PI): Professor Nam Sung Kim➤ Architectural Optimizations for Datacenters, CXL-Based Device Architectures, Smart-I/O Devices (SmartSSD, SmartNIC, etc.) | | |
| 2021.09 - 2022.08 | Research Professor | Yonsei University, Korea |
| <ul style="list-style-type: none">➤ BK21 Y-BASE R&E Institute, Department of Electrical and Electronic Engineering➤ Energy-Efficient CPU/GPU Microarchitectures, Processing-in-Memory (PIM) Architectures | | |
| 2020.03 - 2021.08 | Engineer/Staff Engineer | Samsung Electronics, Korea |
| <ul style="list-style-type: none">➤ Advanced Solution Development Team, Memory Business➤ CXL-Based Accelerator/Memory Expansion Device, SmartSSD 2.0 (Computational Storage Drive) SoC Architecture | | |
| 2014.03 - 2020.02 | Graduate Research Assistant | Yonsei University, Korea |
| <ul style="list-style-type: none">➤ Embedded Systems and Computer Architecture Lab (eSCaL)➤ Advisor: Professor Won Woo Ro➤ Energy-Efficient CPU/GPU Microarchitectures, Multi-Core Architectures | | |
| 2014.03 - 2020.02 | Teaching Assistant | Yonsei University, Korea |
| <ul style="list-style-type: none">➤ Undergraduate courses: Computer Architecture (EEE3530, 14-1st, 16-1st), Electrical and Electronic Engineering Experiments: Fundamentals (EEE2111, 14-2nd, 15-2nd), Graduation Research (15-1st)➤ Graduate courses: Advanced Computer Architecture (E6501, 17-1st), System Design and Applications Lab (EEE6611, 18-1st, 18-2nd) | | |
| 2013.08 - 2014.02 | Undergraduate Research Assistant | Yonsei University, Korea |
| <ul style="list-style-type: none">➤ Embedded Systems and Computer Architecture Lab (eSCaL)➤ Advisor: Professor Won Woo Ro➤ Thesis: Exploiting Back-end Fusion in Multi-Core Processors | | |

»»» Education

2014.03 - 2020.02	Doctor of Philosophy	Yonsei University, Korea
<ul style="list-style-type: none">» Department of Electrical and Electronic Engineering» Dissertation: Energy-Efficient Instruction Scheduling Mechanisms for Out-of-Order Superscalar Processors		
2010.03 - 2014.02	Bachelor's Degree	Yonsei University, Korea
<ul style="list-style-type: none">» School of Electrical and Electronic Engineering» Graduation thesis: Exploiting Back-end Fusion in Multi-Core Processors		

»» Scholarships and Awards

2021.11	Encouragement Prize at the Outstanding Patent Award	SK Hynix
<ul style="list-style-type: none">» Memory Device Including a Plurality of Area Having Different Refresh Periods, Memory Controller Controlling the Same and Memory System Including the Same» US patent, Registered in 2022.03.15 (Application No.: 16/988478, Registration No.: 11276452)		
2020.02	Bronze Prize at the 26th Samsung Humantech Paper Award	Samsung Electronics
<ul style="list-style-type: none">» Ipoom Jeong, Seihoon Park» CASINO Core Microarchitecture: Generating Out-of-Order Schedules Using Cascaded In-Order Scheduling Windows		
2019.11	Excellent Graduate Researcher Scholarship	Yonsei University
2018.02	Encouragement Prize at the 24th Samsung Humantech Paper Award	Samsung Electronics
<ul style="list-style-type: none">» Ipoom Jeong, Changmin Lee» Cg-CMT: Expanding Instruction Window via Coarse-Grained Instruction Commit		
2010.03 - 2014.02	National Scholarship for Science and Engineering	KOSAF

»» Publications

		<i>Corresponding author(s)*</i>
2025.07	Time Series Machine Learning Models for Precise SSD Access Latency Prediction	International Journal
<ul style="list-style-type: none">» Bikrant Das Sharma, Houxiang Ji, Ipoom Jeong*, Nam Sung Kim» IEEE Computer Architecture Letters (CAL, IF: 2.3, Q3, JCR2022)		
2025.07	DART: Dynamic Resource-Aware Tiling for Multi-PIM Architectures	International Conference
<ul style="list-style-type: none">» Taeyoun Kim, Sungbin Kim, Seunghyun Lee, Ipoom Jeong, Won Woo Ro» IEIE International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC)		
2025.06	A4: Microarchitecture-Aware LLC Management for Datacenter Servers with Emerging I/O Devices	International Conference
<ul style="list-style-type: none">» Haneul Park, Jiaqi Lou, Sangjin Lee, Yifan Yuan, KyoungSoo Park, Yongseok Son, Ipoom Jeong*, Nam Sung Kim» IEEE/ACM International Symposium on Computer Architecture (ISCA, NRF BK21+ IF: 4)		
2025.06	UPP: Universal Predicate Pushdown to Smart Storage	International Conference

-
- » **Ipoom Jeong**, Jinghan Huang, Chuxuan Hu, Dohyun Park, Jaeyoung Kang, Nam Sung Kim, Yongjoo Park
» IEEE/ACM International Symposium on Computer Architecture (**ISCA**, **NRF BK21+ IF: 4**)

2025.05 **Intel® In-Memory Analytics Accelerator: Performance Characterization and Guidelines** [International Conference](#)

-
- » Jaeyoung Kang, Qirong Xia, **Ipoom Jeong**^{*}, Yongjoo Park, Nam Sung Kim
» IEEE International Symposium on Performance Analysis of Systems and Software (**ISPASS 2025**, **IF: 1**, **NRF BK21+**)

2025.03 **Marching Page Walks: Batching and Concurrent Page Table Walks for Enhancing GPU Throughput** [International Conference](#)

-
- » Jiwon Lee, Gun Ko, Myung Kuk Yoon, **Ipoom Jeong**, Yunho Oh, Won Woo Ro
» IEEE International Symposium on High-Performance Computer Architecture (**HPCA**, **NRF BK21+ IF: 4**)

2025.03 **Warped-Compaction: Maximizing GPU Register File Bandwidth Utilization via Operand Compaction** [International Conference](#)

-
- » Eunbi Jeong, **Ipoom Jeong**^{*}, Myung Kuk Yoon^{*}, Nam Sung Kim
» IEEE International Symposium on High-Performance Computer Architecture (**HPCA**, **NRF BK21+ IF: 4**)

2024.11 **Demystifying a CXL Type-2 Device: A Heterogeneous Cooperative Computing Perspective** [International Conference](#)

-
- » Houxiang Ji, Srikar Vanavasam, Yifan Yuan, Qirong Xia, Yang Zhou, Jinghan Huang, Yan Sun, Ren Wang, Pekon Gupta, Bhushan Chitlur, **Ipoom Jeong**, Nam Sung Kim
» IEEE/ACM International Symposium on Microarchitecture (**MICRO**, **NRF BK21+ IF: 4**)

2024.06 **Intel Accelerators Ecosystem: An SoC-Oriented Perspective** [International Conference](#)

-
- » Yifan Yuan, Ren Wang, Narayan Ranganathan, Nikhil Rao, Sanjay Kumar, Philip Lantz, Vivekananthan Sanjeevan, Jorge Cabrera, Atul Kwatra, Rajesh Sankaran, **Ipoom Jeong**, Nam Sung Kim
» IEEE/ACM International Symposium on Computer Architecture (**ISCA**, **NRF BK21+ IF: 4**)

2024.06 **HAL: Hardware-assisted Load Balancing for Energy-efficient SNIC-Host Cooperative Computing** [International Conference](#)

-
- » Jinghan Huang, Jiaqi Lou, Srikar Vanavasam, Xinhao Kong, Houxiang Ji, **Ipoom Jeong**, Eun Kyung Lee, Danyang Zhuo, Nam Sung Kim
» IEEE/ACM International Symposium on Computer Architecture (**ISCA**, **NRF BK21+ IF: 4**)

2024.06 **Triple-A: Early Operand Collector Allocation for Maximizing GPU Register Bank Utilization** [International Journal](#)

-
- » **Ipoom Jeong**, Eunbi Jeong, Nam Sung Kim, Myung Kuk Yoon
» IEEE Embedded Systems Letters (**ESL**, **IF: 1.6**, **Q3**, **JCR2022**)

2024.04 **TAROT: A CXL SmartNIC-Based Defense Against Multi-bit Errors by Row Hammer Attacks** [International Conference](#)

-
- » Chihun Song, Michael Jaemin Kim, Tianchen Wang, Houxiang Ji, Jinghan Huang, **Ipoom Jeong**, Jaehyun Park, Hwayong Nam, Minbok Wi, Jung Ho Ahn, Nam Sung Kim
» ACM International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS**, **NRF BK21+ IF: 4**)

2024.04 **A Quantitative Analysis and Guidelines of Data Streaming Accelerator in Modern Intel Xeon Scalable Processors** [International Conference](#)

- › Reese Kuper, **Ipoom Jeong**, Yifan Yuan, Ren Wang, Narayan Ranganathan, Nikhil Rao, Jiayu Hu, Sanjay Kumar, Philip Lantz, Nam Sung Kim
- › ACM International Conference on Architectural Support for Programming Languages and Operating Systems (**ASPLOS, NRF BK21+ IF: 4**)

2024.04 **ScaleCache: A Scalable Page Cache for Multiple Solid-State Drives** [International Conference](#)

- › Pham Tuan Kiet, Seokju Cho, Sang Jin Lee, Lan Anh Nguyen, Hyeonggi Yeo, **Ipoom Jeong**, Sungjin Lee, Nam Sung Kim, Yongseok Son
- › ACM SIGOPS European Conference on Computer Systems (**EuroSys, NRF BK21+ IF: 2**)

2024.01 **A Multi-DNN Acceleration Architecture for Balanced QoS and Throughput** [International Conference](#)

- › **Ipoom Jeong**, Sungji Choi, Minjae Kim, Enhyeok Jang, Seokjin Go, Won Woo Ro
- › The 16th International Conference on Electronics, Information, and Communication (**ICEIC**)

2023.11 **A Convertible Neural Processor Supporting Adaptive Quantization for Real-Time Neural Networks** [International Journal](#)

- › Hongju Kal, Hyoseong Choi, **Ipoom Jeong**, Junsung Yang, Won Woo Ro
- › Journal of Systems Architecture (**JSA, IF: 4.5, Q1, JCR2022**)

2023.10 **Demystifying CXL Memory with Genuine CXL-Ready Systems and Devices** [International Conference](#)

- › Yan Sun, Yifan Yuan, Zeduo Yu, Reese Kuper, Chihun Song, Jinghan Huang, Houxiang Ji, Siddharth Agarwal, Jiaqi Lou, **Ipoom Jeong**, Ren Wang, Jung Ho Ahn, Tianyin Xu, Nam Sung Kim
- › The 56th IEEE/ACM International Symposium on Microarchitecture (**MICRO, NRF BK21+ IF: 4**)

2023.10 **INTERPRET: Inter-Warp Register Reuse for GPU Tensor Core** [International Conference](#)

- › Jae Seok Kwak, Myung Kuk Yoon, **Ipoom Jeong**, Seunghyun Jin, Won Woo Ro
- › The 32nd ACM International Conference on Parallel Architectures and Compilation Techniques (**PACT, NRF BK21+ IF: 3**)

2023.07 **LADIO: Leakage-Aware Direct I/O for I/O-Intensive Workloads** [International Journal](#)

- › **Ipoom Jeong**, Jiaqi Lou, Yongseok Son, Yongjoo Park, Yifan Yuan, Nam Sung Kim
- › IEEE Computer Architecture Letters, Vol. 22, Issue 2, pp. 77 - 80, Jul. 2023 (**CAL, IF: 2.3, Q3, JCR2022**)

2022.12 **CASH-RF: A Compiler-Assisted Hierarchical Register File in GPUs** [International Journal](#)

- › Yunho Oh, **Ipoom Jeong**, Won Woo Ro, Myung Kuk Yoon
- › IEEE Embedded Systems Letters, Vol. 14, pp. 187 - 190, Dec. 2022 (**ESL, IF: 1.6, Q3, JCR2022**)

2022.10 **Reconstructing Out-of-Order Issue Queue** [International Conference](#)

- › **Ipoom Jeong**, Jiwon Lee, Myung Kuk Yoon, Won Woo Ro
- › The 55th IEEE/ACM International Symposium on Microarchitecture (**MICRO, NRF BK21+ IF: 4**)

2022.08 **TEA-RC: Thread Context-Aware Register Cache for GPUs** [International Journal](#)

- › **Ipoom Jeong**, Yunho Oh, Won Woo Ro, Myung Kuk Yoon
- › IEEE Access, Vol. 10, pp. 82049 - 82062, Aug. 2022 (**ACCESS, IF: 3.9, Q2, JCR2022**)

2020.02 **CASINO Core Microarchitecture: Generating Out-of-Order Schedules Using Cascaded In-Order Scheduling Windows** [International Conference](#)

- › **Ipoom Jeong**, Seihoon Park, Changmin Lee, Won Woo Ro
- › The 26th IEEE International Symposium on High Performance Computer Architecture (**HPCA, NRF BK21+ IF: 4**)

2019.12	OverCome: Coarse-Grained Instruction Commit with Handover Register Renaming	International Journal
<ul style="list-style-type: none"> » Ipoom Jeong, Changmin Lee, Keunsoo Kim, Won Woo Ro » IEEE Transactions on Computers, Vol. 68, Issue 12, pp. 1802-1816, Dec. 2019 (TC, IF: 3.131, Q1, JCR2018) 		
2018.06	Constructing Resilient Region in Dynamic Optimization Systems via Dynamic Adjustment of Bias Thresholds	International Conference
<ul style="list-style-type: none"> » Ipoom Jeong, Won Woo Ro » The 3rd IEEE International Conference On Consumer Electronics Asia (ICCE-ASIA) 		
2017.11	Parallel In-Order Execution Architecture for Low-Power Processor	International Conference
<ul style="list-style-type: none"> » Kyungmin Lee, Ipoom Jeong, Won Woo Ro » The 14th International SoC Design Conference (ISOCC) 		
2017.01	Dynamic Warp Scheduler Selection Policy Using Linear Regression for GPUs	International Conference
<ul style="list-style-type: none"> » Hyunjun Shin, Kyungmin Lee, Ipoom Jeong, Jong Hyun Park, Won Woo Ro » The 16th International Conference on Electronics, Information, and Communication (ICEIC) 		
2016.06	Analyzing Development Trends and Performance/Power Characteristics of Multi-Core Processors	Domestic Conference
<ul style="list-style-type: none"> » Ipoom Jeong, Won Woo Ro » 2016 Annual Summer Conference of IEIE 		
2016.06	Heterogeneous Single Core with Functional Unit Gating for High Energy-Efficiency	Domestic Conference
<ul style="list-style-type: none"> » Yoonsoo Kim, Ipoom Jeong, Won Woo Ro » 2016 Annual Summer Conference of IEIE 		
2014.11	Exploiting Back-End Fusion in Multi-Core Processors	Domestic Conference
<ul style="list-style-type: none"> » Jonghyun Park, Ipoom Jeong, Won Woo Ro » 2014 Annual Fall Conference of KIPS 		

»»» Patents

2025.03	Smart Storage Device Using a Compute Express Link (CXL) Interface	Int'l/Dom Patent
<ul style="list-style-type: none"> » Hyeokjun Choe, Younho Jeon, Younggeon Yoo, Hyodeok Shin, Ipoom Jeong » US: Registered in 2025.03.25 (Application No.: 17/403,862, Patent No.: 12,259,817) » KR: Applied in 2021.01.20 (Application No.: 10-2021-0007897) 		
2024.11	Neural Network Processing Method	Domestic Patent
<ul style="list-style-type: none"> » Won Woo Ro, Hongju Kal, Cheonjun Park, Hyunwuk Lee, Ipoom Jeong, Jiwon Lee » KR: Registered in 2024.11.13 (Application No.: 10-2022-0041848, Registration No.: 10-2731690) 		
2024.05	System, device and method for accessing device-attached memory	Int'l/Dom Patent

- › Jeongho Lee, Heehyun Nam, Jaeho Shin, Hyodeok Shin, Younggeon Yoo, Younho Jeon, Wonseob Jeong, **Ipoom Jeong**, Hyeokjun Choe
- › US: **Registered in 2024.05.14** (Application No.: 18/166,244, Patent No.: 11,983,115)
- › EP: Applied in 2021.07.22 (Application No.: 21187164.5)
- › CN: Applied in 2021.07.14 (Application No.: 202110796960.3)
- › KR: Applied in 2020.10.15 (Application No.: 10-2020-0133743)

2024.02 **Storage system and method to perform workload associated with a host**

[Int'l/Dom Patent](#)

- › Wonseob Jeong, Hee Hyun Nam, Younggeon Yoo, Jeongho Lee, Younho Jeon, **Ipoom Jeong**, Chanho Yoon
- › US: **Registered in 2024.02.13** (Application No.: 17/742,184, Patent No.: 11,899,970)
- › CN: Applied in 2022.06.20 (Application No.: 202210699555.4)
- › KR: Applied in 2021.09.29 (Application No.: 10-2021-0128940)

2024.05 **System, device and method for indirect addressing**

[Int'l/Dom Patent](#)

- › Jeongho Lee, **Ipoom Jeong**, Younggeon Yoo, Younho Jeon
- › US: **Registered in 2023.11.07** (Application No.: 17/378,354, Patent No.: 11,809,341)
- › EP: Applied in 2021.07.23 (Application No.: 21187355.9)
- › CN: Applied in 2021.07.14 (Application No.: 202110795792.6)
- › KR: Applied in 2020.10.14 (Application No.: 10-2020-0132978)

2023.08 **Memory device including direct memory access engine, system including the memory device, and method of operating the memory device**

[Int'l/Dom Patent](#)

- › Heehyun Nam, Jeongho Lee, Wonseob Jeong, **Ipoom Jeong**, Hyeokjun Choe
- › US: **Registered in 2023.08.29** (Application No.: 17/368,981, Patent No.: 11,741,034)
- › CN: Applied in 2021.07.22 (Application No.: 202110832714.9)
- › DE: Applied in 2021.07.08 (Application No.: 10 2021 117 636.0)
- › KR: Applied in 2020.11.06 (Application No.: 10-2020-0148133)

2022.12 **Memory Management Unit and Method of Walking Page Table**

[Int'l/Dom Patent](#)

- › Jiwon Lee, Won Woo Ro, **Ipoom Jeong**, Hongju Kal, Gun Ko, Hyunwuk Lee
- › US: Applied in 2023.11.05 (Application No.: 18/502,058)
- › CN: Applied in 2023.12.12 (Application No.: 202311700848.0)
- › KR: Applied in 2022.12.15 (Application No.: 10-2022-0175909)

2022.03 **Memory device including a plurality of area having different refresh periods, memory controller controlling the same and memory system including the same**

[Int'l/Dom Patent](#)

- › Won Woo Ro, Hyunwuk Lee, Gun Ko, **Ipoom Jeong**, Minseong Kim, Yongtag Song, Sungjae Lee
- › US: **Registered in 2022.03.15** (Application No.: 16/988,478, Patent No.: 11,276,452)
- › CN: **Registered in 2024.03.26** (Application No.: 202010879009.X, Patent No.: ZL 2020 11090146.1)
- › KR: Applied in 2020.04.14 (Application No.: 10-2020-0045023)

2021.08 **Apparatus and Method for Managing Physical Register File of High-Performance Out-of-Order Superscalar Cores**

[Domestic Patent](#)

- › Won Woo Ro, **Ipoom Jeong**
- › KR: **Registered in 2021.08.17** (Application No.: 10-2020-0033669, Registration No.: 10-2292580)

2020.10 **Apparatus and Method for Managing Reorder Buffer of High-Performance Out-of-Order Superscalar Cores**

Domestic Patent

- » Won Woo Ro, **Ipoom Jeong**
- » KR: **Registered in 2020.10.22** (Application No.: 10-2019-0146601, Registration No.: 10-2170966)

»» Projects

2024.04 - 2026.12 **Development of CXL-based PNM Architecture and Simulation Platform for LLM Acceleration**

- » Korea Evaluation Institute of Industrial Technology (KEIT)
- » Developing CXL-based PNM architecture and simulation platform

2024.04 - 2025.12 **Development of PIM Software Architecture based on Data-Flow Computing**

- » Institute for Information & communication Technology Planning & evaluation (IITP)
- » Developing software architecture for data-flow-based PIM devices

2020.09 - 2021.08 **SmartSSD 2.0: Developing Next-Generation Computational Storage Drive**

- » Research and development project at Samsung Electronics
- » Designing an SoC (System-on-Chip) for next-generation CSDs (Computational Storage Drives), A prototype was announced in Flash Memory Summit (FMS) 2022

2020.03 - 2020.08 **Developing CXL-Based Accelerator and Memory Expansion Device**

- » Research and development project at Samsung Electronics
- » Developing CXL (Compute eXpress Link) Type 2 accelerator and Type 3 memory expansion device by leveraging NAND flash

2019.02 - 2020.02 **Developing CPU-GPU Heterogeneous Computing Simulation Framework**

- » Research project at Yonsei University joint with SK Hynix
- » Developing a simulation framework for CPU-GPU heterogeneous computing that supports processing of the state-of-the-art deep learning algorithms

2018.07 - 2019.06 **Developing Energy-Efficient Approximate Memory for Neural Network Applications**

- » Research project at Yonsei University joint with SK Hynix
- » Exploring an energy-efficient approximate memory architecture for deep learning applications

2017.09 - 2018.08 **Developing Processor and Memory System for Next-Generation Security Platform**

- » Research project at Yonsei University joint with Samsung Electronics
- » Developing ASIPs (Application-Specific Instruction-Set Processors) for cryptographic algorithms (e.g., AES, SHA-256, and RSA-2048)

2015.07 - 2015.12 **Constructing a Verification Environment for Data Plane Acceleration and Performance Analysis**

- » Research project at Yonsei University joint with ETRI
- » Developing and verifying optimization techniques for improving data plane acceleration in virtualized network environment

2014.07 - 2017.11 **Developing Low-Power Mobile Computing Platform**

- » Research project at Yonsei University joint with LG Electronics
- » Inter- and Intra-core optimization techniques for higher energy efficiency of mobile APs (Application Processors)

»» Activities

Tutorial Organizer

- » On-chip Accelerators in 4th Gen Intel® Xeon® Scalable Processors: Features, Performance, Use Cases, and Future!
- » 50th International Symposium on Computer Architecture (ISCA 2023)

Conference Chair

- » Excursion chair: IEEE/ACM International Symposium on Microarchitecture (MICRO) 2025
- » Publication chair: Korean Institute of Information Scientists and Engineers (KIISE) CSS Conference 2025
- » Session chair: Artificial Intelligence Circuits and Systems (AICAS) 2022

External Reviewer Committee

- » IEEE/ACM International Symposium on Microarchitecture (MICRO) 2025
- » IEEE Transactions on Emerging Topics in Computing (TETC), IEEE Transactions on Computers (TC), IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS), IEEE Computer Architecture Letters (CAL), ACM Transactions on Storage (TOS), ACM Transactions on Architecture and Code Optimization (TACO), Microprocessors and Microsystems

Invited Talk

- » Institute of Electronics and Information Engineers (IEIE) SoC Conference 2025
- » Yonsei University AI Plus Forum 2025
- » Korean Institute of Information Scientists and Engineers (KIISE) CSS Conference 2025
- » Yonsei University EE Open Lab 2024
- » Institute of Electronics and Information Engineers (IEIE) SoC Conference 2024