

IPOOM JEONG | RESUME

- **Status:** Postdoctoral Research Associate at UIUC
- **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

2022.09 - Present **Postdoctoral Research Associate** [University of Illinois Urbana-Champaign, USA](#)

- 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](#)

- 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](#)

- 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](#)

- 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](#)

- 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](#)

- 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](#)

- 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](#)

- » Department 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](#)

- » 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](#)

- » **Ipoom Jeong** and 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](#)

- » **Ipoom Jeong** and Changmin Lee
- » Cg-CMT: Expanding Instruction Window via Coarse-Grained Instruction Commit

2010.03 - 2014.02 **National Scholarship for Science and Engineering**

[KOSAF](#)

»» Publications

2023.07 **CXL \neq NUMA: Device-Specific Characteristics and Effective Use of True CXL Memory** [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, and Nam Sung Kim
- » The 56th IEEE/ACM International Symposium on Microarchitecture (MICRO 2023, IF: 4, NRF BK21+)

2023.06 **LADIO: Leakage-Aware Direct I/O for I/O-Intensive Workloads**

[International Journal](#)

- » **Ipoom Jeong**, Jiaqi Lou, Yongseok Son, Yongjoo Park, Yifan Yuan, and Nam Sung Kim
- » IEEE Computer Architecture Letters (IF: 2.3, Q3, JCR2022)

2022.10 **Reconstructing Out-of-Order Issue Queue**

[International Conference](#)

- » **Ipoom Jeong**, Jiwon Lee, Myung Kuk Yoon, and Won Woo Ro
- » The 55th IEEE/ACM International Symposium on Microarchitecture (MICRO 2022, IF: 4, NRF BK21+)

2022.08 **TEA-RC: Thread Context-Aware Register Cache for GPUs**

[International Journal](#)

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

2022.03 **CASH-RF: A Compiler-Assisted Hierarchical Register File in GPUs**

[International Journal](#)

- » Yunho Oh, **Ipoom Jeong**, Won Woo Ro, and Myung Kuk Yoon
- » IEEE Embedded Systems Letters, Vol. 14, pp. 187 - 190, Mar. 2022 (IF: 1.6, Q3, 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, and Won Woo Ro
- › The 26th IEEE International Symposium on High Performance Computer Architecture (HPCA 2020, IF: 4, NRF BK21+)

2019.12 **OverCome: Coarse-Grained Instruction Commit with Handover Register Renaming** [International Journal](#)

- › **Ipoom Jeong**, Changmin Lee, Keunsoo Kim, and Won Woo Ro
- › IEEE Transactions on Computers, Vol. 68, Issue 12, pp. 1802-1816, Dec. 2019 (IF: 3.131, Q1, JCR2018)

2018.06 **Constructing Resilient Region in Dynamic Optimization Systems via Dynamic Adjustment of Bias Thresholds** [International Conference](#)

- › **Ipoom Jeong** and Won Woo Ro
- › The 3rd IEEE International Conference On Consumer Electronics Asia (ICCE-ASIA 2018)

2017.11 **Parallel In-Order Execution Architecture for Low-Power Processor** [International Conference](#)

- › Kyungmin Lee, **Ipoom Jeong**, and Won Woo Ro
- › The 14th International SoC Design Conference (ISOCC 2017)

2017.01 **Dynamic Warp Scheduler Selection Policy Using Linear Regression for GPUs** [International Conference](#)

- › Hyunjune Shin, Kyungmin Lee, **Ipoom Jeong**, Jong Hyun Park, and Won Woo Ro
- › The 16th International Conference on Electronics, Information and Communication (ICEIC 2017)

2016.06 **Heterogeneous Single Core with Functional Unit Gating for High Energy-Efficiency** [Domestic Conference](#)

- › Yoonsoo Kim, **Ipoom Jeong**, and Won Woo Ro
- › 2016 Annual Summer Conference of IEIE

2016.06 **Analyzing Development Trends and Performance/Power Characteristics of Multi-Core Processors** [Domestic Conference](#)

- › **Ipoom Jeong** and Won Woo Ro
- › 2016 Annual Summer Conference of IEIE

2014.11 **Exploiting Back-End Fusion in Multi-Core Processors** [Domestic Conference](#)

- › Jonghyun Park, **Ipoom Jeong**, and Won Woo Ro
- › 2014 Annual Fall Conference of KIPS

»» Patents

2023.02 **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 2023.02.21** (Application No.: 17/380,805, Patent No.: 11,586,543)
- › 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)

2022.12 **Memory Management Unit and Method of Walking Page Table** [Domestic Patent](#)

- » Jiwon Lee, Won Woo Ro, **Ipoom Jeong**, Hongju Kal, Gun Ko, Hyunwuk Lee
- » KR: Applied in 2022.12.15 (Application No.: 10-2022-0175909)

2022.07 **Apparatus and Method for Instruction Scheduling of High-Performance Out-of-Order Cores**

Domestic Patent

- » Won Woo Ro, **Ipoom Jeong**
- » KR: Applied in 2022.07.15 (Application No.: 10-2022-0087365)

2022.06 **Memory device, memory device operating method, and electronic device including memory device**

Int'l/Dom Patent

- » Wonseob Jeong, Hee Hyun Nam, Younggeon Yoo, Jeongho Lee, Younho Jeon, **Ipoom Jeong**, Chanho Yoon
- » CN: Applied in 2022.06.20 (Application No.: 202210699555.4)
- » US: Applied in 2022.05.11 (Application No.: 17/742,184)
- » KR: Applied in 2021.09.29 (Application No.: 10-2021-0128940)

2022.04 **Neural Network Processing Method**

Domestic Patent

- » Won Woo Ro, Hongju Kal, Cheonjun Park, Hyunwuk Lee, **Ipoom Jeong**, Jiwon Lee
- » KR: Applied in 2022.04.04 (Application No.: 10-2022-0041848)

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.: 16/988478, Patent No.: 11,276,452)
- » CN: Applied in 2020.08.27 (Application No.: 202010879009.X)
- » 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)

2021.07 **System, device and method for indirect addressing**

Int'l/Dom Patent

- » Jeongho Lee, **Ipoom Jeong**, Younggeon Yoo, Younho Jeon
- » EP: Applied in 2021.07.23 (Application No.: 21187355.9)
- » US: Applied in 2021.07.16 (Application No.: 17/378,354)
- » CN: Applied in 2021.07.14 (Application No.: 202110795792.6)
- » KR: Applied in 2020.10.14 (Application No.: 10-2020-0132978)

2021.07 **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
- » CN: Applied in 2021.07.22 (Application No.: 202110832714.9)
- » DE: Applied in 2021.07.08 (Application No.: 10 2021 117 636.0)
- » US: Applied in 2021.07.07 (Application No.: 17/368,981)
- » KR: Applied in 2020.11.06 (Application No.: 10-2020-0148133)

2021.01 **Smart Storage Device**

Domestic Patent

- » Hyeokjun Choe, Younho Jeon, Younggeon Yoo, Hyodeok Shin, **Ipoom Jeong**
- » KR: Applied in 2021.01.20 (Application No.: 10-2021-0007897)

2020.11 **Memory Device Including Direct Memory Access Engine, System Having the Same and Operating Method of Memory Device** [Domestic Patent](#)

- » Heehyun Nam, Jeongho Lee, Won Seob Jeong, **Ipoom Jeong**, Hyeokjun Choe
- » KR: Applied in 2020.11.06 (Application No.: 10-2020-0148133)

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)

2020.10 **System, Device, and Method for Accessing Device-Attached Memory** [Domestic Patent](#)

- » Jeongho Lee, Heehyun Nam, Jaeho Shin, Hyodeok Shin, Younggeon Yoo, Younho Jeon, Won Seob Jeong, **Ipoom Jeong**, Hyeokjun Choe
- » KR: Applied in 2020.10.15 (KR: Application No.: 10-2020-0133743)

»» Projects

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

2023.06 - 2023.06 **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)

2022.06 - 2022.06 **Conference Session Chair**

- » Artificial Intelligence Circuits and Systems (AICAS 2022)

2022.01 - Present **External Reviewer**

- » ACM Transactions on Architecture and Code Optimization (TACO)
- » IEEE Transactions on Emerging Topics in Computing (TETC)
- » Microprocessors and Microsystems