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

Ipoom Jeong · Hardware Engineer · Illinois, USA · **jip9110@gmail.com** · (US, +1) 217 778 8808 · (KR, +82) 10 9180 7008

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**, 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**, Changmin Lee
❱ Cg-CMT: Expanding Instruction Window via Coarse-Grained Instruction Commit

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

❱❱❱ Publications

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 2024, IF: 4, NRF BK21+)

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 2024, IF: 4, NRF BK21+)

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 2024, IF: 4, NRF BK21+)

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, Hyeongi Yeo, **Ipoom Jeong**, Sungjin Lee, Nam Sung Kim, Yongseok Son
❱ ACM SIGOPS European Conference on Computer Systems (EuroSys 2024, IF: 2, NRF BK21+)

Ipoom Jeong · Hardware Engineer · Illinois, USA · **jip9110@gmail.com** · (US, +1) 217 778 8808 · (KR, +82) 10 9180 7008

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 2024)

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 (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 2023, IF: 4, NRF BK21+)

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 2023, IF: 3, NRF BK21+)

2023.08	**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 (IF: 1.6, Q3, JCR2022)

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 - Dec. 2023 (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 (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 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, Myung Kuk Yoon
- ❱ IEEE Access, Vol. 10, pp. 82049 - 82062, Aug. 2022 (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 2020, IF: 4, NRF BK21+)

2019.12	**OverCome: Coarse-Grained Instruction Commit with Handover Register Renaming**	International Journal

❱ **Ipoom Jeong**, Changmin Lee, Keunsoo Kim, 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**, 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**, 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

❱ Hyunjun Shin, Kyungmin Lee, **Ipoom Jeong**, Jong Hyun Park, 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**, 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**, 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**, Won Woo Ro
❱ 2014 Annual Fall Conference of KIPS

❱❱❱ Patents

2024.02 **Storage system and method to perform workload associated with a host** Int'l/Dom Patent

❱ Wonseb 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)

2023.11 **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, Wonseb 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)

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, Wonseb 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)

2022.04	**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 ccontroller 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: 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)

2021.01	**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)

2020.10	**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

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