

# 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

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

## »»» Education

2014.03 - 2020.02      **Doctor of Philosophy**      [Yonsei University, Korea](#)

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» 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](#)

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» 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](#)

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» 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](#)

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» **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](#)

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» **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

2025.06      **A4: Microarchitecture-Aware LLC Management for Datacenter Servers with Emerging I/O Devices**      [International Conference](#)      *Corresponding author(s)\**

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- » 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](#)

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- » **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](#)

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- » 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**<sup>\*</sup>, Myung Kuk Yoon<sup>\*</sup>, 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 - Dec. 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](#)

- › **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](#)

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

2017.11	<b>Parallel In-Order Execution Architecture for Low-Power Processor</b>	International Conference
<ul style="list-style-type: none"> <li>› Kyungmin Lee, <b>Ipoom Jeong</b>, Won Woo Ro</li> <li>› The 14th International SoC Design Conference (<b>ISOCC</b>)</li> </ul>		
2017.01	<b>Dynamic Warp Scheduler Selection Policy Using Linear Regression for GPUs</b>	International Conference
<ul style="list-style-type: none"> <li>› Hyunjun Shin, Kyungmin Lee, <b>Ipoom Jeong</b>, Jong Hyun Park, Won Woo Ro</li> <li>› The 16th International Conference on Electronics, Information, and Communication (<b>ICEIC</b>)</li> </ul>		
2016.06	<b>Analyzing Development Trends and Performance/Power Characteristics of Multi-Core Processors</b>	Domestic Conference
<ul style="list-style-type: none"> <li>› <b>Ipoom Jeong</b>, Won Woo Ro</li> <li>› 2016 Annual Summer Conference of IEIE</li> </ul>		
2016.06	<b>Heterogeneous Single Core with Functional Unit Gating for High Energy-Efficiency</b>	Domestic Conference
<ul style="list-style-type: none"> <li>› Yoonsoo Kim, <b>Ipoom Jeong</b>, Won Woo Ro</li> <li>› 2016 Annual Summer Conference of IEIE</li> </ul>		
2014.11	<b>Exploiting Back-End Fusion in Multi-Core Processors</b>	Domestic Conference
<ul style="list-style-type: none"> <li>› Jonghyun Park, <b>Ipoom Jeong</b>, Won Woo Ro</li> <li>› 2014 Annual Fall Conference of KIPS</li> </ul>		

## »» Patents

2024.11	<b>Neural Network Processing Method</b>	Domestic Patent
<ul style="list-style-type: none"> <li>› Won Woo Ro, Hongju Kal, Cheonjun Park, Hyunwuk Lee, <b>Ipoom Jeong</b>, Jiwon Lee</li> <li>› KR: <b>Registered in 2024.11.13</b> (Application No.: 10-2022-0041848, Registration No.: 10-2731690)</li> </ul>		
2024.05	<b>System, device and method for accessing device-attached memory</b>	Int'l/Dom Patent
<ul style="list-style-type: none"> <li>› Jeongho Lee, Heehyun Nam, Jaeho Shin, Hyodeok Shin, Younggeon Yoo, Younho Jeon, Wonseob Jeong, <b>Ipoom Jeong</b>, Hyeokjun Choe</li> <li>› US: <b>Registered in 2024.05.14</b> (Application No.: 18/166,244, Patent No.: 11,983,115)</li> <li>› EP: Applied in 2021.07.22 (Application No.: 21187164.5)</li> <li>› CN: Applied in 2021.07.14 (Application No.: 202110796960.3)</li> <li>› KR: Applied in 2020.10.15 (Application No.: 10-2020-0133743)</li> </ul>		
2024.02	<b>Storage system and method to perform workload associated with a host</b>	Int'l/Dom Patent
<ul style="list-style-type: none"> <li>› Wonseob Jeong, Hee Hyun Nam, Younggeon Yoo, Jeongho Lee, Younho Jeon, <b>Ipoom Jeong</b>, Chanho Yoon</li> <li>› US: <b>Registered in 2024.02.13</b> (Application No.: 17/742,184, Patent No.: 11,899,970)</li> <li>› CN: Applied in 2022.06.20 (Application No.: 202210699555.4)</li> <li>› KR: Applied in 2021.09.29 (Application No.: 10-2021-0128940)</li> </ul>		
2024.05	<b>System, device and method for indirect addressing</b>	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)

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

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

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**

- » 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 Architecture and Code Optimization (TACO)
- » Microprocessors and Microsystems