

KANG EUN JEON

TOWARDS AIOT: SUSTAINABLE AND RELIABLE INTELLIGENCE EVERYWHERE

IRIS Lab., Dept. of Electrical and Computer Engineering, Sungkyunkwan University, Suwon, Republic of Korea

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RESEARCH INTERESTS

- 1 **Software-Hardware Co-design for Sustainable IoT**
- 2 **Efficient & Reliable Analog Computing for AI**
- 3 **Compression & Acceleration of AI Models**

EDUCATION

- 2022 **HKUST** – (HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY) *Clear Water Bay, Hong Kong*
| **Ph.D. in Electronic & Computer Engineering**
- 2015 Advised by Prof. **James SHE** & Prof. Jun ZHANG
Thesis: Smart BLE Beacons for Sustainable IoT: Hardware, Firmware and Machine Learning Co-designs
- 2015 **HKUST** – (HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY) *Clear Water Bay, Hong Kong*
| **B.Eng. in Electronic Engineering**
- 2012 Advised by Prof. Chi Ying TSUI
Final Year Project: Development of low-cost collaborative robot platform with IR communication system

PROFESSIONAL EXPERIENCE

- Now* **SKKU** – (SUNGKYUNKWAN UNIVERSITY) *Suwon, Korea*
| **Postdoctoral Scholar**
- 2022 Advised by Prof. **Jong Hwan Ko**
- Accelerated computation algorithms for processing-in-memory architecture
 - Energy-efficient/adaptive dynamic neural network architecture
- 2023 **SKKU** – (SUNGKYUNKWAN UNIVERSITY) *Suwon, Korea*
Part-time Lecturer
- ICE 4028: Embedded System Design (Fall 2023)
- 2022 **HKUST** – (HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY) *Clear Water Bay, Hong Kong*
| **Graduate Researcher**
- 2015
- Energy harvesting IoT hardware platform, *luXbeacon*, and design methodology/optimization
 - Energy-saving firmware for BLE devices through a novel user existence detection mechanism
 - Energy-efficient neural network architecture for long-term time-series forecasting on embedded system
- Other achievements/contributions:
- Conducted several real-life deployments and field tests to validate the proposed research works
 - Contributed to multiple tech-transfer and an open source initiative related to *luXbeacon*
- 2021 **OGCIO** – (OFFICE OF THE GOVERNMENT CHIEF INFORMATION OFFICER) *Quarry Bay, Hong Kong*
Consultant
- Integrated BLE beacon technology with Hong Kong's contact tracing app, *LeaveHomeSafe*
 - Designed, manufactured and deployed 100+ energy harvesting BLE beacons, *luXbeacon*
- 2020 **CyPhy Media Ltd.** *Kwun Tong, Hong Kong*
Research Engineer Intern
- Led the research and development of energy harvesting sensor device, *luXsensing beacon*
 - Contributed to the development of cloud platform for the management of sensor devices
 - Deployed *luXsensing beacons* for greenhouse and rooftop temperature monitoring applications

TEACHING EXPERIENCE

- 2023 **ICE 4028: Embedded System Design – SKKU** *Suwon, Korea*
Course Instructor
- Project-based course for 3rd and 4th year undergraduate students
 - Designed and organized lectures to deliver the foundational concepts in embedded systems
 - Designed and organized lab sessions involving embedded C programming
- 2019 **ELEC 6910Q: Analytics for Social Media and Big Data Applications – HKUST** *Clear Water Bay, Hong Kong*
 | **Lead Teaching Assistant**
- 2017 Instructor: Prof. James SHE
- Project-based course for post-graduate students
 - Organized lab sessions involving big data and social network analysis
- 2019 **ELEC 4170: Digital Media and Multimedia Applications – HKUST** *Clear Water Bay, Hong Kong*
Lead Teaching Assistant
- Instructor: Prof. James SHE
- Project-based course for 3rd and 4th year undergraduate students
 - Organized lab sessions involving big data and social network analysis
- 2018 **ELEC 1020: Media Production: Technology and Design – HKUST** *Clear Water Bay, Hong Kong*
 | **Lead Teaching Assistant**
- 2016 Instructor: Prof. James SHE
- Project-based course for all undergraduate students
 - Organized lab sessions to practice media production techniques
- 2016 **ELEC 1200: A System View of Communications – HKUST** *Clear Water Bay, Hong Kong*
Teaching Assistant
- Instructor: Prof. Danny TSANG
- Guided and assisted undergraduate students through the lab sessions

HONORS & AWARDS

HONORS

- H10 **Samsung Best Patent Award – Samsung Electronics & SKKU (2024)**
 Awarded to the top 2 patents generated in collaboration with Samsung Electronics.
- H9 **Samsung Best Paper Award – Samsung Electronics & SKKU (2024)**
 Awarded to the top 4 papers generated in collaboration with Samsung Electronics
- H8 **Best Paper Award (1st Place) – Summer Annual Conference of IEIE (2024)**
 Recognized for the top AI undergraduate paper and presentation among 32 competing teams.
- H7 **Cross-disciplinary Research Award (2nd Place) – SKKU Institute for Cross-disciplinary Studies (2024)**
 Achieved second place out of 17 teams for cross-department collaborative research.
- H6 **BK21 FOUR Postdoctoral Fellowship – National Research Foundation & SKKU (2023 – 2025)**
 Financial support for outstanding post-doctoral researchers.
- H5 **Samsung Outstanding Paper Award – Samsung Electronics & SKKU (2023)**
 Awarded to the top 4 papers generated in collaboration with Samsung Electronics
- H4 **Elevator Pitch Competition Champion – HKUST Entrepreneurship Center (2022)**
 First place in the elevator pitch competition held by HKUST Entrepreneurship Center
- H3 **FYP+ Award – Hong Kong X Foundation (2019)**
 Selected as top 5 most outstanding projects among 100+ projects from all universities in Hong Kong
- H2 **Smart Airport Accelerator Finalist – Airport Authority Hong Kong X Hong Kong Science and Technology Park (2019)**
 Selected as top 3 most outstanding technologies to enable smart airport applications
- H1 **Postgraduate Excellence Award – Hong Kong Telecom Institute of Information Technology (2017)**
 Awarded to 4 postgraduate students with outstanding scholarly research outputs in the areas of Networking Technology, Wireless Communications or Video/Multimedia Technology

FUNDING AWARDS

- F₄ Dream Builder Funds Award (HK\$50,000) – HKUST Entrepreneurship Center (2021)**
Funding award to support the development and acceleration of start-up projects from HKUST
- F₃ U*STAR Award (HK\$40,000) – HKUST Technology Transfer Center (2019)**
Funding award to support start-up projects with unique and novel technologies from HKUST
- F₂ Proof-of-Concept Fund Award (HK\$160,000) – HKUST Technology Transfer Center (2018)**
Funding award to translate HKUST's research outcomes into viable intellectual property
Project title: User Presence-aware Firmware and IoT Analytics for Long-lasting Beacon-based IoT Network
- F₁ Proof-of-Concept Fund Award (HK\$150,000) – HKUST Technology Transfer Center (2017)**
Project title: A Crowd-assisted Software Framework for Securing Bluetooth Low Energy (BLE) Beacon Network

FEATURED PUBLICATIONS

¹: Equal contribution, *: Corresponding author, U: Under review; available as preprint

CORRESPONDING AUTHOR PUBLICATIONS

- C24* S. Han, S. Y. Yoon, J. Kim, D. Wang, **K. E. Jeon***, H. Yang* and J. H. Ko*, "MSQ: Accurate Truncation-Ready Quantization for Deep Neural Networks with Flexible Weight Bit Precision," *2025 International Conference on Computer Vision (ICCV)*, 2025. (Accepted to appear)]
- C23* J. Kim, S. Y. Yoon, T. Lee, J. C. Lee, **K. E. Jeon***, and J. H. Ko*, "TruncQuant: Accurate Truncation-Ready Quantization for Deep Neural Networks with Flexible Weight Bit Precision," *2025 International Symposium on Low Power Electronics and Design (ISLPED)*, 2025. (accepted to appear)]
🏆 H8 Best Paper Award from IEIE (2024), and H7 Undergraduate Research Award from SKKU (2024)
- C22* D. Y. Kang, Y. H. Oh, C. Hwang, J. Kim, **K. E. Jeon***, and J. H. Ko*, "MEMHD: Memory-Efficient Multi-Centroid Hyperdimensional Computing for Fully-Utilized In-Memory Computing Architectures," *2025 Design, Automation and Test in Europe Conference (DATE)*, 2025. (accepted to appear) [Paper]

CONFERENCES

- C25 **K. E. Jeon**, S. H. Yeon, J. Kim, H. Bang, J. Rhe, and J. H. Ko, "Row-Column Hybrid Grouping for Fault-Resilient Multi-Bit Weight Representation on IMC Arrays," *2025 International Conference on Computer-Aided Design (ICCAD)*, 2025. (accepted to appear)]
🏆 H10 Best Patent Award from Samsung (2024)
- C21 **K. E. Jeon**, J. Rhe, and J. H. Ko, "Low-Rank Compression for IMC Arrays," *2025 Design, Automation and Test in Europe Conference (DATE)*, 2025. [Paper]
- C14 **K. E. Jeon**, J. Rhe, H. S. Bang, and J. H. Ko, "Weight-Aware Activation Mapping for Energy-Efficient Convolution on PIM Arrays," *2023 International Symposium on Low Power Electronics and Design (ISLPED)*, 2023. [Paper]
🏆 H5 Outstanding Paper Award from Samsung (2023)
- C11 **K. E. Jeon**, J. She, and B. Wang, "Information-Aware Sensing Framework for Long-Lasting IoT Sensors in Greenhouse," *2023 IEEE Wireless Communications and Networking Conference (WCNC)*, Glasgow, 2023. [Paper]
- C2 **K. E. Jeon**, J. She, and T. Y. Wong, "A Crowd-assisted Architecture for Securing BLE Beacon-based IoT Infrastructure," *2018 IEEE Wireless Communications and Networking Conference (WCNC)*, Barcelona, 2018. [Paper]
🏆 F1 Proof-of-Concept Fund Award from HKUST (2017)

JOURNALS

- J9 **K. E. Jeon**, J. She, and T. Y. Wong, "Extending Beacon Lifetime by Predicting User Occupancy using Deep Neural Networks," *IEEE Transactions on Mobile Computing*, 2024. [Paper]
- J7 **K. E. Jeon**, and J. She, "Sensing-Aware Machine Learning Framework for Extended Lifetime of IoT Sensors," *IEEE Transactions on Mobile Computing*, 2023. [Paper]
- J4 **K. E. Jeon**, and J. She, "User Existence-aware BLE Beacon for Maximized Battery Lifetime," *IEEE Transactions on Mobile Computing*, vol. 21, no. 1, pp. 366-377, 2022. [Paper]
- J3 **K. E. Jeon**, J. She, J. Xue, S. Kim, and S. Park, "luXbeacon—A Batteryless Beacon for Green IoT: Design, Modeling, and Field Tests," *IEEE Internet of Things Journal*, vol. 6, no. 3, pp. 5001-5012, 2019. [Paper]
🏆 H3 FYP+ Award from Hong Kong X Foundation
- J2 **K. E. Jeon**, J. She, P. Soonsawad, and P. C. Ng, "BLE Beacons for Internet of Things Applications: Survey, Challenges, and Opportunities," *IEEE Internet of Things Journal*, vol. 5, no. 2, pp. 811-828, 2018. [Paper]

FULL PUBLICATIONS (682 CITATIONS)

Most up-to-date publication list can be found at <https://scholar.google.com/citations?user=kRYac24AAAAJ>

CONFERENCES (26)

- U26 J. Kim, J. Ahn, **K. E. Jeon***, and J. H. Ko*, "Efficient Multi-bit Quantization Network Training via Weight Bias Correction and Bit-wise Coreset Sampling," *2025 Conference on Neural Information Processing Systems (NeurIPS)*, 2025. (under review)]
- C25 **K. E. Jeon**, S. Y. Yoon, J. Kim, H. Bang, J. Rhe, and J. H. Ko, "Row-Column Hybrid Grouping for Fault-Resilient Multi-Bit Weight Representation on IMC Arrays," *2025 International Conference on Computer-Aided Design (ICCAD)*, 2025. (accepted to appear)]
 **H10** Best Patent Award from Samsung (2024)
- C24 S. Han, S. Y. Yoon, J. Kim, D. Wang, **K. E. Jeon***, H. Yang* and J. H. Ko*, "MSQ: Accurate Truncation-Ready Quantization for Deep Neural Networks with Flexible Weight Bit Precision," *2025 International Conference on Computer Vision (ICCV)*, 2025. (accepted to appear)]
- C23 J. Kim, S. Y. Yoon, T. Lee, J. C. Lee, **K. E. Jeon***, and J. H. Ko*, "TruncQuant: Accurate Truncation-Ready Quantization for Deep Neural Networks with Flexible Weight Bit Precision," *2025 International Symposium on Low Power Electronics and Design (ISPLED)*, 2025. (accepted to appear)]
 **H8** Best Paper Award from IEIE (2024), and **H7** Undergraduate Research Award from SKKU (2024)
- C22 D. Y. Kang, Y. H. Oh, C. Hwang, J. Kim, **K. E. Jeon***, and J. H. Ko*, "MEMHD: Memory-Efficient Multi-Centroid Hyperdimensional Computing for Fully-Utilized In-Memory Computing Architectures," *2025 Design, Automation and Test in Europe Conference (DATE)*, 2025. (accepted to appear) [Paper]
- C21 **K. E. Jeon**, J. Rhe, and J. H. Ko, "Low-Rank Compression for IMC Arrays," *2025 Design, Automation and Test in Europe Conference (DATE)*, 2025. [Paper]
- C20 J. Kim, **K. E. Jeon**, Y. Kim, and J. H. Ko, "Column-wise Quantization of Weights and Partial Sums for Accurate and Efficient Compute-In-Memory Accelerators," *2025 Design, Automation and Test in Europe Conference (DATE)*, 2025. (accepted to appear) [Paper | Code]
- C19 C. Hwang, J. So, J. Rhe, J. Y. Kim, J. Park, **K. E. Jeon**, and J. H. Ko, "An Efficient Ventricular Arrhythmias Detection on Microcontrollers with Optimized 1D CNN," *2024 IEEE Artificial Intelligence Circuits and Systems (AICAS)*, 2024. [Paper]
- C18 **K. E. Jeon**¹, W. Seo¹, J. Rhe, and J. H. Ko, "ConvMapSim: Modeling and Simulating Convolutional Model Mapping for PIM Arrays," *2024 IEEE Artificial Intelligence Circuits and Systems (AICAS)*, 2024. [Paper]
- C17 J. Park, **K. E. Jeon**, Z. Yang, B. Yin, J. H. Ko, and L. K.B. Li, "Early detection of global instability via recurrence plots and neural networks," *2023 76th Annual Meeting of the Division of Fluid Dynamics*, 2023. [Paper]
- C16 H. Bang, **K. E. Jeon**, J. Rhe, and J. H. Ko, "DCR: Decomposition-Aware Column Re-Mapping for Stuck-At-Fault Tolerance in ReRAM Arrays," *2023 IEEE International Conference on Computer Design (ICCD)*, 2023. [Paper]
- C15 J. Rhe, **K. E. Jeon**, S. M. Jeong, J. C. Lee, and J. H. Ko, "Kernel Shape Control for Row-Efficient Convolution on Processing-In-Memory Arrays," *2023 International Conference on Computer-Aided Design (ICCAD)*, 2023. [Paper | Code]
 **H9** Best Paper Award from Samsung (2024)
- C14 **K. E. Jeon**, J. Rhe, H. S. Bang, and J. H. Ko, "Weight-Aware Activation Mapping for Energy-Efficient Convolution on PIM Arrays," *2023 International Symposium on Low Power Electronics and Design (ISPLED)*, 2023. [Paper]
 **H5** Outstanding Paper Award from Samsung (2023)
- C13 J. Rhe, **K. E. Jeon**, H. S. Bang, and J. H. Ko, "PAIRS: Pruning-Aided Row-Skipping for SDK-Based Convolutional Weight Mapping in Processing-In-Memory Architectures," *2023 International Symposium on Low Power Electronics and Design (ISPLED)*, 2023. [Paper | Code]
- C12 S. Jeong, **K. E. Jeon**, and J. H. Ko, "Rate-Controllable and Target-Dependent JPEG-Based Image Compression Using Feature Modulation," *2023 International Conference on Multimedia and Expo Workshops*, 2023. [Paper]
- C11 **K. E. Jeon**, J. She, and B. Wang, "Information-Aware Sensing Framework for Long-Lasting IoT Sensors in Greenhouse," *2023 IEEE Wireless Communications and Networking Conference (WCNC)*, Glasgow, 2023. [Paper]
- C10 T. Y. Wong, J. She, **K. E. Jeon**, "Energy Status Recovery using Recurrent SVR Framework for Solar BLE Beacons," *2022 IEEE Wireless Communications and Networking Conference (WCNC)*, Austin, TX, 2022. [Paper]
- C9 P. Soonsawad, **K. E. Jeon**, and J. She, "Improved Energy Harvesting with One-time Adjusted Solar Panel for BLE Beacon," *2021 IEEE 93rd Vehicular Technology Conference (VTC)*, Helsinki, 2021. [Paper]
- C8 **K. E. Jeon**, and J. She, "BLE Beacon with User Traffic Awareness Using Deep Correlation and Attention Network," *2021 IEEE Wireless Communications and Networking Conference (WCNC)*, Nanjing, 2021. [Paper]
- C7 **K. E. Jeon**, J. She, and T. Y. Wong, "Extending BLE Beacon Lifetime by a Novel Neural Network-driven Framework," *2020 IEEE Wireless Communications and Networking Conference (WCNC)*, Seoul, 2020. [Paper]

- C6 T. Y. Wong, J. She, **K. E. Jeon**, "Efficient Updates of Battery Status for BLE Beacon Network," *2019 IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*, Barcelona, 2019. [Paper]
- C5 S. Seo, **K. E. Jeon**, and S. Park, "Reliable Mobile-Proximity Interaction Mechanism Based on BLE Beacon-Initiated Notification," *2019 IEEE 90th Vehicular Technology Conference (VTC2019-Fall)*, Honolulu, 2019. [Paper]
- C4 P. Soonsawad, **K. E. Jeon**, J. She, C. H. Lam, and P. C. Ng, "Maximizing Energy Harvesting with Adjustable Solar Panel for BLE Beacon," *2019 IEEE International Conference on Cyber Physical and Social Computing (CPSCom)*, Atlanta, 2019. [Paper]
- C3 **K. E. Jeon**, and J. She, "User Existence-aware BLE Beacon Firmware for Extended Battery Lifetime," *2019 IEEE Wireless Communications and Networking Conference (WCNC)*, Marakech, 2019. [Paper]
 **F2** Proof-of-Concept Fund Award from HKUST (2018)
- C2 **K. E. Jeon**, J. She, and T. Y. Wong, "A Crowd-assisted Architecture for Securing BLE Beacon-based IoT Infrastructure," *2018 IEEE Wireless Communications and Networking Conference (WCNC)*, Barcelona, 2018. [Paper]
 **F1** Proof-of-Concept Fund Award from HKUST (2017)
- C1 **K. E. Jeon**, T. Tong, and J. She, "Preliminary design for sustainable BLE Beacons powered by solar panels," *2016 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, San Francisco, 2016. [Paper]

JOURNALS AND MAGAZINES (14 + 1)

- U14 J. Kim, **K. E. Jeon**, Y. Kim, and J. H. Ko, "RUNQuant: High-Resolution Weight Quantization via Unanchored Weight Decomposition in Column-wise Granularity for CIM Accelerators," *IEEE Transactions on Emerging Topics in Computing* (under review)
- J13 J. Rhe, **K. E. Jeon**, and J. H. Ko, "GAROS: Genetic algorithm-aided row-skipping for shift and duplicate kernel mapping in processing-in-memory architectures," *Journal of Systems Architecture*, 2025. [Paper]
- J12 **K. E. Jeon**, J. She, and S. Wong, "Energy Status Recovery using Recurrent SVR Framework with Data Loss Conditions," *IEEE Transactions on Mobile Computing*, 2024. [Paper]
- J11 **K. E. Jeon**¹, T. Y. Wong¹, J. She, and G. Ghinita, "Crowd-assisted Secure Identity Updates for BLE Beacon Networks," *IEEE Internet of Things Journal*, 2024. [Paper]
- J10 J. Rhe, **K. E. Jeon**, S. M. Jeong, J. C. Lee, and J. H. Ko, "KERNTR0L: Kernel Shape Control for Row-Efficient Convolution," *IEEE Transactions on Circuits and Systems*, 2024. [Paper]
- J9 **K. E. Jeon**, J. She, and T. Y. Wong, "Extending Beacon Lifetime by Predicting User Occupancy using Deep Neural Networks," *IEEE Transactions on Mobile Computing*, 2024. [Paper]
- J8 **K. E. Jeon**, T. N. Lin, J. She, T. Y. Wong, R. Govindan, T. Al-Ansari, and B. Wang, "LuXSensing Beacon: Batteryless IoT Sensor, Design Methodology and Field-test for Sustainable Greenhouse Monitoring," *IEEE Transactions on AgriFood Electronics*, 2023. [Paper]
- J7 **K. E. Jeon**, and J. She, "Sensing-Aware Machine Learning Framework for Extended Lifetime of IoT Sensors," *IEEE Transactions on Mobile Computing*, 2023. [Paper]
- J6 T. Y. Wong, J. She, and **K. E. Jeon**, "An Efficient Framework of Energy Status Reporting for BLE Beacon Networks," *IEEE Internet of Things Journal*, 2023. [Paper]
- J5 C. H. Lam, **K. E. Jeon**, T. Y. Wong, and J. She, "Distance Estimation using BLE Beacon on Stationary and Mobile Objects," *IEEE Internet of Things Journal*, vol. 9, no. 7, pp. 4928-4939, 2022. [Paper]
- J4 **K. E. Jeon**, and J. She, "User Existence-aware BLE Beacon for Maximized Battery Lifetime," *IEEE Transactions on Mobile Computing*, vol. 21, no. 1, pp. 366-377, 2022. [Paper]
- J3 **K. E. Jeon**, J. She, J. Xue, S. Kim, and S. Park, "luXbeacon—A Batteryless Beacon for Green IoT: Design, Modeling, and Field Tests," *IEEE Internet of Things Journal*, vol. 6, no. 3, pp. 5001-5012, 2019. [Paper]
 **H3** FYP+ Award from Hong Kong X Foundation
- J2 **K. E. Jeon**, J. She, P. Soonsawad, and P. C. Ng, "BLE Beacons for Internet of Things Applications: Survey, Challenges, and Opportunities," *IEEE Internet of Things Journal*, vol. 5, no. 2, pp. 811-828, 2018. [Paper]
- J1 P. C. Ng, J. She, **K. E. Jeon**, and M. Baldauf, "When Smart Devices Interact with Pervasive Screens: A Survey," *ACM Transactions on Multimedia Computing, Communications, and Applications*, vol. 13, no. 4, pp. 55:1-55:23, 2017. [Paper]
- M1 P. Tedeschi, **K. E. Jeon**, J. She, T. Y. Wong, S. Bakiras, and R. Di Pietro, "Privacy-Preserving and Sustainable Contact Tracing Using Batteryless BLE Beacons," *IEEE Security & Privacy*, 2021. [Paper]

INTELLECTUAL PROPERTIES & TECHNOLOGY TRANSFER

PATENTS

- P7 J. Rhe, **K. E. Jeon**, and J. H. Ko, US Patent Application No.19/069,410, METHOD AND ELECTRONIC DEVICE WITH WEIGHT PRUNING CROSS-REFERENCE TO RELATED APPLICATION, Mar. 2025.
- P6 **K. E. Jeon**, and J. H. Ko, US Patent Application No.19/056,361, APPARATUS AND METHOD FOR IN-MEMORY COMPUTING, Feb. 2025.
- P5 D. Y. Kang, Y. H. Oh, C. Hwang, **K. E. Jeon**, and J. H. Ko, KR Patent Application No. 10-2024-0174593, In-memory computing device and method, Nov. 2024.
- P4 J. Kim, **K. E. Jeon**, Y. H. Kim, and J. H. Ko, KR Patent Application No. 10-2024-0174505, Weight and partial sum quantization apparatus and method, Nov. 2024.
- P3 **K. E. Jeon**, and J. H. Ko, KR Patent Application No.10-2024-0059324, Methods for multi-bit weight representation that maximizes IMC array utilization and the supporting adaptive shift-and-add peripheral circuit, Mar. 2024.
🏆 **H10** Best Patent Award from Samsung (2024)
- P2 J. Rhe, **K. E. Jeon**, and J. H. Ko, KR Patent Application No.10-2024-0058360, A technique to flexibly compress the convolutional weight matrix using pattern-based pruning and genetic algorithm, Feb. 2024.
- P1 J. Rhe, **K. E. Jeon**, J. C. Lee, S. Jeong, and J. H. Ko, KR Patent Application No.10-2023-0171519, Convolution operation method and apparatus utilization kernel shape control, Nov. 2023.

INITIATIVES & PROJECTS

- Now* | **luXbeacon: Open Source Design Initiatives towards Green and Sustainable IoT Infrastructure**
- Developed/published open source energy harvesting IoT device design including HW, FW, and casing designs
- 2015* | **luXbeacon: Open Source Design Initiatives towards Green and Sustainable IoT Infrastructure**
- Adopted by 10+ academic and industrial collaborators
- 2021* | **luXbeacon-Based Contact Tracing on Mobile App, LeaveHomeSafe**
Office of the Government Chief Information Officer (OGCIO)
- Integrated BLE technology with Hong Kong's contact tracing mobile app, *LeaveHomeSafe*
 - Deployed 30+ luXbeacons on public transports and delivered 100 luXbeacons
- 2018* | **Batteryless Indoor Positioning System Infrastructure Deployment**
Electrical and Mechanical Services Department (EMSD)
- Deployed 120+ luXbeacons at EMSD headquarters for indoor positioning application
 - Demonstrated batteryless operation of luXbeacons since 2018 until now

STUDENT GUIDANCE

GRADUATE RESEARCHERS AT SKKU

- 2024* | **Jaejoon Ahn** – *Master student at SKKU*
- Coreset selection for multi-bit quantization networks (**U26**)
- 2023* | **Doyeong Kang** – *Master student at SKKU*
- Hyperdimensional computing systems (**C22**)
- 2023* | **Jiyeon Kim** – *Master student at SKKU*
- Partial-sum quantization for analog in-memory computing systems (**C20**, **U14**)

UNDERGRADUATE RESEARCHERS AT SKKU

- 2024* | **Seokho Han** – *Junior at SKKU*
- Mixed-precision quantization via sparsification (**U24**)
- 2023* | **Daniel Hyochan Chong** – *Software engineer at Samsung Research*
- Post-training multi-bit quantization
- 2023* | **Jinhee Kim** – *Incoming PhD student at Duke*
- Multi-bit/mixed precision quantization (**C23**, **U24**, **U26**)
- 2023* | **Seoyeon Yoon** – *Firmware engineer at Viewworks Co. (AI medical imaging HW)*
- Multi-bit/mixed precision quantization (**C23**, **U24**)

UNDERGRADUATE INTERNS AT SKKU AND HKUST (SINGLE TERM)

Jiyeon Jeong, Nakgyu Lee, Yuna Lee, Jinwoo Lee, Seungwook Oh, Jinyoung Lim, Seung Ha Baek, Hye Lin Bong, Hyuk Heo, Hee Sung Jeong, Min Jun Kam, Ray Tsang, Keon Wong, Alex Choi, Ivan Yeung

PROFESSIONAL SERVICES

ORGANIZING COMMITTEE

- IEEE WF-IoT Workshop TPC

PAPER REVIEWS

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- Design Automation Conference (DAC)
- IEEE Communications Magazine
- IEEE Internet of Things Journal (IoTJ)
- IEEE Wireless Communications and Networking Conference (WCNC)
- ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)
- Elsevier Computer Networks

DEPARTMENTAL AND UNIVERSITY SERVICE

- SKKU BK-21 Trip to HKUST
- HKUST Undergraduate Hall Tutor
- HKUST SENG Student Ambassador

REFERENCES

James She (*Ph.D. advisor*)

Associate Professor

Thrust of Computational Media and Arts

Hong Kong University of Science and Technology (GZ), Guangzhou, China

 <https://cma.hkust-gz.edu.cn/people/pei-man-james-she/> eejames@ust.hk**Jong Hwan Ko** (*Post-doc advisor*)

Associate Professor

Dept. of Electrical and Computer Engineering

SungKyunKwan University, Suwon, Korea

 <https://iris.skku.edu/> jhko@skku.edu**Larry Li**

Associate Professor

Dept. of Mechanical and Aerospace Engineering

Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

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Associate Professor

Dept. of Computer Engineering

Chungbuk National University, Cheongju, Korea

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Associate Professor

College of Science and Engineering

Hamad Bin Khalifa University, Doha, Qatar

 <https://www.ss-sensing.com/> bwang@hbku.edu.qa J8**Huanrui Yang**

Assistant Professor

Department of Electrical and Computer Engineering

University of Arizona, AZ, USA

 <https://sites.google.com/view/huanrui-yang/> huanruiyang@arizona.edu C24**Zhe Wang**

Assistant Professor

Dept. of Civil and Environmental Engineering

Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

 <https://walterzwang.github.io/> cezhewang@ust.hk