이규호 Kyuho Lee

전기전자공학과 / Electrical Engineering

📞 052-217-2252
✉ kyuho.jsn.lee@unist.ac.kr
🏠 https://sites.google.com/view/kyuhojsnlee
LAB 106 BLDG. 410-2

Curriculum Vitae

2018~present: Assistant Professor, UNIST
2017~2018: Postdoctoral Researcher, KAIST
2016: Hardware Designer, SRA, Dallas, TX, USA

Academic Credential

2017: Ph.D., Electrical Engineering, KAIST
2014: M.S., Electrical Engineering, KAIST
2012: B.S., Electrical Engineering, KAIST

Awards/Honors/Memberships

- IEEE Senior Member, 2019 ~ Present
- Fellowship from Korea Foundation for Advanced Studies, 2008 ~ Present
- Korea Foundation for Advanced Studies Scholarship, 2008 ~ 2012
- National Science & Technology Scholarship, 2008 ~ 2017
- National KSAE Baja & Formula Competition Award, KSAE 2008
- National On-Line Electrical Vehicle Design Contest Award, 2009
- Broadcom Foundation Leadership Award , 2015
- Demonstration Session Certificate of Recognition, ISSCC 2016

Intelligent Systems Lab.
지능형시스템연구실

Intelligent Systems Laboratory (ISL) aims to make Artificial Intelligence Systems feasible and permeates our daily-life from autonomous drones or vehicles to Internet-of-Things. The AI system is implemented on a single chip based on advanced digital VLSI and analog-digital mixed-mode circuits to utilize Deep Leaning, AI, and Spiking Neural Networks. We design AI System-on-Chip but not limited to Deep Learning (including CNN and RNN) and embedded system in which integrates the AI System-on-Chip. Also, Spiking Neural Network is integrated to design Neuromorphic Processor, which mimics human brain to realize intelligence with ultra-low-power consumption.

지능형 시스템 연구실에서는 실생활에 적용 가능한 인공지능 시스템을 제작하여, 자율주행 드론 및 자동차에서 Internet-of-Things 까지 일상 생활에 인공지능을 적용하는 것을 목표로 연구 합니다. 딥 러닝, AI 등의 시스템은 진보된 디지털 VLSI 와 아날로그-디지털 혼성회로를 바탕으로 하나의 칩으로 구현합니다. 우리는 CNN과 RNN 등 딥러닝 뿐만 아니라 포괄적인 AI System-on-Chip을 제작하며, 각 칩을 집적한 임베디드 시스템을 제작하는 세계 최고의 연구를 도모하고 있습니다. 또한 사람의 뇌를 모방하여 초저전력 인공지능 연산이 가능한 뉴로몰픽 프로세서를 연구합니다.

< AI SoC >
- Accelerating DL / DRL
- (most likely) Digital processor
- Energy efficiency, throughput, latency
- Autonomous driving, drone, HMD, AR/VR, smartphone

< Neuromorphic SoC >
- Accelerating SNN
- Analog-digital mixed-mode architecture
- Ultra-low-power
- Always-on sensors, surveillance

관심분야	희망분야
AI System-on-Chip, Deep Learning Processor, Neuromorphic Processor, AI Embedded Systems, Automotive Processor	Mixed-mode Circuits, Quantum Computing Circuits, Autonomous Technologies

Research Keywords and Topics

AI System-on-Chip, Deep Learning Processor, Neuromorphic Processor, AI Embedded Systems, Automotive Processor, Network-on-Chip, Processing-in-Memory Architecture

Research Publications

[JSSC 2017] Kyuho Jason Lee, et al., "A 502GOPS and 0.984mW Dual-mode Intelligent ADAS SoC with Real-Time Semi-Global Matching and Intention Prediction for Smart Automotive Black Box System", IEEE Journal of Solid-State Circuits, vol. 52, no. 1, pp. 139-150, January 2017.
[JSSC 2015] Kyuho Jason Lee, et al., "A Vocabulary Forest Object Matching Processor with 2.07 M-vector/s Throughput and 13.3 nJ/vector Per-Vector Energy for Full-HD 60 fps Video Object Recognition", IEEE Journal of Solid-State Circuits, vol. 50, no. 4, pp. 1059-1069, April 2015.
[T-CAS I 2020] Kyuho Jason Lee, et al., "The Development of Silicon for AI: Different Design Approaches", IEEE Transactions on Circuits and Systems I (T-CAS I): Regular Papers, Early Access, 2020.

Patents

Gyeonghoon Kim, Kyuho Lee, Injoon Hong, and Hoi-Jun Yoo, "Cognitive Processor Mimicking Hyper-columns in Visual Cortex", filed to Korean Patent NO.10-1356786, January 21, 2014.