# JUNYOUNG PARK

AI System-on-Chip Engineer & Director

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## WORK EXPERIENCE

**UX Factory, Inc.** Aug. 2015 - Present

*Co-founder and Chief Executive Officier*

- Created a company that delivers the world's leading AI solutions derived from SW-SoC technology
- Participated in 6 government R&D projects for AI & SoC with major Korean fabless companies

**KAIST** Jan. 2015 - Aug. 2015

*Postdoctoral Fellow*

- SoC architecture exploration for Vision & Deep Learning in the hardware-software codesign methodology

**Samsung Mobile Processor Innovation Lab** Sep. 2014 - Dec. 2014

*Research Intern*

- Established a System-C TLM based simulator for early top-level system exploration in many-core SoCs

## EDUCATION

**Ph.D. in Electrical Engineering, KAIST** Aug. 2014

- Thesis: Energy-efficient Context-aware Real-Time Object Recognition Processor
- Designed and implemented an energy-efficient vision SoC for context-aware object recognition
  - presented and demonstrated at *IEEE International Solid-State Circuits Conference*

**M.S. in Electrical Engineering, KAIST** Feb. 2011

- Thesis: On-chip Learning Multi-class Support Vector Machine Processor
- Designed and implemented a traffic sign recognition SoC for advanced driver assistance system
  - published in *IEEE Journal of Solid-State Circuits*

**B.S. in Electrical Engineering, KAIST** Feb. 2009

- Graduated with *Summa Cum Laude*

## AWARDS AND INVITED TALKS

### Awards

- Kim Choong-Ki Scholarship Award for Outstanding Research Accomplishments Apr. 2013
- IEEE International Solid-State Circuits Conference Academic Demo Session Feb. 2013
- Intel/Analog Devices/Catalyst Foundation CICC Student Scholarship Award Sep. 2012
- Eun Jong-Kwan Scholarship Award for Honor of First Place M.S. Freshman Apr. 2009
- Korean Science & Technology Research Scholarship Award Feb. 2009 - Feb. 2011

### Invited Talks

- Bringing Deep Learning to the Edge, *Korea Institute of Science and Technology*, Dec., 2019.
- Technical Directions for the Next-generation AI, *Korea Educational Center of Future Technology*, Mar., 2019.
- Deep learning SW framework and ASIC for AI SoC, *Electronics and Telecommunications Research Institute.*, Sept., 2018.
- Embedded Deep Neural Network SoC, *Korea Electronics Technology Institute*, Sept., 2018.
- Embedded Deep Neural Network SoC, *Electronics and Telecommunications Research Institute*, Mar., 2017.
- Embedded Deep Neural Network SoC: deep learning to mobile devices, *Deep Neural Network SoC Workshop*, Aug., 2016.
- Low-power Pattern recognition SoC with bio-inspired architecture for intelligent cognitive service, *IEEE International Conference on Intelligent Robots and Systems (IROS) Workshops*, Sept., 2015.
- An energy-efficient SoC for real-time context-aware object recognition, *Samsung Research America*, Sept., 2014.
- An energy-efficient heterogeneous many-core processor for real-world object recognition, *Qualcomm*, Feb., 2013.

## PUBLICATIONS

### Journal Papers

- An Energy-Efficient Embedded Deep Neural Network Processor for High Speed Visual Attention in Mobile Vision Recognition SoC, *IEEE Journal of Solid-State Circuits, vol.PP, no.99, pp.1-9*, July. 2016.
  S. Park, I. Hong, **Junyoung Park**, and H.-J. Yoo.
- A 0.5 V 54 μW Ultra-Low-Power Object Matching Processor for Micro Air Vehicle Navigation, *IEEE Transactions on Circuits and Systems I: Regular Papers*, vol.63, no.3, pp.359-369, Mar. 2016.
  Y. Kim, I. Hong, **Junyoung Park**, H.-J. Yoo.
- An Energy-efficient and Scalable Deep Learning/Inference Processor With Tetra-Parallel MIMD Architecture for Big Data Applications, *IEEE Transactions on Biomedical Circuits and Systems*, vol.9, no.6, pp.838-848, Dec. 2015.
  S. Park, **Junyoung Park**, K. Bong, D. Shin, J. Lee, S. Choi, H.-J. Yoo.
- 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, Apr. 2015.
  K.J. Lee, G. Kim, **Junyoung Park**, and H.-J. Yoo.
- Intelligent Network-on-Chip With Online Reinforcement Learning for Portable HD Object Recognition Processor, *IEEE Transactions on Circuits and Systems I: Regular Papers*, vol.61, no.2, pp.476-484, Feb. 2014.
  **Junyoung Park**, I. Hong, G. Kim, B.-G. Nam, and H.-J. Yoo.
- A 320 mW 342 GOPS Real-Time Dynamic Object Recognition Processor for HD 720p Video Streams, *IEEE Journal of Solid-State Circuits*, vol.48, no.1, pp.33-45, Jan. 2013.
  J. Oh, G. Kim, **Junyoung Park**, I. Hong, S. Lee, J.-Y. Kim, J.-H. Woo, H.-J. Yoo.
- Low-Power, Real-Time Object-Recognition Processors for Mobile Vision Systems *IEEE Micro*, vol.32, no.6, pp.38-50, Nov.-Dec. 2012.
  J. Oh, G. Kim, I. Hong, **Junyoung Park**, S. Lee, J.-Y. Kim, J.-H. Woo, H.-J. Yoo.
- A 92-mW Real-Time Traffic Sign Recognition System With Robust Illumination Adaptation and Support Vector Machine, *IEEE Journal of Solid-State Circuits*, vol.47, no.11, pp.2711-2723, Nov. 2012.
  **Junyoung Park**, J. Kwon, J. Oh, S. Lee, J.-Y. Kim, and H.-J. Yoo.
- A 345 mW Heterogeneous Many-Core Processor With an Intelligent Inference Engine for Robust Object Recognition *IEEE Journal of Solid-State Circuits*, vol.46, no.1, pp.42-51, Jan. 2011.
  S. Lee, J. Oh, **Junyoung Park**, J. Kwon, M. Kim, H.-J. Yoo.
- A 118.4 GB/s Multi-Casting Network-on-Chip With Hierarchical Star-Ring Combined Topology for Real-Time Object Recognition, *IEEE Journal of Solid-State Circuits*, vol.45, no.7, pp.1399-1409, July 2010.
  J.-Y. Kim, **Junyoung Park**, S. Lee, M. Kim, J. Oh, and H.-J. Yoo.

## Conference Papers (First Authored Only - 25 Papers in Total)

- A High-throughput 16x Super Resolution Processor for Real-Time Object Recognition SoC, *IEEE European Solid-State Circuits Conference*, pp.259-262, 16-20 Sep. 2013.
  **Junyoung Park**, B.-G. Nam, H.-J. Yoo.
- A multi-granularity parallelism object recognition processor with content-aware fine-grained task scheduling, *IEEE Symposium on Low-Power and High-Speed Chips*, pp.1-3, 17-19 April 2013.
  **Junyoung Park**, I. Hong, G. Kim, Y. Kim, K. Lee, S. Park, K. Bong, H.-J. Yoo.
- A 646 GOPS/W Multi-classifier Many-core Processor with Cortex-like Architecture for Super-Resolution Recognition, *IEEE International Solid-State Circuits Conference*, Feb., 2013.
  **Junyoung Park**, I. Hong, G. Kim, Y. Kim, K. Lee, S. Park, K. Bong, and H.-J. Yoo.
- Online Reinforcement Learning NoC for Portable HD Object Recognition Processor, *IEEE Custom Integrated Circuits Conference*, Sep., 2012.
  **Junyoung Park**, I. Hong, G. Kim, J. Oh, S. Lee, H.-J. Yoo.
- A 92mW Real-Time Traffic Sign Recognition System with Robust Light and Dark Adaptation, *IEEE Asian Solid-state Circuit Conference*, Nov., 2011.
  **Junyoung Park**, J. Kwon, J. Oh, S. Lee, H.-J. Yoo.
- A 30fps Stereo Matching Processor Based on Belief Propagation with Disparity-Parallel PE Array Architecture, *IEEE International Symposium on Circuits and Systems*, Mar., 2010.
  **Junyoung Park**, S. Lee, H.-J. Yoo.

## Patents

- KR101638095 METHOD FOR PROVIDING USER INTERFACE THROUGH HEAD MOUNT DISPLAY BY USING GAZE RECOGNITION AND BIO-SIGNAL, AND DEVICE, AND COMPUTER-READABLE RECORDING MEDIA USING THE SAME
- KR101907028 Analog Digital Interfaced SRAM Structure
- KR101841744 Stereo Image Matching System integrated CMOS Image Sensor and Method thereof
- KR1020170184725 SRAM Structure for Supporting Transposed Read
- KR1020180009756 Low Power Face Recognition System using CMOS Image Sensor Integrated with a Face Detector
- KR101190000 SUPPORT VECTOR MACHINE PROCESSOR AND MEMORY MANAGEMENT METHOD THEREOF