

Yejoong Kim

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EDUCATION

Doctor of Philosophy, Electrical Engineering

University of Michigan, Ann Arbor, MI

May 2015

- Dissertation: Robust Circuit Design for Low-Voltage VLSI
- Advisor: Professor David T. Blaauw

Master of Science in Engineering, Electrical Engineering

University of Michigan, Ann Arbor, MI

May 2012

- Advisor: Professor David T. Blaauw
- GPA: 4.00/4.00

Bachelor of Science, Electrical and Electronic Engineering,

Yonsei University, Seoul, South Korea

February 2008

- *Highest Honors at Graduation (Summa Cum Laude)*
- GPA: 4.06/4.30 overall, 4.26/4.30 upper (4.30: A+, 4.00: A)
- Thesis: Robust High Voltage Generators for Flash Memory Applications (Advisor: Prof. Hongil Yoon)

PROFESSIONAL EXPERIENCE

CubeWorks Inc.

Vice President of Research and Development

Ann Arbor, MI, USA
September 2016 – *present*

- Start-up company specialized in mm³-scale sensor node platform
- Defining new system specifications and its requirements
- Have been designing 50+ modular IC chips for the sensor node system

College of Engineering, EECS, University of Michigan

Engineer in Research Senior

Ann Arbor, MI, USA
March 2020 – *present*

- Research on mm³-scale wireless sensor node platform
- Training doctoral students in IC chip design flow

Michigan Integrated Circuits Lab, University of Michigan

Research Fellow

Ann Arbor, MI, USA
March 2015 – February 2020

- Research on mm³-scale wireless sensor node platform
- Trained doctoral students in IC chip design flow

Michigan Integrated Circuits Lab, University of Michigan

Graduate Student Research Assistant (supervisor: Prof. David Blaauw) September 2010 – December 2014

Ann Arbor, MI, USA

- Conducted research on several projects including: low-power variation-resilient sequential circuit designs; ultra-low power SRAM designs for mm³-scale sensor node platform; robust wide-range level converter designs
- Designed 10+ IC chips in various technology nodes

Circuit Research Lab, Intel Labs, Intel Corp.

Graduate Technical Intern (supervisor: Dr. Ram Krishnamurthy)

Hillsboro, OR, USA
June – August 2014

- Conducted research on Network-on-Chip (NoC)
- Filed a U.S. patent, “Adaptively Switched Network-On-Chip,” as a result of the research

ARM Inc.

Research Intern (supervisor: Betina Hold)

- Conducted research on 7T SRAM Design
- Designed a test chip in 28nm technology

San Jose, CA, USA
September – December 2011**R&D Center, Innowireless Co., Ltd.**

Researcher

- Developed a Bluetooth testing suite

Seongnam, South Korea
December 2008 – June 2009**HONORS AND AWARDS****The 20th Samsung Humantech Paper Award** – Bronze Prize

February 2014

Samsung Electronics, South Korea

- With the paper titled “A Static Contention-Free Single-Phase-Clocked 24T Flip-Flop in 45nm for Low-Power Applications,” **Yejoong Kim**, Wanyeong Jung, Inhee Lee, David Blaauw

The 18th Samsung Humantech Paper Award – Silver Prize

February 2012

Samsung Electronics, South Korea

- With the paper titled “A Modular 1mm³ Die-Stacked Sensing Platform with Optical Communication and Multi-Modal Energy Harvesting,” Yoonmyung Lee, Gyouho Kim, Suyoung Bang, **Yejoong Kim**, Inhee Lee, David Blaauw

2011 MuSyC Annual Review Best Student Poster Award

November 2011

The Multiscale Systems Center and University of California, Berkeley, CA

- With the poster titled “A Modular 1mm³ Die-Stacked Sensing Platform,” Yoonmyung Lee, Gyouho Kim, Suyoung Bang, **Yejoong Kim**, Inhee Lee, Dennis Sylvester, David Blaauw

EECS413 (Monolithic Amplifier Circuits) Design Contest – 2nd Place

December 2010

University of Michigan, Ann Arbor, MI and Cirrus Logic Inc.

- Team project ranked in 2nd place with \$500 cash prize

EECS627 (VLSI Design II) Design Contest – 2nd Place

April 2010

University of Michigan, Ann Arbor, MI and Advanced Micro Devices (AMD) Inc.

- Team project ranked in 2nd place with \$800 cash prize

STX Scholarship

March – August 2008

STX Scholarship Foundation, South Korea

- One of 36 awardees, nationally

Highest Honors at Graduation

February 2008

Yonsei University, South Korea

- One of three awardees among 300+ graduates from EE department

Highest Honors

Yonsei University, South Korea

- One of three awardees among 300+ students in EE department
- Awarded in: February 2003; August 2003; February 2004; February 2008

STX Scholarship

March 2007 – February 2008

STX Scholarship Foundation, South Korea

- One of 26 awardees, nationally

PUBLICATIONS

Journal Papers

1. Li-Xuan Chuo, Zhen Feng, **Yejoong Kim**, Nikolaos Chiotellis, Makoto Yasuda, Satoru Miyoshi, Masaru Kawaminami, Anthony Grbic, David Wentzloff, David Blaauw, and Hun-Seok Kim, "Millimeter-Scale Node-to-Node Radio Using a Carrier Frequency-Interlocking IF Receiver for a Fully Integrated $4 \times 4 \times 4 \text{mm}^3$ Wireless Sensor Node," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 44, no. 5, pp. 1128-1138, May 2020.
2. Jeongsup Lee, Yiqun Zhang, Qing Dong, Wootae Lim, Mehdi Saligane, **Yejoong Kim**, Seokhyeon Jeong, Jongyup Lim, Makoto Yasuda, Satoru Miyoshi, Masaru Kawaminami, David Blaauw, and Dennis Sylvester, "A Self-Tuning IoT Processor Using Leakage-Ratio Measurement for Energy-Optimal Operation," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 55, no. 1, pp. 87-97, Jan. 2020.
3. Yimai Peng, Kyojin D. Choo, Sechang Oh, Inhee Lee, Taekwang Jang, **Yejoong Kim**, Jongyup Lim, David Blaauw, and Dennis Sylvester, "An Efficient Piezoelectric Energy Harvesting Interface Circuit Using a Sense-and-Set Rectifier," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 54, no. 12, pp. 3348-3361, Dec. 2019.
4. Sechang Oh, Minchang Cho, Zhan Shi, Jongyup Lim, **Yejoong Kim**, Seokhyeon Jeong, Yu Chen, Rohit Rothe, David Blaauw, Hun-Seok Kim, and Dennis Sylvester, "An Acoustic Signal Processing Chip With 142-nW Voice Activity Detection Using Mixer-Based Sequential Frequency Scanning and Neural Network Classification," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 54, no. 11, pp. 3005-3016, Nov. 2019.
5. Kyojin D. Choo, Li Xu, **Yejoong Kim**, Ji-Hwan Seol, Xiao Wu, Dennis Sylvester, and David Blaauw, "Energy-Efficient Motion-Triggered IoT CMOS Image Sensor With Capacitor Array-Assisted Charge-Injection SAR ADC," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 54, no. 11, pp. 2921-2931, Nov. 2019.
6. Qing Dong, Supreet Jeloka, Mehdi Saligane, **Yejoong Kim**, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, Makoto Yasuda, David Blaauw, and Dennis Sylvester, "A 4+2T SRAM for Searching and In-Memory Computing with 0.3V VDDmin," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 53, no. 4, pp. 1006-1015, Apr. 2018.
7. Taekwang Jang, Gyouho Kim, Benjamin Kempke, Michael B. Henry, Nikolaos Chiotellis, Carl Pfeiffer, Dongkwun Kim, **Yejoong Kim**, Zhiyoong Foo, Hyeongseok Kim, Anthony Grbic, Dennis Sylvester, Hun-Seok Kim, David D. Wentzloff, and David Blaauw, "Circuit and System Designs of Ultra-Low Power Sensor Nodes with Illustration in a Miniaturized GNSS Logger for Position Tracking: Part I - Analog Circuit Techniques," *IEEE Transactions on Circuits and Systems I*, vol. 64, no. 9, pp. 2237-2249, Sep. 2017.
8. Taekwang Jang, Gyouho Kim, Benjamin Kempke, Michael B. Henry, Nikolaos Chiotellis, Carl Pfeiffer, Dongkwun Kim, **Yejoong Kim**, Zhiyoong Foo, Hyeongseok Kim, Anthony Grbic, Dennis Sylvester, Hun-Seok Kim, David D. Wentzloff, and David Blaauw, "Circuit and System Designs of Ultra-Low Power Sensor Nodes with Illustration in a Miniaturized GNSS Logger for Position Tracking: Part II - Data Communication, Energy Harvesting, Power Management, and Digital Circuits," *IEEE Transactions on Circuits and Systems I*, vol. 64, no. 9, pp. 2250-2262, Sep. 2017.
9. Dongsuk Jeon, Qing Dong, **Yejoong Kim**, Xiaolong Wang, Shuai Chen, Hao Yu, David Blaauw, and Dennis Sylvester, "A 23-mW Face Recognition Processor with Mostly-Read 5T Memory in 40-nm CMOS," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 52, no. 6, pp. 1628-1642, Jun. 2017.
10. Inhee Lee, Ye-Sheng Kuo, Pat Pannuto, Gyouho Kim, Zhiyoong Foo, Ben Kempke, Seokhyeon Jeong, **Yejoong Kim**, Prabal Dutta, David Blaauw, and Yoonmyung Lee, "MBus: A Fully Synthesizable Low-Power Portable Interconnect Bus for Millimeter-Scale Sensor Systems," *Journal of Semiconductor Technology and Science*, vol. 16, no. 6, pp. 745-753, Dec. 2016.
11. Sechang Oh, Yoonmyung Lee, Jingcheng Wang, Zhiyoong Foo, **Yejoong Kim**, Wanyeong Jung, Ziyun Li, David Blaauw, and Dennis Sylvester, "A Dual-Slope Capacitance-to-Digital Converter Integrated in an Implantable Pressure-Sensing System," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 50, no. 7, pp. 1581-1591, Jul. 2015.
12. Inhee Lee, Gyouho Kim, Suyoung Bang, Adriane Wolfe, Richard Bell, Seokhyeon Jeong, **Yejoong Kim**, Jeffrey Kagan, Meriah Arias-Thode, Bart Chadwick, Dennis Sylvester, David Blaauw, and

- Yoonmyung Lee, "System-On-Mud: Ultra-Low Power Oceanic Sensing Platform Powered by Small-Scale Benthic Microbial Fuel Cells," *IEEE Transactions on Circuits and Systems I*, vol. 62, no. 4, pp. 1126-1135, Apr. 2015.
13. Yen-Po Chen, Dongsuk Jeon, Yoonmyung Lee, **Yejoong Kim**, Zhiyoong Foo, Inhee Lee, Nicholas B. Langhals, Grant Kruger, Hakan Oral, Omer Berenfeld, Zhengya Zhang, David Blaauw, and Dennis Sylvester, "An Injectable 64nW ECG Mixed-Signal SoC in 65nm for Arrhythmia Monitoring," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 50, no. 1, pp. 375-390, Jan. 2015.
 14. Dongsuk Jeon, Michael B. Henry, **Yejoong Kim**, Inhee Lee, Zhengya Zhang, David Blaauw, and Dennis Sylvester, "An Energy Efficient Full-Frame Feature Extraction Accelerator with Shift-Latch FIFO in 28nm CMOS," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 49, no. 5, pp. 1271-1284, May 2014.
 15. Mohammad Hassan Ghaed, Gregory Chen, Razi-Ul Haque, Michael Wiecekowsi, **Yejoong Kim**, Gyouho Kim, Yoonmyung Lee, Inhee Lee, David Fick, Daeyeon Kim, Mingoo Seok, Kensall Wise, David Blaauw, and Dennis Sylvester, "Circuits for a Cubic-Millimeter Energy-Autonomous Wireless Intraocular Pressure Monitor," *IEEE Transactions on Circuits and Systems I*, vol. 60, no. 12, pp. 3152-3162, Dec. 2013.
 16. Yoonmyung Lee, Dongmin Yoon, **Yejoong Kim**, David Blaauw, and Dennis Sylvester, "Circuit and System Design Guidelines for Ultra-Low Power Sensor Nodes," *IPSSJ Transactions on System LSI Design Methodology (TSLDM)*, Feb. 2013, invited paper.
 17. Matthew Fojtik, David Fick, **Yejoong Kim**, Nathaniel Pinckney, David Harris, David Blaauw, and Dennis Sylvester, "Bubble Razor: Eliminating Timing Margins in an ARM Cortex[®]-M3 Processor in 45nm CMOS Using Architecturally Independent Error Detection and Correction," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 48, no. 1, pp. 66-81, Jan. 2013.
 18. Yoonmyung Lee, Suyoung Bang, Inhee Lee, **Yejoong Kim**, Gyouho Kim, Mohammad Hassan Ghaed, Pat Pannuto, Prabal Dutta, Dennis Sylvester, and David Blaauw, "A Modular 1mm³ Die-Stacked Sensing Platform with Low-Power I²C Inter-Die Communication and Multi-Modal Energy Harvesting," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 48, no. 1, pp. 229-243, Jan. 2013.

Conference Papers

1. Jeongsup Lee, **Yejoong Kim**, Minchang Cho, Makoto Yasuda, Satoru Miyoshi, Masaru Kawaminami, David Blaauw, and Dennis Sylvester, "A μ Processor Layer for mm-Scale Die-Stacked Sensing Platforms Featuring Ultra-Low Power Sleep Mode at 125°C," *IEEE Asian Solid-State Circuits Conference (A-SSCC)*, 2020, accepted for publication.
2. Zhen Feng, Li-Xuan Chuo, Yao Shi, **Yejoong Kim**, Hun-Seok Kim, and David Blaauw, "A mm-Scale Sensor Node with 2.7GHz 1.3 μ W Transceiver Using Full-Duplex Self-Coherent Backscattering Protocol Achieving 3.5m Range," *IEEE Radio Frequency Integrated Circuits Symposium (RFIC) Dig. Tech. Papers*, 2020, accepted for publication.
3. Seok Hyeon Jeong, **Yejoong Kim**, Gyouho Kim, and David Blaauw, "A Pressure Sensing System with ± 0.75 mmHg (3σ) Inaccuracy for Battery-Powered Low Power IoT Applications," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, Jun. 2020.
4. Inhee Lee, E. Moon, **Yejoong Kim**, Jamie Phillips, and David Blaauw, "A 10mm³ Light-Dose Sensing IoT² System with 35-to-339nW 10-to-300klx Light-Dose-to-Digital Converter," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 180-181, Jun. 2019.
5. Taewook Kang, Inhee Lee, Sechang Oh, Taekwang Jang, **Yejoong Kim**, Hyochan Ahn, Gyouho Kim, Se-Un Shin, Seokhyeon Jeong, Dennis Sylvester, and David Blaauw, "A 1.7 \times 4.1 \times 2mm³ Fully Integrated pH Sensor for Implantable Applications using Differential Sensing and Drift Compensation," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 310-311, Jun. 2019.
6. Li-Xuan Chuo, **Yejoong Kim**, Nikolaos Chiotellis, Makoto Yasuda, Satoru Miyoshi, Masaru Kawaminami, Anthony Grbic, David Wentzloff, Hun-Seok Kim, and David Blaauw, "A 4 \times 4 \times 4-mm³ Fully Integrated Sensor-to-Sensor Radio using Carrier Frequency Interlocking IF Receiver with -94 dBm Sensitivity," *IEEE Radio Frequency Integrated Circuits Symposium (RFIC) Dig. Tech. Papers*, pp. 263-266, Jun. 2019.

7. Sechang Oh, Minchang Cho, Xiao Wu, **Yejoong Kim**, Li-Xuan Chuo, Wootae Lim, Pat Pannuto, Suyoung Bang, Kaiyuan Yang, Hun-Seok Kim, Dennis Sylvester, and David Blaauw, "IoT² – the Internet of Tiny Things: Realizing mm-Scale Sensors through 3D Die Stacking," *Proc. Design, Automation, and Test in Europe Conference & Exhibition (DATE)*, pp. 686-691, Mar. 2019.
8. Kyojin D. Choo, Li Xu, **Yejoong Kim**, Ji-Hwan Seol, Xiao Wu, Dennis Sylvester, and David Blaauw, "Energy-Efficient Low-Noise CMOS Image Sensor with Capacitor Array-Assisted Charge-Injection SAR ADC for Motion-Triggered Low-Power IoT Applications," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 96-98, Feb. 2019.
9. Minchang Cho, Sechang Oh, Zhan Shi, Jongyup Lim, **Yejoong Kim**, Seokhyeon Jeong, Yu Chen, David Blaauw, Hun-Seok Kim, and Dennis Sylvester, "A 142nW Voice and Acoustic Activity Detection Chip for mm-Scale Sensor Nodes Using Time-Interleaved Mixer-Based Frequency Scanning," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 278-280, Feb. 2019.
10. Jeongsup Lee, Yiqun Zhang, Qing Dong, Wootae Lim, Mehdi Saligane, **Yejoong Kim**, Seokhyeon Jeong, Jongyup Lim, Makoto Yasuda, Satoru Miyoshi, Masaru Kawaminami, David Blaauw, and Dennis Sylvester, "A 6.4pJ/cycle Self-Tuning Cortex-M0 IoT Processor Based on Leakage-Ratio Measurement for Energy-Optimal Operation Across Wide-Range PVT Variation," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 314-315, Feb. 2019.
11. Yimai Peng, David Kyojin Choo, Sechang Oh, Inhee Lee, Taekwang Jang, **Yejoong Kim**, Jongyup Lim, David Blaauw, and Dennis Sylvester, "An Adiabatic Sense and Set Rectifier for Improved Maximum-Power-Point Tracking in Piezoelectric Harvesting with 541% Energy Extraction Gain," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 422-424, Feb. 2019.
12. Sechang Oh, Yao Shi, Gyouho Kim, **Yejoong Kim**, Taekwang Jang, Seokhyeon Jeong, Dennis Sylvester, and David Blaauw, "A 2.5nJ Duty-Cycled Bridge-to-Digital Converter Integrated in a 13mm³ Pressure-Sensing System," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 328-329, Feb. 2018.
13. Minchang Cho, Sechang Oh, Seokhyeon Jeong, Yiqun Zhang, Inhee Lee, **Yejoong Kim**, Li-Xuan Chuo, Dongkwun Kim, Qing Dong, Yen-Po Chen, Martin Lim, Mike Daneman, David Blaauw, Dennis Sylvester, and Hun-Seok Kim, "A 6×5×4mm³ General Purpose Audio Sensor Node with a 4.7μW Audio Processing IC," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 312-313, Jun. 2017.
14. Qing Dong, Supreet Jeloka, Mehdi Saligane, **Yejoong Kim**, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, David Blaauw, and Dennis Sylvester, "A 0.3V VDDmin 4+2T SRAM for Searching and In-Memory Computing Using 55nm DDC Technology," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 160-161, Jun. 2017.
15. Suyoung Bang, Jingcheng Wang, Ziyun Li, Cao Gao, **Yejoong Kim**, Qing Dong, Yen-Po Chen, Laura Fick, Xun Sun, Ron Dreslinski, Trevor Mudge, Hun Seok Kim, David Blaauw, and Dennis Sylvester, "A 288μW Programmable Deep-Learning Processor with 270kB On-chip Weight Storage Using Non-Uniform Memory Hierarchy for Mobile Intelligence," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 250-251, Feb. 2017.
16. Qing Dong, **Yejoong Kim**, Inhee Lee, Myungjoon Choi, Ziyun Li, Jingcheng Wang, Kaiyuan Yang, Yen-Po Chen, Junjie Dong, Minchang Cho, Gyouho Kim, Yun-Sheng Chen, Yu-Der Chih, David Blaauw, and Dennis Sylvester, "A 1Mb Embedded NOR Flash Memory with 39μW Program Power for mm-Scale High-Temperature Sensor Nodes," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 198-199, Feb. 2017.
17. Li-Xuan Chuo, Yao Shi, Zhihong Luo, Nikolaos Chiotellis, Zhiyong Foo, Gyouho Kim, **Yejoong Kim**, Anthony Grbic, David Wentzloff, Hun Seok Kim, and David Blaauw, "A 915MHz Asymmetric Radio Using Q-Enhanced Amplifier for a Fully Integrated 3×3×3mm³ Wireless Sensor Node with 20m Non-Line-of-Sight Communication," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 132-133, Feb. 2017.
18. Skylar Skrzyniarz, Laura Fick, Jinal Shah, **Yejoong Kim**, Dennis Sylvester, David Blaauw, David Fick, and Michael Henry, "A 36.8 2b-TOPS/W Self-Calibrating GPS Accelerator Implemented Using

- Analog Calculation in 65nm LP CMOS,” *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 420-421, Feb. 2016.
19. Inhee Lee, Wanyeong Jung, Hyunsoo Ha, Seokhyeon Jeong, **Yejoong Kim**, Gyouho Kim, Zhiyoong Foo, Jae-Yoon Sim, Dennis Sylvester, and David Blaauw, “An Ultra-Low-Power Biomedical Chip for Injectable Pressure Monitor,” *Proc. IEEE Biomedical Circuits and Systems Conference (BioCAS)*, pp. 1-4, Oct. 2015.
 20. Taekwang Jang, Seokhyeon Jeong, Myungjoon Choi, Wanyeong Jung, Gyouho Kim, Yen-Po Chen, **Yejoong Kim**, Wootae Lim, Dennis Sylvester, and David Blaauw, “FOCUS: Key Building Blocks and Integration Strategy of a Miniaturized Wireless Sensor Node,” *Proc. 41st European Solid-State Circuits Conference (ESSCIRC)*, pp. 257-262, Sep. 2015.
 21. Dongsuk Jeon, Qing Dong, **Yejoong Kim**, Xiaolong Wang, Shuai Chen, Hao Yu, David Blaauw, and Dennis Sylvester, “A 23mW Face Recognition Accelerator in 40nm CMOS with Mostly-Read 5T Memory,” *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 48-49, Jun. 2015.
 22. Seokhyeon Jeong, Gyouho Kim, **Yejoong Kim**, Wanyeong Jung, David Blaauw, and Dennis Sylvester, “Ultra-Low Power Circuit Techniques for Miniaturized Sensor Nodes,” *Proc. IEEE International Conference on Electron Devices and Solid-State Circuits (EDSSC)*, pp. 170-173, Jun. 2015.
 23. Sechang Oh, Yoonmyung Lee, Jingcheng Wang, Zhiyoong Foo, **Yejoong Kim**, David Blaauw, and Dennis Sylvester, “Dual-Slope Capacitance to Digital Converter Integrated in an Implantable Pressure Sensing System,” *Proc. 40th European Solid-State Circuits Conference (ESSCIRC)*, pp. 295-298, Sep. 2014.
 24. Inhee Lee, **Yejoong Kim**, Suyoung Bang, Gyouho Kim, Hyunsoo Ha, Yen-Po Chen, Dongsuk Jeon, Seokhyeon Jeong, Wanyeong Jung, Mohammad Hassan Ghaed, Zhiyoong Foo, Yoonmyung Lee, Jae-Yoon Sim, Dennis Sylvester, and David Blaauw, “Circuit Techniques for Miniaturized Biomedical Sensors,” *IEEE Custom Integrated Circuits Conference (CICC) Dig. Tech. Papers*, Sep. 2014, invited paper.
 25. Gyouho Kim, Yoonmyung Lee, Zhiyoong Foo, Patrick Pannuto, Ye-Sheng Kuo, Benjamin Kempke, Mohammad Hassan Ghaed, Suyoung Bang, Inhee Lee, **Yejoong Kim**, Seokhyeon Jeong, Dennis Sylvester, and David Blaauw, “A Millimeter-scale Wireless Imaging System with Continuous Motion Detection and Energy Harvesting,” *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 178-179, Jun. 2014.
 26. David Blaauw, Dennis Sylvester, Prabal Dutta, Yoonmyung Lee, Inhee Lee, Sechang Bang, **Yejoong Kim**, Gyouho Kim, Pat Pannuto, Ye-Sheng Kuo, Dongmin Yoon, Wanyeong Jung, Zhi Yoong Foo, Yen-Po Chen, Seok Hyeon Jeong, and Myungjoon Choi, “IoT Design Space Challenges: Circuits and Systems,” *IEEE Symposium on VLSI Technology Dig. Tech. Papers*, pp. 1-2, Jun. 2014.
 27. Gyouho Kim, Adriane Wolfe, Richard Bell, Suyoung Bang, Yoonmyung Lee, Inhee Lee, **Yejoong Kim**, Lewis Hsu, Jeffrey Kagan, Meriah Arias-Thode, Bart Chadwick, Dennis Sylvester, and David Blaauw, “Chip-On-Mud: Ultra-Low Power ARM-Based Oceanic Sensing System Powered by Small-Scale Benthic Microbial Fuel Cells,” *IEEE International Symposium on Circuits and Systems (ISCAS) Dig. Tech. Papers*, pp. 1985-1988, Jun. 2014.
 28. **Yejoong Kim**, Wanyeong Jung, Inhee Lee, Qing Dong, Michael Henry, Dennis Sylvester, and David Blaauw, “A Static Contention-Free Single-Phase-Clocked 24T Flip-Flop in 45nm for Low Power Applications,” *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 466-467, Feb. 2014.
 29. Dongsuk Jeon, Yen-Po Chen, Yoonmyung Lee, **Yejoong Kim**, Zhiyoong Foo, Grant Kruger, Hakan Oral, Omer Berenfeld, Zhengya Zhang, David Blaauw, and Dennis Sylvester, “An Implantable 64nW ECG Monitoring Mixed-Signal SoC for Arrhythmia Diagnosis,” *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 416-417, 2014.
 30. Dongsuk Jeon, **Yejoong Kim**, Inhee Lee, Zhengya Zhang, David Blaauw, and Dennis Sylvester, “A Low-Power VGA Full-Frame Feature Extraction Processor,” *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) Dig. Tech. Papers*, pp. 2726-2730, May 2013.

31. Suyoung Bang, Yoonmyung Lee, Inhee Lee, **Yejoong Kim**, Gyouho Kim, David Blaauw, and Dennis Sylvester, "A Fully Integrated Switched-Capacitor Based PMU with Adaptive Energy Harvesting Technique for Ultra-Low Power Sensing Applications," *IEEE International Symposium on Circuits and Systems (ISCAS) Dig. Tech. Papers*, pp. 709-712, May 2013.
32. Dongsuk Jeon, **Yejoong Kim**, Inhee Lee, Zhengya Zhang, David Blaauw, and Dennis Sylvester, "A 470mV 2.7mW Feature Extraction Accelerator for Micro Autonomous Vehicle Navigation in 28nm CMOS," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, 2013, pp. 166-167, Feb. 2013.
33. David Blaauw, Dennis Sylvester, Yoonmyung Lee, Inhee Lee, Suyoung Bang, **Yejoong Kim**, Gyouho Kim, and Mohammad Hassan Ghaed, "From Digital Processors to Analog Building Blocks: Enabling New Applications through Ultra-Low Voltage Design," *Proc. IEEE Subthreshold Microelectronics Conference (SubVT)*, pp. 1-1, Oct. 2012.
34. **Yejoong Kim**, Yoonmyung Lee, Dennis Sylvester, and David Blaauw, "SLC: Split-Control Level Converter for Dense and Stable Wide-Range Voltage Conversion," *Proc. 38th European Solid-State Circuits Conference (ESSCIRC)*, pp. 478-481, Sep. 2012.
35. Gyouho Kim, Yoonmyung Lee, Suyoung Bang, Inhee Lee, **Yejoong Kim**, Dennis Sylvester, and David Blaauw, "A 695pW Standby Power Optical Wake-up Receiver for Wireless Sensor Nodes," *IEEE Custom Integrated Circuits Conference (CICC) Dig. Tech. Papers*, pp. 1-4, Sep. 2012.
36. Yoonmyung Lee, **Yejoong Kim**, Dongmin Yoon, David Blaauw, and Dennis Sylvester, "Circuit and System Design Guidelines for Ultra-Low Power Sensor Nodes," *Proc. 49th Annual Design Automation Conference (DAC)*, pp. 1037-1042, Jun. 2012, invited paper.
37. Inhee Lee, Suyoung Bang, Yoonmyung Lee, **Yejoong Kim**, Gyouho Kim, Dennis Sylvester, and David Blaauw, "A 635pW Battery Voltage Supervisory Circuit for Miniature Sensor Nodes," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 202-203, Jun. 2012.
38. Yoonmyung Lee, Gyouho Kim, Suyoung Bang, **Yejoong Kim**, Inhee Lee, Prabal Dutta, Dennis Sylvester, and David Blaauw, "A Modular 1mm³ Die-Stacked Sensing Platform with Optical Communication and Multi-Modal Energy Harvesting," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 402-403, Feb. 2012.
39. Matthew Fojtik, David Fick, **Yejoong Kim**, Nathaniel Pinckney, David Harris, David Blaauw, and Dennis Sylvester, "Bubble Razor: An Architecture Independent Approach to Timing Error Detection and Correction," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 488-489, Feb. 2012.
40. **Yejoong Kim**, Dennis Sylvester, and David Blaauw, "LC²: Limited Contention Level Converter for Robust Wide-Range Voltage Conversion," *IEEE Symposium on VLSI Circuits Dig. Tech. Papers*, pp. 188-189, Jun. 2011.
41. Chia-Hsiang Chen, **Yejoong Kim**, Zhengya Zhang, David Blaauw, Dennis Sylvester, Helia Naeimi, and Sumeet Sandhu, "A Confidence-Driven Model for Error-Resilient Computing," *Proc. Design, Automation, and Test in Europe Conference (DATE)*, pp. 1-6, Mar. 2011.
42. Gregory Chen, Mohammad Hassan Ghaed, Razi-Ul Haque, Michael Wieckowski, **Yejoong Kim**, Gyouho Kim, David Fick, Daeyeon Kim, Mingoo Seok, Kensall Wise, David Blaauw, and Dennis Sylvester, "A 1 Cubic Millimeter Energy-Autonomous Wireless Intraocular Pressure Monitor," *IEEE International Solid-State Circuits Conference (ISSCC) Dig. Tech. Papers*, pp. 310-311, Feb. 2011.

PATENTS

1. Gregory K. Chen, Mark A. Anders, Himanshu Kaul, Ram K. Krishnamurthy, **Yejoong Kim**, "Adaptively Switched Network-On-Chip"
 - US Patent No 9,961,019 (May 1, 2018)
 - European Patent No. 3238391 (June 17, 2020)
 - Chinese Patent No. 107113254 (pending)

- WIPO Patent No. 2016/105816 (pending)
- 2. **Yejoong Kim**, Dennis Michael Sylvester, David Theodore Blaauw, Brian Tracy Cline, “Measurement Circuitry and Method for Measuring a Clock Node to Output Node Delay of a Flip-Flop”
 - US Patent No. 9,638,752 (May 2, 2017)
- 3. **Yejoong Kim**, Michael Brewer Henry, Dennis Michael Sylvester, David Theodore Blaauw, “Static Signal Value Storage Circuitry Using a Single Clock Signal”
 - US Patent No. 9,065,431 (June 23, 2015)
 - Chinese Patent No. 104104366 (April 12, 2019)
 - Korean Patent No. 10-2143359 (August 5, 2020)
 - Taiwanese Patent No. I596903 (August 21, 2017)

IC CHIP DESIGN EXPERIENCE

This list only includes projects where all or significant part of the work was done by myself.

GlobalFoundries 14nm FinFET

- Low-power variation-resilient sequential circuits and level shifter designs (co-worked with Boeing for the chip fabrication), Mar. 2016.

TSMC 28nm CMOS

- New 7T SRAM designs with a new Auto-Shut-Off sensing scheme (co-worked with ARM for the chip fabrication), Mar. 2012.

IBM 32nm SOI

- A GPS-logging chip utilizing a new current-based correlator bank, Aug. 2013.

IBM 45nm SOI

- 2 chips (in 2 MPW runs) for low-power variation-resilient sequential elements with on-chip testing harness, in Jan. 2013 – Jan. 2014.

USJC 55nm DDC (Former Mie Fujitsu Semiconductor)

- 3 chips (in 2 MPW runs) ranging from processors and memories to a node-to-node radio for mm³-scale sensor node platform, in May 2018 – Nov. 2019.

IBM 65nm CMOS

- A custom 8T SRAM chip for mm³-scale sensor node platform, Feb. 2011.

TowerJazz 65nm CIS

- A VGA image sensor chip with a dedicated on-chip processor and instruction memory, Nov. 2017.

TSMC 90nm CMOS

- 14 chips (in 4 MPW runs) mostly for various kinds of embedded Flash memory chips and controllers for mm³-scale sensor node platforms, in Jan. 2015 – Sep. 2017.

IBM 130nm CMOS

- New level-shifter circuits for wide-range voltage conversion, including sub-threshold to I/O voltage, and its on-chip measurement circuit, Feb. 2010.

TSMC 180nm CMOS

- 77 chips (in 4 MLM runs and 17 MPW runs) ranging from processors and memories to analog sensor and power management, mostly for mm³-scale sensor node platform, in Jun. 2010 – Aug. 2020.

BACKGROUND AND SKILLS

Programming and CAD Tools

- VLSI design flow in Cadence including Virtuoso, Innovus, Liberate, NC-Verilog, Ultrasim
- VLSI design flow in Synopsys including VCS, Design Compiler, Hspice, Finesim, CustomSim, NCX, Primitime
- Verilog, System Verilog, SystemC, C/C++, Matlab, LabVIEW, Perl, Python, Tcl

Languages

- Korean: Native
- English: Fluent

Military Service

Seargent, Capital Corps, Republic of Korea Army, Anyang, South Korea

June 2004 – June 2006