

Mingoo Seok

Assistant Professor

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Professional Experience

- **Columbia University at the City of New York** New York, NY
Assistant Professor *Jan.2012 - present*
 - Department of Electrical Engineering
- **Systems and Applications R&D Center, Texas Instruments** Dallas, TX
Member of Technical Staff *Jan.2011 - Nov.2011*
 - Signal processing VLSI design department
- **Design Automation Lab, EECS, University of Michigan** Ann Arbor, US
Research Assistant *Jan.2006 - Dec.2010*
 - Investigate ultra-low power CMOS integrated circuit and system designs

Educations

- **University of Michigan** Ann Arbor, MI, US
MS and Ph.D. in Electrical Engineering *Sep. 2005 - Dec. 2010*
 - Advisor: Dennis Sylvester (co-advised by David Blaauw)
 - Thesis title: *Extreme Power-Constrained IC Design*
- **Seoul National University** Seoul, South Korea
Bachelor of Science in Electrical Engineering *Mar. 1998 - Aug. 2005*
 - *summa cum laude*
- **Seoul Science High School** Seoul, South Korea
School for gifted students in science and mathematics *Mar. 1995 - Feb. 1998*
 - *summa cum laude*

Research Interest

- Variation, thermal, aging, and energy adaptive circuits, architecture, and self-testing frameworks
- Ultra-low-energy hardware design for biomedical devices, brain-machine-interface, wearable electronics, and Internet of Things
- Non-conventional hardware design; hybrid-analog-and-digital computing and event-driven computing
- Machine-learning algorithm and hardware design based on data-mining and neuromorphic approaches

Honors and Awards

- **Wei Family Private Foundation Scholarship**, awarded for Zhewei Jiang's PhD study in Seok's research group, 2015
- **NSF CAREER Award**, 2015
- **AMD/CICC Student Scholarship Award** - Awarded for "A 0.5V 2.2pW 2-Transistor Voltage Reference", US, Aug. 2009

- **DAC/ISSCC Student Design Contest** - Awarded for "Phoenix: an Ultra-Low Power Processor for Cubic Millimeter Sensor Systems", US, Feb. 2009
- **Rackham Pre-doctoral Fellowship** - One of three recipients in the EECS department, University of Michigan, Ann Arbor, US, Sep.2008-Aug. 2009
- **Doctoral Study Abroad Fellowship** - One of 15 recipients, nationally, Korea Foundation for Advanced Studies, South Korea, Sep.2005-Aug. 2007
- **Excellency Fellowship** - Seoul National University, South Korea, Mar.1998-Mar.2001
- **Distinguished Undergraduate Scholarship** - One of 20 recipients, nationally, Korea Foundation for Advanced Studies, South Korea, Sep. 1999 - Feb. 2002

Professional Services

- Journal Editors
 - Associate Editor - IEEE Transactions on Circuits and Systems I: Regular Papers, 2014-present
 - Associate Editor - IEEE Transactions on Very Large Scale Integration (VLSI) Systems, 2015-present
- Technical Society Services
 - Treasure, IEEE New York Section EDS/SSCS Chapter, 2016-present
 - Organizer, Columbia Integrated System Laboratory (CISL) Seminar Series, 2013-present
 - Chair, IEEE New York Section EDS/SSCS Chapter, 2014-2015
 - Vice Chair, IEEE New York Section EDS/SSCS Chapter, 2012-2013
- Conference Organization Committee
 - Tutorial Chair on Energy-Efficient Computing for the Internet of Things - IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S), 2016
 - Registration Co-Chair - IEEE International Conference on Computer Design (ICCD), 2015
 - Student Design Contest Co-Chair - ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), 2013-2014
- Conference Technical Program Committee (TPC) Track-Chairs and Members
 - TPC track co-chair: digital circuits and technology - ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), 2015
 - TPC member: digital circuits and technology - ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), 2013-2015
 - TPC member: subthreshold circuits - IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S), 2014-2015
 - TPC member: digital design - IEEE International Conference on Computer Design (ICCD), 2013 and 2015
 - TPC member: digital design - IEEE/ACM International Conference on VLSI Design (VLSID), 2013 and 2016
- Workshop Organizations
 - IEEE SSCS Distinguished Lecture Tour: Half-Day Colloquium on the Recent Advances in RF, Mixed-Signal, and Digital IC designs; Organize; sponsored by IEEE EDS/SSCS and Columbia University; Dec. 4, 2015
 - IEEE SSCS Distinguished Lecture Tour: Half-Day Colloquium on the Recent Advances in RF, Mixed-Signal, and Digital IC designs; Organize; sponsored by IEEE EDS/SSCS and Columbia University; Oct. 17, 2014

- Full-day Workshop on Engineering and Applied Science; Co-organize with Prof. Javad Lavaei, Prof. Christine P. Fleming, and Prof. Shiho Kawashima; Sponsored by Johns Hopkins Center for Talented Youth and Columbia SEAS Outreach Office; Sep. 20, 2014
- Workshop on Connected, Autonomously Powered Systems; A one-day in-depth discussion of the issues required to address the challenge of bringing energy harvesting, wireless communication, and self-powered systems to market; Co-Organize with Prof. John Kymissis and Prof. Harish Krishinawamy; sponsored by IEEE EDS/SSCS and Columbia University; Apr. 11 2014
- Grant Panel Participation
 - National Science Foundation
- Journal and Conference Paper Reviewers
 - *IEEE Journal of Solid-State Circuits, IEEE Transactions on Very Large Scale Integration Systems, IEEE Transactions on Circuits and System I and II, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, and many others*

Teaching

- EECS 6321 Advanced Digital Electronic Circuits
 - Newly created after more than 10 years of the absence in the department curricula
 - Spring 2015, Spring 2014, Spring 2013, Spring 2012
- ELEN 6920 Topics in VLSI Systems Design – VLSI Architecture for Digital Signal Processing and Machine Learning
 - Newly created
 - Fall 2014, Fall 2015

Invited Talks and Presentations

- Korea Institute of Energy Technology Evaluation and Planning, Ultra-Low-Energy Microsystems for the Internet of Things Era, Nov., 2015
- Columbia University Outreach Office and Seoul Science High School, Introduction to Modern Integrated Circuit Design, Oct., 2015
- Intel, Circuit Research Lab, Hillsboro OR, Tackling Variability Challenge in VLSI Circuits, Apr. 2015
- Columbia University, New York NY, Engineering Exploration Experience (EEE) by Society of Women Engineers (SWE), Mar. 2015
- University of Texas, Austin TX, Tackling Variability Challenge in VLSI Circuits, Jan. 2015
- Columbia University Outreach Office and Seoul Science High School, Introduction to Modern Integrated Circuit Design, Oct., 2014
- International Symposium on New Frontiers in Scientific Innovation (Organized by Korea Foundation of Advanced Studies (KFAS) and Chosun Ilbo), Seoul, Energy-Efficient Integrated Circuits and Systems for Emerging Applications, Jul. 2014, *more than 5,000 RSVPs*
- Seoul National University, Seoul, Advances in Energy-Efficient and Variation-Tolerant Integrated Circuits & Systems Design, Jul. 2014
- Korea Advanced Institute of Science and Technology, Daejeon, Advances in Energy-Efficient and Variation-Tolerant Integrated Circuits & Systems Design, Jul. 2014
- Samsung Electronics, System LSI, Hwaseong, Advances in Energy-Efficient and Variation-Tolerant Integrated Circuits & Systems Design, Jul. 2014

- SK-Hynix, Icheon, Advances in Energy-Efficient and Variation-Tolerant Integrated Circuits & Systems Design, Jul. 2014
- IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S), Monterey CA, "Parallelism and Pipelining in Ultra-Low Voltage Digital Circuits," Oct. 2013
- Columbia University Outreach Office and Seoul Science High School, Introduction to Engineering, Oct. 2013
- International Conference on IC Design and Technology (ICICDT), Austin TX, Extending Energy-Saving Voltage Scaling in Ultra Low Voltage Integrated Circuit Designs, May 2012
- Polytechnic Institute of New York University, Brooklyn NY, The Next Class of Computing: Millimeter-Scale," Nanoelectronic Devices for Defense and Security Conference, Aug. 2011
- Faculty Candidate Talks, University of Southern California, Columbia University, University of Washington at Seattle, Extremely Energy Efficient Circuit and System Design for Millimeter-Scale Medical Devices, Mar. 2011
- Job Talks, IBM TJ Watson Research Center, Intel Advanced Technology Development, AMD Research and Advanced Development Labs, Oracle Sun Lab, Texas Instruments Systems and Applications R&D Center, Extreme-Power Constrained Integrated Circuit Design, Jul.-Nov., 2010

Patents

Patents (issued: 2, filed: 4, provisional filed: 0)

- Seongjong Kim, Mingoo Seok, "Circuits for Temperature Sensors," patent filed, 2015
- Mingoo Seok, Jiangyi Li, "Circuits for Physically Unclonable Function," patent filed, 2015
- Mingoo Seok, Peter Kinget, Teng Yang, "In-Situ Techniques for In-Field Sensing of NBTI Degradation in an SRAM Register File," patent filed, 2015
- Mingoo Seok, Peter Kinget, Teng Yang, Seongjong Kim, "Circuits for temperature sensors," patent filed, 2014
- Mingoo Seok, Jing-Fei Ren, Manish Goel, "Security of Cryptographic Devices Against Differential Power Analysis," US2013191652(A1), US8782446(B2), WO2013110055(A1), WO2013110055(A8), patent issued
- Mingoo Seok, Dennis Sylvester, David Blaauw, Scott Hanson Gregory K. Chen, "Pico-power Reference Voltage Generator," US2010327842(A1) US8564275(B2) WO2010151754(A2) WO2010151754(A3) TW201116968(A), KR20120132459 (A), JP2012531825(A), EP2446337(A2), CN102483634(A), patent issued, *commercially licensed*

Invention Disclosures

- Yannis Tsividis, Ning Guo, Mingoo Seok, "A Continuous-Time Apparatus for Generating Analog Look-up Tables and Generating Analog Nonlinear Functions," Disclosure filed, 2013
- Mingoo Seok, Yoonmyung Lee, Scott Hanson, David Blaauw, Dennis Sylvester, "Low leakage memory circuit," Disclosure filed, UM file number 3760
- Mingoo Seok, Scott Hanson, Jae-sun Seo, David Blaauw, Dennis Sylvester, "Robust low voltage read-only memory," Disclosure filed, UM file number 4159

Students Supervised

Postdocs:

| Name | Project Area | Graduation/Status |
|-------------|--------------|-------------------|
| Minhao Yang | TBD | 2018 (estimated) |

PhD, Chair/Co-Chair:

| Name | Project Area | Graduation/Status |
|--|--|-------------------|
| Seongjong Kim | Variation-Tolerant and Ultra-Low-Voltage Microprocessor Design | 2016 (estimated) |
| Teng Yang (co-supervised by Prof. P. Kinget) | Multi-Modal and Fine-Grained On-Chip Monitoring Techniques for Better-Than-Worst-Case Design | 2017 (estimated) |
| Doyun Kim | Event-Driven Systems and Circuits | 2018 (estimated) |
| Jiangyi Li | Adaptive Integrated Power Management Unit Design | 2019 (estimated) |
| Joao Pedro Cerqueira | Machine Learning Architecture and Circuits for Embedded Devices | 2019 (estimated) |
| Zhewei Jiang | Brain Computer Interface System and Circuits | 2019 (estimated) |

PhD, Committee:

| Name | Project Area | Graduation/Status |
|---------------------|--|---------------------|
| Christos Vezyrtzis | Continuous Time DSP | 2013, IBM TJ Watson |
| John Sarik | Systems for Pervasive Electronics and Interfaces | 2013 |
| Jayanth Kuppambatti | Mixed-Signal Design Techniques in Scaled CMOS | 2014, Startup |
| Chun-Wei Hsu | Voltage-Scalable Analog Circuit Design | 2015, Analog Dev. |
| Chengrui Le | Efficient and Integrated Switched-Capacitor Converter | 2014 |
| Fabio Carte | Low Temperature Monolithic Integration for Silicon and Organic Electronics | 2015 |
| Ning Guo | Hybrid continuous-time computing | 2016 (estimated) |

MS/BS Supervised:

| Name | Project Area | Graduation/Status |
|----------------------|--|-------------------|
| Jian Liu, MS | Asynchronous pipeline design | 2012, Qualcomm |
| Hongtao Li, MS | Active decoupling capacitor design | 2012, LSI |
| Junyan Gao, MS | Digital differential analyzer | 2012, SanDisk |
| Kevin Kuo, MS | Design flow exploration | 2012, Qualcomm |
| Changzhuo Chen, MS | Temperature sensor design | 2012, CAS |
| Masayuki Pak, MS | Power grid integrity analysis | 2012, Sony |
| Hongsen Yu, MS | On-chip SRAM design | 2013, Marvell |
| Zhe Cao, MS | Pipeline and parallel architecture | 2013, Marvell |
| Jiangyi Li, MS | Aging monitoring technique | 2013, Columbia U. |
| Artem Lakoviev, MS | OFET design flow | 2013, Argo-Logic |
| Christopher Hong, BS | Ultra-low-power processor | 2013, Bloomberg |
| Kyung Min Lee, BS | Ultra-low-power processor | 2013, Cornell |
| Zhenyu Zhu, MS | Ultra-low-power processor | 2014, Cavium |
| Andreas Hoffman, BS | Energy-efficient motor control | 2014 |
| Beinuo Zhang, MS | Low-power cognitive computing | 2014, Oracle |
| Cong Zhu, MS | Low-power floating point unit design | 2014, Oracle |
| Jiachen Li, MS | Crosstalk noise analysis | 2014, Oracle |
| Zhewei Jiang, MS | Low-power cognitive computing | 2015, Columbia U. |
| Yini Zhou, MS | Fine-grained thermal monitoring | 2016 (Broadcom) |
| Utkarsh Gupta, MS | Compressive-sensing decoder architecture | 2016 (expected) |

Visitor Supervised:

| Name | Project Area | Duration/Status |
|---------------|--|-----------------|
| Wei Jin | Ultra-low voltage circuits | 2014-2016 |
| Tianchan Guan | Machine-learning architecture for microsystems | 2015-2017 |

Grants and Contracts

- SKHynix, “Fully-Integrated Power Electronics in DRAM Chips,” 1/1/2016-12/31/2017, PI, \$200,000.
- Samsung Global Research Organization (GRO), “Data-Processing Hardware Design Research for Fully-Implantable Brain-Computer-Interface Microsystems”, 9/1/2015-8/30/2016, PI, \$99,706
- National Science Foundation - SBIR/STTR Phase-I, “Low-Power Circuits for LDPC ASICs,” 7/1/2015-12/31/2015, Consultant, \$19,224.
- National Science Foundation, “CAREER: Addressing Deepening Variability Challenges for Next-Generation Margin-Free VLSI Computing Platform Design,” 6/1/2015-5/31/2020, PI, \$461,071.
- Defense Advanced Research Projects Agency ”ESP: Embedded Scalable Platforms for Terascale Energy-Efficient Computing,” 01/01/2013-12/31/2017, co-PI with Luca Carloni (PI, CU), Ken Shephard (co-PI, CU), Martha Kim (co-PI, CU), Magaret Martonosi (co-PI, Princeton), Alberto Sangiovanni-Vincentelli (co-PI, UC-Berkeley), Bill Gallanger (co-PI, IBM), John Knickerbocker (co-PI, IBM), Paul Andry (co-PI, IBM), Eugene O’Sullivan (co-PI, IBM), \$7,250,000.
- Catalyst Foundation ”Self-Aware Computing for Cyber Physical Systems,” 01/01/2013-12/31/2017, PI with Peter Kinget (co-PI, CU), \$338,468.
- National Science Foundation ”CPS: Synergy: Collaborative Research: Hybrid Continuous-Discrete Computers for Cyber-Physical Systems,” 09/01/2012-08/31/2015, co-PI with Yannis Tsividis (PI, CU), Simha Sethumadhavan (co-PI, CU), Michael Bryant (co-PI, UTA), and Benito R. Fernandez (co-PI, UTA), \$1,100,000.

Referred Journals and Conference Publications

Total number of publications = 62, h-index = 18, i10-index = 23, total citation count = 1289 (12/2015)

2016

60. Yipeng Huang, Ning Guo, Mingoo Seok, Yannis Tsividis, Simha Sethumadhavan, “Evaluation of an Analog Accelerator,” *ACM/IEEE International Symposium on Computer Architecture*, 2016, submitted
59. Yini Zhou, Martha Kim, Mingoo Seok, “Holistic Design-Space Exploration of Temperature Sensor Networks for Dynamic Thermal Management,” *ACM/IEEE International Symposium on Computer Architecture*, 2016, submitted
58. Ning Guo, Yipeng Huang, Tao Mai, Shavil Patil, Chi Cao, Mingoo Seok, Simha Sethumadhavan, Yannis Tsividis, “Low-Energy Hybrid Analog/Digital Approximate Computation in Continuous Time,” *IEEE Journal of Solid-State Circuits (JSSC)*, 2015, *invited for the special issue*, submitted
57. Daniel Marti, Mattia Rigotti, Mingoo Seok, Stefano Fusi, “Energy-Efficient Neuromorphic Classifier,” *Neural Computation*, 2016, submitted
56. Doyun Kim, Mingoo Seok, “Fully-Integrated Low Drop-Out Regulator based on Event-Driven PI Control,” *IEEE International Solid-State Circuits Conference (ISSCC)*, 2016, *accepted for publication*

2015

55. Jae-Sun Seo, Mingoo Seok, “Digital CMOS Neuromorphic Processor Design Featuring Unsupervised Online Learning,” *IEEE/IFIP International Conference on VLSI and System-on-Chip (VLSI-SoC)*, 2015, **invited**, [link](#)
54. Teng Yang, Seongjong Kim, Peter R. Kinget, Mingoo Seok, “Ultra-compact and Voltage-Scalable Temperature Sensor Design for Dense Dynamic Thermal Management Techniques,” *IEEE Journal of Solid-State Circuits (JSSC)*, 2015, [link](#)

53. Doyun Kim, Jiangyi Li Mingoo Seok, "Energy-Optimal Voltage Model Supporting a Wide Range of Nodal Switching Rates for Early Design-Space Exploration," *IEEE International Conference on Computer Design (ICCD)*, 2015, [link](#)
52. Seongjong Kim, Mingoo Seok, "A $30.1\mu\text{m}^2$, $\pm 1.1^\circ\text{C}$ - 3σ -Error, 0.4-to-1.0V Temperature Sensor based on Direct Threshold-Voltage Sensing for Dense On-Chip Thermal Monitoring," *IEEE Custom Integrated Circuits Conference (CICC)*, 2015, [link](#)
51. Ning Guo, Yipeng Huang, Tao Mai, Shavil Patil, Chi Cao, Mingoo Seok, Simha Sethumadhavan, Yannis Tsividis, "Continuous-Time Hybrid Computation with Programmable Nonlinearities," *European Solid-State Circuits Conference (ESSCIRC)*, 2015, [link](#)
50. Daniel Marti, Mattia Rigotti, Mingoo Seok, Stefano Fusi, "Energy-Efficient Neuromorphic Classifier," *ArXiv.org*, 2015, [link](#)
49. Beinuo Zhang, Zhewei Jiang, Qi Wang, Jae-Sun Seo, Mingoo Seok, "A Neuromorphic Neural Spike Clustering Processor for Deep-Brain Sensing and Stimulation Systems," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, 2015 [link](#)
48. Jiangyi Li and Mingoo Seok, "A $3.07\mu\text{m}^2/\text{bitcell}$ Physically Unclonable Function with 3.5% and 1% Bit-Instability across 0 to 80°C and 0.6 to 1.2V in a 65nm CMOS," *IEEE Symposium on VLSI Circuits (VLSI)*, 2015 [link](#)
47. Seongjong Kim, Mingoo Seok, "Variation-Tolerant Near-threshold Microprocessor Design with Low-Overhead, Within-a-Cycle In-situ Error Detection and Correction Technique," *IEEE Journal of Solid-State Circuits (JSSC)*, 2015, [link](#)
46. Zhewei Jiang, Qi Wang, Mingoo Seok, "A Low Power Unsupervised Spike Sorting Accelerator Insensitive to Clustering Initialization in Sub-optimal Feature Space," *ACM/EDAC/IEEE Design Automation Conference (DAC)*, 2015, [link](#)
45. Fabio Carta, Htay Hlaing, Hassan Edrees, Shyuan Yang, Mingoo Seok, Ioannis Kymissis, "Co-Development of Complementary Technology and Modified-CPL Family for Organic Digital Integrated Circuits," *Material Research Society Proceedings*, vol.1795, 2015, [link](#)
44. Teng Yang, Doyun Kim, Peter R. Kinget, Mingoo Seok, "In-situ Techniques for In-field Sensing of NBTI Degradation in an SRAM Register File," *IEEE International Solid-State Circuits Conference (ISSCC)*, 2015, [link](#)

2014

43. Seongjong Kim, Mingoo Seok, "Analysis and Optimization of In-Situ Error Detection Techniques in Ultra-Low-Voltage Pipeline," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, 2014, [link](#)
42. Seongjong Kim, Mingoo Seok, "Reconfigurable Interconnect-Driving Technique for Ultra-Dynamic-Voltage-Scaling Systems," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, 2014, [link](#)
41. Seongjong Kim, Mingoo Seok, "R-Processor: 0.4V Resilient Processor with a Voltage-Scalable and Low-Overhead In-Situ Error Detection and Correction Technique in 65nm CMOS," *IEEE Symposium on VLSI Circuits (VLSI)*, 2014, [link](#)
40. Jiangyi Li, Mingoo Seok, "Robust and In-Situ Self-Testing Technique for Monitoring Device Aging Effects in Pipeline Circuits," *ACM/EDAC/IEEE Design Automation Conference (DAC)*, 2014, [link](#)
39. Teng Yang, Seongjong Kim, Peter R. Kinget, Mingoo Seok, "0.6-1.0V, $279\mu\text{m}^2$, $0.92\mu\text{W}$ Temperature Sensor with $< +3.2/-3.4^\circ\text{C}$ Error for Dense On-Chip Thermal Monitoring," *IEEE International Solid-State Circuits Conference (ISSCC)*, pp.282-283, 2014, [link](#)

2013

38. Mingoo Seok, Zhe Cao, "Parallelism and Pipelining in Ultra-Low Voltage Digital Circuits," *IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S)*, 2013, **invited**, [link](#)
37. Yoonmyung Lee, Mingoo Seok, Scott Hanson, Dennis Sylvester, David Blaauw, "Achieving Ultra-low Standby Power with an Efficient SCCMOS Bias Generator," *IEEE Transactions on Circuits and Systems II (TCAS-II)*, 2013, [link](#)
36. Mohammad Hassan Ghaed, Gregory Chen, Razi-ul Haque, Michael Wiecekowsky, Yejoong Kim, Gyouho Kim, Yoonmyung Lee, Inhee Lee, David Fick, Daeyeon Kim, Mingoo Seok, Kensall, and K. Wise, David Blaauw, and Dennis Sylvester, "Circuits for a Cubic-Millimeter Energy-Autonomous Wireless Intraocular Pressure Monitor," *IEEE Transactions on Circuits and Systems I (TCAS-I)*, vol.60, no.12, pp.3152-3162, 2013, [link](#)
35. Matthew Fojtik, Daeyeon Kim, Gregory K. Chen, Yu-Shiang Lin, David Fick, Junsun Park, Mingoo Seok, Mao-Ter Chen, Zhiyoong Foo, David Blaauw, Dennis Sylvester, "Millimeter-Scale Energy-Autonomous Sensor System with Stacked Battery and Solar Cells," *IEEE Journal of Solid-State Circuits (JSSC)*, vol.48, no.3, pp.801-813, Mar. 2013, [link](#)
34. Yu Chen, Mingoo Seok, Steve M. Nowick, "Robust and Energy-Efficient Asynchronous Dynamic Pipelines for Ultra-Low-Voltage Operations Using Adaptive Keeper Control," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, pp.267-272, 2013, [link](#)
33. Jian Liu, Steve M. Nowick, Mingoo Seok, "Soft MOUSETRAP: a Bundled-Data Asynchronous Pipeline Scheme Tolerant to Random Variations at Ultra Low Supply Voltages," *IEEE International Symposium on Asynchronous Circuits and Systems (ASYNC)*, pp.1-7, 2013, [link](#)

2012

32. Mingoo Seok, "Performance and Energy-Efficiency Improvement through Modified CPL in Organic Transistor Integrated Circuits," *ACM/IEEE International Symposium on Low Power Electronics and Designs (ISLPED)*, pp. 215-220, 2012, [link](#)
31. Mingoo Seok, "A Fine-Grained Many VT Design Methodology for Ultra Low Voltage Operations," *ACM/IEEE International Symposium on Low Power Electronics and Designs (ISLPED)*, pp. 161-166, 2012, [link](#)
30. Mingoo Seok, "Decoupling Capacitor Design Strategy for Minimizing Supply Noise of Ultra Low Voltage Circuits," *ACM/EDAC/IEEE Design Automation Conference (DAC)*, pp. 968-973, 2012, [link](#)
29. Dongsuk Jeon, Mingoo Seok, Zhengya Zhang, David Blaauw, Dennis Sylvester, "A Design Methodology for Voltage Overscaled Ultra-Low Power Systems," *Transactions on Circuits and Systems II (TCAS-II)*, vol.59, no.12, pp.952-956, Dec. 2012, [link](#)
28. Mingoo Seok, Gyouho Kim, David Blaauw, Dennis Sylvester, "A Portable 2-Transistor Picowatt Temperature-Compensated Voltage Reference Operating at 0.5V," *IEEE Journal of Solid-State Circuits (JSSC)*, vol.47, no.10, pp.2534-2545, Oct. 2012, [link](#)
27. Dongsuk Jeon, Mingoo Seok, Chaitali Chakrabarti, David Blaauw, Dennis Sylvester, "A Super-Pipelined Energy Efficient Subthreshold 240MS/s FFT Core in 65nm CMOS," *IEEE Journal of Solid-State Circuits (JSSC)*, vol.47, no.1, pp.23-34, 2012, **invited**, [link](#)
26. Mingoo Seok, Dongsuk Jeon, Chaitali Chakrabarti, David Blaauw, Dennis Sylvester, "Extending Energy-Saving Voltage Scaling in Ultra Low Voltage Integrated Circuit Designs," *International Conference on IC Design and Technology (ICICDT)*, pp.1-4, 2012, **invited**, [link](#)

2011

25. Mingoo Seok, Dongsuk Jeon, Chaitali Chakrabarti, David Blaauw, Dennis Sylvester, "A 0.27V, 30MHz, 17.7nJ/transform 1024-pt Complex FFT Core with super-pipelining," *International Solid-State Circuits Conferences (ISSCC)*, pp. 342-344, 2011, [link](#)
24. Mingoo Seok, David Blaauw, Dennis Sylvester, "Robust Clock Network Design Methodology for Ultra-Low Voltage Operations," *Journal on Emerging and Special Topics on Circuits and Systems (JETCAS)*, vol.1. no.2, pp.120-130, 2011, **invited**, [link](#)
23. Mingoo Seok, Gregory Chen, Scott Hanson, Michael Wieckowski, David Blaauw, Dennis Sylvester, "Mitigating Variability in Near Threshold Computing," *Journal on Emerging and Special Topics on Circuits and Systems (JETCAS)*, vol.1. no.1, pp.42-49, 2011, **invited**, [link](#)
22. Mingoo Seok, Scott Hanson, David Blaauw, Dennis Sylvester, "Sleep Mode Analysis and Optimization with Minimal-Sized Power Gating Switch for Ultra-low Vdd Operations," *Transactions on VLSI systems (TVLSI)*, vo.20. no.4, pp.605-615, 2011, [link](#)
21. Gregory Chen, Hassan Ghaed, Razi-Ul Haque, Michael Wieckowski, Yejoong Kim, Gyouho Kim, David Fick, Daeyeon Kim, Mingoo Seok, Kensall Wise, David Blaauw, Dennis Sylvester, "A 1 Cubic Millimeter Energy-Autonomous Wireless Intraocular Pressure Monitor," *International Solid-State Circuits Conferences (ISSCC)*, pp.310-312, 2011, [link](#)
20. Mingoo Seok, Dongsuk Jeon, Chaitali Chakrabarti, David Blaauw, Dennis Sylvester, "Pipeline Strategy for Improving Optimal Energy Efficiency in Ultra-Low Voltage Design" *ACM/IEEE Design Automation Conference (DAC)*, pp.990-995, 2011, [link](#)
19. Dongsuk Jeon, Mingoo Seok, Chaitali Chakrabarti, David Blaauw, Dennis Sylvester, "Energy-Optimized High Performance FFT Processor," *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp.1701-1704, 2011, [link](#)
18. Daeyeon Kim, Gregory K. Chen, Matthew Fojtik, Mingoo Seok, Dennis Sylvester, David Blaauw, "A Femtowatt-Scale Ultra-Low Leakage 10T SRAM with Speed Compensation Scheme," *International Symposium on Circuits and Systems (ISCAS)*, pp.69-72, 2011, [link](#)

2010

17. Mingoo Seok, Gyouho Kim, David Blaauw, Dennis Sylvester, "Variability Analysis of a Digitally Trimmable Ultra-Low Power Voltage Reference," *European Solid-State Circuits Conference (ESSCIRC)*, pp.110-113, Sep, 2010, [link](#)
16. Mingoo Seok, David Blaauw, Dennis Sylvester, "Clock Network Design for Ultra-Low Power Applications," *ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED)*, pp.271-276, Aug, 2010, [link](#)
15. Mingoo Seok, Scott Hanson, Michael Wieckowski, Gregory K. Chen, Yu-Shiang Lin, David Blaauw, Dennis Sylvester, "Circuit Design Advances to Enable Ubiquitous Sensing Environments," *International Symposium on Circuits and Systems (ISCAS)*, pp.285-288, 2010, **invited**, [link](#)
14. Gregory K. Chen, Matthew Fojtik, Daeyeon Kim, David Fick, Junsun Park, Mingoo Seok, Mao-Ter Chen, Zhiyoong Foo, Dennis Sylvester, David Blaauw, "A Millimeter-Scale Nearly-Perpetual Sensor System with Stacked Battery and Solar Cells," *International Solid-State Circuits Conference (ISSCC)*, pp.288-289, 2010, [link](#)

2009

13. Mingoo Seok, Gyouho Kim, Dennis Sylvester, David Blaauw, "A 0.5V 2.2pW 2-Transistor Voltage Reference," *Custom Integrated Circuit Conference (CICC)*, pp.577-580, 2009, [link](#)

12. Michael Wieckowski, Gregory K. Chen, Mingoo Seok, Dennis Sylvester, David Blaauw, "A Hybrid DC-DC Converter for Nanoampere Sub-1V Implantable Applications," *IEEE Symposium on VLSI Circuits (VLSI)*, pp.166-167, 2009, [link](#)
 11. Scott Hanson, Mingoo Seok, Yu-shiang Lin, Zhiyoong Foo, Daeyeon Kim, Yoonmyung Lee, Nurrachman Liu, Dennis Sylvester, David Blaauw, "A Low-Voltage Processor for Sensing Applications With Picowatt Standby Mode," *Journal of Solid State Circuits (JSSC)*, vol.44, no.4, pp.1145-1155, 2009, **invited**, [link](#)
- 2008**
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