Sein Oh

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Education

Ph.D. Candidate, Korea Advanced Institute of Science and Technology (KAIST) **Sep. 2020 – Present**
School of Electrical Engineering (Advisor: prof. Minkyu Je, IMPACT Lab) *Daejeon, Republic of Korea*

M.S., Kookmin University **Mar. 2018 – Feb. 2020**
School of Electrical Engineering (Advisor: prof. Hyungil Chae, CSDL Lab) *Seoul, Republic of Korea*

B.S., Kookmin University **Mar. 2011 – Feb. 2018**
School of Electrical Engineering *Seoul, Republic Korea*

Publications (Selected)

International Conferences

***Equally Credited Authors**

- **Sein Oh**, Seunga Park, Yoontae Jung, Jimin Koo, Donghee Cho, Sohmyung Ha, and Minkyu Je, "A 2.5mW 12MHz-BW 69dB SNDR Passive Bandpass ΔΣ ADC with Highpass Noise-Shaping SAR Quantizers", **SOVC** 2023.
- Yoontae Jung*, **Sein Oh***, Jimin Koo, Seunga Park, Ji-Hoon Suh, Donghee Cho, Sohmyung Ha, and Minkyu Je, "A 187dB FoM$_S$ 46fJ/Conv. 2nd-order Highpass ΔΣ Capacitance-to-Digital Converter", **SOVC** 2023.
- Yoontae Jung, Jimin Koo, **Sein Oh**, Seunga Park, Ji-Hoon Suh, Donghee Cho, and Minkyu Je, "A 56fJ/Conversion-Step 178dB-FoM$_S$ Third-Order Hybrid CT-DT ΔΣ Capacitance-to-Digital Converter", **CICC** 2023.
- Donghee Cho, Hyungjoo Cho, **Sein Oh**, Yoontae Jung, Sohmyung Ha, and Minkyu Je, "A Single-Mode Dual-Path Buck-Boost Converter with Reduced Inductor Current Across All Duty Cases Achieving 95.58% Efficiency at 1A in Boost Operation", **CICC** 2022.
- Soon-Jae Kweon, Joonho Gil, Chulhyun Park, **Sein Oh**, Yoontae Jung, Injun Choi, Song-i Cheon, Hung Phan Dang, Ja-Hyuck Koo, Geunhoe Kim, Sohmyung Ha and Minkyu Je, "An 8MHz 31.25kS/s Impedance-Monitoring IC Based on IF-Sampling Architecture with a Band-Pass Delta-Sigma ADC", **SOVC** 2021.
- **Sein Oh**, Younggyun Oh, Kihyun Kim, Juyoung Lee, Kihyun Kim, Seungjun Lee, Jintae Kim and Hyungil Chae "A 80dB DR 6MHz Bandwidth Pipelined Noise-Shaping SAR ADC with 1–2 MASH structure", **CICC** 2020.

International Journals

- Ji-Hoon Suh, Haidam Choi, Yoontae Jung, **Sein Oh**, Hyungjoo Cho, Nahmil Koo, Seong Joong Kim, Chisung Bae, Sohmyung Ha, and Minkyu Je, "A 16-Channel Impedance-Readout IC With Synchronous Sampling and Baseline Cancelation for Fast Neural Electrical Impedance Tomography", IEEE Solid-State Circuits Letters (***SSCL***), vol. 6, pp. 109–112, Apr. 2023.
- Donghee Cho, Hyungjoo Cho, **Sein Oh**, Yoontae Jung, Sohmyung Ha, and Minkyu Je, "Dynamic-Range-Enhancement Techniques for Artifact-Tolerant Biopotential-Acquisition ICs", IEEE Journal of Solid-State Circuits (***JSSC***), vol. 58, issue 3, pp. 720–731, Mar. 2023.
- **Sein Oh**, Yonggyun Oh, Juyong Lee, Kihyun Kim, Seungjun Lee, Jintae Kim, and Hyungil Chae, "An 85 dB DR 4 MHz BW Pipelined Noise-Shaping SAR ADC With 1–2 MASH Structure", IEEE Journal of Solid-State Circuits (***JSSC***), vol. 56, issue 11, pp. 3424–3433, Jun. 2021.
- **Sein Oh**, Kihyun Kim, and Hyungil Chae , "Bandpass ΔΣ ADC using pipelined SAR ADC", ***Electronics Letters***, vol. 56, pp. 480–482, May. 2020.
- **Sein Oh**, Dong-young Hwang, and Hyungil Chae, "Sensitivity Enhancement of a Vertical-Type CMOS Hall Device for a Magnetic Sensor", IEICE Electronics Express (***ELEX***), vol. 16, Issue 4, pp. 1–8, Jan. 2019.
- **Sein Oh**, Byung-Jun Jang, and Hyungil Chae, "Sensitivity Enhancement of a Vertical-Type CMOS Hall Device for a Magnetic Sensor", Journal of Electromagnetic Engineering and Science (***JEES***), vol. 18, pp. 35–40, Jan. 2018.
- Yoontae Jung*, **Sein Oh***, Sohmyung Ha, and Minkyu Je, "A 187-dB FoM$_S$ Power-Efficient 2nd-order Highpass ΔΣ Capacitance-to-Digital Converter", IEEE Journal of Solid-State Circuits (***JSSC***), Submitted (under review).

Dissertation & Thesis

- **Sein Oh**, "Advanced Oversampling Data Converters," Ph.D. Thesis, KAIST, 2024. [In progress]
- **Sein Oh**, "Hybrid Data Converter for IoT Sensor Application," M.S. Thesis, Kookmin University, 2020.

Research Interests

Analog/Mixed-Signal IC, Data Converters, Sensor Interface IC, Environmental Sensor Interface IC, Wireless Communication

Reviewer Services

Journals: IEEE *JSSC* (2021), IEEE *TCAS-I* (2023)

Skills

EDA Tools

- **Cadence:** Spectre, AMS, Xcelium, OrCAD
- **Synopsys:** Design Compiler, IC Compiler, Prime Time, Formality, StarRC, VCS, Verdi
- **Siemens:** Calibre LVS, DRC, xRC
- **Xilinx:** Vivado

Programming language: C/C++, MATLAB, Python
Hardware Description language: Verilog

Research Projects (as Research Assistant)

([G]: Government-funded, [I]: Industry-funded)

[G] **National Research Foundation(NRF): Human Plus Convergence Challenge Project** **Aug. 2020 – Present**

- Development of Multimodal Wireless Sensor Interface Circuits and Flexible Biosignal Sensors (Project Co-Leader)

[G] **Ministry of Science and Information and Communication Technology** **Sep. 2017 – Aug. 2020**

- Development of Ultra-small and Ultra-low-power IoT Sensor for Detection of Harmful Gas
- Development of Magnetic Sensor IC with High Performance and Low Cost for Smart Cars (Project Leader)

[I] **Samsung Electronics LSI** ***Sep. 2020 – Present / ****Sep. 2018 – Aug. 2020**

- *Ultra-Low Power Clock Generation IC for an IoT Wireless SoC (Project Leader)
- *Resonator-type Gas Sensor Signal-Drift Real-time Calibration Circuit Technique
- **Development of Beyond-5G Wireless Communication Hardware Technology (Project Leader)
- **Multiple Band Receiver Architecture using Bandpass ADC for Low-power and Small-size 5G Mobile Applications

[I] **LG Electronics** **Sep. 2021 – Aug. 2022**

- Muscle Activation Pattern Analysis and Training System for Healthy Aging of Human Musculoskeletal System (Project Leader)

Patents

KR10-2023-0114327 (Filed): An Energy-Efficient Continuous-Time Discrete-Time Hybrid Delta-Sigma Capacitance-to-Digital Converter **Aug. 2023**

KR10-2022-0147590 (Filed): Continuous-Time Noise Shaping Successive Approximation Register Analog-to-Digital Converter **Apr. 2023**

KR10-2022-0147589 (Filed): Wide-Input Range and Input Impedance Boosting NS-SAR-Nested DSM for Bio-signal Acquisition **Dec. 2022**

KR10-2021-0189924 (Public): Impedance Measuring Apparatus and Impedance Measuring Method **Dec. 2021**

KR10-2259493 (Granted): Bandpass Delta-Sigma ADC using Pipelined SAR ADC **Aug. 2021**

References

Prof. Minkyu Je

- Associate Professor, School of Electrical Engineering, KAIST

Prof. Sohmyung Ha

- Assistant Professor, Electrical Engineering and Bioengineering, Division of Engineering, New York University Abu Dhabi

Prof. Hyungil Chae

- Associate Professor, School of Electrical Engineering, Konkuk University