

# Kiseok Song (Ph. D.)

Semiconductor System Laboratory  
#1233, E3-2 (Electrical Engineering), KAIST  
Daejeon, Republic of Korea

+82-10-9272-4364  
[kiseok.song87@gmail.com](mailto:kiseok.song87@gmail.com), [kiseok.song87@kaist.ac.kr](mailto:kiseok.song87@kaist.ac.kr)

## RESEARCH EXPERIENCE

---

### Bio-medical Stimulator System Design and Implementation

- Mobile and wearable (flexible fabric-based) bio-feedback electrical stimulation system implementation
- System verification with *in-vitro* and *in-vivo* measurement
- Low power wearable sensor system implementation

### Bio-medical System on Chip (SoC) Design

- Bio-feedback electrical stimulator SoC and low-power wearable bio-signal sensor SoC design
- Participated in the design of 4 wearable healthcare systems and 6 SoCs over 5 years

## EDUCATION

---

### Ph.D. Student in Electrical Engineering, KAIST (*KAIST Full-Scholarship*) 2011~ Feb. 2015

- Advisor: Hoi-Jun Yoo  
Thesis title: *Closed-loop controlled electrical stimulation system for wearable healthcare*
- Designed a multi-modal (impedance and near-infrared) spectroscopy IC for non-invasive glucose monitoring  
- presented at *IEEE Symposium on VLSI Circuits (S. VLSI)*, Jun. 2014.  
- accepted at *IEEE Journal of Solid-State Circuits (JSSC)*, Apr. 2015.
- Designed a dual-impedance (load and tissue impedances) feedback transdermal drug delivery system  
- presented and demonstrated at *IEEE International Solid-State Circuits Conference (ISSCC)*, Feb. 2013.  
- published at *IEEE Journal of Solid-State Circuits (JSSC)*, Jan. 2014.
- Designed a multi-modal (EMG and temperature) feedback electro-acupuncture system  
- presented and demonstrated at *IEEE International Solid-State Circuits Conference (ISSCC)*, Feb. 2012.  
- published at *IEEE Transactions on Biomedical Circuit and Systems (T-BioCAS)*, Dec. 2012.

### M.S. in Electrical Engineering, KAIST (*National Full-Scholarship*) Feb. 2011

- Thesis title: *Wirelessly-powered electro-acupuncture with adaptive pulse width stimulation*
- Designed a wirelessly-powered (433MHz ISM band) electro-acupuncture system and SoC  
- published at *IEEE Transactions on Biomedical Circuits and Systems (T-BioCAS)*, Apr. 2011.

### B.S. in Electrical Engineering, KAIST (*National Full-Scholarship*) Aug. 2009

- Overall GPA: 3.93/4.3 – *Summa Cum Laude*

## SELECTED AWARDS AND ACTIVITY

---

### Awards

- 2014 *Marconi Society Paul Balan Young Scholar Award* 10/2014
- 2014, 2012 KAIST Research Excellence Award : *Kim Choong-Ki Award* 06/2014, 06/2012
- 2013, 2012 ISSCC Academic Demo Session (as a leading author) Feb. 2013, Feb. 2012
- 2012 CICC Student Scholarship Award: *Intel/Helic/CICC Student Scholarship Award* Sep. 2011

### Activities

- The 8<sup>th</sup> KAIST-Keio-Tsinghua VLSI Design and SoC Workshop: *General Chair* Aug. 2012
- The 5<sup>th</sup> KAIST-Keio-Tsinghua VLSI Design and SoC Workshop: *Presenter* Aug. 2009

## PUBLICATIONS

---

### Journals (*10 Papers in Total – 4 First-authored Papers and 6 Co-authored Papers*)

1. An Impedance and Multi-wavelength Near-infrared Spectroscopy IC for Non-invasive Blood Glucose Estimation, *IEEE Journal of Solid-State Circuits (JSSC)*, Apr. 2015. (*Accepted*)  
**Kiseok Song**, Unsoo Ha, Seongwook Park, Joonsung Bae, and Hoi-Jun Yoo
2. An 87mA·min Iontophoresis Controller IC with Dual-mode Impedance Sensor for Patch-type Transdermal Drug Delivery System, *IEEE Journal of Solid-State Circuits (JSSC)*, Jan. 2014  
**Kiseok Song**, Unsoo Ha, Jaehyuk Lee, Kyeongryeol Bong, and Hoi-Jun Yoo
3. A Sub-10nA DC-balanced Adaptive Stimulator IC with Multi-modal Sensor for Compact Electro-Acupuncture Stimulation, *IEEE Transactions on Biomedical Circuits and Systems (T-BioCAS)*, Dec. 2012  
**Kiseok Song**, Hyungwoo Lee, Sunjoo Hong, Hyunwoo Cho, and Hoi-Jun Yoo
4. A Wirelessly Powered Electro-Acupuncture Based on Adaptive Pulswidth Monophase Stimulation, *IEEE Transactions on Biomedical Circuits and Systems (T-BioCAS)*, Apr. 2011  
**Kiseok Song**, Long Yan, Seulki Lee, Jerald Yoo, and Hoi-Jun Yoo
5. A Wearable Neuro-feedback System with EEG-based Mental Status Monitoring and Transcranial Electrical

- Stimulation, *IEEE Transactions on Biomedical Circuits and Systems (T-BioCAS)*, 2014. (Accepted)
6. A Low Energy Crystal-Less Double-FSK Sensor Node Transceiver for Wireless Body-Area-Network, *IEEE Journal of Solid-State Circuits (JSSC)*, Nov. 2012  
Joonsung Bae, **Kiseok Song**, Hyungwoo Lee, Hyunwoo Cho, and Hoi-Jun Yoo
  7. A 0.24-nJ/b Wireless Body-Area-Network Transceiver With Scalable Double-FSK Modulation, *IEEE Journal of Solid-State Circuits (JSSC)*, Jan. 2012  
Joonsung Bae, **Kiseok Song**, Hyungwoo Lee, Hyunwoo Cho, and Hoi-Jun Yoo
  8. The Signal Transmission Mechanism on the Surface of Human Body for Body Channel Communication, *IEEE Transactions on Microwave Theory (TMTT)*, Mar. 2012  
Joonsung Bae, Hyunwoo Cho, **Kiseok Song**, Hyungwoo Lee, and Hoi-Jun Yoo
  9. A 3.9 mW 25-Electrode Reconfigured Sensor for Wearable Cardiac Monitoring System, *IEEE Journal of Solid-State Circuits (JSSC)*, Jan. 2011  
Long Yan, Joonsung Bae, Seulki Lee, Taehwan Roh, **Kiseok Song**, and Hoi-Jun Yoo
  10. A Low-Energy Inductive Coupling Transceiver With Cm-Range 50-Mbps Data Communication in Mobile Device Applications, *IEEE Journal of Solid-State Circuits (JSSC)*, Nov. 2010  
Seulki Lee, **Kiseok Song**, Jerald Yoo, and Hoi-Jun Yoo

**Conferences** (21 Papers in Total – 9 First-authored Papers and 12 Co-authored Papers)

1. An Impedance and Multi-wavelength Near-infrared Spectroscopy IC for Non-invasive Blood Glucose Estimation, *IEEE Symposium on VLSI Circuits and Technology (S. VLSI)*, 2014 (Accepted)  
**Kiseok Song**, Unsoo Ha, Seongwook Park, and Hoi-Jun Yoo
2. An 87mA·min Iontophoresis Controller IC with Dual-Mode Impedance Sensor for Patch Type Transdermal Drug Delivery System, *IEEE International Solid-State Circuits Conference (ISSCC)*, 2013  
**Kiseok Song**, Unsoo Ha, Jaehyuk Lee, Kyeongryeol Bong, and Hoi-Jun Yoo
3. A Sub-10nA DC-Balanced Adaptive Stimulator IC with Multimodal Sensor for Compact Electro-Acupuncture System, *IEEE International Solid-State Circuits Conference (ISSCC)*, 2012  
**Kiseok Song**, Hyungwoo Lee, Sunjoo Hong, Hyunwoo Cho, and Hoi-Jun Yoo
4. A Dynamic Electrode Impedance Matched Acupuncture-Type Diagnosis System with Concurrent Feedback of Physiological Signals, *IEEE Asian Solid-State Circuits Conference (A-SSCC)*, 2012  
**Kiseok Song**, Sunjoo Hong, Taehwan Roh, Unsoo Ha, and Hoi-Jun Yoo
5. A 20 $\mu$ W Contact Impedance Sensor for Wireless Body-Area-Network Transceiver, *IEEE Custom Integrated Circuits Conference (CICC)*, 2011  
**Kiseok Song**, Joonsung Bae, Long Yan, and Hoi-Jun Yoo
6. The Compact Electro-Acupuncture System for Multi-Modal Feedback Electro-Acupuncture Treatment, *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2012  
**Kiseok Song**, Hyungwoo Lee, Sunjoo Hong, Hyunwoo Cho, and Hoi-Jun Yoo
7. Bio-Feedback Iontophoresis Patch for Controllable Transdermal Drug Delivery, *IEEE Biomedical Circuits and Systems (BioCAS)*, 2013  
**Kiseok Song**, Unsoo Ha, Jaehyuk Lee, and Hoi-Jun Yoo
8. Compact Electro-Acupuncture System for Multi-Modal Feedback Stimulation, *IEEE Biomedical Circuits and Systems (BioCAS)*, 2012  
**Kiseok Song**, Hyungwoo Lee, Sunjoo Hong, Hyunwoo Cho, Kwonjoon Lee, and Hoi-Jun Yoo
9. A Wirelessly-Powered Electro-Acupuncture based on Adaptive Pulse Width Mono-Phase Stimulation, *IEEE International Symposium on Circuits and Systems (ISCAS)*, 2010  
**Kiseok Song**, Seulki Lee, and Hoi-Jun Yoo

**Patents** (Selected – 10 Korea Patents in Total – 7 Registered Patents and 3 Applied Patents)

- *Electro-Acupuncture Platform and the Method for Generating Electric-Stimulus using Thereof*, Korean Patent No. 10-1242553-00-00, 2013
- *Power Supply Apparatus of Wearable Systems*, Korean Patent No. 10-1101867-00-00, 2011

**INVITED TALKS**

- Qualcomm Tech. Talk : *Wearable Healthcare in KAIST and Closed-loop Controlled Electrical Stimulation Systems*  
San Jose, CA, Feb. 2014  
Santa Clara, CA, Feb. 2014
- Qualcomm Tech. Talk: *Closed-loop Controlled Electrical Stimulation System*  
San Diego, CA, Feb. 2013

**LANGUAGES**

- Native Korean / Fluent English