

Sanghoon Lee

ELECTRONICS ENGINEER · HARDWARE

Globalplaza B/D No.1318, Kyungpook National University(KNU), 80, Daehak-ro, Buk-gu, Daegu, Republic of Korea, 41566

☎ (+82) 10-9494-5115 | ✉ tonightparty@knu.ac.kr, tonightparty82@gmail.com | 🌐 <https://tonightparty.github.io>

Education

Kyungpook National University

PH.D. IN ELECTRONICS ENGINEERING

- Thesis : Efficient Power Control Using Variable Resolution Algorithm for LiDAR Sensor-based Autonomous Vehicle

Daegu, S.Korea

Mar. 2011 – Aug. 2021

Kyungpook National University

M.S. IN ELECTRONICS ENGINEERING

- Thesis : Design of the Hybrid 4-bits A/D Converter

Daegu, S.Korea

Mar. 2009 – Feb. 2011

Dong-A University

B.S. IN ELECTRONICS ENGINEERING

Busan, S.Korea

Mar. 2005 – Feb. 2009

Job Carrier

Kyungpook National University(KNU)

PROFESSOR FOR INDUSTRY COLLABORATION PURPOSE

- Industry-University Collaboration Purpose
- Hardware design / verification of circuit & system
- Coding & design for FPGA

Daegu, S.Korea

Mar. 2022 – Present

CARNAVICOM Co., Ltd.

HARDWARE ENGINEER (SENIOR RESEARCHER)

- System architecture design of LiDAR sensor
- Hardware design / verification of LiDAR sensor
- Software design for efficient power control of LiDAR sensor
- System architecture design of domain control unit (DCU)
- Hardware design and verification of domain control unit (DCU)

Incheon, S.Korea

Jun. 2018 – Feb. 2022

Gyeongbuk Institute of IT Convergence Industry Technology

HARDWARE ENGINEER (RESEARCHER)

- Hardware design of circuit & system
- Application test of LiDAR sensor

Gyeongsan, S.Korea

Nov. 2015 – May. 2018

Skills

Design PCB & Artwork, ASIC Simulation & Design

Programming C/C++, LaTeX, Verilog

Languages Korean, English

Extracurricular Activity

ASIC (Application Specific Integrated Circuit) Lab.

MEMBER

- Analog Circuit & A/D Converter design
- Write several paper about A/D Converter

S.Korea

Mar. 2009 - Feb. 2023

AI-SoC (AI-Embedded System-Software-on-Chip Platform) Lab.

MEMBER

- LiDAR sensor in Hardware design & Algorithm
- Write several paper about LiDAR sensor

S.Korea

Jun. 2019 - PRESENT

Publications

INTERNATIONAL JOURNAL PAPER

Accuracy-Power Controllable LiDAR Sensor System with 3D Object Recognition for Autonomous Vehicle

S. H. LEE, D. K. LEE, P. CHOI, AND D. J. PARK

- SCI(E), Q1

Sensors

Oct. 2020

DOMESTIC JOURNAL PAPER (KCI)

Run-time Current/Voltage-level Pattern Monitoring and Comparison System for Detecting Malfunctions by Embedded System Software Errors

S. H. LEE, AND D. J. PARK

Journal of the Korea Institute of Information and Communication Engineering (JKIICE)

Sep. 2023

Dynamic Object Detection Architecture for LiDAR Embedded Processors

M. W. JUNG, S. H. LEE, AND D. Y. KIM

Journal of Platform Technology (JPT)

Dec. 2021

Efficient Power Reduction Technique of LiDAR Sensor for Controlling Detection Accuracy Based on Vehicle Speed

S. H. LEE, M. W. JUNG, D. K. LEE, P. CHOI, AND D. J. PARK

IEMEK Journal of Embedded Systems and Applications

Oct. 2020

Preliminary study of Angle sensor module for Vehicle Steering System Based on Multi-track Encoder

S. T. WOO, C. S. HAN, J. B. BAEK, S. H. LEE, M. W. JUNG, S. J. CHOO, J. R. PARK, J. H. YOO, S. H. JUNG, AND J. Y. KIM

Journal of Sensor Science and Technology (JSST)

Nov. 2017

Algorithm of Modified Single-slope A/D Converter with Improved Conversion Time for CMOS Image Sensor System

S. H. LEE, J. T. KIM, J. K. SHIN, AND P. CHOI

Journal of Sensor Science and Technology (JSST)

Nov. 2015

Design of 8-bit Single Slope ADC for Signal Processing of Multiple Image Sensors

J. C. LEE, S. H. LEE, J. T. KIM, J. R. PARK, J. K. SHIN, AND P. CHOI

Journal of Sensor Science and Technology (JSST)

Oct. 2015

Presentation

INTERNATIONAL CONFERENCE

ISOC2021 (18th International SoC Design Conference)

POSTER PRESENTATION

- Efficient Power Control Using Variable Resolution Algorithm for LiDAR Sensor-based Autonomous Vehicle

Jeju Island, S.Korea

Oct. 2021

TENSYMP2021 (2021 IEEE Region 10 Symposium)

ORAL PRESENTATION

- Accelerated Signal Processing of Burst-Mode Streamline Data for Low-Power Embedded Multi-Channel LiDAR Systems

Jeju Island, S.Korea

Aug. 2021

GCCE2020 (2020 IEEE 9th Gloval Conference on Consumer Electronics)

ORAL PRESENTATION

- Frequency Shift Keying and Error Correction Technique for Robust Electrostatic Coupling Intra-Body Communication

Kobe, Japan

Oct. 2020

BIC2020 (The International Conference on Big data, IoT, and Cloud Computing)

ORAL PRESENTATION

- Accuracy-Power Controllable LiDAR Sensor for Autonomous Vehicles using an Algorithm of Variable Resolution

Jeju Island, S.Korea

Aug. 2020

AWAD2015 (2015 Asia-Pacific Workshop on Fundamentals and Applications of Advanced Semiconductor Devices)

Jeju Island, S.Korea

ORAL PRESENTATION

Jun. 2015

- Modified Single-slope A/D Converter with Improving Conversion Time for CIS System

ICEIC2015 (The 14th International Conference on Electronics, Information, and Communication)

Singapore

POSTER PRESENTATION

Jan. 2015

- Clock-Less 8-bit Pipeline-Like Novel A/D Converter

APCOT2014 (The 7th Asia-Pacific Conference on Transducers and Micro/Nano Technologies)

Daegu, S.Korea

POSTER PRESENTATION

Jul. 2014

- MODIFIED SINGLE-SLOPE A/D CONVERTER WITH IMPROVING CONVERSION TIME FOR CIS SYSTEM

DOMESTIC CONFERENCE

2023 IEMEK Fall Conference

Jeju Island, S.Korea

POSTER PRESENTATION

Nov. 2023

- Real-time Current-level Monitoring and Data Comparison System for Detecting Malfunctions in Embedded Systems

2020 KICS Winter Conference

Yongpyung, S.Korea

POSTER PRESENTATION

Feb. 2020

- Efficient Power Consumption Algorithm of LiDAR Sensor for Vehicles using Variable Resolution depending on Vehicle Speed

2017 IEIE Fall Conference

Incheon, S.Korea

POSTER PRESENTATION

Nov. 2017

- Object Perception Algorithm based on LiDAR for Autonomous Vehicle

2017 IEMEK Fall Conference

Jeju Island, S.Korea

POSTER PRESENTATION

Nov. 2017

- Hybrid 4-bits A/D Converter for LiDAR Sensor Signal Processing
- Best Paper Award

ISET2017 (2017 IEMEK Symposium on Embedded Technology)

Busan, S.Korea

POSTER PRESENTATION

May. 2017

- Design of InGaAs quantum well laser diode for LiDAR application

ISET2017 (2017 IEMEK Symposium on Embedded Technology)

Busan, S.Korea

POSTER PRESENTATION

May. 2017

- Automatic Recognition System for Weld Bead Detection

ISET2016 (2016 IEMEK Symposium on Embedded Technology)

Daejeon, S.Korea

POSTER PRESENTATION

May. 2016

- Algorithm of Clock-less 8-bit Pipeline-like Novel A/D Converter for Bead Detection Image Sensor
- Best Paper Award

ISOCCC2014 (2014 IDEC SoC Congress Chip Design Contest)

Jeju Island, S.Korea

POSTER PRESENTATION

Nov. 2014

- Design of Clock-Less 8-bit Pipeline A/D Converter

2014 IEEK Summer Conference

Jeju Island, S.Korea

ORAL PRESENTATION

Jun. 2014

- Development of Ultraviolet Signal Processing Circuit System for Ultraviolet Image

2011 IEEK Fall Conference

Daejeon, S.Korea

POSTER PRESENTATION

Nov. 2011

- Design of the Hybrid 8-bits A/D Converter

Honors & Awards

DOMESTIC

2017 **Best Paper AWARD**, 2017 IEMEK FALL Conference

Jeju Island, S.Korea

2016 **Best Paper AWARD**, ISET2016 (2016 IEMEK Symposium on Embedded Technology)

Daejeon, S.Korea

National Project

Software Disaster Research Center

ROLE: R&D MANAGEMENT (KNU)

*Ministry of Science and ICT (MSIT)
and National Research Foundation
of Korea (NRF), S.Korea
Mar. 2022 – Present*

High-Resolution 3D Solid-Stat Lidar Development

ROLE: SIGNAL PROCESSING MODULE DESIGN (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Apr. 2021 – Feb. 2022*

(Part2) Electric truck bus vehicle application technology and operation environment development using flexible rolling chassis

ROLE: DEVELOPMENT OF SENSORS FOR ELECTRIC TRUCK (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
May. 2020 – Feb. 2022*

Development of automatic steering-based accident avoidance system for electric-driven port yard tractors operating at low speed (less than 30 km/h)

ROLE: DEVELOPMENT OF SYSTEM (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Apr. 2020 – Feb. 2022*

Development of Selfdriving Parts and Vehicle Mounting Technology for Large Bus

ROLE: CIRCUIT DESIGN OF LIDAR SENSOR (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Jun. 2019 – Dec.2021*

Development of low price 3D LiDAR for measurement of service robots in indoor and outdoor environment

ROLE: CIRCUIT DESIGN OF LIDAR SENSOR (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Apr. 2019 – Dec.2021*

Open Platform Development for Remote Management on Embedded Software

ROLE: EMBEDDED SOFTWARE TEST (CARNAVICOM)

*Ministry of Education (MOE) and
National Research Foundation of
Korea (NRF), S.Korea
Jun. 2018 – Aug. 2021*

The Development of low-cost LiDAR Sensor including Laser Diode and Semiconductor for Autonomous Car

ROLE: TEST/VERIFICATION (GITC) AND CIRCUIT DESIGN OF LIDAR SENSOR (CARNAVICOM)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
May. 2017 – Dec. 2020*

Development of paper document management system with smart cabinet based on IoT technology

ROLE: CIRCUIT & MODULE DESIGN FOR IOT (GITC)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Mar. 2017 – May. 2018*

Development of negative-ion air purification device for vehicles with indoor pollution detection function

ROLE: CIRCUIT DESIGN FOR SENSOR (GITC)

*Ministry of SMEs and Startups(MSS),
S.Korea
Jun. 2016 – May. 2018*

System development of automated sensing of hazardous objects for construction safety and precise location tracking of workers

ROLE: CIRCUIT DESIGN FOR SENSOR (GITC)

*Ministry of Land, Infrastructure and
Transport (MOLTI), S.Korea
Apr. 2016 – Dec. 2017*

The Development of the 8-channel 15f/s grade scanning LiDAR Sensor for autonomous car

ROLE: VERIFICATION OF LIDAR SENSOR (GITC)

*Ministry of Trade, Industry & Energy
(MOTIE), S.Korea
Aug. 2015 – Jul. 2017*

Development of Intelligence Fusion Visual Sensor Module

ROLE: CIRCUIT DESIGN FOR IMAGE, UV AND IR SENSOR (KNU)

Ministry of Education and Science
Technology (MEST), S.Korea

Mar. 2012 – Feb. 2015

MEMS Research Center for National Defense

ROLE: CIRCUIT DESIGN FOR SENSOR (KNU)

Agency for Defense Development
(ADD), S.Korea

Mar. 2009 – Dec. 2012

Patents

INTERNATIONAL PATENTS

Oct. 2022	US20220317265A1 , LiDAR system for reducing power consumption and method of driving the same	United State of America, USA
Dec. 2020	PCT/KR2020/018248 , LiDAR system for reducing power consumption and method of driving the same	S.Korea, KIPO
Dec. 2020	PCT/KR2020/018249 , Autonomous unmanned aerial vehicle and control method in the same	S.Korea, KIPO

DOMESTIC PATENTS

Nov. 2021	10-2021-0163010 , Vision-based real-time vehicle detection and tracking algorithm for forward collision warning	S.Korea
Nov. 2021	10-2021-0163009 , Semantic depth data transmission reduction techniques using frame-to-frame masking method for light-weighted LiDAR signal processing platform	S.Korea
Jan. 2021	10-2210-6010000 , LiDAR system for reducing power consumption and method of driving the same, registered	S.Korea
Dec. 2020	10-2191-1090000 , Autonomous unmanned aerial vehicle and control method in the same, registered	S.Korea
Dec. 2019	10-2019-0175337 , Operation server for searching code block using hot spot extraction and operation platform system including the same	S.Korea
Nov. 2017	10-2017-0152535 , Platform system for employment of IoT device, registered	S.Korea
May. 2016	10-2016-0058685 , Weld bead detecting method based on image	S.Korea