

# Jongyun Byeon

ELECTRONICS ENGINEER · HARDWARE

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## Bio Sketch

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Mr. Byeon is now with LIG NEX1 as junior research engineer, solving issues related production and operation of guided missile. He received the B.S degree in Electronics Engineering at Pusan National University, Pusan, Korea. He is now pursuing toward his M.S degree in Kyungpook National University. His research interests Embedded system and Hardware logic design.

## Education

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### Pusan National University

B.S. IN ELECTRONICS ENGINEERING

*Busan, S.Korea*

*Mar. 2012 – Feb. 2019*

### Kyungpook National University

M.S IN ELECTRONICS ENGINEERING

*Daegu, S.Korea*

*Mar. 2024 – Present*

## Skills

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**Programming** C/C++, LaTeX, Verilog

**Languages** Korean, English

## Experience

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### LIG Nex1 - Production Technology Team

JUNIOR RESEARCH ENGINEER

*Gumi, S.Korea*

*May. 2021 – Present*

- Solving errors during production of guided missile
- technical assistance for operation of guided missile

### ACES Coding camp, Kyungpook National University

SOFTWARE TRAINER

*Daegu, S.Korea*

*Dec. 2016 – Feb. 2017*

- Taught Linux programming and Data structure
- Construct Shortest path finding program using google map API

### CK, Kyungpook National University

TUTOR

*Daegu, S.Korea*

*Mar. 2017 – Dec. 2017*

- Taught Microprocessor to electronics engineering students
- Taught Computer system to electronics engineering students

### Kyungpook National University

TEACHING ASSISTANT

*Daegu, S.Korea*

*Mar. 2018 – Jun. 2019*

- Taught Microprocessor to electronics engineering students from Mar. 2018 to Jun. 2018
- Taught Data structure to electronics engineering students from Sep. 2018 to Dec. 2018
- Taught Microprocessor to electronics engineering students from Mar. 2019 to Jun. 2019

### Kyungpook National University

EXPERIMENT LECTURER

*Daegu, S.Korea*

*Mar. 2020 – Present*

- Taught C programming language

# Extracurricular Activity

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## AI-SoC (AI-Embedded System-Software-on-Chip Platform) LAB

S.Korea

MEMBER

MARCH, 2024 - PRESENT

- Gained fundamental knowledge in Hardware design
- Write several paper about visualization platform

## Publications

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### INTERNATIONAL JOURNAL PAPER

#### **Semantic Depth Data Transmission Reduction Techniques Based on Interpolated 3D Plane Reconstruction for Light-Weighted LiDAR Signal Processing Platform**

Taewon Chong, **Dongkyu Lee**, Daejin Park  
*Electronics*, vol. 11, no. 14. 2022

SCIE, Contributed equally

#### **Energy-Efficient FPGA Accelerator with Fidelity-Controllable Sliding-Region Signal Processing Unit for Abnormal ECG Diagnosis on IoT Edge Devices**

**Dongkyu Lee**, Seungmin Lee, Sejong Oh, Daejin Park  
*IEEE Access*. 2021

SCIE, Accepted for publication

#### **On-Demand Remote Software Code Execution Unit Using On-Chip Flash Memory Cloudification for IoT Environment Acceleration**

**Dongkyu Lee**, Moon Gi Seok, Daejin Park

*Journal of Information Processing Systems (JIPS)*, vol. 17, no. 1, pp. 191–202. Korea Information Processing Society, 2021

#### **mIoT: Metamorphic IoT Platform for On-Demand Hardware Replacement in Large-Scaled IoT Applications**

**Dongkyu Lee**, Hyeongyun Moon, Sejong Oh, Daejin Park

*Sensors*, vol. 20, no. 12. 2020

SCIE

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

Sanghoon Lee, **Dongkyu Lee**, Pyung Choi, Daejin Park

*Sensors*, vol. 20, no. 19, p. 5706. Multidisciplinary Digital Publishing Institute, 2020

SCIE

#### **Processing M-based IoT Visualization for Fast Development of Safe, Collision-Free Autonomous Driving**

**Dongkyu Lee**, Jeonghun Cho, Daejin Park

*International Journal of Applied Engineering Research (IJAER)*, vol. 12, no. 16, pp. 6318–6322. 2017

SCOPUS

### DOMESTIC JOURNAL PAPER (KCI)

#### **Comparative Learning based Deep Learning Algorithm for Abnormal Beat Detection using Imaged Electrocardiogram Signal**

Jinkyung Bae, Minsoo Kwak, Kyeungkap Noh, **Dongkyu Lee**, Daejin Park, Seungmin Lee

*Journal of the Korea Institute of Information and Communication Engineering*, vol. 26, no. 1, pp. 30–40. The Korea Institute of Information and Communication Engineering, 2022

#### **Adaptive Processing Algorithm Allocation on OpenCL-based FPGA-GPU Hybrid Layer for Energy-Efficient Reconfigurable Acceleration of Abnormal ECG Diagnosis**

**Dongkyu Lee**, Seungmin Lee, Daejin Park

*IEMEK Journal of Embedded Systems and Applications (IEMEK)*. Institute of Embedded Engineering of Korea, 2021

Accepted for publication

#### **Hardware and Software Co-Design Platform for Energy-Efficient FPGA Accelerator Design**

**Dongkyu Lee**, Daejin Park

*Journal of the Korea Institute of Information and Communication Engineering (JKIICE)*, vol. 25, no. 1, pp. 20–26. The Korea Institute of Information and Communication Engineering, 2021

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

Sanghoon Lee, **Dongkyu Lee**, Pyung Choi, Daejin Park

*IEMEK Journal of Embedded Systems and Applications (IEMEK)*, vol. 15, no. 5, pp. 215–225. Institute of Embedded Engineering of Korea, 2020

#### **Cloudification of On-Chip Flash Memory for Reconfigurable IoTs using Connected-Instruction Execution**

**Dongkyu Lee**, Jeonghun Cho, Daejin Park

## INTERNATIONAL CONFERENCE

### **On-Demand Streamable Code Executable Link Layer for OpenAPI-based Edge-Cloud Infrastructure**

**Dongkyu Lee**, Daejin Park

*International Conference on Electronics, Information, and Communication 2023 (ICEIC 2023)*, Shangri La, Singapore, 2023

On Writing

### **A Study on the Effectiveness of the Comparative Neural Network Model for Abnormal Beat Detection in Electrocardiogram Signals**

Jinkyung Bae, Minsoo Kwak, Kyeungkap Noh, **Dongkyu Lee**, Seungmin Lee, Daejin Park

*2021 IEEE International Conference on Consumer Electronics-Asia (ICCE-Asia)*, 2021

### **Efficient Signal Processing Acceleration using OpenCL-based FPGA-GPU Hybrid Cooperation for Reconfigurable ECG Diagnosis**

**Dongkyu Lee**, Seungmin Lee, Daejin Park

*The 18th International SoC Design Conference (ISOCC 2021)*, Jeju, Korea, 2021

Accepted for publication

### **FPGA-based Cloudification of ECG Signal Diagnosis Acceleration**

**Dongkyu Lee**, Seungmin Lee, Daejin Park

*The 12th International Conference on Ubiquitous and Future Networks (ICUFN 2021)*, Jeju, Korea, 2021

### **Binary Classification for Linear Approximated ECG Signal in IoT Embedded Edge Device**

Seungmin Lee, **Dongkyu Lee**, Daejin Park

*The 12th International Conference on Ubiquitous and Future Networks (ICUFN 2021)*, Jeju, Korea, 2021

### **Scrambling technique of instruction power consumption for side-channel attack protection**

**Dongkyu Lee**, Myeongjin Kang, Peter Plesznik, Jeonghun Cho, Daejin Park

*2020 International Conference on Electronics, Information, and Communication (ICEIC)*, 2020

### **On-Chip Flash Memory Cloudification for IoT Environment Acceleration Using Server-Side Remote Execution Code**

**Dongkyu Lee**, Daejin Park

*The 2020 World Congress on Information Technology Applications and Services (WITC 2020)*, Seoul, Korea, 2020

Invited to JIPS, Not published

### **Optimized FPGA Accelerator with a Fidelity-Controllable Sliding-Region for Energy-Efficient Matrix Calculation**

**Dongkyu Lee**, Daejin Park

*The 12th International Conference on Computer Science and its Applications (CSA2020)*, Jeju, Korea, 2020

Not published

### **Efficient Partitioning of On-Cloud Remote Executable Code and On-Chip Software for Complex-Connected IoT**

**Dongkyu Lee**, Jeonghun Cho, Daejin Park

*2019 IEEE International Conference on Big Data and Smart Computing (BigComp)*, Kyoto, Japan, 2019

### **Software execution freeze-safe microcontroller using power profile tracking for IoT-driven connected services**

Hyeongrae Kim, **Dongkyu Lee**, Jeonghun Cho, Daejin Park

*2018 IEEE 4th World Forum on Internet of Things (WF-IoT)*, 2018

### **Remote On-Demand Code Execution Framework using Code Memory Cloudification for Low-Power, Large-Scaled IoT Applications**

**Dongkyu Lee**, Jeonghun Cho, Daejin Park

*IEEE Symposium on Low-Power and High-Speed Chips and Systems (Cool Chips 21)*, Yokohama, Japan, 2018

### **Interactive simulation platform using processing-based visualization for safe collision-free autonomous driving development**

**Dongkyu Lee**, Jeonghun Cho, Daejin Park

*2017 IEEE Conference on Dependable and Secure Computing (DSC 2017)*, Taipei, Taiwan, 2017

### **Processing-based IoT Visualization for Fast Development of Safe Collision-Free Autonomous Driving**

**Dongkyu Lee**, Moon Gi Seok, Jeonghun Cho, Daejin Park

*The international Conference on Big data, IoT, and Cloud computing (BIC 2017)*, Jeju, Korea, 2017

Not published

## DOMESTIC SOCIETY

### **A Study on the Remote On-Demand Code Execution Framework using Code Memory Cloudification**

**Dongkyu Lee, Jeonghun Cho, Daejin Park**

*The Korean Institute of Communications and Information Sciences, pp. 1138–1138. 2018*

## **A Study on Simulation Platform using Processing-based Visualization for Autonomous Driving Algorithm Development**

**Dongkyu Lee, Jeonghun Cho, Daejin Park**

*The Korean Institute of Communications and Information Sciences, pp. 736–736. 2017*

## **Presentation**

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### **2017 IEEE Conference on Dependable and Secure Computing (DSC 2017)**

*Taipei, Taiwan*

POSTER PRESENTER

*Aug. 2017*

- Interactive Simulation Platform using Processing-based Visualization for Safe Self-Organizing Autonomous Driving Algorithm Development

### **2018 IEEE Symposium on Low-Power and High-Speed Chips and Systems (CoolChips 2018)**

*Yokohama, Japan*

POSTER PRESENTER

*Apr. 2018*

- Remote On-Demand Code Execution Framework using Code Memory Cloudification for Low-Power, Large-Scaled IoT Applications

### **ICIT 2018**

*Hongkong*

ONLY FOR PRESENTATION SESSION

*Dec. 2018*

- Efficient Partitioning of On-Cloud Remote Executable Code and On-Chip Software for Complex-connected IoT

### **The 6th IEEE International Conference on Big Data and Smart Computing (BigComp 2018)**

*Kyoto, Japan*

REGULAR PRESENTER

*Feb. 2019*

- Efficient Partitioning of On-Cloud Remote Executable Code and On-Chip Software for Complex-connected IoT

### **International Conference on Electronics, Information, and Communication (ICEIC) 2020**

*Barcelona, Spain*

POSTER PRESENTER

*Jan. 2020*

- Scrambling Technique of Instruction Power Consumption for Side-Channel Attack Protection

### **World IT Congress 2020 (WITC 2020)**

*Seoul, Korea*

REGULAR PRESENTER

*Feb. 2020*

- On-Chip Flash Memory Cloudification for IoT Environment Acceleration Using Server-Side Remote Execution Code

### **Computer Science and its Applications (CSA 2020)**

*Jeju, Korea*

REGULAR PRESENTER

*Dec. 2020*

- Optimized FPGA Accelerator with a Fidelity-Controllable Sliding-Region for Energy-Efficient Matrix Calculation

### **The 12th International Conference on Ubiquitous and Future Networks (ICUFN 2021)**

*Jeju, Korea*

REGULAR PRESENTER

*Aug. 18th. 2021*

- FPGA-based Cloudification of ECG Signal Diagnosis Acceleration

### **The 18th International SoC Design Conference (ISOCC 2021)**

*Jeju, Korea*

POSTER PRESENTER

*Oct. 8th. 2021*

- Efficient Signal Processing Acceleration using OpenCL-based FPGA-GPU Hybrid Cooperation for Reconfigurable ECG Diagnosis