Insu Jang

insujang@casys.kaist.ac.kr https://insujang.github.io

Research Interests

Computer Architecture, Distributed Systems, Parallel Computing, Heterogeneous Computing, GPUs, FPGAs, High Performance Computing, Cloud Computing

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, Republic of Korea

Master of Science in Computer Science (GPA: 3.98 / 4.30)

Mar 2016 - Feb 2018

Advisor: Dr. Jaehyuk Huh

Thesis: Secure I/O Architecture for Isolated Heterogeneous Computing with Hardware Assisted Trusted Execution Environment

• Sungkyunkwan University (SKKU)

Suwon, Republic of Korea

Bachelor of Science in Computer Engineering (GPA: 4.24 / 4.50)

Mar 2011 - Feb 2016

PUBLICATIONS

1. I. Jang, A. Tang, T. Kim, S. Sethumadhavan, and J. Huh. 2019. "Heterogeneous Isolated Execution for Commodity GPUs." International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '19), April 2019.

RESEARCH EXPERIENCE

Computer Architecture and Systems Lab, KAIST

Daejeon, Republic of Korea

Jan 2020 - Jul 2020

Research Assistant (Advisor: Dr. Youngjin Kwon)

• **Infiniband RDMA**: Worked on studying RDMA and reproducing Hyperloop, an Infiniband RDMA framework that optimizes replicated transactions published in SIGCOMM'18.

Computer Architecture and Systems Lab, KAIST

Daejeon, Republic of Korea

Graduate Research Assistant (Advisor: Dr. Jaehyuk Huh)

Mar 2016 - Feb 2018

- **Trusted Heterogeneous Execution Environment**: Worked on extending the protection of Intel SGX to heterogeneous devices connected to the system via PCIe architecture.
- o Accelerating Machine Learning: Worked on studying hardware architecture for machine learning.
- · Neworking Lab, Sungkyunkwan University

Suwon, Republic of Korea

Undergraduate Research Assistant (Advisor: Dr. Hyunseung Choo)

May 2014 - Jul 2015

- **Inaudible Sound Communication System**: Worked on implementing a data transmission system with inaudible sound over 20kHz frequency using commodity Android smartphones.
- M2M Lab, Purdue University (Purdue/NIPA Capstone Program)

West Lafayette, IN, USA

Undergraduate Research Assistant (Advisor: Dr. Eric T. Matson)

Jul 2014 – Aug 2014

• Cooprerative Fire Security System using HARMS: Worked on implementing Human Agent Robot Machine Sensor (HARMS) message protocol for robot-based firefighting system.

PATENTS

- 1. **I. Jang**, T. Kim, and J. Huh. 2018. "Heterogeneous Isolated Execution for Commodity GPUs." *Republic of Korea Patent No. 10-2105760.* Filed June 19, 2018, Issued December 30, 2019.
- I. Jang, S. Ryu, G. Jeon, H. Lee, M. Chung, and H. Choo. 2015. "Data Communication Method using Inaudible Frequency Band" Republic of Korea Patent No. 10-1560798. Filed February 23, 2015, Issued October 16, 2015.

WORK EXPERIENCE

TmaxA&C

Seongnam, Republic of Korea Feb 2018 – Present

System Software Engineer

- Kubernetes: Worked on implementing TmaxOS container system based on Kubernetes.
- o Linux: Worked on implementing TmaxOS APIs based on Linux low-level features, e.g. udev, netlink, etc.

KAIST

Daejeon, Republic of Korea

Teaching Assistant (CS230 System Programming)

• Electronics and Telecommunications Research Institute (ETRI) Daejeon,

Research Intern

Daejeon, Republic of Korea Jan 2016 – Feb 2016

- **Hypervisor**: Worked on studying internal architecture of Xen hypervisor.
- **Software Development Process**: Worked on studying Test Driven Development (TDD) process for reliable software development.
- Advanced Institute of Convergence Technology (AICT)

Suwon, Republic of Korea

Research Intern

- Jul 2015 Aug 2015 computing frameworks and
- Apache Hadoop and Apache Spark: Worked on studying distributed computing frameworks and internal architecture of Apache Hadoop and Apache Spark.
- Samsung Software Membership (Student Program of Samsung Electronics)
 Suwon, Republic of Korea
 Student Member
 Jan 2013 Apr 2014
 - **Android**: Worked on implementing several Android applications.
 - HTML5 and Javascript: Worked on implementing several HTML5 based web applications.
 - o Led several projects as a team leader.

Honors and Awards

Korea National Scholarship

Mar 2016 - Feb 2018

KAIST and Korea Ministry of Science and ICT

• Korea National Scholarship for Science and Engineering

Mar 2014 – Feb 2016

 ${\it Korea\ Student\ Aid\ Foundation\ and\ Korea\ Ministry\ of\ Education}$

• 2nd Prize, 2015 Convergence App Contest

Dec 2015

College of Software, Sungkyunkwan University

• Dean's List

Oct 2014, Apr 2015

Department of Computer Engineering, Sungkyunkwan University

• 1st Prize, 2013 Smart TV App and Peripherals Contest

Nov 2013

Korea Association of Smart Home and Korea Ministry of Trade, Industry and Energy

• 1st Prize, 2013 Mobile E-learning App Idea Contest

Sep 2013

Korea Ministry of Education

TECHNICAL SKILLS

- Languages: C, C++14, Python, Go
- Frameworks: CUDA, Intel SGX, Kubernetes, RDMA, Android, Linux, QEMU, KVM
- Tools: Vivado HLS, Docker, Markdown, LaTeX

References

- Jaehyuk Huh: Professor at KAIST, jhhuh@kaist.ac.kr
- Youngjin Kwon: Assistant Professor at KAIST, yjkwon@kaist.ac.kr