

RESEARCH INTERESTS

Computer Architecture, Memory Disaggregation, Distributed Systems, Parallel Computing, Heterogeneous Computing, GPUs, FPGAs, High Performance Computing, Cloud Computing, Computation Offloading

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: Prof. 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 Science and 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
Research Assistant (Advisor: Prof. Youngjin Kwon) Jan 2020 – Present
 - **Infiniband RDMA**: Hyperloop is an Infiniband RDMA framework that optimizes performance of transactions in replicated storage systems published in SIGCOMM'18. Worked on studying RDMA and reproducing Hyperloop.
- **Computer Architecture and Systems Lab, KAIST** Daejeon, Republic of Korea
Research Assistant (Advisor: Prof. Jaehyuk Huh) Mar 2016 – Feb 2018
 - **Trusted Heterogeneous Execution Environment**: Intel SGX is a CPU hardware based technology that provides trusted execution environment. Worked on extending the protection scope of trusted execution environment to heterogeneous devices connected to the system via PCI Express architecture, i.e. GPUs.
 - **Accelerating Machine Learning**: Worked on studying machine learning architecture and researching hardware support for acceleration.
- **Networking Lab, SKKU** Suwon, Republic of Korea
Research Assistant (Advisor: Prof. Hyunseung Choo) May 2014 – Jul 2015
 - **Inaudible Sound Communication System**: Worked on implementing a communication system with inaudible sound over 20kHz frequency using commodity Android smartphones.
- **M2M Lab, Purdue University (Purdue/NIPA Capstone Program)** West Lafayette, IN, USA
Research Assistant (Advisor: Prof. Eric T. Matson) Jul 2014 – Aug 2014
 - **Cooperative 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. 10-2018-0070169*, Filed June 19, 2018.
2. **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
System Software Engineer Feb 2018 – Present
 - **Kubernetes:** TmaxOS is a cloud-based operating system that provides unified user experience wherever it runs on, i.e. on a laptop or in a cloud. Worked on implementing TmaxOS container system based on Kubernetes.
 - **Linux:** Worked on implementing TmaxOS APIs based on Linux low-level features, e.g. udev, netlink, etc.
- **Electronics and Telecommunications Research Institute (ETRI)** Daejeon, Republic of Korea
Research Intern 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
 - **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.
 - Led several projects as a team leader.

HONORS AND AWARDS

- **National Scholarship** Mar 2016 – Feb 2018
KAIST
- **Korea National Scholarship for Science and Engineering** Mar 2014 – Feb 2016
Korea Student Aid Foundation
- **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, 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, Infiniband RDMA, Android, Linux, QEMU
- **Technologies:** Vivado HLS, KVM, Docker, Markdown, LaTeX