Insu Jang

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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
  Research Assistant (Advisor: Dr. Youngjin Kwon) Jan 2020 – Jul 2020
  - **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.
  - **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.
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**: 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.
- **KAIST** Daejeon, Republic of Korea
  Teaching Assistant (CS230 System Programming)
- **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

- **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
  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