Insu Jang

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https://insujang.github.io

Research Interests

System Architecture, Cloud Computing, Distributed Systems, Heterogeneous Computing

Education

- **The University of Michigan** — Ann Arbor, MI, USA
  Ph.D. Student in Computer Science and Engineering — Aug 2021 – Present
  Advisor: Dr. Mosharaf Chowdhury
- **Korea Advanced Institute of Science and Technology (KAIST)** — Daejeon, Republic of Korea
  Master of Science in Computer Science — Mar 2016 – Feb 2018
  Advisor: Dr. Jaehyuk Huh
- **Sungkyunkwan University (SKKU)** — Seoul, Republic of Korea
  Bachelor of Science in Computer Engineering — Mar 2011 – Feb 2016

Publications

1. Jongyul Kim, **Insu Jang**, Waleed Reda, Jaeseong Im, Marco Canini, Dejan Kostić, Youngjin Kwon, Simon Peter, and Emmett Witchel. **"LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism."** *ACM Symposium on Operating Systems Principles **(SOSP)***, October 2021. **Best Paper Award.**
2. **Insu Jang**, Adrian Tang, Taehoon Kim, Simha Sethumadhavan, and Jaehyuk Huh. **"Heterogeneous Isolated Execution for Commodity GPUs."** *International Conference on Architectural Support for Programming Languages and Operating Systems **(ASPLOS)***, April 2019.

Research Experience

- **Graduate Student Research Assistant (GSRA)** — University of Michigan
  Sep 2021 – Present
  Studying an efficient system architecture for distributed ML training. Scrutinized Megatron-LM and DeepSpeed to understand large scale ML training.
- **Research Assistant** — KAIST
  Jan 2020 – Jul 2020
  Implemented Hyperloop to use it as a baseline of LineFS, which offloads replicated transaction into Infiniband adaptors. Studied Infiniband RDMA architecture and witnessed the benefits of offloading. LineFS paper has been published to SOSP21 and won the best paper award.
- **Graduate Research Assistant** — KAIST
  Mar 2016 – Feb 2018
  Designed a HW-SW codesigned architecture for GPU trusted execution environment. To realize it, studied the PCIe interconnect architecture and Intel SGX architecture. It focuses on providing protection in the path between the GPU and the CPU to support commodity GPUs for practicality. HIX paper has been published to ASPLOS19.
- **Undergraduate Research Assistant** — SKKU
  May 2014 – Jul 2015
  Designed and implemented an inaudible communication system that can be implemented with commodity smartphones.
- **Undergraduate Research Asssitant** — Purdue University
  Jul 2014 – Aug 2014
  Designed and implemented a HARMS (Human, Agent, Robot, Machine, Sensor) based collective robot system.

Work Experience

- **System Software Engineer** — Feb 2018 – Jun 2021
  TmaxSoft Inc. — Seongnam, Republic of Korea
- **Research Intern** — Jan 2016 – Feb 2016
  Electronics and Telecommunications Research Institute (ETRI) — Daejeon, Republic of Korea
- **Research Intern** — Jul 2015 – Aug 2015
  Advanced Institute of Convergence Technology (AICT) — Suwon, Republic of Korea
- **Student Member** — Jan 2013 – Apr 2014
  Samsung Software Membership (Student Program of Samsung Electronics) — Suwon, Republic of Korea

Honors and Awards

- **Best Paper Award** — Oct 2021
  "LineFS: Efficient SmartNIC Offload of a Distributed File System with Pipeline Parallelism"
  The 28th ACM Symposium on Operating Systems Principles (SOSP)
- **Richard H. Orenstein Fellowship in Memory of Murray Orenstein** — Aug 2021
  Department of Electrical Engineering and Computer Science, The University of Michigan
- **Korea National Scholarship** — Mar 2016
  KAIST and Korea Ministry of Science and ICT
- **Korea National Scholarship for Science and Engineering** — Mar 2014
  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++20, Python, Go, Markdown, LaTeX
- **Frameworks**: PyTorch, DeepSpeed, CUDA, Intel SGX, Kubernetes, RDMA, Ceph, Linux, QEMU, KVM

References

Available upon request.