

# SEONJIN NA

Phone: +82 10-3027-8795

Email: sjna@casys.kaist.ac.kr

Github: <https://github.com/sjna-casys>

## RESEARCH INTERESTS

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My research interests lie in GPU architecture, trusted computing, heterogeneous systems, distributed computing, systems for machine learning. My current research is focused on building secure architecture to provide the trusted execution environment on GPUs with low performance overhead.

## EDUCATION

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### KAIST

Ph.D. Candidate in Computer Science

Advisor: Jaehyuk Huh

*Mar. 2018 - Present*

### KAIST

M.S. in Computer Science

Advisor : Jaehyuk Huh

*Mar. 2016 - Feb. 2018*

### Sogang University

B.S. in Computer Science

Summa CumLaude

*Mar. 2012 - Feb. 2016*

## RESEARCH PROJECTS

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### Secure GPU Architecture

*Mar. 2017 - Sep. 2020*

- The goal of this project is to provide the trusted execution environment on GPUs
- Investigated the limitations of existing TEEs such as Intel SGX, ARM TrustZone
- Implemented state-of-the-art memory protection & integrity verification techniques on GPGPUSim
- Analyzed the memory write behaviors of GPU benchmark suites and real-world GPU programs by using NVBit tool
- Proposed an efficient GPU memory encryption technique to reduce the performance overhead of securing GPU memory.
- The results of this work are published in **HPCA 2021**

### Machine Learning Inference on Mobiles

*Mar. 2019 - Jun. 2019*

- Participated in this research project during Microsoft Research Asia internship
- Investigated and implemented the state-of-the-art research on machine learning inference on mobiles by using Tensorflow Lite framework.

### Prefetching

*Mar. 2018 - Aug. 2018*

- Investigated the HW-based prefetching techniques on CPUs
- Implemented state-of-the-art HW-based prefetching techniques on Gem5 simulator

## PUBLICATIONS

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- Seonjin Na, Sunho Lee, Yeonjae Kim, Jongse Park, and Jaehyuk Huh, "Common Counters: Compressed Encryption Counters for Secure GPU Memory", **HPCA 2021**.

## RESEARCH EXPERIENCE

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### Microsoft Research Asia

*Mar. 2019 - Jun. 2019*

- Research Intern, Advisor : Lintao Zhang

### KAIST

*Mar. 2016 - Present*

- Graduate Research Assistant & Teaching Assistant

## TEACHING EXPERIENCE

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### KAIST

- System Programming(CS230) : Fall 2016, Spring 2017, Fall 2018, Fall 2020
- Computer Organization(CS311) : Fall 2019

### Sogang University

- C Programming : Winter 2014

## AWARDS AND HONORS

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### National Scholarship, KAIST

*Mar. 2016 - Present*

### Gold Prize

*Nov. 2015*

- The 2015 ACM-ICPC Asia Daejeon Regional Contest 4th place

### Honorable Mention

*Nov. 2013*

- The 2015 ACM-ICPC Asia Daejeon Regional Contest 13th place

### Academic Scholarship, 8 semesters

*Mar. 2012 - Sep. 2015*

- Sogang University

## SKILLS

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- **Programming Languages** : C/C++, Go, CUDA, Python, Java
- **Library/Frameworks** : NVBit, Pytorch, Tensorflow
- **Simulators** : GPGPUSim, MGPUSim, Gem5