# Sungchan Yi

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## RESEARCH INTERESTS

Computer Architecture, Hardware Software Co-design, Security, Formal Verification

## EDUCATION

**Seoul National University**                                                    *Sept. 2024 - Present*
*M.S. Candidate in Computer Science and Engineering*
- GPA: 4.18/4.3

**Seoul National University**                                                    *Mar. 2017 - Feb. 2024*
*B.S. in Computer Science and Engineering, Minor in Mathematical Sciences*
- GPA: 3.96/4.3 (*Summa Cum Laude*)

## RESEARCH EXPERIENCE

**Architecture and Code Optimization Lab**, Seoul National University            *Mar. 2024 - Present*
*M.S. Candidate (Advisor: Professor Jae W. Lee)*
- Leading **Software Defined Manycores** project to design a manycore processor that preemptively switches coroutines and hides memory access latency
- Proposed core ideas to implement preemptive C++ coroutines and verified them with gem5 simulator
    - Modified gem5 simulator to support hardware coroutines and preemptive scheduling
    - Designed a flexible software interface for the manycore processor that integrates seamlessly with existing C++ coroutines
- Currently working on speculative coroutine switches to further reduce switching overhead

**Cryptography and Privacy Lab**, Seoul National University                      *Jan. 2024 - Feb. 2024*
*Undergraduate Research Assistant (Advisor: Professor Yongsoo Song)*
- Implemented BFV homomorphic encryption scheme and its bootstrapping over a large message space
- Analyzed automorphism group of the plaintext space and determined their effects on ciphertext

**Software Foundations Lab**, Seoul National University                          *Jul. 2023 - Oct. 2023*
*Undergraduate Research Assistant (Advisor: Professor Chung-Kil Hur)*
- Implemented stack variable merging optimization that reduces memory allocation calls and tried to prove its correctness with Rocq theorem prover

**Architecture and Code Optimization Lab**, Seoul National University            *Jan. 2023 - Mar. 2023*
*Undergraduate Research Assistant (Advisor: Professor Jae W. Lee)*
- Implemented a parametrized experiment framework to automate training and evaluation of various CNN models with different activation functions and their knowledge distillation based ReLUifications
- Quantified benefits of ReLUification on sparsity-aware NPU for Samsung mobile SoC in terms of memory footprint and computation reduction

## PUBLICATIONS

1. Soosung Kim, Yeonhong Park, Hyunseung Lee, **Sungchan Yi**, and Jae W. Lee, "ReLUifying Smooth Functions: Low-Cost Knowledge Distillation to Obtain High-Performance ReLU Networks", *Asian Conference on Computer Vision (ACCV)*, 2024. (pdf)

2. **Sungchan Yi**, "Secure IAM on AWS with Multi-Account Strategy", *Undergraduate Thesis*, 2023. *Best Undergraduate Paper Award.* (pdf)

## WORK EXPERIENCE

**Scatter Lab**, *Software Reliability / Security Engineer*        *Nov. 2020 - Sept. 2022*
- Led cloud security project, co-worked with AWS to completely rebuild and secure the cloud infrastructure
- Led software reliability team, cut server operation costs with spot instances and container orchestration

**Logpresso**, *Big Data Platform Engineer*        *Jul. 2019 - Oct. 2020*
- Implemented loggers, parsers, and query commands that collect and analyze data from various sources, applied software-level optimizations to improve performance
- Optimized distributed security operation system from pull to push architecture to reduce latency

## HONORS AND AWARDS

**Best Undergraduate Paper Award**        *Feb. 2024*
- Title: Secure IAM on AWS with Multi-Account Strategy

**Top Prize in Hacking and Defense Contest 2021**        *Dec. 2021*
- Awarded by Korea Internet & Security Agency (KISA)
- Topic: Design and Operation of Secure Cloud Architectures

**Kwanjeong Educational Foundation Scholarship**        *Mar. 2018 - Feb. 2024*
- Full tuition and fees for 2 years of undergraduate studies

## EXTRACURRICULAR ACTIVITIES

**Web Administrator of Architecture and Code Optimization Lab**        *Feb. 2025 - Present*
- Responsible for maintaining the web infrastructure: website, cloud, accounts, wiki, etc.
- Installation of convenient tools such as shared password manager and schedule notification system

**Seoul National University College of Engineering Honor Society**        *Mar. 2022 - Aug. 2023*
- SNU Tomorrow's Edge Membership (STEM)
- **Web Administrator**: reduced cloud infrastructure costs by 50% and installed shared storage

**Guardian**, Seoul National University Security Club        *2018 - Present*
- Former president of the club in 2019
- Taught basic Linux, x86 assembly, and C programming to new members
- Created 30 linux/x86 assembly wargame challenges for members to practice

## TECHNICAL SKILLS

- Programming Languages: C/C++, Java, Python, Golang, Coq, Julia
- Architectural Simulators: gem5
- DevOps: Docker, Kubernetes, AWS

## LANGUAGES

iBT TOEFL: 113 (Reading: 30, Listening: 30, Speaking: 26, Writing: 27)