Hyunik Kim

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http://hyunik.kim

INTERESTS Distributed Systems, Operating Systems, Systems Security

EDUCATION

Seoul National University Seoul, Korea
M.S. Student Mar 2019 - Aug 2021
Thesis: Efficient and Reliable Memory Disaggregation on Virtualized Environment
Advisor: Prof. Bernhard Egger

Dankook University Yongin, Korea
B.E. in Mobile Systems Engineering, *Summa Cum Laude* Mar 2013 - Feb 2019
GPA: 4.28 / 4.5 (Overall), 4.34 / 4.5 (Major)

HONORS AND AWARDS

- ***Best Paper Award***, Korea Software Congress, 2017
- *Alumni Award*, Dankook University Alumni Association, 2019
- *3rd Place*, Korea Environmental Industry and Technology Institute, 2018
- *Excellence Award*, Korea Information Security Agency, 2017
- *Diligent Award*, One Asia Foundation, 2014
- *Dean's Award*, Dankook University, 2014
- *Scholarship for Academic Excellence*, 2013-2019
- *Scholarship for College of International Studies*, 2013-2019

RESEARCH EXPERIENCE

Computer Systems and Platforms Lab, Seoul National University
Research Assistant Mar 2019 - Aug 2021
Advisor: Prof. Bernhard Egger

- Built remote memory for virtualized environment
  - Increased overall memory utilization by sharing memory between nodes in cluster with high-throughput and low-latency interconnect
  - Implemented and improved fault-tolerance by leveraging versatile replication policy on the custom work-in-progress framework
- Extended remote memory for instant Virtual Machine (VM) live migration
  - Minimized VM live migration cost by implementing and performing the migration on distributed shared remote memory

Mobile Operating Systems Lab, Dankook University
Undergraduate Research Assistant Aug 2014 - Dec 2018
Advisor: Prof. Seehwan Yoo

- Participated and actively contributed to various research topics but not limited to systems security, hardware accelerator, and automated code generation:
  - Designed and implemented an isolated big data processing environment based on Tensorflow framework and Intel Software Guard Extensions (SGX)
  - Surveyed on academic papers exploiting side-channels to attack and leak data from trusted computing base in the cloud environment
  - Analyzed the design and the implementation of the secure OS architecture called Nested Kernel, which aims to assure lifetime integrity of the kernel
  - Integrated Measured/Secure boot with Intel open-source attestation framework, allowing Trusted Platform Module-based remote attestation on cloud environment without vendor-specific hardware support while ensuring chain-of-trust

  - Set development and experiment environment for performance evaluation on Intel Xeon Phi based Many-core cluster servers
  - Developed testing automation framework for LG webOS TV platform which supports planned automatic testing for various scenarios and parameters.
- Published and presented research contributions at international/domestic conferences and journal including Linux Security Summit, and SysTEX.

PUBLICATION

Refereed Conferences (International)

Changyeon Jo, **Hyunik Kim**, Hexiang Geng, and Bernhard Egger. "RackMem: A Tailored Caching Layer for Rack Scale Computing." In *Proceedings of the 29th International Conference on Parallel Architectures and Compilation Techniques (PACT'20)*, Virtual Event, October 2020. [pdf][doi]

Changyeon Jo, **Hyunik Kim**, and Bernhard Egger. "Instant Virtual Machine Live Migration." In *Proceedings of the 17th International Conference on the Economics of Grids Clouds, Systems and Services (GECON'20)*, Virtual Event, September 2020. [pdf]

Youngsu Cho, Changyeon Jo, **Hyunik Kim**, and Bernhard Egger. "Towards Economical Live Migration in Data Centers." In *Proceedings of the 17th International Conference on the Economics of Grids Clouds, Systems and Services (GECON'20)*, Virtual Event, September 2020. [pdf]

Seehwan Yoo, **Hyunik Kim**, and Joongheon Kim. "Secure-compute VM." In *Proceedings of the 3rd Workshop on System Software for Trusted Execution (SysTEX'18)*, Toronto, Canada, October 2018. [pdf]

Refereed Journal (Domestic, written in Korean)

Hyunik Kim, and Seehwan Yoo. "Vulnerability Analysis on Kernel Code and Memory Protection in Nested Kernel." In *Journal of Korean Institute Information Scientists and Engineers (JOK), 2018.* [link]

Refereed Conferences (Domestic, written in Korean)

Suhho Lee, **Hyunik Kim**, and Seehwan Yoo. "Comparison between Intel SGX and ARM TZ for Software base trust execution environment." In *Proceedings of Korea Computer Congress 2018*, Jeju, Korea, June 2018.

Hyunik Kim, Suhho Lee, and Seehwan Yoo. "Security Vulnerability Analysis in Nested Kernel." In *Proceedings of Korea Software Congress 2017*, Busan, Korea, December 2017. **(Best Paper Award)**

Hyunik Kim, and Seehwan Yoo. "Comparative Study of Trusted Computing: Intel TXT vs. ARM TrustZone." In *Proceedings of Korea Computer Congress 2017*, Jeju, Korea, June 2017.

Yoonseok Shim, **Hyunik Kim**, and Seehwan Yoo. "Black-box Test Automation Tool for Open TV Platform." In *Proceedings of Korea Institute Information Scientists and Engineers Winter Conference 2014*, Pyeongchang, Korea, December 2014.

TEACHING EXPERIENCE

Teaching Assistant, Seoul National University

- M1522.000800 System Programming — Fall 2020
- 4190.308 Computer Architecture — Spring 2020
- M1522.000800 System Programming — Fall 2019
- 4190.308 Computer Architecture — Spring 2019