

Gwangmu Lee

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Research Interest

Vulnerability Detection

Directed Fuzzing
Regression Fuzzing

Kernel Security

Continuous Patch Testing
Automatic Patch Backporting

Static Analysis

Compiler Optimization
Source Code Analysis

Education

Seoul National University (SNU)

Seoul, South Korea.

Ph.D. in Electrical and Computer Engineering (Advisor: Byoungyoung Lee)

Mar 2017 - Feb 2022

Pohang University of Science and Technology (POSTECH)

Pohang, South Korea.

M.S. in Computer Science and Engineering (Advisor: Jangwoo Kim)

Sep 2014 - Feb 2017

Pohang University of Science and Technology (POSTECH)

Pohang, South Korea.

B.S. in Physics / Computer Science and Engineering (Double Major)

Mar 2010 - Aug 2014

Work Experience

École Polytechnique Fédérale de Lausanne (EPFL)

Lausanne, Switzerland.

Post-doc Researcher (Software Security), HexHive

Apr 2022 - Now

Korea Institute for Advanced Study (KIAS)

Seoul, South Korea.

Research Intern (Astrophysics)

Jul 2013 - Aug 2013

Publications

SyzRisk: A Change-Pattern-Based Continuous Kernel Regression Fuzzer

The 19th ACM ASIA Conference on Computer and Communications Security (ASIACCS), July 2024. [to appear]

Gwangmu Lee, Duo Xu, Solmaz Salimi, Byoungyoung Lee, and Mathias Payer

FuzzOrigin: Detecting UXSS vulnerabilities in Browsers through Origin Fuzzing

The 31st USENIX Security Symposium (USENIX), August 2022.

Sunwoo Kim, Young Min Kim, Jaewon Hur, Suhwan Song, Gwangmu Lee, and Byoungyoung Lee

MundoFuzz: Hypervisor Fuzzing with Statistical Coverage Testing and Grammar Inference

The 31st USENIX Security Symposium (USENIX), August 2022.

Cheolwoo Myung, Gwangmu Lee, and Byoungyoung Lee

Constraint-guided Directed Greybox Fuzzing

The 30th USENIX Security Symposium (USENIX), August 2021.

Gwangmu Lee, Woochul Shim, and Byoungyoung Lee

DynaMix: Dynamic Mobile Device Integration for Efficient Cross-device Resource Sharing

2018 USENIX Annual Technical Conference (ATC), July 2018.

Dongju Chae, Joonsung Kim, Gwangmu Lee, HanJun Kim, Kyung-Ah Chang, Hyogun Lee, and Jangwoo Kim.

Flexon: A Cost-Effective Digital Neuron for Flexible Spiking Neural Network Simulation

The 45th International Symposium on Computer Architecture (ISCA), June 2018.

Dayeol Lee, Gwangmu Lee, Sunghwa Lee, Dongup Kwon, Youngsok Kim, and Jangwoo Kim.

———— Co-first ————

Architecture-aware Automatic Computation Offload for Native Applications

The 48th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), December 2015.

Gwangmu Lee, Hyunjoon Park, Seonyeong Heo, Kyung-Ah Chang, Hyogun Lee, and HanJun Kim

Selected Projects

Automatic Patch Backporting for the Linux Kernel

May 2023 - Present

Research Project (HexHive), EPFL, Project Lead

Investigating Clang Static Analyzer's False-positives and False-negatives

Mar 2023 - Jun 2023

Master's thesis (Cosme Jordan), Supervisor

Porting IR Pass for Address Sanitizer [MEDS, NDSS'18] to LLVM 12

Jun 2020 - Nov 2020

National Security Research Institute (NSR) × Computer Security Lab. (CompSec), SNU, Researcher

Optimizing Shader Compiler for ARM VLIW-Based Mobile GPU

Nov 2014 - Jun 2015

Samsung Electronics × High-performance Computing Lab. (HPC), POSTECH, Researcher

POSTECH-KAIST Science War Official AI Game (Diplomatics)

Jun 2012 - Sep 2012

College game development group (G-POS), POSTECH, Lead Programmer

Recognition

26th Graduate Student Scholarship

Mar 2015 - Feb 2020

Korea Foundation for Advanced Study (KFAS)

National Science and Engineering Scholarship

Mar 2010 - Feb 2014

Korea Student Aid Foundation (KOSAF)

Teaching Experience

Introduction to Programming, Dongji High School, Instructor

Winter 2014

Introduction to Programming, Dongji High School, Instructor

Summer 2015

Object Oriented Programming, POSTECH, Teaching Assistant

Fall 2015

Computer Architecture, POSTECH, Teaching Assistant

Fall 2016

Computer Organization, Seoul National University, Teaching Assistant

Spring 2017

Digital Logic Design, Seoul National University, Teaching Assistant

Fall 2017

Cyber Security and Blockchain, Seoul National University, Teaching Assistant

Fall 2019

Professional Services

<i>Invited Talk</i>	The Chronicle of Software Vulnerability Detection Kyung Hee University. Slides available at https://gwangmu.github.io/experience/ .	Jun 2023
<i>Reviewer</i>	IEEE Transactions on Dependable and Secure Computing IEEE Transactions on Software Engineering	2023 2023

Skills & Etc

<i>Language</i>	Korean (native), English (fluent)
<i>Programming Language</i>	C (expert), Python (expert), C++ (advanced), Go (advanced), Bash (advanced), Java (proficient), Verilog (proficient), Scala (proficient), Rust (familiar), OCaml (familiar)
<i>Tool and Software</i>	AFL (expert), Syzkaller (expert), LLVM IR (advanced), Clang Static Analyzer (advanced), Linux CLI (advanced), Linux Kernel Codebase (advanced), LLVM Frontend (advanced), Docker (proficient), QEMU (familiar), Qt (familiar)
<i>Personal Repo. (Selected)</i>	“Mini Excel” Educational C++ Project Semester project for the Bachelor’s course “Object Oriented Programming” (Fall 2015), link . Cycle-accurate Custom Hardware Simulator A spin-off project of <i>Flexon</i> (ISCA’18), link .