

# Gwangmu Lee

Software Engineer @ Swiss National Computing Centre (CSCS)

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## Professional Interest

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### Software Security

Vulnerability Detection  
Kernel Security

### Software Engineering

Dynamic/Static Software Testing  
Code Analysis & Optimization

### High-performance Computing

Workload Containerization  
Container Engine Development

## Education

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### 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

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### Swiss National Computing Centre (CSCS)

Lugano, Switzerland.

Software Engineer (Container Engine and Framework)

Apr 2024 - Now

### École Polytechnique Fédérale de Lausanne (EPFL)

Lausanne, Switzerland.

Post-doc Researcher (Software Security), HexHive

Apr 2022 - Mar 2024

### Korea Institute for Advanced Study (KIAS)

Seoul, South Korea.

Research Intern (Astrophysics)

Jul 2013 - Aug 2013

## Publications

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### 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, Woonchul 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

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### **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

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### **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

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**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  
**Digital Logic Design**, Seoul National University, Teaching Assistant  
**Cyber Security and Blockchain**, Seoul National University, Teaching Assistant

Spring 2017  
Fall 2017  
Fall 2019

## Professional Services

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<i>Invited Talk</i>	<b>The Chronicle of Software Vulnerability Detection</b> Kyung Hee University. Slides available at <a href="https://gwangmu.github.io/experience/">https://gwangmu.github.io/experience/</a> .	Jun 2023
<i>Reviewer</i>	<b>IEEE Transactions on Dependable and Secure Computing (TDSC)</b> <b>IEEE Transactions on Software Engineering (TSE)</b>	2023 2023
<i>Prog. Committee</i>	<b>Intl. Symposium on Research in Attacks, Intrusions and Defense (RAID)</b>	2024

## Skills & Etc

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