Hojin Choi

Undergraduate student at Sogang University

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Research Interest

I have interests across a wide range of topics in software engineering and security, including but not limited to:

- **Software Testing, Program Analysis, Software Security, Program Repair**

Education

Sogang University Mar. 2020 – Feb. 2026 (Expected)

- *B.S. in Computer Science and Engineering (CGPA: 3.95 / 4.0, 3rd out of 136)* *Seoul, Republic of Korea*
  (On leaving for 2 years: Mandatory military service)

Research Experience

Undergraduate Internship at Information Security Lab, Sogang University Jan. 2024 - Present
Advisor: Prof. Jaeseung Choi

Conducted research on **fuzz testing for Ethereum smart contracts**, focusing on constraint-aware argument mutation that leverages semantic dependencies between function arguments and persistent state variables. Implemented a novel fuzzer (**IConFuzz**) and demonstrated improved bug-finding effectiveness compared to existing state-of-the-art tools. This work has been **submitted to ACM Transactions on Software Engineering and Methodology (TOSEM)** and is currently under review.

Remote Internship at System Security Lab, Indiana University Bloomington Feb. 2025 - Jun. 2025
Advisor: Prof. Hyungsub Kim

During this internship, I studied system security topics and completed several hands-on assignments. I developed a dynamic analysis tool on **Valgrind** for data-dependency tracking, implemented an **LLVM** ModulePass to build call graphs including indirect calls, and analyzed the **ArduPilot** code base, where I implemented a simple rover control program. Implementation details can be found on my GitHub (link).

Publications

1. **H. Choi** and J. Choi. "IConFuzz: A Constraint-Aware Argument Mutation for Effective Smart Contract Fuzz Testing" *ACM Transactions on Software Engineering and Methodology (TOSEM)*, under review.
2. **H. Choi**, J. Park, and J. Choi. "The Impact of Bug Oracle Implementation on the Effectiveness of Smart Contract Analysis Tools" *Korea Software Congress (KSC)*, 2024.

Honors and Awards

Capstone Design Competition *2nd place, Sogang University* *2025*

Scholarship from Woon Hae Foundation *₩10,000,000 a year* *2024*

Dean's list *Top 1% GPA honor, Sogang University* *2023*

SW Excellence Scholarship for Freshmen *Sogang University* *2020*

Academic Service

Student volunteer

- KIISE SIGPL (Special Interest Group on Programming Languages) Summer School 2025

Teaching Experience

Hacking and Information Security *Fall. 2025*

- *Assisting course instructor with grading and managing assignments*

Introduction to AI Programming *Fall. 2023 - Spring. 2025*

- *Covered basic Python programming and related frameworks*
- *Assisting lab sessions and managing assignments*

Selected Academic Projects

Fundamentals of Compiler Configuration *Fall. 2024*

Personal project using C within the course

- Implement the simplified compiler with three phases:
  Type checker, AST-to-IR translator, and IR optimization

Operating System *Fall. 2024*

Personal project using C within the course

- Implement the basic kernel features with PintOS:
  System call, Process scheduling, and Virtual memory

Programming Language *Spring. 2024*

Personal project using F# within the course

- Implement simple programming languages and type checker
  Imperative language, Functional language, and Type checker

System Programming *Spring. 2024*

Personal project using C within the course

- Three independent implementations:
  A simple shell, A concurrent server, and Custom malloc and free

Skills

Programming: C/C++, Python, F#, OCaml, Assembly Language(x86-64)

Languages: Korean (Native), English (TOEFL iBT MyBest score 98/120)