Hojin Choi

Undergraduate student at Sogang University

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Research Interest

- **Program Analysis, Software Security, Automated Testing, Automated 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 leave for 2 years: Mandatory military service)

Research Experience

Undergraduate Researcher 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 on real-world smart contracts compared to three existing state-of-the-art tools (Smartian, SmarTest, and RLF). This work has been **submitted to ACM Transactions on Software Engineering and Methodology (TOSEM)** and is currently under review. (code) (artifact)

Internship at System Security Lab, Indiana University Bloomington Feb. 2025 - Jun. 2025

Advisor: Prof. Hyungsub Kim

During this internship, 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" *Under submission* (code) (artifact)
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. (paper)

Academic Experience

Student volunteer

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

Honors and Awards

Capstone Design Competition *2025*

- *2nd place among 12 teams, Sogang University*
- *Developed applications for a dementia care robot using state-of-the-art TTS, lip-sync models*
- *Awarded $3,800 USD from the sponsor, Wonderful Platform*
- *Presented at the Korea Computer Congress (KCC) 2025 in the poster session*

Scholarship from Woon Hae Foundation *2024*

- *nominated by Sogang University (15 students) and selected as one of 294 recipients nationwide*
- *$7,000 annual merit-based scholarship (equivalent to one year of tuition)*

Dean's list *2023*

- *Awarded to top 1% students in Sogang University*

SW Excellence Scholarship for Freshmen *2020*

- *Awarded to 11 outstanding freshmen, Sogang University*
- *$7,000 annual merit-based scholarship (equivalent to one year of tuition)*

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*

Implement a simplified compiler

- Type checker, AST-to-IR translator, and IR optimization

Operating System *Fall. 2024*

Implement basic kernel features with PintOS

- System call, Process scheduling, and Virtual memory

Programming Language *Spring. 2024*

Implement simple programming languages and type checker

- Imperative language, Functional language, and Type checker

Skills

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

Tools: Git, GDB, Docker, LaTeX

Languages: Korean: Native, English: TOEFL iBT 96/120 (MyBest score 102/120)