

Curriculum Vitae

Sunbeom So (소순범)

- Assistant Professor at GIST (Gwangju Institute of Science and Technology)
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- Webpage: <https://gist-pal.github.io>

Research Interests

I am interested in various research topics for improving the safety and reliability of software, including:

- **Program verification** for automatically proving the absence of bugs in programs.
- **Program testing** for automatically finding bugs in programs.
- **Program repair** for automatically fixing bugs in programs.
- **Program synthesis** for automatically generating safe and correct programs.

To tackle my research problems, I often develop and use techniques based on *SMT-based formal methods* such as symbolic execution, but I am also interested in using other techniques such as fuzzing to effectively achieve the goal of my research.

Education

- **Ph.D. in Computer Science and Engineering** 2016.09 – 2022.08
Korea University Seoul, Korea
Thesis: Automatic Verification, Testing, and Repair of Smart Contracts
Advisor: Hakjoo Oh
- **B.S. in Computer and Communication Engineering** 2011.03 – 2016.08
Korea University Seoul, Korea
Graduation with Top Honors (Valedictorian)

Work Experience

- Assistant Professor 2023.09 – current
School of Electrical Engineering and Computer Science Gwangju, Korea
GIST
- Research Professor 2022.09 – 2023.08
BK21 FOUR R&E Center for Computer Science and Engineering Seoul, Korea
Korea University

Publications

I have published papers at top-tier conferences in the field of software security (**Security 2021**, **S&P 2020**), software engineering (**ICSE 2023**, **FSE 2023**), programming languages (**OOPSLA 2018**), and artificial intelligence (**IJCAI 2018**).

1. SMARTFIX: Fixing Vulnerable Smart Contracts by Accelerating Generate-and-Verify Repair using Statistical Models
Sunbeom So, and Hakjoo Oh
ESEC/FSE 2023: *ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering*
2. DIVER: Oracle-Guided SMT Solver Testing with Unrestricted Random Mutations
 Jongwook Kim*, Sunbeom So*, and Hakjoo Oh (*: co-first authors)
ICSE 2023: *45th International Conference on Software Engineering*
3. SMARTTEST: Effectively Hunting Vulnerable Transaction Sequences in Smart Contracts through Language Model-Guided Symbolic Execution
Sunbeom So, Seongjoon Hong, and Hakjoo Oh
Security 2021: *30th USENIX Security Symposium*
4. VERISMART: A Highly Precise Safety Verifier for Ethereum Smart Contracts
Sunbeom So, Myungho Lee, Jisu Park, Heejo Lee, and Hakjoo Oh
S&P 2020: *41st IEEE Symposium on Security and Privacy*
5. Automatic Diagnosis and Correction of Logical Errors for Functional Programming Assignments
 Junho Lee, Dowon Song, Sunbeom So, and Hakjoo Oh
OOPSLA 2018: *ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*
6. Synthesizing Pattern Programs from Examples
Sunbeom So, and Hakjoo Oh
IJCAI 2018: *International Joint Conference on Artificial Intelligence*
7. Synthesizing Imperative Programs from Examples Guided by Static Analysis
Sunbeom So, and Hakjoo Oh
SAS 2017: *Static Analysis Symposium*
8. Synthesizing Regular Expressions from Examples for Introductory Automata Assignments
 Mina Lee*, Sunbeom So*, and Hakjoo Oh (*: co-first authors)
GPCE 2016: *ACM SIGPLAN International Conference on Generative Programming: Concepts and Experiences*
Best Paper Award

Academic Activities

Artifact Evaluation Committee (AEC) member

- **CAV 2023**: 35th International Conference on Computer Aided Verification
- **OOPSLA 2020**: ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications

Journal Reviewer

- **TSE**: IEEE Transactions on Software Engineering (2022)
- **TOSEM**: ACM Transactions on Software Engineering and Methodology (2023)

Open-sourced Research Software

I have developed the following open-sourced software.

- **Main developer** of VERISmart and SMARTest
VERISmart: a formal safety verification tool for Solidity smart contracts
SMARTest: a symbolic execution tool for Solidity smart contracts
<https://github.com/kupl/VeriSmart-public>
- **Main developer** of PAT
A pattern program synthesizer
<https://github.com/kupl/pat>
- **Main developer** of SIMPL
An imperative program synthesizer
<https://github.com/kupl/SimplPublic>
- **Developer** of ALPHAREGEX
A regular expression synthesizer
<https://github.com/kupl/AlphaRegexPublic>

Research Grant (Principal Investigator)

- **Research Subsidies for Ph.D. Candidates** 2020.06 – 2021.05
National Research Foundation of Korea (NRF)
20,000,000 KRW

Technology Transfer

- **스마트 컨트랙트 검증 장치 및 방법** (오학주, 소순범, 이명호) 2020.09 – 2023.08
SOOHO.IO Inc.
5,000,000 KRW

Awards

- **The 27th Humantech Paper Award* (Participation Prize)** 2021.02
Samsung Electronics
*: # of awarded submissions: 116 out of 1991 (5.8%)
- **Naver Ph.D Fellowship Award** 2020.12
Naver
- **Valedictorian at the College of Information & Communication** 2017.02
Korea University
- **Best Paper Award** 2016.10
ACM SIGPLAN GPCE 2016

Scholarships

- **Junior Fellow-Research Grant** 2020 Fall – 2021 Spring
Korea University
- **Honor Graduates Scholarship** 2017 Spring – 2020 Spring
Korea University
- **Undergraduate Student Scholarship** 2015 Spring – 2016 Spring
Kwanjeong Educational Foundation
- **Academic Excellence Scholarship** 2012 Spring, 2014 Fall
Korea University

Invited Talks

- SMARTTEST: Effectively Hunting Vulnerable Transaction Sequences in Smart Contracts through Language Model-Guided Symbolic Execution
Top Conference Session at Korea Software Congress (KSC) 2021 2021.12.22
- VERISmart: A Highly Precise Safety Verifier for Ethereum Smart Contracts
Top Conference Session at Korea Computer Congress (KCC) 2020, Online 2020.07.03

Conference Presentations

- SMARTTEST: Effectively Hunting Vulnerable Transaction Sequences in Smart Contracts through Language Model-Guided Symbolic Execution
Security 2021, Online 2021.08.11
- VERISmart: A Highly Precise Safety Verifier for Ethereum Smart Contracts
S&P 2020, Online 2020.05.20
- Synthesizing Pattern Programs from Examples
IJCAI 2018, Stockholm (Sweden) 2018.07.16
- Synthesizing Imperative Programs from Examples Guided by Static Analysis
SAS 2017, New York (USA) 2017.08.30
- Synthesizing Regular Expressions from Examples for Introductory Automata Assignments
GPCE 2016, Amsterdam (Netherlands) 2016.10.31