# 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](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. SMARTEST: 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, 2023)

- **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, SMARTEST, and SMARTFIX
  VERISMART: a formal safety verification tool for smart contracts
  SMARTEST: a symbolic execution tool for smart contracts
  SMARTFIX: a vulnerability-repair tool for 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

- SMARTEST: 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

- SMARTFIX: Fixing Vulnerable Smart Contracts by Accelerating Generate-and-Verify Repair using Statistical Models
  **ESEC/FSE 2023**, San Francisco (USA)  2023.12.05

- SMARTEST: 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