

# Seunghoon Woo

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OPEN-SOURCE SOFTWARE SECURITY; SOFTWARE COMPOSITION ANALYSIS;  
SOFTWARE VULNERABILITY DETECTION; CODE CLONE DETECTION.

## EARNED DEGREES

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- **M.S. & Ph.D.** in Computer Science and Engineering, Korea University Sep 2016 - Aug 2022
- **B.S.** in Computer Science and Engineering, Korea University Mar 2010 - Feb 2016

## PH.D. THESIS

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- Detecting Software Vulnerabilities for Mitigating Risks of Open-Source Reuse (advisor: Prof. Heejo Lee) Aug 2022

## WORKING EXPERIENCES

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- **Center for Software Security and Assurance**, Research Professor Sep 2022 - Present  
Researching open-source software security *Seoul, Korea*
- **IOTCUBE Inc.**, Chief Scientist May 2022 - Present  
Developed open-source security techniques (<https://iotcube.com>) *Seoul, Korea*
- **Center for Software Security and Assurance**, Researcher & Developer Mar 2016 - Present  
Developed automated software security analysis tools (<https://iotcube.net>) *Seoul, Korea*
- **National University of Singapore**, Research Intern Jan 2017 - Feb 2017  
Developed a DDoS attack simulation tool (advisor: Prof. Minsuk Kang) *Singapore*
- **Samsung Electronics**, Employee Dec 2015 - Jan 2016  
Developed a multi-platformed application for supporting Smart TVs *Suwon, Korea*
- **DoDotDo (startup)**, Core Developer Jan 2015 - Sep 2015  
Developed a smart watch-based hotel management system *Seoul, Korea*
- **Samsung Electronics**, Student Intern Jun 2014 - Aug 2014  
Developed a multi-platformed application for supporting Smart TVs *Suwon, Korea*

## PUBLICATIONS - INTERNATIONAL CONFERENCE

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- [1] **Seunghoon Woo**, Hyunji Hong, Eunjin Choi, and Heejo Lee, "MOVERY: A Precise Approach for Modified Vulnerable Code Clone Discovery from Modified Open-Source Software Components," *In Proceedings of the 31st USENIX Security Symposium (Security 2022)*, August 2022. (Acceptance rate: 18.0%)
- [2] Haram Park, Carlos Nkuba Kayembe, **Seunghoon Woo**, and Heejo Lee, "L2Fuzz: Discovering Bluetooth L2CAP Vulnerabilities Using Stateful Fuzz Testing," *In Proceedings of the 52nd IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2022)*, June 2022. (Acceptance rate: 18.7%)
- [3] Hyunji Hong, **Seunghoon Woo**, and Heejo Lee, "DICOS: Discovering Insecure Code Snippets from Stack Overflow Posts by Leveraging User Discussions," *In Proceedings of the Annual Computer Security Applications Conference (ACSAC 2021)*, December 2021. (Acceptance rate: 24.5%)
- [4] **Seunghoon Woo**, Dongwook Lee, Sunghan Park, Heejo Lee, and Sven Dietrich, "V0Finder: Discovering the Correct Origin of Publicly Reported Software Vulnerabilities," *In Proceedings of the 30th USENIX Security Symposium (Security 2021)*, August 2021. (Acceptance rate: 19.0%)

- [5] Seongkyeong Kwon, **Seunghoon Woo**, Gangmo Seong, and Heejo Lee, “OctoPoCs: Automatic Verification of Propagated Vulnerable Code Using Reformed Proofs of Concept,” *In Proceedings of the 51st IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2021)*, June 2021. (Acceptance rate: 16.3%)
- [6] **Seunghoon Woo**, Sunghan Park, Seulbae Kim, Heejo Lee, and Hakjoo Oh, “CENTRIS: A Precise and Scalable Approach for Identifying Modified Open-Source Software Reuse,” *In Proceedings of the 43rd International Conference on Software Engineering (ICSE 2021)*, May 2021. (Acceptance rate: 22.4%)
- [7] Seulbae Kim, **Seunghoon Woo**, Heejo Lee, and Hakjoo Oh, “VUDDY: A Scalable Approach for Vulnerable Code Clone Discovery,” *In Proceedings of the 38th IEEE Symposium on Security and Privacy (S&P 2017)*, May 2017. (Acceptance rate: 12.9%)
- [8] Seulbae Kim, **Seunghoon Woo**, Heejo Lee, and Hakjoo Oh, “Poster: IoTcube: an automated analysis platform for finding security vulnerabilities”, *In 2017 IEEE Symposium on Poster presented at Security and Privacy (S&P Poster 2017)*, May 2017.

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#### PUBLICATIONS - INTERNATIONAL JOURNAL

- [1] Hyunji Hong, **Seunghoon Woo**, Eunjin Choi, Jihyun Choi, and Heejo Lee, “xVDB: A High-Coverage Approach for Constructing a Vulnerability Database,” **IEEE ACCESS (IF: 3.476)**, 2022.

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#### PUBLICATIONS - OTHERS

- [1] Seulbae Kim, **Seunghoon Woo**, Heejo Lee, and Hakjoo Oh, “Poster: IoTcube: an automated analysis platform for finding security vulnerabilities”, *In 2017 IEEE Symposium on Poster presented at Security and Privacy (S&P Poster 2017)*, May 2017.

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#### PROJECTS

- **Project Manager**, International Joint Research Jun 2019 - Present  
Development of Automated Vulnerability Discovery Technologies for Blockchain Platform Security
- **Researcher & Developer**, University of Southern California & LA City Nov 2017 - Present  
The Intelligent IoT Integrator (I3): LA Smart City Project
- **Main Researcher** Apr 2020 - Oct 2020  
Verifying Open-Source Software Reliability for Reinforcing Operating System Security
- **Main Researcher** May 2018 - Oct 2018  
Development of DNS-based Lightweight Framework for Addressing Abnormal Network Behaviors
- **Project Manager**, Office of Naval Research Sep 2017 - Sep 2019  
A Study of a DDoS-resilient Network Architecture through Traffic Classification and Isolation
- **Researcher & Developer**, International Joint Research Feb 2016 - May 2018  
Development of Vulnerability Discovery Technologies for IoT Software Security

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#### PATENT

- [1] Heejo Lee and **Seunghoon Woo**, METHOD FOR IDENTIFYING OPEN-SOURCE SOFTWARE COMPONENTS AT THE SOURCE-CODE LEVEL, APPLICATION, US (17525126, Nov 2021)
- [2] Heejo Lee and **Seunghoon Woo**, METHOD FOR IDENTIFYING OPEN-SOURCE SOFTWARE COMPONENTS AT THE SOURCE-CODE LEVEL, APPLICATION, EUROPE (EP21202849.2, Oct 2021)
- [3] Heejo Lee and **Seunghoon Woo**, METHOD FOR IDENTIFYING OPEN-SOURCE SOFTWARE COMPONENTS AT THE SOURCE-CODE LEVEL, APPLICATION, KOREA (10-2021-0010585, Jan 2021)

## STANDARD

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- [1] Heejo Lee, **Seunghoon Woo**, Hyunji Hong, Choonsik Park, Yunseong Choi, Structured Software Vulnerability Database Information Expression for Vulnerability Detection and Resolution, Korea (TTAK.KO-12.0384, Jun 2022)

## OPEN-SOURCE CONTRIBUTIONS (SELECTED)

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- **Apple**, Fixing security vulnerabilities (with Haram Park) Dec 2021  
Discovered DoS vulnerabilities in Apple tvOS, watchOS, iOS, iPadOS, and macOS Monterey Bluetooth stack
- **XPDF**, Fixing security vulnerabilities (CVE-2020-35376 assigned) Dec 2020  
Detected a stack consumption vulnerability in XPDF (<https://www.xpdfreader.com>)
- **Redis**, Fixing security vulnerabilities (CVE-2020-14147 assigned) Feb 2020  
Detected a possible stack-based buffer overflow vulnerability in Redis (<https://github.com/redis/redis>)
- **Stepmania**, Fixing security vulnerabilities (CVE-2020-20412 assigned) Sep 2019  
Detected a improper validation vulnerability in Stepmania (<https://github.com/stepmania/stepmania>)
- **Godot**, Fixing security vulnerabilities Jul 2019  
Detected a possible remote code execution vulnerability in Godot (<https://github.com/godotengine/godot>)
- **LibGDX**, Fixing security vulnerabilities Jul 2019  
Detected a possible remote code execution vulnerability in LibGDX (<https://github.com/libgdx/libgdx>)

## TALKS AND PRESENTATIONS (SELECTED)

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- **Supply Chain Security Workshop 2022** Jul 2022  
Open Source Vulnerability Detection for Supply Chain Security
- **IoTcube Conference 2021** Aug 2021  
Analysis of Reused Open-Source Software Components for Software Bill of Materials
- **USENIX Security 2021**, Paper Presentation Aug 2021  
V0Finder: Discovering the Correct Origin of Publicly Reported Software Vulnerabilities
- **ICSE 2021**, Paper Presentation May 2021  
CENTRIS: A Precise and Scalable Approach for Identifying Modified Open-Source Software Reuse
- **KIISC Online Short Course 2021** Nov 2020  
Verification Technology for Open-Source Software Security
- **IoTcube Conference 2019** Aug 2019  
Automatic Vulnerability Analysis Framework Applied to LA Smart City Projects
- **Workshop among Asian Information Security Labs (WAIS) 2018** Jan 2018  
Identifying Constituent OSS in Software through Code Similarity Detection
- **IEEE S&P Poster 2017** May 2017  
Poster presentation: "IoTcube: an automated analysis platform for finding security vulnerabilities"

## HONORS (SELECTED)

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- **Academic Scholarship**, Korea University 2010 2R, 2011 1R, 2013 2R
- **Foreign Regular Course Major Study Scholarship**, Korea University 2013 2R
- **National Excellence Scholarship (Science and Engineering)**, Korea University 2014 1R - 2015 2R
- **BK21PLUS Scholarship**, Brain Korea 21 2017 1R - 2021 1R