# Seunghoon Woo

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Open-source Software Security; Software Composition Analysis;
Software Vulnerability Detection; Code Clone Detection.

## Earned Degrees

- **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

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

## Working Experiences

- **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

[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%)

## 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.

## 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.

## 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

## 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

[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)

- **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)

- **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)

- **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