

# Haehyun Cho

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## ○ EDUCATION

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### **Ph.D., Computer Science**

Feb 2021

Arizona State University, Tempe, AZ

- Thesis: *Exploiting and Mitigating Advanced Security Vulnerabilities*

### **M.S., Computer Science and Engineering**

Feb 2015

Soongsil University, Seoul, Korea

- Thesis: *Mobile App Tamper Detection Scheme Based on Core Code Attestation*

### **B.S., Computer Science and Engineering**

Feb 2013

Soongsil University, Seoul, Korea

## ○ PROFESSIONAL APPOINTMENTS

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### **Co-Director of Cyber Security Research Center**

Mar 2021–Present

Soongsil University, Seoul, Korea

### **Assistant Professor**

Mar 2021–Present

Soongsil University, Seoul, Korea

## ○ PUBLICATIONS

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### **• Conference Presentation with Proceedings (refereed)**

1. Penghui Zhang, Zhibo Sun, Sukwha Kyung, Hans Behrens, Zion Leonahenahe Basque, **Haehyun Cho**, Adam Oest, Ruoyu Wang, Tiffany Bao, Yan Shoshitaishvili, Gail-Joon Ahn, and Adam Doupe, “I’m SPARTACUS, No, I’m SPARTACUS: Proactively Protecting Users From Phishing by Intentionally Triggering Cloaking Behavior,” in *Proceedings of the 29th ACM Conference on Computer and Communications Security (CCS)*, Los Angeles, CA, Nov 2022.
2. Bora Lee, Kyungchan Lim, JiHo Lee, Chijung Jung, Doowon Kim, Kyu Hyung Lee, **Haehyun Cho**, and Yonghwi Kwon, “Dazzle-attack: Anti-Forensic Server-side Attack via Fail-free Dynamic State Machine,” in *Proceedings of the 23rd World Conference on Information Security Applications (WISA)*, Jeju Island, Aug 2022.
3. Kyle Zeng, Yueqi Chen, **Haehyun Cho**, Xinyu Xing, Adam Doupe, Tiffany Bao, and Yan Shoshitaishvili, “Playing for K(H)eaps: Understanding and Improving Linux Kernel Exploit Reliability,” in *Proceedings of the 31st USENIX Security Symposium (SEC)*, Boston, MA, Aug 2022.
4. **Haehyun Cho**, Jinbum Park, Adam Oest, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupe, and Gail-Joon Ahn. “ViK: Practical Mitigation of Temporal Memory Safety Violations through Object ID Inspection,” in *Proceedings of the 27th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, Lausanne, Switzerland, Feb–Mar 2022.
5. Doowon Kim, **Haehyun Cho**, Yonghwi Kwon, Adam Oest, Adam Doupe, Sooel Son, Gail-Joon Ahn, and Tudor Dumitras, “Security Analysis on Practices of Certificate Authorities in the HTTPS Phishing Ecosystem,” in *Proceedings of the 16th ACM ASIA Conference on Computer and Communications Security (ASIA CCS)*, Online, Jun 2021.

6. Penghui Zhang, Adam Oest, **Haehyun Cho**, Zhibo Sun, RC Johnson, Brad Wardman, Shaown Sarker, Alexandros Kapravelos, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “CrawlPhish: Large-scale Analysis of Client-side Cloaking Techniques in Phishing,” in *Proceedings of the 42nd IEEE Symposium on Security and Privacy (IEEE S&P)*, San Francisco, CA, May 2021.  
\*Best Student Paper Award
7. Sung Ta Dinh, **Haehyun Cho**, Kyle Martin, Adam Oest, Kyle Zeng, Alexandros Kapravelos, Tiffany Bao, Ruoyu Wang, Adam Doupé, Gail-Joon Ahn, Yan Shoshitaishvili, “Favocado: Fuzzing the Binding Code of JavaScript Engines Using Semantically Correct Test Cases,” in *Proceedings of the 2021 Network and Distributed System Security Symposium (NDSS)*, Online, Feb 2021.
8. Marzieh Bitaab, **Haehyun Cho**, Adam Oest, Penghui Zhang, Zhibo Sun, Rana Pourmohamad, Doowon Kim, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “Scam Pandemic: How Attackers Exploit Public Fear through Phishing,” in *Proceedings of the 2020 APWG Symposium on Electronic Crime Research (eCrime)*, Online, Nov 2020.
9. **Haehyun Cho**, Jinbum Park, Joonwon Kang, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “Exploiting Uninitialized Stack Memory Uses in the Linux Kernel for Leaking Kernel Pointers,” in *Proceedings of the 14th USENIX Workshop on Offensive Technologies (Usenix WOOT)*, Online, Aug 2020.
10. **Haehyun Cho**, Jinbum Park, Donguk Kim, Ziming Zhao, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “SmokeBomb: Effective Mitigation Against Cache Side-channel Attacks on the ARM Architecture,” in *Proceedings of the 18th ACM International Conference on Mobile Systems, Applications, and Services (ACM MobiSys)*, Online, Jun 2020.
11. Penghui Zhang, **Haehyun Cho**, Ziming Zhao, Adam Doupé, and Gail-Joon Ahn, “iCORE: Continuous and Proactive Extrospection on Multi-core IoT Devices,” in *Proceedings of the 34th ACM/SIGAPP Symposium On Applied Computing (ACM SAC)*, Limassol, Cyprus, Apr 2019.
12. **Haehyun Cho**, Penghui Zhang, Donguk Kim, Jinbum Park, Choong-Hoon Lee, Ziming Zhao, Adam Doupé, and Gail-Joon Ahn, “Prime+Count: Novel Cross-world Covert Channels on ARM Trust-Zone,” in *Proceedings of the 34th Annual Computer Security Applications Conference (ACSAC)*, San Juan, Puerto Rico, USA, Dec 2018.
13. Jaejong Baek, Sukwha Kyung, **Haehyun Cho**, Ziming Zhao, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “Wi Not Calling: Practical Privacy and Availability Attacks in Wi-Fi Calling,” in *Proceedings of the 34th Annual Computer Security Applications Conference (ACSAC)*, San Juan, Puerto Rico, USA, Dec 2018.

#### • Published and Accepted Journal Articles (refereed)

1. Geochang Jeon, Jeong Hyun yi, and **Haehyun Cho**, “Hiding Data in the Padding Area of Android Applications,” *IEICE Transactions on Information and Systems*, Vol. 105, No. 11, pp. 1928–1929, Jun 2022.
2. Minh Kim, **Haehyun Cho**, Jeong Hyun Yi, “Large-Scale Analysis on Anti-Analysis Techniques in Real-World Malware,” *IEEE Access*, Vol. 10, pp. 75802–75815, Jul 2022.
3. Jinsung Kim, Younghoon Ban, Geochang Jeon, Young Geun Kim, and **Haehyun Cho**, “LiDAR: A Light-Weight Deep Learning-Based Malware Classifier for Edge Devices,” *Wireless Communications and Mobile Computing*, Vol. 2022, Jun 2022.

4. Dongho Lee, Geochang Jeon, Sunjun Lee, and **Haehyun Cho**, “Deobfuscating Mobile Malware for Identifying Concealed Behaviors,” *COMPUTERS MATERIALS & CONTINUA*, Vol. 72, No.3, pp.5909–5923, Apr 2022.
5. Penghui Zhang, Adam Oest, **Haehyun Cho**, Zhibo Sun, RC Johnson, Brad Wardman, Shaown Sarker, Alexandros Kapravelos, Tiffany Bao, Ruoyu Wang, Yan Shoshitaishvili, Adam Doupé, and Gail-Joon Ahn, “CrawlPhish: Large-Scale Analysis of Client-Side Cloaking Techniques in Phishing,” *IEEE Security & Privacy*, Vol. 20, pp. 10–21, Apr 2022.
6. YoungHoon Ban, Sunjun Lee, Dokyung Song, **Haehyun Cho**, and Jeong Hyun Yi, “FAM: Featuring Android Malware for Deep Learning-based Familial Analysis,” *IEEE Access*, Vol. 10, pp. 20008–20018, Feb 2022.
7. Jinsung Kim, Younghoon Ban, Eunbyeol Ko, **Haehyun Cho**, and Jeong Hyun Yi, “MAPAS: A Practical Deep Learning-based Android Malware Detection System,” *International Journal of Information Security*, Feb 2022.
8. Eunbyeol Ko, Jinsung Kim, Younghoon Ban, **Haehyun Cho**, and Jeong Hyun Yi, “ACAMA: Deep Learning-based Detection and Classification of Android Malware using API-based Features,” *Security and Communication Networks*, Vol.2021, Dec 2021.
9. Geochang Jeon, Minseoung Choi, Sunjun Lee, Jeong Hyun Yi, and **Haehyun Cho**, “Automated Multi-Layered Bytecode Generation for Preventing Sensitive Information Leaks From Android Applications,” *IEEE Access*, Vol. 9, pp. 119578–119590, Aug 2021.
10. **Haehyun Cho**, Jeong Hyun Yi, and Gail-Joon Ahn. “DexMonitor: Dynamically Analyzing and Monitoring Obfuscated Android Applications,” *IEEE Access*, Vol. 6, pp.71229–71240, Nov 2018.
11. **Haehyun Cho**, Jiwoong Bang, Myeongju Ji, and Jeong Hyun Yi, “Mobile application tamper detection scheme using dynamic code injection against repackaging attacks,” *The Journal of Supercomputing*, Vol.72, No.9, pp.3629–3645, Sep 2016.
12. Yiming Jing, Gail-Joon Ahn, Hongxin Hu, **Haehyun Cho**, and Ziming Zhao, “TRIPLEMON: A Multi-layer Security Framework for Mediating Inter-Process Communication on Android,” *Journal of Computer Security*, Vol.24, No.4, pp.405–426, Sep 2016.
13. **Haehyun Cho**, Jiwoong Bang, Myeongju Ji, and Jeong Hyun Yi, “Anti-debugging scheme for protecting mobile apps on android platform,” *The Journal of Supercomputing*, Vol.72, No.1, pp.232–246, Jan 2016.
14. Jongwon Choi, **Haehyun Cho**, and Jeong Hyun Yi, “Personal Information Leaks with Automatic Login in Mobile Social Network Services,” *Entropy Journal*, Vol.17, No.6, pp.3947–3962, Jun 2015.

#### • Invited Paper

1. Bernard Ngabonziza, Daniel Martin, Anna Bailey, **Haehyun Cho**, and Sarah Martin. “Trustzone explained: Architectural features and use cases.” in *Proceedings of the IEEE 2nd International Conference on Collaboration and Internet Computing*, Pittsburgh, PA, Nov 2016.

#### • Other Refereed Material

1. Jinbum Park, **Haehyun Cho**, Sungbae Yoo, Seolheui Kim, Yeji Kim, Bumhan Kim, Taesoo Kim, “Taking Kernel Hardening to the Next Level,” *Black Hat Asia 2022*, Singapore, May 2022.

## ○ TALKS

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- **“Challenges in Mitigating Phishing Attacks”**
  - Personal Information Security Fair (PISFAIR) 2022, Seoul, Korea, Jun 2022.
- **“Mitigating Cache Side-channel Attacks on the ARM Architecture”**
  - Korea University, Online, Apr 2022.
- **“Mitigating Temporal Memory Safety Violations”**
  - Sungkyunkwan University, Suwon, Korea, Mar 2022.
- **“Fuzzing the Binding Code of JavaScript Engines Using Semantically Correct Test Cases”**
  - The 21st Korean Computer Scientists and Engineers Association in America (KOCSEA) Tech Symposium, Online, Nov 2021.
- **“Understanding the Underbelly of Phishing Attacks”**
  - Korea Advanced Institute of Science and Technology (KAIST), Online, Oct 2021.
  - Ulsan National Institute of Science and Technology (UNIST), Online, Oct 2021.
- **“PhD Lecture Series: Information Leaks from Systems Software and Mitigations”**
  - Qualcomm Technologies, Inc., Online, Aug 2020.
- **“Introduction and Security Concerns of Cache on ARM architecture”**
  - Samsung Research, Seoul, Korea, Jun 2018.
  - Soongsil University, Seoul, Korea, May 2018.

## ○ SERVICE

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- **Conference Organization**
  - Program co-Chair for the 29th Network Security Conference Korea (NetSec-KR 2023)
  - General co-Chair for Conference on Information Security and Cryptography Winter 2022
  - Poster Chair for the 23rd World Conference on Information Security Applications (WISA 2022)
  - Poster Chair for the 5th International Symposium on Mobile Internet Security (MobiSec 2021)
  - Program co-Chair for Conference on Information Security and Cryptography Summer 2021
- **Program Committee**
  - 2023 ACM ASIA Conference on Computer and Communications Security (AsiaCCS)
  - 2022 SecWeb Workshop
  - 2022 Workshop on Binary Analysis Research (BAR)
  - 2022 ACM ASIA Conference on Computer and Communications Security (AsiaCCS)
  - 2022 ACM Conference on Data and Application Security and Privacy (CODASPY)
  - 2021 ACM Conference on Data and Application Security and Privacy (CODASPY)
- **Journal Reviewer**
  - IEEE Transactions on Dependable and Secure Computing (TDSC)
  - IEEE Transactions on Information Forensics & Security (TIFS)
- **External Reviewer**
  - 2019 ACM Conference on Computer and Communications Security (CCS)
  - 2019 ACM Conference on Data and Application Security and Privacy (CODASPY)
  - 2018 ACM Conference on Computer and Communications Security (CCS)
  - 2018 European Symposium on Research in Computer Security (ESORICS)

- 2017 ACM Conference on Computer and Communications Security (CCS)
- 2017 ACM Asia Conference on Computer and Communications Security (AsiaCCS)
- 2017 ACM Conference on Data and Application Security and Privacy (CODASPY)

## ○ HONORS AND AWARDS

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- **Best Student Paper Award**  
by the 23rd World Conference on Information Security Applications, Aug 2022.
- **The Minister of Science and Information and Communication Technologies (ICT) Award**  
for the Best Paper at CISC-S 2021, Jun 2021.
- **Best Student Paper Award**  
by the 42nd IEEE Symposium on Security and Privacy (Oakland), May 2021.
- **The Engineering Graduate Fellowship**  
by Ira A. Fulton Schools of Engineering, Arizona State University, May 2020.
- **The CIDSE Doctoral Fellowship**  
by the School of Computing, Informatics, and Decisions Systems Engineering (CIDSE), Arizona State University, Mar 2020.
- **The Cybersecurity Fellowship**  
by the School of Computing, Informatics, and Decisions Systems Engineering (CIDSE), Arizona State University, Aug 2019.
- **Scholarship for Human Resources Development**  
by Soongsil University, Seoul, Korea, Oct 2018.
- **Distinguished Poster Award**  
“SeCore: Continuous Extrospection with High Visibility on Multi-core ARM Platforms,” by the Organizing Committee of the 8th ACM Conference on Data and Application Security and Privacy (CODASPY), Mar 2018.
- **Academic Excellence Scholarship**  
by Soongsil University, Seoul, Korea.

## ○ EXPERIENCE SUMMARY

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<b>Secure Systems Group</b> — PhD Intern	Qualcomm, San Diego, CA May 2020–Aug 2020
<b>Qualcomm Product Security Initiative (QPSI)</b> — PhD Intern	Qualcomm, San Diego, CA May 2019–Aug 2019
<b>SEFCOM - Security Engineering for Future Computing</b> — Graduate Research Associate	Arizona State University, Tempe, AZ Mar 2016–Feb 2021
<b>Cyber Security Research Center</b> — Research Associate	Soongsil University, Seoul, Korea Mar 2013–Feb 2016
<b>Republic of Korea Army</b>	Feb 2007–Feb 2009

## ○ TEACHING EXPERIENCE

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- **Instructor**

- Spring 2023, Systems Security, Soongsil University.
- Fall 2022, Operating Systems, Soongsil University.
- Spring 2022, Systems Security, Soongsil University.
- Fall 2021, Operating Systems, Soongsil University.
- Spring 2021, Systems Programming, Soongsil University.
- Fall B 2020, CSE 543: Info Assurance & Security, Arizona State University.

- **Teaching Assistant**

- System Security Principles, Samsung Electronics, Jan 2015.
- Android Security, LG Electronics, Jul 2014.
- System Security Principles, Samsung Electronics, Jan 2014.
- Network Security and Practice, Samsung Electronics, Aug 2013.