Doowon Kim

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EDUCATION

- **University of Maryland, College Park**, MD, USA   Aug. 2014 – May 2020
  Ph.D. in Computer Science
  Advisor: Prof. Tudor Dumitraş

- **Washington University in St. Louis**, St. Louis, MO, USA   May 2013 – May 2014
  Attended in the Dept. of Computer Science and Engineering for Ph.D. program
  Transferred to University of Maryland due to Dr. Turner's retirement
  Advisor: Prof. Jonathan Turner

- **University of Utah**, Salt Lake City, UT, USA   Aug. 2011 – May 2013
  M.S. in Computer Science

- **Hankuk University of Foreign Studies** (HUFS), South Korea   Mar. 2003 – Feb. 2011
  B.E. in Computer Science and Engineering

APPOINTMENTS

- **University of Tennessee, Knoxville**, Knoxville, TN
  Assistant Professor, Department of Electrical Engineering and Computer Science   Aug. 2020 – present

- **Symantec Research Labs**, Culver City, CA
  Research Intern   Jun. 2019 – Aug. 2019

- **Korea Electronics Technology Institute (KETI)**, South Korea
  Research Intern   Feb. 2008 – Jul. 2011

HONORS & AWARDS

- Best Student Paper Award, *WISA*, 2022
- Ann G. Wylie Dissertation Fellowship, *University of Maryland*, 2019
- 2nd and 4th Prizes at Research Competition for Korean Graduate Students, 2018
- 5th Annual NSA Best Scientific Cybersecurity Paper, *NSA*, 2017
- Valedictorian Award, *Dept. of CSE*, *HUFS*, 2011

PUBLICATIONS

Refereed Conference Proceedings

C.19. **Poisoned ChatGPT Finds Work for Idle Hands: Exploring Developers' Coding Practices with Insecure Suggestions from Poisoned AI Models.**
Sanghak Oh, Kiho Lee, Seonhye Park, **Doowon Kim**, and Hyoungshick Kim.
IEEE S&P '24: The 45th IEEE Symposium on Security and Privacy.

C.18. **Sharing Cyber Threat Intelligence: Does It Really Help?**
Beomjin Jin, Eunsoo Kim, Hyunwoo Lee, Elisa Bertino, **Doowon Kim**, Hyoungshick Kim.
NDSS '24: The 31st Network and Distributed System Security Symposium.

C.17. **A Large Scale Study and Classification of VirusTotal Reports on Phishing and Malware URLs.**
Euijin Choo, Mohamed Nabeel, **Doowon Kim,** Ravindu De Silva, Ting Yu, and Issa Khalil.
ACM SIGMETRICS '24: ACM Special Interest Group on Measurement and Evaluation 2024.

C.16. **A Longitudinal Study of Vulnerable Client-side Resources and Web Developers' Updating Behaviors.**
Kyungchan Lim, Yonghwi Kwon, and **Doowon Kim**.
ACM IMC 2023: The 23rd ACM Internet Measurement Conference.

C.15. **PyFET: Forensically Equivalent Transformation for Python Binary Decompilation.**
Ali Ahad, Chijung Jung, Ammar Askar, **Doowon Kim**, Taesoo Kim, and Yonghwi Kwon.
IEEE S&P'23: The 44th IEEE Symposium on Security and Privacy (Oakland).

C.14. **Deep Sequence Models for Packet Stream Analysis and Early Decisions.**
Minji Kim, Dongeun Lee, Kookjin Lee, **Doowon Kim**, Sangman Lee, and Jinoh Kim.
LCN'22: The 47th IEEE Conference on Local Computer Networks.

C.13. **Dazzle-attack: Anti-Forensic Server-side Attack via Fail-free Dynamic State Machine.**
*Best Student Paper Award.
Bora Lee*, Kyungchan Lim*, JiHo Lee, Chijung Jung, **Doowon Kim**, Kyu Hyung Lee, Haehyun Cho, and Yonghwi Kwon. (*: co-first authors)
WISA'22: The 23rd World Conference on Information Security Applications.

C.12. **Hiding Critical Program Components via Ambiguous Translation.**
Chijung Jung, **Doowon Kim**, An Chen, Weihang Wang, Yunhui Zheng, Kyu Hyung Lee, and Yonghwi Kwon.
ICSE 2022: International Conference on Software Engineering.
Acceptance rate: 28.5% (197 out of 691).

C.11. **Defeating program analysis techniques via Ambiguous Translation.**
Chijung Jung, **Doowon Kim**, Weihang Wang, Yunhui Zheng, Kyu Hyung Lee, and Yonghwi Kwon.
ASE 2021 (NIER): 36th IEEE/ACM International Conference on Automated Software Engineering (New Ideas and Emerging Results Track).

C.10. **Certified Malware in South Korea: A Localized Study of Breaches of Trust in Code-Signing PKI Ecosystem.**
Bumjun Kwon, Sanghyun Hong, Yuseok Jeon, and **Doowon Kim**.
ICICS 2021: The 2021 International Conference on Information and Communications Security.
Acceptance rate: 24.3% (49 out of 202).

C.9. **Security Analysis on Practices of Certificate Authorities in the HTTPS Phishing Ecosystem.**
Doowon Kim, Haehyun Cho, Yonghwi Kwon, Adam Doupe, Sooel Son, Gail-Joon Ahn, Tudor Dumitras.
AsiaCCS 2021: ACM ASIA Conference on Computer and Communications Security.
Acceptance rate: 19.3% (70 out of 362)

C.8. **Analyzing Spatial Differences in the TLS Security of Delegated Web Services.**
Joonhee Lee, Hyunwoo Lee, Jongheon Jeong, **Doowon Kim**, Taekyoung "Ted" Kwon.
AsiaCCS 2021: ACM ASIA Conference on Computer and Communications Security.
Acceptance rate: 19.3% (70 out of 362).

C.7. **TLS 1.3 in Practice: How TLS 1.3 Contributes to the Internet.**
Hyunwoo Lee, **Doowon Kim**, and Yonghwi Kwon.
The Web Conference 2021 (TheWebConf 2021, formerly WWW).
Acceptance rate: 20.6% (357 out of 1736).

C.6. **Scam Pandemic: How Attackers Exploit Public Fear through Phishing.**
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.
eCrime 2020: The 2020 APWG Symposium on Electronic Crime Research.

C.5. **The Broken Shield: Measuring Revocation Effectiveness in the Windows Code-Signing PKI.**
Doowon Kim, Bum Jun Kwon, Kristián Kozák, Christopher Gates, and Tudor Dumitraș.
USENIX Security 2018: USENIX Security Symposium.
Acceptance rate: 19.2% (100 out of 520).

C.4. **Certified Malware: Measuring Breaches of Trust in the Windows Code-Signing PKI.**
Doowon Kim, Bum Jun Kwon, and Tudor Dumitraș.
CCS 2017: ACM Conference on Computer and Communications Security.
Acceptance rate: 18.1% (151 out of 836).

C.3. **Comparing the usability of cryptographic APIs.**
Yasemin Acar, Michael Backes, Sascha Fahl, Simson Garfinkel, **Doowon Kim**, Michelle L. Mazurek, and Christian Stransky. (The authors are alphabetically ordered.)
S&P 2017: IEEE Symposium on Security and Privacy (S&P).
Acceptance rate: 14.3% (60 out of 419).

C.2. **An inconvenient trust: User attitudes toward security and usability tradeoffs for key-directory encryption systems.**
Wei Bai, **Doowon Kim**, Moses Namara, Yichen Qian, Patrick Gage Kelley, and Michelle L. Mazurek.
SOUPS 2016: Symposium on Usable Privacy and Security.

C.1. **You get where you're looking for: The impact of information sources on code security.**
Awarded the 5th annual NSA Best Scientific Cybersecurity Paper.
Yasemin Acar, Michael Backes, Sascha Fahl, **Doowon Kim**, Michelle L. Mazurek, and Christian Stransky. (The authors are alphabetically ordered.)
S&P 2016: IEEE Symposium on Security and Privacy (S&P).
Acceptance rate: 13.4% (55 out of 411).

Refereed Journal & Magazine Articles

J.4. **fFTP: a fast file transfer protocol for home N-screen platform.**
Doowon Kim, Jinsuk Baek, Paul S Fisher, Sangchul Kim.
Personal and Ubiquitous Computing. October 2017. DOI: 10.1007/s00779-017-1082-5

J.3. **Balancing security and usability in encrypted email.**
Wei Bai, **Doowon Kim**, Moses Namara, Yichen Qian, Patrick Gage Kelley, and Michelle L. Mazurek.
IEEE Internet Computing: 21 (3), 30-38. 2017

J.2. **How Internet Resources Might Be Helping You Develop Faster but Less Securely.**
Yasemin Acar, Michael Backes, Sascha Fahl, **Doowon Kim**, Michelle L Mazurek, Christian Stransky. (The authors are alphabetically ordered.)
IEEE Security & Privacy, vol. 15, no. 2, pp. 50-60, 2017. doi: 10.1109/MSP.2017.24.

J.1. **An Adaptive Primary Path Switching Scheme for Seamless mSCTP Handover.**
Jinsuk Baek, **Doowon Kim**, Paul S. Fisher, and Minho Jo.
Smart Computing Review (Smart CR) 2014 (Invited Paper).

Refereed Workshop Proceedings

W.3. **Evaluating Password Composition Policy and Password Meters of Popular Websites.**
Kyungchan Lim, Joshua H. Kang, Matthew Dixson, Hyungjoon Koo, and **Doowon Kim**.
SecWeb 2023: SecWeb Workshop 2023 co-located with IEEE S&P '23.

W.2. **Issued for Abuse: Measuring the Underground Trade in Code Signing Certificate.**
Kristián Kozák, Bum Jun Kwon, **Doowon Kim**, and Tudor Dumitraş.
WEIS 2018: The Workshop on the Economics of Information Security.

W.1. **Lessons learned from using an online platform to conduct large-scale, online controlled security experiments with software developers.** Christian Stransky, Yasemin Acar, Duc Cuong Nguyen, Dominik Wermke, Elissa M. Redmiles, **Doowon Kim**, Michael Backes, Simson Garfinkel, Michelle L. Mazurek, and Sascha Fahl.
CSET 2017: Workshop on Cyber Security Experimentation and Test.

Refereed Posters and Demos

P.5. **Poster: Analysis of Reused Private Keys in the Code Signing PKI.**
Doowon Kim, S. Gokberk Karaca and Tudor Dumitras.
NDSS 2019: Network and Distributed System Security Symposium

P.4. **An Inconvenient Trust: User Attitudes toward Security and Usability Tradeoffs for Key-Directory Encryption Systems.**
Wei Bai, **Doowon Kim**, Moses Namara, Yichen Qian, Patrick Gage Kelley, Michelle L. Mazurek.
Black Hat USA, August 2016.

P.3. **You get where you're looking for: The impact of information sources on code security.**
Yasemin Acar, Michael Backes, Sascha Fahl, **Doowon Kim**, Michelle L. Mazurek, and Christian Stransky.
SOUPS 2016: Symposium on Usable Privacy and Security. (Previously published paper.)

P.2. **Adaptive Video Streaming over HTTP.**
Doowon Kim, Jinsuk Baek, and Paul S. Fisher.
ACM SE 2014: The 49th ACM Southeast Conference.

P.1. **Implementation of Framework to Identify Potential Phishing Websites.**
Doowon Kim, Chaitanya Achan, Jinsuk Baek, and Paul S. Fisher.
IEEE ISI 2013: 2013 IEEE Intelligence and Security Informatics.

PROFESSIONAL ACTIVITIES

Technical Program Committee

- **[CCS]** ACM Conference on Computer and Communications Security – 2021
- **[NDSS]** Network and Distributed System Security Symposium – 2023, 2024
- **[WWW]** The Web Conference (security track) – 2022
- **[AsiaCCS]** ACM Asia Conference on Computer and Communications Security – 2022, 2023, 2024
- **[Euro S&P]** IEEE European Symposium on Security and Privacy – 2023
- **[RAID]** International Symposium on Research in Attacks, Intrusions and Defenses – 2021, 2022, 2023
- **[TMA]** Network Traffic Measurement and Analysis Conference – 2022, 2023, 2024
- **[WiSec]** ACM Conference on Security and Privacy in Wireless and Mobile Networks – 2021, 2022
- **[CODASPY]** ACM Conference on Data and Application Security and Privacy – 2021
- **[ICICS]** International Conference on Information and Communications Security – 2021, 2022
- **[WISA]** World Conference on Information Security Applications – 2022, 2023
- **[MSN]** International Conference on Mobility, Sensing and Networking – 2021
- **[CSET]** Workshop on Cyber Security Experimentation and Test – 2020, 2021
- **[CheckMATE]** Man-At-The-Middle Attacks Workshop – 2021, 2022
- **[WPES]** Workshop on Privacy in the Electronic Society – 2022
- **[WebSec]** SecWeb Workshop – 2023

Journal Reviewer

- IEEE Transactions on Computers
- Institute of Electronics, Information and Communication Engineers

Program Chair/Co-Chair

- Scholarship/Mentorship Chair: *Korean Computer Scientists and Engineers Association in America Technical Symposium 2022*
- Publication Chair: *IEEE Secure Development Conference (SecDev) 2022*
- Student Travel Grants Chair: *ACM Conference on Computer and Communications Security (CCS) 2021*
- Poster Session Chair: *Korean Computer Scientists and Engineers Association in America Technical Symposium 2021*

External Reviewer

- ACM Conference on Computer and Communications Security (CCS) – 2017, 2018, 2019
- The Network and Distributed System Security Symposium (NDSS) – 2018, 2019, 2020
- IEEE Symposium on Security and Privacy (S&P) – 2018, 2019
- USENIX Security Symposium (USENIX Security) – 2018
- Conference on Data and Application Security and Privacy (CODASPY) – 2020
- Research in Attacks, Intrusions and Defenses (RAID) – 2018, 2019

TEACHING

- COSC 469/569: Human Factors in Cybersecurity, *UTK*, Instructor.   Fall 2023
- COSC 466/566: Software Security, *UTK*, Instructor.   Spring 2023
- COSC 469/569: Human Factors in Cybersecurity, *UTK*, Instructor.   Fall 2022
- COSC 366: Introduction to Cybersecurity, *UTK*, Instructor.   Spring 2021
- COSC 469/569: Human Factors in Cybersecurity, *UTK*, Instructor.   Fall 2021
- COSC 366: Introduction to Cybersecurity, *UTK*, Instructor.   Spring 2020
- COSC 469/569: Human Factors in Cybersecurity, *UTK*, Instructor.   Fall 2020
- CMSC 131: Object-Oriented Programming, *UMD*, Teaching Assistant.   Spring 2017
- CMSC 131: Object-Oriented Programming, *UMD*, Teaching Assistant.   Spring 2015

SELECTED PRESS

- **[Ars Technica]** Hackers infect multiple game developers with advanced malware, May 2020.
- **[Elastic]** Introducing Elastic Endpoint Security, Oct. 2019.
- **[Venafi]** Dark Web e-Shops Now Distributing Code Signing Certificates for Malware, Jul. 2018.
- **[Help Net Security]** Underground vendors can reliably obtain code signing certificates from CAs, Jun. 2018.
- **[The Register]** 'No questions asked' Windows code cert slingers 'fuel trade' in digitally signed malware, Jun 2018.
- **[MUO]** What Is Code-Signed Malware and How Do You Avoid It?, May, 2019.
- **[Security Affairs]** Study confirms the trade of code-signing certificates is a flourishing business, Mar. 2018.
- **[The Register]** Suspicious cert-sellers give badware a good name for just a few thousand bucks, Mar. 2018.
- **[ENISA]** Valid Digital Certificates Code Signing Malware, Jun. 2018.

- **[Schneier on Security]** Signed Malware, Feb. 2018.
- **[Intezer]** Don't Be Fooled By Malware Signed with Stolen Certificates - How Intezer Analyze™ Detects Major Breaches in Security, Dec. 2017.
- **[Cyber Defense Magazine]** Malware signed with stolen Digital code-signing certificates continues to bypass security software, Nov. 2017
- **[Tech Target]** Certificate authority business undergoes major changes, Nov. 2017.
- **[Security Intelligence]** Public Key Infrastructure Concerns Raise Questions Over Internet Authentication System, Nov. 2017.
- **[Hacker News]** The Rise of Super-Stealthy Digitally Signed Malware - Thanks to the Dark Web, Nov. 2017.
- **[Security Affairs]** Malware signed with stolen Digital code-signing certificates continues to bypass security software, Nov. 2017.
- **[Systweak]** Legitimate digitally signed certificates for sale on dark web, Nov. 2017.
- **[CPS-VO]** Hackers Abusing Digital Certs Smuggle Malware past Security Scanners, Nov. 2017.
- **[TechWire Asia]** How US$1000 (or nothing) buys malware access to your network, Nov. 2017.
- **[ThreatPost]** Assessing Weaknesses in Public Key Infrastructure, Nov. 2017.
- **[Ars Technica]** Stuxnet-style code signing is more widespread than anyone thought, Nov. 2017.
- **[HashedOut]** Compromised Code Signing Certificates Aiding Hackers Spread Malware, Nov. 2017.
- **[The Register]** Hackers abusing digital certs smuggle malware past security scanners. Nov. 2017.

INVITED TALKS

- Understanding of the Security Threats in the Software Supply Chain Ecosystem.
  Silicon Valley Cybersecurity Conference 2022. Online   Aug. 2022

- Certified Malware and Phishing Attacks.
  Federal Bureau of Investigation (FBI), Knoxville, TN, USA   May 2022

- Intro to Computer Science and Cybersecurity.
  Bearden High School, Knoxville, TN, USA   Apr. 2022

- Understanding of Security Threats in the PKIs.
  Soongsil University, Korea (Remote)   Jun. 2021

- Security Analysis on Practices of Certificate Authorities in the HTTPS Phishing Ecosystem.
  AsiaCCS 2021, China (Remote)   Jun. 2021

- Intro to Computer Science and Cybersecurity.
  Bearden High School, Knoxville, TN, USA   May 2021

- TLS 1.3 in Practice: How TLS 1.3 Contributes to the Internet.
  The Web Conference 2021 (Formerly WWW), Virtual   Apr. 2021

- The Code-Signing PKI and Abuse, *Research talk at University of Texas at Dallas*, TX, USA   Jun. 2020

- How Usability of Crypto APIs and Information Sources Impact Code Security.
  Korean Workshop on Usable Security (K-USEC), South Korea   Jan. 2019
  Stony Brook University Korea (SUNY Korea), South Korea   Jan. 2019

- End-to-end Measurements of Security Threats in the Code Signing PKI.
  Yonsei University, South Korea   Jan. 2019
  Korea University, South Korea   Jan. 2019
  Sungkyunkwan University (SKKU), South Korea   Dec. 2018
  Samsung Research, South Korea   Aug. 2018

Korea Advanced Institute of Science and Technology (KAIST), South Korea   Aug. 2018
Electronics and Telecommunications Research Institute (ETRI), South Korea   Aug. 2018

- The Broken Shield: Measuring Revocation Effectiveness in the Windows Code-Signing PKI.
  USENIX Security Symposium, MD, USA   Aug. 201

- Certified Malware: Measuring Breaches of Trust in the Windows Code-Signing PKI.
  ACM CCS Conference, Dallas, TX, USA   Oct. 2017

- You Get Where You're Looking For: The Impact of Information Sources on Code Security.
  HCIL Annual Symposium, MD, USA   May 2016
  Bowie State University, MD, USA   Apr. 2016

INDUSTRY IMPACT

- Transient revoked code signing certificates in CRLs (USENIX Sec '18): a Certificate Authority fixed the bug in its dissemination system.
- Malformed digital signatures (CCS '17): two Anti-Virus companies fixed the flaw of not checking (even incorrectly) signed malware.

ADVISING

Graduate Students

- Kyungchan Lim (PhD CS; 2021 – present)
- Fujiao Ji (PhD CS; 2022 – present)
- Lu Liu (PhD CS; 2023 – present)

Undergraduate Students

- Mason Hyman (2023 – present)

Visiting Scholars & Interns

- Woonghee Lee (Summer 2022)

Previous Students

- Autumn Henderson (BS, 2022), now at Cadre5
- Zachary Ables (BS, 2021), now at NTT Data
- Megan Stanton (BS, 2021), now at CGI Federal
- Madeline Phillips (MS, 2022)

Committees

- Matthew Dixson (MS, 2023)
- John Sadik (MS, 2023)
- Christopher (Blake) Childress (MS, 2023)
- Sean Oesch (PhD, 2021)
- Austin Saporito (MS, 2021)
- Hunter Price (2021 – 2022)
- Andrei Cozma (2021 – 2022)
- Matthew Dixson (2021 – 2023)
- Parker Collier (2022 – 2023)

- Mike Hughes (2022 – 2022)
- Anthony Roman (2022 – 2022)
- Cole Elliott (2022 – 2022)
- Reed Semmel (2022 – 2022)