

Jinwoo Kim

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Short Bio

I am an Assistant Professor in the Department of Computer Engineering at Chungbuk National University (CBNU), where I direct the Computing & Network Security (CNS) Lab. Prior to my appointment at CBNU in March 2026, I served as an Assistant Professor at the School of Software at Kwangwoon University for four years. I obtained my Ph.D. in Electrical Engineering and a Master's degree in Information Security from KAIST. My academic journey began at Chungnam National University, where I received my B.S. degree. My research focuses on enhancing the security of cloud computing and network systems.

Research Interests

Cloud and systems security, network security, virtual reality (VR/XR) security, eBPF-based intrusion detection, WebAssembly security, software-defined networking (SDN) security.

Positions

Assistant Professor Mar. 2026 – Present
Department of Computer Engineering, Chungbuk National University, Cheongju, Republic of Korea

Assistant Professor Mar. 2022 – Feb. 2026
School of Software, Kwangwoon University, Seoul, Republic of Korea

Grants & Funding

Development of Provenance-based Causal Cognitive Autonomous Agents for Zero Trust Cloud Environments

National Research Foundation of Korea (NRF), Excellent Young Researcher Program Mar. 2026 – Feb. 2029

Principal Investigator

Dataset Construction and System Development for Detecting Harassment in Metaverse Environments

Electronics and Telecommunications Research Institute (ETRI)

Feb. 2025 – Aug. 2025

Principal Investigator

Design and Implementation of Security Layers for Secure WebAssembly-based Serverless Environments

National Research Foundation of Korea (NRF), Mid-career Research Program Sep. 2024 – Aug. 2026

Principal Investigator

Analysis of Security Vulnerabilities in Application and Network Layer within the Metaverse Environment

Electronics and Telecommunications Research Institute (ETRI) Jul. 2023 – Nov. 2023

Principal Investigator

Design of a Model-driven Testing System for Systematically Finding Vulnerabilities from Distributed SDN Controllers

National Research Foundation of Korea (NRF), First Research Grant Sep. 2022 – Feb. 2024

Principal Investigator

Education

Ph.D. in Electrical Engineering

KAIST, Daejeon, Republic of Korea

Dissertation: *Securing Software-Defined WAN Through Analyzing Network Attack Surfaces*

M.S. in Information Security

KAIST, Daejeon, Republic of Korea

B.S. in Computer Science and Engineering (Graduated with High Honors)

Chungnam National University, Daejeon, Republic of Korea

Publications

* denotes co-first authors; † denotes corresponding author. **Bold** indicates the author of this CV.

Refereed Journal Articles

- [J1] Junhee Lee, Minseok Kim, Hwanjo Heo, Seungwon Woo, **Jinwoo Kim**[†]. “HarassGuard: Detecting Harassment Behaviors in Social Virtual Reality with Vision-Language Models.” *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, to appear. (Presented at IEEE VR 2026)
- [J2] Haney Kang*, Eduard Marin*, Myoungsung You, Diego Perino, Seungwon Shin, and **Jinwoo Kim**[†]. “BeaCon: Automatic Container Policy Generation using Environment-aware Dynamic Analysis.” *Computers & Security (JCR Q1)*.
- [J3] Seunghyeon Lee*, Hyunmin Seo*, Hwanjo Heo, Anduo Wang, Seungwon Shin, and **Jinwoo Kim**[†]. “SecTracer: A Framework for Uncovering the Root Causes of Network Intrusions via Security Provenance.” *Computers & Security (JCR Q1)*.
- [J4] Jaehan Kim, Minkyoo Song, Minjae Seo, Youngjin Jin, Seungwon Shin, **Jinwoo Kim**[†]. “PassREfinder-FL: Privacy-Preserving Credential Stuffing Risk Prediction via Graph-Based Federated Learning for Representing Password Reuse between Websites.” *Expert Systems with Applications (JCR Q1)*.

- [J5] Dongmin Choi*, Hyunmin Seo*, Kwangwoo Kim, Myungsung You, Seungwon Shin, **Jinwoo Kim**[†]. “Uncovering Threats in Container Systems: A Study on Misconfigured Container Components in the Wild.” *IEEE Access* (JCR Q2).
- [J6] Minjae Seo*, Jaehan Kim*, Myungsung You, Seungwon Shin, **Jinwoo Kim**[†]. “gShock: A GNN-based Fingerprinting System for Permissioned Blockchain Networks over Encrypted Channels.” *IEEE Access* (JCR Q2).
- [J7] Suyeol Lee*, Jaehan Kim*, Minjae Seo, Seung Ho Na, Seungwon Shin, and **Jinwoo Kim**[†]. “CENSor: Detecting Illicit Bitcoin Operation via GCN-based Hyperedge Classification.” *IEEE Access* (JCR Q2).
- [J8] Taejune Park, Myungsung You, **Jinwoo Kim**[†], Seungsoo Lee[†]. “Fatriot: Fault-Tolerant MEC Architecture for Mission-Critical Systems using a SmartNIC.” *Journal of Network and Computer Applications (JNCA)*, 2024 (JCR Q1).
- [J9] **Jinwoo Kim**, Minjae Seo, Eduard Marin, Seungsoo Lee, Jaehyun Nam, and Seungwon Shin. “Ambusher: Exploring the Security of Distributed SDN Controllers through Protocol State Fuzzing.” *IEEE Transactions on Information Forensics and Security (TIFS)*, 2024 (JCR Q1).
- [J10] **Jinwoo Kim**, Minjae Seo, Seungsoo Lee, Jaehyun Nam, Vinod Yegneswaran, Phillip Porras, Guofei Gu, Seungwon Shin. “Enhancing Security in SDN: Systematizing Attacks and Defenses from a Penetration Perspective.” *Computer Networks*, 2024 (JCR Q1).
- [J11] **Jinwoo Kim**, Yeonkeun Kim, Vinod Yegneswaran, Phillip Porras, Seungwon Shin, Taejune Park. “Extended SDN Data Plane Architecture for In-Network Security Services.” *Computers & Security*, 2023 (JCR Q2).
- [J12] Seungsoo Lee, Seungwon Woo, **Jinwoo Kim**, Jaehyun Nam, Vinod Yegneswaran, Phillip Porras, Seungwon Shin. “A Framework for Policy Inconsistency Detection in Software-Defined Networks.” *IEEE/ACM Transactions on Networking*, 2022 (JCR Q1).
- [J13] **Jinwoo Kim**, Jaehyun Nam, Suyeol Lee, Vinod Yegneswaran, Phillip Porras, Seungwon Shin. “BottleNet: Hiding Network Bottlenecks Using SDN-Based Topology Deception.” *IEEE Transactions on Information Forensics and Security*, 2021 (JCR Q1).
- [J14] Hyeonseong Jo, **Jinwoo Kim**, Phillip Porras, Vinod Yegneswaran, Seungwon Shin. “GapFinder: Finding Inconsistency of Security Information From Unstructured Text.” *IEEE Transactions on Information Forensics and Security*, 2020 (JCR Q1).
- [J15] Seungsoo Lee, **Jinwoo Kim**, Seungwon Woo, Changhoon Yoon, Sandra Scott-Hayward, Vinod Yegneswaran, Phillip Porras, Seungwon Shin. “A Comprehensive Security Assessment Framework for Software-Defined Networks.” *Computers & Security*, 2020 (JCR Q2).

Refereed Conference Papers

- [C1] Junhee Lee, Seungwon Woo, Hwanjo Heo, **Jinwoo Kim**[†]. “Social VR Administrator: A Context-Aware Model Agent Design for Harassment Prevention in Social VR.” *GenAI-XR: Generative Artificial Intelligence meets Extended Reality (co-located with IEEE VR 2026)*, to appear.
- [C2] Dongeun Kim*, Jongseop Kim*, Minjae Seo, Junhee Lee, **Jinwoo Kim**[†]. “SafeMask-VR: Real-time Explicit Content Masking for Secure Social Interaction.” *2nd Workshop on Social*

Interaction and Collaboration in eXtended Reality (SIC-XR, co-located with IEEE VR 2026), to appear.

- [C3] Gunwoo Kim, Taejune Park, **Jinwoo Kim**[†]. “Noisy Neighbor: Exploiting RDMA for Resource Exhaustion Attacks in Containerized Clouds.” *The 4th International Workshop on System Security Assurance (SecAssure, co-located with ESORICS)*, 2025.
- [C4] Eduard Marin, **Jinwoo Kim**, Alessio Pavoni, Mauro Conti, Roberto Di Pietro. “The Hidden Dangers of Public Serverless Repositories: An Empirical Security Assessment.” *The 30th European Symposium on Research in Computer Security (ESORICS)*, 2025.
- [C5] Gyeonghoon Park, Jaehan Kim, Jinu Choi, **Jinwoo Kim**[†]. “CryptoGuard: Lightweight Hybrid Detection and Response to Host-based Cryptojackers in Linux Cloud Environments.” *ACM ASIA Conference on Computer and Communications Security (AsiaCCS)*, 2025. (Acceptance rate: 20.4%)
- [C6] Minjae Seo*, Myungsung You*, Jaehan Kim, Taejune Park, Seungwon Shin, **Jinwoo Kim**[†]. “MUFFLER: Secure Tor Traffic Obfuscation with Dynamic Connection Shuffling and Distributing.” *IEEE International Conference on Computer Communications (INFOCOM)*, 2025.
- [C7] **Jinwoo Kim**, Eduard Marin, Mauro Conti, Seungwon Shin. “EqualNet: A Secure and Practical Defense for Long-term Network Topology Obfuscation.” *The Network and Distributed Systems Security Symposium (NDSS)*, 2022. (Acceptance rate: 16.2%)
- [C8] Minjae Seo*, Jaehan Kim, Eduard Marin, Myongsung You, Taejune Park, Seungsoo Lee, Seungwon Shin, **Jinwoo Kim**[†]. “Heimdallr: Fingerprinting SD-WAN Control-Plane Architecture via Encrypted Control Traffic.” *The Annual Computer Security Applications Conference (ACSAC)*, 2022. (Acceptance rate: 24%)
- [C9] Seungsoo Lee, Seungwon Woo, **Jinwoo Kim**, Vinod Yegneswaran, Phillip Porras, Seungwon Shin. “AudiSDN: Automated Detection of Network Policy Inconsistencies in Software-Defined Networks.” *IEEE Conference on Computer Communications (INFOCOM)*, 2020.
- [C10] Seungwon Woo, Seungsoo Lee, **Jinwoo Kim**, Seungwon Shin. “Re-checker: Towards Secure Restful Service in Software-Defined Networking.” *IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, 2018.
- [C11] **Jinwoo Kim**, Seungwon Shin. “Software-Defined HoneyNet: Towards Mitigating Link Flooding Attacks.” *IEEE/IFIP International Conference on Dependable Systems and Networks Workshops (DSN-W)*, 2017.
- [C12] Seunghyeon Lee, **Jinwoo Kim**, Seungwon Shin, Phillip Porras, Vinod Yegneswaran. “Athena: A Framework for Scalable Anomaly Detection in Software-Defined Networks.” *IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2017.

Posters

- [P1] Junhee Lee, Hwanjo Heo, Seungwon Woo, Minseok Kim, Jongseop Kim, **Jinwoo Kim**[†]. “Illusion Worlds: Deceptive UI Attacks in Social VR.” *IEEE VR*, 2025.
- [P2] Minjae Seo, Myongsung You, Junhee Lee, Jaehan Kim, Hwanjo Heo, Jintae Oh, **Jinwoo Kim**[†]. “EO-VLM: VLM-Guided Energy Overload Attacks on Vision Models.” *The Annual Computer*

Security Applications Conference (ACSAC), 2024. (**Best Poster Presentation Award**)

- [P3] Minjae Seo*, Myoungsung You*, Taejune Park, Seungwon Shin, **Jinwoo Kim**[†]. “Towards a Secure and Practical System to Obfuscate Tor Network Traffic.” *The 8th IEEE European Symposium on Security and Privacy (Euro S&P)*, 2023.
- [P4] **Jinwoo Kim**, Jaehyun Nam. “Towards Building Secure and Reconfigurable Virtual Networks on Multi-Tenant Data Centers.” *IEEE Pacific Rim International Symposium on Dependable Computing (PRDC) Fast Abstract*, 2022.

Patents

International Patents

- “Protocol state fuzzing method and system for security of distributed software-defined network control plane.” US12126632B2, Oct. 2024.
- “Honeynet method, system and computer program for mitigating link flooding attacks of software defined network.” US11005887B2, May 2021.
- “Method for detecting network anomaly in distributed software defined networking environment, apparatus therefor, and computer program therefor.” US10609055B2, Mar. 2020.

Invited Talks

- “Development of a Cryptojacking Detection and Prevention System in Cloud Environments.” 2024 Technical Seminar & Communication Day for Information Security Professionals, Women’s Committee of KIISC, Aug. 2024.
- “Analysis of Potential Vulnerabilities in Distributed SDN Controllers within SD-WAN Environments.” Seminar on Latest 5G Technologies: Network Security and SLAM, ETRI Honam Research Center, Oct. 2022.
- (Briefing) “The Finest Penetration Testing Framework for Software-Defined Networks.” Seungsoo Lee, Jinwoo Kim, Seungwon Woo, Seungwon Shin. *Black Hat*, Las Vegas, NV, USA, Aug. 2018.
- (Arsenal) “DELTA: SDN Security Evaluation Framework.” Jinwoo Kim, Seungsoo Lee, Seungwon Woo, Seungwon Shin. *Black Hat*, Las Vegas, NV, USA, Aug. 2018 & Jul. 2017.

Professional Service

Journal Editorial Board

- Journal of Computing Science and Engineering (JCSE), Associate Editor, 2026–Present

Conference Committee

- Asia-Pacific Network Operations and Management Symposium (APNOMS) 2023, Technical Program Committee

Conference Reviewer

- IEEE VR 2026 (External Reviewer)

Journal Reviewer

- Computers & Security (COSE)
- Computer Communications (COMCOM)
- Computer Networks (COMNET)
- Reliability Engineering and System Safety (RESS)
- IEEE Transactions on Dependable and Secure Computing (TDSC)
- IEEE Transactions on Network Science and Engineering (TNSE)
- ACM Digital Threats: Research and Practice (DTRAP)

Research Experience

Research Observer

Summer 2019, Winter 2017

SRI International, Menlo Park, CA, USA

Supervisor: Phillip Porras

Awards & Honors

- 29th Samsung HumanTech Paper Award, **Bronze Prize**
Jaehan Kim, Myungsung Yoo, Jinwoo Kim, Seungwon Shin
- 28th Samsung HumanTech Paper Award, **Silver Prize**
Jinwoo Kim, Seungwon Shin
- 2021 Cybersecurity Paper Competition, **Encouragement Award**
Minjae Seo, Jinwoo Kim, Jae-han Kim, Taejun Park, Myungsung Yoo, Seungwon Shin
- 2021 KIISC Honam Branch Paper Competition, **Grand Prize**
Myungsung Yoo, Jinwoo Kim, Taejun Park, Seungwon Shin
- 26th Samsung HumanTech Paper Award, **Silver Prize**
Jinwoo Kim, Sooyoul Lee, Jaehyun Nam, Seungwon Shin