

Geonwoo Yoon

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Research Interests

Security, Cloud-Native, Distributed Networked System, Anomaly Detection, eBPF-based Provenance

Education

Pusan National University <i>M.S. in Computer Engineering</i>	Busan, Republic of Korea <i>Mar. 2024 – Feb 2026 (Expected)</i>
Pusan National University <i>B.S. in Computer Sciences and Engineering</i> <i>Served mandatory military service</i>	Busan, Republic of Korea <i>Mar. 2018 – Feb. 2024</i> <i>May. 2020 – Nov. 2021</i>

Publications

- Lightweight Service Mesh for Intrusion Detection using KD-CNN in Cloud-Native Environments**
Geonwoo Yoon, Jae-Seok Kim, Seunghyuk Kim, Jaeyoung Jeong, Millati Pratiwi, Yoon-Ho Choi
ACM Cloud Computing Security Workshop (CCSW in conjunction with the ACM CCS), 2025. [Paper]
- Automated Cybersecurity Risk Assessment and Visualization Framework for Resilient Cloud IT Asset Management**
Joonho Seo, Jinmyeong Shin, Geonwoo Yoon, Jae-Seok Kim, Yoon-Ho Choi
ACM/SIGAPP Symposium on Applied Computing (SAC), 2025. [Paper]

Under Review

- SCALE: Distributed System Call Audit Framework for Cloud-Native Environments**
Geonwoo Yoon, Seunghyuk Kim, Jaeyoung Jeong, Jae-Seok Kim, Yoon-Ho Choi
Under review (double-blinded)
- Context-Preserving Adversarial System Call Injection for Cloud Anomaly Detection Evasion**
Jae-Seok Kim, Geonwoo Yoon, Seunghyuk Kim, Joonho Seo, Yoon-Ho Choi
Under review (double-blinded)
- Container-Specific Service Mesh-based System for Mitigating Lateral Movement Attacks**
Geonwoo Yoon, Jinmyeong Shin, Jae-Seok Kim, Seunghyuk Kim, Jaeyoung Jeong, Yoon-Ho Choi
Under review (double-blinded)

Projects

Inhancing VPD Control Web Framework (SCOPE) <i>Developer</i>	In collaboration with LG Electronics <i>Aug. 2025 – Dec. 2025 (Expected)</i>
PNU ZeroTrust CSRC CASB (Cloud Acccess Security Broker) [Web] <i>Developer</i>	Developed by S3Lab <i>Jul. 2024 – May. 2025</i>
<ul style="list-style-type: none">Optimized SCOPE framework architecture to improve scalability, stability, and code quality.Enhanced security and accessibility through testing and user-centered UI/UX improvements.Improved maintainability with technical documentation and framework refinement.	
Industrial Coating Film Defect Detection and Monitoring System <i>Developer</i>	In collaboration with GBLIGHT <i>Jul. 2024 – Dec. 2024</i>

- Implemented logic for the analysis server to control the PLC module via OPC UA communication.
- Preprocessed coating film datasets, trained detection models using YOLOv5, and deployed them to production.
- Developed the analysis server for real-time monitoring and reporting.

Web-based Psychoeducational Platform [Web] In collaboration with the Dept. Psychology, PNU
Project Manager & Developer May. 2024 – Nov. 2024

- Planned development schedules, roles, and scope as a project manager.
- Set up the initial development environment and contributed to frontend, backend, and database development.
- Deployed the platform to production and performed ongoing maintenance.

PNU Cloud RMF (Risk Management Framework).v1 Developed by S3Lab
Developer Dec. 2023 – May. 2024

- Analyzed NIST SP 800-37, SP 800-53, and SP 800-30 standards and devised strategies for cloud application.
- Designed and developed the *Select*, *Implement*, and *Assess* steps of the RMF according to NIST standards.
- Implemented automated report generation functionality.

Teaching Experience

Operating Systems Pusan National University
Teaching Assistant 1st Semester 2024

Employment

ERUTY Busan, Republic of Korea
Software Engineer Dec. 2022 – Mar. 2023

- Contributed as an early-stage developer to backend development of a 3D graphic design marketplace platform.

Honors and Awards

Spear-phishing response training mini-challenge Dec. 2023

- Awarded **Third Place** in the spear-phishing response training mini-challenge, hosted by the Ulsan Information Security Center and Korea Internet & Security Agency (KISA).

4th PATH-HACK Makerthon Feb. 2023

- Awarded **First Place** in the PATH-HACK Makerthon for developing an integrated software–hardware prototype, hosted by pathfinder & Korean Institute of Startup and Entrepreneurship Development.

Academic Excellence Scholarship 1st & 2nd Semester. 2022

National Science & Technology Scholarship 1st Semester 2018

- Merit-based national STEM scholarship awarded for outstanding scores in math and science on the Korean CSAT.

Patents

- **Geonwoo Yoon**, Yoon-Ho Choi, "METHOD AND SYSTEM FOR DETECTING ABNORMAL BEHAVIOR TO PREVENT LATERAL MOVEMENT ATTACKS IN KUBERNETES ENVIRONMENT". Korean Patent Application No. 10-2025-0067413 (Pending)
- **Geonwoo Yoon**, Yoon-Ho Choi, "ZERO-COPY BASED MAIN CONTAINER'S SYSTEM CALL COLLECTION DEVICE AND METHOD FOR USING EBPF IN KUBERNETES SECONDARY CONTAINER". Korean Patent Application No. 10-2025-0067396 (Pending)
- Jae-Seok Kim, **Geonwoo Yoon**, Yoon-Ho Choi, "EQUIPMENT CONTROL BASED VISION METHOD AND SYSTEM FOR AI-BASED DEFECT DETECTION AND DATA COLLECTION IN HIGH-SPEED AND WIDE-AREA REFLECTIVE FILMS". Korean Patent Application No. 10-2024-0133547

Skills

Languages C/C++, Python, JavaScript

Libraries Pytorch, TensorFlow, scikit-learn, React, FastAPI

Tools Docker, Kubernetes, eBPF, PostgreSQL, pgAdmin