Sungsu Kwag

Google Scholar | LinkedIn

Location: Seoul, Republic of Korea
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Research Interest

Machine Learning & Security, Data-driven Security, Authentication, Usable Security

Experience

Graduate Assistant — Sep 2023 – Present
University of Maryland, College Park - Maryland Cybersecurity Center — *College Park, MD, USA*

Software Engineer — Mar 2018 – Jul 2023
Samsung Electronics - Security & Privacy Team, Samsung Research — *Seoul, Republic of Korea*

- Developed EDP (Enhanced Data Protection) using End-to-End Encryption for Samsung Multi-Device Environment (Knox Matrix)
- Researched seamless authentication using bio-acoustics for wearable devices (e.g., AR glasses).
- Researched and developed CMFA (Continuous Multi-Factor Authentication) for mobile devices (Knox SDK 3.8 Advanced Access Control).
- Researched and developed voice liveness detection for secure voice-assistant.

Auxiliary Police — Oct 2015 – Jul 2017
Republic of Korea Army — *Seoul, Republic of Korea*

Intern — Jul 2014 – Aug 2014
Samsung Electronics - Security Lab, Software R&D Center — *Suwon, Republic of Korea*

- Developed voice-password unlock application.
- Developed motion-sensor based smartphone controller of Arduino driving car.

Undergraduate Research Assistant — Mar 2014 – Sep 2015
Sungkyunkwan University - Security Lab — *Suwon, Republic of Korea*

- Researched practical smudge attack on Android pattern lock of mobile devices.

Education

University of Maryland, College Park — College Park, MD, USA
Ph.D. in Electrical and Computer Engineering — *Sep 2023 – Present*
Advisor: Tudor Dumitras

Sungkyunkwan University — Seoul, Republic of Korea
B.S. in Software Engineering — *Mar 2012 – Feb 2018*
Advisor: Hyoungshick Kim

Publications

C = Conference, J = Journal

- **[J2] "On the Long-Term Effects of Continuous Keystroke Authentication: Keeping User Frustration Low through Behavior Adaptation"**

  Jun Ho Huh, **Sungsu Kwag**, Iljoo Kim, Alexandr Popov, Younghan Park, Geumhwan Cho, Juwon Lee, Hyoungshick Kim and Choong-Hoon Lee

  Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, Vol 7, No. 2, Article 58, June 2023 (IMWUT/UbiComp)

- **[J1] "Voice Spoofing Detection through Residual Network, Max Feature Map, and Depthwise Separable Convolution"**

  Il-Youp Kwak, **Sungsu Kwag**, Junhee Lee, Youngbae Jeon, Jeonghwan Hwang, Hyo-Jung Choi, Jong-Hoon Yang, So-Yul Han, Jun Ho Huh, Choong-Hoon Lee, and Ji Won Yoon

  IEEE Access, 2023 (Access)

- **[C3] "Towards Usable and Secure Location-based Smartphone Authentication"**
  Geumhwan Cho, **Sungsu Kwag**, Jun Ho Huh, Bedeuro Kim, Choong-Hoon Lee, and Hyoungshick Kim
  The 17th Symposium On Usable Privacy and Security, 2021 (SOUPS)
- **[C2] "ResMax: Detecting Voice Spoofing Attacks with Residual Network and Max Feature Map"**
  Il-Youp Kwak, **Sungsu Kwag**, Junhee Lee, Jun Ho Huh, Choong-Hoon Lee, Youngbae Jeon, Jeonghwan Hwang and Ji Won Yoon
  The 25th International Conference on Pattern Recognition, 2020 (ICPR)
- **[C1] "Boosting the Guessing Attack Performance on Android Lock Patterns with Smudge Attacks"**
  Seunghun Cha, **Sungsu Kwag**, Hyoungshick Kim and Jun Ho Huh
  The 10th ACM Asia Conference on Computer and Communications Security, 2017 (AsiaCCS)

Teaching

- **ENEE 324 - Engineering Probability (Teaching Assistant)**, University of Maryland, College Park, Fall 2023

Scholarships & Awards

- **Dean's Fellowship**, University of Maryland, College Park, 2023-2024
- **The 2nd Prize (Minister's Award), The 4th Software Secure Coding Contest**, KISA, 2017
- **Samsung Talent Program Scholarship**, Samsung Electronics, 2015
- **National Science & Engineering Scholarship**, Korea Student Aid Foundation, 2014-2017
- **Sungkyun Software Scholarship**, Sungkyunkwan University, 2012-2013

Technical Skills

Languages	:	Python, C/C++, Java
Libraries	:	Keras, Pytorch, scikit-learn
Dev. Platform	:	Android, Tizen
Databases	:	SQLite, MySQL
Tools	:	Git, Latex

(Updated, Dec 2023)