

# Yuseok Jeon

ASSISTANT PROFESSOR OF COMPUTER SCIENCE, UNIST

EMAIL : [ysjeon@unist.ac.kr](mailto:ysjeon@unist.ac.kr)

WEB : <http://ysjeon.net/>

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RESEARCH INTERESTS	I am interested in software and system security including compiler-based, runtime-based, and language based protection mechanisms and security policies. In particular, my research is focused in enforcing strong type/memory safety guarantees at the compiler and runtime level.
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EDUCATION	<b>Purdue University</b> , West Lafayette, IN, USA <span style="float: right;">Aug. 2015 - Dec. 2020</span> <i>Ph.D. in Computer Science</i> – Advisors: Prof. Mathias Payer and Prof. Byoungyoung Lee
	<b>POSTECH</b> , Pohang, South Korea <span style="float: right;">Feb. 2008 - Feb. 2010</span> <i>M.S. in Computer and Communication Engineering</i> – Advisor: Prof. Jong Kim
	<b>Inha University</b> , Incheon, South Korea <span style="float: right;">Mar. 2003 - Aug. 2007</span> <i>B.S. in Computer Science and Engineering</i> – Special admission in recognition of outstanding computer programming skill

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WORK EXPERIENCE	<b>UNIST</b> , Ulsan, South Korea <span style="float: right;">Feb. 2021 - Current</span> Assistant Professor, Dept. of Computer Science
	<b>Purdue University</b> , West Lafayette, IN, USA <span style="float: right;">Aug. 2015 – Dec. 2020</span> <i>Graduate Research Assistant</i> , Dept. of Computer Science – Worked on developing practical type and memory safety violation detection techniques – Designed and developed advanced type confusion detectors – Designed and developed efficient sanitizer metadata structure for fuzzing – Won Bilsland dissertation fellowship award for outstanding Ph.D. candidates
	<b>Intel Corporation</b> , Hillsboro, OR, USA <span style="float: right;">May. 2018 – Aug. 2018</span> <i>Graduate Intern</i> , Platform Security Division – Surveyed control flow hijacking attack trends – Designed and developed security evaluation framework for control flow integrity (CFI) schemes
	<b>NEC Labs America</b> , Princeton, NJ, USA <span style="float: right;">May. 2016 – Aug. 2016</span> <i>Research Intern</i> , Security Department – Designed and developed high level semantic events for Automated Security Intelligence (ASI) – Designed and developed a tool for detecting suspicious privilege changes of a process
	<b>Samsung Electronics</b> , Suwon, South Korea <span style="float: right;">Dec. 2013 – Jun. 2015</span> <i>Research Engineer</i> , Software Center – Maintained and repaired security modules for the Tizen OS – Designed and developed of secure storage (Key-manager) for Tizen OS
	<b>National Security Research Institute</b> , Daejeon, South Korea <span style="float: right;">Feb. 2010 – Jun. 2013</span> <i>Research Engineer</i> , Cyber Technology Department – Designed and developed a logical network partition solution based on VirtualBox – Designed and developed core security technologies for Smart Grid and SCADA systems – Designed and developed HunterBee, a vulnerability detection device for Zigbee – Performed several projects including obfuscated code analysis and penetration testing

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PUBLICATIONS	<b>CONFERENCES</b>
	[C10] Pspray: Timing Side-Channel based Linux Kernel Heap Exploitation Technique, Yoochan Lee, Jinhan Kwak, Junesoo Kang, Yuseok Jeon, and Byoungyoung Lee, USENIX Security Symposium 2023 (SEC'23).
	[C9] DriveFuzz: Discovering Autonomous Driving Bugs through Driving Quality-Guided Fuzzing, Seulbae Kim, Major Liu, Junghwan Rhee, Yuseok Jeon, Yonghwi Kwon, and Chung Hwan Kim, ACM Confer-

ence on Computer and Communications Security 2022 (CCS'22).

[C8] ShadowAuth: Backward-Compatible Automatic CAN Authentication for Legacy ECUs, Sungwoo Kim, Gisu Yeo, Taegy Kim, Junghwan John Rhee, Yuseok Jeon, Antonio Bianchi, Dongyan Xu, and Dave (Jing) Tian, ACM ASIA Conference on Computer and Communications Security 2022 (ASIACCS'22). (18.4% acceptance rate - 85/463).

[C7] SwarmFlawFinder: Discovering and Exploiting Logic Flaws of Swarm Algorithms, Chijung Jung, Ali Ahad, Yuseok Jeon, and Yonghwi Kwon, IEEE Symposium on Security and Privacy 2022 (SP'22). (14% acceptance rate - 57/407).

[C6] 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, International Conference on Information and Communications Security (ICICS'21). (24.3% acceptance rate - 49/202).

[C5] FuZZan: Efficient Sanitizer Metadata Design for Fuzzing, Yuseok Jeon, Wookhyun Han, Nathan Burow, Mathias Payer, USENIX Annual Technical Conference 2020 (ATC'20). (18.6% acceptance rate - 65/348).

[C4] PoLPer: Process-Aware Restriction of Over-Privileged Setuid Calls in Legacy Applications, Yuseok Jeon, Junghwan Rhee, Chung Hwan Kim, Zhichun Li, Mathias Payer, Byoungyoung Lee, Zhenyu Wu, ACM Conference on Data and Application Security and Privacy 2019 (CODASPY'19). (23.5% acceptance rate - 28/119).

[C3] HexType: Efficient Detection of Type Confusion Errors for C++, Yuseok Jeon, Priyam Biswas, Scott Carr, Byoungyoung Lee, Mathias Payer, ACM Conference on Computer and Communications Security 2017 (CCS'17). (18.1% acceptance rate - 151/836).

[C2] TypeSan: Practical Type Confusion Detection, Istvan Haller, Yuseok Jeon, Hui Peng, Mathias Payer, Herbert Bos, Cristiano Giuffrida, and Erik van der Kouwe, ACM Conference on Computer and Communications Security 2016 (CCS'16). (16.4% acceptance rate - 137/831).

[C1] LT-OLSR: Attack-Tolerant OLSR against Link Spoofing, Yuseok Jeon, Tae-Hyung Kim, Yuna Kim, and Jong Kim, IEEE Conference on Local Computer Networks 2012 (LCN'12). (short paper).

#### WORKSHOPS

[W1] A Distributed Monitoring Architecture for AMIs: Minimizing the Number of Monitoring Nodes and Enabling Collided Packet Recovery, Incheol Shin, Junho Huh, **Yuseok Jeon**, and David M. Nicol, Smart Energy Grid Security Workshop 2013 in conjunction with CCS 2013 (SEGS'13).

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#### ACADEMIC SERVICE PROGRAM COMMITTEE

USENIX Security Symposium (SEC) 2023, 2022, 2021  
Network and Distributed System Security (NDSS) 2023  
European Symposium on Research in Computer Security (ESORICS) 2022, 2021  
International Symposium on Research in Attacks, Intrusions and Defenses (RAID) 2022, 2021  
ACM Conference on Data and Application Security and Privacy (CODASPY) 2022, 2021  
Man-At-The-Middle Attacks Workshop (CheckMATE) Co-located with the ACM CCS, 2021

#### REVIEWER

IEEE Trans. Dependable and Secure Computing

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#### TEACHING

(CSE551) Advanced Computer Security: Fall 2021  
(CSE467) Computer Security: Spring 2022, Spring 2021  
(CSE241) Object Oriented Programming: Fall 2020  
(UNI204) Software hacking and defense: Winter 2021

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PATENTS	<p>[PT5] Blackbox Program Privilege Flow Analysis with Inferred Program Behavior Context, Junghwan Rhee, Yuseok Jeon, Zhichun Li, Kangkook Jee, Zhenyu Wu, Guofei Jiang, US Patent 10,505,962.</p> <p>[PT4] Fine-Grained Analysis and Prevention of Invalid Privilege Transitions, Junghwan Rhee, Yuseok Jeon, Zhichun Li, Kangkook Jee, Zhenyu Wu, Guofei Jiang, US Patent 10,402,564.</p> <p>[PT3] Automated blackbox inference of external origin user behavior, Zhenyu Wu, Jungwhan Rhee, Yuseok Jeon, Zhichun Li, Kangkook Jee, Guofei Jiang, US Patent 10,572,661.</p> <p>[PT2] Apparatus and method for collecting network data traffic, Incheol Shin, Yuseok Jeon, Sinkyu Kim, Jungtaek Seo, US Patent App. 14/401,364 / South Korea 1013693830000.</p> <p>[PT1] Apparatus and method for analyzing vulnerability of ZigBee Network, Yuseok Jeon, Incheol Shin, Jaeduck Choi, Gunhee Lee, Sinkyu Kim, Jungtaek Seo, US Patent 9,294,496 / South Korea 1014141760000.</p>
HONORS AND AWARDS	<p>CERIAS Diamond Award, 2020</p> <p>Bilsland Dissertation Fellowship, 2020</p> <p>ACM CCS travel grant, 2016.</p> <p>Expert certification (top grade), Samsung S/W certificate, 2015.</p> <p>19th place, Samsung S/W Programming Contest Final, 2014.</p> <p>19th place, ACM International Collegiate Programming Contest in Asia - Seoul, 2004.</p> <p>Top prize, National Computer Competition, South Korea, 2001.</p> <p>Bronze prize, Information Technology Competition, South Korea, 2001.</p> <p>Bronze prize, Korea Computer Competition, South Korea, 2001.</p>
OPEN SOURCE SOFTWARE	<p>FuZZan: Efficient Sanitizer Metadata Design for Fuzzing (<a href="#">GitHub repo</a>)</p> <p>HexType: Efficient Detection of Type Confusion Errors for C++ (<a href="#">GitHub repo</a>)</p> <p>TypeSan: Practical Type Confusion Detection (<a href="#">GitHub repo</a>)</p> <p>Key-Manager (In Samsung Tizen OS): reducing probability of key leaking from device (<a href="#">GitHub repo</a>)</p>
REPORTED VULNERABILITIES	<p>QT library: report four type confusion bugs (<a href="#">patch1</a>) (<a href="#">patch2</a>)</p> <p>Apache Xcerces C++: report two type confusion bugs (<a href="#">patch</a>)</p> <p>MySQL: report four type confusion bugs (Bug #90116, patched)</p>
REFERENCES	<p>Available upon a request.</p>