Yuseok Jeon
ASSISTANT PROFESSOR OF COMPUTER SCIENCE, UNIST

EMAIL : ysjeon@unist.ac.kr
WEB : http://ysjeon.net/

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.

APPOINTMENTS

UNIST, Dept. of Computer Science, Ulsan, South Korea
Assistant Professor   Aug. 2020 - Current

EDUCATION

Purdue University, Dept. of Computer Science, West Lafayette, IN, USA
Ph.D. in Computer Science   Aug. 2015 - Aug. 2020
– Advisors: Prof. Mathias Payer and Prof. Byoungyoung Lee

Postech, Dept. of Computer and Communication Engineering, Pohang, South Korea
M.S. in Computer and Communication Engineering   Feb. 2008 - Feb. 2010
– Advisor: Prof. Jong Kim

Inha University, Dept. of Computer Science and Engineering, Incheon, South Korea
B.S. in Computer Science and Engineering   Mar. 2003 - Aug. 2007
– Special admission in recognition of outstanding computer programming skill
– GPA: 3.70/4.00

WORK EXPERIENCE

Purdue University, Dept. of Computer Science
Graduate Research Assistant   Aug. 2015 – Aug. 2020
– 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

Intel Corporation, Platform Security Division
Graduate Intern   May. 2018 – Aug. 2018
– Surveyed control flow hijacking attack trends
– Designed and developed security evaluation framework for control flow integrity (CFI) schemes

NEC Labs America, Security Department
Research Intern   May. 2016 – Aug. 2016
– 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

Samsung Electronics, Software Center
Research Engineer   Dec. 2013 – Jun. 2015
– Maintained and repaired security modules for the Tizen OS
– Designed and developed of secure storage (Key-manager) for Tizen OS

National Security Research Institute, Cyber Technology Department
Research Engineer   Feb. 2010 – Jun. 2013
– 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

PUBLICATIONS

CONFERENCES

[C5] FuZZan: Efficient Sanitizer Metadata Design for Fuzzing, **Yuseok Jeon**, Wookhyun Han, Nathan Burow, Mathis 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**).

POSTERS

[**P2**] HexType: fast type safety for C++ programs, **Yuseok Jeon**, Hui Peng and Mathias Payer, Greater Chicago Area Systems Research Workshop 2016 (**GCASR'16**).

[**P1**] HunterBee: An Advanced ZigBee Vulnerability Analysis System, **Yuseok Jeon**, Incheol Shin, Sinkyu Kim, Sungho Kim, and Jungtaek Seo, USENIX Security Symposium 2013 (**SEC'13**).

PATENTS	[**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. [**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. [**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. [**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. [**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.
HONORS AND AWARDS	Bilsland Dissertation Fellowship, 2020 ACM CCS travel grant, 2016. Expert certification (top grade), Samsung S/W certificate, 2015. 19th place, Samsung S/W Programming Contest Final, 2014. 19th place, ACM International Collegiate Programming Contest in Asia - Seoul, 2004. Top prize, National Computer Competition, South Korea, 2001. Bronze prize, Information Technology Competition, South Korea, 2001. Bronze prize, Korea Computer Competition, South Korea, 2001.
OPEN SOURCE SOFTWARE	FuZZan: Efficient Sanitizer Metadata Design for Fuzzing (GitHub repo) HexType: Efficient Detection of Type Confusion Errors for C++ (GitHub repo) TypeSan: Practical Type Confusion Detection (GitHub repo) Key-Manager (In Samsung Tizen OS): reducing probability of key leaking from device (GitHub repo)
REPORTED VULNERABILITIES	QT library: report four type confusion bugs (patch1) (patch2) Apache Xcerces C++: report two type confusion bugs (patch) MySql: report four type confusion bugs (Bug #90116, patched)

PROFESSIONAL ACTIVITIES	**REVIEWER**
	IEEE Trans. Dependable and Secure Computing
	EXTERNAL REVIEWER
	International Conference on Dependable Systems and Networks (DSN 2020)
	Network and Distributed System Security Symposium (NDSS 2019)
	ACM Conference on Computer and Communications Security (CCS 2019)
	USENIX Security Symposium (SEC 2018)
	Annual Computer Security Applications Conference (ACSAC 2018)
	ALGORITHM TRAINER
	IM4U (InforMatics for You), 2003.03 - 2007.02
	Information Olympiad training camp, 2004

TALKS AND PRESENTATIONS	INTEL CORPORATION, USA	2018
	- Security Evaluation Framework for CFI schemes	
	NATIONAL SECURITY RESEARCH INSTITUTE, SOUTH KOREA	2017
	- HexType: Efficient Detection of Type Confusion	
	SOONCHUNHYANG UNIVERSITY, SOUTH KOREA	2017
	- HexType: Efficient Detection of Type Confusion	
	HANNAM UNIVERSITY, SOUTH KOREA	2017
	- HexType: Efficient Detection of Type Confusion	
	NEC LABS AMERICA, USA	2016
	- Introducing High Level Semantic Events to ASI	
	SAMSUNG ELECTRONICS, SOUTH KOREA	2015
	- Profiling with Dynamic Instrumentation Tools	

TECHNICAL SKILLS	Languages/Compilers: C, C++, Java, Java Script, Python, PHP, Rust, LaTeX, LLVM, and NS-2
	Kernel/Driver: Windows Kernel/Driver and Linux Kernel
	Security: Vulnerability Analysis and Debuggers (IDA/WinDbg/OllyDbg/GDB)
	Code Management: git/gerrit, P4, Prevent, Valgrind, Gprof, Gcov, and Protex

REFERENCES	Available upon a request.