

Yuseok Jeon

CONTACT INFORMATION 305 N University Street (765) 586-7308
West Lafayette, IN 47907 jeon41@purdue.edu
http://ysjeon.net

EDUCATION **Purdue University, West Lafayette, IN, USA**

Ph.D. candidate in Computer Science, Aug. 2015 - Present

- Research area: Enforcing type/memory safety guarantees for C/C++
- Advisor: [Prof. Mathias Payer](#) and [Prof. Byoungyoung Lee](#).

Postech, Pohang, South Korea

MS in Computer and Communication Engineering, Feb. 2008 - Feb. 2010

- Thesis: LT-OLSR: Attack-Tolerant OLSR Protocol against Link Spoofing
- Advisor: [Prof. Jong Kim](#)

Inha University, Incheon, South Korea

BS in Computer Science and Engineering, Feb. 2003 - Aug. 2007

- Special admission in recognition of outstanding computer programming skill
- GPA: 3.70/4.00

RESEARCH INTERESTS I am interested in 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 for C/C++ at the compiler and runtime level.

WORK

EXPERIENCE

Purdue University

Graduate Research Assistant, [HexHive group](#)

Aug. 2015 - Present

- Working on improving software testing policies
- Designed and implemented type confusion detectors TypeSan (CCS 2016) and HexType (CCS 2017) which improve the detection coverage as well as reduce the overhead compared to existing approaches to detect type confusion attacks

Intel Corporation

Graduate Intern, Platform Security Division

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

Research Intern, Security Department

May. 2016 - Aug. 2016

- Designed and developed high level semantic events for Automated Security Intelligence
- Designed and developed a tool for detecting suspicious privilege changes of a process

Samsung Electronics

Research Engineer, Software Center, Security Department

Dec. 2013 - June. 2015

- Designed and developed security modules for the Tizen OS

- Contributed to the design and development of Key-manager, which provides secure storage for Tizen OS

The Affiliated Institute of ETRI

Research Engineer, Cyber Technology Department

Feb. 2010 - June. 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 novel vulnerability detection device for Zigbee in the Smart Grid environment
- Performed several projects including obfuscated code analysis, Smart Grid test bed design, and penetration testing

- CONFERENCES
- [C1] **Yuseok Jeon**, Junghwan Rhee, Chung Hwan Kim, Zhichun Li, Mathias Payer, Byoungyoung Lee, Zhenyu Wu “PoLPer: Process-Aware Restriction of Over-Privileged Setuid Calls in Legacy Applications”. In: CODASPY: ACM Conf. on Data and Application Security and Privacy. 2019. (23.5% acceptance rate - 28/119).
 - [C2] **Yuseok Jeon**, Priyam Biswas, Scott Carr, Byoungyoung Lee, Mathias Payer “HexType: Efficient Detection of Type Confusion Errors for C++”. In: CCS: ACM Conf. on Computer and Communication Security. 2017. (18.1% acceptance rate - 151/836).
 - [C3] Istvan Haller, **Yuseok Jeon**, Hui Peng, Mathias Payer, Herbert Bos, Cristiano Giuffrida, and Erik van der Kouwe. “TypeSan: Practical Type Confusion Detection”. In: CCS: ACM Conf. on Computer and Communication Security. 2016. (16% acceptance rate - 137/831).
 - [C4] **Yuseok Jeon**, Tae-Hyung Kim, Yuna Kim, and Jong Kim. “LT-OLSR: Attack-Tolerant OLSR against Link Spoofing”. In: LCN: IEEE Conf. on Local Computer Networks. 2012. Short Paper.
- WORKSHOPS
- [W1] Incheol Shin, Junho Huh, **Yuseok Jeon**, and David M. Nicol. “A Distributed Monitoring Architecture for AMIs: Minimizing the Number of Monitoring Nodes and Enabling Collided Packet Recovery”. In: SEGS: Smart Energy Grid Security Workshop (In conjunction with CCS). 2013.
- POSTER
- [P1] **Yuseok Jeon**, Hui Peng and Mathias Payer. “HexType: fast type safety for C++ programs”. In: GCASR: Greater Chicago Area Systems Research Workshop. 2016.
 - [P2] **Yuseok Jeon**, Incheol Shin, Sinkyu Kim, Sungho Kim, and Jungtaek Seo. “HunterBee: An Advanced ZigBee Vulnerability Analysis System”. In: SEC: 22nd Usenix Security Symposium. 2013.
- PATENTS
- [PT1] **Yuseok Jeon**, Incheol Shin, Jaeduck Choi, Gunhee Lee, Sinkyu Kim, Jungtaek Seo. “Apparatus and method for analyzing vulnerability of ZigBee Network”. Patent No: US9294496 B2 (USA) / 1014141760000 (South Korea).
 - [PT2] Incheol Shin, **Yuseok Jeon**, Sinkyu Kim, Jungtaek Seo. “Apparatus and method for collecting network data traffic”. Patent No: US20150128271 A1 (USA) / 1013693830000 (South Korea).

- [PT3] Zhenyu Wu, Jungwhan Rhee, **Yuseok Jeon**, Zhichun Li, Kangkook Jee, Guofei Jiang. “Automated blackbox inference of external origin user behavior”. Application No: 15/652,796 (USA)
- [PT4] Junghwan Rhee, **Yuseok Jeon**, Zhichun Li, Kangkook Jee, Zhenyu Wu, Guofei Jiang. “Fine-Grained Analysis and Prevention of Invalid Privilege Transitions”. Application No: 15/623,589 (USA)
- [PT5] Junghwan Rhee, **Yuseok Jeon**, Zhichun Li, Kangkook Jee, Zhenyu Wu, Guofei Jiang. “Blackbox Program Privilege Flow Analysis with Inferred Program Behavior Context”. Application No: 15/623,538 (USA)

HONORS AND AWARDS

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

HexType: type confusion detector based on LLVM (TypeSan extension version) ([code](#))
TypeSan: type confusion detector based on LLVM ([code](#))
Key-Manager (Tizen OS): reducing probability of key leaking from device ([code](#))

REPORTED VULNERABILITIES

QT library: report four type confusion bugs ([patch1](#)) ([patch2](#))
Apache Xerces 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
Algorithm Trainer: IM4U (InforMatics for You), 2003.03 - 2007.02
Algorithm Trainer: Information Olympiad training camp, 2004

TALKS AND PRESENTATIONS

Security Evaluation Framework for CFI Schemes, Intel, Aug. 2018
HexType: Efficient Detection of Type Confusion, The Affiliated Institute of ETRI, May. 2017
HexType: Efficient Detection of Type Confusion, Soonchunhyang University, May. 2017
HexType: Efficient Detection of Type Confusion, Hannam University, May. 2017
Introducing High Level Semantic Events to ASI, NEC Labs America, Aug. 2016
Profiling with Dynamic Instrumentation Tools, Samsung Electronics, Mar. 2015

TECHNICAL SKILLS

Languages/Compilers: C, C++, Java, Java Script, Python, PHP, 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

PERSONAL INTERESTS

Baseball, meditation, solving algorithm contest problems, running, boxing, swimming, cinema, and (history) literature