

# CURRICULUM VITA

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## EDUCATION:

- Ph.D. - Computer Science, Purdue University, 2008 ~ 2014
- Master – Computer Engineering, Hong-Ik University, 2005 ~ 2008
- Bachelor – Computer Engineering, Hong-Ik University, 1998 ~ 2005

## DISSERTATION:

- “Selective Logging for Accurate, Space Efficient Forensic Analysis and Reducible Execution Replay”, Purdue University, 2014

## POSITIONS:

- Assistant Professor – Computer Science, University of Georgia, Fall 2014 ~ Now

## RESEARCH INTERSTS:

Cybersecurity, Cyber Forensics, Software reliability and security, Mobile Security, Program Analysis, Software engineering, Distributed Systems

## CURRENT RESEARCH:

- Lightweight Logging Component for Smart Devices
- Effective and Efficient Forensic Analysis Framework for Enterprise Data Center
- Automated Detection and Analysis of Performance Problems in Long-running applications
- High-performance Log Analysis for Real-time Provenance Tracking System

## GRANTS RECEIVED:

- NSF, “SaTC: CORE: Medium: Collaborative: Measurement and Prevention of Online Content Management System Abuse,” 10/1/2019 – 9/30/2023, \$359,964, PI at University of Georgia
- US DEPT OF ARMY, “A Framework for Asymmetric Information Interactions among (Cyber) Defenders and Attackers”, \$ 389,902, 10/2/2017 -10/1/2020, Role: Co-investigator (PI: Dr. Prashant Doshi)

- DARPA-BAA-15-15, “Transparent Computing: TRacking and Analysis of Causality at Enterprise level (TRACE),” \$5,352,881, 7/1/2015 - 6/30/2019, PI at University of Georgia (my share: \$360,000)
- Faculty Research Grants in the Sciences, University of Georgia: Development of Accurate Forensic Analysis Framework for Enterprise Data Center, \$12,000, 7/1/2015 - 6/30/2016, PI, 100%

#### GRANTS PENDING:

- NSF, “OAC Core: Small: Collaborative Research: Data Provenance Infrastructure towards Robust and Reliable Data sharing and Analytics,” 7/1/2019 – 6/30/2022, \$249,880, PI at University of Georgia (*Recommended for an award*)

#### PUBLICATIONS:

##### Refereed Journal Publications:

- Monjur Alam, Zhe Cheng Lee, Chrysostomos Nicopoulos, Kyu Hyung Lee, Jongman Kim, Junghee Lee, “SBBBox: A Tamper-Resistant Digital Archiving System,” In International Journal of Cyber-Security and Digital Forensics (IJCSDF) 2016 Volume 5.

##### Refereed Conferences:

- Jinho Jung, Hong Hu, David Solodukhin, Daniel Pagan, Kyu Hyung Lee, Taesoo Kim, “Fuzzification: Anti-Fuzzing Techniques,” In 28th Usenix Security Symposium, Santa Clara, CA, 2019
- Shiqing Ma, Juan Zhai, Yonghwi Kwon, Kyu Hyung Lee, Xiangyu Zhang, Gabriela Ciocarlie, Ashish Gehani, Vinod Yegneswaran, Dongyan Xu, Somesh Jha, “Kernel-Supported Cost-Effective Audit Logging for Causality Tracking,” In Usenix Annual Technical Conference, Boston, MA, 2018 (ATC '18)
- Bo Li, Phani Vadrevu, Kyu Hyung Lee, Roberto Perdisci, “JSgraph: Enabling Reconstruction of Web Attacks via Efficient Tracking of Live In-Browser JavaScript Executions,” In Proceedings of the 2018 Network and Distributed System Security Symposium, San Deigo, CA, 2018 (NDSS '18)
- Yonghwi Kwon, Fei Wang, Weihang Wang, Kyu Hyung Lee, Wen-Chuan Lee, Shiqing Ma, Xiangyu Zhang, Dongyan Xu, Somesh Jha, Gabriela Ciocarlie, Ashish Gehani, Vinod Yegneswaran, “MCI : Modeling-based Causality Inference in Audit Logging for Attack Investigation,” In Proceedings of the 2018 Network and Distributed System Security Symposium, San Deigo, CA, 2018 (NDSS '18)
- Shiqing Ma, Juan Zhai, Fei Wang, Kyu Hyung Lee, Xiangyu Zhang, Dongyan Xu, “MPI: Multiple Perspective Attack Investigation with Semantic Aware Execution Partitioning,” In 26th Usenix Security Symposium, Vancouver, BC, Canada, 2017, *Distinguished Paper Award*
- Xingzi Yuan, Omid Setayeshfar, Hongfei Yan, Pranav Panage, Xuetao Wei, Kyu Hyung Lee, “DroidForensics: Accurate Reconstruction of Android Attacks via Multi-layer Forensic Logging,” In ACM Asia Conference on Computer and Communications Security, Abu Dhabi, UAE, 2017 (AsiaCCS '17)

- Phani Vadrevu, Jienan Liu, Bo Li, Babak Rahbarinia, Kyu Hyung Lee, Roberto Perdisci, “Enabling Reconstruction of Attacks on Users via Efficient Browsing Snapshots”, In Proceedings of the 2017 Network and Distributed System Security Symposium, San Deigo, CA, 2017 (NDSS ’17)
- Yonghwi Kwon, Brendan Saltaformaggio, I Luk Kim, Kyu Hyung Lee, Xiangyu Zhang, Dongyan Xu, “A2C: Self Destructing Exploit Executions via Input Perturbation”, In Proceedings of the 2017 Network and Distributed System Security Symposium, San Deigo, CA, 2017 (NDSS ’17)
- Xuetao Wei, Michael Wolf, Lei Guo, Kyu Hyung Lee, Ming-Chun Huang, and Nan Niu, “emphaSSL: Towards Emphasis as a Mechanism to Harden Networking Security in Android Apps,” In IEEE GLOBECOM, Washington, DC, 2016 (GLOBECOM ’16)
- Chung Hwan Kim, Junghwan Rhee, Kyu Hyung Lee, Xiangyu Zhang, and Dongyan Xu, “PerfGuard: Binary-Centric Application Performance Monitoring in Production Environments,” In ACM SIGSOFT International Symposium on the Foundations of Software Engineering, Seattle, WA, USA, 2016 (FSE ’16)
- Shiqing Ma, Kyu Hyung Lee, Chung Hwan Kim, Junghwan Rhee, Xiangyu Zhang, and Dongyan Xu, “Accurate, Low Cost and Instrumentation-Free Security Audit Logging for Windows,” In *Annual Computer Security Applications Conference*, Los Angeles, CA, USA, 2015 (ACSAC ’15)
- Kyu Hyung Lee, Dohyeong Kim and Xiangyu Zhang, “Infrastructure-Free Logging and Replay of Concurrent Execution on Multiple Cores,” The European Conference on Object-Oriented Programming , Uppsala, Sweden, 2014 (ECOOP ’14)
- Kyu Hyung Lee, Xiangyu Zhang and Dongyan Xu, “LogGC: Garbage Collectable Audit Log,” ACM Conference on Computer and Communications Security, Berlin, Germany, 2013 (CCS ’13).
- Kyu Hyung Lee, Xiangyu Zhang and Dongyan Xu, “High Accuracy Attack Provenance via Binary- Based Execution Partition,” In Proceedings of the Network and Distributed System Security Symposium, San Deigo, CA, 2013 (NDSS ’13).
- Kyu Hyung Lee, Nick Sumner, Xiangyu Zhang and Patrick Eugster, “Unified Debugging of Dis- tributed Systems with Recon,” IEEE/IFIP International Conference on Dependable Systems and Networks, Hong Kong, China, 2011 (DSN-DCCS ’11).
- Kyu Hyung Lee, Yunhui Zheng, Nick Sumner and Xiangyu Zhang, “Toward Generating Reducible Replay Log,” ACM SIGPLAN conference on Programming Language Design and Implementation, San Jose, CA, 2011 (PLDI ’11).
- Soyeon Park, Weiwei Xiong, Zouning Yin, Rini Kaushik, Kyu H. Lee, Shan Lu and Yuanyuan Zhou, “PRES: Probabilistic Replay with Execution Sketching on Multiprocessors,” ACM Symposium on Operating Systems Principles, Big Sky, MT, 2009 (SOSP ’09).
- Zhe Zhang\*, Kyuhyung Lee\*, Xiaosong Ma and Yuanyuan Zhou, “PFC: Transparent Optimization of Existing Prefetching Strategies for Multi-level Storage Systems,” International Conference on Distributed Computing Systems, Beiging, China, 2008 (ICDCS ’08). \* These authors contributed equally to this work.
- Ding Yuan, Kyuhyung Lee, Hong Cheng, Gopal Krishna, Zhenmin Li, Xiao Ma, Yuanyuan Zhou and Jiawei Han, “CISpan: Comprehensive Incremental Mining Algorithms of Closed Sequential Pattern for Multi-Versional Software Mining,” SIAM International Conference on Data Mining, Atlanta, GA, 2008 (SDM ’08).

- Hyo J. Lee, Kyu H. Lee and Sam H. Noh, “Augmenting RAID with an SSD for Energy Relief,” Workshop on Power Aware Computing and Systems, San Diego, CA, 2008 (HotPower ’08), co-located with OSDI 2008
- Kyu Hyung Lee, In Hwan Doh, Jongmoo Choi, Donghee Lee and Sam H. Noh, “Write-Aware Buffer Cache Management Scheme for Nonvolatile RAM,” International Conference on Advances in Computer Science and Technology, Phuket, Thailand, 2007 (ACST ’07)
- Kyu Hyung Lee, Jongmoo Choi, Donghee Lee and Sam H. Noh, “Reconsidering Performance Measurement when Non-Volatile RAM is Used in the Buffer Cache,” 32nd Korea Information Science Society, South Korea, 2005 (KISS ’05), (Korean).

## INVITED TALKS

- “Cyber Forensic Analysis”, National Security Research Institute in Korea, July, 2016
- “Cyber Forensic Analysis of an Advanced Persistent Threat (APT)”, Ulsan National Institute of Science and Technology (UNIST) in Korea, July, 2016
- “Accurate and Space Efficient Cyber Forensic Analysis”, NEC Laboratories America, Inc. (NEC Labs), March, 2016
- “Towards Effective and Efficient Replay Debugging”, 44<sup>th</sup> US-Korea Conference on Science, Technology, and Entrepreneurship, Atlanta, GA, July, 2015
- “Selective Logging for Accurate, Space Efficient Cyber Forensic Analysis”, 15<sup>th</sup> Technical Symposium of The Korean Computer Scientists and Engineers Association in America (KOCSEA), IBM T. J. Watson Research Center, NY December 11, 2014
- “Infrastructure-Free Logging and Replay of Concurrent Execution on Multiple Cores”, 28<sup>th</sup> European Conference on Object-Oriented Programming (ECOOP), Uppsala, Sweden July 30, 2014
- “LogGC: Garbage Collecting Audit Log”, 20<sup>th</sup> ACM Conference on Computer and Communications Security, Berlin, Germany November 7, 2013
- “High Accuracy Attack Provenance via Binary-Based Execution Partition”, 20<sup>th</sup> Annual Network & Distributed System Security Symposium, San Diego, CA February 25, 2013
- “Unified Debugging of Distributed Systems with Recon”, 41<sup>st</sup> IEEE/IFIP International Conference on Dependable Systems and Networks, Hong Kong, China June 28, 2011
- “Toward Generating Reducible Replay Log”, 32nd ACM SIGPLAN conference on Programming Language Design and Implementation, San Jose, CA June 7, 2011

## CLASSROOM COURSES TAUGHT:

- CSCI8240: Software Security and Cyber Forensics – Fall 2018, Fall 2017, Spring 2016
- CSCI4250/6250: Computer Security – Spring 2018
- CSCI4730/6730: Operating Systems – Fall 2017, Spring 2017, Fall 2015
- CSCI8060: Advanced Software Engineering – Fall 2016, Spring 2015
- CSCI4900/6900: Special Topics – Fall, 2014

**PROFESSIONAL ACTIVITIES:**

- Publicity Chair and PC member for the 16th Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA), 2019
- Program Committee for the 20th World Conference on Information Security Applications (WISA), 2019
- Reviewer for funding agencies, National Science Foundation (NSF) panelist, 2015, 2018, 2019
- Program Committee for the ACM Asia Conference on Computer and Communications Security (AsiaCCS), 2018
- Review of the IEEE Transactions on Software Engineering (TSE-2017-08-0241)
- Program Committee for the ACM Conference on Computer and Communications Security (CCS), 2017
- Program Committee for Cyber and Information Security Research Conference at Oak Ridge National Laboratory (CISRC), 2017
- Program Committee for the IEEE/ACM International Conference on Mobile Software Engineering and Systems, May 2017
- External Reviewer of the ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE), April 2016
- Reviewer of the Journal of Communications and Networks, April 2016
- Reviewer of the IEEE International Workshop on Security, Trust, and Privacy for Software Applications, March 2016
- Guest Editor of the Journal of Computer Science and Technology, June 2015
- Program Committee for the 10th IEEE International Workshop on Security, Trust, and Privacy for Software Applications, 2015
- Guest Editor of the IEEE Transaction on Computers, February 2015