

Qiang Zeng, Tenure-track Assistant Professor

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RESEARCH INTERESTS

My main research interest is Systems and Software Security. I work on topics such as Vulnerability Discovery, PoC Exploit Generation, Runtime Defense Generation, Automatic Patch Generation, and Program Analysis. Currently, I am exploring mobile security, middleware security, IoT security, and deep learning for solving security problems. I published papers in PLDI, NDSS, MobiSys, DSN, ICSE, and CGO.

EDUCATION

Ph.D., Computer Science & Engineering, Penn State University	2014
M.E., Computer Science & Engineering, Beihang University	2008
B.E., Computer Science & Engineering, Beihang University	2005

RESEARCH EXPERIENCE

Temple University , Tenure-track Assistant Professor Conduct research and teaching in the CIS department.	07/2015 – present
Cyber Security Lab, PSU Research Assistant (Doctoral study) Finished multiple research projects on security. Published work in NDSS'12, PLDI'11 and DSN'15.	08/2009 – 12/2014
NEC Laboratories America , Research Intern Improved the technique below in order to work with dynamic class loading. Published in CGO'14.	01/2013 – 04/2013
NEC Laboratories America , Research Intern Built the first scalable call stack information encoding technique for OO programs. Filed two patents.	05/2012 – 08/2012
IBM Thomas J. Watson Research Center , Research Intern Invented the first safe query executor for multi-party distributed databases. Published in TKDE.	05/2011 – 08/2011
State Key Lab of Software Dev. Envir. , Research Assistant (Master study) Built a scalable distributed system for a video conferencing system. One patent was awarded.	08/2005 – 03/2008

PUBLICATIONS

SELECTED PAPERS

- [1] **Qiang Zeng**, Lannan Luo, Zhiyun Qian, Xiaojiang Du, and Zhoujun Li. “Resilient Decentralized Android Application Repackaging Detection.” In *Proceedings of IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*, 2018. (Acceptance rate = $30/105 = 29\%$)
- [2] Lannan Luo,* **Qiang Zeng**,* Chen Cao, Kai Chen, Jian Liu, Limin Liu, Neng Gao, Min Yang, Xinyu Xing, and Peng Liu (*co-first authors). “System Service Call-oriented Symbolic Execution of Android Framework with Applications to Vulnerability Discovery and Exploit Generation.” *MobiSys*, 2017. (Acceptance rate = $34/188 = 18\%$)
- [3] Lannan Luo and **Qiang Zeng**. “SolMiner: Mining Distinct Solutions in Programs.” In *the 38th International Conference on Software Engineering (ICSE), SEET track*, 2016 (Acceptance rate = $22/64 = 34\%$)
- [4] **Qiang Zeng**,* Mingyi Zhao,* and Peng Liu (*co-first authors). “HeapTherapy: An Efficient End-to-end Solution Against Heap Buffer Overflows.” In *Proceedings of the 45th Annual IEEE/IFIP*

International Conference on Dependable Systems and Networks (DSN), 2015. (Acceptance rate = $50/229 = 22\%$)

- [5] Jun Wang, Mingyi Zhao, **Qiang Zeng**, Dinghao Wu, and Peng Liu. “Risk Assessment of Buffer Heartbleed Over-read Vulnerabilities” (Practical Experience Report). In *Proceedings of the 45th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, 2015. (Acceptance rate = $50/229 = 22\%$)
- [6] **Qiang Zeng**, Mingyi Zhao, Peng Liu, Poonam Yadav, Seraphin Calo, and Jorge Lobo. “Enforcement of Autonomous Authorizations in Collaborative Distributed Query Evaluation.” In *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2014.
- [7] **Qiang Zeng**, Junghwan Rhee, Hui Zhang, Nipun Arora, Guofei Jiang, and Peng Liu. “DeltaPath: Precise and Scalable Calling Context Encoding.” In *Proceedings of the International Symposium on Code Generation and Optimization (CGO)*, pages 109–119, 2014. (Acceptance rate = $29/100 = 29\%$)
- [8] Donghai Tian, **Qiang Zeng**, Dinghao Wu, Peng Liu, and Changzhen Hu. “Kruiser: Semi-synchronized Non-blocking Concurrent Kernel Heap Buffer Overflow Monitoring.” In *Proceedings of the 19th Annual Network and Distributed System Security Symposium (NDSS)*, 2012. (Acceptance rate = $46/258 = 18\%$)
- [9] **Qiang Zeng**, Dinghao Wu, and Peng Liu. “Cruiser: Concurrent Heap Buffer Overflow Monitoring Using Lock-free Data Structures.” In *Proceedings of the 32nd ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI)*, page 367–377, 2011. (Acceptance rate = $55/236 = 23\%$)

OTHER PUBLICATIONS

- [10] Mingyue Liang, Zhoujun Li, **Qiang Zeng**, and Zhejun Fang. “Deobfuscation of Virtualization-obfuscated Code through Symbolic Execution and Compilation Optimization.” In *19th International Conference on Information and Communications Security (ICICS)*, 2017
- [11] Mingyue Liang, Zhoujun Li, **Qiang Zeng**, and Zhejun Fang. “Deobfuscation of Virtualization-based Obfuscated Binary.” In *26th Usenix Security Symposium, Poster Session*, 2017.
- [12] Ravshanbek Norboev, Zakia Hossain, **Qiang Zeng**, and Lannan Luo. “On the Robustness of Stochastic Stealthy Network against Android App Repackaging.” Technical Report, 2017.
- [13] **Qiang Zeng**, Zhi Xin, Dinghao Wu, Peng Liu, and Bing Mao. “Tailored Application-specific System Call Tables.” Technical Report. 2014.
- [14] **Qiang Zeng**, Mingyi Zhao, and Peng Liu. “Targeted Therapy for Program Bugs.” In *35th IEEE Symposium on Security and Privacy (Oakland), Poster Session*, 2014.
- [15] Dinghao Wu, Peng Liu, **Qiang Zeng**, and Donghai Tian. “Software Cruising: A New Technology for Building Concurrent Software Monitor.” *Book chapter*, in *Secure Cloud Computing, Advances in Information Security Series*, Sushil Jajodia, Krishna Kant, Pierangela Samarati, Anoop Singhal, Vipin Swarup, and Cliff Wang (eds.), pages 303–324. Springer, 2014.
- [16] Mingyi Zhao, **Qiang Zeng**, Jorge Lobo, Peng Liu, Fan Ye, Seraphin Calo, and Tom Berman. “Decentralized Query Planning in Coalition Networks.” In *Annual Conference of International Technology Alliance*, 2013 (short paper).
- [17] **Qiang Zeng**, Jorge Lobo, Peng Liu, Seraphin Calo, and Poonam Yadav. “Safe Query Processing for Pairwise Authorizations in Coalition Networks.” In *Annual Conference of International Technology Alliance*, 2012.

INVENTIONS AND PATENTS

- [18] Junghwan Rhee, Hui Zhang, Nipun Arora, Geoff Jiang, and **Qiang Zeng**. “Guarding a Monitoring Scope and Interpreting Partial Control Flow Context.” Publication No.: US9471461 B2, awarded 2016.
- [19] **Qiang Zeng**, Baosong Shan, Hua Miao, and Wei Li. “A Distributed System for Large-scale Real-time Streaming Transmission.” Publication No.: CN-101123526-B, awarded 2010.
- [20] Hua Miao, Baosong Shan, **Qiang Zeng**, Xianglong Liu, and Wei Li, “A Sliding Windows Based Method for Rapid FGS Bandwidth Allocation.” Publication No.: CN-100579226-B, awarded 2010.

SCHOLARLY SERVICE

- TPC member for the IEEE Conference on Communications and Network Security, 2018
- TPC member for the 36th IEEE International Conference on Consumer Electronics, 2018
- Reviewer for the 9th International Conference on Information Security Theory and Practice, 2015
- Reviewer for the 16th European Symposium on Research in Computer Security, 2011
- Reviewer for the IEEE 30th International Conference on Distributed Computing Systems, 2010
- Reviewer for IEEE Transactions on Dependable and Secure Computing
- Reviewer for IEEE Transactions on Information Forensics and Security
- Reviewer for IEEE Transactions on Parallel and Distributed Systems

DEPARTMENTAL & UNIVERSITY SERVICE

- Hosted the CIS Weekly Tea Social Events, 2016–2017 academic year
- IS&T Undergraduate Committee, 2016–2017 academic year
- Tenure-track Junior Faculty Search Committee, 2015–2016 academic year
- CS Undergraduate Committee, 2015–2016 academic year
- PSM Cyber Security Master Program Committee, 2015–2016 academic year

SOFTWARE RELEASE

- Code for CENTAUR (MobiSys’17) is publicly available at <https://github.com/Android-Framework-Symbolic-Executor/Centaur>.
- Code for CRUISER (PLDI’11) is publicly available at <http://cruiser-psu.googlecode.com>.

TEACHING

- Fall 2017, *CIS5512: Operating Systems*, Graduate.
- Spring 2017, *CIS4360: Secure Computer Systems (Seminar Topics in Computer Science)*, Undergraduate. *Student feedback: 4.5/5 (this is a newly developed course)*.
- Fall 2016, *CIS5512: Operating Systems*, Graduate. *Student feedback: 4.2/5*.
- Fall 2015, *CIS5512: Operating Systems*, Graduate. *Student feedback: 4.3/5*.

MENTORSHIP/STUDENT SUPERVISION

- Undergraduate Research Assistants
 - Patrick Young, May 2017–present
 - Emil Mohammed, May 2017–present
 - Ravshanbek Norboev, May 2017–July 2017 (REU summer program)
 - Zakia Hossain, May 2017–August 2017 (2017 Frances Velay Fellowship)
- PhD Students
 - Golam Kayas, August 2017–present
 - Fei Zuo, August 2017–present