

HONG HU

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EDUCATION

National University of Singapore, Singapore May 2016

Ph.D. in Computer Science

Dissertation: Systematic Methods for Memory Error Detection and Exploitation

Advisor: Prof. Zhenkai Liang

Huazhong University of Science of Technology, Wuhan, China June 2011

B.E. in Information Security

Thesis: Cloud-Based Isolated Execution Environment

RESEARCH EXPERIENCE

Postdoctoral Fellow, Georgia Institute of Technology, Atlanta, GA, USA February 2017–Present

Advisors: Prof. Wenke Lee and Prof. Taesoo Kim

Protect buggy programs from control-flow hijacking attacks

Study and develop tools to debloat operating system and user space programs

Research Fellow, National University of Singapore, Singapore July 2016–January 2017

Advisor: Prof. Zhenkai Liang

Develop toolchains to lift binary into LLVM intermediate language (IR)

Research Assistant, National University of Singapore, Singapore February 2016–Jun 2016

Advisor: Prof. Zhenkai Liang

Develop exploit techniques to demonstrate the Turing-Completeness of data-oriented attacks

Detect tools to automatically construct data-oriented attacks

RESEARCH INTERESTS

System security: design secure systems to detect program bugs, explore new attack vectors and prevent various exploits.

PUBLICATIONS

Four papers in top-tier security conferences (*Oakland*, *Security*, *CCS*)—Three as the first author

In total, I have published four first-authored and four co-authored referred conference papers.

Conference Proceedings

[1] **Enforcing Unique Code Target Property for Control-Flow Integrity.**

Hong Hu, Chenxiong Qian, Carter Yagemann, Simon Pak Ho Chung, William R. Harris, Taesoo Kim, and Wenke Lee.
In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, October 2018.

- [2] **The "Web/Local" Boundary Is Fuzzy - A Security Study of Chrome's Process-based Sandboxing.**
Yang Ji, Zheng Leong Chua, **Hong Hu**, Shuo Chen, Prateek Saxena, and Zhenkai Liang.
In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, October 2016.
- [3] **Data-Oriented Programming: On the Expressiveness of Non-Control Data Attacks.**
Hong Hu, Shweta Shinde, Sendriu Adrian, Zheng Leong Chua, Prateek Saxena, and Zhenkai Liang.
In *Proceedings of the IEEE Symposium on Security and Privacy (Oakland)*, May 2016.
- [4] **Identifying Arbitrary Memory Access Vulnerabilities in Privilege-Separated Software.**
Hong Hu, Zheng Leong Chua, Zhenkai Liang, and Prateek Saxena.
In *Proceedings of the European Symposium on Research in Computer Security*, September 2015.
- [5] **Automatic Generation of Data-Oriented Exploits.**
Hong Hu, Zheng Leong Chua, Sendriu Adrian, Prateek Saxena, and Zhenkai Liang.
In *Proceedings of the USENIX Security Symposium (Security)*, August 2015.
- [6] **DroidVault: A Trusted Data Vault for Android Devices.**
Xiaolei Li, **Hong Hu**, Guangdong Bai, Yang Ji, Zhenkai Liang, and Prateek Saxena.
In *Proceedings of the International Conference on Engineering of Complex Computer Systems*, August 2014.
* **Best paper award.**
- [7] **Practical Analysis Framework for Software-based Attestation Scheme.**
Li Li, **Hong Hu**, Jun Sun, Yang Liu, and Jin Song Dong.
In *Proceedings of the International Conference on Formal Engineering Methods*, November 2014.
- [8] **A Quantitative Evaluation of Privilege Separation in Web Browser Designs.**
Xinshu Dong, **Hong Hu**, Zhenkai Liang, and Prateek Saxena.
In *Proceedings of the European Symposium on Research in Computer Security*, September 2013.

HONORS AND AWARDS

Student Travel Grant , the 24th USENIX Security	2015
Best Paper Award , the 19th ICECCS	2014
NUS Research Scholarship , National University of Singapore	2011-2015
Meritorious Winner , the Mathematical Contest in Modeling	2010
Google Excellence Scholarship , Google	2010
National Endeavor Fellowship , China Ministry of Education	2010
National Scholarship , China Ministry of Education	2008,2009

PROFESSIONAL ACTIVITIES

External Reviewer

Network and Distributed System Security Symposium (NDSS)	2019,2018,2017,2016,2015,2014
IEEE Symposium on Security and Privacy (IEEE S&P)	2019,2018,2016,2015,2014
ACM Conference on Computer and Communications Security (CCS)	2018,2017,2015,2014
USENIX Security Symposium	2018,2016,2014
USENIX Symposium on Operating Systems Design and Implementation (OSDI)	2018
USENIX Annual Technical Conference (ATC)	2018
European Conference on Computer Systems (EuroSys)	2018

Teaching

Teaching Assistant - CS4239 Software Security	2016
Teaching Assistant - CS5231 Systems Security	2014
Teaching Assistant - CS4238 Computer Security Practice	2013

INVITED TALKS

System Debloating via Compile-time Configuration and Hybrid Binary Rewriting (Keynote)

The FEAST workshop 2018, Toronto, ON, Canada

October 2018

Enforcing Unique Code Target Property for Control-Flow Integrity

The CCS 2018, Toronto, ON, Canada

October 2018

Hacking Data-Flow for Turing-Complete Attacks

Cybersecurity Lecture Series, Atlanta, GA, USA

February 2018

Data-Oriented Attacks: Expressiveness, Construction and Application

Tsinghua University, Beijing, China

February 2017

Chinese Academy of Sciences, Beijing, China,

February 2017

Georgia Tech, Atlanta, GA, USA

May 2016

ADSC, Singapore

January 2016

Data-Oriented Programming: On the Expressiveness of Non-Control Data Attacks

The IEEE S&P 2016, San Jose, CA, USA

May 2016

Identifying Arbitrary Memory Access Vulnerabilities in Privilege-Separated Software

The ESORICS 2015, Vienna, Austria

September 2015

Automatic Generation of Data-Oriented Exploits

The USENIX Security 2015, Washington D.C., USA

August 2015

REFERENCES

Dr. Wenke Lee (Postdoc Advisor)

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 Georgia Institute of Technology, Atlanta, GA
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Dr. Zhenkai Liang (PhD Advisor)

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 National University of Singapore, Singapore
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Dr. Prateek Saxena

Dean's Chair Assistant Professor of Computer Science
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