

Zhongjie Wang

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EDUCATION

University of California, Riverside, CA, United States

Ph.D. student in Computer Science, 2020 (expected) - GPA 3.95/4.00

- Research Area: Network Security, Internet Measurement, Program Analysis
- Advisor: Zhiyun Qian and Srikanth V. Krishnamurthy

Peking University, Beijing, China

M. Sc. in Computer Architecture, June 2012

- Research Area: P2P Network, Search Engine & Recommendation System, Network Security

Beijing University of Posts and Telecommunications, Beijing, China

B. Eng. in Information Security, June 2009

- Member of Innovation Lab in Information Engineering school, which consists of top 5% students

WORKING EXPERIENCE

June 2019 – June 2020, Samsung Research America, Mountain View, CA, USA

Research Intern at KNOX Security Team

- Exploring statefulness of Trusted Applications (TAs) and its control flow dependance with Symbolic Execution technique
- Automated bug finding for TAs

June 2018 – Sept 2018, International Computer Science Institute (ICSI), Berkeley, CA, USA

Research Intern at Networking and Security Group

- Offloading network protocol identification from Bro to programmable NIC. Using smart NIC to perform signature-based protocol identification, then informing Bro of the identification results
- Modifying Bro source code to conduct some proof-of-concept measurement

Mar 2015 – June 2015, Maxent, Inc., Shanghai, China

Software Developer & Data Analyst

- Analyze tera-scale visiting data of mobile customers
- Built and maintained data warehouse on HDFS+Hive+Spark

July 2012 – May 2014, Netease, Inc., Guangzhou, China

Advanced Software Development Engineer in Test at Online Game Department

- Developed automatic source code analysis platform, which performs static code analysis on multiple projects concurrently and automatically
- Developed real-time code coverage testing tool, which traces the code execution of both server-side and client-side, then presents the executions of code lines in real time
- Designed and conducted automatic tests and stress tests for MMORPG (Massively Multiplayer Online Role Playing Game) with 10000+ concurrent players

July 2011 – Aug 2011, Morgan Stanley, Shanghai, China

Technology & Data Intern at Institutional Security Group Technology

- Developed a backend module for equity trading system, which executes post-trade position verification using finite state machines

Nov 2008 – May 2009, **Microsoft Research Asia**, Beijing, China

Research Intern at Machine Learning Group

- Devised a distributed key-value retrieval algorithm using MapReduce and B+ Tree
- Designed and implemented a ranking algorithm based on distributed random walk using MapReduce on a cluster of hundreds of machines
- Devised algorithms to measure similarity between search queries

PUBLICATIONS

1. **Zhongjie Wang**, Shitong Zhu, Yue Cao, Zhiyun Qian, Chengyu Song, Srikanth V. Krishnamurthy, Tracy Braun, Kevin Chan, “SymTCP: Eluding Stateful Deep Packet Inspection with Automated Discrepancy Discovery”, **NDSS 2020**, San Diego, USA, 2020
2. **Zhongjie Wang**, Yue Cao, Zhiyun Qian, Chengyu Song, Srikanth Krishnamurthy, “Your State is Not Mine: A Closer Look at Evading Stateful Internet Censorship”, **IMC’17**, London, UK, 2017
3. Alan Quach*, **Zhongjie Wang***, Zhiyun Qian, “Investigation of the 2016 Linux TCP Stack Vulnerability at Scale”, **SIGMETRICS’17**, Urbana-Champaign, Illinois, USA, 2017 (* co-first author)
4. Keyu Man, Zhiyun Qian, **Zhongjie Wang**, Xiaofeng Zheng, Youjun Huang, Haixin Duan, “DNS Cache Poisoning Attack Reloaded: Revolutions With Side Channels”, **ACM CCS 2020 (Distinguished Paper Award)**, Virtual Event, USA, 2020
5. Yue Cao, Zhiyun Qian, **Zhongjie Wang**, Tuan Dao, Srikanth Krishnamurthy, Lisa M. Marvel, “Off-Path TCP Exploits: Global Rate Limit Considered Dangerous”, 25th **USENIX Security Symposium**, Austin, Texas, USA, 2016
6. Yue Cao, **Zhongjie Wang**, Zhiyun Qian, Chengyu Song, Srikanth Krishnamurthy, Paul Yu, “Principled Unearthing of TCP Side Channel Vulnerabilities”, **ACM CCS 2019**, London, UK, 2019
7. Pengxiong Zhu, Keyu Man, **Zhongjie Wang**, Zhiyun Qian, Roya Ensafi, J. Alex Halderman, Haixin Duan, “Characterizing Transnational Internet Performance and the Great Bottleneck of China”, **SIGMETRICS’20**, Boston, Massachusetts, USA, 2020
8. Shitong Zhu, Umar Iqbal, **Zhongjie Wang**, Zhiyun Qian, Zubair Shafiq, Weiteng Chen, “ShadowBlock: A Lightweight and Stealthy Adblocking Browser”, The Web Conference (formerly **WWW** conference), San Francisco, USA, 2019
9. Shitong Zhu, Shasha Li, **Zhongjie Wang**, Xun Chen, Zhiyun Qian, Srikanth V. Krishnamurthy, Kevin S. Chan, Ananthram Swami, “You Do (Not) Belong Here: Detecting DPI Evasion Attacks with Context Learning”, The 16th International Conference on emerging Networking EXperiments and Technologies (**CoNEXT’20**), Barcelona, Spain, 2020

SELECTED PROJECTS

July 2015 – now, **Eluding Network Intrusion Detection Systems and Censorship Systems**

- Studying evasion techniques against network intrusion detection systems and censorship systems
- Automatically discovering and generating TCP-level evasion strategies
- Developed a practical tool INTANG running on client-side only to evade NIDS with high success rate
- Papers published in IMC 2017, NDSS 2020

Sept 2015 – May 2019, **TCP Challenge ACK Side-channel Vulnerability**

- Participated in designing and implementing the proof-of-concept attack
- Evaluated the Challenge ACK Vulnerability (CVE-2016-5696) against Alexa top 1m websites, Tor

relays, and other Internet servers

- Designed and implemented a large-scale network scanner to measure the vulnerability status of Alexa Top 1M websites on a daily basis for 3 months, and analyzed the data collected
- Papers published in USENIX Security 2016, SIGMETRICS 2017, CCS 2019

Mar 2010 – Mar 2012, Peer-to-Peer Streaming Media Live/VOD System

- Devised and implemented algorithms for peer selection and data caching strategy, which enabled the system to bear 3000+ concurrent users with low latency
- Developed the front-end video player using DirectShow
- Developed log collection module for QoE (Quality of Experience) analysis

Apr 2011 – Oct 2011, Open Monitor – Global Internet Connectivity Monitoring System

Google Summer of Code 2011 Project, with the Umit Project open source community

- Proposed a hybrid P2P structure to maintain the web of agent nodes spread all over the world, which are used to collect and report Internet connectivity status in different regions
- Developed the cross-platform agent node with Python. The node is separated into a back-end service and a front-end GUI, and supports various platforms such as Windows, Linux, and Mac OS
- Wrote several technical specifications

Mar 2010 – Oct 2010, TraceExploit – Vulnerability Exploitation Analysis and Replay

Google Summer of Code 2010 Project, with The HoneyNet Project open source community

- Designed and implemented a template-based penetration attack replaying tool as part of a POC (Proof of Concept) of vulnerability exploitation auto-replay
- Cooperated with a Singaporean student and wrote several technical documents published on the community website

AWARDS AND HONORS

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| Morgan Stanley Code Storm , Advanced to Final (top 30 in China) | 2011 |
| Google Summer of Code , Selected Student Contract Developer | 2010 & 2011 |
| Tencent Campus Star Development Competition , Winning Prize | 2010 |
| Microsoft Research Asia “Stars of Tomorrow” , Award of Excellence | 2009 |
| Microsoft Imagine Cup , Second Place Worldwide in Embedded Development | 2008 |
| Beijing Univ. of Posts and Telecom. Sci-Tech Innovation Award , First Prize | 2007 & 2008 |
| National Undergraduate Electronic Design Contest , Second Prize of Beijing Region | 2007 |

TECHNICAL SKILLS

Language Fluent English, Native Mandarin

Programming C/C++, Python, SQL, Java, Javascript, HTML5, Matlab, Assembly, Lua

REFERENCE

Dr. Zhiyun Qian

Associate Professor

Computer Science and Engineering

University of California, Riverside

Email: zhiyunq@cs.ucr.edu

Dr. Srikanth V. Krishnamurthy

Professor

Computer Science and Engineering

University of California, Riverside

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