

Mohammad Rezaeirad

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RESEARCH INTEREST

I am interested and working in the fields of Cyber (and Cyber-Physical) Security. I particularly enjoy developing measurement strategies and tools to evaluate the defense capacity of existing systems. To this end, Cyber Threat Intelligence, Reverse Engineering, and Vulnerability Analysis are my main concentrations. The fundamental topics that I have worked on and, influenced my research interests are: System Security, Network Security, and Modern Cryptography.

EDUCATION

Ph.D., Information Security and Assurance

George Mason University, USA, (August 2013-Current).

Advisors: Dr. Damon McCoy & Dr. Arun Sood.

Master of Science, Computer Engineering (GPA: 4.00)

University of Louisiana at Lafayette, USA, (Dec 2012).

Thesis: A Novel Clustering Paradigm for Pre-distribution Key Management for Mobile Homogeneous Wireless Sensor Networks

Advisors: Dr. Magdy Bayoumi & Dr. Dmitri Perkins.

Bachelor of Information Technology (Honours), Security Technology (GPA: 3.28)

Multimedia University, Malaysia, (Jan 2010).

Thesis: An Analysis & Design of An Identity Based Encryption Scheme.

Advisor: Dr. Heng Swee-Huay.

PROJECT

RAT Protocols Study: (2016-Current)

Description & Goals: This project studies the various RAT protocols, and ultimately proposes methods: to study scanning/sinkholing operations, to monitor the RAT operators' C&C.

My Contributions: Protocol reverse engineering, RAT protocol emulator (sinkhole) development, Threat intelligence analysis.

RAT Operators Behavioral Study: (2015-16)

Description & Goals: This project aimed to shed a light on DarkComet RAT operators from the behavioral perspective. This includes, operator life cycle and motivation when engaged with a victim machine.

My Contributions: RAT protocol reverse engineering, Developing network decoder and network signature, Developing behavioral signature, Developing unpacker and RAT configuration extractor, Honeypot development

Security Assessment of In-Vehicle Infotainment (IVI) System: (2013-15)

Description & Goals: The goals of this project was to perform a comprehensive security analysis on an IVI system that is included in at least one 2015 model vehicle from a major automotive manufacturer.

My Contributions: Hardware reverse engineering, Firmware extraction and analysis, Vulnerability analysis, Exploit development, Protocol emulation.

PUBLICATION

To Catch a Ratter: Monitoring the Behavior of Amateur DarkComet RAT Operators in the Wild

Brown Farinholt, **Mohammad Rezaeirad**, Paul Pearce, Hitesh Dharamdasani, Haikuo Yin, Stevens LeBlond, Damon McCoy, Kirill Levchenko, IEEE Symposium on Security & Privacy (Oakland 2017)

A Security Analysis of an In-Vehicle Infotainment and App Platform

Sahar Mazloom, **Mohammad Rezaeirad**, Aaron Hunter, Damon McCoy. 10th USENIX Workshop on Offensive Technologies (WOOT 16), Austin, TX., August 2016
(Co-first authors)

A novel clustering paradigm for key pre-distribution: Toward a better security in homogenous WSNs

Mohammad Rezaeirad, Mahdi Orooji, Sahar Mazloom, Dmitri Perkins and Magdy Bayoumi. IEEE Consumer Communications & Networking Conference (CCNC 13), San Fransisco, CA., January 2013

COMPUTER SKILL

Reverse Engineering and Penetration Testing: IDA-PRO, OllyDbg, Cuckoo(-modified), Zer0m0n, Malheur, Volatility, FTK, Autopsy, Scalpel, Binwalk, WinDbg, Bochs, OpenOCD, Magic16, Rec Studio, Dependency Walker, Bus Pirate, JTAGulator, Wireshark, Nmap, Scapy.

Data Platform: Virus Total Intelligence, Emerging Threat (proofpoint-IQRisk), Farsight, Passive Total (RISKIQ), Malshare.

Internet Technology: VMware (vSphere and vCenter), OPNsense, Iptables, Suricata, Squid, Bro, Amazon-AWS, Cloudra, KVM, Xen, Subversion, Git, PostgreSQL, Redis.

Simulation: MATLAB, QualNet, NetSim, ns2, Magic 8.5, Hspice.

Computer Programming: Assembly (MIPS, x86), C/C++ , Python, SQL

Operating Systems: Linux, macOS.

Work Place: Latex, Adobe, Office.

SELECTED COURSE

Research in Digital Forensics, Forensic Artifact Extraction, Malware Reverse-engineering, Operating System Security, Cryptographic Engineering, Secure Software Design, Cloud Computing, Wireless Computing and Computer Networks, Network Protocols Security, Information Theory, Linux Kernel Programming, Data Communications & Networking, Applied Cryptography, Computer Security, Network Security & Management, Database Security, Ethical Hacking & Security Assessment, Password Authentication & Biometrics, System Analysis & Design, Computer Networks, Web Based Computing, Client Server Computing, Digital Watermarking, Operating systems, VLSI Design,

Advanced Topics in Computer Architecture, Principle of Computer Architecture.

RESEARCH AFFILIATION & COLLOBURATION

Affiliated Researcher, *International Cyber Center (ICC)*, (2016-Current)

Visiting Researcher, *New York University*, (Summer 2016)

Collaborator and Researcher, *Intelligence Operations, DeepSight at Symantec Corporation*, (2014-16)

Research Assistant and Member, *Security Lab at George Mason University*, (2013-Current)

Research Assistant and Member, *Wisper Lab at University of Louisiana at Lafayette*, (2011-13)

PROFESSIONAL EXPERIENCE

Network System Administrator and Security Navigator at The Center of Advanced Computer Studies (CACCS), University of Louisiana at Lafayette (ULL), USA, (2010-12).

Network Engineer at Trans-innovation Sdn Bhd, Malaysia, (2009-10).

TEACHING

ISA 562: Information Security Theory and Practice, TA, (Spring 2017)

CS 469: Security Engineering, TA, (Fall 2016)

CS 262: Introduction to Low-level Programming, Lab Instructor, (Spring 2014 - Fall 2016)

AWARD & MEMBERSHIP

Awarded with Research Scholarship, NYU, (Summer 2016).

Awarded with Fellowship, General Motors, (2013-2015).

Achieved the second place in 15th annual paper contest at ULL, (April 2012).

Awarded with Certificate of Achievement for Academic Excellence, Honors Convocation, (April 2012).

Awarded with Certificate of Honor Society of Phi Kappa Phi University of Louisiana at Lafayette Chapter, (March 2012).

Member of IEEE-CS at University of Louisiana at Lafayette Student Chapter, (August 2010-Current).

Bachelor Thesis Award Premier Research Project in faculty of Information Science & Technology, MMU, Malaysia, (2009).

Awarded with the YAYASAN TM Scholarship, (2006-09).

Professional Network

Linkedin.com  - Professional profile and links.

github.com  - Repositories and project contributions.