CHU HUANG

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EDUCATION

The Pennsylvania State University, University Park, PA 2011.05 –2015.12

- Ph.D. student of Information Sciences and Technology

The Pennsylvania State University, University Park, PA 2009.08 – 2011.05

- M.S. in Information Sciences and Technology

Huazhong University of Science and Technology, Wuhan, China 2005.09 – 2009.07

- B.E. in Computer Science and Technology

SKILLS

Programming Languages: Java, C, C++, x86 Assembly
Operating Systems: Linux, Windows, Android
Cloud Computing: MapReduce, Hadoop
Communications Protocols: TCP/UDP, HTTP, FTP, SSL
Web development: HTML, CSS, and JavaScript
Databases: MySQL, MS Access and Oracle
Penetration testing tools: Wireshark, Nessus, Nmap, Metasploit, Snort

RESEARCH EXPERIENCE

Android Project on Children Mobile Protection 2014.06 – 2015.05

- Involved in the designing and developing of an Android client application that enable parents to monitor child's smartphone.

Ant Colony Optimization-based Software Assignment 2014.06 – 2015.05

- Proposed an ant colony optimization (ACO) based algorithm to find Pareto solutions for the multi-objective software assignment problem.
- Simulated ant agents with route planning capabilities based on both heuristic information and pheromone-mediated communication.
- Implemented the proposed algorithm in C++ and experimented it on various types of simulated networks.

Maximal Network Survivability with Adaptive Software Diversity 2011.06 – 2014.06

- Explored software diversity as a viable security strategy against worm infections in networked environments.
- Designed and implemented software assignment algorithms based on graph coloring.
- Examined the performance of algorithms under different network structures through simulations and evaluated the tradeoffs between software diversity and the resulting tolerance to attacks.

Watermarking-based Computation Assurance Framework for MapReduce 2010.08 – 2011.05

- Designed a watermarking-based framework which guarantees secure multi-party computations with MapReduce.
- Introduced a novel verifier embedding method with the usage of a set of check blocks, which enables the detection of data tampering or deletion
- Implemented the prototype on Hadoop.

Risk Assessment on Grey Relational Projection in Ad Hoc Networks 2009.02 – 2009.06

- Introduced the vulnerability of the ad hoc networks and problems exist in the traditional risk assessment methods.
- Proposed a novel risk assessment method for mobile ad hoc networks based on grey theory, using performance and reliability indicators identified.

Source Tracing and Pursuing of Network Virus 2008.09 – 2009.05

- Utilized packet sniffer software to capture traces of packets.
- Designed and implemented a classifier in C++, which categorized captured packets into different classes upon user's requests.
- Analyzed the virus propagation patterns and constructed a propagation model based on the analytical results.

Intrusion Prevention in Virtual Machine Environment 2008.07 – 2008.09

- Conducted in-depth research on the distributed system and intrusion detection system.
- Participating in designing intrusion prevention system in the virtualization-based cloud computing environment.
- Implemented the mechanism on an open-source virtual machine monitor platform – Xen.

PUBLICATIONS

Chu Huang, Sencun Zhu, Quanlong Guan, "Ant Colony Optimization-based Algorithm for Software Assignment Problem", in progress Huang, C., Zhu, S., & Guan, Q., Multi-objective Software Assignment for Active Cyber Defense. In *Proceedings of IEEE Conference on Communications and Network Security*, Florence, Italy, September 28-30, 2015.

Chu Huang, Sencun Zhu, and Robert Erbacher, "Toward Software Diversity in Heterogeneous Networked Systems", In *Data and Applications Security and Privacy XXVIII*, pp. 114-129. Springer Berlin Heidelberg, 2014

Chu Huang, Sencun Zhu, "An Approach to Achieve Software Diversity for Network Survivability," National Symposium on Moving Target Research, Annapolis, June 10-13, 2012

Chu Huang, Sencun Zhu, and Dinghao Wu, "Towards Trusted Services: Result Verification Schemes for MapReduce," In Proceedings of the 12th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGrid 2012), May 13–16, 2012, Ottawa, Canada.

Cai Fu, **Chu Huang**, Yunhe Zhang, LanSheng Han, Bing Peng, "A Risk Assessment Method Based on Grey Relational Projection in Ad Hoc Networks," mines, vol. 1, pp.370-373, 2009 International Conference on Multimedia Information Networking and Security, 2009