

George R. Louthan IV

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Education

- **University of Tulsa** Tulsa, OK
M.S., Computer Science (expected) *May, 2011*
 - Federal Information Assurance Certifications CNSS 4013-4016 (expected)
- **University of Tulsa** Tulsa, OK
B.S., Computer Science; B.S. Mathematics *May, 2009*
 - Federal Information Assurance Certifications CNSS 4011-4012

Federal Information Assurance Certifications

CNSS-4011 National Training Standard for Information Systems Security Professionals

CNSS-4012 National Information Assurance Training Standard for Senior Systems Managers

CNSS-4015 National Training Standard for Systems Certifiers

Employment History

- **Institute for Information Security, TU** Tulsa, OK
Research Assistant *May 2009 - Present*
 - See Projects section for details
- **University of Tulsa** Tulsa, OK
Teaching Assistant *Spring 2010*
 - Assisting students in learning Java
 - Teaching a sophomore-level programming lab
- **Vidloop** Tulsa, OK
Research and Technical Writing Intern *- March 2009*
 - Developed technical documentation for an authentication security product, conducted a NIST 800-63 compliance study
 - Traveled to provide technical expertise at trade shows
 - Performed vulnerability assessments and delivered recommendations for mitigation

Courses Taught

- **Fundamentals of Algorithm and Computer Applications Lab** Tulsa, OK
University of Tulsa *Spring 2010*
 - Weekly sophomore-level lab section for assisting students with weekly assignments
 - Topics include basic data structures, sorting, searching, and basic analysis of algorithms

Projects

- **Cyber-physical Systems** Tulsa, OK
Institute for Information Security, TU *January 2010 - Present*
 - Leading a formal methods research group for networked hybrid systems (i.e. systems with discrete and continuous components)

- Building a formal framework for modeling and analyzing networked process control systems
- **Deployment Plan** Tulsa, OK
University of Tulsa *Spring 2010*
 - Wrote and compiled a complete deployment plan for a generic enterprise computing system.
 - Included hardware and software deployment procedures and checklists, maintenance, as well as business IT policies (e.g. backup/restore, acceptable use, remote access, password, etc.)
- **Intrusion Detection System** Tulsa, OK
University of Tulsa *Spring 2010*
 - Developing a Snort rule compatible network intrusion detection system in Java
 - Includes packet sniffing and parsing as well as generation, running directly on libpcap
- **CogTogs Risk Assessment** Tulsa, OK
University of Tulsa *Spring 2010*
 - Participating in a NIST SP 800-30 risk assessment for a social network company
- **SAND/DVNE** Tulsa, OK
Enterprise Security Group, TU *Summer 2007 - Present*
 - Led a network monitoring research group
 - Led the project's deployment at FAA Computer Security Incident Response Center
 - Developing large-screen multi-touch network visualization system
- **Disastro** Tulsa, OK
University of Tulsa *Spring 2009*
 - Functioned as technical lead and developer for a citizen-facing relief management system for disaster response
 - Integrated systems for voice phone (IVR), and web services for aggregation and dissemination of urgent relief information in disaster situations
- **Lunchman** Tulsa, OK
University of Tulsa *Fall 2006 - Spring 2007*
 - Technical team member for a prototype web application for restaurant search and selection
 - Received runner-up award in the Donald W. Reynolds Governor's Cup business plan competition for 2007
- **NOVA** Tulsa, OK
Enterprise Security Group, TU *Spring 2006*
 - Participated in development of a major network analysis project written in Java
 - Assisted deployment at FAA Computer Security Incident Response Center

Selected Coursework

- **Network Security** Tulsa, OK
University of Tulsa *Spring 2010*
 - Topics included host-based and network-based intrusion detection, anomaly and misuse detection, and appliances including firewalls
 - Semester-long project to build a Snort-compatible network intrusion detection system
- **Secure System Administration** Tulsa, OK
University of Tulsa *Spring 2010*
 - Topics included provisioning, procurement and installation of network, hardware and software systems, as well as incident handling.

- Emphasis on specific policy and procedure development (acceptable use, password, backup and restore, data redundancy, patch management, etc)
- Semester-long project to develop a complete deployment plan for an enterprise computing system
- **Risk Management for Information Systems** Tulsa, OK
University of Tulsa *Spring 2010*
 - Risk analysis and threat profiling for mission critical information systems. Adversarial analysis and countermeasure synthesis. Policy development and implementation. Incident handling and response.
- **Computational Neuroscience** Tulsa, OK
University of Tulsa *Fall 2009*
 - Fundamentals of neurobiology and neurochemistry for the central nervous system and neuromuscular junction.
 - Neurological modeling techniques including circuit-equivalent model, integrate and fire, leaky integrator, and artificial neural networks.
- **Information Systems Assurance** Tulsa, OK
University of Tulsa *Fall 2009*
 - Included design and analysis methods for high assurance information systems, formal models such as Biba and Bell-LaPadula.
 - Emphasis on security controls documents, specifically DIACAP (DoD Instruction 8510.01) and NIST SP 800-53
 - Built from scratch a set theoretic formal model for contingency planning
- **Machine Learning** Tulsa, OK
University of Tulsa *Fall 2009*
 - Survey of machine learning topics, including decision trees and ID3, genetic algorithms, artificial neural networks with backpropagation, reinforcement learning, unsupervised learning, and game theory
- **Senior Software Projects** Tulsa, OK
University of Tulsa *Fall 2008 - Spring 2009*
 - Two-course sequence in software engineering, focusing on the Rational Unified Process, including formal and semi-formal methods of specification and design
 - First semester included several non-trivial small group software projects including documentation
 - Second semester included a semester-long major group project (See Disastro in Projects section above)
- **Compiler Construction** Tulsa, OK
University of Tulsa *Fall 2008*
 - Studied languages, grammars, syntax-directed translation, finite automata, and other fundamentals of language syntax and semantics
 - Built the frontend of a PASCAL compiler
- **Operating Systems** Tulsa, OK
University of Tulsa *Spring 2008*
 - Studied OS principles including process synchronization, threading, scheduling, memory and virtual memory management, and paging
 - Implemented synchronization primitives, user processes, and scheduling in the NACHOS operating system

- **Artificial Intelligence** Tulsa, OK
University of Tulsa *Spring 2008*
 - Introduced to fundamentals of AI, including agents and environments, search techniques, rule-based reasoning, logic, game-playing, and planning
 - Completed numerous projects in Common Lisp, including CLOS, and with the CLIPS expert system language
- **Numerical Methods for IVP/BVPs** Tulsa, OK
University of Tulsa *Spring 2008*
 - Studied finite element and finite difference methods for elliptic, parabolic, and hyperbolic partial differential equations
 - Developed numerical solutions to problems using the Mathematica software and language
- **Computer Animation** Tulsa, OK
University of Tulsa *Spring 2008*
 - Introduced to techniques of 3D modeling and animation in a lab setting
- **Computer Networks** Tulsa, OK
University of Tulsa *Fall 2007*
 - Included TCP/IP, the OSI model, encoding, framing, error detection, reliable transmission, and other computer network principles
 - Completed projects including implementing reliable delivery through sliding-window protocol over UDP, and HTTP server
- **Enterprise Security Management** Tulsa, OK
University of Tulsa *Spring 2007*
 - Studied the managerial aspects of computer security; included development and maintenance of policies and procedures, regulatory compliance, risk management, and disaster planning and recovery
 - Participated in tabletop exercises in risk management and development of specific policies and procedures
 - Significant work with NIST SP 800-63 and ISO-17799 documents
- **Computer Security** Tulsa, OK
University of Tulsa *Spring 2006*
 - Basic introduction to cryptography, various secure protocols, best practices, network security, and legal and ethical issues in computer security
 - Developed several non-trivial secure software systems, including oblivious transfer; key exchange and management and secure file transfer; and PKI with RSA and X.509 certificates
- **Computer Forensics** Tulsa, OK
University of Tulsa *Spring 2006*
 - Topics included incident response and recovery, identification and extraction of electronic evidence, and forensic tools
 - Projects included email tracing, interviewing witnesses, evidence collection, live volatile data collection, network traffic analysis, imaging drives, file restoration, and investigating web attacks

Awards and Honors

General Co-Chair, TU Student Research Colloquium	2010
Chair, Computer Security Special Topic Symposium, TU Student Research Colloquium	2010
Honorable Mention, Best Presentation, AAAS-SWARM 2009	2009
Tulsa Undergraduate Research Challenge Participant	2006-08
Runner-Up, Donald W. Reynolds Governor's Cup Business Plan Competition	2007
National Merit Scholar	2005-2009
Oklahoma St. Regents for Higher Education Academic Scholar	2005-2009
University of Tulsa Presidential Scholar	2005-2009
Robert C. Byrd Academic Scholar	2005-2009

Publications and Presentations

- *Towards Formal Analysis of Cyber-Physical Systems* TU Colloquium
G Louthan, N Singleton, M Papa, and J Hale March 2010
- *Large-scale Multitouch Interactive Network Visualization* USENIX Security
(Poster) *C Pollet, G Louthan and J Hale* August 2009
- *SAND: An Architecture for Signature-based Automatic Network* USENIX Security
Protocol Detection (Poster) *G Louthan and J Hale* August 2009
- *Hack Like the Movie Stars: A Big-Screen Multitouch Network* DEFCON 17
Monitor *G Louthan, C Pollet, and J Hale* August 2009
- *Content-based Alternatives to Conventional Network* CSIIRW '09
*Monitoring*¹ *G Louthan, B Deetz, M Walker, and J Hale* April 2009
- *Toward Robust and Extensible Network Protocol Identification*¹ ICOMP '09
G Louthan, C McMillan, C Johnson, and J Hale July 2009
- *Communication without Boundaries: Breaching the Great* AAAS-SWARM '09
Firewall of China *G Louthan and J Hale* March 2009

Skill set

Programming Languages Java, Python, Clojure, Common Lisp, BASIC, C/C++, Perl, PHP

Technologies TCP/IP, Computer networking, Shorewall, Mathematica, L^AT_EX, XML, SQL, CLIPS, Maya, Network monitoring

Processes Risk management for information systems (NIST SP 800-30), Information Security Management (ISO/IEC 17799:2005), Information Assurance Controls and Accreditation (NIST SP 800-53 and DoDI 8510.01), Incident response and computer forensics, General policy development, General familiarity with NIST 800 series

Platforms Linux (especially Debian/Ubuntu), Mac OS X, Windows 2000/XP/Vista/7 (Personal and Server versions), OpenWrt/FreeWrt

Mathematics Numerical analysis, Finite difference methods, Finite element analysis, Real analysis, Discrete mathematics, Modern algebra, Finite state automata, Hybrid automata, Process calculi, Analysis of algorithms

¹Denotes a peer-reviewed publication

Interests

Academic Computer security, Network monitoring and analysis, Network protocols, Free software, Distributed social networking