George R. Louthan IV

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Education

- **University of Tulsa** — Tulsa, OK
  M.S., Computer Science (expected) — *May, 2011*
- **University of Tulsa** — Tulsa, OK
  B.S., Computer Science; B.S. Mathematics — *May, 2009*

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*
  - Student lead for a formal methods research project
  - Overseeing the deployment and upkeep of the Institute's computer systems
- **University of Tulsa** — Tulsa, OK
  Teaching Assistant — *Spring 2010*
  - Assisting students in learning Java
  - Teaching a sophomore-level programming lab
- **Vidoop** — Tulsa, OK
  Research and Technical Writing Intern — *May 2007 - Mar 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 — *Jan 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 Responce 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 backpropogation, 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, *March 2010*
  G Louthan, N Singleton, M Papa, and J Hale
- ***Large-scale Multitouch Interactive Network Visualization*** **(Poster)** — USENIX Security, *August 2009*
  C Pollet, G Louthan and J Hale
- ***SAND: An Architecture for Signature-based Automatic Network Protocol Detection*** **(Poster)** — USENIX Security, *August 2009*
  G Louthan and J Hale
- ***Hack Like the Movie Stars: A Big-Screen Multitouch Network Monitor*** — DEFCON 17, *August 2009*
  G Louthan, C Pollet, and J Hale
- ***Content-based Alternatives to Conventional Network Monitoring***[1] — CSIIRW '09, *April 2009*
  G Louthan, B Deetz, M Walker, and J Hale
- ***Toward Robust and Extensible Network Protocol Identification***[1] — ICOMP '09, *July 2009*
  G Louthan, C McMillan, C Johnson, and J Hale
- ***Communication without Boundaries: Breaching the Great Firewall of China*** — AAAS-SWARM '09, *March 2009*
  G Louthan and J Hale

Skill set

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

Technologies TCP/IP, Computer networking, Shorewall, Mathematica, LaTeX, 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

[1] Denotes a peer-reviewed publication