

George R. Louthan IV

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Education

- **University of Tulsa** Tulsa, OK
M.S. Computer Science May 2011
Thesis: A Formal Approach to Cyber-Physical Event Reconstruction With Hybrid Automata (expected)
B.S. Computer Science May 2009
B.S. Mathematics May 2009

Certifications

- **CNSS National Information Assurance Training Standards** Tulsa, OK
CNSS 4011-4016, Issued by the University of Tulsa 2006 - 2011

Employment History

- **University of Tulsa** Tulsa, OK
Small research university with a prestigious information security program and extensive research operations under its Institute for Information Security, an NSA/CSS Center of Excellence in information assurance.
Graduate Research Assistant May 2009 - Present
Part of TU's Institute for Information Security's security engineering research initiative. Serving as the student lead for a formal methods research project. Collaborating with researchers in cyber security training, information visualization, and critical infrastructure protection initiatives. Peer-reviewed publications in cyber security education, network intelligence, and secure collaboration.
Led the development and deployment of the Institute's IT infrastructure and supervising its upkeep (approximately 40 workstations and 5 servers).
Graduate Teaching Assistant Jan 2010 - May 2010
Taught a sophomore-level programming lab in the Java language. Developed supplementary course materials on code style, algorithms, documentation, and best practices.
Undergraduate Research Scientist May 2006 - May 2009
Undergraduate researcher in the Enterprise Security Group. Worked in enterprise security management, threat modeling, network intelligence, and information visualization. Peer-reviewed publications in network intelligence.

- **IV Consulting, Inc.** Tulsa, OK

Side venture between myself and a TU colleague as a custom software contractor, working in database and web services.

Co-owner/Developer Jul 2010 - Present

Co-founder of the company as well as web and database developer in Python's Django framework. Developing two production systems for patient management and subject tracking for a psychiatric hospital and brain research institution. Responsible for back-end web development, project management, client relations, and documentation.

- **Vidoop** Tulsa, OK

Technology start-up company that produced a web-based multi-factor authentication product and advertising platform.

Security Research Intern May 2008 - Sep 2008

Performed a vulnerability assessment on the user-facing portions of the company's authentication product. Developed proof-of-concept code for several attacks, including bypassing the product's CAPTCHA properties using computer vision. Delivered a comprehensive report and developed proof-of-concept mitigation strategies.

Technical Writing Intern May 2007 - Mar 2009

Served as a copy writer and editor for technical documentation, specifications, white papers, user documentation, and marketing materials. Developed, recorded, and narrated a series of educational videos for Vidoop's products as well as OpenID. Primary author on the corporate blog. Worked closely both with developers and business personnel. Staffed the company's exhibit at the IT Security World trade show.

Projects

- **GSM Scale** Tulsa, OK

Project for the wireless collection and remote analysis of patients' weights as automatically recorded by a cellular-enabled scale. Collaboration with Alexander Barclay (Laureate Institute for Brain Research) and Kevin Hall (National Institute of Diabetes and Digestive and Kidney Diseases).

Personal (Collaborator: NIH) Jul 2010 - Present

Designing and developing the scale client hardware and software, as well as participating in the specification of reporting protocols and web service API.

- **Neuroimaging Research Database System** Tulsa, OK

End-to-end management solution for neuroimaging research project including subject tracking and medical charting, lab and assessment result management, billing, and auditing.

IV Consulting (Client: Laureate Institute for Brain Research) Sep 2010 - Present

Managing and supervising development. Specific personal responsibilities include documentation, project management, client interaction, and development of the auditing, report generation, and cost tracking/billing subsystems.

- Laureate Psychiatric Clinic and Hospital Electronic Intake System** Tulsa, OK
 Electronic, web-based version of LPCH's legacy pen-and-paper intake system. Manages the creation of new patients, basic demographic information, personal inventory, and other data collection. Generates daily new patient reports for medical charts.
IV Consulting (Client: LPCH) Sep 2010 - Nov 2010
 Supervised development of the entire system; responsible for development of report generation and clinical staff views for patient tracking. Managed documentation and client interactions.
- SAND/DVNE** Tulsa, OK
 Network monitoring and visualization tool for the passive identification of network protocols using signatures.
Enterprise Security Group, University of Tulsa May 2007 - Present
 Led a network monitoring research group; contributed to the original design and executed subsequent reimplementation of the protocol identification library (SAND). Oversaw the project's successful test deployment at FAA Computer Security Incident Response Center. Co-developed a large-screen multi-touch network traffic visualization tool (DVNE). Contributing to future work by actively maintaining the library.
- Disastro** Tulsa, OK
 Citizen-facing relief management system for disaster response; includes web service and IVR (phone) data collection and reporting capabilities. Senior semester capstone project from Senior Software course.
Senior Software, University of Tulsa Jan 2009 - May 2009
 Served as project lead and IVR developer. Responsibilities focused upon design, architecture, specification, documentation, developer coordination, and project management.

Academics

Instructor Information Security: Assurance and Risk Assessment (short course – taught applied portions), Fundamentals of Algorithms and Computer Applications Lab

Teaching Assistant Fundamentals of Algorithms and Computer Applications Lecture

Information Assurance Coursework Network Security, Secure System Administration, Risk Management for Information Systems, Information Systems Assurance, Enterprise Security Management, Computer Security, Computer Forensics, Applied Cyber Defense (independent study)

Computer Science Coursework Mobile Device Application Development, Computational Neuroscience, Machine Learning, Senior Software Projects, Compiler Construction, Operating Systems, Artificial Intelligence, Computer Animation, Computer Networks, Computer Network Analysis (independent study)

Mathematics Coursework Numerical Methods, Numerical Methods for IVP/BVP PDEs, Modern Algebra, Real Analysis, Linear Algebra, Mathematics Seminar (a survey of unusual problems)

Sample Class Projects Snort rule compatible IDS, Comprehensive IT system deployment plan, Top-down corporate risk assessment, Formal model for contingency planning, Reinforcement learner for Infinite Mario game, Front-end of a Pascal compiler, Simple web server

Conferences

- **USENIX Security Symposium** – Participant (2009 - 2010)
 Workshop: Cyber Security Experimentation and Test – Speaker (2010)
 Event: Poster Session – Presenter (2009)
- **Blackhat USA** – Participant (2010)
- **DEFCON** – Human (2008, 2010), Speaker (2009)
- **University of Tulsa Student Research Colloquium** – General Co-Chair (2010), Speaker and Session Chair (2009)
 Special Topic Symposium: Cyber Security and Critical Infrastructure – Speaker and Symposium Chair (2010)
- **International Conference on Internet Computing (ICOMP) at WORLDCOMP** – Speaker (2009)
- **Computer Security and Information Intelligence Research Workshop (CSIIRW)** – Speaker (2009)
- **International Conference for High Performance Computing, Networking, Storage and Analysis (SC)** – Participant (2008)
- **IT Security World** – Exhibitor (2008)

Publications and Presentations

- “The Blunderdome: An Offensive Exercise for Building Network, Systems, and Web Security Awareness”¹. Paper at CSET 2010 at 19th USENIX Security Symposium, September 2010. G Louthan, W Roberts, M Butler, and J Hale.
- “Toward Sensitive Information Redaction in a Collaborative, Multilevel Security Environment”¹. Paper at WikiSym 2010, July 2010. P Gehres, N Singleton, G Louthan, and J Hale.
- “Towards Formal Analysis of Cyber-Physical Systems”. Presentation at the Cyber Security and Critical Infrastructure Symposium at the 2010 TU Student Research Colloquium, March 2010. G Louthan, N Singleton, M Papa, and J Hale.
- “Large-scale Multitouch Interactive Network Visualization”. Poster at the 18th USENIX Security Symposium, August 2009. C Pollet, G Louthan and J Hale.
- “SAND: An Architecture for Signature-based Automatic Network Protocol Detection”. Poster at the 18th USENIX Security Symposium, August 2009. G Louthan and J Hale.
- “Hack Like the Movie Stars: A Big-Screen Multitouch Network Monitor”. Presentation at DEFCON 17, August 2009. G Louthan, C Pollet, and J Hale.
- “Toward Robust and Extensible Network Protocol Identification”¹. Paper at ICOMP '09, July 2009. G Louthan, C McMillan, C Johnson, and J Hale.
- “Content-based Alternatives to Conventional Network Monitoring”¹. Paper at CSIIRW '09, April 2009. G Louthan, B Deetz, M Walker, and J Hale.

¹Denotes a peer-reviewed publication

- “Communication without Boundaries: Breaching the Great Firewall of China”. Presentation at the 2009 TU Student Research Symposium and 84th Regional Meeting of AAAS-SWARM, March 2009. G Louthan and J Hale. (Honorable Mention for Best Presentation)

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
Runner-Up, Donald W. Reynolds Governor’s Cup Business Plan Competition	2007

Skill set

Languages Python; Java; Lisp (Clojure and Common Lisp); L^AT_EX; Mathematica; some Ruby, Perl, PHP, and Objective C

Platforms Linux (especially Debian/Ubuntu, also OpenWRT/FreeWRT); Windows (modern workstation and server versions); VMWare ESXi (3 and 4); Mac OS X

Technologies Computer networking (TCP/IP); Virtualization; Firewalls (iptables and Shorewall, some pf and Cisco); Django; Version control (Subversion and Mercurial); Network monitoring and IDS; Android OS; iOS; Application security; Forensics; PKI.

Processes Risk management for information systems (NIST SP 800-30), including some familiarity with IT aspects of Sarbanes-Oxley risk assessment (PCAOB Auditing Standard 5); 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

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