

Travis Atkison

Director, Digital Forensics and Control Systems Security Lab
Assistant Professor Computer Science
University of Alabama

Education

2009: Ph.D., Computer Science, Mississippi State University, Starkville, MS

1997, M.S., Computer Science, University of Alabama, Tuscaloosa, AL

1995, B.S., Electrical Engineering, University of Alabama, Tuscaloosa, AL

1995, B.S., Computer Science, University of Alabama, Tuscaloosa, AL

Academic Experience

2015–present: Assistant Professor, Computer Science, University of Alabama, Tuscaloosa, AL.

2013–2015: Program Chair, Cyber Engineering, Louisiana Tech University, Ruston, LA.

2010–2013: Graduate Faculty, Computer Science, University of Alabama, Tuscaloosa, AL.

2009–2015: Assistant Professor, Computer Science, Louisiana Tech University, Ruston, LA.

2007–2009: Lecturer, Computer Science and Engineering, Mississippi State University, Starkville, MS.

2005–2009: Graduate Research Assistant, Computer Science and Engineering, Mississippi State University, Starkville, MS.

1998–1998: Researcher/Developer, Computer Science, University of Alabama, Tuscaloosa, AL.

1996–1997: Graduate Research Assistant, Computer Science, University of Alabama, Tuscaloosa, AL.

1993–1995: Undergraduate Research Assistant, Computer Science, University of Alabama, Tuscaloosa, AL.

Industrial/Private Enterprise Experience

1998–2005: Computer Systems Researcher/Computer Scientist, National Security Agency, Fort George G. Meade, MD.

Honors/Awards

Best paper award at *The 9th Cyber and Information Security Research Conference*, ORNL, Oak Ridge, TN, April 2014.

Upsilon Pi Epsilon, National Honor Society for Computer Science

Recipient of the James Worth Bagley Ph.D. Fellowship

Recipient of the Joseph Barrier Graduate Fellowship

Phi Kappa Phi, National Honor Society

University of Alabama's Engineering Science and Mechanics Role of Honor

Scholarship

Articles in peer-reviewed journals

B. Chen, H. Le, T. Atkison, and D. Che, "A Wineinformatics Study for White-box Classification Algorithms to Understand and Evaluate Wine Judges," *Transactions on Machine Learning and Data Mining*, 2016. (Accepted)

S. Ponomarev, and T. Atkison, "Feature Extraction Optimization for Network Intrusion Detection in Control System Networks," *Journal of Information Security and Applications*, 2016. (Submitted)

N. Wallace and T. Atkison, "A Power Grid Incident Identification Based on Physically Derived Cyber-Event Detection," *Journal of Digital Forensics, Security and Law*, 2016. (Submitted)

N. Wallace, and T. Atkison, "On the Detection of Cyber-Events in the Grid Using PCA," *International Journal of Critical Infrastructures*, 2016. (Accepted)

S. Ponomarev, and T. Atkison, "Industrial Control System Network Intrusion Detection by Telemetry Analysis," *IEEE Transactions on Dependable and Secure Computing*, vol. 13, no. 2, 2016, pp. 252-260.

P. Shao, T. Atkison, N. Kraft and R. Smith, "Combining Lexical and Structural Information for Static Bug Localization," *International Journal of Advancements in Computing Technology*, vol. 44, no. 1, 2012, pp. 61-71.

J. Durand, J. Flores, N. Kraft, R. Smith and T. Atkison, "Using Executable Slicing to Improve Rogue Software Detection Algorithms," *International Journal of Secure Software Engineering*, vol. 2, no. 2, 2011, pp. 53-64.

R. J. Vickery, A. Cedilnik, J. P. Martin, Y. Dandass, T. Atkison, R. J. Moorhead, J. Clarke and P. Adams, "Web-based Secure High Performance Remote Visualization," *Journal of Physics: Conference Series 46*, SciDAC 2006, pp 545-549.

Peer-reviewed papers presented at conferences

B. Chen, C. Rhodes, D. Fink, and T. Atkison, "Wineinformatics: Wine Regions Determined by K-Nearest Neighbor," *SWDSI 2017 Annual Conference*, Little Rock, AR, March 2017.

M. Al-Zyouud, T. Atkison, and J. Carver, "An Overview of Emerging Privacy Issues in the Internet of Things," *The 2016 International Symposium on Internet of Things and Internet of Everything (CSCI-ISOT)*, Las Vegas, NV, December 2016.

M. Leeds, and T. Atkison, "Preliminary Results of Applying Machine Learning Algorithms to Android Malware Detection," *The 2016 International Symposium on Mobile Computing, Wireless Networks, and Security (CSCI-ISMC)*, Las Vegas, NV, December 2016.

S. Ponomarev, and T. Atkison, "Session Duration Based Feature Extraction for Network Intrusion Detection in Control System Networks," *The 2016 International Symposium on Mobile Computing, Wireless Networks, and Security (CSCI-ISMC)*, Las Vegas, NV, December 2016.

N. Wallace, S. Semple, and T. Atkison, "Identification of State Parameters for Stealthy Cyber-Events in the Power Grid Using PCA," *IEEE Power and Engineering Society General Meeting*, National Harbor, MD, July 2014.

N. Wallace, S. Ponomarev, and T. Atkison, "Identification of Compromised Power System State Variables," *The 2014 International Conference on Information and Knowledge Engineering (IKE'14)*, Las Vegas, NV, July 2014.

S. Ponomarev, N. Wallace, and T. Atkison, "Fourier Transform as a Feature Extraction for Malware Classification," *The 2014 International Conference on Security and Management (SAM'14)*, Las Vegas, NV, July 2014.

S. Ponomarev, N. Wallace, and T. Atkison, "Detection of SSH Host Spoofing in Control Systems Through Network Telemetry Analysis," *The 9th Cyber and Information Security Research Conference*, ORNL, Oak Ridge, TN, April 2014.

N. Wallace, S. Ponomarev, and T. Atkison, "A Dimensional Transformation Scheme for Power Grid Cyber Event Detection," *The 9th Cyber and Information Security Research Conference*, ORNL, Oak Ridge, TN, April 2014. **Best Paper Award**

- N. Wallace and T. Atkison, "Detecting Cyber-Incidents in the Power Grid Using Principal Component Analysis," *The 3rd Annual Graduate Research Conference College of Engineering and Science*, Louisiana Tech University, October, 2013.
- S. Ponomarev, J. Durand, N. Wallace and T. Atkison, "Evaluation of Random Projection for Malware Classification," *The 7th International Conference on Software Security and Reliability*, Washington, DC, June 2013.
- N. Wallace and T. Atkison, "Observing Industrial Control System Attacks Launched Via Metasploit Framework," *The 51st ACM Southeast Conference*, Savannah, GA, April 2013.
- J. Poore, J. Flores and T. Atkison, "Evolution of Digital Forensics in Virtualization by Using Virtual Machine Introspection," *The 51st ACM Southeast Conference*, Savannah, GA, April 2013.
- S. Semple, S. Ponomarev, J. Durand and T. Atkison, "Applying Static Analysis to High-Dimensional Malicious Application Detection," *The 51st ACM Southeast Conference*, Savannah, GA, April 2013.
- N. Wallace and T. Atkison, "Industrial Control System Security Concerns and Measures," *In Louisiana Scientist*, Grambling, LA, Vol 4, No 1. March, 2013.
- J. Durand and T. Atkison, "Applying Random Projection to the Classification of Malicious Applications using Data Mining Algorithms," *The 50th ACM Southeast Conference*, Tuscaloosa, AL, March 2012.
- J. Flores and T. Atkison, "Evolution of Traditional Digital Forensics in Virtualization," *The 50th ACM Southeast Conference*, Tuscaloosa, AL, March 2012.
- J. Durand and T. Atkison, "Using Randomized Projection Techniques to Aid in Detecting High-Dimensional Malicious Applications," *The 49th ACM Southeast Conference*, Kennesaw, GA, March 2011.
- J. Flores and T. Atkison, "Digital Forensics on a Virtual Machine," *The 49th ACM Southeast Conference*, Kennesaw, GA, March 2011. (Poster)
- M. Gates, U. Dhital, T. Lindsay and T. Atkison, "A Different Approach to Network Security: The Best Defense is a Good Offense," *The 3rd Cyberspace Research Workshop*, Shreveport, LA, November 2010.
- S. Kasimalla, S. Bala, T. Ahmen and T. Atkison, "GSM Security Threats and Countermeasures," *The 3rd Cyberspace Research Workshop*, Shreveport, LA, November 2010.
- H. Nuhait, C. Sakpal and T. Atkison, "Securing a Wireless Network – WPA Attacked and Defended," *The 3rd Cyberspace Research Workshop*, Shreveport, LA, November 2010.

H. May, A. Dhungana, J. Chen and T. Atkison, “Defending Against Cross Site Scripting,” *The 3rd Cyberspace Research Workshop*, Shreveport, LA, November 2010.

T. Atkison, “Aiding Prediction Algorithms in Detecting High-Dimensional Malicious Applications Using a Randomized Prediction Technique,” *The 48th ACM Southeast Conference*, Oxford, MS, April 2010, ACM

B. Malone, T. Atkison, M. Kosa, and F. Hadlock, “Pedagogically Effective Effortless Algorithm Visualization with a PCIL,” *Frontiers in Education 39th Annual Conference*, San Antonio, Texas, October 2009, IEEE.

T. Atkison, “Applying Randomized Projection to Aid Prediction Algorithms in Detecting High-Dimensional Rogue Applications,” *The 47th ACM Southeast Conference*, Clemson, SC, March 2009, ACM.

T. Atkison, “Using an Information Retrieval Technique to Discover Malicious Software,” In *the Proceedings of the 12th World Multi-Conference on Systemics, Cybernetics and Informatics*, Orlando, FL, June 2008, IIIS, pages 284-289.

R Vickery, A Cedilnik, J Martin, Y Dandass, T Atkison, R Moorhead, P Adams and J Clarke, “Web-based High Performance Remote Visualization,” In *the Proceedings of the 17th Annual Department of Defense High Performance Computing Modernization Programs (HPCMP) Users Group Conference*, Pittsburgh, PA, June 2007, IEEE Computer Society.

T. Atkison, K. Pensy, C. Nicholas, D. Ebert, R. Atkison and C. Morris, “Case Study: Visualization and Information Retrieval Techniques for Network Intrusion Detection,” In *Proceedings of the Third IEEE Eurographics Visualization Symposium*, Ascona, Switzerland, May 2001, Springer, pages 283-290.

L. Butler, T. Atkison, and E. Miller, “Comparing CPU Performance Between and Within Processor Families,” *Proceedings of the 25th Annual International Conference on Computer Measurement and Performance (CMG 2000)*, Orlando, FL, December 2000, pages 421430.

Technical Reports

R. Vickery, A. Cedilnik, J. Martin, Y. Dandass, T. Atkison, R. Moorhead, J. Clarke and P. Adams, “Remote Visualization of Large Datasets,” Invited Poster, SciDAC 2006 Conference, Denver, CO, 25-29 June 2006.

R. Vickery, A. Cedilnik, R. Moorhead, Y. Dandass, T. Atkison and J. Martin, “WebVis Secure Communications Model and Preliminary Performance Study,” RMV-KY5-001 Technical Report, 1 December 2005.

T. Atkison, H. Kargupta and C. Nicholas, “Dimensionality Reduction Using a Randomized Projection Algorithm: Preliminary Results,” University of Maryland Baltimore County Technical Report TR-CS-01-11, September 2001.

Invited Talks

6/2016: *Digital Forensics, Analysis and Investigation through Cyber-Based Scenarios*, University of Central Arkansas.

5/2014: *Overview of Cyber Security and Digital Forensics*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

5/2014: *Case Study: Use of Digital Forensics in Credit Card Fraud Case*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

11/2011: *Control System Security*, Cyber Engineering Conference, Shreveport, LA.

3/2010: *Experiences with Applying for and Interviewing for a Faculty Job*, CoES Office for Women in Science and Engineering (OWISE), Louisiana Tech University.

10/2008: *Applying Dimensionality Reduction Techniques to Attack the Malicious Software Detection Problem*, Department of Computer Science Research Colloquium Series, University of Alabama.

Research grants

2016: “Building a Curriculum-Wide Hands-On Learning Experience (WHOLE) in Cyber-Security at the University of Alabama,” NSF, \$500,000; PI, *currently under evaluation*.

2016: “NeTS: Small: VC-VANET: A Sustainable Vehicle-Crowd Based Vehicular Ad Hoc Network Supporting Mobile Cloudlet Computing,” NSF, \$499,199; Co-PI, *currently under evaluation*.

2016: “Texassure Vehicle Insurance Verification,” Texas Department of Insurance, \$14,000,000; Co-PI, *currently under evaluation*.

2016: “Enhancing Application Interoperation to Improve the Quality of Alabama CMV Data,” Alabama Law Enforcement Agency (ALEA), \$246,600; Co-PI, *currently under evaluation*.

2016: “DOR Mobile App & Notice of Sale Proposal for the Missouri University of Science & Technology,” MUST, \$174,080; Co-PI, *currently under evaluation*.

2016: “Insurance Check Proposal for the Alabama Law Enforcement Agency,” Alabama Law Enforcement Agency (ALEA), \$106,456; Co-PI, *currently under evaluation*.

09/16–05/17: “CORRLocator Proposal for the Alabama Center for Insurance Information and Research,” ACIIR, \$140,000; Co-PI.

09/2012–06/2015, “Developing Effective Rogue Application Prediction Techniques Through Combining of Multiple Machine Learning and Data Mining Techniques,” Louisiana Board of Regents, \$119,025; PI.

11/2011: “Computer Forensics Lab,” Louisiana Tech CoES Lab Fee Team, \$20,000; PI.

11/2011: “Android-based Cell Phones for Introductory CS and Cyber Engineering,” Louisiana Tech CoES Lab Fee Team, \$7,500; Co-PI.

11/2011: “cyber_{LAB}: Applied Cyber Security, Digital Forensics and Networking Lab,” Louisiana Tech Student Technology Fee Board, \$80,000; Co-PI.

06/2010–06/2014: “Developing an Effective Dimensionality Reduction Methodology for Malicious Software Detection Predictors,” Air FCoESorce Office of Scientific Research, \$50,150; PI.

06/2010–06/2014: “Forensics in a Virtual Environment,” Air Force Office of Scientific Research, \$40,311; PI.

06/2010–06/2014: “LA Tech Proposal for the Cybersecurity Research Program at the Cyberspace Research Laboratory,” Air Force Office of Scientific Research, \$1,189,458; Co-PI.

Other Scholarship

Received a patent (classified) in June 2007 for an idea developed while at the National Security Agency.

2011-2012: Consultant, Riverside Research, Shreveport, LA.

Professional Development

Since I have been a faculty member at both Louisiana Tech University and the University of Alabama I have attended several workshops that have covered a range of topics such as Louisiana Board of Regents RCS program, NSF CAREER, mentorship, faculty development, and so on. I feel that attending these meeting and workshops are beneficial to my growth as faculty at the University of Alabama. I obtained in February 2003 and continue to hold today my CISSP (Certified Information Systems Security Professional) certification.

Service

Service to profession

2016: NSF CPS Panelist.

2016: NSF SaTC Panelist.

2016: Reviewer, Journal on Cybersecurity Education, Research and Practice.

2016: Reviewer, Information Security Education Journal.

2015: Reviewer, ASEE Southeast Conference.

2015: Reviewer, Computers and Security.

2014: Reviewer, IEEE Transactions on Smart Grid.

5/2014: Invited Talk, *Overview of Cyber Security and Digital Forensics*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

5/2014: Invited Talk, *Case Study: Use of Digital Forensics in Credit Card Fraud Case*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

2014: Session Chair, The 9th Cyber and Information Security Research Conference, ORNL, Oak Ridge, TN.

2012: Session Chair, ACM Southeast Conference (ACMSE 2012), Tuscaloosa, AL.

2012: Program Committee Member/Reviewer, The 2012 Colloquium for Information Systems Security Education, Lake Buena Vista, FL.

2012: Publicity Chair, Sixth International Conference on Information Systems, Technology and Management, Grenoble, France.

11/2011: Invited Talk, *Control System Security*, Cyber Engineering Conference, Shreveport, LA.

2011: Program Committee Member, Fourth International Conference on Contemporary Computing, Noida, India.

2011: Program Committee Member/Reviewer, The 15th Colloquium for Information Systems Security Education, Fairborn, OH.

2011: Program Committee Member, Fifth International Conference on Information Systems, Technology and Management, Gurgaon, India.

2010: Technical Program Committee Member/Reviewer, CRW'10: 3rd Cyberspace Research Workshop, Shreveport, LA.

2010: Program Committee Member/Review, Third International Conference on Contemporary Computing, Noida, India.

2010: Session Chair, ACM Southeast Conference (ACMSE 2010), Oxford, MS.

2010: Reviewer, Digital Forensics – Pedagogy and Foundational Research Activity minitrack at the 43rd Hawaii International Conference on System Science (HICSS-43), Kauai, HI.

2009: Reviewer, Information Systems Security and Privacy track at the International Conference on Information Systems 2009 (ICIS 2009), Phoenix, AR.

2009: Session Chair/Reviewer, ACM Southeast Conference (ACMSE 2009), Clemson, SC.

10/2008: Invited Talk, *Applying Dimensionality Reduction Techniques to Attack the Malicious Software Detection Problem*, Department of Computer Science Research Colloquium Series, University of Alabama.

Service to academic program

2016: Supervised Research, Md Shariful Haque, Topic: *A Data Provenance Technique in Public Cloud Systems for Forensics Investigation*, University of Alabama.

2016: Supervised Research, Matthew Leeds, Topic: *Applying Machine Learning Algorithms to Android Malware Detection*, University of Alabama.

2016: Supervised Research, Kyle Galloway, Topic: *An Overview of PLC Security*, University of Alabama.

2015: Supervised Research, Harry May, Topic: *A look at the detection and mitigation of wireless ad-hoc networks associated with control systems*, Louisiana Tech University.

2014: Supervised Research, Luke Hebert, Topic: *Overcoming Garbage Collection in Solid State Drive Forensics*, Louisiana Tech University.

2013: Supervised Research, James Poore, Topic: *Verifying Diversity in a Set of Randomly Compiled Applications*, Louisiana Tech University.

2013: Supervised Research, Stanislav Ponomarev, Topic: *Evaluation of Fourier transform in Malicious Application Detection*, Louisiana Tech University.

2013: Member, Computer Science Faculty Search Committee.

2012: Supervised Research, James Poore, Topic: *An Analysis of Software Diversity through Randomized Compilation*, Louisiana Tech University.

2012–2015: Faculty Advisor, Association of Cyber Engineers, Louisiana Tech University.

2012–2015: Chair, Ph.D. Advisory Committee, Stanislav Ponomarev, Topic: *Intrusion Detection System of Industrial Control Networks Using Network Telemetry*, Louisiana Tech University.

2011–2014: Chair, Ph.D. Advisory Committee, Nathan Wallace, Topic: *A Knowledge Discovery Approach for the Detection of Power Grid State Variable Attacks*, Louisiana Tech University.

2010–2012: Chair, M.S. Advisory Committee, Juan Flores, Topic: *Evolution of Traditional Digital Forensics in Virtualization by Using Virtual Machine Introspection*, Louisiana Tech University.

2010–2012: Chair, M.S. Advisory Committee, Jan Durand, Topic: *Evaluation of Random Projection for Malware Classification*, Louisiana Tech University.

2009–2015: Member, Ph.D. Advisory Committees of 22 students, Louisiana Tech University.

2009–2012: Member, Ph.D. Advisory Committees of 2 students, University of Alabama.

2009–2015: Member, M.S. Advisory Committees of 28 students, Louisiana Tech University.

2009–2015: Student Advisor, Computer Science Program, Louisiana Tech University.

Service to college

2013–2015: Program Chair, Cyber Engineering Program, Louisiana Tech University.

2013–2015: Louisiana Tech University Faculty Senate.

2012–2015: Judge, Freshman Design Expo, CoES, Louisiana Tech University.

2010: Member, Electrical Engineering Faculty Search Committee.

03/2010: Invited Talk, *Experiences with Applying for and Interviewing for a Faculty Job*, CoES Office for Women in Science and Engineering (OWISE), Louisiana Tech University.

Service to community

2016–present: Webmaster, Tuscaloosa County High Band, Tuscaloosa County High School.

2016: Facilitator/Subject Matter Expert, Analysis and Investigation through Cyber-Based Scenarios, University of Central Arkansas.

5/2014: Invited Talk, *Overview of Cyber Security and Digital Forensics*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

5/2014: Invited Talk, *Case Study: Use of Digital Forensics in Credit Card Fraud Case*, Louisiana Forgery and Fraud Investigators Training Conference, Ruston, LA.

2014: Volunteer/Coach, Class B Science Olympiad Team, I. A. Lewis Elementary School.

2012–2013: Course Development and Instructor, Advanced Certification Technical Training (ACTT) Program, Louisiana Tech University.

2012: Facilitator/Subject Matter Expert, Cyber Discovery, University of Baltimore.

2010–2013: Event Coordinator, Louisiana Region 3 Science Olympiad, Louisiana Tech University.

2010–2015: Judge, Louisiana Regional Science Fair, Louisiana Tech University.

2010–2012: Curriculum Development and Implementation, Cyber Science, CoES, Louisiana Tech University.

2010–2015: Facilitator/Subject Matter Expert, Cyber Discovery, CoES, Louisiana Tech University.