Travis Atkison

Director, Cyber Security Program
Director, Digital Forensics and Control Systems Security Lab
Associate 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

2021–present: Associate Professor, Computer Science, University of Alabama, Tuscaloosa, AL.

2019–present: Cyber Security Program Director, Computer Science, University of Alabama, Tuscaloosa, AL.

2015–2021: Assistant Professor, Computer Science, University of Alabama, Tuscaloosa, AL.

2015: Associate Professor, Computer Science, Louisiana Tech University, Ruston, LA.

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 2019 International Congress on Big Data*, San Diego, CA, June 2019.

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

Research Grants and Contracts

2022: "Collaborative Research: CyberComics: Informal learning adventures in digital forensics to promote cyber security interest, career awareness, and character development," NSF, $1,487,001 (UA Portion $289,598); UA PI. *currently under evaluation.*

2021: "Enabling Space Weather Research with Global Scale Amateur Radio Dataset," NASA, $1,275,557 (UA Portion $193,136); UA PI. *Awarded.*

01/20–09/25: "SFS@BAMA: The University of Alabama's Scholarship for Service Program," NSF, $3,101,017; Co-PI.

12/21–12/23: "[CERL-18] Validation and Vulnerability Testing of Biometric Technologies at Access Control Points," United States Army Corps of Engineers, $574,869; PI.

01/20–12/22: "Collaborative Proposal: DASI Track 1: Personal Space Weather Station," NSF, $1,275,557 (UA Portion $402,832); UA PI.

08/20–07/21: "Security of Transportation Cyber Infrastructure in Smart Cities - A Case Study of Intelligent Traffic Signal Systems using Machine Learning/Artificial Intelligence," UA Cyber Seed, $29,448; Co-PI.

06/20–03/22: "Queuing Detection and Warning System," ALDOT, $238,883; PI.

04/17–03/22: "Preparing Engineering Students for Three Gateway Courses," NSF, $999,973; Co-PI.

06/20–12/21: "[CERL-17] Research Evaluation Framework and Preliminary Planning for Entry of Connected and Automated Vehicles at Checkpoints on Military Installations," United States Army Corps of Engineers, $196,620; Co-PI.

10/18–09/21: "GAANN: Next-Generation Science and Practice of Cybersecurity," Department of Education, $746,250; Co-PI.

08/20–07/21: "Drone Power Electronics Security," UA Cyber Seed, $29,914; Co-PI.

08/18–07/21: "NeTS: Small: VC-VANET: A Sustainable Vehicle-Crowd Based Vehicular Ad Hoc Network Supporting Mobile Cloudlet Computing - Supplemental," NSF, $16,000; Co-PI.

08/17–07/21: "NeTS: Small: VC-VANET: A Sustainable Vehicle-Crowd Based Vehicular Ad Hoc Network Supporting Mobile Cloudlet Computing," NSF, $499,199; Co-PI.

03/20–02/21: "Basics of Cyber Security, Civil Air Patrol," United States Air Force, $10,000; Co-PI.

03/19–12/20: "Alabama Connected Vehicle Application Research," ALDOT, $265,301; Co-PI.

10/18–09/19: "Enhancements to Traffic Signal Hi Resolution Data Logger Enumerations," Indiana Department of Transportation, $91,194; Co-PI.

08/17–03/19: "ALGO TIMS Reporting Dashboard," ALDOT, $235,664; PI.

01/17–09/17: "Insurance Check Proposal for the Alabama Law Enforcement Agency," Alabama Law Enforcement Agency (ALEA), $106,456; Co-PI.

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

09/12–06/15, "Developing Effective Rogue Application Prediction Techniques Through Combining of Multiple Machine Learning and Data Mining Techniques," Louisiana Board of Regents, $119,025; PI.

06/10–06/14: "Developing an Effective Dimensionality Reduction Methodology for Malicious Software Detection Predictors," Air Force Office of Scientific Research, $50,150; PI.

06/10–06/14: "Forensics in a Virtual Environment," Air Force Office of Scientific Research, $40,311; PI.

06/10–06/14: "LA Tech Proposal for the Cybersecurity Research Program at the Cyberspace Research Laboratory," Air Force Office of Scientific Research, $1,189,458; Co-PI.

11/11: "Computer Forensics Lab," Louisiana Tech CoES Lab Fee Team, $20,000; PI.

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

11/11: "cyber$_{\text{LAB}}$: Applied Cyber Security, Digital Forensics and Networking Lab," Louisiana Tech Student Technology Fee Board, $80,000; Co-PI.

Scholarship

Articles in Peer-Reviewed Journals (*denotes student co-author)

A. Phan* and T. Atkison, "MAX-Q with Particle Swarm Optimization for the Path Planning Problem," *IEEE Transactions on Neural Networks and Learning Systems*, 2021. (Submitted)

A. Phan* and T. Atkison, "Q-Learning with Local Particle Swarm Optimization for the Path Planning Problem," *IEEE Transactions on Neural Networks and Learning Systems*, 2021. (Submitted)

S. Talukder*, E. Tedla, A. Hainen, and T. Atkison, "Analytical and Empirical Evaluation of Freight Priority System in Connected Vehicle Environment," *Journal of Transportation Engineering, Part A: Systems*, 2021. (Accepted)

Z. Dong*, T. Atkison, and B. Chen, "Wineinformatics: Using the Full Power of the Computational Wine Wheel to Understand 21st Century Bordeaux Wines From the Reviews," *Beverages*, 2020, vol. 7, no. 1, 2021, article 3.

S. Talukder*, A. Lidbe, E. Tedla, A. Hainen, and T. Atkison, "Trajectory-Based Signal Control in Mixed Connected Vehicle Environments," *Journal of Transportation Engineering, Part A: Systems*, vol. 147, no. 5, 2021, pp. 1-13.

M. Lee* and T. Atkison, "VANET Applications: Past, Present, and Future," *Vehicular Communications*, vol. 28, no. 1, 2021, pp. 1-14.

S. Haque*, T. Atkison, and B. Chen, "Mining High Priority Alert Sequences in Intrusion Analysis," *International Journal of Information Security*, 2019. (In Revision)

N. Islam*, S. Talukder*, A. Hainen, and T. Atkison, "Characterizing Co-modality in Urban Transit Systems from a Passengers' Perspective," *Public Transport*, vol. 12, no. 2, 2020, pp. 405-430.

J. Palmer*, V. Sheng*, T. Atkison, and B. Chen, "Classification on Grade, Price, and Region with Multi-Label and Multi-Target Methods in Wineinformatics," *Big Data Mining and Analytics*, vol. 4, no. 1, 2020, pp. 1-12.

B. Chen, V. Velchev*, J. Palmer*, and T. Atkison, "Wineinformatics: A Quantitative Analysis of Wine Reviewers," *Fermentation*, vol. 4, no. 4, 2018, pp. 82-98.

S. Haque* and T. Atkison, "A Forensic Enabled Data Provenance Model for Public Cloud," *Journal of Digital Forensics, Security and Law*, vol. 13, no. 3, 2018, article 7.

T. Atkison, S. Ponomarev*, R. Smith, and B. Chen, "Feature Extraction Optimization for Network Intrusion Detection in Control System Networks," *International Journal of Network Security (IJNS)*, vol. 20, no. 5, 2018, pp. 853-861.

S. Haque* and T. Atkison, "An Evolutionary Approach of Attack Graph to Attack Tree Conversion," *International Journal of Computer Network and Information Security (IJCNIS)*, vol. 9, no. 11, 2017, pp. 1-16.

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*, vol. 10, no. 1, 2017, pp. 3-24.

N. Wallace* and T. Atkison, "A Power Grid Incident Identification Based on Physically Derived Cyber-Event Detection," *Journal of Digital Forensics, Security and Law*, vol. 12, no. 2, 2017, pp. 5-18.

N. Wallace* and T. Atkison, "On the Detection of Cyber-Events in the Grid Using PCA," *International Journal of Critical Infrastructures*, vol. 13, no. 2/3, 2017, pp. 96-112.

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 (*denotes student co-author)

S. Dasgupta*, M. Rahman, T. Atkison, C. Hollis, and S. Jones, "An Innovative Attack Modelling and Attack Detection Approach for a Waiting Time-based Adaptive Traffic Signal Controller," *ASCE International Conference on Transportation and Development (ICTD 2022)*, Seattle WA, June 2022.

S. Talukder*, A. Lidbe, E. Tedla, A. Hainen, and T. Atkison, "Development and Evaluation of a Weighted Delay-Based Signal Control Algorithm for Connected and Non-Connected Vehicles," *Transportation Research Board 2021 Annual Meeting*, Washington DC, Jan 2021.

N. Frissell, D. Joshi, V. Romanek, K. Collins, A. Montare, D. Kazdan, J. Gibbons, W. Engelke, T. Atkison, H. Kim, S. Cowling, T. McDermott, J. Ackermann, D. Witten, J. Madey, W. Silver, W. Liles, S. Cerwin, P. Erickson, E. Miller, J, Vierinen, "HamSCI Personal Space Weather Station (PSWS): Architecture and Current Status," *NSF CEDAR (Coupling, Energetics, and Dynamics of Atmospheric Regions)*, Virtual, June 2021.

M. Lee*, B. Yang*, and T. Atkison, "802.11ac and p in a Simulated VANET Environment," *The 2019 IEEE International Conference on Big Data*, Los Angeles, CA, Dec 2019.

M. McLeroy*, B. Hallihan*, B. Wright*, and T. Atkison, "Sustainable Mobility: Developing a Web-based Software Suite for Transportation and Traffic Analysis using Google Maps," *The 17th International Conference on Software Engineering Research and Practice (SERP'19)*, Las Vegas, NV, July 2019, pages 29-35.

L. Malis*, A. Payne*, M. McLeroy*, and T. Atkison, "Vehicle Crashes: Early Detection Through Image Recognition," *The 23rd International Conference on Image Processing, Computer Vision, & Pattern Recognition (IPCV'19)*, Las Vegas, NV, July 2019, pages 23-28.

B. Hallihan*, M. McLeroy*, B. Wright*, and T. Atkison, "Using Isochrones to Examine NICU Availability in Rural Alabama," *The 5th International Conference on Health Informatics and Medical Systems (HIMS'19)*, Las Vegas, NV, July 2019, pages 45-50.

P. Sheinidashtegol*, A. Musaev, and T. Atkison, "Investigating Personally Identifiable Information Posted on Twitter Before and After Disasters," *SERVICES 2019 of SCF 2019*, San Diego, CA, June 2019, pages 31-45.

C. Wang*, A. Musaev, P. Sheinidashtegol*, and T. Atkison, "Towards Detection of Abnormal Vehicle Behavior Using Traffic Cameras," *2019 International Congress on Big Data*, San Diego, CA, June 2019, pages 125-136. **Best Paper Award**

T. Elliott*, A. Payne*, T. Atkison, and R. Smith, "Algorithms in Law Enforcement: Toward Optimal Patrol and Deployment Algorithms," *The 17th International Conference on Information & Knowledge Engineering (IKE'18)*, Las Vegas, NV, July 2018, pages 93-99.

X. Zhao*, A. Payne*, and T. Atkison, "TTExtS: A Dynamic Framework to Reverse UML Sequence Diagrams from Execution Traces," *The 16th International Conference on Software Engineering Research & Practice (SERP'18)*, Las Vegas, NV, July 2018, pages 82-88.

A. Lee*, A. Payne*, and T. Atkison, "A Review of Popular Reverse Engineering Tools from a Novice Perspective," *The 16th International Conference on Software Engineering Research & Practice (SERP'18)*, Las Vegas, NV, July 2018, pages 68-74.

E. Caballero-Espinosa*, A. Payne*, and T. Atkison, "An Approach to Analyze Power Consumption on Apps for Android OS Based on Software Reverse Engineering," *The 16th International Conference on Software Engineering Research & Practice (SERP'18)*, Las Vegas, NV, July 2018, pages 75-81.

N. Eisty*, A. Payne*, and T. Atkison, "Improving the Permission Model to Protect the Smartphone Users' Privacy and Applying it on Android," *The 2018 International Conference on Security and Management (SAM'18)*, Las Vegas, NV, July 2018, pages 143-149.

S. Jones, P. Jutte*, T. Atkison, and O. Musoni, "Understanding Healthcare Access in a Developing Country through Mapping - Two Case Studies in Rwanda," *The 10th International Conference on African Development 2018*, Kalamazoo, MI, August 2018.

S. Haque*, J. Carver, and T. Atkison, "Causes, Impacts, and Detection Approaches of Code Smell: A Survey," *The 2018 ACM Southeast Conference*, Richmond, KY, March 2018.

T. Willingham*, C. Henderson*, B. Kiel*, S. Haque*, and T. Atkison, "Testing Vulnerabilities in Bluetooth Low Energy," *The 2018 ACM Southeast Conference*, Richmond, KY, March 2018.

V. Nakade*, A. Musaev, and T. Atkison, "Preliminary Research on Thesaurus-Based Query Expansion for Twitter Data Extraction," *The 2018 ACM Southeast Conference*, Richmond, KY, March 2018.

S. Kim*, M. Keffeler*, T. Atkison, and A. Hainen, "Using Time Series Forecasting for Adaptive Traffic Signal Control," *The 13th International Conference on Data Mining (DMIM'17)*, Las Vegas, NV, July 2017, pages 34-39.

M. Leeds*, M. Keffeler*, and T. Atkison, "Examining Features for Android Malware Detection," *The 2017 International Conference on Security and Management (SAM'17)*, Las Vegas, NV, July 2017, pages 217-223.

S. Haque*, M. Keffeler*, and T. Atkison, "An Evolutionary Approach of Attack Graphs and Attack Trees: A Survey of Attack Modeling," *The 2017 International Conference on Security and Management (SAM'17)*, Las Vegas, NV, July 2017, pages 224-229.

B. Chen, K. Buck, C. Moore, C. Lawrence, J. Yeatts, and T. Atkison, "Granular Computing in Wineinformatics," *The 2017 13th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD 2017)*, Guilin, China, July 2017, pages 1228-1232.

A. Sainju* and T. Atkison, "An Experimental Analysis of Windows Log Events Triggered by Malware," *The 2017 ACM Southeast Conference*, Kennesaw, GA, April 2017, pages 195-198.

M. Leeds*, M. Keffeler*, and T. Atkison, "A Comparison of Features for Android Malware Detection," *The 2017 ACM Southeast Conference*, Kennesaw, GA, April 2017, pages 63-68.

A. Mahaju* and T. Atkison, "Evaluation of Firefox Browser Forensics Tools," *The 2017 ACM Southeast Conference*, Kennesaw, GA, April 2017, pages 5-12.

A. Lee* and T. Atkison, "A Comparison of Fuzzy Hashes: Evaluation, Guidelines, and Future Suggestions," *The 2017 ACM Southeast Conference*, Kennesaw, GA, April 2017, pages 18-25.

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-Zyoud*, 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, pages 1070-1073.

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, pages 892-896.

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, pages 1-5.

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 Method 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, pages 21-24.

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, pages 13-16. **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, pages 68-73.

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, pages 286-291.

J. Flores* and T. Atkison, "Evolution of Traditional Digital Forensics in Virtualization," *The 50th ACM Southeast Conference*, Tuscaloosa, AL, March 2012, pages 18-23.

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, pages 166-172.

J. Flores* and T. Atkison, "Digital Forensics on a Virtual Machine," *The 49th ACM Southeast Conference*, Kennesaw, GA, March 2011, pages 326-327. (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, pages 1-6.

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, pages 364-369.

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 421-430.

Technical Reports/Other Academic Output

H. Li, A. Hainen, J. Sturdevant, T. Atkison, S. Talukder, J, Mathew, D. Bullock, D. Nelson, D. Maas, J. Fink, and T. Stiles, "Indiana Traffic Signal Hi Resolution Data Logger," Indiana Department of Transportation and Purdue University, West Lafayette, Indiana, 2019.

M. McNamara, A. Hainen, S. Jones, and T. Atkison, "Route-Based Travel Time Analysis of Hospital Access in Alabama," Poster, 19th Annual Rural Health Conference, Tuscaloosa, AL, 25-26 April 2018. **3rd Place Poster**

M. McNamara, A. Hainen, S. Jones, and T. Atkison, "Route-Based Travel Time Analysis of Hospital Access in Alabama," Poster, SDITE Annual Meeting, Mobile, AL, 10 April 2018.

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

3/2019: *The Future is Bright: An Understatement for Computer Science and Cyber Security*, Keynote Address, Tuscaloosa Academy Technology Showcase, Tuscaloosa, AL.

4/2018: *University of Alabama Cyber Research Capabilities and Areas*, TTP Cyber Security Projects Workshop, Birmingham, AL.

4/2018: *Research Activities of the Digital Forensics and Control Systems Security Lab*, TTP Cyber Security Projects Workshop, Birmingham, AL.

3/2018: *Research Activities of the Digital Forensics and Control Systems Security Lab*, Computer Science New Faculty Research Talks, University of Alabama.

2/2018: *Overview of the Digital Forensics and Control Systems Security Lab*, College of Engineering Meet Your Neighbors, University of Alabama.

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.

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 NSF CAREER, NSF Grant Writing, Aspiring CPS PIs, DARPA Young Investigator, mentorship, faculty development, and so on. I feel that attending these meetings and workshops is beneficial to my growth as faculty. I obtained in February 2003 and continue to hold today my CISSP (Certified Information Systems Security Professional) certification. The CISSP is the gold-standard and demonstrates competency in practical skills and knowledge across the cyber domain.

Service

Service to Profession

NSF Panelist

- 2016–2018: Cyber-Physical Systems.
- 2016–2018: Secure and Trustworthy Cyberspace.

Committee Member

- 2017: ACM Joint Task Force on Cybersecurity Education - Data Security Working Group (JTF-DSWG).

Review Board

- 2017: International Journal for Communication and Technology.

Publicity Chair

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

Conference Committee Member

- 2019: International Conference on Web Services (ICWS 2019).
- 2019: International Conference on Services Computing (SCC 2019).
- 2017: The 16th International Conference on Wireless Networks.
- 2017: The 16th International Conference on Information and Knowledge Engineering.
- 2017: The 15th International Conference on Software Engineering Research and Practice.
- 2011–2012: The Colloquium for Information Systems Security Education.
- 2011: Fourth International Conference on Contemporary Computing, Noida, India.
- 2011: Fifth International Conference on Information Systems, Technology and Management, Gurgaon, India.
- 2010: CRW'10: 3rd Cyberspace Research Workshop, Shreveport, LA.
- 2010: Third International Conference on Contemporary Computing, Noida, India.

Session Chair

- 2014: The 9th Cyber and Information Security Research Conference, ORNL, Oak Ridge, TN.
- 2012: ACM Southeast Conference (ACMSE 2012), Tuscaloosa, AL.
- 2010: ACM Southeast Conference (ACMSE 2010), Oxford, MS.
- 2009: ACM Southeast Conference (ACMSE 2009), Clemson, SC.

Reviewer

- 2020–present: Vehicular Communications.
- 2017–present: Journal of Digital Forensics, Security and Law.
- 2017–present: International Journal on Network Security.
- 2016–present: Journal of Cybersecurity Education, Research and Practice.
- 2015–present: Computers and Security.
- 2020: IEEE Software.
- 2019: Journal of Cyber Security Technology.
- 2018: International Conference on Web Services.
- 2018: Information.

- 2017: International Journal of Engineering Science and Technology.
- 2017: Symmetry.
- 2017: Computers.
- 2017: Forensic Science Research Journal.
- 2017: Conference on Cybersecurity Education, Research and Practice.
- 2017: 23rd Americas Conference on Information Systems.
- 2016: Information Security Education Journal.
- 2015: ASEE Southeast Conference.
- 2014: IEEE Transactions on Smart Grid.
- 2011–2012: The Colloquium for Information Systems Security Education.
- 2010: Digital Forensics – Pedagogy and Foundational Research Activity mini-track at the 43rd Hawaii International Conference on System Science (HICSS-43), Kauai, HI.
- 2010: CRW'10: 3rd Cyberspace Research Workshop, Shreveport, LA.
- 2010: Third International Conference on Contemporary Computing, Noida, India.
- 2009: Information Systems Security and Privacy track at the International Conference on Information Systems 2009 (ICIS 2009), Phoenix, AR.
- 2009: ACM Southeast Conference (ACMSE 2009), Clemson, SC.

Service to Academic Program

Course/Curriculum Development

- 2018–2020: Lead Designer/Developer, B.S. in Cyber Security, University of Alabama.
- 2018–2019: Lead Designer/Developer, Cyber Security Concentration, University of Alabama.
- 2009–2012: Designer/Developer, B.S. in Cyber Engineering, Louisiana Tech University.
- 2011: Designer/Developer, Cyber Security Concentration, Louisiana Tech University.

Supervised Research

- 2020–present; Russell Weas, University of Alabama.
  - *LIDAS*
- 2021–present; Stephen Kirby, University of Alabama.
  - *Queuing Detection and Warning System*
- 2020–present; Savannah Grasmick, University of Alabama.
  - *Parking Lot Detection*

- 2020–present; Jonah Sussman, University of Alabama.
  - *LIDAS*
- 2020–present; Cole Robbins, University of Alabama.
  - *Personal Space Weather Station*
- 2020–present; Nicholas Muscolino, University of Alabama.
  - *Personal Space Weather Station*
- 2020–present; Sinan Al Ani, University of Alabama.
  - *LIDAS*
  - *Survey of Security Mechanisms in the Transportation Infrastructure*
- 2020–present; Chen Wang, University of Alabama.
  - *Applying Machine Learning to Traffic Anomalies by Using Video Image Processing*
- 2019–present; Chandler Staggs, University of Alabama.
  - *Analysis of Threat Avoidance and Intrusion Detection in the Transportation Infrastructure*
  - *Automated Image Detection Algorithms for Automated Parking Lot Detection System*
- 2015–present; Harry May, Louisiana Tech University.
  - *Detection and Mitigation Strategy for Wormhole Attacks in the AODV Protocol*
  - *A look at the detection and mitigation of wireless ad-hoc networks associated with control systems*
- 2021–2021; Zachary Weske, University of Alabama.
  - *Drone Power and Security*
- 2021–2021; Stephen Sottosanti, University of Alabama.
  - *Drone Power and Security*
- 2018–2021; Laura Malis, University of Alabama.
  - *Personal Space Weather Station*
  - *Vehicle Crashes: Early Detection Through Image Recognition*
- 2017–2021; Abigail Payne, University of Alabama.
  - *Queuing Detection and Warning System*
  - *Radius-based Algorithm Simulations for a Vehicle Crowd-based VANET*
  - *Increasing Optical Character Recognition by Adding Localization Algorithms*
- 2016–2021; Michael Lee, University of Alabama.
  - *An Intersection-based Clustering Technique for a Vehicle Crowd-based VANET*
  - *VANET Applications: Past, Present, and Future*
  - *Fast Training Machine Learning Techniques for Low Computational Systems*
  - *A Novel Intersection-Based Clustering Scheme for VANET*
- 2019–2020; Inyeneotobong Akpan, University of Alabama.
  - *Underlying Software Architecture for the Personal Space Weather Station*

- 2015–2020; Md Shariful Haque, University of Alabama.
  - *Mining High Priority Alert Sequence in Intrusion Analysis*
  - *Feature Selection Process for Time Series Intrusion Data*
  - *Feature Selection Techniques in Intrusion Detection System*
  - *Analysis of Intrusion Data and Existing Algorithm on Alert Correlation*
  - *A Data Provenance Technique in Public Cloud Systems for Forensics Investigation*
- 2018–2020; Nehal Vora, University of Alabama.
  - *Detection of HTTP Botnet Command and Control Servers Using Protocol-Based Analysis*
  - *Highway Inventories using a Specialized Object Detection Algorithm*
- 2018–2020; Myles McLeroy, University of Alabama.
  - *Automated Parking Lot Detection System*
  - *Sustainable Mobility: Developing a Web-based Software Suite for Transportation and Traffic Analysis using Google Maps*
  - *Using Isochrones to Analyze Pedestrian Transportation of the Elderly*
- 2019; Ben Hallihan and Blake Wright, University of Alabama.
  - *Using Isochrones to Examine NICU Availability in Rural Alabama*
- 2017–2019; Leete Skinner, University of Alabama.
  - *Enhancements to Traffic Signal Hi Resolution Data Logger Enumerations*
- 2016–2018; Tzofi Klinghoffer, University of Alabama.
  - *Deep-Learning Methods for Image Detection in Transportation Infrastructures*
  - *Traffic Control System Security*
- 2016–2018; Sungkyun Kim, University of Alabama.
  - *Using Time Series Forecasting for Adaptive Traffic Signal Control*
- 2016–2018; Miclain Keffeler, University of Alabama.
  - *Application of Isochrone Algorithm using Google Maps Traffic Data to Veterans in Alabama*
  - *Development of an Isochrone Algorithm using Google Maps Traffic Data*
  - *The Digital Forensics and Control Systems Security Lab (DCSL) Transportation Analysis Tool Suite*
  - *Android Malware Detection*
- 2016; Matthew Leeds, University of Alabama.
  - *Applying Machine Learning Algorithms to Android Malware Detection*
- 2016; Kyle Galloway, University of Alabama.
  - *An Overview of PLC Security*
- 2014; Luke Hebert, Louisiana Tech University.
  - *Overcoming Garbage Collection in Solid State Drive Forensics*
- 2013; Stanislav Ponomarev, Louisiana Tech University.

    * *Evaluation of Fourier transform in Malicious Application Detection*
  - 2012–2013; James Poore, Louisiana Tech University.
    * *Verifying Diversity in a Set of Randomly Compiled Applications*
    * *An Analysis of Software Diversity through Randomized Compilation*

Committees

- Faculty Search
  * 2018–2019: Member, Computer Science Faculty Search Committee, University of Alabama.
  * 2013: Member, Computer Science Faculty Search Committee, Louisiana Tech University.
- Ph.D. Advisory
  * 2015–present: Member, 15 students, University of Alabama.
  * 2020–present: Chair, Ashley Phan, Topic: *Combining Reinforcement Learning and Particleswarm Optimization for Continuous Domains (working title)*, University of Alabama.
  * 2020–present: Chair, Sinan Al Ani, Topic: *Advanced Security and Privacy Mechanisms for the Intelligent Transportation Infrastructure (working title)*, University of Alabama.
  * 2020–present: Chair, Chen Wang, Topic: *Applying YOLOv3 and Kalman Filters to Short-term Traffic Flow Prediction Using Video Image Processing (working title)*, University of Alabama.
  * 2019–present: Chair, Chandler Staggs, Topic: *Threat Avoidance Analysis for the Transportation Infrastructure (working title)*, University of Alabama.
  * 2017–2021: Chair, Michael Lee, Topic: *A Novel Intersection-Based Clustering Scheme for VANET*, University of Alabama.
  * 2015–2020: Chair, Md Shariful Haque, Topic: *Mining and Ranking Incidents for High Priority Intrusion Analysis*, University of Alabama.
  * 2017–2019: Co-Chair, Mahran Al-Zyoud, Topic: *Refining Privacy: Case Study of Smart Health Applications*, University of Alabama.
  * 2016–2017: Co-Chair, Beau Elliott, Topic: *Law Enforcement Deployment Algorithms: Historic Sharing Approaches and Results*, University of Alabama.
  * 2009–2015: Member, 22 students, Louisiana Tech University.
  * 2012–2015: Chair, Stanislav Ponomarev, Topic: *Intrusion Detection System of Industrial Control Networks Using Network Telemetry*, Louisiana Tech University.
  * 2011–2014: Chair, Nathan Wallace, Topic: *A Knowledge Discovery Approach for the Detection of Power Grid State Variable Attacks*, Louisiana Tech University.
  * 2009–2012: Member, 2 students, University of Alabama.
- M.S. Advisory

    * 2018–present: Chair, Inyeneotobong Akpar, Non-Thesis Research Topic: *Control Software and Data Collection for the Personal Space Weather Station*, University of Alabama.
    * 2009–2015: Member, 28 students, Louisiana Tech University.
    * 2010–2012: Chair, Juan Flores, Topic: *Evolution of Traditional Digital Forensics in Virtualization by Using Virtual Machine Introspection*, Louisiana Tech University.
    * 2010–2012: Chair, Jan Durand, Topic: *Evaluation of Random Projection for Malware Classification*, Louisiana Tech University.

Advisor

- Student Advisor
    * 2012–2015: Cyber Engineering Program, Louisiana Tech University.
    * 2009–2015: Computer Science Program, Louisiana Tech University.

Service to University/College

2019–present: Point of Contact, Center of Academic Excellence - Research, University of Alabama.

Faculty Advisor

- 2017–present: Crimson Defense Cyber Security Club, University of Alabama.
- 2012–2015: Association of Cyber Engineers, Louisiana Tech University.

Appointments

- 2019–present: Member, University of Alabama Undergraduate Council.
- 2013–2015: Program Chair, Cyber Engineering Program, Louisiana Tech University.
- 2013–2015: Louisiana Tech University Faculty Senate.

Committees

- 2019–present: Member, University of Alabama Undergraduate Council - Curriculum Committee.
- 2019–present: Member, Computer Science Graduate Application Review Committee.
- 2010: Member, Electrical Engineering Faculty Search Committee, Louisiana Tech University.

Judge

- 2018: Judge, Undergraduate Research & Creative Activity (URCA) Poster Competition.
- 2012–2015: Judge, Freshman Design Expo, CoES, Louisiana Tech University.

Service to Community

Facilitator/Subject Matter Expert

- 2016–present: Analysis and Investigation through Cyber-Based Scenarios, University of Central Arkansas.
- 2012: Cyber Discovery, University of Baltimore.
- 2010–2015: Cyber Discovery, CoES, Louisiana Tech University.

Event Coordinator/Organizer

- 2019–present: University of Alabama Capture the Flag Competition.
- 2010–2013: Louisiana Region 3 Science Olympiad, Louisiana Tech University.

Course/Curriculum Development

- 2021: Cyber Security Standards Review Committee
- 2012–2013: Course Development and Instructor, Advanced Certification Technical Training (ACTT) Program, Louisiana Tech University.
- 2010–2012: Curriculum Development and Implementation, Cyber Science, CoES, Louisiana Tech University.

Other Volunteer Activities

- 2016–present: Member, CybatiWorks Advisory Board.
- 2016–2019: Webmaster, Tuscaloosa County High Band, Tuscaloosa County High School.
- 2010–2015: Judge, Louisiana Regional Science Fair, Louisiana Tech University.
- 2014: Volunteer/Coach, Class B Science Olympiad Team, I. A. Lewis Elementary School.