

Justin M. Beaver

Curriculum Vitae

Cybersecurity Research Group
National Security Sciences Directorate
Oak Ridge National Laboratory

Work Address:

One Bethel Valley Road
P.O. Box 2008, MS-6418
Oak Ridge, TN 37831-6418, U.S.A.

Work Phone:

(865) 576-0327

Work Email:

beaverjm@ornl.gov

Personal Phone:

(865) 456-8181

Personal Email:

jbeaver107@gmail.com

ORNL Profile: <https://www.ornl.gov/staff-profile/justin-m-beaver>

LinkedIn: <https://www.linkedin.com/in/justin-beaver-7a302017/>

Twitter: https://twitter.com/ORNL_CISR

ORCID: <https://orcid.org/0000-0002-0281-6017>

Google Scholar: <https://scholar.google.com/citations?user=1GNzOMUAAAAJ&hl=en>

ResearchGate: https://www.researchgate.net/profile/Justin_Beaver

Areas of Specialization

Mission-Critical Systems • Cybersecurity Analytics • Software Engineering • Intrusion Detection
• Network Security • Machine Learning • Text Analysis • Data Mining

Recent Accomplishments

July/August 2019

National Cyber Range Exercise

Led a 4-week exercise at the National Cyber Range in Orlando, FL. The research goal of the exercise was to quantify how machine-learning-based (ML-based) commercial/government-off-the-shelf defensive technologies add value in a cybersecurity analytic architecture. The exercise included an evaluation of detection performance, and also a user test where DOD analysts assessed how well interactive tools communicated cybersecurity events during an adversarial campaign. The exercise results will inform DOD acquisition decisions for future network security architectures.

March 2019

Accreditation of an ORNL ML Sensor Platform

Earned a DOD type accreditation for an ORNL-developed network sensing platform that leverages machine learning for defensive network data analysis.

October 2019

Nov/Dec 2018

Delivered DOE Research Reports

Lead author on a technical report titled "Power Network Inferencing" for DOE. Contributing author on a technical report titled "Sensor Study for Bulk Cyber-physical Security" for DOE.

Professional Experience

Dec 2018 - Present

Cybersecurity Research (CYR) Group Lead

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Leads a group of ~10 computer scientists/engineers in research/development in the cybersecurity domain. CYR has capabilities in AI/ML for cybersecurity, situational awareness, systems/software engineering, malware analysis, network defense, cybersecurity forensics, intrusion detection/prevention, and cybersecurity architectures.

Dec 2017 – Nov 2018

Cyber and Information Security Research (CISR) Group Lead

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Led a group of ~40 computer scientists and electrical engineers in research/development in the cyber physical systems security domain. CISR had capabilities in cyber data analytics, situational awareness, systems/software engineering, signals analysis, malware analysis, network defense, software-defined radio, incident forensics, trusted communications, and applied cryptography.

Aug 2017 – Nov 2018

Vehicle Security Center (VSC) Director

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Led a research center focused on vendor-agnostic research and development of cybersecurity for vehicle systems and systems of vehicles. The VSC had a research/development component and also managed the ORNL Vehicle Security Laboratory (VSL), a facility for security testing of vehicle systems. VSC capabilities included intrusion detection/prevention, vehicle vulnerability analysis, trusted communication architectures and privacy modeling in connected vehicle environments, vehicle software supply chain security and vehicle behavioral analysis.

October 2019

Jan 2017 – Nov 2017

Systems Security Research (SSR) Team Lead

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Led a team of ~10 scientists and engineers focused on understanding the various methods of computer attack, and developing novel and effective detectors and defensive countermeasures. This group has research strengths in malware analysis, network security, vehicle security, and cyber-physical systems.

Jun 2011 – Jan 2017

Intelligent Computing Research (ICR) Team Lead

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Led a team of ~15 researchers and engineers in the application of methods of intelligent data analysis, including text analysis, machine learning, emergent behaviors, information fusion, visual analytics, and intelligent systems dependability. The team focus is to address pressing national computing problems in the domains of law enforcement, cyber security, scientific data analysis, health care informatics, and national security.

Jan 2008 - Present

Senior Research Staff

Oak Ridge National Laboratory
Oak Ridge, Tennessee

Applied research in information fusion and intelligent data analysis in the domains of cyber security, threat anticipation, command and control systems, and software engineering.

Jan 2005 – Apr 2005

Adjunct Instructor

University of Central Florida
Orlando, FL

Developed and taught the “Software Engineering Life Cycle Control” graduate course, focused on software development processes, cost estimation, and project management.

May 1995 – Dec 2007

AST, Computer Engineer

National Aeronautics and Space Administration (NASA)
Kennedy Space Center, Florida

Command and control system computer engineer, primarily doing development work for the Space Shuttle program.

Software Element Lead, 2005 - 2007

Served as an element lead for the next generation launch site command and control system at Kennedy Space Center. Duties include modeling, design, implementation, and testing of the Common Services framework.

Software Engineering Researcher, 2004 - 2005

Developed a model for diagnosis and prognosis of software product quality in a software development effort.

Chair, Engineering Process Group, 2003 - 2004

Led the Engineering Process Group for an organization of 120 people. Developed, reviewed, and approved engineering processes. Organized and served on the appraisal team for a Capability Maturity Model Integration® (CMMI) appraisal.

Systems Engineer, 2003

Led the elicitation of requirements and the development of a software specification for a supervisory control system that monitors and controls plant growth chambers.

Kennedy Graduate Fellowship, 2000 - 2002

Attended the University of Central Florida to pursue graduate degrees in Computer Engineering.

Software Element Lead, 1997 - 2000

Led the design and development of embedded real-time software for a Space Shuttle launch processing system replacement project.

Simulation Engineer, 1995 - 1997

Developed a prototype software interface to a re-hosting of the Space Shuttle's ground simulation system.

Education

2001 - 2006

Ph.D., Computer Engineering

University of Central Florida
Orlando, Florida

Advisor: Dr. Guy A. Schiavone

Dissertation Title: "A Life-Cycle Software Quality Model Using Bayesian Belief Networks"

1997 - 2001

M.S., Computer Engineering

University of Central Florida
Orlando, Florida

Advisor: Dr. Darrell G. Linton

Emphasis: Software Engineering

1990 - 1995

B.S., Electrical Engineering

Tennessee Technological University
Cookeville, Tennessee

Activities and Societies: Pi Kappa Alpha, Tau Beta Pi, Eta Kappa Nu

Minor: Mathematics

Emphasis: Digital Design, Power Systems

Honors and Awards

2015

CCSD Employee of the Quarter

2012

ORNL Significant Event Award

Demonstration of Zero-Day Network Attack Detection

2009

ORNL Significant Event Award

Development and Delivery of High-Risk Proof-of-Concept Cybersecurity System

2006

Kennedy Space Center Distinguished Performance Award

2004

Kennedy Space Center Silver Dollar Award

In honor of your dedication, innovation, and can-do attitude, which delight our customers and result in process improvements that have forever changed the way we do business at Kennedy Space Center.

2003

Space Act Award, NASA Case No. KSC-12349,

Web Based Interface for Configuration, Status & Control of a Real Time Embedded System

2002

Kennedy Space Center Certificate of Recognition

For the creative development of technically significant software which has been accepted and approved for dissemination to the public by NASA.

2000 – 2001

Kennedy Graduate Fellowship Program

2000

Kennedy Space Center Certificate of Commendation

Technical Skills

Languages Java • Python • C/C++ • HTML • VxWorks • Tcl/tk • Perl • XML • UML

Operating Systems OS X, Linux (RHEL, Ubuntu), Windows, VxWorks

Data Analytics Tools/Libraries scikit-learn • kafka • MinorThird

Security Tools/Libraries libpcap • Wireshark • splunk • dtrace • argus • bro

Development Tools Eclipse • IntelliJ • Atom • git • Maven • UML

Office MS Office • iWork • MS Project • Dropbox • Slack • LaTeX

Other Adobe Flex Builder • Balsamiq • Wordpress

Research/Development Funding

Principal Investigator (PI) on 19 funding packages totaling \$18,300,000.

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| 2015 - 2019 | <i>Principal Investigator, Integration and Production Engineering in Support of Fielding the Oak Ridge Cyber Analytics Platform</i> , Space and Naval Warfare Systems Command (SPAWAR), \$9,599,000. |
| 2015 - 2016 | <i>Principal Investigator, Criteria for Retraining In-Situ Machine Learning Network Intrusion Sensors</i> , Resurgo, LLC, \$200,000. |
| 2015 | <i>Principal Investigator, Evaluating the Oak Ridge Cyber Analytics Attack Variant Detector</i> , Allied Minds, Inc, \$35,700. |
| 2015 - 2016 | <i>Investigator (PI: Chad Steed), Visual Analytics of Complex Systems</i> , DOD, \$600,000. |
| 2014 - 2015 | <i>Principal Investigator, Cyber Defense and Analytics Research and Development Support</i> , Naval Cyber Defense Operations Command, \$2,886,000. |
| 2013 – 2014 | <i>Principal Investigator, Detecting Malicious Network Behaviors At Scale</i> , ORNL LDRD, \$700,000. |
| 2013 - 2014 | <i>Investigator (PI: Chad Steed), Interactive Analysis of High Throughput, Unstructured Information Streams</i> , ORNL LDRD, \$900,000. |
| 2013 – 2014 | <i>Investigator (PI: Mark Buckner), Distributed Enterprise-Level cyber-PHysical Intelligence (DELPHI)</i> , ORNL LDRD, \$750,000. |
| 2012 - 2013 | <i>Principal Investigator, Fused Intelligent Network Defense: Development (FIND)</i> , Lockheed Martin Corporation, \$300,000. |

2011-2012	<i>Principal Investigator, Intelligent Intrusion Detection</i> , Lockheed Martin Corporation, \$270,000.
2012	<i>Principal Investigator, Integration and Performance Tuning</i> , Lockheed Martin Corporation, \$60,000.
2012	<i>Principal Investigator, Intrusion Detection Validation and Improvement</i> , Lockheed Martin Corporation, \$75,000.
2011 - 2017	<i>Principal Investigator, Cyber Analytics Research and Development Support</i> , DOD/US Pacific Command, \$1,573,000.
2011	<i>Principal Investigator, Cyber Security Indications and Warning System</i> , Lockheed Martin Corporation, \$200,000.
2011	<i>Principal Investigator, Discovery of Advanced Persistent Threats Through E-mail Message Text Mining</i> , Lockheed Martin Corporation, \$72,000.
2010 - 2011	<i>Principal Investigator, Knowledge Discovery Toolset (KODIAK)</i> , Lockheed Martin Corporation, \$350,000.
2010 – 2011	<i>Principal Investigator, Cyber Defensive Countermeasures</i> , ORNL LDRD, \$700,000.
2010	<i>Principal Investigator, Asset Valuation Automated Category Learning</i> , Lockheed Martin Corporation, \$180,000.
2009 - 2010	<i>Principal Investigator, Defending and Self-Healing Networks</i> , Lockheed Martin Corporation, \$1,100,000.
2008 – 2009	<i>Investigator (PI: Xiaohui Cui), Understanding the Emergence and Evolution of Self-Organized Insurgent Groups</i> , Lockheed Martin Corporation, \$50,000.
2008	<i>Investigator (PI: Ray Brittain), Feasibility of Air Cargo Screening</i> , Battelle Memorial Institute, \$250,000.

Publications

Conferences:	24
Journals:	1
Patents:	1
Abstracts:	1
Tech Reports:	13
Dissertation:	1

- 2018 T. P. Karnowski, **J.M. Beaver**, et al, "Sensor Study for Bulk Electrical System Cyber-physical Security", ORNL Technical Report, 2018
- J.M. Beaver**, Chris Craig, Travis Smith, Philip Irminger, Rob Gillen, "Power Network Inferencing", ORNL Technical Report ORNL/TM-2018/1056, 2018
- J.M. Beaver**, "Oak Ridge Cyber Analytics: A Network Traffic Classification Engine." Refereed abstract in Proceedings of the 2nd Annual Workshop on Naval Applications of Machine Learning, San Diego, CA, February 2018.
- 2016 C.T. Symons, **J.M. Beaver**, T.E. Potok. U.S. Patent No. 9,497,204, "In-Situ Trainable Intrusion Detection System", Issued: November 15, 2016.
- 2015 C.A. Steed, M.G. Drouhard, **J.M. Beaver**, J.M. Pyle, and P.L. Bogen. "Matisse: A Visual Analytics System for Exploring Emotion Trends in Social Media Text Streams." In Proceedings of the 2015 IEEE International Conference on Big Data, Santa Clara, California, November 2015.
- C.A. Steed, **J.M. Beaver**, P.L. Bogen, M.G. Drouhard, and J.M. Pyle. "Text Stream Trend Analysis using Multiscale Visual Analytics with Applications to Social Media Systems." In Proceedings of the 2015 ACM IUI Workshop on Visual Text Analytics, Atlanta, Georgia, March 2015.
- 2014 R.C. Borges-Hink, **J.M. Beaver**, M.A. Buckner, T. Morris, U. Adhikari and S. Pan. "Machine Learning for Power System Disturbance and Cyber-attack Discrimination." In Proceedings of the 7th International Symposium on Resilient Control Systems, Denver, Colorado, 2014.
- 2013 **J.M. Beaver**, R.C. Borges-Hink and M.A. Buckner. "An Evaluation of Machine Learning Methods to Detect Malicious SCADA Communications." In Proceedings of the 2013 International Conference on Machine Learning and Applications, Miami, Florida, December 2013.
- J.M. Beaver**, C.T. Symons and R.E. Gillen. "A Learning System for Discriminating Variants of Malicious Network Traffic." In Proceedings of the 8th Cyber Security and Information Intelligence Research Workshop, Oak Ridge, Tennessee, January 2013.

2012

C.T. Symons and **J.M. Beaver**. "Nonparametric Semi-supervised Learning for Network Intrusion Detection: Combining Performance Improvements with Realistic In-Situ Training." In Proceedings of the 5th ACM Workshop on Artificial Intelligence and Security, Raleigh, North Carolina, October 2012.

X. Cui, **J.M. Beaver**, and J.N. Treadwell. "ShadowNet: An Active Defense Infrastructure for Insider Cyber Attack Prevention." In Proceedings of the 12th International Conference on Computational Science and Its Applications (ICCSA 2012), Salvador, Brazil, June 2012.

J.M. Beaver. "Machine Learning for Malicious Transaction Detection in Critical Infrastructure Communications", ORNL Technical Report ORNL/TM-2012/478, 2012.

2011

R.M. Patton, **J.M. Beaver**, C.A. Steed, J.N. Treadwell, and T.E. Potok. "Hierarchical Clustering and Visualization of Aggregate Cyber Data." In Proceedings of the 7th International Wireless Communications and Mobile Computing Conference (IWCMC-2011), Istanbul, Turkey, July 2011.

J.M. Beaver, C.A. Steed, R.M. Patton, X. Cui, and M.A. Schultz. "Visualization Techniques for Computer Network Defense." In Proceedings of the SPIE Conference on Defense, Security, and Sensing 2011, Orlando, Florida, April 2011.

J.M. Beaver, R.M. Patton, and T.E. Potok. "An Approach to the Automated Determination of Host Information Value." In Proceedings of the 2011 IEEE Symposium on Computational Intelligence in Cyber Security, Paris, France, April 2011.

B.A. Jewell and **J.M. Beaver**. "Host-based Data Exfiltration Detection via System Call Sequences." In Proceedings of the 6th International Conference on Information Warfare and Security, Washington, D.C., March 2011.

X. Cui, **J.M. Beaver** and T.E. Potok. "Visual Mining Intrusion Behaviors By Using Swarm Technology." In Proceedings of the 44th Hawaii International Conference on System Sciences, Kauai, Hawaii, January 2011.

R.M. Patton, **J.M. Beaver** and T.E. Potok. "Classification of Distributed Data Using Topic Modeling and Maximum Variation Sampling." In Proceedings of the 44th Hawaii International Conference on System Sciences, Kauai, Hawaii, January 2011.

J.M. Beaver, C. Rojas, C.T. Symons. "Knowledge Discovery for Attack Sources: Methods and Analytics for Cyber Incident Investigation.", ORNL Technical Report ORNL/TM-2011/28, 2011.

J.M. Beaver, R.M. Patton. "Mail Monitor: Text Mining for the Discovery of Advanced Persistent Threats.", ORNL Technical Report ORNL/TM-2011/301, 2011.

J.M. Beaver, C. T. Symons. "Tigershark: Machine Learning Framework for Network Intrusion Variant Detection.", ORNL Technical Report ORNL/TM-2011/487, 2011.

J.M. Beaver, C. Rojas, J. Tolliver. "Fused Intelligent Network Defense: Methods and Analytics for Cyber Event Investigation and Attribution.", ORNL Technical Report ORNL/TM-2011/532, 2011.

2010

S.J. Fernandez, A.N. Rose, E.A. Bright, **J.M. Beaver**, C.T. Symons and O.A. Omitaomu. "Construction of Synthetic Populations with Key Attributes: Simulation Set-up while Accommodating Multiple Approaches within a Flexible Platform." In Computational Modeling and Discovery in Social Systems (CMDSS) 2010, Minneapolis, Minnesota, August 2010.

X. Cui, **J.M. Beaver**, E. Stiles, L.L. Pullum, B. Klump, J.N. Treadwell and T.E. Potok. "The Swarm Model in Open Source Software Developer Communities." In Proceedings of the 2nd International Conference on Social Computing, August 2010.

J.M. Beaver, R.M. Patton, X. Cui, T.E. Potok, C.T. Symons, B. Klump, J.N. Treadwell. "Oak Ridge Cyber Analytics: Methods for Advanced Intrusion Detection and Cyber Security Data Analysis.", ORNL Technical Report ORNL/TM-2010/21, 2011.

J.M. Beaver, R.M. Patton, T.E. Potok, B. Klump, J.N. Treadwell. "Host Information Value Engine: Methods for Advanced Information Discovery and Valuation.", ORNL Technical Report ORNL/TM-2010/22, 2011.

2009

X. Cui, **J.M. Beaver**, T.E. Potok, L.L. Pullum and J.N. Treadwell. "A Stigmergy Approach for Open Source Software Developer Community Simulation." In Proceedings of the 2009 Symposium on Social Computing Applications (SCA09), Vancouver, Canada, September 2009.

J.M. Beaver, R.A. Kerekes and J.N. Treadwell. "An Information Fusion Framework for Threat Assessment." In Proceedings of the 12th International Conference on Information Fusion, Seattle, Washington, July 2009.

J.M. Beaver, X. Cui, J.L. St. Charles and T.E. Potok. "Modeling Success in FLOSS Project Groups." In Predictor Models in Software Engineering (PROMISE) 2009, Vancouver, Canada, May 2009.

J.M. Beaver, R.A. Kerekes and J.N. Treadwell. "Decision-level Information Fusion to Assess Threat Likelihood in Shipped Containers." In

Proceedings of the 2009 IEEE International Conference on Technologies for Homeland Security, Waltham, Massachusetts, May 2009.

J.M. Beaver, R.M. Patton, X. Cui, Y. Jiao, C.T. Symons, J.N. Treadwell, T.E. Potok. "Advanced Methods for Cyber Security Asset Valuation and Intelligent Event Correlation.", ORNL Technical Report ORNL/TM-2010/1, 2009.

S. Fernandez, C.T. Symons, Y. Jiao, **J.M. Beaver**, T.E. Potok. "Project Aidan Final Report: A pilot of the Battelle Threat Anticipation Initiative (TAI).", ORNL Technical Report ORNL/TM-2009/301, 2009.

2008 X. Cui, J.L. St. Charles, T.E. Potok and **J.M. Beaver**. "Dimensionality Reduction Particle Swarm Algorithm for High Dimensional Clustering." In IEEE Swarm Intelligence Symposium 2008, St. Louis, Missouri, September 2008.

2006 **J.M. Beaver**. "A Life Cycle Software Quality Model Using Bayesian Belief Networks." University of Central Florida, 2006.

J.M. Beaver and G.A. Schiavone. "The Effects of Development Team Skill on Software Product Quality." In ACM Software Engineering Notes, Vol 31, Iss 3, pp. 1-5, May 2006.

2005 **J.M. Beaver**, G.A. Schiavone, and J.S. Berrios. "Predicting software suitability using a Bayesian belief network." In Proceedings of the Fourth International Conference on Machine Learning and Applications (ICMLA '05), Dec 15-17, 2005.

J.M. Beaver. "Model for Software Quality Prognosis and Diagnosis.", Kennedy Space Center Director's Discretionary Fund 2005 Annual Report, pp. 83-88, 2005.

J.M. Beaver. "Software Quality Diagnosis and Prognosis Model" KSC Technology Development and Application 2005, pp. 132-133.

2003 **J.M. Beaver** and G.A. Schiavone. "A Comparison of Software Quality Modeling Techniques." In Proceedings of the 2003 International Conference on Software Engineering Research and Practice, Las Vegas, Nevada, June 2003.

J.M. Beaver and G.A. Schiavone. "Spatial Data Analysis as a Software Quality Modeling Technique." In Proceedings of the 15th International Conference of Software Engineering and Knowledge Engineering, July 2003.

2002 **J.M. Beaver** and Darrell G. Linton. "Using Design Metrics to Predict Error-Prone Modules." In Proceedings of the 6th IASTED International

Conference on Software Engineering and Applications, Cambridge, MA, November 2002.

Professional Service

2018	ORNL Resilient Cyber Physical Systems LDRD Committee
2017	Reviewer, El Sevier Computers and Security Journal ORNL Exascale LDRD Committee Cybersecurity Technology Expo Coordinator
2016	Reviewer, El Sevier Computers and Security Journal Reviewer, IEEE Transactions on Systems, Man, and Cybernetics Journal Program Committee, Cyber and Information Security Research Conference
2015	Reviewer, El Sevier Computers and Security Journal Program Committee, Cyber and Information Security Research Conference
2014	Program Committee, Cyber and Information Security Research Conference. Conference Organizer, ICMLA Workshop on Machine Learning Challenges in Cyber Security Applications
2013	CAC Workshop Program Committee. ICMLA 2013 Workshop Program Committee.
2010	Reviewer, ACM Transactions on Software Engineering and Methodology (TOSEM).
2009	Reviewer, ACM Transactions on Software Engineering and Methodology (TOSEM).

Student Advising and Mentoring

2017	ORNL Early Career Mentor for James (Mitch) Allmond.
2016	Raymond Borges-Hink, Post-MS, West Virginia. ORNL Women in Computing Mentor for Kelly Huffer.
2015	Raymond Borges-Hink, Post-MS, West Virginia. Allison Cabo, Undergraduate Summer student, Allegheny College
2014	Raymond Borges-Hink, Post-MS, West Virginia. Brad Bazemore, Undergraduate Summer student, Georgia Southern
2013	Raymond Borges-Hink, Post-MS, West Virginia. Adam Gillfillan, Undergraduate Summer student, Berry College Devin Gibson, Undergraduate Summer student
2012	Brian Jewell, Post-MS, Tennessee Tech. Blake MacNair, High School intern, Hardin Valley Academy.
2011	Brian Jewell, Post-BS, Tennessee Tech.
2010	Matt Schultz, Undergraduate Summer student, Liberty University. Brian Jewell, Undergraduate Summer student, Tennessee Tech.
2009	Undergraduate summer student.

Media Coverage

2017	The science behind national security, ORNL Review, Nov 7, 2017.
2012	Oak Ridge Lab takes new tack on 'big security', Government Computing News, April 12, 2012.
2011	Lab's behavioral system can catch insider threats, Government Computing News, November 17, 2011.
	Avoiding the Great Compromise: Tracking the information, ORNL Review, Vol. 44, No. 1, January 2011.
2010	ORNL Technology May Better Detect Cyber Security Attacks, Communications of the ACM, March 3, 2010.
	Oak Ridge turbocharges intrusion detection systems, Government Computer News, February 15, 2010.
	Advanced attack analysis, Oak Ridge National Laboratory Story Tip, February 11, 2010
2009	Risk Assessment for Cyber Protection, Lockheed Martin Insights, Vol. 6, No. 1, 2009.

Presentations

Aug 2018	"Cyber and Information Security Research." Presented to RADM Ronald R. Fritzemeier, Chief Engineer, Space and Naval Warfare Systems Command, at ORNL.
Feb 2018	"Oak Ridge Cyber Analytics: A Network Traffic Classification Engine." Presented at the 2 nd Annual Workshop on Naval Applications of Machine Learning, San Diego, CA.
Nov 2017	Invited Panelist on "Your Cyber Security" at the Intersect '17 Conference, Knoxville, TN.
Mar 2017	"Machine Learning for Cyber/Intel." Presented to DOE/IN at ORNL.
Aug 2017	"National Challenges in Cybersecurity." Presented to TN Senator Bob Corker's staff, at ORNL.
Jul 2017	"Oak Ridge Cyber Analytics: Attack Variant Detector". Presented to the TN State Cyber Security Committee, at ORNL.
Apr 2017	"Rapid Cyber Detect/Defeat." Presented to Army Research Lab, at ORNL.
Feb 2017	"Vehicle Security Research/Development." Invited presentation at the IC Telematics Conference, Chantilly, VA.
Feb 2016	"Cyber Situational Awareness." Invited presentation at the PACOM Pacific Operational Science and Technology Conference, Honolulu, HI.

Apr 2016 "Data Analytics." Presented to INSCOM, at ORNL.

Jul 2016 "Cyber Forensics.", Presented to the FBI, Chantilly, VA.

Jul 2016 "Cyber Data Analytics." Presented to the NCIJTF, Chantilly, VA.

Mar 2015 "Cyber data analytics: the future of computer network defense." Presented at the University of Tennessee, Knoxville, TN.

Apr 2015 "Rademacher Complexity Analysis for Model Selection and Retraining." Presented at the DARPA Mission-oriented Resilient Clouds Conference, Palo Alto, CA.

Apr 2015 "Cyber Data Analytics." Presented to US Navy/SPAWAR, San Diego, CA.

Apr 2015 "Oak Ridge Cyber Analytics." Presented to DHS Transition to Practice Program, at ORNL.

Sep 2015 "Cyber Data Analytics." Presented to DOE IN, at ORNL.

Oct 2015 "Cyber Data Analytics." Presented to 24th Air Force, at Lachland AF Base, San Antonio, TX.

Jun 2014 "Cyber Data Analytics." Presented to NSA Cyber Task Force.

Aug 2014 "Cyber Data Analytics." Presented to 24th Air Force, at Lachland AF Base, San Antonio, TX.

Aug 2014 "Computational Data Analytics." Presented to Northrup Grumman, at ORNL.

Oct 2014 "Computational Data Analytics." Presented to PayPal, Inc, at ORNL.

Dec 2014 "Cyber Data Analytics." Presented to USAF SAF/CIO A6S, Pentagon, Washington, DC.

Dec 2014 "Cyber Data Analytics." Presented to the Global Security Directorate Strategic Advisory Committee, at ORNL.

Jan 2013 "A Learning System for Discriminating Variants of Malicious Network Traffic." Presented at the 8th Cyber Security and Information Intelligence Research Workshop, Oak Ridge, Tennessee.

Feb 2013 "Intelligent Computing Research." Presented to NGA in Springfield, VA.

Jan 2012 "Insider Threat." Presented to University of South Alabama faculty.

Feb 2012 "Intelligent Computing and Cyber Security." Presented at the Navy/AF Cybersecurity Technology Conference in Colorado Springs, CO.

Apr 2012 "Intelligent Computing and Cyber Security." Invited speaker at the University of Tennessee Science Forum, Knoxville, TN.

Apr 2012 "Cyber Data Analytics." Presented to NORTHCOM at ORNL.

Apr 2011 "Visualization Techniques for Computer Network Defense." Presented at the SPIE Conference on Defense, Security, and Sensing 2011, Orlando, Florida

Jan 2009 "Information Fusion for Threat Assessment." Presented to Raytheon.

May 2009 "Decision-level Information Fusion to Assess Threat Likelihood in Shipped Containers." Presented at the 2009 IEEE International Conference on Technologies for Homeland Security, Waltham, Massachusetts.

May 2009 "Modeling Success in FLOSS Project Groups." Presented at Predictor Models in Software Engineering (PROMISE) 2009, Vancouver, Canada.

Dec 2005 "Predicting software suitability using a Bayesian belief network." Presented at the Fourth International Conference on Machine Learning and Applications (ICMLA '05).

Jun 2003	"A Comparison of Software Quality Modeling Techniques." Presented at the 2003 International Conference on Software Engineering Research and Practice, Las Vegas, Nevada.
Jul 2003	"Spatial Data Analysis as a Software Quality Modeling Technique." Presented at the 15th International Conference of Software Engineering and Knowledge Engineering.
Nov 2002	"Using Design Metrics to Predict Error-Prone Modules." Presented at the 6 th IASTED International Conference on Software Engineering and Applications, Cambridge, MA.

Personal Information

- US Citizen
- Married, with two sons
- Resident of Knoxville, TN
- Activities: Running, Volleyball, Soccer

Community Service

2008 – current	Regular contributor to: United Methodist Church Youth Ministry Institute
	Occasional contributor to: Compassion International St. Jude's Hospital ALS Research Tennessee Tech University
2014 – current 1996 – 2007	Church Youth Counselor
2018 – current	Developer/maintainer of www.farragutadmiralsbasketball.com
2013 – 2016	Youth Basketball Coach
2011 – 2012	Youth Flag Football Coach
2010 – 2011	Cub Scout Leader
2005 – 2008	Youth Soccer Coach