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900 N. Glebe Rd.
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LAURA J. FREEMAN

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703-946-0859(cell)
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https://scholar.google.com/citations?user=A5lcl4cAAAAJ&hl=en&authuser=1

EDUCATION

Virginia Polytechnic Institute & State University, Blacksburg, VA

Ph.D. Statistics, 2010
   Thesis: Statistical Methods for Reliability Data from Designed Experiments
M.S. Statistics, 2006
B.S. Aerospace Engineering, Minor: Mathematics, 2005

PROFESSIONAL EXPERIENCE

Virginia Tech, 2019 - Present

Current: Director, Intelligent Systems Division, National Security Institute
              Faculty, Hume Center for National Security and Technology
              Assistant Dean of Research, College of Science
              Associate Research Professor, Department of Statistics
Previous: Director, Intelligent Systems Lab, Hume Center for National Security and
              Technology (2020-2021)
              Associate Director, Intelligent Systems Lab (2019-2020)

Summary: Leads a research division and sponsored research programs. My research leverages experimental methods to solve problems in emerging technologies. Current research brings together cyber-physical systems, data science, artificial intelligence, and machine learning to address critical challenges in national security. Current active funding is $10.6M (PI Role) and $14.8 M (PI and Co-PI Roles).

Virginia Tech, Applied Research Corporation, 2021 – Present
Title: Director, Information Sciences and Analytics Division

Institute for Defense Analyses, 2010 - 2019

2014 – 2019: Assistant Director, Operational Evaluation Division
2017 – 2018: Senior Technical Advisor to Director Operational Test and Evaluation
2012 – 2014: Task Leader: Test Science Research and Test Science Applications
2010 – 2012: Research Staff Member

Summary: Established and developed an interdisciplinary analytical team of statisticians, psychologists, and engineers to advance the state of DoD test and evaluation. Served as an acting Senior Technical (ST) leader for Director Operational Test and Evaluation (DOT&E). Led research projects on test and evaluation reform for the Chief Management Officer (CMO) and test science research and applications for DOT&E. Worked to institutionalize scientific thinking in DoD testing. Focus areas include test design, statistical data analysis, modeling and simulation validation, software testing, cybersecurity testing, reliability analysis, and human-system interactions. Designed tests and conducted statistical analyses for programs of national importance including weapon systems, missile defense, undersea warfare systems, command and control systems, and most recently the F-35.

Science Applications International Corporation (SAIC), 2010

Title: Statistician
Summary: Provided technical expertise to the Director Operational Test and Evaluation.

Research Consultant NASA, 2008-2010

Title: Research Consultant
Summary: Worked with interdisciplinary team from NASA's Engineering Safety Center to design carbon fiber strands fatigue tests. Developed experimental design protocols and documented analysis methods for large scale solid rocket motor calibration for Ares I.

Virginia Tech, 2007 - 2008

Title: Interim Director, Laboratory for Interdisciplinary Statistical Analysis
Summary: Developed strategic plan for a new statistical laboratory. Developed initial, operating plans, policy, financial plans, and website. Directed the day-to-day operations for 25 consultants. Secured, in collaboration with University officials, $750,000 for three years of initial funding.

BOOKS AND CHAPTERS IN EDITED VOLUMES

Rigdon, S., Montgomery, D. and Freeman, L. J., and Pang, R. (2022). *Design of Experiments for Reliability Analysis.* Wiley publication in progress, expected release March 2022.

Batarseh, F., Freeman, L.J., et.al. (2022). *Artificial Intelligence Assurance.* Elsevier Academic Press publication in process, expected release June 2022. Editors: Batarseh, F. and Freeman, L.

Freeman L. J., Johnson, T., Avery, M., Lillard, V., Clutter, J. "Testing Defense Systems." *Analytic Methods in Systems and Software Testing.* © 2018, John Wiley & Sons, Ltd. Editors: Kenett, R., Ruggeri, F., Faltin, F. 439-487.

Vining, G.G., Freeman, L.J., & Kensler, J. (2015). An Overview of Designing Experiments for Reliability Data. Frontiers in Statistical Quality Control 11., Springer International Publishing. Editors: Knoth, S., Wolfgang, S. 321-336.

PUBLICATIONS

Peer Reviewed

Hong, Y., Lian, J., Xu, L., Min, J., Wang, Y. Freeman, L., Deng, X. (2021). Statistical Perspectives on Reliability of Artificial Intelligence Systems. Submitted to International Statistics Review. arXiv preprint: https://arxiv.org/pdf/2111.05391.pdf.

Batarseh, F. A., Freeman, L., & Huang, C. H. (2021). A Survey on Artificial Intelligence Assurance. Journal of Big Data, 8(1), 1-30.

Monken, A., Haberkorn, F., Gopinath, M., Freeman, L., & Batarseh, F. A. (2021). Graph Neural Networks for Modeling Causality in International Trade. In The International FLAIRS Conference Proceedings (Vol. 34, No. 1).

Wood, S., Lanus, E., Doyle, D., Ogorzalek, J. Franck, C., Freeman, L. (2021) Developing Hierarchies for Image Classification Model Evaluation. IEEE, 4th International Conference on Artificial Intelligence for Industries (AI4I) (pp. 34-37).

Lanus, E., Freeman, L. J., Kuhn, D. R., & Kacker, R. N. (2021). Combinatorial Testing Metrics for Machine Learning. In 2021 IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW) (pp. 81-84).

Lian, J., Freeman, L., Hong, Y., & Deng, X. (2021). Robustness with Respect to Class Imbalance in Artificial Intelligence Classification Algorithms. Journal of Quality Technology 53 (5), 505-525.

Freeman, L.J., Rahman, A. Batarseh, F. (2021). Enabling Artificial Intelligence Adoption through Assurance. Social Sciences. 10 (9).

Lanus, E., Hernandez, I., Dachowicz, A., Freeman, L., Grande, M., Lang, A., & Welch, S. (2021). Test and Evaluation Framework for Multi-Agent Systems of Autonomous Intelligent Agents. arXiv preprint arXiv:2101.10430.

Higgins, E., Sobien, D., Freeman, L., & Pitt, J. S. (2021). Data Fusion for Combining Information for Disparate Data Sources for Maritime Remote Sensing. In AIAA Scitech 2021 Forum (p. 0915).

Johnson, TH, Haman, JT, Wojton, H, Freeman, L. (2020). Circular prediction regions for miss distance models under heteroscedasticity. Quality Reliability Engineering International. 1– 13.

Freeman, L. (2020) Test and Evaluation for Artificial Intelligence. INSIGHT, 23: 27-30.

Freeman, L.J., Dickinson, R., and Johnson, T. (2019).Challenges and New Methods for Design Reliability Experiments. Quality Engineering Quality Engineering 31 (1), 108-121.

Dickinson, R., Freeman, L.J., Kensler, J., Vining, G. (2019). Analysis of a Split-Plot Reliability Experiment with Subsampling. Quality and Reliability Engineering International 35 (3), 738-749.

Johnson, T., Dickinson, R., Freeman, L.J. (2019). Power Approximations for Failure-Time Regression Models. Quality and Reliability Engineering International 35 (6), 1666-1675.

Johnson, T.H., Medlin, R.M., Freeman, L.J. (2018). On Scoping a Test that Addresses the Wrong Objective. Quality Engineering, 1-10.

Avery, M., Avery, K., Freeman, L.J. (2018). Statistical Methods for Defense Testing. Wiley StatsRef: Statistics Reference Online (pp.1-5).

Freeman, L.J. and Warner C. (2018). Informing the Warfighter – Why Statistical Methods Matter in Defense Testing. Chance Magazine 31 (2), 4-11.

Johnson, T., Freeman, L.J., Simpson, J. & Anderson, C. (2017). Power Approximations for Generalized Linear Models using the Signal-to-Noise Transformation Method. *Quality Engineering*, 1-14.

Avery, M., Orndorff, M., Robinson, T., & Freeman, L.J. (2016). Regularization for Continuously Observed Ordinal Response Variables with Piecewise-constant Functional Covariates. Quality and Reliability Engineering International. 32(6), 2033-2042.

Dickinson, R.; Freeman, L.J., Simpson, B., Wilson, A. (2015). Statistical Methods for Combining Information: Stryker Family of Vehicles Reliability Case Study. Journal of Quality Technology. 47 (4), 400-415.

Johnson, T.H.; Freeman, L.J.; Hester, J.; Bell, J.L. (2014). A Comparison of Ballistic Resistance Testing Techniques in the Department of Defense. IEEE Access, 1442-1455.

Kensler, J., Freeman. L.J., and G.G. Vining. (2014). A Practitioner's Guide to Analyzing Reliability Experiments with Random Blocks and Subsampling. Quality Engineering. Vol. 26 (3), 359-369.

Freeman, L.J., Ryan, A., Kensler, J., Dickinson, R., Vining, G. (2013). A Tutorial on the Planning of Experiments. Quality Engineering. Vol. 24 (4), 315-332.

Freeman, L.J., Vining, G.G. (2013). Reliability Data Analysis for Life Test Designed Experiments with Sub-Sampling. Quality Reliability Engineering International. Vol. 29 (4), 509-519.

Freeman, L.J., (2011). A Cautionary Tale: Small Sample Size Concerns for Grouped Lifetime Data. Quality Engineering. Vol. 23, 134-141.

Olteanu, D., Freeman, L.J. (2010). The Evaluation of Median Rank Regression and Maximum Likelihood Estimation Techniques for a Two-Parameter Weibull Distribution." Quality Engineering. Vol. 22 (4), 256-272.

Freeman, L.J., Vining, G.G., (2010). Reliability Data Analysis for Life Test Experiments with Sub-Sampling. Journal of Quality Technology. Vol. 42, Number 3.

Kemper, A.R.., McNally, Pullins, C.A., Freeman, L.J., and Stefan M. Duma. (2007). The Biomechanics of Human Ribs." Stapp Car Crash Journal. Vol. 51.

Peer Reviewed Technical Reports

Freeman, L.J., Avery, K., et. al., "Handbook on Statistical Design and Analysis Techniques for Modeling and Simulation Validation." (2019) IDA Document D-10455.

Freeman, L.J., Flack, A., Kirshenbaum, K., "Managing Test and Evaluation Data to Encourage Reuse." (2019) IDA Document D-10395.

Freeman, L.J., Edwards, D., Forbes, D., Bell, J., "Integrated Testing Best Practices and Recommendations." (2019) IDA Document D-10386.

Freeman, L.J., Ambroso, M., Hong, J., Paul, J., "Shift Left Framework Strategy and Implementation Plan." (2019) IDA Document D-10394.

Freeman, L.J. and Erikson, B. "F-35 Mission Effectivness Test Concept Overview and Analysis." (2018) IDA Document D-8609.

Thomas, D., Goodman, A., Avery, M., Bell, J., Dickinson, R., Hueckstaedt, R., Peek, D., Roberts, M. and Freeman, L. "Assessment of Reliability in DoD Acquisition Programs". (2018) IDA Document D-8997.

Freeman, L.J., Kirshenbaum, K. and Avery, M. "Reproducible Research for OED". (2017) IDA Document D-8675.

Freeman, L.J. and Avery, M.. "Prediction Uncertainty for Autocorrelated Lognormal Data with Random Effects". (2017) IDA Document, D-8629.

Freeman, L.J., McGinnity, K. and Wojton, H. "Users Are Part of the System: How to Account for Human Factors When Designing Operational Tests for Software Systems". (2017) IDA Document D-8630.

Freeman, L.J., Goodman, A., Avery, M., Bell, J., Hueckstaedt, R., Peek, D. and Roberts, M. "2015 Reliability Assessment". (2016) IDA Document D-8152.

Avery, M., Johnson, T., Lillard, V. and Freeman, L. "Applications of Modern Statistical Techniques to Operational Testing". (2016) IDA Document NS D-8119.

Freeman, L.J., Khoury, G., Pechkis, D., Rambow, P., Schulman, E. and Weber, P. "Problem Discovery in Operational Testing". (2016) IDA Paper P-5356.

Freeman, L.J., Avery, M., Daniello, A., Peek, D., Rambow, P. and Roberts, M. "2014 Reliability Assessment". IDA Document D-5711.

Kramer, C., Cazares, S., Freeman, L.J., Hottendorf, K. (MCOTEA), Keltz, I., Mariella, R. (LLNL), Ralston, J., Snyder, J., and Ziskin, M.(Temple University). "Human Effects Assessment Panel: Active Denial Technology Risk of Significant Injury". (2015) IDA Document D-5638.

Freeman, L.J., Gaither, C., Hester, J., DeWolfe, D. and Thomas, D. "Problem Discovery in Operational Testing". (2015) IDA Paper P-5268.

Fronczyk, K., Dickinson, R., Wilson, A., Browning, C. and Freeman, L.J. "Bayesian Hierarchical Models for Common Components Across Multiple System Configurations". (2015). IDA Document D-5514.

Freeman, Laura J., Avery, M., Butler, D. and Peek, D. "Reliability Survey of DOT&E Acquisition Programs". (2015) IDA Document D-5287.

Freeman, L.J., St. Thomas, B. and Jones, T. "Topic Modeling with Natural Language Priors". (2015). IDA Document D-5359.

Freeman, Laura J., Johnson, Thomas H. and Simpson, J. "Power Analysis Tutorial for Experimental Design Software". (2014). IDA Document D-5205.

Hester, J. and Freeman, L.J. "Applying Risk Analysis to Acceptance Testing of Combat Helmets". (2014). IDA Document D-5334.

Freeman, L.J., Thomas, D. and Eveker, K. "Reasons Behind Program Delays". (2014). IDA Document D-5289.

Khoury, G., Clutter, J. and Freeman, L.J. "Design of Experiments for In-Lab Operational Testing of the AN/BQQ-10 Submarine Sonar System". (2014). IDA Document D-5286.

McGinnity, K. and Freeman, L.J. "Statistical Analysis: Model Selection Tutorial". (2014). IDA Document D-5201.

Lillard, V. and Freeman, L.J. "Taking the Next Step: Improving the Science of Test in DoD T&E". (2014). IDA Document D-5101.

Freeman, L.J., Bell, J., Wells, M. and Avery, M.. "2012 Reliability Survey of Selected Acquisition Programs Under DOT&E Oversight". (2013). IDA Document D-5007.

Freeman, L.J., Bell, J. and Bearden, S. "Reliability Growth Planning Based on Essential Function Failures". (2013). IDA Document D-4872.

Freeman, L.J., Wells, M., Bell, J. and Snyder, C. "Reliability Survey of DOT&E Acquisition Programs". (2013). IDA Document D-4775.

Freeman, L.J., Lillard, V., Johnson, T, Heuring, E. and Grier, R. "Design and Analysis of Experiments and Survey Design and Evaluation for Action Officers". (2013). IDA Document D-4716.

Freeman, L.J., Johnson, T.H. and Anderson, C.. "Power Analysis Methods For Test and Evaluation". (2012). IDA Paper P-4887.

Peterson, R., Tan, K. and Freeman, L.J. "Test and Evaluation Concept for the Joint Air-to-Ground Missile (JAGM)". (2012). IDA Paper P-4867.

Thomas, D., Anderson, T., Thayer, B., Schofield, J., Freeman, L.J., McAllister, C., Reichenbach, H. and Rhoads, J. "Test and Evaluation Concept for the KC-46A Replacement Tanker Aircraft". (2012). IDA Document D-4700.

Thayer, B. and Freeman, L.J. "Test and Evaluation Concept for the Joint and Allied Threat Awareness System (JATAS)". (2012). IDA Paper P-4740.

Freeman, L.J. and Lillard, V. "Demystifying Design of Experiments (DOE) and Illustrating the Value of DOE-Based Analyses". (2012). IDA Document D-4663.

Freeman, L.J. "Design for Reliability Using Robust Parameter Design". (2011) IDA Document D-4200.

Non Peer Reviewed

Freeman, L.J. (2020). Test and Evaluation for Artificial Intelligence. INSIGHT. 23(1), 27-30.

Freeman, L.J. (2019). Book review of "Soren Bisgaard's Contributions to Quality Engineering" by Vining, Does, Murat. Journal of Quality Technology. 52(3), 325-326.

Freeman, L.J., Avery, K., Johnson, T. (2019). "Design of Experiments for Model Validation – The Foundations for Uncertainty Quantification." ITEA Journal of Test and Evaluation. Vol 40 (1).

Freeman, L.J. (2018). A Groundswell for Test and Evaluation. ITEA Journal of Test and Evaluation. Vol. 39 (4).

Fronczyk, K. & Freeman, L.J. (2016). Improving Reliability Estimates with Bayesian Statistics. ITEA Journal of Test & Evaluation. Vol. 37 (4).

Freeman, L.J. (2016). Rigorous Test and Evaluation for Defense Aerospace, and National Security: A Panel Session Summary. ITEA Journal of Test and Evaluation. Vol. 37 (4).

Freeman, L.J. (2015). Book review of "Reliability Engineering" by K.C. Kapur and M. Pecht. Journal of Quality Technology.

Freeman, L. J., Murphy, T, Leiby, L. D., & Glaeser, K. (2015). How Scientific Test and Analysis Techniques Can Assist the Chief Developmental Tester. ITEA Journal of Test & Evaluation. Vol 36 (2).

Freeman, L. J., Hutto, G., and N. Mackertich. (2014). Scientific Methods for Improving DoD Test and Evaluation — Statistical Test Optimization Synthesis Panel. ITEA Journal of Test and Evaluation. Vol. 35 (1), 31- 39.

Freeman, L. J., Rucker, A., and K. Glaesar. (2011). Use of Statistically Design Experiments to Inform Decisions in a Resource Constrained Environment. ITEA Journal of Test and Evaluation. Vol. 32 (3), 267-276.

FUNDING

Virginia Tech

2021 – 2021 Top-down 5G Network Security Design and Implementation, Deloitte (Co-PI, $400k)

2021 – 2021 Developmental Test and Evaluation for Cyberattack Resilient Systems (Co-PI, $181k)

2021 – 2021 Transitioning Mission Aware Concepts and Methods for Secure Design (Co-PI, $158k)

2020 – 2021 MITRE University Innovation Exchange, Metrics for Evaluating Human Agent Teaming (PI, $110k)

2020 – 2021 Raytheon Cyber Fellowship Program (Co-PI, $2.4M)

2020 – 2020 MITRE University Innovation Exchange, Artificial Intelligence Model Certification in Operating Environments (PI, $66k)

2020 – 2020 Raytheon Augmented Reality and Analytics as a Service (Co-PI, $20k)

2019 – 2020 Performance Measures, Environments, Actuators, Sensors for Cognitive Agents, Systems Engineering Research Center, (PI, $125k)

2019 – 2020 Threat Beacon, Virginia Tech - Applied Research Corporation, DTRA (PI, $2.5M)

2019 – 2020 Enhancing Cybersecurity Research, NSF, Security and Software Engineering Research Center (PI, $325k)

2019 – 2020 Comprehensive National Incident Management System Support, DTRA (PI, $3.5M)

2019 – 2019 Verification and Validation Test and Evaluation Competencies, System Engineering Research Center (PI, $21k)

Institute for Defense Analyses

2018 - 2019 DoD Chief Management Office, Test and Evaluation Reform (PI, $315k)

2014 – 2018 Statistics and Data Science Cross-Divisional Research and Working Group, IDA Corporate Research Program (PI, $765k)

2015 – 2018 Defense and Aerospace Test and Analysis Techniques Workshop, IDA Corporate Research Program (PI, $200k)

2012 – 2017 Test Science Applications, Director Operational Test and Evaluation (PI, $6.3M)

2012 – 2017 Test Science Research, Director Operational Test and Evaluation (PI, $2.5M)

FELLOWSHIPS AND AWARDS

2019 International Test and Evaluation Association Cross Award

2019 International Test and Evaluation Association Publication Award

2018 Welch Award Finalist for Best External Publication, IDA

2017 Andrew J. Goodpaster Award for Excellence in Research, IDA

2015 Welch Award Finalist for Best External Publication, IDA

2014 Welch Award Finalist for Best External Publication, IDA

2014 Best Paper Award - International Test and Evaluation Association

2013 Junior Achiever Award - International Test and Evaluation Association

2011 American Society for Quality, 40 New Voices of Quality Award

2011 NASA Engineering and Safety Center Group Achievement Award

2010 Mary G. and Joseph Natrella Scholarship

2009-2010 Virginia Space Grant Consortium, Graduate Research Fellowship Recipient

2008-2010 Amelia Earhart Fellow

2009 Graduate Woman of the Year, Virginia Tech

2005-2008 Department of Homeland Security Fellow
2008, 2009 College of Science, Roundtable Scholarship Finalist
2007 Virginia Tech Citizen Scholar
2006 Outstanding Graduate Assistant Award, Department of Statistics

STUDENT ADVISING

Statistics

Jennifer Kensler, Ph.D., Virginia Tech, 2012, Committee Member
Rebecca Medlin, Ph.D., Virginia Tech, 2014, Co-Chair
Victoria Sieck, Ph.D., University of New Mexico, 2021, Committee Member
Yueyao Wang, Ph.D., Virginia Tech, Expected 2022, Committee Member

Industrial Systems Engineering

Yongchun, Li, Ph.D. Student, Virginia Tech, Committee Member

Electrical and Computer Engineering

Logan Eisenbeiser, M.S., Virginia Tech, 2020, Co-Chair

Aerospace and Ocean Engineering

Erik Higgins, Ph.D. Student, Virginia Tech, Committee Member

TEACHING

Introduction to Statistical Programming, Data Analytics and Applied Statistics Program, 2019

Adjunct Faculty, George Washington University, 2013
- STAT 6283: Risk Analysis

Teaching Assistant/Instructor, Virginia Tech, 2005 - 2009
- STAT 3704 Online: Statistics for Engineering Applications, 2009
    - Designed, developed, and taught Department's first web-based implementation of 3704.
- STAT 4024/5024: Communications in Statistics/Statistical Consulting, 2008
    - Graduate level course preparing students for statistical consulting positions
- STAT 3704: Statistics for Engineering Applications, 2006 –2007, 100+ Students per semester
- STAT 2004: Introductory Statistics, Teaching Assistant, 2005 – 2006

Peer Mentor, STAT 3704/ STAT 3615, Department of Statistics, Fall 2007– Spring 2008
- Developed a mentoring program for new student teachers
- Prepared monthly presentations on: Blackboard tutorials, teaching strategies, grading policies and honor code issues

SHORT COURSES

Scientific Test and Analysis Techniques (STAT) Continuous Learning Module (CLM)
    Short course for the Defense Acquisition University (DAU), in progress
Probability and Statistics Continuous Learning Module (CLM)

Online short course for the Defense Acquisition University (DAU), required since 2014 for all T&E certified practitioners.

One-day short courses delivered on numerous occasions for DoD, NASA, DHS, and Service Test Agencies including:

- Design of Experiments
- Design for Reliability and Reliability Analysis
- Statistical Analysis for Operational Testers
- Modeling and Simulation Validation
- Generalized Linear Models
- Requirements Analysis

Statistical Summer Seminar Series, Virginia Tech, Summer 2008

Developed 2-hour talks on: Design of Experiments, Regression, ANOVA, Principal Component Analysis & Factor Analysis, General Linear Mixed Models

CONFERENCES

2018 Co-Chair Defense and Aerospace Test and Analysis Workshop (DATAWorks)
2017 Co-Chair, Science of Test Workshop
2016 Founding Co-Chair, Science of Test Workshop
2014 Organizing Committee Member Conference on Applied Statistics in Defense (CASD)

PRESENTATIONS

INVITED

Digital Acquisition and Data Strategy, Acquisition Innovation Research Center Sponsor Review, November 2021

Theoretical Issues in T&E of Artificial Intelligence, MORS AI and Autonomy Workshop, October 2021

Invited Panel: T&E Workforce – Developing the Current and Future Workforce, International Test and Evaluation Association Symposium, September 2021

Invited Panel T&E for AI/ML Enabled Systems, International Test and Evaluation Association Symposium, September 2021

Design of Experiments Approaches for Investigating and Improving Machine Learning Robustness, Joint Statistical Meetings, August 2021

Research Frontiers for Digital Transformation, Acquisition Innovation Forum, April 2021

Performance Measures, Environments, Actuators, Sensors (PEAS) for Testing Autonomous Intelligent Agents, SERC Research Review, November 2020

Demystifying Machine Learning and Artificial Intelligence for the Defense Community, JMP Statistically Speaking Seminar Series, August 2020

Balancing Robust Classical Designs With Design Constraints – Applications In Testing Defense Systems, The Fifth International Conference on the Interface between Statistics and Engineering, June 2019

Institutionalizing Statistical Thinking in Defense Testing – A F-35 Case

Invited Case Study, Statistical Engineering Summit, October 2018.

Methods for Accelerated Delivery of Capability – Reforming Test and Evaluation
   Invited Panel, National Defense Industrial Association, Systems and Mission Engineering
   Conference, October 2018.

A Life Cycle View of Statistics – The Statistician as a Leader
   Invited Panel, Joint Statistical Meetings, August 2018.

Challenges and New Methods for Designing Reliability Experiments
   Invited Talk, Stu Hunter Research Conference, March 2018.

Reliability Best Practices And Lessons Learned In The Department Of Defense
   Keynote Address, Reliability and Maintainability Symposium, January 2018.

Institutionalizing Statistical Thinking in Defense Testing
   Invited Seminar, University of Wisconsin, September 2017.

The Science of Test and Evaluation: Tools and Methods for the Future of T&E
   Invited Presentation to the Air Force Science Advisory Board, January 2017.

Optimizing Sensitivity Experiments: Balancing Mathematical and Practical Constraints
   Invited, Conference on Experimental Design and Analysis, December 2016.

The Value of Statistical Thinking in Rigorous, Defensible, Efficient Testing
   Keynote Address, Quality Workshop Picatinny Arsenal, May 2016.
   Technical Keynote, Conference on Quality in Defense and Industry, March 2016.

Incorporating New Advances in Sensitivity Test Procedures in DoD Test Protocols
   Invited Session. Joint Statistical Meetings, August 2014.

Implementing Design and Analysis of Experiments in the U.S. Department of Defense Testing Community
   Invited Talk. European Network for Business and Industrial Statistics, September 2012.

Meta-Analysis for the Assessment of Defense System Reliability
   Invited Talk. Quality Productivity Research Conference. June 2012

Statistically Rigorous Decisions in Defense Testing
   Invited Talk. Institute for Continual Quality Improvement, May 2012.

Accelerated Life Testing: Tutorial with NASA and DoD Applications
   Invited, NASA Statistical Engineering Symposium. Williamsburg, VA May 2011.

Reliability Data Analysis for Designed Experiments from Engineering Applications
   Invited, Virginia Space Grant Student Research Conference, Hampton, VA. April 2010

CONTRIBUTED

Implementing a Policy of Statistical Rigor in Defense Testing
   Topic Contributed, Joint Statistical Meetings, August 2017.

Capitalizing on all Test Data: Statistical Methods for Doing More without More
   Best Paper Award International Test and Evaluation Symposium, October 2014.

Science of Test: Improving the Efficiency and Effectiveness of DoD

Conference on Statistics in Defense. October 2014.

Statistical Engineering Case Study: Revising Test Protocols for Combat Helmet Testing
Honorable Mention SPES Presentation Award. Joint Statistical Meetings, August 2013.

Continuous Metrics for Efficient and Effective Testing
National Defense Industrial Association, Nation Test and Evaluation Conference, March 2012

Design of Experiments in Highly Constrained Design Spaces
Contributed, Army Conference on Applied Statistics, October 2011.

Design for Reliability using Robust Parameter Design
Topic Contributed, Joint Statistical Meetings, August 2011.

Design of Experiments for Test and Evaluation: Best Practices and Future Challenges
Contributed, Army Conference on Applied Statistics, October 2010.

Reliability Data Analysis for Designed Experiments
Contributed, Joint Research Conference, May 2010.
Contributed, Joint Statistical Meetings, August 2010.

A Comparative Statistical Analysis for Forest Service Trail Tread Width
Contributed Poster, Joint Statistical Meetings, Washington, D.C. August 2009

A Comparison Between Rank Regression and Maximum Likelihood Methods of Estimation for Weibull Regression
Topic Contributed, Joint Statistical Meetings, Denver, CO August 2008.

Panel on Teaching in Your Discipline: Mathematical and Physical Sciences
Panel Moderator, Preparing the Future Professoriate 2008 GTA Workshop, Virginia Tech, August 2008

SERVICE AND OUTREACH

Editor-In-Chief, International Test and Evaluation Association Journal, 2019 - Present
Systems Engineering Research Center, Technical Advisory Board, 2020 – Present
Academic Innovation Council, Project Maven, Member, 2019 – Present
Technometrics Management Committee, 2020-2022
Associate Editor, Quality Engineering, 2014-2021
Guest Editor, Quality Reliability Engineering International, 2018
ITEA, Publication Committee Member, 2010-2018
American Statistical Association
- Chair, Section on Statistics in Defense and National Security, 2017
- Secretary/Treasurer, Section on Statistics in Defense and National Security, 2015-2017
- Program Chair, 2014
American Society for Quality, Government Division, Secretary, 2011-2014
Virginia Tech Graduate Student Assembly
- President, 2009-2010
- Health Insurance Committee Chair, 2008-2009

- Delegate, 2008-2009
- Vice President of Programs, 2006-2007, 2007-2008
- Research Symposium Chair, 2005-2006
- Student Summer Status Committee Chair, 2005-2006

Virginia Tech Committees and Commissions
- University Budget Board, 2009-2010
- Town Gown, University & Town Relationship Committee, 2008-2009
- Commission on Graduate Studies and Policies Member, 2008-2009
- April 16 Planning Committee, Member, 2008
- University Council Member, 2006-2007, 2007-2008, 2009-2010
- Committee on Student Affairs, 2005-2006 & 2009-2010

Virginia Tech Department of Statistics

Statistics Graduate Student Association, 2008 - 2009
Student Outreach Seminar Committee, 2006-2007
Teacher Mentoring Program Founder and Mentor, 2008-2009

Other Service

Graduate Honor System Panelist, 2008-2009
AP Statistics Reader, Louisville, Kentucky, June 2008

MEMBERSHIPS

International Test and Evaluation Association (ITEA)
National Defense Industrial Association
American Statistical Association
American Society for Quality