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GRADUATE SCHOOL OF ENGINEERING & MANAGEMENT

2022-2023

FACULTY EXCELLENCE SHOWCASE

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THE GRADUATE SCHOOL OF THE U.S. AIR FORCE

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The AFIT Graduate School Faculty Excellence was designed to showcase publications, awards and accomplishments of current faculty and to serve as a reference guide for potential external research partners by featuring research areas of expertise.



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www.AFIT.edu/BIOS

FACULTY QUICK FACTS



**Number of Tenure-track
and Tenured Faculty
Fall 2022**

82
MILITARY

80
CIVILIAN

**Faculty Patents
Awarded
2001-2022**

79

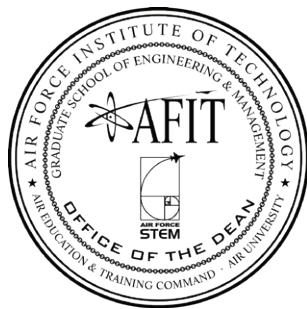


DEAN'S MESSAGE



Adedeji B. Badiru

Dean, Graduate School of
Engineering and Management



The reputation of a university is predicated on the excellence of the faculty who represent the intellectual foundation of the university. Although AFIT is a military organization, our academic mission places us in the enviable position of operating within the nexus of three cultures of government, academia, and military. Judging by the benchmarks available in academia, I am proud enough of the quality and excellence of our faculty that I refer to AFIT as the "MIT of the Midwest." The contents of this edition of our faculty excellence publication confirms this astute representation.

The Air Force Institute of Technology has a proud heritage dating back over 100 years. Faculty, staff, students, and graduates of AFIT have contributed in no small measure to the national defense of the U.S. consistently for decades. History buffs can confirm this by looking back into the accounts of the courage, determination, and accomplishments of the Doolittle Raiders during World War II. Nowadays, we are leveraging research and development, coupled with technology transfer, as the primary weapon of preserving and advancing national defense. Therein lies the basis for promoting the excellence of the faculty in AFIT's Graduate School of Engineering and Management.

I encourage readers to use this publication as a guide to discovering the diverse expertise of our faculty. Partnership within and outside the school is important to us. Thus, this handbook serves effectively as a "research partner finder." I encourage everyone to use it accordingly.

With the best AFIT regards to all,

A handwritten signature in black ink, reading "Adedeji B. Badiru". The signature is fluid and cursive.

Adedeji B. Badiru, Ph.D., P.E.

The views expressed in this publication are those of the authors and do not reflect the official policy or position of the Air Force Institute of Technology, Department of the Air Force, Department of Defense, or United States government.



Dr. Adedeji B. Badiru, PE, PMP, FIIE

PhD Industrial Engineering, University of Central Florida

Dean, Graduate School of Engineering and Management

Professor of Systems Engineering

Most Notable Publications

Badiru, A. B. (2023), "Systems Engineering Using DEJI Systems Model: Design, Evaluation, Justification, and Integration with Case Studies and Applications", Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. (2022), Global Supply Chain: "Using Systems Engineering Strategies to respond to Disruptions," Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. and Gary Lamont (2022), "Innovation Fundamentals: Quantitative and Qualitative Techniques," Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. and Tina Agustiady (2021), "Sustainability: A Systems Engineering Approach to the Global Grand Challenge," Taylor & Francis CRC Press, Boca Raton, FL. Selected as Book-of-the-Month, *IISE Magazine*, June 2021.

Badiru, A. B. (2021), "Data Analytics: Handbook of Formulas and Techniques," Taylor & Francis CRC Press, Boca Raton, FL.

Badiru, A. B. (2020), "Innovation: A Systems Approach," Taylor & Francis CRC Press, Boca Raton, FL. Listed in Qualiware's 52 recommended Enterprise Architecture books from 2020 (<https://www.qualiware.com/blog/52-books>)

Badiru, A. B. (2019), "Project Management: Systems, Principles, and Applications, Second Edition," Taylor & Francis CRC Press, Boca Raton, FL.

Selected Honors & Awards

- 2022 Frederick Winslow Taylor Award, Highest Award from IEOM Society (Industrial Engineering and Operations Management), January 2022
- 2022 Career Achievement in Government Award, BEYA (Black Engineer of the Year) program
- 2020 Lifetime Achievement Award, Taylor and Francis/CRC Press, October 2020. Youtube video of award ceremony: <https://www.youtube.com/watch?v=q0ltUSt4pcM>
- 2016 Outstanding Global Engineering Education Award, Industrial Engineering and Operations Management (IEOM) award
- 2015 Air Force-level Winner of National Public Service Award, The American Society for Public Administration and the National Academy of Public Administration
- 2012 IIE Medallion Award, Institute of Industrial Engineers

Significant Accomplishments

- DEJI Systems Model® - Trademark for systems Design, Evaluation, Justification, and Integration
- Fellow of Industrial Engineering and Operations Management (IEOM) Society
- Fellow of Nigerian Academy of Engineering
- Fellow of Institute of Industrial & Systems Engineering (IISE)
- ABET Program Evaluator (PEV)



Research Interest Areas

Project engineering and management, data and computational analysis for learning curves, systems modeling for operational improvement, engineering economic analysis, supply chain optimization, innovation systems management, and organizational efficiency.



Dr. Mark F. Reeder

PhD, Mechanical Engineering, Ohio State University

Professor of Aerospace Engineering

Most Notable Publications

Probst, Z., **Reeder, M.**, Johnson, R., and Grove J., "Flight-Test Experiments on Cavity Flow in an SUU- 41 Pod," *Journal of Aircraft*, Vol. 54, No. 5, September 2017, pp. 1814-1824.

Seney, S.D., Huffman, R.E., Bailey, W., Liu, D., **Reeder, M.F.**, and Stults, J., "Improving Performance of a Sliding Dielectric Barrier Discharge Actuator Using Multiple Potentials", *AIAA Journal*, Vol. 54 (10), October 2016, pp. 3316-3319.

Merrick, J. & **Reeder, M.F.**, "Sphere Release from a Rectangular Cavity at Mach 2.22 Freestream Conditions," *AIAA Journal of Aircraft*, Vol. 53, No. 3, May-June 2016, pp. 822-829.

Cleaver, T.A., Gutman, A.J., Martin, C.L., **Reeder, M.F.** & Hill, R.R., "Using design of experiments methods for applied computational fluid dynamics: A case study," *Quality Engineering*, Vol. 28 (3), May 2016, pp. 280-292.

Callaway, D., **Reeder, M.**, Greendyke, R., and Gosse, R., "Measurement and Analysis of Ablation of Solid Carbon Dioxide exposed to a Mach 3 Flow," *AIAA Journal of Spacecraft and Rockets*, Vol. 51, No. 1, January 2014, pp. 213-225.

Significant Accomplishments

- Co-author of 43 refereed journal publications and 4 U.S. patents.
- AIAA Associate Fellow
- Member of the American Society of Mechanical Engineering
- Licensed Professional Engineer (State of Ohio)



Research Interest Areas

- Fluid Dynamics
- Air Vehicle Design
- Aerodynamic Measurement Techniques



Dr. Bradley Ayres

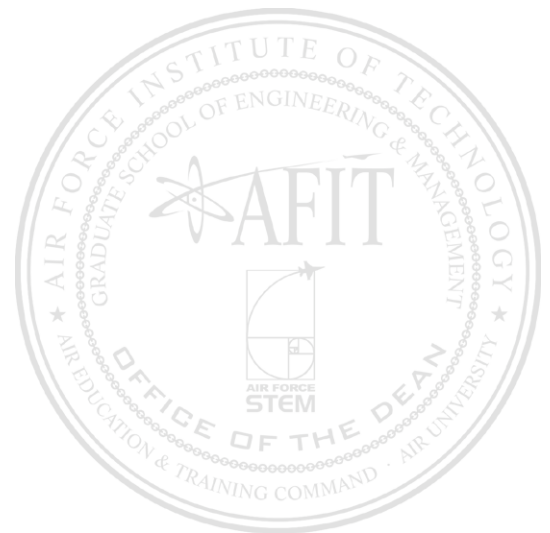
PhD, Business Administration Specializing in MIS, Florida State University

Assistant Professor of Aerospace Engineering



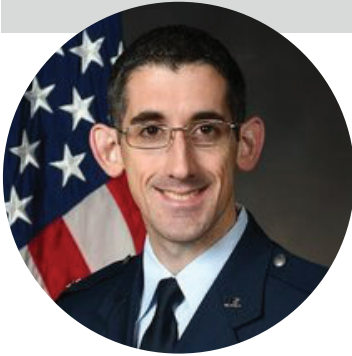
Research Interest Areas

- Complex systems
- Model-based systems engineering
- Space systems engineering





DEPARTMENT OF AERONAUTICS & ASTRONAUTICS



Lt Col Robert A. Bettinger

PhD, Astronautical Engineering, Air Force Institute of Technology

Deputy Director, Center for Space Research & Assurance

Assistant Professor of Astronautical Engineering

Most Notable Publications

Wilmer, A. P., Boone, N. R., **Bettinger R. A.**, "Debris Propagation and Spacecraft Survivability Assessment for Catastrophic Mishaps Occurring in Cislunar Periodic Orbits," *Journal of Space Safety Engineering*, Vol. 9, No. 2, June 2022, pp. 207-222.

Wilmer, A. P., **Bettinger R. A.**, "Beyond the High Ground: A Taxonomy for Earth-Moon System Operations," *Air and Space Operations Review*, Vol. 1, No. 2, Summer 2022.

Bettinger, R. A., "Atmospheric Reentry Hemisphere Prediction for Prograde Orbits Using Logical Disjunction," *Advances in Space Research*, Vol. 67, No. 10, May 2021, pp. 3267-3281.

Poole, C., **Bettinger, R. A.**, "'Black Space' versus 'Blue Space': A Proposed Dichotomy of Future Space Operations," *Air & Space Power Journal*, Vol. 35, No. 1, Spring 2021, pp. 4-18.

Bettinger, R. A., "Linear Model for Reentry Time Prediction of Spacecraft in Low-Eccentricity, Low Earth Orbits," *Journal of Spacecraft and Rockets*, Vol. 56, No. 5, September-October 2019, pp. 1300-1311.

Selected Honors & Awards

- 2021 Air Force Science and Engineering Award, Exploratory or Advanced Technology Development (Individual) Category
- 2020 Graduate School of Engineering & Management (GSEM) Early Career Achievement Award
- 2020 AETC Outstanding Scientist/Engineer (Mid-Career Military)
- 2020 AETC Outstanding Scientist/Engineer Team of the Year (CSRA)
- 2019 General Muir S. Fairchild Education Achievement Award (CSRA)
- 2019 AFIT Innovation Award – Junior Faculty (Centennial Award Series)
- 2019 AU Nominee for Air Force Outstanding Scientist/Engineer (Mid-Career Military)

Significant Accomplishments

- Bettinger, R. A., "Early Warning Reentry System Comprising High Efficiency Module for Determining Spacecraft Reentry Time," AFD-1925, U.S. Patent No. 11,312,512; Issue Date: 26 April 2022.



Research Interest Areas

- Atmospheric Re-entry
- Cislunar Trajectory and Mission Design
- Spacecraft Survivability
- Spacecraft Control and Navigation
- Space Law and Doctrine



Maj John S. Brewer Jr.

PhD, Aeronautical Engineering, Air Force Institute of Technology

Assistant Professor of Aerospace Engineering

Most Notable Publications

J. Brewer, A. Palazotto, J. Feie, C. Holycross, "Bearing Fatigue Response in Bolted Hybrid Composite Joints," *AIAA Scitech 2021 Forum*, <https://doi.org/10.2514/6.2021-1402>

M. Sherburne, C. Roberts, **J. Brewer**, T. Weber, T. Laurvick, and H. Chandralim, "Comprehensive Optical Strain Sensing Through the Use of Colloidal Quantum Dots," *ACS Applied Materials & Interfaces* 2020 12 (39), 44156-44162, DOI: [10.1021/acsami.0c1211](https://doi.org/10.1021/acsami.0c1211)

M. Sherburne, C. Roberts, **J. Brewer**, T. Weber, T. Laurvick, H. Chandralim, "Strain Sensing Using Colloidal Quantum Dots Integrated With Epoxy," *IEEE Sensors* 2020.

J. Brewer, A. Palazotto, J. Feie, M. Gran, "Bearing Response Characterization in Bolted Hybrid Composite Joints," Orlando, FL, *AIAA Scitech 2020 Forum*, <https://doi.org/10.2514/6.2020-1928>

J. Brewer, A. Palazotto, M. Falugi, "Optimization of the Bearing Stress of a Hybrid Composite," San Diego, CA, *AIAA Scitech 2019 Forum*, <https://doi.org/10.2514/6.2019-0779>

Selected Honors & Awards

- Best Session Presentation Award, 15th Annual Dayton Engineering Sciences Symposium



Research Interest Areas

- Composite and hybrid composite structures
- Aerospace materials evaluation
- Computational structural analysis
- Development of aerospace manufacturing



Dr. Richard G. Cobb

PhD, Astronautical Engineering, Air Force Institute of Technology

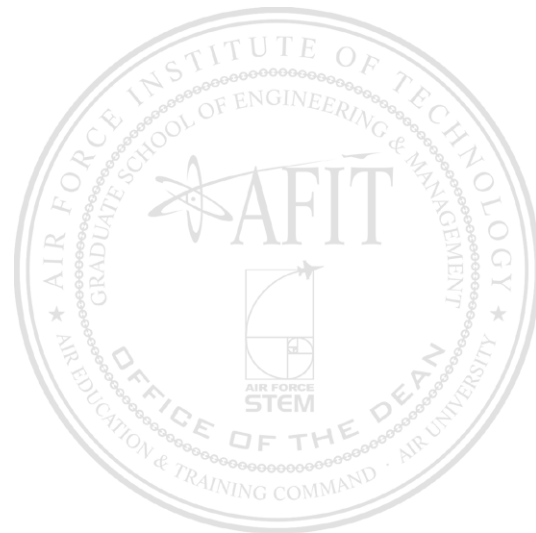
Professor Emeritus of Aerospace Engineering

Most Notable Publications

Livermore, R., Lindholm, G., Neal, C., **Cobb, R.** and Colombi, J., "Heuristic Near-Optimal UAS Path Planning for Convoy Overwatch", *Journal of Unmanned Aerial Systems*, Vol 2, No 1, 2016.

Humphreys, C., **Cobb, R.**, Jacques, R. and Reeger, J., "A Hybrid Technique to Rapidly Solve the Intermediate-Target Optimal Control Problem", *Global Journal of Technology & Optimization*, August 2016, DOI: [10.4172/2229-8711.1000200](https://doi.org/10.4172/2229-8711.1000200).

Denton, J., Hodson, D., **Cobb, R.**, Mailloux, L., Grimaila, M., and Baumgartner, G., "A Model to Estimate Performance of Space-Based Quantum Communication Protocols Including Quantum Key Distribution Systems", *Journal of Defense Modeling and Simulation (JDMS)*, Nov 2016.



Research Interest Areas

- Dynamics and control of aerospace systems, including control of aircraft, spacecraft, large flexible structures, and optical systems.

Recent work includes:

- Developing optimal trajectory plans for Global Strike missions
- Optimal aircraft air and ground collision avoidance algorithms for manned and unmanned systems
- Active buffet alleviation using piezoelectric actuators for F-16 aircraft

- Maneuver planning for satellite proximity operations
- Dynamics and control techniques for lightweight space optics and optimal/novel sensor systems
- Architectures for enhancing space situational awareness



Lt Col S. Darrell Crowe

PhD, Aeronautical Engineering, Air Force Institute of Technology

Assistant Professor of Aerospace Engineering

Most Notable Publications

Bills, J., **Crowe, D. S.**, Rutledge, J., and Coy, E. "Modeling Fuel Film Cooling on a Flat Plate", *Journal of Thermophysics and Heat Transfer*, Vol. 32, No. 3, pp. 736-746.

Crowe, D. S., Martin, C. L. "Hot Streak Characterization of High-Performance Double-Serpentine Exhaust Nozzles at Design Conditions", *Journal of Propulsion and Power*, Vol. 35, No. 3, pp. 501-511.

Crowe, D. S., Thornock, R. L., Brown, T. "Propulsion Aerodynamic Workshop IV: Modeling of the Jet From a High Aspect Ratio Rectangular Convergent Nozzle, With and Without an Aft Deck, at Pressure Ratios up to 3.5, Including a Comparison With Experimental Results (Invited)", *AIAA Paper* 2019-3927.

Crowe, D. S., Depaola, R. "A Method to Compute Thermal Distortion in Non-Circular Ducts", *AIAA Paper* 2019-1449.

Pung, J., **Crowe, D. S.** "Tracking Shock Movement on the Surface of an Oscillating, Straked Delta Wing", *AIAA Paper* 2019-2318.

Selected Honors & Awards

- American Institute of Aeronautics and Astronautics Associate Fellow, 2020
- Field Grade Officer of the Quarter, Air University, 2015, 2018
- Southwestern Ohio Council for Higher Education Faculty Excellence Award, 2015



Research Interest Areas

- Applied computational fluid dynamics
- Nozzle flows
- Store separation
- Weapons integration
- Advanced grid generation methods



Lt Col David H. Curtis

PhD, Astronautical Engineering, Air Force Institute of Technology

Assistant Professor of Aerospace Engineering

Most Notable Publications

Curtis, D. H., Reeder, M. F., Svanberg, C. E., and Cobb, R. G. "Flapping Wing Micro Air Vehicle Bench Test Set-up," *47th AIAA Aerospace Sciences Meeting*, Orlando FL, 2009.

Curtis, D. H., and Cobb, R. G. "Satellite Articulation Tracking Using Monocular Computer Vision," *AAS 41st Annual Guidance and Control Conference*, pages 1-13, Breckenridge, CO, 2018.

Curtis, D.H., and Cobb, R. G., "Satellite Articulation Tracking Using Computer Vision," *Journal of Spacecraft and Rockets* (2019), 1-14.

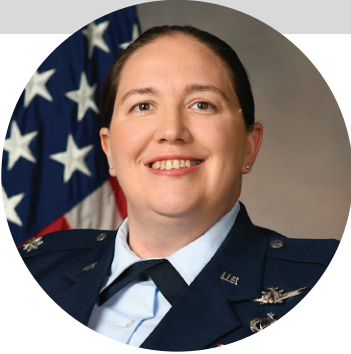
Selected Honors & Awards

- AFRL Nominee for Lance P. Sijan Leadership Award, 2010
- Meritorious Service Medal x 2
- Defense Meritorious Service Medal



Research Interest Areas

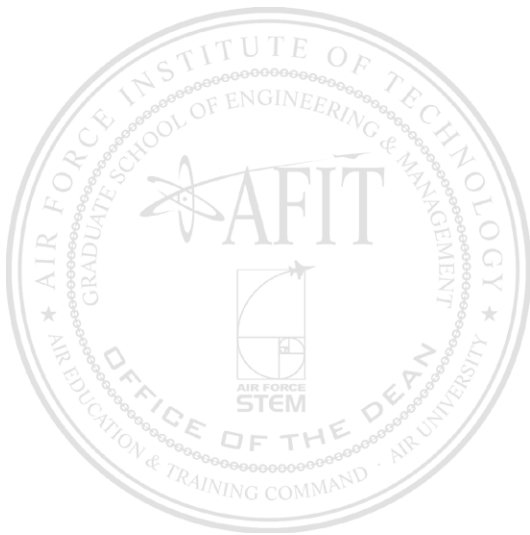
- Spacecraft rendezvous and proximity operations
- Orbital engagement maneuvers
- Spacecraft autonomous guidance
- Trajectory optimization
- On-orbit robotics
- Computer vision
- Stochastic estimation and control



Lt Col Rachel M. Derbis

PhD Candidate, Astronautical Engineering, Air Force Institute of Technology

Instructor of Astronautical Engineering



Selected Honors & Awards

- 2020 – Tau Beta Pi National Honor Society in Engineering Inductee
- 2020 – Eta Kappa Nu National Honor Society in Engineering Inductee



Research Interest Areas

- Space Domain Awareness
- Astrodynamics, especially multi-body / cislunar
- Orbit and trajectory design
- Autonomous tasking of space assets



Dr. Rama S. Gorla

PhD, Mechanical Engineering, University of Toledo

Professor of Aerospace Engineering

Most Notable Publications

Tripathi, J., Vasu, B., Dubey, A., **Gorla, R.S.R.**, Murthy, P.V.S.N., Anwar Beg, O. and Ponnaiah, S., "A review on Recent Advancements in the Hemodynamics of Nano-Drug Delivery Systems," *International Journal of Nanoscience and Technology*, 2020, DOI: [10.1615/NanoscienceTechnologyIntJ/2020033448](https://doi.org/10.1615/NanoscienceTechnologyIntJ/2020033448)

Dubey, A., Vasu, B., Anwar Beg, O., **Gorla, R.S.R.** and Kadir, A., "Computational Fluid Dynamic Simulation of Two-Fluid Non-Newtonian Nanohemodynamics through a Diseased Artery with a Stenosis and Aneurysm," *Computer Methods in Biomechanics and Biomedical Engineering*, 2020, DOI: [10.1080/10255842.2020.1729755](https://doi.org/10.1080/10255842.2020.1729755)

Vasu, B., **Gorla, R.S.R.**, Murthy, P.V.S.N. and Anwar Beg, O., "Entropy Analysis of a Convective Film Flow of a Power-Law Fluid with Nanoparticles along an Inclined Plate," *Journal of Applied Mechanics and Technical Physics*, Vol. 60, 2019, pp. 1-15.

Siddiqi, S., Begum, N., Hossain, M.A., Shoaib, M. and **Gorla, R.S.R.**, "Radiative Heat Transfer Analysis of Non-Newtonian Dusty Casson Fluid Flow along a Complex Wavy Surface," *Numerical Heat Transfer, Part A: Applications*, 2018.

Begum, N., Siddiqi, S., Hossain, M.A. and **Gorla, R.S.R.**, "Natural Convection and Separation Points of a Non-Newtonian Fluid along a Rotating Round-Nosed Body," *AIAA Journal of Thermophysics and Heat Transfer*, 2018.

Selected Honors & Awards

- Life Fellow ASME
- Fenn Distinguished Research Professor, 2008
- Distinguished Technical Educator Award from Cleveland Technical Societies Council on May 17, 2006
- Distinguished Faculty Teaching Award from Cleveland State University in 2004
- Teaching Excellence Award from the Northeast Ohio Council on Higher Education in 2004
- Distinguished Faculty Research Award from Cleveland State University in 1999



Research Interest Areas

- Hypersonics
- Computational Fluid Dynamics
- Two Phase Flow
- Heat and Mass Transfer
- Turbomachinery
- Complex Fluids
- Reliability Analysis



Dr. Ramana V. Grandhi

PhD, Engineering Mechanics, Virginia Tech

Professor of Aeronautics and Astronautics

Most Notable Publications

Deaton, J.D., and **Grandhi, R.V.**, "A Survey of Structural and Multidisciplinary Continuum Topology Optimization: post 2000," *Journal of Structural and Multidisciplinary Optimization*, Vol. 49, 2014, pp. 1-38.

Park, I., and **Grandhi, R.V.**, "Quantifying Multiple Types of Uncertainty in Physics-based Simulation Using Bayesian Model Averaging," *AIAA Journal*, Vol. 49, No. 5, 2011, pp. 1038-1045.

Riley, M., and **Grandhi, R.V.**, "Quantification of Model-Form and Predictive Uncertainty for Multi-Physics Simulation," *Computers and Structures*, Vol. 89, Nos. 25-26, 2011, pp. 1206-1213.

Amarchinta, H.K., **Grandhi, R.V.**, Clauer, A.H., Langer, K., and Stargel, D., "Simulation of Residual Stress Induced by a Laser Peening Process through Inverse Optimization of Material Models," *Journal of Materials Processing Technology*, Vol. 210, No. 14, 2010, pp. 1997-2006.

Alyanak, E., **Grandhi, R.**, and Bae, H., "Gradient Projection for Reliability-based Design Optimization Using Evidence Theory," *Engineering Optimization*, Vol. 40, 2008, pp. 923-935.

Selected Honors & Awards

- American Society of Mechanical Engineers – ASME Fellow
- American Institute of Aeronautics and Astronautics – AIAA Fellow
- 2017 Mahatma Gandhi Pravasi Samman Award. Presented at the House of Lords, British Parliament, London, UK. NRI Welfare Society of India, representing 31 million Indians abroad.
- 2015 Distinguished Alumni Professional Achievement Award – given by the National Institute of Technology, Warangal, India.
- 2014 AIAA Sustained Service Award – given for conference leadership, significant publications, and leadership in technical committees. Presented in Washington, D.C.
- 2012 Outstanding Leadership Award – given by Wright State University College of Engineering and Computer Science for leadership of Ph.D. in Engineering Program.



Research Interest Areas

- Aerospace Structures and Design
- Multidisciplinary Design Optimization
- Hypersonics
- Aircraft Structures



Maj John H. Hansen

PhD, Aerospace Engineering, University of Michigan

Assistant Professor of Aerospace Engineering

Most Notable Publications

J. H. Hansen, M. Duan, I. V. Kolmanovsky, and C. E. S. Cesnik, "Load Alleviation of Flexible Aircraft by Dynamic Control Allocation," *Journal of Guidance Control and Dynamics*, Vol. 45, No. 10 (2022), pp. 1890-1898

J. H. Hansen, M. Duan, I. V. Kolmanovsky, and C. E. S. Cesnik, "Control Allocation for Maneuver and Gust Load Alleviation of Flexible Aircraft," *AIAA SciTech Forum*, January 2020, p. 1186.

S. Usry, B. Sinclair, T. Brouze, C. Pinedo and **J. H. Hansen**, "Comparison of Flight Control Input Methods for Aerodynamic Parameter Estimation (HAVE PiTI)," *US Air Force Test Pilot School*, Dec 2013.

J. H. Hansen, T. Kameyama, "Formation Flight Control for Unmanned Aircraft using Swarm Control Principles," *Proceedings of International Conference on Unmanned Aircraft Systems*, Philadelphia PA, 2012.

M. Pachter, **J. H. Hansen**, D. Jacques and P. Blue, "Optimal Guidance of a Relay Aircraft to Extend Small Unmanned Aircraft Range," *International Journal of Micro Air Vehicles*, September 2010.

Selected Honors & Awards

- 2016 Field Grade Officer of the Year, Operations Group, Eglin AFB, FL
- 2011 Best Presentation for Poster Session, Technical Research and Development Institute Annual Symposium, Tokyo, Japan
- 2008 Best Presentation in Aircraft & Flow Control, Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, OH
- 2007 - Sigma Gamma Tau National Honor Society in Aerospace Engineering Inductee

Significant Accomplishments

- Fluent Japanese Speaker 3/3 Defense Language Proficiency Test



Research Interest Areas

- Aircraft stability and control
- Aero-servo-elasticity and control
- Aircraft Combat Survivability
- Optimization



Dr. Carl R. Hartsfield

PhD, Astronautical Engineering, Naval Postgraduate School

Associate Professor of Aerospace Engineering

Most Notable Publications

Shelton, T, G. Cobb, **C. Hartsfield**, B. Doane, C. Eckley, R. Kemnitz, 2021, "The Impact of Laser Control on the Porosity and Microstructure of Selective Laser Melted Nickel Superalloy 718," *Results in Materials*. Volume 11, Sept 2021.

DOI: ([10.1016/j.rinma.2021.100211](https://doi.org/10.1016/j.rinma.2021.100211))

Eckley, C.C., Kemnitz, R.A., Fassio*, C.P., **Hartsfield, C.R.**, Leonhardt, T.A., 2021, "Selective Laser Melting of Tungsten-Rhenium Alloys," *Journal of Materials*.

DOI: ([10.1007/s11837-021-04776-x](https://doi.org/10.1007/s11837-021-04776-x))

Hartsfield, C.R., Shelton, T.E., Cobb, G.R., Kemntiz, R.A., Weber, J., 2021, "Understanding Flow Characteristics in Metal Additive Manufacturing," *ASCE Journal of Aerospace Engineering*, Accepted 4 May 2021, DOI: ([10.1061/\(ASCE\)AS.1943-5525.0001325](https://doi.org/10.1061/(ASCE)AS.1943-5525.0001325))

Tommila, C.*, **C. Hartsfield**, J. Redmond*, J. Komives, T. Shelton, 2021, "Performance Impacts of Metal Additive Manufacturing of Very Small Nozzles," *ASCE Journal of Aerospace Engineering*, Vol. 34, No. 2. DOI: ([10.1061/\(ASCE\)AS.1943-5525.0001229](https://doi.org/10.1061/(ASCE)AS.1943-5525.0001229))

Crouch, S.*, **Hartsfield, C.**, 2020, "Triggered Lightning Threat Prediction Based on Launch Vehicle Parameters," *Journal of Defense Research and Engineering*, Volume 3, Issue 2, pp 39-50. (FOUO) (DTIC Accession number for issue: AD1101059)



Research Interest Areas

- Rocket Propulsion (chemical and electric)
- Spacecraft Design
- Additive Manufacturing

Selected Honors & Awards

- AFIT Category 4 Civilian of the Year, 2019
- AIAA Special Service Citation, 2018
- SOCHE Faculty Excellence in Teaching Award, 2017

Significant Accomplishments

- Program Chair for Graduate Space Systems Curriculum at AFIT
- Member of AIAA Small Satellites Technical Committee (2019-Present)
- Program Chair for Dayton Cincinnati Aerospace Sciences Symposium, 2018



Maj Ryan A. Kemnitz

PhD, Materials Science, Air Force Institute of Technology

Assistant Professor of Aerospace Engineering

Most Notable Publications

"Characterization of simulated low earth orbit space environment effects on acid-spun carbon nanotube yarns." **Kemnitz, R. A.**, Cobb, G. R., Singh, A. K., & Hartsfield, C. R. *Materials & Design*, Vol 184 (2019).

DOI: <https://doi.org/10.1016/j.matdes.2019.108178>

"Quantifying the effects of hyperthermal atomic oxygen and thermal fatigue environments on carbon nanotube sheets for space-based applications." Singleton, J. W., Cobb, G. R., Misak, H. E., & **Kemnitz, R. A.** *Results in Materials* 3, 100034 (2019).

DOI: <https://doi.org/10.1016/j.rinma.2019.100034>

"Mitigation of anisotropic fatigue in nickel alloy 718 manufactured via selective laser melting." Sabelkin, V. P., Cobb, G. R., Shelton, T. E., Hartsfield, M. N., Newell, D. J., O'Hara, R. P., & **Kemnitz, R. A.** *Materials & Design*, 182, 108095 (2019).

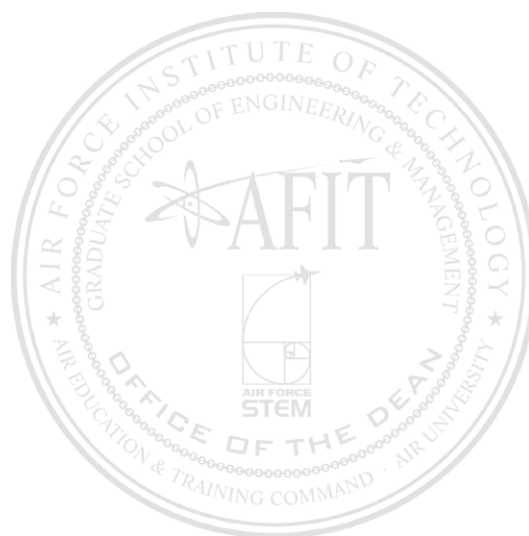
DOI: <https://doi.org/10.1016/j.matdes.2019.108095>

"Quantifying the effects of ultraviolet type C radiation on the mechanical and electrical properties of carbon nanotube sheet for space-based applications." Cobb, G. R., O'Hara, R. P., **Kemnitz, R. A.**, Sabelkin, V. P., & Doane, B. M. *Materials Today Communications*, 18, 7-13 (2019).

DOI: <https://doi.org/10.1016/j.mtcomm.2018.10.016>

"In-situ characterization of bulk carbon nanotube behavior in a sheet under tensile load." Singh, A. K., Cobb, G. R., & **Kemnitz, R. A.**, *Materials Today Communications*, 17, 493-500 (2019).

DOI: <https://doi.org/10.1016/j.mtcomm.2018.10.017>



Research Interest Areas

- Additive Manufacturing
- Carbon Nanotubes
- Materials Characterization



Dr. Donald L. Kunz

PhD, Aerospace Engineering, Georgia Institute of Technology

Professor of Aerospace Engineering

Most Notable Publications

Kunz, D.L., *Intermediate Dynamics for Aeronautics & Astronautics*, Second Edition, Headmaster Press, ISBN: 978-1687350664, September 2019.

*Hope, D.N., and **Kunz, D.L.**, "Investigation of Shock Motion in Transonic Flow Using an Oscillating, Straked, Delta Wing," *AIAA Journal*, Vol. 57, No. 10, October 2019. DOI: <http://arc.aiaa.org/doi/abs/10.2514/1.J057456>. (JIF=1.080).

*Olsen, C.C., Kalyanam, K., Baker, W.P., and **Kunz, D.L.**, "Maximal Distance Discounted & Weighted Revisit Period: A Utility Approach to Persistent Unmanned Surveillance," *Unmanned Systems*, Vol. 7, No. 4, July 2019, pp. 1-18. <http://doi.org/10.1142/S2301385019500079>.

*Kim, J.P. and **Kunz, D.L.**, "Handling Qualities Assessment of an Unmanned Aircraft Using Performance and Workload Metrics," *Journal of Guidance, Control and Dynamics*, Vol 40, No. 10, October 2017, pp. 2701-2709. DOI: <http://arc.aiaa.org/doi/abs/10.2514/1.G002306> (JIF=1.651)

*Tauer, T.M., **Kunz, D.L.** and Lindsley, N.J., "Visualization of Nonlinear Aerodynamic Phenomena During F-16 Limit-Cycle Oscillation," *Journal of Aircraft*, Vol. 53, No. 3, May-June 2016, pp. 865-870. DOI: <http://arc.aiaa.org/doi/abs/10.2514/1.C033534> (JIF=0.632)

Selected Honors & Awards

- Distinguished Service Award, American Institute of Aeronautics & Astronautics (2006)
- Leadership Award, American Institute of Aeronautics & Astronautics (2004)

Significant Accomplishments

- Professional Engineer (ME) Commonwealth of Virginia



Research Interest Areas

- Rotorcraft aeromechanics
- Aeroelasticity
- Structural dynamics
- Dynamics
- UAV handling qualities



Lt Col Bryan D. Little

PhD, Astronautic Engineering, Purdue University

Deputy Department Head

Assistant Professor of Astronautical Engineering

Most Notable Publications

Vasso, A., Cobb, R., Colombi, J., **Little, B.** and Meyer, D. (2021), "Augmenting the space domain awareness ground architecture via decision analysis and multi-objective optimization," *Journal of Defense Analytics and Logistics*, Vol. 5 No. 1, pp. 77-94.

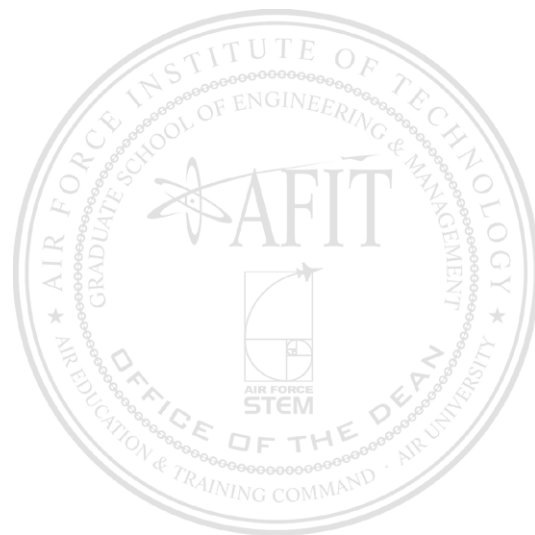
<https://doi.org/10.1108/JDAL-11-2020-0023>

Little, B. D., Frueh, C. E. "Multiple Heterogeneous Sensor Tasking Optimization in the Absence of Measurement Feedback," *The Journal of the Astronautical Sciences* (2020). <https://doi.org/10.1007/s40295-020-00232-1>

Little, B. D., Frueh, C. E. (2020). "Space situational awareness sensor tasking: Comparison of machine learning with classical optimization methods," *Journal of Guidance, Control, and Dynamics*, 43(2), 262–273. <https://doi.org/10.2514/1.G004279>

R. A. Bettinger, N. Boone, N. S. Hamilton and **B. D. Little**, "Spacecraft Charging Vulnerability near the Stable Earth-Moon Lagrange Points," *2021 IEEE Aerospace Conference* (50100), 2021, pp. 1-9, DOI:10.1109/AERO50100.2021.9438151

Knister, S., Williams, B. R., Hayhurst, D., Johnson, K. W., **Little, B. D.**, "Evaluation Framework for Cislunar Space Domain Awareness Systems," *American Astronautical Society Paper* 21-520, August 2021.



Research Interest Areas

- Sensor Tasking for Space Situational Awareness
- Astrodynamics
- Cis-Lunar Orbit Design
- Space Based Electro-Optical Sensor Systems



Lt Col Robert B. MacDermott

PhD, Astronautical Engineering, Air Force Institute of Technology

Assistant Professor of Aerospace Engineering

Most Notable Publications

MacDermott, R., Greendyke, R., Temme, N., Morgan, R., and McIntyre, T., "An Experimental Analysis of Hypersonic Carbon-Carbon Ablation in Representative-Wake Expansion Regions," *JANNAF Journal of Propulsion and Energetics*, Vol 12, Issue 1, 2021.

MacDermott, R., Greendyke, R., Temme, N., Morgan, R., and McIntyre, T., "Experimental Analysis of Hypersonic Carbon-Carbon Ablation in Representative-Wake Expansion Regions," *38th Exhaust Plume and Signatures Meeting (JANNAF)*, 2020-0006N, Virtual Meeting, December 2020.

MacDermott, R., and Greendyke, R., "Experimental Analysis of Gas-Surface Interactions with Ablating Material," *2020 National Space and Missile Materials Symposium*, Virtual Meeting, June 2020.

Selected Honors & Awards

- Air Force Materiel Command Special Programs Awards, Military Systems Engineer of the Year, 2015



Research Interest Areas

- Hypersonics
- Aerothermodynamics
- Computational Fluid Dynamics
- Nonequilibrium Flows
- Gas Surface Interactions
- Radiative Emissions



DEPARTMENT OF AERONAUTICS & ASTRONAUTICS



Dr. Anthony N. Palazotto

PhD, Solid Mechanics, New York University

Distinguished Professor of Aerospace Engineering

Most Notable Publications

More than 255 archival and over 450 presentations

Deleon, A., Baker, W. and **Palazotto, A.**, "Modeling a Nonlinear Melt Region as a Result of High-Speed Sliding," *Journal of Thermophysics and Heat Transfer*, Vol. 33, No. 3, July-September, 2019.

You, C., **Palazotto, A.**, and Buentello, R., "Evaluation of Thermomechanical Damage of a Slipper and Rail in a Rocket Sled System," *Journal of Testing and Evaluation*, Vol. 44, No. 4, pp 1443-1453, 2016.

Just, L., Deluca, A., and **Palazotto, A.**, "Nonlinear Dynamic Analysis of an Icosahedron Frame Which Exhibits Chaotic Behavior," *ASME Journal of Computational and Nonlinear Dynamics*, Vol. 12, pp 011006-1-10, January, 2017.

Abid, N, Abu-Al-Rub, R., and **Palazotto, A.**, "Micromechanical Finite Element Analysis of the Effects of Martensite Morphology on the Overall Mechanical Behavior of Dual Phase Steel," *International Journal of Solids and Structures*, Vol. 104-105, pp 8-24, 2017.

Easterday, O., **Palazotto, A.**, Baker, W., and Branam, R., "Damping Properties of Coatings at Elevated Temperatures," *Surface and Coatings Technology*, Vol. 321, pp 186-199, 2017.

Selected Honors & Awards

- Nominated for AIAA honorary Fellow, National Academy of Engineering (NAE), and Crichlow Award
- AIAA Achievement Award (2004)
- Structures, Structural Dynamics and Material Award, ASCE (1986)
- Hetanyi Award, Society of Experimental Mechanics, (1982)
- Cleary Award, Air Force Material Lab (1981)

Significant Accomplishments

- Fellow in AIAA, ASCE, Engineering Mechanics Institute, and American Academy of Mechanics



Research Interest Areas

- Nonlinear mechanics
- Shell analysis
- Finite elements
- Composite materials
- Viscoplasticity
- Nonlinear dynamics



Dr. Marc D. Polanka

PhD, Mechanical Engineering, University of Texas-Austin

Professor of Aeronautical Engineering

Most Notable Publications

Over 125 conference papers and over 55 peer-reviewed journal articles

Polanka, M.D., Rutledge, J.L., Bogard, D.G., and Anthony, R.J., "Determination of Cooling Parameters for a High Speed, True Scale, Metallic Turbine Vane Ring," *Journal of Turbomachinery*, Vol. 139(1), pg 011001 1:9, 2017. DOI: [10.1115/1.4033974](https://doi.org/10.1115/1.4033974)

Wiese, C.J., Rutledge, J.L., **Polanka, M.D.**, "Experimental Evaluation of Thermal and Mass Transfer Techniques to Measure Adiabatic Effectiveness with Various Coolant to Freestream Property Ratios," *Journal of Turbomachinery*, Vol. 140 (2), pg 021001 1:9, Feb 2018. DOI: [10.1115/1.4038177](https://doi.org/10.1115/1.4038177). **ASME Best Paper Award – Heat Transfer.**

Ausserer, J.K., **Polanka, M.D.**, Baranski, J.R and. Litke, P.J., "Mapping of Fuel Anti-Knock Requirements for a Small Remotely Piloted Aircraft Engine", *SAE Int. Journal of Aerospace* 12(1): June 2019, pg 1-17. DOI: [10.4271/2016-32-0045](https://doi.org/10.4271/2016-32-0045). **SAE Manly Award Winner for Best Paper.**

Huff, R., **Polanka, M.D.**, McClearn, M.J., Schauer, F.R, Fotia, M.L., Hoke, J.L., "Design and Operation of a Radial Rotating Detonation Engine," *Journal of Propulsion and Power*, Vol. 35, No. 6, 2019, pp. 1143-1150.

Bohan, B.T. and **Polanka, M.D.**, "Experimental Analysis of an Ultra-Compact Combustor Powered Turbine Engine," *Journal of Engineering for Gas Turbines and Power*, Vol. 142 (5) pg. 051014 1-10, May 2020.

Selected Honors & Awards

- Air Force Outstanding Science and Engineering Educator Award, 2019
- AFIT/EN Distinguished Teaching Professor, 2019
- AFIT Innovation Award, Senior Faculty, 2019
- AETC AF Outstanding Scientist/Engineer, Senior Civilian, 2017
- AIAA Sustained Service Award, 2017
- AFIT Faculty Administrative Fellow, 2016
- AFIT Civilian Category III of the Year, 2015
- AIAA Outstanding Section Award, Very Large Category, 1st Place, 2011, 2012, and 2018
- AFIT Charles P. Brothers Award for Outstanding Volunteer Service, 2010

Significant Accomplishments

- Fellow, American Society of Mechanical Engineers (ASME)
- Associate Fellow, American Institute of Aeronautics (AIAA)
- Chair of the AIAA Associate Fellow Committee (2018-2021)
- Chair of the ASME K-14 Heat Transfer Committee (2020-2022)



Research Interest Areas

- Ultra compact combustor development
- Film cooling of turbine airfoils
- Rotating detonation engines
- Internal combustion engines
- Scramjets



Dr. Marina B. Ruggles-Wrenn

PhD, Mechanical Engineering, Rensselaer Polytechnic Institute

Professor of Aerospace Engineering

Most Notable Publications

S. J. Robertson, **M. B. Ruggles-Wrenn**, R. S. Hay, T. Shillig, R. Mitchell, B. Kroeger, L. Gumucio, "Static fatigue of Hi-Nicalon™-S fiber at elevated temperature in air, steam and silicic-acid-saturated steam", *Journal of the American Ceramic Society*, DOI: [10.1111/jace.16799](https://doi.org/10.1111/jace.16799).

M. B. Ruggles-Wrenn and T. A. Wallis, "Creep in interlaminar shear of an Hi-Nicalon™/SiC-B4C composite at 1300°C in air and in steam", *Journal of Composite Materials*, <https://doi.org/10.1177/0021998319886621>.

M. B. Ruggles-Wrenn, S. N. Minor, C. P. Przybyla, and E. L. Jones, "Creep of a Nextel™720/alumina ceramic composite containing an array of small holes at 1200°C in air and in steam", *International Journal of Applied Ceramic Technology*, Vol. 16, 2019, pp. 3-13.

M. B. Ruggles-Wrenn and M. Noomen, "Fatigue of unitized polymer/ceramic matrix composites with 2D and 3D fiber architecture at elevated temperature", *Polymer Testing*, Vol. 72, 2018, pp. 244-256.

M. B. Ruggles-Wrenn, N. J. Boucher and C. P. Przybyla, "Fatigue of three advanced SiC/SiC ceramic matrix composites at 1200°C in air and in steam", *International Journal of Applied Ceramic Technology*, Vol. 15, 2018, pp. 3-15.

Selected Honors & Awards

- Board of Governors Award, ASME (2016)
- Stinson Trophy, NAA (2015)

Significant Accomplishments

- Fellow, American Society of Mechanical Engineers (ASME)



Research Interest Areas

- Material behavior in extreme environments
- Advanced structural materials
- Composite materials and structures
- High-temperature structural design methods
- Viscoplasticity – constitutive modeling



Lt Col James L. Rutledge

PhD, Aeronautical Engineering, Air Force Institute of Technology

Associate Professor of Aeronautical Engineering

Most Notable Publications

Fischer, J.P., McNamara, L.J., **Rutledge, J.L.**, Polanka, M.D., 2020, "Scaling Flat-Plate, Low-Temperature Adiabatic Effectiveness Results Using the Advective Capacity Ratio," *Journal of Turbomachinery*.

Bryant, C.E. and **Rutledge, J.L.**, 2020, "A Computational Technique to Evaluate the Relative Influence of Internal and External Cooling on Overall Effectiveness," *Journal of Turbomachinery*.

Rutledge, J.L., Baker, W.P., 2018, "Unsteady Effects on the Experimental Determination of Overall Effectiveness," *Journal of Turbomachinery*.

Wiese, C.J., **Rutledge, J.L.**, Polanka, M.D., 2018, "Experimental Evaluation of Thermal and Mass Transfer Techniques to Measure Adiabatic Effectiveness with Various Coolant to Freestream Property Ratios," *Journal of Turbomachinery*, Vol. 140, No. 2.

Bills, J.D., Crowe, D.S., **Rutledge, J.L.**, Coy, E.B., 2018, "Modeling Fuel Film Cooling on a Flat Plate," *Journal of Thermophysics and Heat Transfer*, Vol. 32, No. 3.

Selected Honors & Awards

- 2021 U.S. Air Force Outstanding Science & Engineering Educator
- 2020 ASME Turbo Expo Best Paper (Heat Transfer)
- 2019 ASME Turbo Expo Best Paper (Heat Transfer)
- 2018 AFIT Outstanding Military Faculty
- 2017 ASME Turbo Expo Best Paper (Heat Transfer)

Significant Accomplishments

- Fellow, American Society of Mechanical Engineers (ASME)
- AFIT Senior Military Faculty
- Professional Engineer, State of Texas
- U.S. Patent No. 10,648,882 B2, "Wind Tunnel Wake Generator"
- U.S. Patent No. 9,316,547 B1: "A Method to Determine Time-Resolved Waveforms of Periodic Unsteady Heat Transfer Coefficient and Adiabatic Wall Temperature"



Research Interest Areas

- Fluid dynamics
- Heat transfer
- Propulsion



Dr. Fred Schauer

PhD, Mechanical Engineering, University of Illinois at Urbana-Champaign

Associate Professor of Aeronautical Engineering

Most Notable Publications

"T63 Turbine Response to Rotating Detonation Combustor Exhaust Flow", A. Naples; J. Hoke; R. Battelle; **F. Schauer**, GTP-18-1424, *J. Eng. Gas Turbines Power*, Vol 141 (2), Feb 2019.

"Thermodynamic Model of a Rotating Detonation Engine," C.A. Nordeen, D. Schwer, **F. Schauer**, J. Hoke, T.H. Barber, and B. Cetegen, *Combustion, Explosion, and Shock Waves*, Vol 50 (5), Sept 2014.

"Petroleum-based and Bio-derived Jet Fuel Efficiency Optimization Using Fuel Injection in a 34cc 4-Stroke Spark Ignition Engine," C. Wilson, **F. Schauer**, P. Litke, J. Hoke, and J.R. Groenewegen, *SAE 2011-11-08*.

"Detonation Initiation and Performance in Complex Hydrocarbon Fueled Pulsed Detonation Engines," **F. Schauer**, J. Stutrud, R. Bradley, V. Katta, and J. Hoke, *50th JANNAF Propulsion Meeting*, paper I-05, 2001.

"Stealing the Moon", **F. Schauer**, *AFRL INSPIRE Lecture*, <https://www.youtube.com/watch?v=LWWzdJ6CUIE>, 2016.

Selected Honors & Awards

- Air Force Research Laboratory Innovator of the Year (2011)
- Finalist for Collier Trophy (2009)
- American Institute of Aeronautics Engineer of the Year (2009)
- Air Force Scientist of the Year (2008)

Significant Accomplishments

- Fellow, Air Force Research Laboratory (AFRL)
- Associate Fellow, American Institute of Aeronautics (AIAA)
- AFOSR Star Team (2012-2014; 2006-2008)



Research Interest Areas

- Energy, propulsion, and power – particularly novel cycles.



Dr. William E. Wiesel

Ph.D., Harvard University, Astronomy

Professor Emeritus of Aerospace Engineering

Most Notable Publications

“Estimating Nongravitational Accelerations on High Area-to-Mass Ratio Objects”, **W. E. Wiesel**, *Journal of Guidance, Control, and Dynamics*, 39, 1438-1443, 2016.

“A KAM Tori Algorithm for Earth Satellite Orbits”, **W. E. Wiesel**, *Journal of the Astronautical Sciences*, 64, 46-62, 2017.

“Stochastic Dynamics of and Collision Prediction for Low Altitude Earth Satellites”, Adam T. Rich, Kenneth J. Stuart, **William E. Wiesel**. *Journal of the Astronautical Sciences*; Sept 2018; 65; 3; p307-p320.

“Impulsive Control of Earth Satellites on Low-Eccentricity KAM Tori”, Christopher T. Craft and **William E. Wiesel**, accepted by the *Journal of Guidance, Control, and Dynamics*, 2019.

Significant Accomplishments

Author of three widely-regarded texts on spacecraft and orbital dynamics:

- Spaceflight Dynamics
- Modern Astrodynamics
- Modern Orbit Determination



Research Interest Areas

- Orbital mechanics, especially the application of the KAM theorem to orbital systems
- Dynamical system theory
- Control and estimation
- Control of time dependent nonlinear systems
- Satellite cluster navigation
- Mission planning
- Past research interests have included solar system orbital dynamics and planetary astronomy



Maj Costantinos Zagaris

PhD, Astronautical Engineering, Naval Postgraduate School

Assistant Professor of Astronautical Engineering

Most Notable Publications

W. Harris, R. Cobb, C. Taylor, **C. Zagaris**, "Visual Servoing for Spacecraft Proximity Operations with Unknown Targets," *Journal of DoD Research and Engineering*, Vol. 4, Issue 4, January 2022.

C. Zagaris and M. Romano, "Reachability Analysis of Planar Spacecraft Docking with Rotating Body in Close Proximity," *Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 6, pp. 1416-1422, Jan. 2018.

C. Zagaris, H. Park, J. Virgili-Llop, R. Zappulla II, M. Romano, and I. Kolmanovsky, "Model Predictive Control of Spacecraft Relative Motion with Convexified Keep-Out-Zone Constraints," *Journal of Guidance, Control, and Dynamics*, Vol. 41, No. 9, pp 2051-2058, Sep. 2018.

J. Virgili-Llop, **C. Zagaris**, R. Zappulla II, A. Bradstreet, and M. Romano, "A convex programming-based guidance algorithm to capture a tumbling object on-orbit using a spacecraft equipped with a robotic manipulator," *International Journal of Robotics Research*, Vol. 38, No.1, pp. 40-72, Jan. 2019.

J. Virgili-Llop, **C. Zagaris**, H. Park, R. Zappulla II and M. Romano, "Experimental evaluation of model predictive control and inverse dynamics control for spacecraft proximity and docking maneuvers," *CEAS Space Journal*, Vol. 10, No. 1, pp. 37-49, May 2017.

Selected Honors & Awards

- 2021 Air Force Outstanding Science/Engineering Educator Award
- 2021-2022 Academic Year Graduate School of Engineering and Management (GSEM) Dean's Distinguished Teaching Professor
- Best Astrodynamics paper, AIAA SciTech Forum & Expo, Jan 2019
- AFIT Distinguished Graduate, Mar 2012



Research Interest Areas

- Autonomous spacecraft guidance and control
- Optimal control
- Reachability analysis
- Robotics
- Autonomous multi-agent systems



Lt Col Michael D. Zollars

PhD, Aeronautical Engineering, Air Force Institute of Technology

Assistant Professor of Aeronautical Engineering

Most Notable Publications

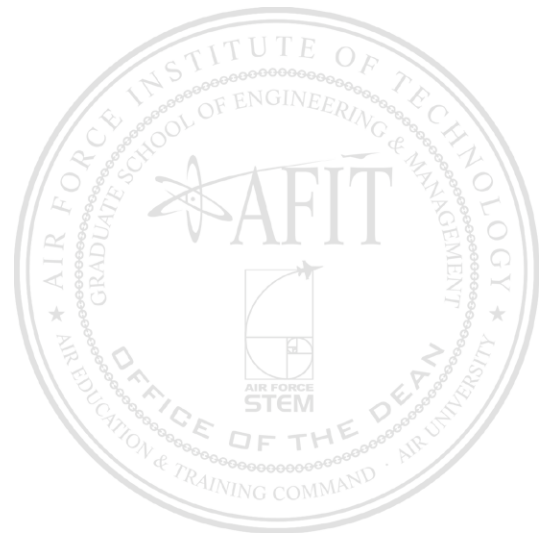
Michael D. Zollars, Richard G. Cobb, and David J. Grymin. "Optimal SUAS Path Planning in Three-Dimensional Constrained Environments." *Unmanned Systems*, 7(2), (2019), pp.105-118, DOI:10.1142/S2301385019500031

Michael D. Zollars, Richard G. Cobb, and David J. Grymin. "Optimal Path Planning for Unmanned Aircraft Target Observation Through Constrained Urban Environments." *Journal of Air Transportation*, 27(3), (2019), DOI:10.2514/1.D0141

M. D. Zollars, R. G. Cobb and D. J. Grymin, "Optimal Path Planning for SUAS Waypoint Following in Urban Environments," *2018 IEEE Aerospace Conference*, Big Sky, MT, 2018, pp. 1-8, DOI: 10.1109/AERO.2018.8396483

M. D. Zollars, R. G. Cobb and D. J. Grymin, "Simplex Optimal Control Methods for Urban Environment Path Planning," *AIAA Sci-Tech Information Systems Conference*, Orlando, FL, 2018, pp. 1-16, DOI: 10.2514/6.2018-2259

M. D. Zollars, R. G. Cobb and D. J. Grymin, "Simplex Methods for Optimal Control of Unmanned Aircraft Flight Trajectories," *ASME Dynamic Systems and Controls Conference*, Tysons Corner, VA, 2017, pp. 1-10, DOI: 10.1115/DSCC2017-5031



Research Interest Areas

- Optimal control theory
- Autonomous aircraft guidance and control
- Trajectory optimization
- Aircraft stability and control
- Dynamics
- Estimation theory



Dr. Kenneth M. Hopkinson

PhD, Computer Science, Cornell University

Department Head, Electrical & Computer Engineering

Professor of Computer Science

Most Notable Publications

H. Song, **Hopkinson, K.**, De Cola, T., Alexandrovich, T., Liu, D., eds., *Avionics Cybersecurity: Foundations, Principles, and Applications*, IET Scitech Publishing, London, United Kingdom, February 2022, pp. 309 pages, ISBN-10 1839533218, ISBN-13 978-1839533211.

Humphrey, L., Baity, R., **Hopkinson, K.**, Formal Verification of Safety-Critical Software Using SPARK, *Avionics Cybersecurity: Foundations, Principles, and Applications*, H. Song, deCola, T., Alexandrovich, T., Liu, D., Hopkinson, K., eds., IET Scitech Publishing, London, United Kingdom, February 2022, pp. 31-45.

Heglund, J., **Hopkinson, K.**, Tran, H.T., "Social Sensing: Towards Social Media as a Sensor for Resilience in Power Systems and Other Critical Infrastructures," *Taylor and Francis Journal of Sustainable and Resilient Infrastructure*, 12 March 2020, pp. 1-13.

Bodnar, T., Dering, M.L., Tucker, C., **Hopkinson, K.M.**, Use Large Scale Social Media Networks as a Scalable Sensing System for Modeling Real Time Energy Utilization Patterns, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, Volume 47, Issue 10, October 2017, pp. 2627-2640.

Hamman, S.T., **Hopkinson, K.M.**, Fadul, J.E., "A Model Checking Approach to Characterizing the Fault Tolerance of Smart Grid Protection Systems," *IEEE Transactions on Power Delivery*, Volume

Selected Honors & Awards

- 2014 AFIT Winner and Air Education and Training Command (AETC) Runner-Up for the Educator of the Year Award
- 2010 Air Education and Training Command (AETC) Junior Civilian Scientist of the Year
- Institute of Electrical and Electronics Engineers (IEEE) Senior Member
- Association for Computing Machinery (ACM) Senior Member



Research Interest Areas

- Trusted Compilers, Languages, and Architectures
- Networking
- Security
- Automated Software Verification
- Applied Machine Learning
- Data Mining
- Data Fusion
- Space Applications
- Critical Infrastructure Protection



Dr. Brett J. Borghetti

PhD, Computer Science, University of Minnesota, Twin Cities

Professor of Computer Science

Most Notable Publications

*Decker, Kevin T., **Borghetti, Brett J.**, "Composite Style Pixel and Point Convolution Based Deep Fusion Neural Network Architecture for the Semantic Segmentation of Hyperspectral and Lidar Data," Special Issue Information Retrieval from Remote Sensing Images, *Remote Sensing Journal (MDPI)*, Vol 14(9) pg 2113, 28 Apr 2022. <https://doi.org/10.3390/rs14092113>; <https://www.mdpi.com/2072-4292/14/9/2113>.

*Gutierrez del Arroyo, Jose A., **Borghetti, Brett J.**, and Temple, Michael A., "Considerations for Radio Frequency Fingerprinting across Multiple Frequency Channels," *Sensors Journal, Special Issue on Radio Frequency Machine Learning (RFML) Applications (MDPI)*, volume 22, no 6: 2111, pp 1-21, 9 Mar 2022. <https://www.mdpi.com/1424-8220/22/6/2111>

*Kamrud, Alexander J., Borghetti, Brett J., Schubert Kabban, C. M., "The Effects of Individual Differences, Non-Stationarity, and the Importance of Data Partitioning Decisions for Training and Testing of EEG Cross-Participant Models", *Sensors Journal, Special Issue on Intelligent Biosignal Analysis Methods*, 21(9), 3225, MDPI, 6 May 2021 <https://www.mdpi.com/1424-8220/21/9/3225>; <https://doi.org/10.3390/s21093225>

Westing, Nicholas M., **Borghetti, Brett J.**, Gross, Kevin C., "Fast and Effective Techniques for LWIR Radiative Transfer Modeling: A Dimension Reduction Approach", *Remote Sensing (MDPI)*, 9 Aug 2019, Vol 11, issue 6, pp. 1866-1886, DOI: 10.3390/rs11161866 <https://www.mdpi.com/2072-4292/11/16/1866/htm>

Dickey, Joshua T., **Borghetti, Brett J.**, and Junek, William, "Improving Regional and Teleseismic Detection for Single-Trace Waveforms Using a Deep Temporal Convolutional Neural Network Trained with an Array-Beam Catalog", *Sensors (MDPI)*, 31 Jan 2019, Vol 19, issue 3, pp 597-618, DOI: 10.3390/s19030597 <https://www.mdpi.com/1424-8220/19/3/597>

Selected Honors & Awards

- President of the AFIT Graduate School of Engineering and Management Faculty Council, (2021-2022)
- Human Factors and Ergonomics Society Conference Best Paper Award (2017)
- Human Factors and Ergonomics Society Conference Best Paper Award (2016)
- AETC Nominee to AF: AF STEM Outstanding Science and Educator Award (2014)



Research Interest Areas

- Improving human-machine team performance in complex environments using artificial intelligence and machine learning.
- Research experience in estimating human cognitive performance, seismic signal analysis, hyperspectral imagery analysis, statistical machine learning, genetic algorithms, self-organizing systems, neural networks, game theory, information theory and cognitive science.



Dr. Stephen C. Cain

PhD, Electrical Engineering, University of Dayton

Associate Professor of Electrical Engineering

Most Notable Publications

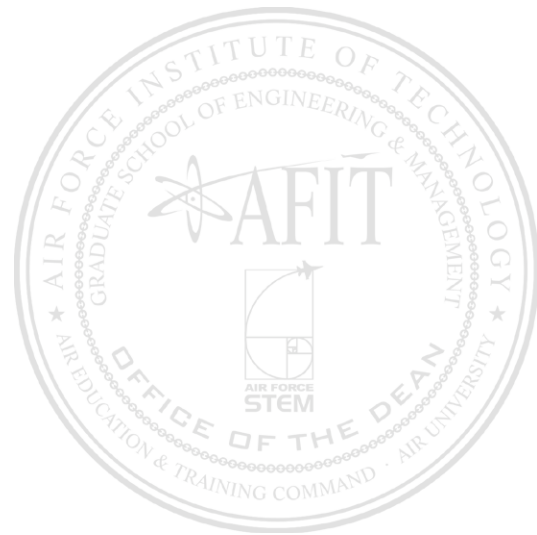
Nicholas J. Yielding, **Stephen C. Cain**, Michael D. Seal, "Statistical photocalibration of photodetectors for radiometry without calibrated light sources," *Opt. Eng.*, Vol. 57 no. (1) DOI: [014107](#) (25 January 2018).

David Becker and **Stephen C. Cain**, "Improved space object detection using short- exposure image data with daylight background", *Applied Optics*, Vol. 57, Issue 14, pp. 3968-3975 (2018).

Stephen Cain and Tatsuki Watts, "Non-Paraxial Fourier propagation tool for aberration analysis and point spread function calculation", *Optical Engineering*, Vol. 55, Issue 8, DOI: [10.1117/1.OE.55.8.085104](#), (2016).

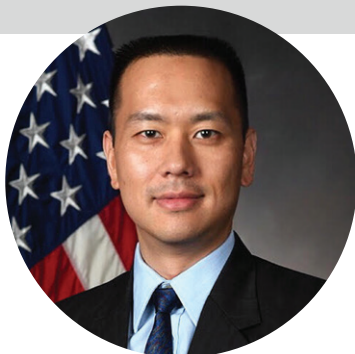
Tyler Hardy, Travis Blake, and **Stephen Cain**, "Unequal a priori probability multiple hypothesis testing in space domain awareness with the space surveillance telescope", *Applied Optics*, Vol. 55, Issue 15, pp. 4036-4046, (2016).

Richard D. Richmond and **Stephen C. Cain**, *Direct Detection LADAR Systems*, SPIE press, Bellingham, WA, 2010.



Research Interest Areas

- Remote sensing
- Image processing
- Space situational awareness



Dr. Hengky Chandrahalim

PhD, Electrical and Computer Engineering, Cornell University

Director of AFIT Nanofabrication and Characterization Facility

Assistant Professor of Electrical Engineering

Most Notable Publications

David D. Lynes, **Hengky Chandrahalim**, Justin M. Brown, Karanvir Singh, Kyle T. Bodily, and Kevin D. Leedy (2022), "A statistical method to optimize the chemical etching process of zinc oxide thin films," *R. Soc. Open Sci.*, Vol 9, pp. 211560.

<https://scholar.afit.edu/facpub/986/>

Jeremiah C. Williams, **Hengky Chandrahalim**, Joseph S. Suelzer, and Nicholas G. Usechak (2022), "Multiphoton nanosculpting of optical resonant and non-resonant microsensors on fiber tips," *ACS Appl. Mater. Interfaces*, Vol 14, pp. 19988–19999.

<https://scholar.afit.edu/facpub/953/>

Jeremiah C. Williams, **Hengky Chandrahalim**, Joseph S. Suelzer, and Nicholas G. Usechak (2022), "Two-photon nanomachining of a micromechanically enhanced optical cavity sensor on an optical fiber tip," *Adv. Photonics Res.*, Vol 3, pp. 2100359.

<https://scholar.afit.edu/facpub/954/>

Jonathan W. Smith, Jeremiah C. Williams, Joseph S. Suelzer, Nicholas G. Usechak, and **Hengky Chandrahalim** (2020), "Three-dimensional Fabry-Pérot cavities sculpted on fiber tips using a multiphoton polymerization process," *J. Micromech. Microeng.*, Vol 30, pp. 125007. <https://scholar.afit.edu/facpub/658/>

Michael D. Sherburne, Candice R. Roberts, John S. Brewer Jr., Thomas E. Weber, Tod V. Laurvick, and **Hengky Chandrahalim** (2020), "Comprehensive optical strain sensing through the use of colloidal quantum dots," *ACS Appl. Mater. Interfaces*, Vol 12, pp. 44156–44162. <https://scholar.afit.edu/facpub/646/>

Selected Honors & Awards

- Society of Asian Scientists and Engineers (SASE) Professional Achievement Award (2022)
- AFIT Chancellor's Innovation Excellence Award (2022)
- Strategic Ohio Council for Higher Education (SOCHE) Faculty Excellence Award (2020-2021)
- AFIT Graduate School of Engineering and Management Dean's Distinguished Teaching Professors Award (2020-2021)

Significant Accomplishments

- US Patents 11,366,05 B2, 11,326,970 B2, 11,320,596 B2, 11,287,575 B2 (2022)
- Elected Senior Member, Optica (2021)
- US Patents 11,204,468 B2, 11,156,782, 10,942,313 (2021)
- US Patent 8,390,398 (2013)
- Elected Senior Member, Institute of Electrical and Electronics Engineers (2011)



Research Interest Areas

- Symbiotically enhancing electronic, phononic, magnonic, and photonic microsystems
- MEMS-enabled reconfigurable quantum systems
- Optofluidics, photoacoustics, biophotonics, nonlinear optics, and optomechanics
- Mutually assisting micro- and nanosystems
- Fabrication techniques for novel integrated micro and nanosystems
- Molecular engineering



Maj Patrick Cunningham

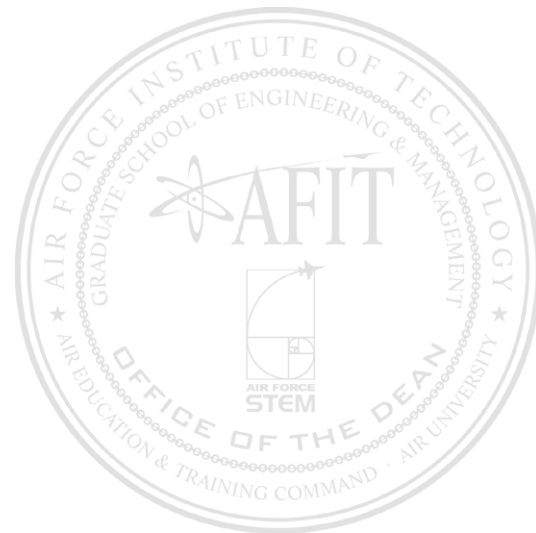
PhD, Electro-Optics, Air Force Institute of Technology

Assistant Professor of Electrical Engineering

Most Notable Publications

* **Cunningham, P.**, Derbis, R., Thornton D., Bettinger, R., and Schubert Kabban, C., "Refined Linear Models for Spacecraft Reentry Predictions", *DCASS*, Dayton, OH, March 2020.

* **Cunningham, P.** and Cain, S., "Optical detection of closely spaced sources for improved space situational awareness", in *SPIE Sensors and Systems for Space Applications*, Baltimore, MD, May 2016.



Research Interest Areas

- Remote sensing
- Image processing
- Space situational awareness



Lt Col James W. Dean

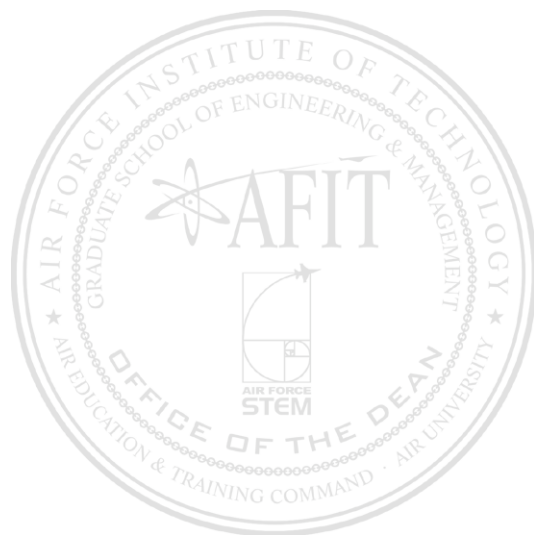
PhD, Computer Engineering, Air Force Institute of Technology

Assistant Professor of Computer Engineering



Research Interest Areas

- Machine Learning (ML) and Artificial Intelligence (AI) algorithms, and their application to Department of Defense (DoD) problems.
- Artificial Neural Networks
- Embedded computing platforms
- Autonomous systems
- Cyber physical systems security





Maj Richard R. Dill

PhD, Computer Science, Air Force Institute of Technology

Assistant Professor of Computer Engineering

Most Notable Publications

DeBerry W.T., **Dill R.**, Hopkinson K., Hodson D.D., Grimaila M. The wargame commodity course of action automated analysis method. *The Journal of Defense Modeling and Simulation*. July 2021.

DOI: [10.1177/15485129211028318](https://doi.org/10.1177/15485129211028318)

K. Basrawi and **R. Dill**, "Reverse Engineering the Soli Radar API for Military Applications," *2021 IEEE Radar Conference (RadarConf21)*, 2021, pp. 1-8, DOI: [10.1109/RadarConf2147009.2021.9455321](https://doi.org/10.1109/RadarConf2147009.2021.9455321)

Long, S., **Dill, R.**, & Mullins, B. (2021). Security Analysis of the Masimo MightySat: Data Leakage to a Nosy Neighbor. *Proceedings of the 54th Hawaii International Conference on System Sciences*, 6893. <https://doi.org/10.24251/hicss.2021.827>

Tryhorn D, **Dill R.**, Hodson D.D., Grimaila M.R., Myers CW. Modeling fog of war effects in AFSIM. *The Journal of Defense Modeling and Simulation*. August 2021. <https://doi.org/10.1177/15485129211041963>

Hannah, J., Mills, R., **Dill, R.**, & Hodson, D. (2021). Traffic collision avoidance system: false injection viability. *Journal of Supercomputing*. <https://doi.org/10.1007/s11227-021-03766-9>

Significant Accomplishments

- USAF CRADA: Air Force Institute of Technology and Bright Apps, LLC- Apr 2021



Research Interest Areas

- Cyber Security
- Artificial intelligence
- Algorithms
- Wargaming



Dr. Frank Van Graas

PhD, Electrical Engineering, Ohio University

Research Professor of Electrical Engineering

Most Notable Publications

Van Graas, Frank, Ugazio, Sabrina, "GNSS Signal Quality Monitoring," Chapter in Position, Navigation, and Timing Technologies in the 21st Century, Morton, van Diggelen, Spilker and Parkinson, *IEEE-Wiley*, 2021.

Van Graas, Frank, Craig, Samantha, Pelgrum, Wouter, Ugazio, Sabrina, "Laboratory and Flight Test Analysis of Rubidium Frequency Reference Performance," *NAVIGATION*, 60(2), 2013.

Van Graas, Frank, Soloviev, Andrey, Uijt de Haag, Maarten, Gunwardena, Sanjeev, "Closed-Loop Sequential Signal Processing Techniques and Open-Loop Batch Processing Approaches for GNSS Receiver Design," *IEEE Journal of Selected Topics in Signal Processing*, Special Issue on: Advanced Signal Processing for GNSS and Robust Navigation, Vol. 3., Issue 4, 2009.

Van Graas, Frank, Soloviev, Andrey, "Precise Velocity Estimation Using a Stand-Alone GPS Receiver," *NAVIGATION*, 51(4), 2004.

Van Graas, Frank, Diggie, David W., Hueschen, Richard M., "Interferometric GPS Flight Reference/Autoland System: Flight Test Results," *NAVIGATION*, 41(1), 1994.

Selected Honors & Awards

- Fellow, Institute of Navigation, 2001
- Johannes Kepler Award, Satellite Division of The Institute of Navigation, 1996
- Distinguished Service Award, The Institute of Navigation, 1999
- Ohio University Presidential Research Scholar, Ohio University, 2001
- Colonel Thomas L. Thurlow Award, The Institute of Navigation, 2002
- John Ruth Avionics Award, American Institute of Aeronautics and Astronautics, 2010

Significant Accomplishments

- President, The Institute of Navigation, 1998-1999
- Treasurer, The Institute of Navigation, 2011-2022
- Director, Consortium of Ohio Universities on Navigation and Timekeeping, 2010-2017, 2018-2022



Research Interest Areas

- Global Navigation Satellite Systems
- Signal Processing
- Integrated Navigation Systems



Dr. Scott R. Graham

PhD, Electrical Engineering, University of Illinois at Urbana-Champaign

Director, Center for Cyberspace Research

Professor of Computer Engineering

Most Notable Publications

Badenhop, C.W., **Graham, S.R.**, Mullins, B.E., Mailloux, L.O., "Looking Under the Hood of Z-Wave: Volatile Memory Introspection for the ZW0301 Transceiver", *ACM Transactions on Cyber-Physical Systems*, Vol 3 Issue 2, Dec 2018.

Nolan, B.C., **Graham, S.R.**, Mullins, B.E., Schubert-Kabban, C.M., "Automated Signal Extraction from Controller Area Networks", *IEEE Connected and Automated Vehicles Symposium*, Chicago, IL, USA, Aug 2018.

Badenhop, C.W., **Graham, S.R.**, Ramsey, B.W., Mullins, B.E., Mailloux, L.O., "The Z-Wave Routing Protocol and its Security Implications", *Elsevier Journal of Computers & Security*, Volume 68, Jul 2017, pp. 112-129.

Reber, P.E., **Graham, S.R.**, "Evaluating System on a Chip Design Security", *Journal of Information Warfare*, Vol 16, Issue 3, Summer 2017.

Gutierrez, J.A., Bindewald, J.M., **Graham, S.R.**, Rice, M.J., "Enabling Bluetooth Low Energy auditing through synchronized tracking of multiple connections", *International Journal of Critical Infrastructure Protection*, Sep 2017.

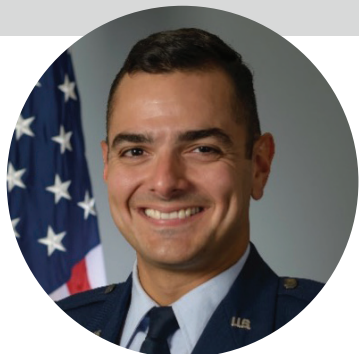
Selected Honors & Awards

- 2017 Air University Cat III Civilian of the Quarter



Research Interest Areas

- Embedded Systems Security
- Cyber Physical Systems
- Computer Communication Networks



Maj Jose A. Gutierrez del Arroyo

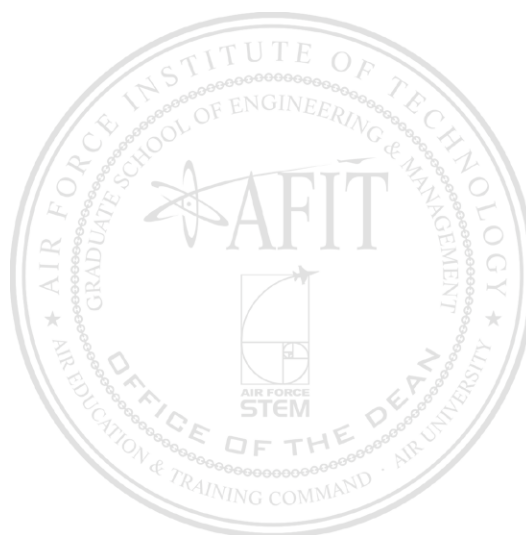
PhD, Computer Science, Air Force Institute of Technology

Assistant Professor of Computer Science

Most Notable Publications

J. A. Gutierrez del Arroyo, B. J. Borghetti, and M. A. Temple, "Considerations for Radio Frequency Fingerprinting across Multiple Frequency Channels," *Sensors*, vol. 22, p. 2111, 2022. [Online].

Available: <https://doi.org/10.3390/s22062111>



Research Interest Areas

Cybersecurity of wireless devices using artificial intelligence and machine learning.



Dr. Sanjeev Gunawardena

PhD, Electrical Engineering, Ohio University

Research Associate Professor of Electrical Engineering

Most Notable Publications

Pentecost, S., and **Gunawardena, S.** (2018, January). Dynamic Power Allocation with Constant Envelope Transmission for Next Generation Software-Defined GPS Payloads. *Proceedings of the 2018 International Technical Meeting of The Institute of Navigation* (pp. 869-877). Reston, Virginia.

Gunawardena, S., Raquet J., and Carroll, M. (2017, January). Innovation: Correlator Beamforming for Low-Cost Multipath Mitigation. GPS World. Retrieved from <http://gpsworld.com/innovation-correlator-beamforming-for-low-cost-multipathmitigation/>

Gunawardena, S., Raquet, J., and Carroll, M. (2017, January). Correlator Beamforming for Multipath Mitigation in High-Fidelity GNSS Monitoring Applications. *Proceedings of the 2017 International Technical Meeting of The Institute of Navigation* (pp. 1173-11880). Monterey, California.

J. M. Guerrero, and **Gunawardena, S.** (2017, January). Characterization of Timing and Pseudorange Biases Due to GNSS Front-End Filters by Type, Temperature, and Doppler Frequency. *Proceedings of the 2017 International Technical Meeting of The Institute of Navigation* (pp. 418-444). Monterey, California.

Wireman, M., **Gunawardena, S.**, and Carroll, M. (2017, January) High-Fidelity Signal Deformation Analysis of the Live Sky GLONASS Constellation using Chip Shape Processing, *Proceedings of the 2017 International Technical Meeting of The Institute of Navigation* (pp. 521-535). Monterey, California.

Selected Honors & Awards

Civilian CAT III Award, 2016 1st Quarter, School of Engineering and Management, Air Force Institute of Technology, April 2016.

Significant Accomplishments

Dickman, J., Ahmadi, R., Cosgrove, M. A., and Gunawardena, S. (2015, January). System and Method for Detection of RF Signal Spoofing, US Patent No. 8934859. <http://www.google.com/patents/US8934859>

Gunawardena, S., Dickman, J., and Cosgrove, M. A. (2015, September). Reconfigurable Correlator for a Navigation System, US Patent No. 9124356. <http://www.google.com/patents/US9124356>

Gunawardena, S., Dickman, J., and Cosgrove, M. A. (2014, December). Systems and Methods for Adaptive Sample Quantization, US Patent No. 8923414. <http://www.google.com/patents/US8923414>

Gunawardena, S., Dickman, J., and Cosgrove, M. A. (2015, January). Packet-Based Input/Output Interface for a Correlation Engine, US Patent No. 8934384. <http://www.google.com/patents/US8934384>

Van Graas F., Soloviev, A., and Gunawardena, S. (2011, September). Systems and Methods for Acquisition and Tracking of Low CNR GPS Signals, US Patent No. 8013789, <http://www.google.com/patents/US8013789>



Research Interest Areas

Satellite Navigation and Timing (SatNav) Systems, Navigation Warfare, Advanced SatNav Signal Design and Payload Architectures, Positioning Navigation and Timing (PNT) Receiver Design, SatNav Signal Monitoring, Digital Signal Processing, Digital Systems Design, RF Systems Design, Embedded Systems Design, Reconfigurable Computing, Software Defined Radio, High Performance Computing, Domain-Specific Programmable ASICs and Architectures.



Dr. Michael J. Havrilla

PhD, Electrical Engineering, Michigan State University

Professor of Electrical Engineering

Most Notable Publications

Karuppuswami, S., E. Rothwell, P. Chahal and **M. Havrilla** (2018), "A triaxial applicator for the measurement of the electromagnetic properties of materials," *Sensors*, Vol 18, No. 1, pp. 1-15.

Bogle, A., M. Hyde, **M. Havrilla** and J. Sovern (2017), "High-temperature RF material characterization using a dual-chambered rectangular waveguide fixture," *IEEE Transactions on Instrumentation and Measurement*, Vol 66, No 9, pp. 2422-2427.

Uber, R., A. Wood and **M. Havrilla** (2017), "Analysis and Numerical Solution of Transient Electromagnetic Scattering from Two Cavities," *Journal of Computational Physics*, Vol 343, pp. 217-234.

Hyde, M. and **M. Havrilla** (2016), "A broadband, nondestructive microwave sensor for characterizing magnetic sheet materials," *IEEE Sensors Journal*, Vol 16, No 12, pp. 4740-4748.

Hyde, M., **M. Havrilla** and A. Bogle (2016), "Nondestructive determination of the permittivity tensor of a uniaxial material using a two-port clamped coaxial probe," *IEEE Transactions on Microwave Theory and Techniques*, Vol 64, No 1, pp. 239-246.

Selected Honors & Awards

- Vice President, Antenna Measurement Techniques Association (2018)
- Best student paper award, 1st place, A. Knisely, Antenna Measurement Techniques Association Conference, advised by M. Havrilla (2017)
- Elected Senior Member, Antenna Measurement Techniques Association (2016)



Research Interest Areas

- Electromagnetics
- Metamaterials
- Stealth technology
- Antennas
- Nanophotonics



Lt Col Wayne "Chris" Henry

PhD, Electrical Engineering, Air Force Institute of Technology

Assistant Professor of Computer Engineering

Most Notable Publications

Park, A.T., Peck, N., Dill, R., Hodson, D.D., Grimaila, M.R., & **Henry, W.C.**, "Quantifying DDS-Cerberus Network Control Overhead," in *Journal of Supercomputing*, (Accepted 14 Apr 22).

Koraneck, D.F., Graham, S.R., Borghetti, B.J., and **Henry, W.C.**, "Identification of Return-Oriented Programming Attacks Using RISC-V Instruction Trace Data," in *IEEE Access*, vol. 10, pp. 45347-45364, 2022.

Falco, G., Gordon, N., **Henry, W.C.**, Tsamis, N., Bailey, B., Hills, G., and Fetrow, M., "The Space Mission Resilience Technical Committee: An Opportunity to Systematically Coordinate Across Organizations and Promote Workforce Development Efforts," to appear in *AIAA ASCEND Conference*, 24-26 Oct 2022.

Theborge, J., **Henry, W.C.**, and Falco, G., "Defending Space: Intrusion Detection Systems for Satellites," to appear in *AIAA ASCEND Conference*, 24-26 Oct 2022.

Henry, W.C. and Peterson, G.L., "SensorRE: Provenance Support for Software Reverse Engineers," in *Computers & Security*. IEEE, Vol. 95, pp. 1-13, 2020.

Selected Honors & Awards

- Tau Beta Pi, Engineering Honor Society, 2019
- Eta Kappa Nu, Electrical Engineering Honor Society, 2019

Significant Accomplishments

- NSA Military & Police Codebreaker Cybersecurity Challenge 1st place, AFIT CTF Coach, 2021
- Team NSA Codebreaker Challenge #33 / 600 Universities, AFIT CTF Coach, 2021



Research Interest Areas

Software reverse engineering, space system cybersecurity, IoT/embedded system security, vulnerability analysis, human-machine teaming, and information visualizations.



Dr. Douglas D. Hodson

PhD, Computer Engineering, Air Force Institute of Technology

Professor of Computer Engineering

Most Notable Publications

D.B. Worth, B.G. Woolley and **D.D. Hodson**, "SwarmSim: A Framework for Modeling Swarming UAVs using Hardware-in-the-Loop," *Journal of Defense Modeling and Simulation (JDMS)*, Jul 2017.

A.J. Roberts, L.O. Mailloux and **D.D. Hodson**, "A Case Study in Understanding and Evaluating Live Virtual Constructive Command and Control Training Effectiveness," *ITEA Journal of Test and Evaluation*, Vol 38, pp. 265-273, Jun 2017.

L.O. Mailloux, M.R. Grimaila, **D.D. Hodson** and G.B. Baumgartner, "The Benefits of Joining an Effective Research Team," *IEEE Potentials*, Vol 35, No. 3, May/June 2017.

J.R. Millar, **D.D. Hodson**, G.L. Peterson and D.K. Ahner, "Optimizing Update Scheduling Parameters for Distributed Virtual Environments," *Concurrency and Computation: Practice and Experience (CCPE), Special Issue on Trends and Advances in Collaboration Technologies and Systems*, Mar 2017.

L.O. Mailloux, M.R. Grimaila, **D.D. Hodson**, R.D. Engle*, C. McLaughlin and G.B. Baumgartner, "Modeling, Simulation, and Performance Analysis of Decoy State Enabled Quantum Key Distribution Systems," *Applied Sciences*, Jan 2017.

Selected Honors & Awards

- Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence Award (2017)



Research Interest Areas

- Software Engineering
- Modeling and Simulation
- Real-Time Interactive Distributed Simulations
- Software Engineering Analytics



Capt Leleia A. Hsia

PhD, Electrical Engineering, Air Force Institute of Technology

Assistant Professor of Electrical Engineering

Most Notable Publications

L. A. Hsia, L. D. Merkle, D. E. Weeks, G. Vernizzi, M. Y. Lanzerotti, D. Langley, "Physically Unclonable Characteristics for Verification of Transmon-Based Quantum Computers," *Proceedings of 2020 Government Microcircuit Applications and Critical Technology Conference*, San Diego, CA, March 2020.

L. A. Hsia, L. D. Merkle, G. Vernizzi, M. Y. Lanzerotti, D. Langley, "On Classical Hardware Verification and Security Techniques for Quantum Computing Systems," *Proceedings of 2019 Government Microcircuit Applications and Critical Technology Conference*, Albuquerque, NM, March 2019, 6 pages.

L. A. Hsia, G. Vernizzi, M. Y. Lanzerotti, D. Langley, "Sampling Iso-Functional Signal Switches in Library Circuits for Microelectronics Verification with Topological Constraints," *National Aerospace & Electronics Conference (NAECON)*, Dayton, OH, June 2017, 4 pages.

L. A. Hsia, G. Vernizzi, M. Y. Lanzerotti, D. Langley, "Building a Library for Microelectronics Verification with Topological Constraints," *Proceedings of 2017 Government Microcircuit Applications and Critical Technology Conference*, Reno, NV, March 2017, 4 pages.

L. A. Hsia, G. Vernizzi, M. Y. Lanzerotti, D. Langley, M. K. Seery, L. Orlando, "Topological Constraints of Gate-Level Circuits Obtained Through Standard Cell Recognition (SCR)," *National Aerospace & Electronics Conference (NAECON)*, Dayton, OH, June 2015, 11 pages.

Selected Honors & Awards

- Company Grade Officer of the Quarter Award, 2022 2nd Quarter, Air Force Institute of Technology, July 2022
- Company Grade Officer of the Quarter Award, 2020 1st Quarter, Air Force Institute of Technology, April 2020



Research Interest Areas

- Quantum Hardware Verification
- Quantum Hardware Security
- Quantum Computing
- Classical Hardware Verification
- Classical Hardware Security
- VLSI



Dr. Julie A. Jackson

PhD, Electrical Engineering, The Ohio State University

Professor of Electrical Engineering

Most Notable Publications

J. A. Jackson and F. Lee-Elkin, "Exploiting Channel Crosstalk for Polarimetric SAR Compressive Sensing," to appear *IEEE Transactions on Aerospace and Electronic Systems*, available online Early Access May 2019: <https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8718553>

A. Evers and **J. A. Jackson**, "A Generalized Phase Gradient Autofocus Algorithm," *IEEE Transactions on Computational Imaging*, available online Early Access Feb 2019: <https://ieeexplore.ieee.org/document/8642429>

A. Evers and **J. A. Jackson**, "Cross-Ambiguity Characterization of Communication Waveform Features for Passive Radar," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, no. 4, pp. 3440-3455, Oct 2015.

S. R. Stevens and **J. A. Jackson**, "Emitter Selection Criteria for Passive Multistatic Synthetic Aperture Radar Imaging," *IET Radar Sonar and Navigation, special topics section on Waveform Diversity and Spectrum Engineering*, vol. 8, no. 9, pp. 1267-1279, Dec. 2014.

J. A. Jackson, B. D. Rigling, and R. L. Moses, "Canonical Scattering Feature Models for 3D and Bistatic SAR," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 46, no. 2, pp. 525-541, April 2010.

Selected Honors & Awards

- IEEE Aerospace and Electronic Systems Society Fred Nathanson Memorial Radar Award Winner (2019)
- Air University and AFIT Winner Civilian Category 3 Quarterly Award (2018)
- Southwestern Ohio Council for Higher Education (SOCHE) 2016 Faculty Excellence Award (2016)
- Air Force level Winner: 2012 Air Force Science, Technology, Engineering, and Mathematics (STEM) Awards, Outstanding Engineer Award, Junior Civilian Category

Significant Accomplishments

- Serves on the IEEE AEES Radar Systems Panel



Research Interest Areas

- Radar signal and image processing
- Radar cross section scattering prediction
- Phenomenology



Lt Col David W. King

PhD, Computer Science, Air Force Institute of Technology

Assistant Professor of Computer Science

Most Notable Publications

David King, Gilbert Peterson, "Decentralized Control Strategies for Unmanned Aircraft System Pursuit and Evasion," *Proceedings of the IEEE 2019 90th Vehicular Technology Conference (VTC2019-Fall)*, 22-25 Sep 2019.

David King, Lukas Esterle, Gilbert Peterson, "Entropy-Based Team Self-Organization with Signal Suppression," *Proceedings of the 2019 conference on Artificial Life (ALIFE2019)*, 29 Jul-2 Aug 2019.

David King, Gilbert Peterson, "The Emergence of Division of Labor in Multi-Agent Systems," *Proceedings of the IEEE 2019 13th International Conference on Self-Adaptive and Self-Organizing Systems (SASO2019)*, 16-20 June 2019.

David King, Gilbert Peterson, "A Macro-Level Order Metric for Self-Organizing Adaptive Systems," *Proceedings of the IEEE 12th International Conference on Self-Adaptive and Self-Organizing Systems (SASO2018)*, 2-6 Aug 2018.

David King, Gilbert Peterson, "Epaminondas: Exploring Combat Tactics," *International Computer Games Association Journal*, vol. 37, no. 3, 131-143, Jan 2014.

Selected Honors & Awards

- Outstanding Contributor, Squadron Officer School, 2015
- Distinguished Graduate, AFIT, 2014
- USAFE Ground Tactical Communications CGO of the Year, 2009
- 52 FW Communications and Information CGO of the Year, 2009
- Distinguished Graduate, Expeditionary Communications and Information Officer Training, 2005
- Distinguished Graduate, ROTC, University of Maryland, College Park, 2005
- John Levitow Award, Airman Leadership School, 1999

Significant Accomplishments

- Reviewer, IEEE Conference on Autonomic Computing and Self-Organizing Systems (ACSOS)



Research Interest Areas

- Emergence
- Self-organizing systems
- Artificial intelligence
- Multi-agent systems
- Agent learning
- Machine learning
- Games



Dr. Gary B. Lamont

PhD, Electrical Engineering, University of Minnesota Institute of Technology

Professor of Electrical and Computer Engineering

Most Notable Publications

Books (6), Book Chapters (8)

Carlos A. Coello Coello, **Gary B. Lamont**, David A. Van Veldhuizen, "Evolutionary Algorithms for Solving Multi-Objective Problems", *Springer*, 2007, 2nd Revised Edition.

Papers – (over 200; 1970-2017)

Jason M. Blackford and **Gary B. Lamont**, "A Novel Approach to The Real-Time Strategy Build Order Problem with Skill Level as a Metric", *IEEE Transactions on Computational Intelligence and Games*, 2016.

Nicholas S. Kovach*, Alan S. Gibson*, **Gary B. Lamont**, "Hypergame Theory: A Model for Conflict, Misperception, and Deception", *International Journal of Computer Games Technology*, Volume 2015, Article ID 570639, 20 pages, Hindawi Publishing.

Selected Honors & Awards

- IEEE Fritz Russ Bio-Engineering Award (2008)
- IEEE Senior Life Member (2004)
- Eta Kappa Nu AFIT Teacher of the Year (2002)



Research Interest Areas

- Evolutionary computation
- Artificial immune systems
- Bio-inspired computing
- Information security
- Intrusion and anomaly detection
- Parallel and distributed computation
- Combinatorial optimization problems (single objective and multi-objective)
- Image processing
- Protein structure prediction
- Software engineering
- Digital signal processing
- Intelligent and distributed control systems
- Autonomous multi-agent systems (unmanned ad-hoc aerial vehicles, robots, etc.)



Maj Tor Langehaug

PhD, Computer Science, Air Force Institute of Technology

Assistant Professor of Computer Science

Most Notable Publications

Tor Langehaug, Scott Graham, Christine Schubert Kabban, and Brett Borghetti, "MADFAM: MicroArchitectural Data Framework and Methodology," in *IEEE Access*, vol. 10, pp. 23511-23531, 2022. doi: [10.1109/ACCESS.2022.3153313](https://doi.org/10.1109/ACCESS.2022.3153313)

Tor Langehaug, Brett Borghetti, and Scott Graham, "Classifying Co-Resident Computer Programs Using Information Revealed by Resource Contention," in *Digital Threats and Practices*. (Accepted 21 April 2021) <https://doi.org/10.1145/3464306>

Selected Honors & Awards

- Tau Beta Pi, Engineering Honor Society, 2020



Research Interest Areas

- Cyber security
- Machine learning
- Anomaly detection
- Microprocessor design
- Transient execution attacks
- IoT/embedded system security



Capt Timothy I. Machin

PhD Candidate, Electrical Engineering, Air Force Institute of Technology

Instructor of Electrical Engineering

Most Notable Publications

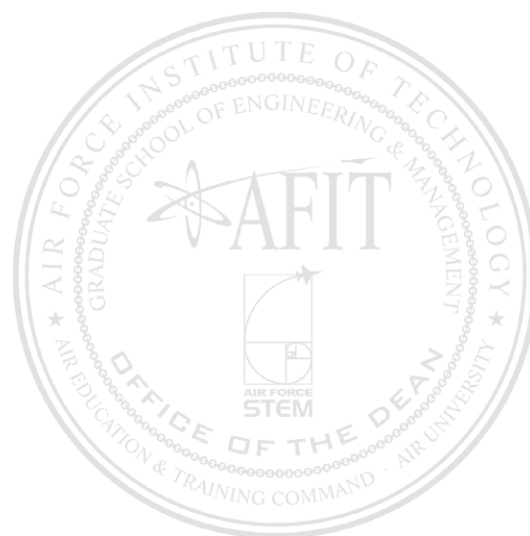
Machin, T. I. (2016). "Real-time implementation of vision-aided monocular navigation for small fixed-wing unmanned aerial systems."

Machin, T. I., & Leishman, R. C. (2022, June). "Implementation of the Rapidly-exploring Random Belief Tree and Statistical Analysis of Functionality." In *2022 International Conference on Unmanned Aircraft Systems (ICUAS)* (pp. 427-433). IEEE.

Machin, T., Raquet, J., Jacques, D., & Venable, D. (2016, September). "Real-time implementation of vision-aided navigation for small fixed-wing unmanned aerial systems." In *Proceedings of the 29th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2016)* (pp. 1305-1311).

Bihl, T. J., Cox, C., & Machin, T. (2019, July). "Towards a Taxonomy of Planning for Autonomous Systems." In *2019 IEEE National Aerospace and Electronics Conference (NAECON)* (pp. 74-79). IEEE.

Machin, T. I., & Qiao, L. (2013). "Advanced Visualization Techniques of Hot-Jet Combustion of Lean and Ultra-Lean Substances."



Research Interest Areas

- Autonomy
- Defense focused AI/ML
- Path planning
- Guidance navigation and control
- Alternative navigation



Dr. Richard K. Martin

PhD, Electrical Engineering, Cornell University

Professor of Electrical Engineering

Most Notable Publications

Christian K. Keyser, **Richard K. Martin**, P. Khanh Nguyen, and Arielle M. Adams, "Single-Pulse Mueller Matrix LiDAR Polarimeter: Modeling and Demonstration," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 57, no. 6, pp. 3296-3307, June 2019. Nominated for TGRS Best Paper award, CY2019 (pending).

Joshua Dickey, Brett Borghetti, William Junek, and **Richard K. Martin**, "Beyond Correlation: A Path-Invariant Measure for Seismogram Similarity," *Seismological Research Letters*, vol. 91, no. 1, pp. 356-369, Jan 2020.

Christopher Vergara, **Richard K. Martin**, Peter J. Collins, and James R. Lievsay, "Multi-Sensor Data Fusion between Radio Tomographic Imaging and Noise Radar," *IET Radar, Sonar & Navigation*, vol. 14, no. 2, pp. 187-193, Feb 2020.

Christian K. Keyser, **Richard K. Martin**, Helena Lopez-Aviles, Khanh Nguyen, Arielle M. Adams, and Demetrios Christodoulides, "Single-Pulse, Kerr-Effect Mueller Matrix LiDAR Polarimeter," *Optics Express*, vol. 28, no. 9, pp. 13694-13713, 27 April 2020.

Pranav Patel and **Richard K. Martin**, "End-to-End Direct Digital Synthesis Simulation and Mathematical Model to Minimize Quantization Effects of Digital Signal Generation," to appear in *IEEE Open Journal of the Communications Society*, accepted on 28 Sep 2020, 10 pages.

Significant Accomplishments

- Holds seven patents



Research Interest Areas

- Through-wall radio imaging
- Laser radar target identification
- Engineering education methodology



Dr. Laurence D. Merkle

PhD, Computer Engineering, Air Force Institute of Technology

Assistant Professor of Computer Engineering

Most Notable Publications

C. Johnson, M. McGill, D. Bouchard, M. K. Bradshaw, V. A. Bucheli, **L. D. Merkle**, M. J. Scott, Z. Sweedyk, J. Ángel, Z. Xiao, and M. Zhang. "Game Development for Computer Science Education." In *Proceedings of the 2016 ITiCSE Working Group Reports (ITiCSE '16)*. ACM, New York, NY, USA, 23-44, 2016.

A. Chidanandan and **L. D. Merkle**. "Use of Version Control Software in a Project-Based Introductory Computer Architecture Course." *Computers in Education Journal*, Vol. XVIII [sic], 2009, No. 3, pp 38-50.

L. D. Merkle and J. W. Luginsland. "Design Optimization for a Novel Class of High Power Microwave Sources." *Proceedings of the 2003 IEEE Congress on Evolutionary Computation*, presented in the special session on Evolutionary Design Optimization.

G. B. Lamont and **L. D. Merkle**. "Towards Effective Evolutionary Algorithms for Polypeptide Structure Prediction." In G. Fogel and D. W. Corne, editors, *Evolutionary Computation in Bioinformatics*, 2003.

B. S. Fagin and **L. D. Merkle**. "Quantitative Analysis of the Effects of Robots on Computer Science Education." *ACM Journal of Educational Resources in Computing*, Vol. 2, No. 4, December 2002, pp. 1-18.

Selected Honors & Awards

- Best Poster, 22nd Colloquium for Information Security Systems Education
- Best Paper, Mechanical Engineering Division, 2005 American Society for Engineering Education Annual Conference & Exposition
- Best Presentation, Space Situational Awareness Session, 20th Annual Advanced Maui Optical and Space Surveillance Technologies Conference, 2019
- USAFA Department of Computer Science Research Excellence Award, 2001-02



Research Interest Areas

- Algorithms
- Computability and complexity
- Computational science and engineering
- Cybersecurity education
- Evolutionary computation
- Games in computing education
- Optimization
- Quantum computing
- Space situational awareness



Dr. Robert F. Mills

PhD, Electrical Engineering, University of Kansas

Professor of Electrical Engineering

Most Notable Publications

Span, M., Mailloux, L.O., **Mills, R.F.**, and Young, W., "Conceptual Systems Security Requirements Analysis: Aerial Refueling Case Study", accepted for publication in *IEEE Access*, 30 Jul 2018.

Rich, M.D., **Mills, R.F.**, Dube, T.E., and Rogers, S.K., "Evaluating Machine Learning Classifiers for Defensive Cyber Operations", *Military Cyber Affairs*, Vol 2, Issue 1, Article 6, pp 1-19, 2016.

Vaughan, S.L., **Mills, R.F.**, Peterson, G.L., Grimaila, M.R., Rogers, S.K., Oxley, M.E., and Patterson, R.E., "A dual-process Qualia Modeling Framework", *Biologically Inspired Cognitive Architectures (BICA) Journal*, 2016, pp 71-85.

Selected Honors & Awards

- Air Force Association Bernard A. Schriever Award for advancing aerospace power, technology, doctrine, or the Air Force as a profession (2015).
- U.S. Government Information Security Leadership Awards, Workforce Improvement Category, Team Award: Cyberspace 200/300 Professional Continuing Education Team, Air Force Cyberspace Technical Center of Excellence, International Information Systems Security Certification Consortium, Inc., (ISC)²® (2011 and 2014).



Research Interest Areas

- Electronic warfare
- Avionics security
- RF fingerprinting
- Network operations and security
- Situation awareness



Dr. Barry E. Mullins

PhD, Electrical Engineering, Virginia Tech

Professor of Computer Engineering

Most Notable Publications

L. Bradford, **B. E. Mullins**, S. Dunlap, and T. Lacey, "Variable Speed Simulation for Accelerated Industrial Control System Cyber Training," *Critical Infrastructure Protection XII*, J. Staggs and S. Sheno, eds., Springer, New York, NY, https://doi.org/10.1007/978-3-030-04537-1_15, December 2018, pp. 283-306.

K. A. Girtz, **B. E. Mullins**, M. Rice, and J. Lopez Jr., "Practical Application Layer Emulation In Industrial Control System Honey pots," *Critical Infrastructure Protection X*, M. Rice and S. Sheno, eds., Springer, New York, NY, November 2016, pp. 83-98.

S. M. Beyer, **B. E. Mullins**, S. R. Graham, and J. M. Bindewald, "Pattern-of-Life Modeling in Smart Homes," *IEEE Internet of Things Journal*, vol. 5, no. 6, December 2018, DOI: [10.1109/JIOT.2018.2840451](https://doi.org/10.1109/JIOT.2018.2840451), pp. 5317-5325.

B. W. Ramsey, **B. E. Mullins**, M. A. Temple, and M. R. Grimaila, "Wireless Intrusion Detection and Device Fingerprinting through Preamble Manipulation," *IEEE Transactions on Dependable and Secure Computing*, vol. 12, no. 5, September/October 2015, pp. 585-596.

C. W. Badenhop and **B. E. Mullins**, "A Black Hole Attack Model Using Topology Approximation for Reactive Ad-hoc Routing Protocols," *International Journal of Security and Networks (IJSN)*, Inderscience Publishers, vol. 9, no. 2, 2014, pp. 63-77.

Selected Honors & Awards

- Research Advisor for Chancellor's Award Recipient (Best AFIT thesis), S. Beyer, 2018
- Cage H. Crocker Outstanding AFIT Professor Award for CY2011, awarded by AFIT Board of Visitor.
- IEEE and Eta Kappa Nu – C. Holmes MacDonald Outstanding Electrical and Computer Engineering Teacher Award, 2011
- Air Force Science & Engineering Educator of the Year, 2010
- Professor Ezra Kotcher Award for CY2008, awarded by AFIT Board of Visitor, 2009
- Dr. Leslie M. Norton Teaching Excellence Award for CY2008, awarded by AFIT Student Association, 2009
- Outstanding Teaching Award, Eta Kappa Nu, Delta Xi Chapter, Electrical Engineering / Computer Engineering, 2009
- AFIT Thesis Advisor Award, Tau Beta Pi, Ohio Eta Chapter, for K. R. Schrader thesis, 2009
- Outstanding Academy Educator, Department of Electrical Engineering, U.S. Air Force Academy, Colorado, 2002



Research Interest Areas

- Cyber-physical systems security/sensing
- Internet of Things security
- Cyber operations
- Critical infrastructure protection
- Computer/network/embedded systems security
- Reverse code engineering



Dr. Aaron P. Nielsen

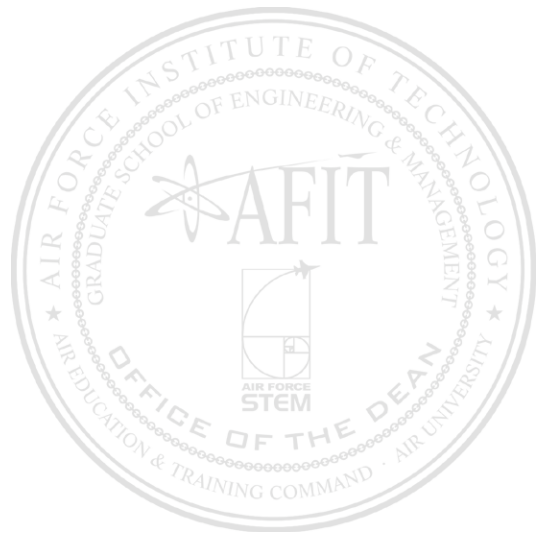
PhD, Physics, University of Maryland, College Park

Assistant Research Professor



Research Interest Areas

Alternative navigation techniques, in particular, navigation using the Earth's magnetic anomaly field (MagNav).





Dr. Scott L. Nykl

PhD, Computer Science, Ohio University

Associate Professor of Computer Science

Most Notable Publications

N. Seydel A, W. DallmannA, and **S. Nykl**, “Visualizing behaviors when using real vs synthetic imagery for computer vision,” in *Proceedings of the 2018 International Conference on Scientific Computing*, Las Vegas, NV, 2018.

K. Bentjen O, S. GrahamF, and **S. Nykl**, “Modelling Misbehaviour in Automated Vehicle Intersections in a Synthetic Environment,” in *13th International Conference on Cyber Warfare and Security (ICCWS)*. ICCWS, March 2018.

K. Bentjen O, S. Graham F, and **S. Nykl**, “Introducing Persistent Human Control into a Reservation-Based Autonomous Intersection Protocol,” in *International Conference of Critical Infrastructure Protection*. IFIP, March 2018.

N. Becherer, J. Pecarina, **S. Nykl** and K. Hopkinson, “Improving optimization of convolutional neural networks through parameter fine-tuning,” *Neural Computing and Applications*, Nov 2017.

D. T. Johnson, **S. Nykl**, and J. Raquet, “Combining Stereo Vision and Inertial Navigation for Automated Aerial Refueling,” *Journal of Guidance, Control, and Dynamics*, vol. 40, no. 9, pp. 2250–2259, May 2017.

Selected Honors & Awards

- AETC MAJCOM Winner - Air Force Outstanding Scientist/Engineer, Junior (2017)
- AFIT/ ENG’s 3rd Quarter Nominee (2017)
- Gage H. Crocker Outstanding Professor Award Nominee (2016)



Research Interest Areas

Computer Graphics, Interactive 3D Graphics, Synthetic Vision (SVS), Augmented Reality (AR), Computational Geometry, GPGPU (General Purpose Graphics Processing Unit) Programming, OpenGL, Level of Detail, Image-Based Rendering, Distributed Real Time Visualizations, Algorithms, Big Data, Parallel Computation, Networking, TCP/IP, Distributed Computing, Embedded Systems, Parallel/ Concurrent Programming, Multi-Core/Multi-Threading, Sensor Fusion, Neural Networks, Machine Learning, Linear Algebra, Numerical Analysis, and Data Structures



Dr. Meir N. Pachter

PhD, Applied Mathematics, Israel Institute of Technology

Professor of Electrical Engineering

Most Notable Publications

M. Pachter, E. Garcia and D. Casbeer (2018) "Toward a Solution of the Active Target Defense Differential Game", *Dynamic Games And Applications*, Appeared electronically on March 19.

M. Pachter (2018) "On Linear-Quadratic Gaussian Dynamic Games", in *Advances in Dynamic Games and Mean Field Games*, Birkhauser/Springer, pp. 301-322.

M. Pachter, E. Garcia and D. Casbeer (2017) "The Differential Game of Guarding a Target", *AIAA Journal of Guidance, Control and Dynamics*, Vol 40, No. 11, November 2017, pp. 2986 - 2993.

M. Pachter and T. J. Montgomery (2017) "Visual-INS Using a Human Operator and Converted Measurements", *IEEE Trans. on Aerospace and Electronic Systems*, Vol. 53, Issue 5, pp. 2359-2371.

A. Mirabile and **M. Pachter** (2017) "Pilot-Assisted INS Aiding Using Bearings-Only Measurements Taken Over Time", *NAVIGATION*, Vol. 64, Issue 2, pp. 183-196.

Selected Honors & Awards

- Distinguished Researcher Award, granted by the Affiliated Professional Societies, Dayton, OH (1999).



Research Interest Areas

- Guidance, Control and Navigation
- Game Theory
- Optimal Control
- System Identification
- Mathematical Modeling



Dr. Gilbert L. Peterson

PhD, Computer Science, University of Texas at Arlington

Professor of Computer Science

Most Notable Publications

Jordan, P.L., **Peterson, G.L.**, Lin, A.C., Mendenhall, M.J., and Sellers, A.J., "Narrowing the scope of failure prediction using targeted fault load injection", *Enterprise Information Systems*, October 2017, pp. 1-16 (DOI: <https://doi.org/10.1080/17517575.2017.1390167>).

Lapso, J., **Peterson, G.L.**, and *Okolica, J.S., "Whitelisting system state in windows forensic memory visualizations", *Digital Investigation*, Vol. 20, March 2017, pp. 2-15.

Bindewald, J.M., **Peterson, G.L.**, Miller, M.E., "Clustering-Based Online Player Modeling," In: Cazenave T., Winands M., Edelkamp S., Schiffel S., Thielscher M., Togelius J. (eds) *Computer Games. Communications in Computer and Information Science*, vol 705. Springer, 2017.

Schmitt, D.T. and **Peterson, G.L.**, "Feature Detection and Matching on Atmospheric Nuclear Detonation Video," *IET Computer Vision Journal*, vol. 10, no. 5, pp. 359-365, 2016.

King, D.W., and **Peterson, G.L.**, "Epaminondas: Exploring Combat Tactics", *International Computer Games Association Journal*, vol. 37, no. 3, 2015, pp. 131-143.

Selected Honors & Awards

- Chair of the IFIP Working Group 11.9 Digital Forensics (Present)
- International Federation of Information Processing Silver Core Award (2017)

Significant Accomplishments

- 1st Place Grand Champion-Annual DoD Cyber Crime Center (DC3) Digital Forensics Challenge (2009)
- Air Force Outstanding Scientist Award, Junior Civilian (2008)
- Recipient of UTA/CSE Outstanding PhD Research Award (2001)



Research Interest Areas

- Artificial Intelligence Statistical Machine Learning
- Autonomous Robots
- Digital Forensics



Dr. Mark G. Reith

PhD, Computer Science, University of Texas at San Antonio

Assistant Professor of Computer Science

Most Notable Publications

Noel, G. and **Reith, M.** "Cyber-Warfare Evolution and Role in Modern Conflict", *Journal of Information Warfare*, 20(4), 30-44. Fall 2021.

Flack, N., Lin, A., Peterson, G., and **Reith, M.** "Battlespace NextTM: Developing a Serious Game to Explore Multi-Domain Operations", *International Journal of Serious Games*, 7(2), 49-70. 1 June 2020.

Tomcho, L. and **Reith, M.** "Engaging Airmen with Cyber Education and Training: Designing a Platform Using Gamification", *Journal of The Colloquium on Information Systems Security Education*, 6(2), 1-23. 28 February 2019.

Niu, J., **Reith, M.** and Winsborough, W.H. "Formal Verification of Security Properties in Trust Management Policy", *Journal of Computer Security*, 22(1), 69-153, 2014.

Reith, M., Carr, C. and Gunsch G. "An Examination of Digital Forensic Models", *International Journal of Digital Evidence*, 1(3), 1-12. Fall 2002.

Selected Honors & Awards

- AFIT Team of the Quarter (2021)
- Bernard A. Schriever Essay Contest Runner-Up (2018)
- Army Commendation Medal (2018)
- AFIT Team of the Quarter (2017)
- Bernard A. Schriever Essay Contest Winner (2017)

Served in command positions contributing toward:

- 67th Cyberspace Wing rated "Highly Effective" (AFSPC/IG, 2016)
- 690th Network Support Squadron rated "Highly Effective" (67 CW/IG, 2015)
- 67th Cyberspace Wing awarded 2013 Omaha Trophy (USSTRATCOM)
- 67th Cyberspace Wing awarded 2012 General Moorman Award (AFSPC)
- Joint Service Accommodation Medal (2011)
- Afghanistan Campaign Medal (2011)
- AFIT Field Grade Officer of the Quarter (2010)
- Outstanding Contributor Award (peer selection, Squadron Officer School, 2005)

Significant Accomplishments

- Featured in Wright-Patterson AFB's *Skywrighter* article "Research Project Evolves into Cyber Education Hub" by Stacy Geiger (2 August 2019)
- Featured in *Airman Magazine* article "Byte-size Learning" by Joseph Eddins (8 May 2018)



Research Interest Areas

- Digital Learning Technologies
- Digital Engineering
- Cyber Education
- Cyber Situational Awareness & Mission Assurance
- Joint All Domain / Multi-Domain Operations
- Cyber Warfare Theory



Lt Col Christopher M. Rondeau

PhD, Electrical Engineering, Air Force Institute of Technology

Associate Dean of Students

Adjunct Assistant Professor of Electrical Engineering

Most Notable Publications

Rondeau, C. M., Temple, M. A., and Schubert Kabban C. "DNA Feature Selection for Discriminating WirelessHART IIoT Devices", *Proceedings of the 53rd Hawaii International Conference on System Sciences*, pp. 6387–6396. Jan 2020. <http://hdl.handle.net/10125/64524>

Rondeau, C. M., Temple, M. A., and Lopez, J., Schubert Kabban, C. "Extending Critical Infrastructure Element Longevity Using Constellation-Based ID Verification." *Computers and Security: A Transdisciplinary Approach Internet of Things Cybersecurity and Risk Management*, Special Issue, Oct 2020. <https://doi.org/10.1016/j.cose.2020.102073>

Rondeau, C. M., Temple, M. A., and Lopez, J. "Industrial IoT cross-layer forensic investigation." *Wiley Interdisciplinary Reviews: Forensic Science*, vol. 2018, Dec 2018. <https://doi.org/10.1002/wfs2.1322>

Rondeau, C. M., Temple, M. A., Betances, J. A., & Kabban, C. S. "Protection of Critical Infrastructure MCOTS Elements using Constellation-Based Distinct Native Attribute Fingerprints." *Journal of DoD Research and Engineering*, Oct 2020.

Meagher, T., Hefron, R., Jorris, T., and **Rondeau, C.**, Flight Test Challenges & Risks for the X-51A Scramjet Engine Demonstrator Program. *Proceedings of the 2013 Society of Experimental Test Pilots*. Sep 2013.

Selected Honors & Awards

- 2019 – Eta Kappa Nu (IEEE) National Honor Society in Engineering Inductee
- 2018 – Tau Beta Pi National Honor Society in Engineering Inductee



Research Interest Areas

Cyber Physical Systems; RF Fingerprinting; Physical Layer Defense/Exploitation; Artificial Intelligence (feature selection, data preparation, bias reduction); Test Technique Development (cyber test, space test, AI, and all domain systems); Critical Infrastructure Security



Lt Col James M. Sattler

PhD, Electrical Engineering, Air Force Institute of Technology

Assistant Professor of Electrical Engineering

Most Notable Publications

J.M. Sattler, R.A. Coutu, Jr., R. Lake, T. Laurvick, T. Back, S. Fairchild, "Modeling micro-porous surfaces for secondary electron emission control to suppress multipactor," *J. Appl. Phys.*, vol. 122, no. 055304, 2017.

T.V. Laurvick, R.A. Coutu, Jr., **J.M. Sattler**, R.A. Lake, "Surface feature engineering through nanosphere lithography," *J. Micro/Nanolithography, MEMS, and MOEMS*, vol. 15, no. 3, p. 031602, 2016.

J.W. McClory, J.C. Petrosky, **J.M. Sattler**, T.A. Jarzen, "An analysis of the effects of low-energy electron irradiation of AlGaIn/GaN HFETs," *IEEE Trans. Nucl. Sci.*, vol. 54, no. 6, pp. 1946-1952, 2007.

Selected Honors & Awards

- IEEE Dayton Section Ravi Pallerla Young Professionals Award 2018
- AFIT Student Field Grade Officer of the Year 2016
- Rensselaer Polytechnic Institute Erik Jonsson Prize 2002



Research Interest Areas

- Semiconductor Devices
- Radiation Effects on Semiconductor Devices
- Secondary Electron Emission



Dr. Clark N. Taylor

PhD, Electrical Engineering, University of California, San Diego

Assistant Professor of Computer Engineering

Most Notable Publications

D.B. Barber, J.D. Redding, T.W. McLain, R.W. Beard, and **C.N. Taylor**, "Vision-based Target Geo-location Using a Fixed-Wing Miniature Air Vehicle," *Journal of Intelligent and Robotic Systems*, Vol. 47, No. 4, pp. 361-382, Dec 2006.

C.N. Taylor and A.N. Bishop, "Homogeneous Functionals and Bayesian Data Fusion with Unknown Correlation," *Information Fusion*, v. 45, Jan 2019.

R. Sharma, R.W. Beard, **C.N. Taylor**, and S. Quebe, "Graph-based Observability Analysis of Bearing-only Cooperative Localization," *IEEE Transactions on Robotics*, Vol. 28, No. 2, pp. 522-529, Apr 2012.

Selected Honors & Awards

- AFRL Sensors Directorate, Innovation Award, 2015
- AFRL Sensors Directorate, Mid-Career Civilian Engineer/Scientist Award, 2014
- AFOSR Young Investigator Award, 2007

Significant Accomplishments

- **C.N. Taylor**, U.S. Patent, "Two-dimensional Color Barcode with Preserved Plane and Lossy Plane Layers," Patent # 7,118,041, 10 Oct 2006



Research Interest Areas

- Vision-aided navigation
- Particle Filters
- Kalman Filters
- Distributed Data Fusion
- Uncertainty Estimation



Dr. Michael A. Temple

PhD, Electrical Engineering, Air Force Institute of Technology

Professor of Electrical Engineering

Most Notable Publications

Voetberg, Benjamin J., *et.al.*, "Using Active DNA Fingerprinting to Discriminate AJP Conductive Ink Elements Embedded in Integrated Circuits," *Distribution D, Jour of DoD Rsrch & Engr (IDR&E)*, Special Edition, Vol. 2 (2) 2-12, August 2019.

Rondeau, Christopher **M., Temple**, Michael A., and Lopez, Juan, "Industrial IoT Cross-Layer Forensic Investigation," *Wiley Interdisciplinary Reviews (WIREs): Forensic Science*, WIREs Forensic Sci. 2019;1:e1322, Vol. 1, No. 1, December 2018, <https://doi.org/10.1002/wfs2.1322>.

Talbot, Christopher **M., Temple**, Michael A., Carbino, Timothy J., and Betances, Addison, "Detecting Rogue Attacks on Commercial Wireless Insteon Home Automation Systems," *Computers & Security*, No. 74, pp. 296-307, May 2018, <https://www.sciencedirect.com/science/article/pii/S0167404817302055>.

Bihl, Trevor J., Bauer, Kenneth W., and **Temple, Michael A.**, "Feature Selection for RF Fingerprinting with MDA and Using ZigBee Device Emissions," *IEEE Trans on Info Forensics & Security*, Vol 11, Issue 8, pp. 1862-1874, Aug 2016, <https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7464336>.

Reising, Donald R., **Temple, Michael A.**, and Jackson, Julie A., "Authorized and Rogue Device Discrimination Using Dimensionally Reduced RF-DNA Fingerprints," *IEEE Trans on Info Forensics and Security*, Vol. 10, Issue. 6, pp. 1180-1192, June 2015, <https://ieeexplore.ieee.org/document/7031931>.

Significant Accomplishments

- W.E. Cobb, **M.A. Temple**, R.O. Baldwin, E. Garcia, E. Laspe, U.S. Patent, "Intrinsic Physical Layer Authentication of Integrated Circuits," Patent # 9,036,891, 19 May 15.



Research Interest Areas

- Discovery, extraction and exploitation of Distinct Native Attribute (DNA) fingerprinting features supporting offensive, defensive and exploitive communication network operations.
- Device hardware identity and/or device normal vs. anomalous (aged, failed, attacked, etc.) operating state discrimination.



Dr. Andrew J. Terzuoli, Jr.

PhD, Electrical Engineering, The Ohio State University

Associate Professor Emeritus of Electrical Engineering

Most Notable Publications

Lawrence Lee, Ivan Frasure, Trevor Nartker, Ronald Marhefka, Joseph Sugrue, **Andrew Terzuoli**, Raymond Wasky, "Deployable Cruciform Reflector Antenna With Crossed-Dipole Array Feed For L-Band Remote Sensing," *Proceedings of the 2018 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2018)*, Valencia, SP, 22-27 July 2018.

Bertus Shelters, Brannon Elmore, James Ethridge, Jaclyn Schmidt, Jarred Burley, Steven Fiorino, Joseph Sugrue, **Andrew Terzuoli**, "Calculation Of Long-Term Tropospheric Attenuation Statistics Using Weather Cubes," *Proceedings of the 2018 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2018)*, Valencia, SP, 22-27 July 2018.

Lawrence Lee, Ivan Frasure, Trevor Narker, Ronald Marhefka, Joseph Sugrue, **Andrew Terzuoli**, Raymond Wasky, "Tightly-Packed Crossed-Dipole Array for L-band Satellite Communications," *Proceedings of the 2018 IEEE Symposium on Antennas and Propagation and USNC/URSI Radio Science Meeting (APS/URSI)*, Boston, MA, 8-13 July 2018.

Bertus Shelters, Brannon Elmore, James Ethridge, Jaclyn Schmidt, Jarred Burley, Steven Fiorino, Joseph Sugrue, **Andrew Terzuoli**, "Attenuation Statistics Derivation in the V&W Band Using Weather Cubes," *Proceedings of the 2018 IEEE Symposium on Antennas and Propagation and USNC/URSI Radio Science Meeting (APS/URSI)*, Boston, MA, 8-13 July 2018.

D. Smith, P. Collins, J. Fee, J. Petrosky, **A. Terzuoli**, C. Yardim, "Ionospheric Effects on Communication Signals in the V and W Bands," *Proceedings of the 23rd Union Radio Scientifique Internationale General Assembly and Scientific Symposium (URSI 2017 GASS)*, Montreal, QUE, Can, 19-26 Aug 2017.

Significant Accomplishments

- Fellow of the Electromagnetics Academy (FEMA) (Present)
- IEEE Life Senior Member (Present)



Research Interest Areas

- Antennas and Electromagnetics
- Computer Model Based Studies
- Application of Parallel Computation, VLSI Technology, and RISC Architecture to Numerical and Transform Methods
- Remote Sensing & Communication
- Passive RF Sensing
- Wave Scattering, Radar Cross Section, and Stealth (LO/CLO) Technology
- Machine Vision and Image Processing
- Automated Object Recognition



Maj Matthew J. Vincie

PhD, Electrical and Computer Engineering, Air Force Institute of Technology

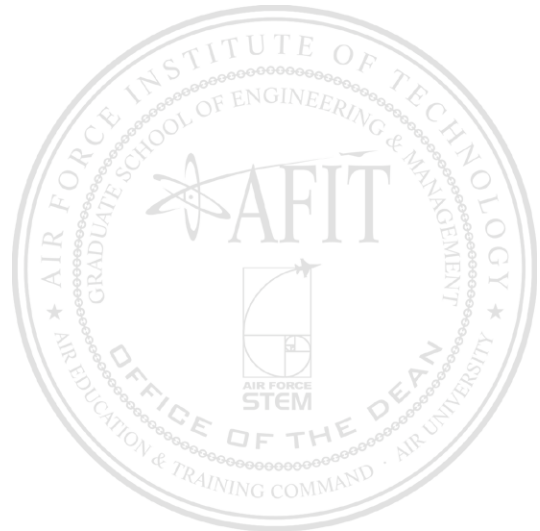
Deputy Director of AFIT Nanofabrication and Characterization Facility

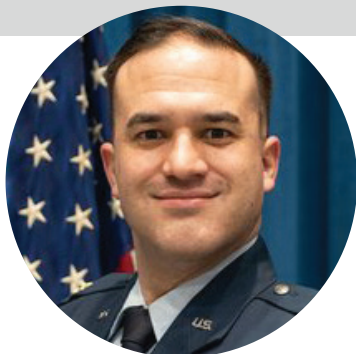
Assistant Professor of Electrical Engineering



Research Interest Areas

- Solid-state Devices
- Micro-electromechanical Systems
- Monolithic Microwave Integrated Circuits
- Analog Circuit Design
- RF and Microwave Engineering
- Optoelectronics
- Vacuum Tube Devices
- Instrumentation and Measurement
- Control Systems





Maj Timothy S. Wolfe

PhD, Electrical Engineering, Purdue University

Assistant Professor of Electrical Engineering

Most Notable Publications

T.S. Wolfe, R.M. Van Ginhoven, A. Strachan, "Computational study of first-row transition metals in monodoped 4H-SiC," *Modelling Simul. Mater. Sci. Eng.*, vol. 29, no. 055008, 2021.

T.S. Wolfe, S.A. Francis, D. Langley, J.C. Petrosky, J. Roos, A. Terzuoli, T. Zens, "Integrated Computational Investigation of Photoconductive Semiconductor Switches in Pulsed Power Radio Frequency Applications," *IEEE Trans. Plas. Sci.*, vol. 44, no. 1, 2016.

T.S. Wolfe, S.A. Francis, D. Langley, J.C. Petrosky, J. Roos, A. Terzuoli, T. Zens, "Waveguide Mode Formation as a Potential Cause of Switch Failure in High-Power Wide-Bandgap Photoconductive Switches," *IEEE Trans. Plas. Sci.*, vol. 43, no. 12, 2015.

Selected Honors & Awards

- 2019 Best Graduate Student Presentation, INMM Conference on Active Nonproliferation
- 2015 Company Grade Officer of the Quarter, AFIT



Research Interest Areas

- Microelectronics, Power Electronics, Optoelectronics/Photonics, Solid State Physics, Condensed Matter Physics, Device Modeling and Simulation (M&S), Computational Chemistry, Atomistic Modeling, Ab Initio M&S, Semiconductor Point Defects, Directed Energy, High Power Electromagnetic (HPEM) Systems, Antennas and Propagation



Dr. David A. Woodburn

PhD, Electrical Engineering, University of Central Florida

Distance Learning Director

Assistant Professor of Electrical Engineering

Most Notable Publications

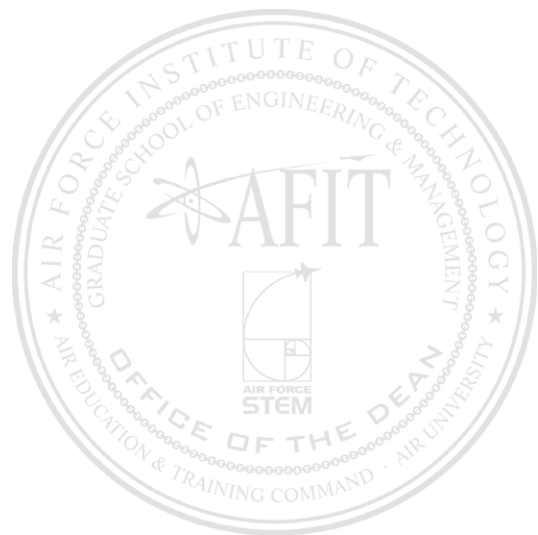
Woodburn, D.; Wu, T.X.; Chow, L.; Leland, Q.; “Novel Nonlinear Inductance Modeling of Permanent Magnet Motor,” *IEEE Trans. Magnetics*, to be submitted for publication 2013.

Woodburn, D.; Wu, T.X.; Zhou, L.; Hu, Y.; Lin, Y.; Chow, L.; Leland, Q.; “Dynamic Heat Generation Modeling of High Performance Electromechanical Actuator,” *IEEE Trans. Aerosp. Electron. Syst.*, accepted for publication 2013.

Woodburn, D.; Wu, T.X.; Lin, S.; Bindl, J.; Hu, Y.; Brokaw, W.; Chow, L.; Zhou, L.; Lin, Y.; Leland, Q.; Tran, B.; Jordan, B.; Gregory, E.; Iden, S.; Rolinski, N., “Integrated Nonlinear Dynamic Modeling and Field Oriented Control of Permanent Magnet (PM) Motor for High Performance EMA,” Paper 2010-01-1742, *2010 SAE Power Systems Conference*, Dallas, TX.

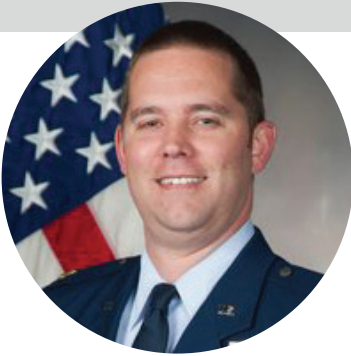
Rolinski, N.; Leland, Q.; Gregory, E.; Jordan, B.; **Woodburn, D.;** Wu, T.X., “Dynamic Testing of Electromechanical Actuators Using Time-history Data,” Paper 2010-01-1748, *2010 SAE Power Systems Conference*, Dallas, TX.

Zhou, L.; Lin, Y.; Chow, L.; **Woodburn, D.;** Wu, T.X.; Bindl, J.; Hu, Y.; Brokaw, W.; Leland, Q.; Tran, B.; Jordan, B.; Gregory, E.; Iden, S.; Rolinski, N., “Lumped Node Thermal Modeling of EMA with FEA Validation,” Paper 2010-01-1749, *2010 SAE Power Systems Conference*, Dallas, TX.



Research Interest Areas

All things pertaining to inertial navigation and controls.



Lt Col Kenneth W. Burgi

PhD, Engineering Physics, Air Force Institute of Technology

Department Head, Engineering Physics

Assistant Professor of Optical Engineering

Most Notable Publications

Nagamine, Eric K., **Kenneth W. Burgi**, and Samuel D. Butler. "Beam Formation and Vernier Steering Off of a Rough Surface," *Micromachines* 12.8 (2021): 871.

Burgi, Kenneth, Michael Marciniak, Mark Oxley, and Stephen Nauyoks. "Measuring the reflection matrix of a rough surface." *Applied Sciences* 7, no. 6 (2017): 568.

Burgi, Kenneth, Jessica Ullom, Michael Marciniak, and Mark Oxley. "Reflective inverse diffusion." *Applied Sciences* 6, no. 12 (2016): 370.

Nagamine, Eric K., **Kenneth W. Burgi**, Samuel D. Butler, and Michael A. Marciniak. "Nonmechanical beam-steering in reflective inverse diffusion." In *Laser Beam Shaping XIX*, vol. 11107, p. 1110706. International Society for Optics and Photonics, 2019.

Burgi, Kenneth W., Michael A. Marciniak, Stephen E. Nauyoks, and Mark E. Oxley. "Exploiting redundant phase information of a reflection matrix." In *Optical Trapping and Optical Micromanipulation XIV*, vol. 10347, p. 103470K. International Society for Optics and Photonics, 2017.

Selected Honors & Awards

- Meritorious Service Medal (2020)
- Air Force Commendation Medal, 1st Oak Leaf Cluster (2013)
- Air Medal, 10th Oak Leaf Cluster (2012)
- Aerial Achievement Medal (2012)
- Air Force Achievement Medal (2005)
- Afghanistan Campaign Medal with 3 Devices
- Iraq Campaign Medal with 2 Devices
- Global War on Terrorism Expeditionary Medal
- Global War on Terrorism Service Medal

Significant Accomplishments

- C-17A Instructor Aircraft Commander
- MC-12W Mission Commander
- 2,605 Flight Hours / 617 Sorties
- 1,295 Combat Flight Hours / 363 Combat Sorties



Research Interest Areas

- Scatterometry
- Statistical and adaptive optics
- Various aspects of light-matter interaction



Dr. William F. Bailey

PhD, Air Force Institute of Technology

Associate Professor Emeritus of Physics

Most Notable Publications

William J. Palm, Michael A. Marciniak, Glen P. Perram, Kevin C. Gross and **William F. Bailey**, "Wavelength and temperature-dependence of CW laser absorptance in Kapton thin films", *Optical Engineering*, Vol. 51 No. 12, 2012.

J.W. Englert, J.C. Petrosky, **W.F. Bailey**, and J.W. McClory, A. Heger, L. Tauxe, D. R. Watts, "Estimating Peak EMP Magnetic Fields Using Alternating Field Demagnetization", *Journal of Radiation Effects, Research and Engineering*, vol. 30, no. 1, pp.103-112, February 2012.

Cusumano, S.J., Fiorino, S. T., Bartell, R. J., Krizo, M. J. , **Bailey, W. F.**, Beauchamp R. L. , Marciniak, M. A., "Modeling Bistatic spectral measurements of temporally evolving reflected and emitted energy from a distant and receding target", *Journal of Applied Remote Sensing*, Vol. 5, Sept 2011.

Josyula, E., **Bailey, W.F.** and Suchyta, III, C.J., "Dissociation Modeling in Hypersonic Flows Using State-to-State Kinetics", *Journal of Thermophysics and Heat Transfer*, Vol. 25, No. 1, Jan-Mar 2011.

Selected Honors & Awards

- AF Outstanding Science and Engineering Educator—AFIT 2012
- AETC Merewether Award—AFIT 2004
- Professor Ezra Kotcher Award—AFIT 1993

Significant Accomplishments

- Developed Directed Energy Curriculum
- Developed Space Environment Curriculum
- Initiated discussions with Director of Weather that led to approval of new program—Atmospheric Science



Research Interest Areas

- Atomic and Molecular Physics
- Computational Fluid Dynamics
- High Power Microwave Systems
- Simulation Modeling and Analysis



Dr. Abigail A. Bickley

PhD, Chemistry, University of Maryland

Research Assistant Professor of Nuclear Engineering

Most Notable Publications

M. R. Halstead, S. Lee, J. Petrosky, **A. Bickley**, J. W. McClory, S. Clark, P. Sokol, "Neutron Flux Spectrum Characterization of a Compact, Accelerator-Driven Neutron Source at Indiana University," *Journal of Radiation Effects, Research and Engineering*, 31, 117, (2013).

A. A. Bickley, M. R. Halstead, J. W. McClory, S. Lee, P. Sokol, J. C. Petrosky, "Evaluation of the Neutron Energy Spectrum Produced at the Neutron Radiation Effects Beam Line Utilizing a Computational Monte Carlo Approach," *Journal of Radiation Effects, Research and Engineering*, 31, 23, (2013).

A. A. Bickley, G.K. Demaree, J. W. McClory, W. H. Miller, T. M. Oakes, J. C. Petrosky, "Design optimization of a layered boron based solid state neutron spectrometer," *Nuclear Science Symposium and Medical Imaging Conference, IEEE*, 4872 (2011).

*Classified publications since 2013

Significant Accomplishments

- Developed PhD-level Advanced Nuclear Forensics Classes taught at the Secret/CNWDI level
- Developed MS-level Technical Nuclear Forensics Course taught at the Secret/CNWDI level
- Referee for the NA-22 program for the National Nuclear Security Administration of the US Department of Energy
- Computational support for several National Labs, and HPC at AFRL/DSRC
- Mentorship of post-doctoral researchers, interns, research assistants, and PhD students
- Member, Nuclear Event and Analysis Testing Center for Specialized Research



Research Interest Areas

- Radiation transport and modeling
- Optimization of nuclear systems
- Pre- and post-detonation nuclear forensics
- Nuclear weapons effects



Dr. Santasri R. Bose-Pillai

PhD, Electrical Engineering, New Mexico State University

Research Assistant Professor of Engineering Physics

Most Notable Publications

Steven Fiorino, **Santasri Bose-Pillai** and Kevin Keefer, "Re-visiting acoustic sounding to advance the measurement of optical turbulence," *Applied Sciences*, vol. 11, no. 16, 7658, Aug 2021, DOI: [10.3390/app11167658](https://doi.org/10.3390/app11167658).

Benjamin Wilson, **Santasri Bose-Pillai**, Jack McCrae, Kevin Keefer and Steven Fiorino, "Estimating turbulence distribution over a heterogeneous path using time-lapse imagery from dual cameras," *Applied Sciences*, vol. 11, no. 13, 6221, Jul 2021, DOI: [10.3390/app11136221](https://doi.org/10.3390/app11136221).

Santasri R. Bose-Pillai, Jack E. McCrae, Christopher A. Rice, Ryan A. Wood, Connor E. Murphy, and Steven T. Fiorino, "Estimation of atmospheric turbulence using differential motion of extended features in time-lapse imagery," *Optical Engineering*, vol. 57, no. 10, 104108 (14 pp.), Oct 2018, DOI: [10.1117/1.OE.57.10.104108](https://doi.org/10.1117/1.OE.57.10.104108).

Milo W. Hyde, **Santasri R. Bose-Pillai**, and Ryan A. Wood, "Synthesis of non-uniformly correlated partially coherent sources using a deformable mirror," *Applied Physics Letters*, vol. 111, no. 10, 101106 (5 pp.), Sep 2017, DOI: [10.1063/1.4994669](https://doi.org/10.1063/1.4994669).

Milo W. Hyde IV, **Santasri Basu**, David G. Voelz, and Xifeng Xiao, "Experimentally generating any desired partially-coherent Schell-model source using phase-only control," *Journal of Applied Physics*, vol. 118, no. 9, 093102 (10 pp.), Sep 2015, DOI: [10.1063/1.4929811](https://doi.org/10.1063/1.4929811).

Selected Honors & Awards

- Elected senior member of Optica (formerly Optical Society of America) and SPIE, the International Society for Optics and Photonics for outstanding contributions in the field of Optics.

Significant Accomplishments

- Elected Chair of Optica's Laser Systems technical group.

Patent and Patent applications:

- Santasri R. Bose-Pillai, Jack E. McCrae, Benjamin C. Wilson and Steven T. Fiorino, "Profiling of Atmospheric Turbulence using Time-Lapse Imagery of Non-Cooperative Targets from Multiple Spatially Separated Cameras," AFD-1990P2. Provisional application filed on 15 June 2021, with the U.S. Patent and Trademark Office. The application was accorded U.S. Serial No. 63/210,693.
- Santasri R. Bose-Pillai, Jack E. McCrae, Christopher A. Rice, and Steven T. Fiorino, "Estimation of Atmospheric Turbulence Parameters using Differential Motion of Extended Features in Time-lapse Imagery," AFD 1990. Non-provisional application filed on 22 October 2020. The application was accorded U.S. Serial No. 17/077,323.
- Milo W. Hyde IV and Santasri R. Bose-Pillai, "Generation of Vector Partially Coherent Optical Sources Using Phase-Only Spatial Light Modulators", Patent No. 10809626, October 2020.



Research Interest Areas

- Atmospheric turbulence characterization using optical techniques
- Mitigation of turbulence effects and turbulence compensation in directed energy
- Laser communications and imaging applications
- Synthesis of partially coherent sources and their propagation through turbulence



Dr. Larry W. Burggraf

PhD, Chemistry, University of Denver

Professor of Chemical and Engineering Physics

Most Notable Publications

"Semiconductor color-center structure and excitation spectra: Equation-of-motion coupled-cluster description of vacancy and transition-metal defect photoluminescence," J. J. Lutz, X. F. Duan, and **L. W. Burggraf**, *Physical Review B*, 97, 115108 (2018).

"The closo-Si₁₂C₁₂ molecule from cluster to crystal: A theoretical prediction," Xiaofeng F. Duan and **Larry W. Burggraf**, *J. Chem. Phys.* 144, 114309 (2016).

"Searching for stable SinCn Clusters: Combination of Stochastic Potential Surface Search and Pseudopotential Plane-Wave Car-Parinello Simulated Annealing Simulations," Xiaofeng F. Duan, **Larry W. Burggraf** and Lingyu Huang, *Molecules*, 18, 8591-8606 (2013).

"A Modulating Liquid Collimator for Coded Aperture Adaptive Imaging of Gamma-Rays," Jack G. M. FitzGerald, **Larry W. Burggraf**, Benjamin R. Kowash, and Ethan L. Hull, *IEEE Transactions on Nuclear Science*, Vol. 60, No. 3, 2300-2307 (June 2013).

"Three-dimensional electron-positron momentum distribution of O₃⁺-irradiated 6H SiC using two positron spectroscopy techniques simultaneously," Christopher Williams, **Larry Burggraf**, Paul Adamson and James Petrosky, *J. Phys. Conf. Ser.* 262(1) 012064 (2011).

Selected Honors & Awards

- Recognized by Dr Ahmed Zewail (Nobel Laureate) in June 2009 Plenary Address at San Diego HPC Conference and in his autobiography "Voyage Through Time"

Patents:

- Larry W. Burggraf, Benjamin R. Kowash, Jack G. M. FitzGerald, "Reconfigurable liquid attenuated collimator", Aug 30, 2016, US9431141 B1
- Holland, D., Olesen, R., Burggraf, L., O'Day, B., Bevins, J. 2019. "Rotating Scatter Mask Design Classes for Directional Radiation Detection and Imaging." U.S. Patent Application 62,816,435, filed March 11, 2019. Patent Pending.
- Olesen, R., Egner, B., Holland, D., Martin, V., Bevins, J. 2019. "An Efficient, Dual-particle Directional Detection System using a Rotating Scatter Mask." U.S. Patent Application 62,816,451, filed March 11, 2019. Patent Pending.

Significant Accomplishments

- 2013 Nuclear Deterrence Operations Professional Team of the Year Award at the Air Education and Training Command level.
- Air Force Special Service Award (1994)
- AFRL HEDM Program ISp Award (1992)
- Air Force Institute of Technology PhD CI Distinguished Graduate (1981)



Research Interest Areas

- Positron spectroscopy
- Gamma Imaging
- Radioisotope propulsion
- Surface chemistry
- Molecular spectroscopy
- Laser printing of refractor alloys in concert with quantum chemistry calculations to solve DoD problems and create new capabilities



Maj Timothy I. Calver

PhD, Applied Physics, Air Force Institute of Technology

Assistant Professor of Physics

Most Notable Publications

T. I. Calver, M. B. Shattan, and G. P. Perram, "Shock front detachment during pulsed laser ablation of graphite," *Applied Physics A*, 128, 15, January 2022.

T. I. Calver, W. A. Bauer, C. A. Rice, and G. P. Perram, "Shock front behavior during pulsed laser ablation of graphite," *Optical Engineering*, 60, 057103, May 2021.

T. I. Calver, J. W. Evans, P. A. Berry, "Fe:ZnSe power amplifier for an OPGaAs optical parametric amplifier," *SENSIAC Military Sensing Symposium*, IB07, 2015.

T. Calver, M. Grimaila, and J. Humphries, "An empirical analysis of the cascade error reconciliation protocol for quantum key distribution," *Proceedings of the Seventh Annual Workshop on Cyber Security and Information Intelligence Research*, October 2011.

Selected Honors & Awards

- Meritorious Service Medal, 2018
- Commendation Medal with Oak Leaf Cluster, 2013
- Military Outstanding Volunteer Service Medal, 2011
- Nuclear Deterrence Operations Service Medal, 2017
- Directorate Field Grade Officer of the Quarter, Air Force Technical Applications Center 2018
- US Secretary of State Commendation, 2016
- Company Grade Officer of the Quarter, Arnold Engineering Development Center 2012
- Company Grade Officer of the Quarter, AFRL Sensors Directorate 2011
- Junior Military Engineer of the Year, AFRL Sensors Directorate 2010
- Air Force Office of Scientific Research Star Team, 2008-2011
- Honor Societies: Tau Beta Pi, Eta Kappa Nu



Research Interest Areas

- Pulsed Laser Ablation
- Laser Damage Assessment
- Optical Diagnostics
- Lasers and Optics



LTC Andrew W. Decker

PhD, Nuclear Engineering, University of Tennessee, Knoxville

Assistant Professor of Nuclear Engineering

Most Notable Publications

A.W. Decker, C.J. Delzer, S. Hok, N.J. Cherepy, and J.P. Hayward, "X-ray Characterization Using a Bismuth-Loaded Polyvinyl Toluene Array," *Journal of Radiation Effects, Research and Engineering*, vol. 39, no.1, pp. 11-21, Apr. 2021.

A.W. Decker, N.J. Cherepy, S. Hok and J.P. Hayward, "Simulated X-Ray Radiographic Performance of a Bismuth-Loaded PVT Array," *Transactions on Nuclear Science*, vol. 67, no. 11, pp. 2329-2336, Nov. 2020, DOI: [10.1109/TNS.2020.3029498](https://doi.org/10.1109/TNS.2020.3029498).

S. McHale, **A. Decker**, "Estimating radiation protection factor (RPF) values for a simple surrogate vehicle using the MCNP6.1 code," *Applied Radiation and Isotopes*, vol. 153, July 2019.

A.W. Decker, "Verification and Validation Report for the Radiation Protection Factor Methodology using the Monte Carlo N-Particle Code," version 6. (Fort Belvoir, VA: U.S. Defense Threat Reduction Agency) (2018) DTRA-TR-18-71.

A.W. Decker, S.R. McHale, M.P. Shannon, J.A. Clinton, J.W. McClory, "Novel Bonner Sphere Spectrometer Response Functions Using MCNP6," *Transactions on Nuclear Science*, IEEE, vol.62, no.4, pp.1689-1694, Aug. 2015.

Selected Honors & Awards

- Defense Meritorious Service Medal
- Bronze Star (1 OLC)
- Meritorious Service Medal

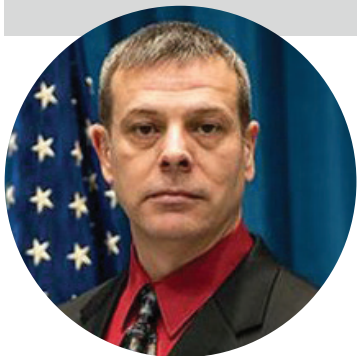
Significant Accomplishments

- Lead Researcher for DTRA Radiation Protection Factor research for four years (2014-2018), completing the early V&V of MCNP6 for the task and publishing a DoD Technical Report (DTRA-TR-18-71) from the assembled research.



Research Interest Areas

- Radiation Protection Factor (RPF) Calculations for Military Vehicles
- Neutron and Photon Radiography
- Characterization of Novel Plastic Scintillators for Dual Particle Radiography measurements



Dr. Michael L. Dexter

PhD, Nuclear Physics, Air Force Institute of Technology

Director, AFIT Center for Technical Intelligence Studies and Research

Assistant Professor of Nuclear Engineering

Most Notable Publications

M. L. Dexter, J. W. McClory, and B. R. Kowash, "Investigation and Development of Forensic Techniques for Estimating the Mass-To-Yield Ratio of a Nuclear Detonation with Remote Optical Sensors," *Journal of Radiation Effects, Research and Engineering*, vol. 34, no. 1, pp. 43-52, December 2016.

Significant Accomplishments

- Completed a deployment in 2019 as a member of a Joint Task for support of Operation Inherent Resolve as a Subject Matter Expert (SME) for combating weapons of mass destruction (CWMD).
- Developed PhD course in Advanced Nuclear Forensics taught at the Secret/CNWDI level.
- Deployed in November 2018 to Northern Iraq in support of Operation Inherent Resolve as the first-ever subject matter expert (SME) for combating weapons of mass destruction (CWMD).



Research Interest Areas

- Nuclear Weapons Effects
- Nuclear forensics
- High energy density plasma physics
- Optical transport
- Digital image processing and analysis
- High energy laser interactions



LTC Christina L. Dugan

PhD, Nuclear Science, Air Force Institute of Technology

Director, Nuclear Expertise for Advancing Technologies

Assistant Professor of Nuclear Engineering

Most Notable Publications

C. Dugan, C. Young, R. Carmona, M. Schneider, J. Petrosky, J. M. Mann, E. Hunt, and J.W. McClory, "The Debye Temperature of a Single Crystal Thorium Uranium Dioxide Alloy," *Physica Status Solidi – Rapid Research Letters*, vol. 12, no. 12, 1800436 (5 pages), December 2018.

C. Dugan, G. Peterson, A. Mock, C. Young, J. M. Mann, M. Nastasi, M. Schubert, L. Want, W. Mei, L. Tanabe, P. Dowben, and J. Petrosky, "Electrical and Material Properties of Hydrothermally Grown Single Crystal (111) UO₂," *The European Physical Journal B*, 91:67, April 2018.

C. Dugan, R. Hengehold, S. McHale, J. Santana, J. McClory, V. Adamiv, Y. Burak, Y. Losovyj and P. Dowben, "Reversible Mn Segregation at the Polar Surface of Lithium Tetraborate," *Applied Physics Letters*, vol. 102, 161602 (4 pages), April 2013.

C. Dugan, R. Hengehold, S. McHale, Ya. Losovyj, J. W. McClory, and J. Petrosky, "Photoemission and Cathodoluminescence of Doped Lithium Tetraborate Crystals Being Developed for Neutron Detection," *Material Research Society Symposium*, vol. 134, Nuclear Radiation Detection Materials, July 2011.

Knight, **C. Dugan**, J. Petrosky, A. Mock, P. Dowben, J.M. Mann, M. Kimani, and M. Schubert, "Infrared-Active Phonon Modes in Single-Crystal Thorium Dioxide and Uranium Dioxide," *Journal of Applied Physics*, 127, 125103, March 2020.

Selected Honors & Awards

- USAFA Basic Science Division Instructor of the Quarter (Spring 2012)
- Tau Beta Pi and Sigma Pi Sigma Honor Societies
- Top 10 Finalist in 2011 National Security Innovation Competition
- U.S. Army Deployment Excellence Award, Small Unit Category – 2020
- U.S. Army MG William L. Sibert Award – Best CBRN Unit – 2020

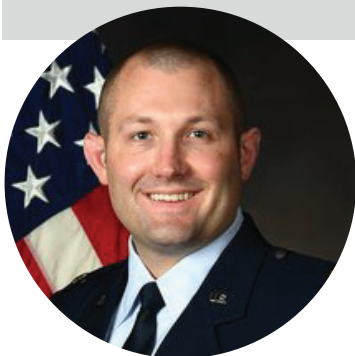
Significant Accomplishments

- Director of AFIT's Nuclear Expertise for Advancing Technologies (NEAT) Center



Research Interest Areas

Laser-Induced Breakdown Spectroscopy (LIBS) for nuclear forensics purposes, Surface science and material properties research via Cathodoluminescence and Photoemission Spectroscopy



Maj Daniel J. Emmons

PhD, Applied Physics, Air Force Institute of Technology

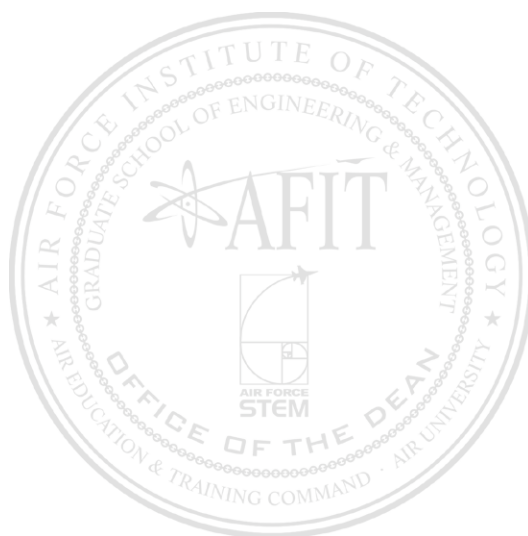
Assistant Professor of Applied Physics

Most Notable Publications

Emmons, D. J., & Weeks, D. E. (2019). Effect of $\text{Ar}(3p54p; 2p) + M \Rightarrow \text{Ar}(3p54s; 1s) + M$ branching ratio on optically pumped rare gas laser performance. Accepted for publication in *Optics Express*, 11 Nov 2019.

Emmons, D. J., Weeks, D. E., Eshel, B., & Perram, G. P. (2018). Metastable Ar (1s5) density dependence on pressure and argon-helium mixture in a high pressure radio frequency dielectric barrier discharge. *Journal of Applied Physics*, 123(4), 043304.

Emmons, D. J., & Weeks, D. E. (2017). Kinetics of high pressure argon-helium pulsed gas discharge. *Journal of Applied Physics*, 121(20), 203301.



Research Interest Areas

- Ionospheric Disturbances
- Gas Discharges
- Laser & Plasma Kinetics



Dr. Jonathan W. Evans

PhD, Optical Sciences and Engineering, Air Force Institute of Technology

Assistant Professor of Engineering Physics

Most Notable Publications

Jonathan W. Evans, Thomas R. Harris, Eric J. Turner, Martin M. Kimani, J. Matthew Mann, Ronald W. Stites, Gary Cook, Kenneth L. Schepler, "Re-absorption and nonradiative energy transfer in vibronic laser gain media," *Opt. Eng.* 60(5) 056103 (19 May 2021).

Jonathan W. Evans, Ronald W. Stites, Thomas R. Harris, "Increasing the performance of an Fe:ZnSe laser using a hot isostatic press," *Optical Materials Express*, Volume 7, Issue 12, 2017, Pages 4296-4303.

Tigran Sanamyan, **Jonathan W. Evans**, and Sean A. McDaniel, "Path to doubling the efficiency of mid-IR erbium lasers," *Opt. Express* 25, 16452-16457 (2017).

Jonathan W. Evans, Brian D. Dolasinski, Thomas R. Harris, Justin W. Cleary, and Patrick A. Berry, "Demonstration and power scaling of an Fe:CdMnTe laser at 5.2 microns," *Opt. Mat. Express* 7, 860-867 (2017).

J. W. Evans, P. A. Berry and K. L. Schepler, "A Passively Q-Switched, CW-Pumped Fe:ZnSe Laser," in *IEEE Journal of Quantum Electronics*, vol. 50, no. 3, pp. 204-209, (March 2014).

Selected Honors & Awards

- 2021 – William F. Bahret Technical Excellence Award, Systems Technology Office, AFRL/STO
- 2019 – AFRL Science and Engineering Early Career Award, AFRL Headquarters, AFRL/CC
- 2019 – Exemplary Civilian Service Award, AFRL Headquarters, AFRL/CC, AF-level
- 2018 – Brian M. Henderson Memorial Award, ADIOS Team, Sensors Directorate AFRL/RV
- 2015 – Member, AFOSR STAR Team CY12-CY15, CY09-CY11

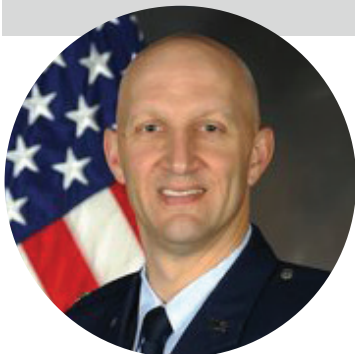
Significant Accomplishments

- Senior Member of Optical (formerly OSA)
- Chair: Fundamental Laser Sciences Technical Group (Optica)
- Guest Editor, *Optical Engineering* 57 (2), 021201: Special Section Guest Editorial: Solid-State Lasers (2017)
- Laser publication highlighted in *Laser Focus World*, April 2017



Research Interest Areas

- Mid-Infrared Solid State Laser Architectures
- Vibronic Laser Materials
- Nonlinear optical parametric sources
- Laser Beam Control



Col James R. Fee Jr.

PhD, Nuclear Engineering, Air Force Institute of Technology

Associate Dean, Graduate School of Engineering & Management

Assistant Professor of Nuclear Engineering

Most Notable Publications

J. R. Fee, J. C. Petrosky, "Medium-Altitude Electromagnetic Pulse (EMP) Model Requirements and Development", *Journal of Radiation Effects*, 33(1), 78-84 (May 2015).

J. R. Fee, J. C. Petrosky, B. F. Akers, "Reestablishing an Air Burst EMP Simulation Capability", *Journal of Radiation Effects*.

J. R. Fee, J. C. Petrosky, "Validation of the Air Burst EMP Simulation Capability", B-Code, *Journal of Radiation Effects*.

J. R. Fee, J. C. Petrosky, "Validation of the Air Burst EMP Simulation Capability", B-code, *2016 Hardened Electronics and Radiation Technology Conference*, Monterey, CA, 16-20 April 2016.

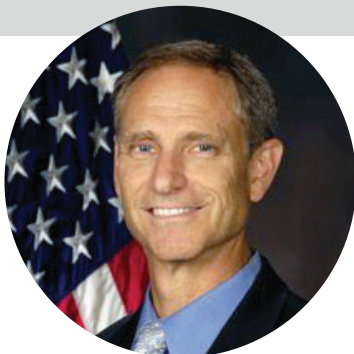
Selected Honors & Awards

- Meritorious Service Medal with 3 Oak Leaf Clusters, 2019
- Lt Col Charles P. Brothers Outstanding Volunteer Service Award, 2015
- Defense Meritorious Service medal with 2 Oak Leaf Clusters, 2011



Research Interest Areas

- Effects of Nuclear Weapons
- Simulations of Electromagnetic Pulses



Dr. Steven T. Fiorino

PhD, Physical Meteorology, Florida State University

Director, AFIT Center for Directed Energy

Professor of Atmospheric Physics

Most Notable Publications

Fiorino, S.T., S.R. Bose-Pillai, J.E. Schmidt, B.J. Elmore, K.J. Keefer, 2020: "Implications of 4D weather cubes for improved cloud free line of sight assessments of free space optical communications link performance," *Opt. Eng.* 59(8), 081808, doi: 10.1117/1.OE.59.8.081808.

McCrae, J.E., S. Bose-Pillai, and **S.T. Fiorino**, 2017: "Estimation of turbulence from time-lapse imagery," *Opt. Eng.* 0001; 56(7):071504. DOI: 10.1117/1.OE.56.7.071504.

Burley, J.L., **S.T. Fiorino**, B. Elmore, and J. Schmidt, 2017: "A Fast Calculating Two-Stream-Like Multiple Scattering Algorithm that Captures Azimuthal and Elevation Variations," *J. Appl. Meteor. Climatol.* 56:11, pp. 3049-3063. DOI:10.1175/JAMC-D-17-0044.1.

McCrae, J.E., S. Bose-Pillai, and **S.T. Fiorino**, 2017: "Estimation of turbulence from time-lapse imagery," *Opt. Eng.* 0001; 56(7):071504. doi:10.1117/1.OE.56.7.071504.

Fiorino, S.T., R.M. Randall, M.F. Via*, and J.L. Burley*, 2014: "Validation of a UV-to-RF high-spectral-resolution atmospheric boundary layer characterization tool," *J. Appl. Meteor. Climatol.* Vol 53, No. 1, pp. 136-156.

Selected Honors & Awards

- Promoted to full Professor with tenure August 2019
- Promoted from Research Associate Professor to tenure-track Associate Professor, May 2016

Significant Accomplishments

- Chair, Modeling and Simulation Technical Area Working Group, Joint Directed Energy Transition Office
- Appointed to NATO STO Technical Team: SCI-316 on High Energy Laser Weapons: Quantifying the Impact of Atmospheric and Reflections



Research Interest Areas

- Microwave remote sensing of the environment
- Development of weather signal processing algorithms
- Atmospheric effects on military systems such as high energy lasers and weapons of mass destruction



Lt Col Kyle E. Fitch

PhD, Atmospheric Sciences, University of Utah

Chair, Atmospheric Science Program

Assistant Professor of Atmospheric Science

Most Notable Publications

Fitch, K. E., & Garrett, T. J. (2022). "Measurement and analysis of the microphysical properties of Arctic precipitation showing frequent occurrence of riming." *Journal of Geophysical Research: Atmospheres*, 127(7), e2021JD035980.

<https://doi.org/10.1029/2021JD035980>

Fitch, K. E., & Garrett, T. J. (2022). "Graupel precipitating from thin Arctic clouds with liquid water paths less than 50 g m⁻²." *Geophysical Research Letters*, 49(1), e2021GL094075.

<https://doi.org/10.1029/2021GL094075>

Fitch, K. E., Hang, C., Talaei, A., & Garrett, T. J. (2021). "Arctic observations and numerical simulations of surface wind effects on Multi-Angle Snowflake Camera measurements," *Atmospheric Measurement Techniques*, 14(2), 1127-1142. <https://doi.org/10.5194/amt-14-1127-2021>

Dunnavan, E. L., Jiang, Z., Harrington, J. Y., Verlinde, J., **Fitch, K. E., Garrett, T. J. (2019).** "The shape and density evolution of snow aggregates," *Journal of the Atmospheric Sciences*, 76(12), 3919-3940. <https://doi.org/10.1175/JAS-D-19-0066.1>

Fitch, K. E., Hutchison, K. D., Bartlett, K. S., Wacker, R. S., Gross, K. C. (2016). "Assessing VIIRS cloud base height products with data collected at the Department of Energy Atmospheric Radiation Measurement sites," *International Journal of Remote Sensing*, 37(11), 2604-2620.

<https://doi.org/10.1080/01431161.2016.1182665>

Selected Honors & Awards

- AFIT Dean's Award, Department of Engineering Physics 2016
- Advanced Technical Intelligence Outstanding Student Award 2016
- AFIT Distinguished Graduate 2016
- Meritorious Service Medal
- Air Force Commendation Medal, 1 OLC
- Army Commendation Medal

Significant Accomplishments

- Deployed to Afghanistan in direct support of Operation ENDURING FREEDOM, 2010-2011 & 2013-2014



Research Interest Areas

- Arctic cloud and precipitation physics
- Remote sensing of clouds
- Machine-learning-based image classification



Dr. Anthony L. Franz

PhD, Physics, University of Maryland, College Park

Research Assistant Professor of Physics

Most Notable Publications

Carlos D. Diaz, **Anthony L. Franz**, and Michael A. Marciniak. "Spatial resolution comparison of a diffractive plenoptic camera and an intermediate image diffractive plenoptic camera," *Optical Engineering* 58(12), 123102 (24 December 2019). <https://doi.org/10.1117/1.OE.58.12.123102>.

Jack A. Shepherd, **Anthony L. Franz**, "Evaluation of plenoptic algorithm performance for measuring scene spectra captured by a diffractive plenoptic camera," *Proc. SPIE* 10669, Computational Imaging III, 1066909 (14 May 2018); DOI: <https://doi.org/10.1117/12.2303894>.

Francis D. Hallada, **Anthony L. Franz**, Michael R. Hawks. "Fresnel zone plate light field spectral imaging," *Optical Engineering* 56(8), 081811 (2017). DOI: <https://doi.org/10.1117/1.OE.56.8.081811>.

A. L. Franz, R. Roy, L. B. Shaw, and I. B. Schwartz. "Effect of Multiple Time Delays on Intensity Fluctuation Dynamics in Fiber Ring Lasers," *Physical Review E* 78, 016208 (2008). DOI: <https://doi.org/10.1103/PhysRevE.78.016208>.

A. L. Franz, R. Roy, L. B. Shaw, and I. B. Schwartz. "Changing Dynamical Complexity with Time Delay in Coupled Fiber Laser Oscillators," *Physical Review Letters* 99, 053905 (2007). DOI: <https://doi.org/10.1103/PhysRevLett.99.053905>.

Selected Honors & Awards

- Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence Award for the Department of Engineering Physics, AFIT (2017).
- AFIT and Air Education and Training Command winner for the 2014 Air Force Outstanding Scientist and Engineer of the Year Award, Senior Military Category, (2015).
- John T. McGrath award for best junior faculty member in the Department of Physics, U.S. Air Force Academy, (2003).

Significant Accomplishments

- Deployed, Rustamayah, Iraq, Jan 2009 - July 2009
- Deployed, Kabul, Afghanistan, Oct 2010 - Nov 2011



Research Interest Areas

- Remote Sensing
- Hyperspectral Imaging
- Dynamics and Information in Complex Systems



Dr. Nancy C. Giles

PhD, Physics, North Carolina State University

Executive Associate Dean for Strategies

Professor of Physics

Most Notable Publications

"Oxygen vacancies in LiB_3O_5 crystals and their role in nonlinear absorption," B. C. Holloway, C. A. Lenyk, T. D. Gustafson, **N. C. Giles**, D. Perlov, and L. E. Halliburton, *Optical Materials Express*, vol 12, pp 4155-4168 (23 Sep 2022).

" Cu^{2+} and Cu^{3+} acceptors in beta- Ga_2O_3 crystals: A magnetic resonance and optical absorption study," T. D. Gustafson, **N. C. Giles**, B. C. Holloway, C. A. Lenyk, J. Jesenovec, J.S. McCloy, M. D. McCluskey, and L. E. Halliburton, *Journal of Applied Physics*, vol. 131, article no. 065702 (14 pages) (Feb 2022).

"Optically active selenium vacancies in BaGa_4Se_7 crystals," B. C. Holloway, T.D. Gustafson, C.A. Lenyk, **N.C. Giles**, K.T. Zawilski, P.G. Schunemann, K.L. Averett, and L.E. Halliburton, *Journal of Applied Physics*, vol. 130, article no. 173104 (10 pages) (Nov 2021).

"Zn Acceptors in beta- Ga_2O_3 crystals," T. D. Gustafson, J. Jesenovec, C. A. Lenyk, **N. C. Giles**, J.S. McCloy, M. D. McCluskey, and L. E. Halliburton, *Journal of Applied Physics*, vol. 129, article no. 155701 (10 pages) (April 2021).

"Deep donor behavior of iron in beta- Ga_2O_3 crystals: Establishing the $\text{Fe}^{4+/3+}$ level," T. D. Gustafson, C. A. Lenyk, L. E. Halliburton, and **N. C. Giles**, *Journal of Applied Physics*, vol. 128, article no. 145704 (8 pages) (14 Oct 2020).

Selected Honors & Awards

- Benedum Distinguished Scholar Award, West Virginia University (WVU)
- WVU Foundation Outstanding Teacher Award
- Outstanding Teacher Award, Eberly College of Arts and Sciences, WVU
- Outstanding Researcher Award, Eberly College of Arts and Sciences, WVU

Significant Accomplishments

- Over 6000 career citations of publications (under Giles or Giles-Taylor); h-index=41.
- Authored 210 refereed journal publications.
- Currently serving as strategist for increased STEM education and research outreach for AF personnel.

Two book chapters:

- "Electron Paramagnetic Resonance (EPR) from $\beta\text{-Ga}_2\text{O}_3$ crystals," **N. C. Giles** and L. E. Halliburton, Chapter 8, pp. 169-190, in *Gallium Oxide (Ga_2O_3): Technology, Devices and Applications*, edited by S. Pearton, M. Mastro, and F. Ren (Elsevier, 2018).
- "HgTe-CdTe Superlattices," J.R. Meyer, C.A. Hoffman, T.H. Myers, and **N.C. Giles**, Chapter 7, pp. 535-593, in *Handbook of Semiconductors: Materials, Properties, and Preparation*, Vol. 3a, edited by S. Mahajan (North Holland, Amsterdam, 1994).



Research Interest Areas

- Identification of point defects and device-limiting absorption bands in semiconducting and optical materials
- Inorganic crystalline materials (bulk, thin films) for defense countermeasures and high-power mid-IR lasers
- Photoluminescence, absorption, thermoluminescence, and magnetic resonance spectroscopy of point defects in crystals



Dr. Michael R. Hawks

PhD, Optical Sciences, Air Force Institute of Technology

Research Assistant Professor

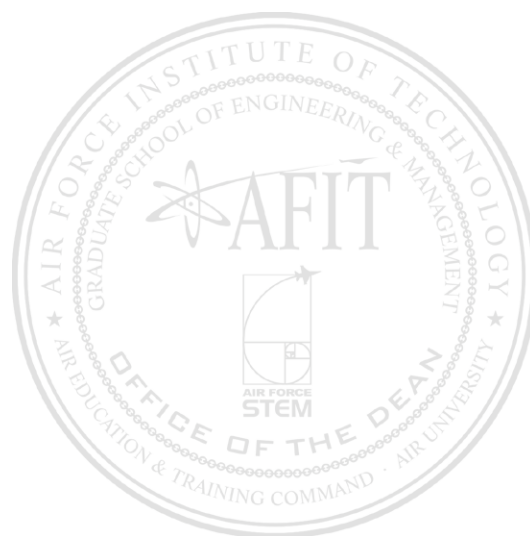
Most Notable Publications

Thomas, R. Cobb, S. Fiorino, **M.R. Hawks**, "SNR modeling for ground-based daytime imaging of GEO-satellites in the SWIR", *2019 IEEE Aerospace Conference* (2019).

F.D. Fernandez, B.J. Steward, K.C. Gross, **M.R. Hawks**, "Implementation of a non-linear CMOS and CCD focal plane array model in ASSET", *Proceedings of the SPIE*, vol 11001 (2019).

A. Gavriales, L.A. Schlie, R.D. Loper, **M.R. Hawks**, G.P. Perram, "Analytic treatment of beam quality and power efficiency in high power transverse flow Diode Pumped Alkali Laser", *J. Opt. Soc. Am. B*, 35(9) (2018).

F.D. Hallada, A.L. Franz, **M.R. Hawks**, "Fresnel zone plate light field spectral imaging", *Opt Eng* 56(8) (2017).



Research Interest Areas

- Electro-optic and infrared remote sensing
- Hyperspectral imaging
- Computational physics



Dr. Darren E. Holland

PhD, Mechanical Engineering, University of Michigan

Research Assistant Professor of Engineering Physics

Most Notable Publications

Logan, J., **Holland, D.**, Burggraf, L., Clinton, J., O'Day, B. 2019. "Monte Carlo and Experimental Analysis of a Novel Directional Rotating Scatter Mask Gamma Detection System." *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*. 947, pp. 162698. <https://doi.org/10.1016/j.nima.2019.162698>

Olesen R., O'Day B., **Holland D.**, Burggraf L., and Bevins J., 2018. "Characterization of novel rotating scatter mask designs for gamma direction identification". *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*. In Press. <https://doi.org/10.1016/j.nima.2018.09.067>

Holland, D. E., Bevins, J. E., Burggraf, L. W., and O'Day, B. E., 2018. "Rotating scatter mask optimization for gamma source direction identification". *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*. 901, pp. 104-111. <https://doi.org/10.1016/j.nima.2018.05.037>

Holland, D. and Epureanu, B., 2013. "A component damping identification method for mistuned blisks". *Mechanical Systems and Signal Processing*. 41 (1-2), pp. 598-612. <http://dx.doi.org/10.1016/j.ymssp.2013.07.003>

Holland, D. and Epureanu, B., 2012. "Hybrid modal damping identification for bladed disks and blisks". *Journal of Vibration and Control*. 20 (1), pp. 51-65. <http://dx.doi.org/10.1177/1077546312461028>

Selected Honors & Awards

Patents:

- **Holland, D.**, Olesen, R., Burggraf, L., O'Day, B., Bevins, J. 2019. "Rotating Scatter Mask Design Classes for Directional Radiation Detection and Imaging." U.S. Patent Application 62,816,435, filed March 11, 2019. Patent Pending.
- Olesen, R., Egner, B., **Holland, D.**, Martin, V., Bevins, J. 2019. "An Efficient, Dual-particle Directional Detection System using a Rotating Scatter Mask." U.S. Patent Application 62,816,451, filed March 11, 2019. Patent Pending.

Significant Accomplishments

- Member of Nuclear Event Analysis and Testing (NEAT) Center for Specialized Research (CSR)



Research Interest Areas

- Source detection and identification
- Design optimization and uncertainty analysis
- Radiation transport modeling, simulation, verification, and validation
- Machine learning techniques for imaging



Lt Col Milo W. Hyde IV

PhD, Electrical Engineering, Air Force Institute of Technology

Associate Professor of Optical Physics

Most Notable Publications

Milo W. Hyde IV, "Twisted space-frequency and space-time partially coherent beams," *Scientific Reports*, vol. 10, 12443 (12 pp.), Jul 2020, doi: 10.1038/s41598-020-68705-9.

Milo W. Hyde IV and Svetlana Avramov-Zamurovic, "Generating dark and antidark beams using the genuine cross-spectral density function criterion," *Journal of the Optical Society of America A*, vol. 36, no. 6, pp. 1058-1063, May 2019, doi: 10.1364/JOSAA.36.001058.

Milo W. Hyde IV, Santasri Bose-Pillai, David G. Voelz, and Xifeng Xiao, "Generation of vector partially coherent optical sources using phase-only spatial light modulators," *Physical Review Applied*, vol. 6, no. 6, 064030 (12 pp.), Dec 2016, doi: 10.1103/PhysRevApplied.6.064030.

Milo W. Hyde IV, Santasri R. Bose-Pillai, and Ryan A. Wood, "Synthesis of non-uniformly correlated partially coherent sources using a deformable mirror," *Applied Physics Letters*, vol. 111, no. 10, 101106 (5 pp.), Sep 2017, doi: 10.1063/1.4994669.

Milo W. Hyde IV, Santasri Basu, David G. Voelz, and Xifeng Xiao, "Experimentally generating any desired partially-coherent Schell-model source using phase-only control," *Journal of Applied Physics*, vol. 118, no. 9, 093102 (10 pp.), Sep 2015, doi: 10.1063/1.4929811.

Selected Honors & Awards

- Air Force Association Wright Memorial Chapter General Bernard A. Schriever Award
- Military Officers Association of America Outstanding Military Faculty Award
- Eta Kappa Nu (Delta Xi Chapter) Outstanding Teaching Award for Electrical and Computer Engineering

Significant Accomplishments

- OSA Senior Member
- IEEE Senior Member
- SPIE Senior Member



Research Interest Areas

- Statistical optics
- Fourier optics
- Guided wave theory
- Electromagnetic material characterization



CDR Royce W. James

PhD, Plasma Physics

Visiting Professor

Most Notable Publications

M. Shilov, C. Cates, **R. James**, et al., "Dynamical plasma response of resistive wall modes to changing external magnetic perturbations," *Phys. Plasmas* 11, 2573 (2004).

M. E. Mauel, J. Bialek, A. H. Boozer, C. Cates, **R. James**, O. Katsuro-Hopkins, A. Klein, Y. Liu, D. Maurer, D. Maslovsky, G. Navratil, T. Pedersen, M. Shilov, and N. Stillitis., "Dynamics and control of resistive wall modes with magnetic feedback control coils: experiment and theory", *Phys. Plasmas* (2005).

R.W. James, E.L. Page, N. Thayer, B. Romano, D. Woodman, C. Welicka, T. Fitzgerald "Low Pressure High Density Plasma Development on a Small Helicon Plasma Experiment (HPX)," *American Physical Society's 54th Annual Meeting of the Division of Plasma Physics*, Providence, RI; November, 16, 2012.

R.W. James, "Progress on Development of Low Pressure High Density Plasmas on the Helicon Plasma Experiment (HPX)," *American Physical Society's 61st Annual Meeting of the Division of Plasma Physics*, Fort Lauderdale, FL; November, 5 - October, 24, (2019).

Freeman, **R.W. James**, R.W., Allen, L.A., Tejero, E., Daeffler, M. "CGA/NRL Impedance Probe as a ThinSat Spacecraft Payload" *American Physical Society's 61st Annual Meeting of the Division of Plasma Physics*, Fort Lauderdale, FL; November, 5 - October, 24, (2019).

Selected Honors & Awards

- Coast Guard Meritorious Service Medal
- Black Engineer of the Year Award (BEYA): Professional Achievement Award
- US Coast Guard Academy's Center for Academic Studies Summer Fellowship Award
- Coast Guard Commendation Medal
- Coast Guard Representative for National Aeronautics and Space Administration Astronaut Selection Process
- US Coast Guard Permanent Commissioned Teaching Staff (military version of Tenured Professor) sworn in – selected in 2005

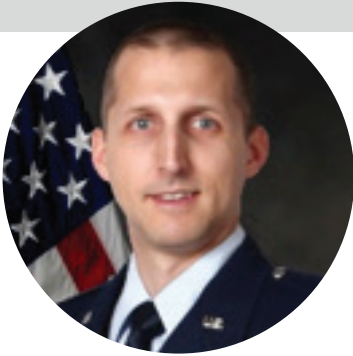
Significant Accomplishments

- Air Force Institute of Technology Visiting Faculty Fellow
- Unitarian Universalist Association President's International Award for Volunteer Service
- Special Congressional Recognition for Volunteer Service to Children and Families
- US Coast Guard Academy's Ms. Frances Neal Humanitarian Award
- Columbia University Research Fellow



Research Interest Areas

- Laboratory and Space based Magnetized Plasmas
- Plasma Interactions with Electromagnetic Radiation (with emphasis on high energy lasers)
- Fusion Energy
- Plasma Water Treatment



Lt Col Christopher A. Lenyk

PhD, Air Force Institute of Technology

Assistant Professor of Nuclear Engineering

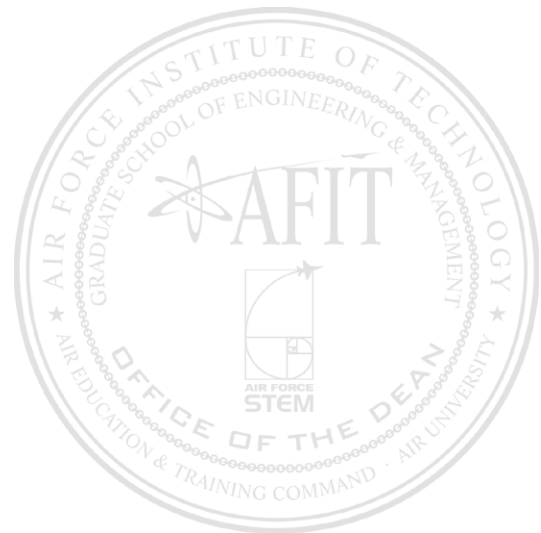
Most Notable Publications

C. A. Lenyk, N. C. Giles, E. M. Scherrer, B. E. Kananen, L. E. Halliburton, K. T. Stevens, G. K. Foundos, J. D. Blevins, D. L. Dorsey, S. Mou, "Ir⁴⁺ ions in α -Ga₂O₃: an unintentional deep donor," *J. Appl. Phys.* 125, 045703 (2019).

C. A. Lenyk, M. S. Holston, B. E. Kananen, L. E. Halliburton, N. C. Giles, "Lithium and gallium vacancies in LiGaO₂ crystals," *J. Appl. Phys.* 124, 135702 (2018).

T. E. R. Dodson, L. E. Halliburton, G. S. Kedziora, **C. A. Lenyk**, N. C. Giles, "Self-trapped holes (small polarons) in ferroelectric KH₂PO₄ crystals," *J. Phys.: Condens. Matter* 31, 505503 (2019).

C. A. Lenyk, D. J. Bunker, J. W. McClory, S. R. McHale, B. R. Kowash, "Defining a Methodology for Data Analysis Using Streak Films," *Journal of Radiation Effects, Research and Engineering*, 33, 1-E, (2015).



Research Interest Areas

- Isolated point defects in single crystals
- Electron paramagnetic resonance (EPR)
- Thermoluminescence (TL)
- Photoluminescence (PL)
- Fourier-transform infrared (FTIR) spectroscopy
- Ultra-wide-bandgap oxides
- Scintillators
- Optical materials
- Radiation effects on materials
- Nuclear weapon effects



Dr. Juan Jose Manfredi, Jr.

PhD, Physics, Michigan State University

Assistant Professor of Nuclear Engineering

Most Notable Publications

J. Manfredi, J. Lee, A.M. Rogers, et al., "Quenching of single-particle strengths in direct reactions," *Phys. Rev. C*, 104, 024608, 2021.

T. A. Laplace, B. L. Goldblum, **J. J. Manfredi**, J. A. Brown, D. L. Bleuel, C. A. Brand, G. Gabella, J. Gordon, and E. Brubaker, "Simultaneous measurement of organic scintillator response to carbon and proton recoils," *Phys. Rev. C*, 104, 014609, 2021.

J. J. Manfredi, B. L. Goldblum, T. A. Laplace, et al., "Proton light yield of fast plastic scintillators for neutron imaging," *IEEE Transactions on Nuclear Science*, vol. 67, no. 2, pp. 434–442, 2020.

J. Manfredi, J. Lee, W. Lynch, et al., "On determining dead layer and detector thicknesses for a position sensitive silicon detector," *Nucl. Inst. and Meth. A*, vol. 888, pp. 177 – 183, 2018.

J. Manfredi, R. J. Charity, K. Mercurio, et al., "Alpha decay of the excited states in ^{12}C at 7.65 and 9.64 MeV," *Phys. Rev. C*, 85, 037603, 2012.

Selected Honors & Awards

- Nuclear Science and Security Consortium Postdoctoral Fellow (2020-2021)
- NNSA Stewardship Science Graduate Fellowship (2013-2017)
- National Superconducting Cyclotron Laboratory Fellowship (2012-2017)

Significant Accomplishments

- AFIT Point of Contact for the Nuclear Science and Security Consortium
- Member of review panels for programs at the Department of Energy Office of Defense Nuclear Nonproliferation and Office of Nuclear Physics
- Mentorship of graduate students



Research Interest Areas

- Radiation detector development, characterization, and application
- Nuclear physics
- Modeling and simulation of nuclear processes
- Natural language processing and machine learning



Dr. Michael A. Marciniak

PhD, Engineering Physics, Air Force Institute of Technology

Professor of Physics

Most Notable Publications

B. Adomanis, D.B. Burckel and **M. Marciniak**, "3D plasmonic design approach for efficient transmissive Huygens metasurfaces," *Optics Express* 27(15), 20928-20937 (Jul 2019).

G.E. Lott, **M.A. Marciniak** and J.H. Burke, "Three Dimensional Imaging of Trapped Cold Atoms with a Light Field Microscope," *Applied Optics* Vol. 56, No. 31, pp. 8738-8745 (Oct 2017).

J.C. Vap, S.E. Nauyoks, M.R. Benson and **M.A. Marciniak**, "Use of a novel infrared wavelength-tunable Mueller-matrix polarimetric scatterometer to measure nanostructured optical materials," *Review of Scientific Instruments* Vol. 88, pp. 103104(1-6) (Oct 2017).

S.D. Butler, S.E. Nauyoks and **M.A. Marciniak**, "Comparison of micro-facet BRDF model to modified Beckmann-Kirchhoff BRDF model for rough and smooth surfaces," *Optics Express* Vol. 23, No. 22, pp. 29100-29112 (Nov 2015).

M.R. Benson, A.G. Kinsley, **M.A. Marciniak**, M.D. Seal and A.M. Urbas, "Permittivity and permeability tensor extraction technique for arbitrary anisotropic materials," M.R. Benson,* *IEEE Photonics Journal* Vol. 7, No. 3, pp. 2600613(1-13) (Jun 2015).

Selected Honors & Awards

- 2009 Wright Memorial Chapter, Air Force Association, Col Gage H. Crocker Outstanding Professor Award (1 Jan-31 Dec 2008)

Significant Accomplishments

- "Remote sensing of hidden objects," M.G. Hoelscher and M.A. Marciniak, US Patent No. 8,976,256 B2, 10 March 2015.



Research Interest Areas

- Light-matter interaction, including polarimetric scatterometry of nanostructured materials (photonic crystals, plasmonic materials and optical meta-materials)
- Bidirectional reflectance distribution functions (BRDF) for optical signatures
- High-energy-laser damage assessment



Dr. John W. McClory

PhD, Nuclear Engineering, Air Force Institute of Technology

Professor of Nuclear Engineering

Most Notable Publications

James J. Frey, Richard G. Cobb, and **John W. McClory**, "Modeling a Lossy Dielectric Polymer-Based Thermoacoustic High Power Microwave Directed Energy Exposure Detection System", published online in the *Health Physics*, April 2022.

<https://doi.org/10.1097/HP.0000000000001559>

J. Seik, B.J. Borghetti, **J.W. McClory**, A.A. Bickley, A. Holland, "Application of an Artificial Neural Network to Assay Data for Nuclear Forensics Analysis," *Journal of Radiation Effects, Research and Engineering*, vol. 40, no. 1, pp. 93-100, March 2022.

Zachary W. LaMere, Darren E. Holland, Whitman T. Dailey, and **John W. McClory**, "Space to Air High-Altitude Region Adjoint Neutron Transport," published online in the *Journal of Defense Modeling and Simulation*, July 2021. <https://doi.org/10.1177/15485129211031669>

Lei Pan, Praneeth Kandlakunta, Matthew Van Zile, Xuezheng Dai, Jinsong Huang, **John W. McClory**, and Lei R. Cao, "Acquiring and Modeling of Si Solar-Cell Transient Response to Pulsed X-Ray," *IEEE-Transactions on Nuclear Science*, vol. 68, no. 5, pp. 1152-1160, May 2021. <http://dx.doi.org/10.1109/TNS.2021.3067193>

N. Gale, **J.W. McClory**, M. Hogsed, and B. Wang, "Neutron Displacement Damage in Germanium-Tin Photodiodes," *Journal of Radiation Effects, Research and Engineering*, vol. 39, no. 1, pp. 116-123, April 2021.

Selected Honors & Awards

- Dean's Distinguished Teaching Professor Award (2019)
- AETC Nuclear Deterrence Operations Professional Team of the Year Award (2019)

Significant Accomplishments

- Nuclear Engineering Program Curriculum Chair (2018-present)
- Member Joint National Security Applications Council-Peer Review Panel (JNSAC-PRP) (2013-present)
- Director, Nuclear Weapons Effects, Policy, and Proliferation Graduate Certificate Program (2013-present)
- AFTAC Endowed Term Chair Professor for Materials



Research Interest Areas

- Radiation effects
- Radiation detector development
- Nuclear weapon effects
- Nuclear forensics techniques



Dr. Jack E. McCrae

PhD, Physics, Air Force Institute of Technology

Research Assistant Professor of Physics

Most Notable Publications

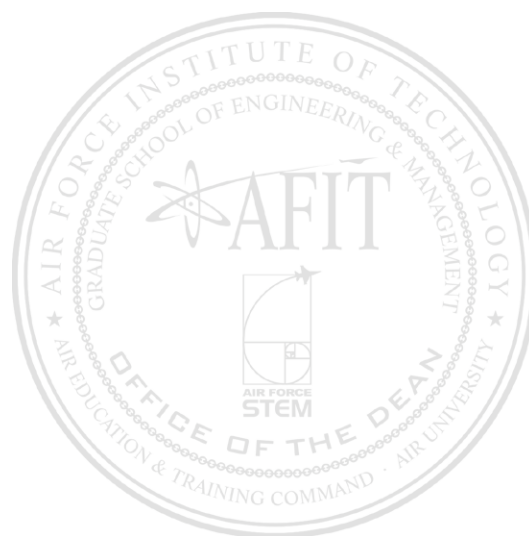
Noah R. Van Zandt, **Jack E. McCrae**, and Steven T. Fiorino, "Modeled and measured image-plane polychromatic speckle contrast," *Opt. Eng.* 55 (2):024106 (1-7), (Feb 2016).

Santasri Basu, **Jack E. McCrae**, Steven Fiorino, and Jared Przelomski, "Estimation of temporal variations in path-averaged atmospheric refractive index gradient from time-lapse imagery," *Submitted to Optical Engineering Letters*.

Basu, Santasri, **J.E. McCrae**, and S.T. Fiorino, "Estimation of atmospheric refractive index gradient variations and Cn2 from time-lapse imagery," *Propagation through and Characterization of Atmospheric and Oceanic Phenomena (pCAOP), Imaging and Applied Optics Conference*, Arlington VA, 27-29 June 2016.

Jack E. McCrae, Santasri Basu, and Steven T. Fiorino, "Estimation of atmospheric parameters from time-lapse imagery," *Proc. SPIE 9833, Atmospheric Propagation XIII*, 983303 (May 13, 2016) doi:10.1117/12.2223986.

McCrae, J.E. and S.T. Fiorino, "Simulation of Array Tilt Effects in Laser Phased Arrays," *2016 IEEE Aerospace Conference Big Sky*, Montana. 5-12 March 2016.



Research Interest Areas

- Optics
- Lasers
- Quantum and non-linear optics
- Quantum computing
- Laser radar
- Modeling and measurements of atmospheric propagation, and imaging



Dr. Michael V. Pak

PhD, Theoretical Physics, St. Petersburg State University

PhD, Quantum Chemistry, Iowa State University

Research Assistant Professor of Physics

Most Notable Publications

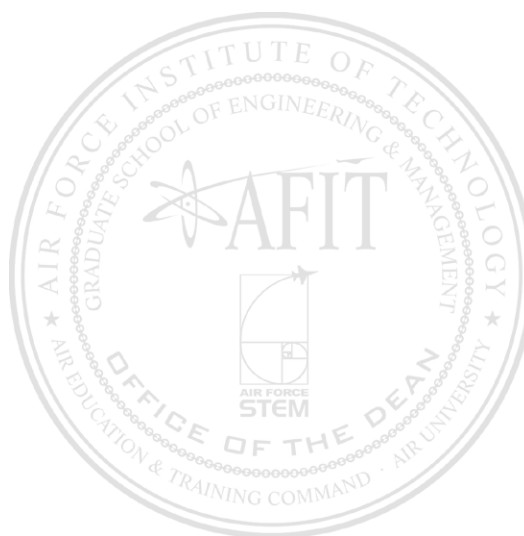
A. Scheppe, **M.V. Pak** "Complete description of fault-tolerant quantum gate operations for topological Majorana qubit systems", *Phys. Rev. A* 105, 012415 (2022)

D.Watkins, P.Adamson, A.S.Richardson, S.Swanekamp, I.Rittersdorf, J.Schumer, **M.V. Pak**, "A Semi-Classical Model for Computing Vibrationally-Resolved Electron-Impact Ionization Cross Sections", *Bulletin of the American Physical Society*, 66 (2021)

E.Ilin, I.Burkova, X.Song, **M.V. Pak**, S.Golubev, A.Bezryadin "Superconducting phase transition in inhomogeneous chains of superconducting islands", *Phys. Rev. B* 102, 134502 (2020)

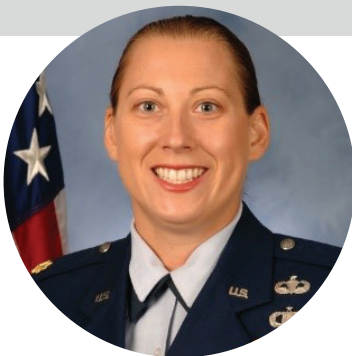
K.R. Brorsen, **Michael V.Pak**, S. Hammes-Schiffer "Calculation of positron binding energies and electron-positron annihilation rates for atomic systems with the reduced explicitly correlated Hartree-Fock method in the Nuclear-Electronic Orbital framework", *J. Phys. Chem. A*, 121 (2), pp 515-522 (2017)

A.V. Tulub, V.F. Brattsev, **Michael V. Pak**, "Electron density in the interior of nuclei with allowance for QED effects in the many-electron theory of atoms", *Phys. Atom. Nuc.*, 61 (4), pp.520-524



Research Interest Areas

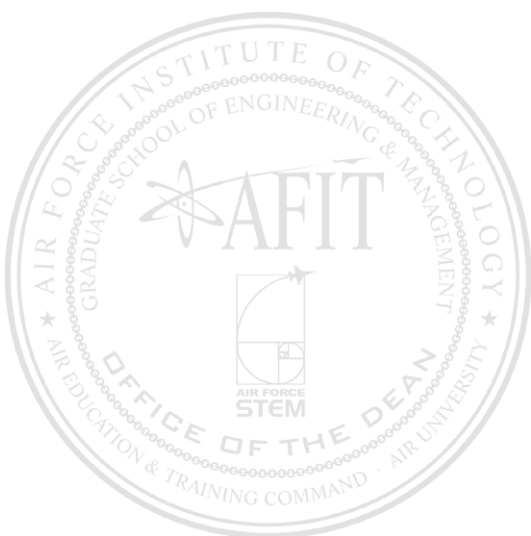
- Theory of quantization, topological quantum computing and quantum theory of multi-component systems.
- Development of new methods to accurately describe matter-antimatter interactions, and specifically positron annihilation in complex multi-electron environment.
- Physics of nuclear beta decay in intense radiation field.



Lt Col Chandra M. Pasillas

Doctoral Candidate, Atmospheric Sciences, Colorado State University

Instructor of Atmospheric Science



Selected Honors & Awards

- Bronze Star
- Meritorious Service Medal with one oak leaf cluster
- Air Force Commendation Medal with one oak leaf cluster
- Army Commendation Medal
- Air Force Achievement Medal with one oak leaf cluster
- Meritorious Unit Award
- AF Outstanding Unit Award with two oak leaf clusters
- AF Organizational Excellence Award
- Air Force Recognition Ribbon
- National Defense Service Medal
- Afghanistan Campaign Medal
- Global War on Terrorism Service Medal
- NATO Medal



Research Interest Areas

Lt Col Pasillas' research interests include remote sensing of clouds and tropical cyclones. Her current focus is on improving remote sensing retrievals of nocturnal low-level clouds through manipulation of long wave infrared radiation using machine learning techniques.



Dr. Anil K. Patnaik

PhD, Quantum Optics, Physical Research Laboratory (India)

Associate Professor of Physics

Most Notable Publications

"Investigating chemometric methods to improve the limit of detection for trace elements in plutonium via a handheld laser-induced breakdown spectroscopy device," Ashwin P. Rao, Phillip R. Jenkins, Dung M. Vu, John D. Auxier II, **Anil K. Patnaik**, Michael B. Shattan, *Analytical Methods* 13, 3368-3378 (2021).

"Influence of Coherent Population Trapping on Raman Scattering," Puja Singh, **Anil K. Patnaik**, Sukesh Roy, James R. Gord, and Yuri V. Rostovtsev, *Phys. Rev. A* 100, 023808 (2019).

"Recent advances in ultrafast-laser-based spectroscopy and imaging for reacting plasmas and flames," **Anil K. Patnaik**, Igor Adamovich, James R. Gord, and Sukesh Roy, *Plasma Sources Science and Technology* 26, 103001 (2017).

"All-optically controlled concurrent slow-fast light," **Anil K. Patnaik**, Sukesh Roy, and James R. Gord, *Optics Letters* 36, 3272-3274 (2011).

"A simple study of photon correlations from Hanbury-Brown and Twiss to Einstein," Podolsky, Rosen and beyond, Roy J. Glauber, Manfred Kleber, **Anil K. Patnaik**, Marlan O. Scully, and Herbert Walther, *Journal of Physics B* 38, S521-S534 (2005).

Selected Honors & Awards

- AFIT Dean's Distinguished Teaching Professor Award 2021
- Research work in international news [Physics World, 2015]
- Japanese Society for Promotion of Science (JSPS) fellowship for the period 2001-2003, with a research grant

Significant Accomplishments

- Highly cited papers with ~ 1350 citations; h-index 18, i10-index 31 (Source: Google Scholar)
- Serving as Program Chair in Optical Society of America (OSA) conference on Laser Applications in Chemical, Security and Environmental Analysis
- Plenary speaker and organizer of a technical session at 51st Winter Colloquium on the Physics of Quantum Electronics 2022



Research Interest Areas

- Quantum optics and information
- Extreme light-matter interactions for
- Laser spectroscopic applications for nuclear diagnostics



Dr. Glen P. Perram

PhD, Physics, Air Force Institute of Technology

Professor of Physics

Most Notable Publications

N.D. Haluska, **G. P. Perram**, and Christopher A. Rice, "Efficient cascade lasing on over 17 wavelengths from two-photon excitation of cesium 6^2D ," *Optics Communications*, 476, 126328, August 2020.

Douglas E. Thornton, Mark F. Spencer, Christopher A. Rice, and **Glen P. Perram** "Impacts of Laboratory Vibrations and Laser Flicker Noise on Digital Holography," *IEEE Journal of Quantum Electronics*, 56, 1400107, Oct 2020.

T.A. Van Woerkom, **G.P. Perram**, B.D. Dolasinski, P.A. Berry, and C.D. Phelps, "Laser ablation of metals and semiconductors with 100 ps - 100 μ s pulses," *Optical Engineering*, 58, 08611, August 2019

Ashley E. Gonzales, Nicholas C. Herr, and **Glen P. Perram**, "Experimental Study of Laser Irradiated Graphite Oxidation using IFTS," *Combustion and Flame*, 192, 180-189, Mar 2018.

Athanasios Gavrielides, L.A. (Vern) Schlie, Robert D. Loper, Michael R. Hawks, and **Glen P. Perram**, "Analytic treatment of beam quality and power efficiency in high power transverse flow Diode Pumped Alkali Laser," *J Optical Society of America B*, 35, 2202-2210, Sep 2018.

Selected Honors & Awards

- Air Force Science, Technology and Mathematics Award, Outstanding Senior Civilian Scientist
- Air Force Science and Engineering, Exploratory Team Award

Significant Accomplishments

- Fellow, Optical Society of America
- Fellow, Directed Energy Professional Society



Research Interest Areas

- Lasers devices
- Laser weapons
- Spectroscopy
- Chemical kinetics
- Remote sensing



Dr. James C. Petrosky

PhD, Engineering Physics, Rensselaer Polytechnic Institute

Professor Emeritus of Nuclear Engineering

Most Notable Publications

Nichole Benker, Elena Echeverria-Mora, Jennifer Hamblin, Peter A. Dowben, Axel Enders, Brant Kananen, **James Petrosky**, John McClory. "Possible detection of solar neutrons from the ISS." *American Astronomical Society Meeting Abstracts*, 232 (2018).

Christina L. Dugan, George Glenn Peterson, Alyssa Mock, Christopher Young, J. Matthew Mann, Michael Nastasi, Mathias Schubert, Lu Wang, Wia-Ning Mei, Lori Tanabe, Peter A. Dowben, **James Petrosky**. "Electrical and material properties of hydrothermally grown single crystal (111) UO₂." *The European Physical Journal B* 91:67, April, 2018.

J. R. Fee Jr. and **J. C. Petrosky**, "Validation of the Air Burst EMP Simulation Capability, B-code," *Journal of Rad Effects, Res, and Eng.* Vol 35 (SECRET), April, 2018.

David Smith, *Bertus Shelters, Derek Hesser, Peter Collins, James Fee, **James Petrosky**, Andrew Terzuoli, Caglar Yadim. "Effects of ionospheric scintillation on V and W band signals," *2017 IEEE International Symposium on Antennas and Propagation & USNC/URSI Radio Science Meeting*, 9-14 July 2017.

Christopher Young, **James Petrosky**, J. Matthew Mann, Eric M. Hunt, David Turner and Peter A. Dowben, "The lattice stiffening transition in UO₂ single crystals," *Journal of Physics: Condensed Matter*, 29 (2017), 21 November 2016.

Selected Honors & Awards

- Charles Stone Award
- Aldren Research Excellence Award
- AETC Science and Technology Professor of the Year Award
- General Bernard Schriever Award
- Member of the AETC Nuclear Deterrence Operations Professional Team of the Year

Significant Accomplishments

- NNSA Review Committee Member of the following: Radiation Effects and High Energy Density Sciences (REHEDS) research consortium, Qualification Alternatives to the Sandia Pulsed Reactor (QASPR) and the Radiation-aware Electrical Multi-Scale Model Based Design (REMS-MDB) L2 review team



Research Interest Areas

- Radiation effects on electronic devices, EMP, experimental design, radiation detection, and nuclear weapon effects.
- Narrow- and wide-band gap materials, using combinations of electrical, optical, and absorption spectroscopy to gain information on the damaging effects of ionizing and non-ionizing radiation.



Dr. Heidi R. Ries

PhD, Applied Physics, Old Dominion University

Provost and Chief Academic Officer

Professor of Physics

Most Notable Publications

"Microwave response near zero magnetic field in transition-metal-doped silicate glasses," R.R. Rakhimov, **H.R. Ries**, D.E. Jones*, L.B. Glebov, and L.N. Glebova. *Appl. Phys. Lett.* 76 (6) pp. 751-753 (2000).

"Spin dynamics of the triplet Cr⁴⁺ in the vicinity of energy level anti-crossing," R. R. Rakhimov, H. R. Horton*, D. E. Jones*, G. B. Loutts, and **H. R. Ries**. *Chem. Phys. Lett.* (319) 5-6 (2000) pp. 639-644

"Manganese-doped yttrium orthoaluminate: A potential material for holographic recording and data storage," G.B. Loutts, M. Warren*, L. Taylor*, R.R. Rakhimov, **H.R. Ries**, G. Miller, III; M.A. Noginov, M. Curley, N. Noginova, N. Kukhtarev, H.J. Caulfield, P. Venkateswarlu. *Phys. Rev. B* 57 (7) 3706-3709 (1998)

"Crystal growth, spectroscopic characterization, and laser performance of a new efficient laser material Nd:Ba₅(PO₄)₃F," G.B. Loutts, C. Bonner, C. Meegoda*, **H. Ries**, M.A. Noginov, N. Noginova, M. Curley, P. Venkateswarlu, A. Rapaport, and M. Bass, *Applied Physics Letters* 71(3) 303 (1997) (selected for inclusion in the *SPIE's Milestone Series of Selected Reprints on the subject Laser Crystal Growth*, Robert Uhrin, editor).

"Mechanism of Electrical Conductivity in an Irradiated Polyimide," **H.R. Ries**, W.L. Harries, S.A.T. Long, and E.R. Long, Jr., *J. Phys. Chem. of Solids* 50, 735 (1989).

Selected Honors & Awards

- Air Force Exemplary Civilian Service Award (2013)
- Air Force winner of the 2011 Department of Defense Women's History Month Science, Technology, Engineering and Mathematics Role Model Award, Civilian category
- Air Force winner of the 2011 National Latina Distinguished Service Award
- Ten Top Women Award (Dayton Daily News, 2009)
- Air Force Meritorious Civilian Service Award (2008)

Significant Accomplishments

- Higher Learning Commission Team Chair and Peer Reviewer
- Chair, Board of Trustees, Engineering and Science Foundation of Dayton



Research Interest Areas

- Radiation effects
- Nonlinear optical materials
- Electron paramagnetic resonance spectroscopy
- Laser processing of materials



Dr. Adib J. Samin

PhD, Mechanical Engineering, The Ohio State University

Assistant Professor of Nuclear Engineering

Most Notable Publications

Samin, A.J., Andersson, D. A., Holby, E. H., and Uberuaga, B. P. Ab initio based examination of the kinetics and thermodynamics of oxygen in Fe-Cr alloys, *Physical Review B*. 99 (2019) 174202.

Samin, A. J., Andersson, D.A., Holby, E. H., and Uberuaga, B. P. First-principles localized cluster expansion study of the kinetics of hydrogen diffusion in homogeneous and heterogeneous Fe-Cr alloys, *Physical Review B*. 99 (2019) 014110.

Samin, A. J., Holby, E. F. Andersson, D. and Uberuaga, B. P. On the role of electro-migration in the evolution of radiation damage in nanostructured ionic materials. *Electrochemistry Communications*, 2018. 96: p. 47-52.

Samin, A. J. and C.D. Taylor, A one-dimensional time-dependent model for studying oxide film growth on metallic surfaces. *Journal of Applied Physics*, 2018. 123(24): p. 245303.

Samin, A. J. and Taylor, C. A. First-principles investigation of surface properties and adsorption of oxygen on Ni-22Cr and the role of molybdenum. *Corrosion Science*, 2018. 134: 103-111.

Selected Honors & Awards

- 2018 Director's Postdoctoral Fellowship at the Los Alamos National Laboratory (LANL).
- 2010 Distinguished University Fellowship for graduate students – The Ohio State University

Significant Accomplishments

- 2007 Physical Chemistry Undergraduate Award – Wayne State Department of Chemistry



Research Interest Areas

- Modeling and simulation of corrosion
- Defect transport
- Electrochemical phenomena
- Radiation damage



Maj Peter A. Saunders

PhD, Atmospheric Science, University of Utah

Academic Advisor, Atmospheric Science Program

Assistant Professor of Atmospheric Science

Most Notable Publications

Saunders, Peter, Yafan Yu, and Zhaoxia Pu. "Sensitivity of numerical simulations of hurricane Joaquin (2015) to cumulus parameterization schemes: Implications for processes controlling a hairpin turn in the track." *Journal of the Meteorological Society of Japan*. Ser. II (2019).

Selected Honors & Awards

- GSEM CGO of the Year, 2020
- Air Force Commendation Medal, 2 OLC
- AFMC CGO of the Year, 2015
- Weather Officer Course Distinguished Graduate, 2011

Significant Accomplishments

- Lead for AFIT Facilitator Cadre
- Forward deployed to Korea, 2013-2014



Research Interest Areas

- Tropical cyclone rainfall
- Lightning analysis and modeling
- Machine-learning-based image classification



Maj Todd V. Small

PhD, Applied Physics, Air Force Institute of Technology

Deputy Department Head

Assistant Professor of Physics

Most Notable Publications

Small, Todd V., Samuel D. Butler, and Michael A. Marciniak, "Augmenting CASI BRDF measurement device to measure out-of-plane scatter with CCD pixel array," *Proc. SPIE* 11485, 114850B (2020).

Small, Todd V., Samuel D. Butler, and Michael A. Marciniak, "Scatter Coordinate mapping and out-of-plane BRDF measurements for specular materials using an augmented CASI measurement system," *Proc. SPIE* 11727, 117270X (2021).

Werkley, Anne W., Samuel D. Butler, **Todd V. Small**, Michael A. Marciniak, "Data-driven algorithm to classify the degree of isotropy in the bidirectional reflectance distribution function," *Opt. Eng.* 60(9), 094108 (2021), DOI: [10.1117/1.OE.60.9.094108](https://doi.org/10.1117/1.OE.60.9.094108).

Small, Todd V., Samuel D. Butler, and Michael A. Marciniak, "Uncertainty Analysis for CCD-Augmented CASI BRDF Measurement System," *Accepted by Opt. Eng.* on 12 Oct 2021.

Small, Todd V., Samuel D. Butler, and Michael A. Marciniak, "Solar Cell BRDF Measurement and Modeling with Out-of-Plane Data," *Accepted by Opt. Express* on 5 Oct 2021.

Selected Honors & Awards

- Meritorious Service Medal
- Air Medal with 7 Oak Leaf Clusters
- Joint Service Commendation Medal
- Air Force Commendation Medal
- Afghanistan Campaign Medal with 2 devices

Significant Accomplishments

- Four Deployments in support of the Global War on Terrorism
- U-28A Pilot with 915 Combat Flight Hours / 186 Combat Sorties



Research Interest Areas

- Optical Scatter
- Remote Sensing
- Optical Properties of Materials
- Space Domain Awareness



Dr. Bryan J. Steward

PhD, Optical Sciences & Engineering, Air Force Institute of Technology

Research Assistant Professor of Optical Engineering

Technical Advisor, Center for Technical Intelligence Studies & Research

Most Notable Publications

Fernandez, Fernando D., **Steward, Bryan J.**, Hawks, Michael R. and Gross, Kevin C. (15 April 2019), "Implementation of a non-linear CMOS and CCD focal plane array model in ASSET," *Proceedings of SPIE*. 11001, 11001-10.

Schwaab, Matthew J., Greendyke, Robert and **Steward, Bryan J.** (9 July 2017), "Arrhenius Rate Chemistry-Informed Inter-Phase Source Terms (ARCIIST)," *20th Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter*, St. Louis, MO, Vol. 62, No. 9.

Young, Shannon R., **Steward, Bryan J.**, and Gross, Kevin C. (11 April 2017), "Development and Validation of the AFIT Sensor Simulator for Evaluation and Testing (ASSET)," *Proceedings of SPIE*. 10178, 101780A.

Steward, Bryan J. and Hawks, Michael R (2016), "End-to-End Model Enhancements and Hypothetical Detection Scenarios," Air Force Institute of Technology, DTIC No. AD1020340.

Young, Shannon R., **Steward, Bryan J.**, Hawks, Michael R., and Gross, Kevin C. (17 May 2016), "Improving Detection of Low SNR Targets Using Moment-based Detection," *Proceedings of SPIE*. 9828, 98280K.

Selected Honors & Awards

- Civilian of the Quarter: Persistent Infrared Squadron (NASIC), Category III (2013 & 2015)
- Civilian of the Quarter: GEOINT/MASINT Squadron (NASIC), Category II (Spring 2010)
- U.S. Force Science, Technology, and Engineering – Team Scientist Award (Aug 2010)
- Civilian of the Quarter: Wright Patterson Air Force Base, Category I (Fall 2006)

Significant Accomplishments

- Air Force Institute of Technology MS Applied Physics Distinguished Graduate (2006)
- National Defense Science and Engineering Graduate Fellow (Sep 2004 – Aug 2007)



Research Interest Areas

- EO/IR Remote Sensing
- Radiometric Sensor and Scene Modeling
- Signal and Image Processing Algorithm Development
- Overhead Persistent Infrared (OPIR)
- On-Orbit Sensor Characterization
- Machine Learning



Dr. Gaiven Varshney

PhD, Applied Chemistry, Z. H. College of Engineering and Technology, AMU, India

Research Assistant Professor of Nuclear Engineering

Most Notable Publications

G. Daniel, **G. Varshney**, A. Holland, J. McClory and A. Bickley, "A Machine Learning Approach to Characterizing Particle Morphology in Nuclear Forensics," *Journal of Radiation Effects, Research and Engineering*, Vol 39, 141-148, 2021.

J. Cezeaux, **G. Varshney**, A. Bickley and J. C. Petrosky "Morphological Classification and Analysis of Fuel Bearing Debris from a Non-Critical Event," *Journal of Radiation Effects, Research and Engineering*, Vol 38, Issue 1, 2020. (S//RD)

G. Varshney, J. Cezeaux, and J.C. Petrosky. Investigation of "Fissile Materials Collected from a Non-Critical Nuclear Explosion Site using Non-destructive Analytical Techniques," *Journal of Radioanalytical and Nuclear Chemistry*, 2018, 318 (1) 505-513.

G. Varshney, D.M. Kempisty, S.R. Kanel, E.S. Demessie, R.S. Varma, M. Nadagouda, A. Agrawal, and V. Varshney. A Nanoscale "TiO₂ films and their Application in Remediation of Organic Pollutants," *Coordination Chemistry Reviews*, 2016, 306, 43-64.

G. Varshney, H. S. Rathore, S. C. Mojumdar and M. T Saleh. "Synthesis, Characterization and Fungicidal Activity of Zinc diethyldithiocarbamate and Phosphate," *Journal of Thermal Analysis and Calorimetry*, 2007, 90 (3) 681.

Selected Honors & Awards

- 2021 Society of Asian Scientists and Engineers (SASE) Promising Professional Award. Recognized in SASE's magazine and website (2021)
- Recognized by Defense Threat Reduction Agency (DTRA)/Nuclear Science Engineering Research Center (NSERC) (2020)
- Graduate School 3rd Quarter CY20 Countering Weapons of Mass Destruction Team award (2020)
- AETC Nuclear Deterrence Operations Professional Team of the Year Award (2019)

Significant Accomplishments

- Co-Chair, Countering Weapons of Mass Destruction Graduate Certificate Program (2020-Present)
- Member, Nuclear Expertise for Advancing Technologies Center (2019-Present)



Research Interest Areas

- Radiation detection
- Investigation of post-detonation debris using various microscopic and spectroscopic characterization techniques
- Characterization of semiconductors and nanomaterials
- Wastewater treatment
- Environmental remediation



Dr. David E. Weeks

PhD, Physics, University of Arkansas

Professor of Physics

Most Notable Publications

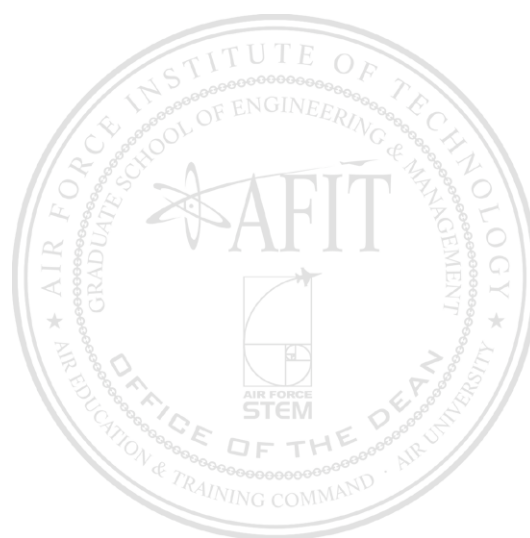
A.R. Sharma and **D.E. Weeks**, "Interatomic Potentials for Ground and Excited States of Ar + He," *J. Chem. Phys.* 149 (2018) 194302.

A.R. Sharma and **D.E. Weeks**, "Excited Interatomic Potential Energy Surfaces of Rb + He that Correlate with Rb Terms 52S through 72S," *Phys. Chem. Chem. Phys.* 20 (2018) 29274-29284.

L.A. Blank, A.R. Sharma, and **D.E. Weeks**, "Influence of Basis-Set Size on the X 2S_{1/2}, A 2P_{1/2}, A 2P_{3/2}, and B 2S_{1/2} Potential-Energy Curves, A2P_{3/2} Vibrational Energies, and D1 and D2 Line Shapes of Rb+He," *Phys. Rev. A*, 97 (2018) 032705.

D.J. Emmons, **D.E. Weeks**, B. Eshel, and G.P. Perram, "Metastable Ar(1s₅) Density Dependence on Pressure and Argon-Helium mixture in a High Pressure Radio Frequency Dielectric Barrier Discharge," *J. Appl. Phys.*, 123 (2018) 043304.

C.D. Lewis and **D.E. Weeks**, "Theoretical Cross Sections of the Inelastic Fine Structure Transition M(2P_{1/2}) + Ng → M(2P_{3/2}) + Ng for M = K, Rb, and Cs, and Ng = He, Ne, and Ar," *J. Phys. Chem. A*, 121 (2017) 3351.



Research Interest Areas

- Atomic and Molecular Physics
- Laser Modeling and Simulation
- Quantum Information
- Computer Graphics
- Mathematical Physics
- Condensed Matter Physics



Lt Col Whitman T. Dailey

PhD, Nuclear Engineering, Air Force Institute of Technology

Deputy Director, Nuclear Expertise for Advancing Technologies (NEAT) Center

Assistant Professor of Nuclear Engineering

Most Notable Publications

Alexander L.Q. Spring, **Whitman T. Dailey**, Darren E. Holland, Juan Manfredi, Edward Lum, Kevin Tsai, "Modeling and Analysis of Gadolinium Self Powered Neutron Detectors in MCNP," Poster presented at: *37th annual Hardened Electronics and Radiation Technologies Conference*, 7-11 March 2022, Tarrytown, NY.

Zachary W. Lamere, Darren E. Holland, **Whitman T. Dailey**, John W. McClory, "Space to Air High-Altitude Region Adjoint Neutron Transport," *The Journal of Defense Modeling and Simulation*, July 2021.

Whitman T. Dailey, "Gravity and Detector Motion in the Air to Space Neutron Transport Problem," Poster presented at: *35th annual Hardened Electronics and Radiation Technologies Conference*, 16-20 April 2018, Tucson, AZ.

Selected Honors & Awards

- Meritorious Service Medal, 2021
- Defense Meritorious Service Medal, 2020
- Joint Service Commendation Medal, 2013
- Air Force Commendation Medal (2), 2014, 2009
- Air Force Achievement Medal, 2012



Research Interest Areas

Lt Col Dailey performs multidisciplinary research related to Defense interests in nuclear weapons and their effects. This includes methods and applications for computational nuclear engineering, radiation transport, shock and thermal transport and effects, and radiation effects on electronics in strategic environments. He also has a strong interest in investigating development of computational methods and approaches for digital engineering and nuclear effects analysis questioning the traditional assumptions and approximations made in legacy approaches to problems of strategic relevance to better understand the precision, accuracy, and quantified and unquantified uncertainties in estimated quantities used for decision-making.



Dr. Paul J. Wolf

PhD, Physics, Air Force Institute of Technology

Professor Emeritus of Physics

Most Notable Publications

P.J. Wolf, "The Plasma Properties of Laser Ablated SiO₂," *J. Appl. Phys.* 72, 1280 (1992).

J.J. Kester, **P.J. Wolf**, and W.R. White, "Second Harmonic Generation in Planar Waveguides of Doped Silica," *Opt. Lett.* 17, 1779 (1992).

P.J. Wolf, "Investigations on the Expansion Dynamics of Ge Atoms Produced from Laser-Ablated GeO₂," *Applied Physics A*, 62, 553 (1996).

R.S. Pope, **P.J. Wolf**, and G.P. Perram, "Line Broadening in the A-band of O₂ by Molecular Perturbers," *J. Quant. Spectrosc. Radiat. Transfer*, 64, 363 (2000).

R.S. Pope and **P.J. Wolf**, "Noble Gas Broadening of the Fundamental Band of Nitric Oxide," *J. Mol. Spectrosc.*, Sept 2001.

J. Holtgrave and P.J. Wolf, "Pressure broadening and line shifting of atomic strontium 5s2 1S0 → 5s5p 3P1 and 5s5p 3P0,1,2 → 5s6s 3S1 absorption transitions induced by noble-gas collisions," *Phys. Rev A*, 72, 012711 (2005).

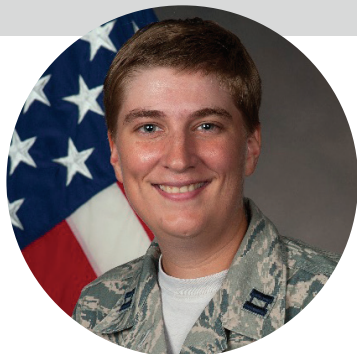
Significant Accomplishments

- Higher Learning Commission Peer Reviewer



Research Interest Areas

- Atomic and molecular spectroscopy
- Foundations of quantum mechanics
- Philosophy of science
- Existential-threat analyses



Capt Shannon R. Young

PhD, Applied Physics, Air Force Institute of Technology

Assistant Professor of Physics

Most Notable Publications

Young, Shannon R., Steward, Bryan J., and Gross, Kevin C. (11 April 2017), "Development and Validation of the AFIT Sensor Simulator for Evaluation and Testing (ASSET)," *Proceedings of SPIE*. 10178, 101780A.

Young, Shannon R., Steward, Bryan J., Hawks, Michael R., and Gross, Kevin C. (17 May 2016), "Improving Detection of Low SNR Targets Using Moment-based Detection," *Proceedings of SPIE*. 9828, 98280K.

Roger D. Tippetts, Stephen Wakefield, **Shannon Young**, Ian Ferguson, Christopher Earp-Pitkins, Francis K. Chun, "Slitless spectroscopy of geosynchronous satellites," *Opt. Eng.* 54(10) 104103 (9 October 2015) <https://doi.org/10.1117/1.OE.54.10.104103>.

Selected Honors & Awards

- Company Grade Officer of the Quarter, Air Force Research Lab, Multispectral sensing & detection division (AFRL/RYM), Fall 2013 & Spring 2014
- Company Grade Officer of the Quarter, Air Force Research Lab (AFRL), Fall 2020



Research Interest Areas

- EO/IR Remote Sensing
- Radiometric Sensor and Scene Modeling
- Signal and Image Processing Algorithm Development
- Edge processing Algorithm Development
- Overhead Persistent Infrared (OPIR)
- Machine Learning



Dr. Alan V. Lair

PhD, Mathematics, Texas Tech University

Department Head, Mathematics and Statistics

Most Notable Publications

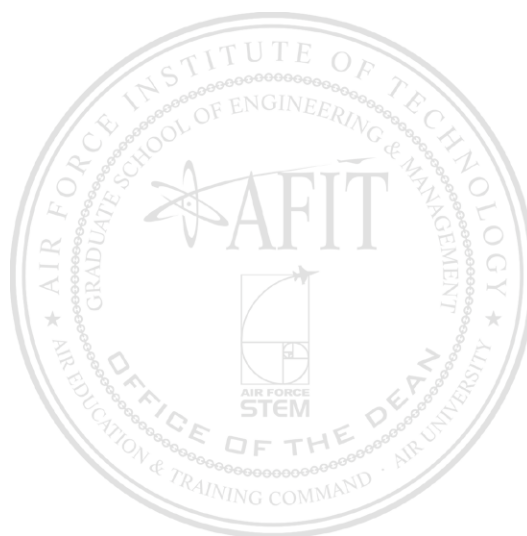
A. V. Lair and A. W. Shaker, "Classical and weak solutions of a singular semilinear elliptic problem", *Journal of Mathematical Analysis and Applications* 211 (1997), 371-385.

A. V. Lair, "A necessary and sufficient condition for existence of large solutions to semilinear elliptic equations", *Journal of Mathematical Analysis and Applications* 240 (1999), 205-218.

A. V. Lair and A. W. Wood, "Existence of entire large positive solutions of semilinear elliptic systems", *Journal of Differential Equations* 164 (2000), 380-394.

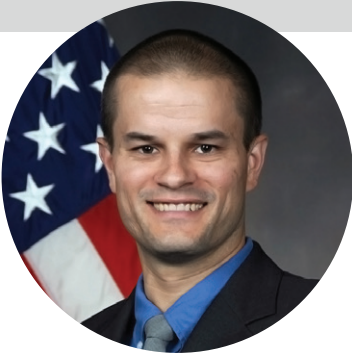
A. V. Lair, "Entire large solutions to semilinear elliptic systems", *Journal of Mathematical Analysis and Applications* 382 (2011), 324-333.

A. V. Lair and A. Mohammed, "Entire large solutions to elliptic equations of power non-linearities with variable exponents", *Advanced Nonlinear Studies* 13 (2013), 699-719.



Research Interest Areas

- Nonlinear Diffusion
- Boundary Blowup Solutions of Semilinear Elliptic Equations



Dr. Benjamin F. Akers

PhD, Mathematics, University of Wisconsin-Madison

Professor of Mathematics

Most Notable Publications

B.F. Akers and J.A. Reeger, "Numerical Simulation of Thermal Blooming with Laser-Induced Convection", *J. Electromagnetic Waves and Applications*. 33(1), 96-106, (2019).

B. F. Akers, "Modulational instabilities of periodic traveling waves in deep water," *Physica D: Nonlinear Phenomena*, 300, 26-33, (2015).

B. Akers, D.M. Ambrose and J.D. Wright, "Gravity Perturbed Crapper Waves," *Proc. of the Roy. Soc. A.*, 470, 2161, (2014).

B. Akers and Wenxuan Gao, "Wilton ripples in weakly nonlinear model equations," *Commun. Math. Sci.*, 10(3), 1015-1024, (2012).

B. Akers and P.A. Milewski, "A model equation for wavepacket solitary waves arising from capillary-gravity flows," *Stud. Appl. Math.*, 122, 249-274, (2009).

Selected Honors & Awards

- AFIT Dean's Distinguished Teaching Professorship (Schoolwide): 2020
- AFOSR Visiting Scientist Program: 2019
- AFIT-ENC Instructor of the Year (Departmental): 2018
- AFIT-ENC Instructor of the Quarter (Departmental): 2011, 2012, 2013, 2015, 2016, 2019
- SOCHE Excellence in Teaching (Regional): 2012, 2019
- Ohio Magazine Excellence in Education (Regional): 2013



Research Interest Areas

- Approximate models in nonlinear wave problems
- Traveling and solitary waves
- The existence and stability of coherent structures in nonlinear wave equations
- Perturbation methods for eigenvalue problems
- Numerical analysis
- Fluid dynamics
- Nonlinear optics



Dr. William P. Baker

PhD, Applied Mathematics, Northwestern University

Associate Professor Emeritus of Mathematics

Most Notable Publications

Rutledge JL, **Baker WP**. "Unsteady Effects on the Experimental Determination of Overall Effectiveness". ASME. *Turbo Expo: Power for Land, Sea, and Air*, Volume 5B: Heat Transfer ():V05BT13A006. doi:10.1115/GT2018-75846

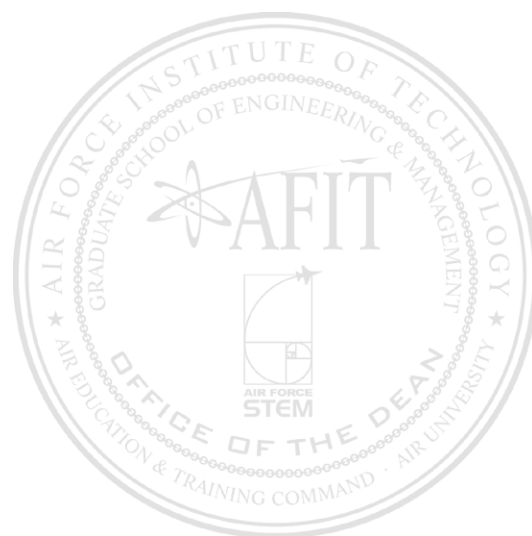
Easterday, O., Palazotto, A., **Baker, W.**, and Branam, R., "Damping Properties of Coatings at Elevated Temperatures," *Surface and Coatings Technology*, Vol. 321, pp. 186–199, 2017.

"Stochastic Real-Time Optimal Control for Bearing-Only Trajectory Planning", Ross, S.M., Cobb, R.G., Baker, **W.P.**, *International Journal of Micro Air Vehicles* 6(1):1-28, March 2014.

"Optimal Control of a Librating Electrodynamics Tether Performing a Multi-revolution Orbit Change", Robert Stevens, **William Baker**, *Journal of Guidance Control and Dynamics* 32(5):1497-1507, August 2009.

"A variable stiffness device selection and design tool for lightly damped structures", M.F. Winthrop, **W.P. Baker**, R.G. Cobb, *Journal of Sound and Vibration* 287(4-5):667-682, November 2005.

Ross, S.M., Cobb, R.G., **Baker, W.P.**, and Harmon, F., "Implementation lessons and pitfalls for real-time optimal control with stochastic systems," *Journal of Optimal Control Applications and Methods*, Vol. 36, No. 2, pp. 198-217, Mar 2015.



Research Interest Areas

- Asymptotic and Perturbation Methods
- Wave Propagation and Scattering Theory
- Optimal Control Theory
- Thermal Dynamics of high speed wear events
- Vibrational dynamics of thermal loaded materials



Dr. Dursun A. Bulutoglu

PhD, Statistics, University of California, Berkeley, California

Associate Professor of Statistics

Most Notable Publications

D.A. Bulutoglu and C.S. Cheng "Hidden Projection Properties of Some Nonregular Fractional Factorial Designs and Their Applications" *The Annals of Statistics* 31, 1012-1026, (2003).

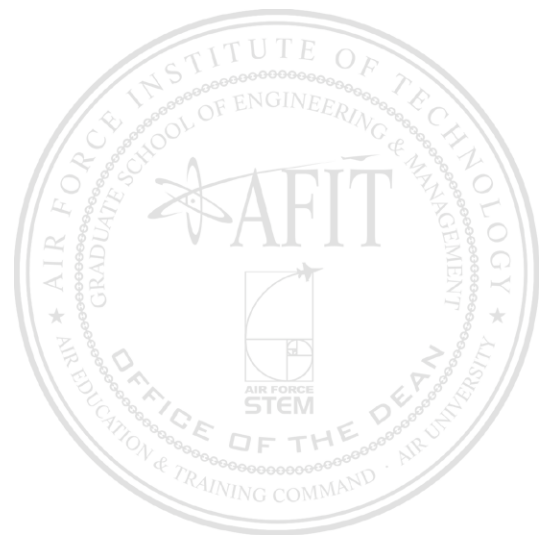
D.A. Bulutoglu and C.S. Cheng "Construction of E(s2)-optimal Supersaturated Designs" *The Annals of Statistics* 32, 1662-1678, (2004).

G. Roelke, R. Baldwin and **D.A. Bulutoglu** "Analytical Models for the Performance of Von Neumann Multiplexing" *IEEE Transactions on Nanotechnology* 6, 2007.

K.J. Ryan and **D.A. Bulutoglu** "E(s2)-optimal Supersaturated Designs with Good Minimax Properties" *Journal of Statistical Planning and Inference* 137, 2250-2262, 2007.

D.A. Bulutoglu "Cyclically Generated Supersaturated Designs" *Journal of Statistical Planning and Inference* 137, 2413-2428, 2007.

D.A. Bulutoglu and F. Margot "Classification of Orthogonal Arrays by Integer Programming" *Journal of Statistical Planning and Inference* 138, 654-666, 2008.



Research Interest Areas

- Design of Experiments
- Discrete Optimization
- Combinatorial Optimization



Dr. Matthew Fickus

PhD, Mathematics, University of Maryland

Professor of Mathematics

Most Notable Publications

M. Fickus, J. Jasper, D. G. Mixon, "Packings in real projective spaces," *SIAM J. Appl. Algebra Geom.* 2 (2018) 377-409.

M. Fickus, J. Jasper, D. G. Mixon, J. D. Peterson, C.E. Watson, "Equiangular tight frames with centroidal symmetry," *Appl. Comput. Harmon. Anal.* 44 (2018) 476-496.

M. Fickus, J. Jasper, D. G. Mixon, J. D. Peterson, "Tremain equiangular tight frames," *J. Combin. Theory Ser. A.* 153 (2018) 54-66.

M. Fickus, D. G. Mixon, J. Jasper, "Equiangular tight frames from hyperovals," *IEEE Trans. Inform. Theory.* 62 (2016) 5225-5236.

A. S. Bandeira, **M. Fickus**, D. G. Mixon, J. Moreira, "Derandomizing restricted isometries via the Legendre symbol," *Constr. Approx.* 43 (2016) 409-424.

Selected Honors & Awards

- Department of Mathematics & Statistics
Instructor of the Year (2016 & 2017).



Research Interest Areas

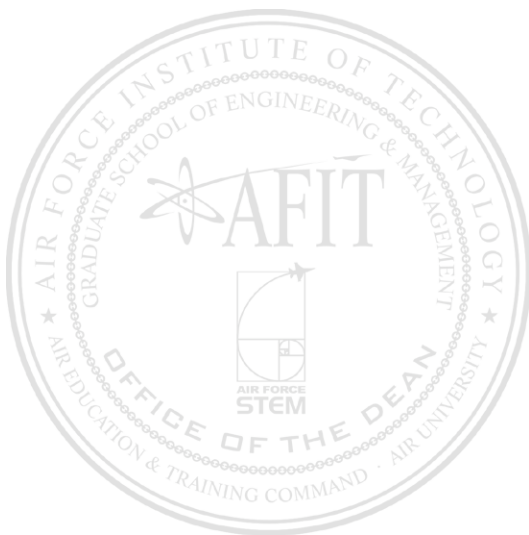
- Applied harmonic analysis, including applications of frame theory
- Compressed sensing and wavelets to problems of waveform design for radar and wireless communication
- Coding theory
- Quantum information theory



Capt Gonzalo Hernando

PhD, Applied Mathematics, Air Force Institute of Technology

Assistant Professor of Statistics



Selected Honors & Awards

- Air and Space Commendation Medal, 2019
- Air and Space Achievement Medal, 2019



Research Interest Areas

- Multivariate Hypothesis Testing
- Clustering Algorithms
- Tree Pruning Methodology
- Information Measures



Capt Takayuki Iguchi

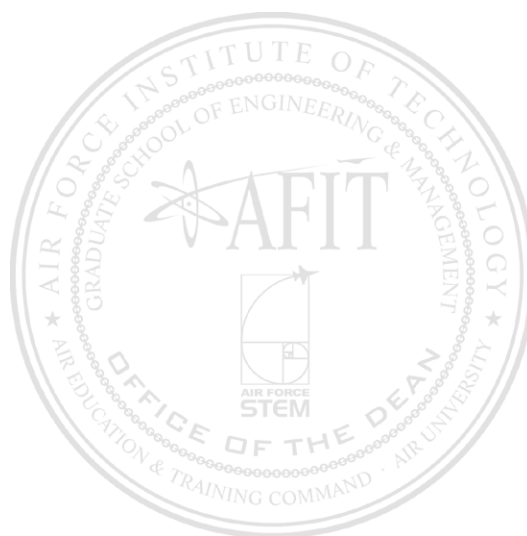
PhD, Statistics, Florida State University

Assistant Professor of Statistics

Most Notable Publications

Iguchi T, Barrientos AF, Chicken E, Sinha D. "Nonlinear profile monitoring with single index models." *Qual Reliab Eng Int.* 2020;114.

Iguchi, T., Mixon, D.G., Peterson, J., Villar S. "Probably certifiably correct k-means clustering." *Math. Program.* 165, 605-642 (2017).



Research Interest Areas

- Nonparametric statistical process control
- Profile monitoring
- Change-point detection
- Wavelets
- Bayesian modeling



Dr. John Jasper

PhD, Mathematics, University of Oregon

Assistant Professor of Mathematics

Most Notable Publications

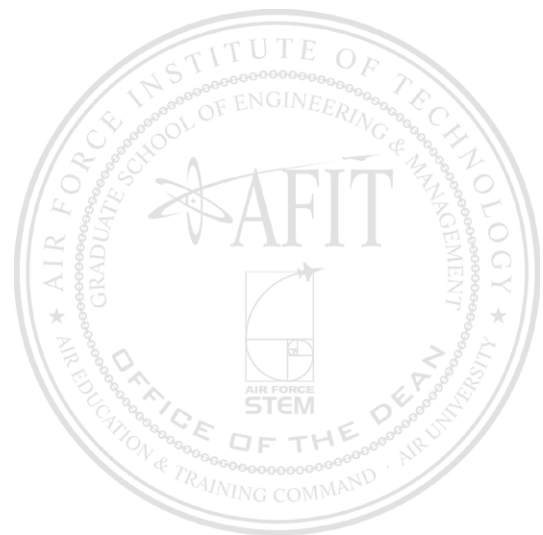
M. Fickus, **J. Jasper**, D. G. Mixon, J. D. Peterson, "Tremain equiangular tight frames," *J. Combin. Theory Ser. A* 153 (2018) 54-66.

Fickus, M., **Jasper, J.**, and Mixon, D. G., "Packings in real projective spaces," *SIAM J. Appl. Algebra Geom.* 2(3), 377-409 (2018).

M. Fickus, D. G. Mixon, **J. Jasper**, "Equiangular tight frames from hyperovals," *IEEE Trans. Inform. Theory* 62 (2016) 5225-5236.

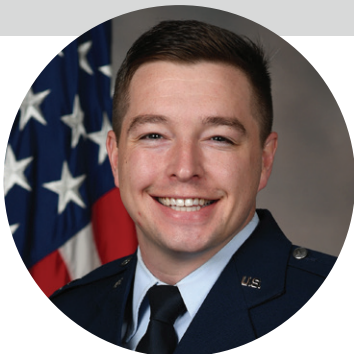
M. Bownik and **J. Jasper**, "The Schur-Horn theorem for operators with finite spectrum," *Trans. Amer. Math. Soc.* 367 (2015), no. 7, 5099-5140.

J. Jasper, D. G. Mixon, M. Fickus, "Kirkman equiangular tight frames and codes," *IEEE Trans. Inform. Theory* 60 (2014) 170-181.



Research Interest Areas

- Applied harmonic analysis
- Combinatorial design theory
- Operator theory



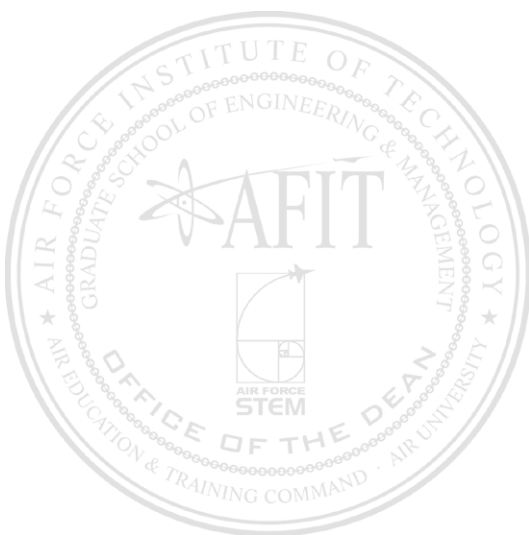
Capt Chancellor AJ Johnstone

PhD, Statistics, Iowa State University

Assistant Professor of Statistics

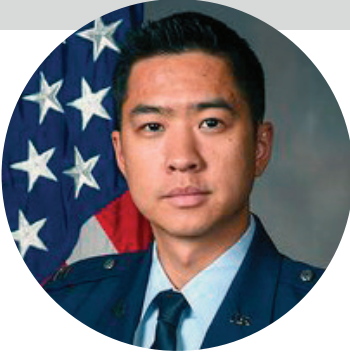
Selected Honors & Awards

- Air Force Junior Analyst of the Year 2016



Research Interest Areas

- Nonparametric Statistics
- Conformal Prediction
- Robust Optimization



Maj Tony Liu

PhD, Applied Mathematics, Arizona State University

Assistant Professor of Mathematics

Most Notable Publications

Liu, T., & Platte, R. B. (2021). "Node Generation for RBF-FD Methods by QR Factorization," *Mathematics*, 9(16), 1845.

Akers, B., Liu, T., & Reeger, J. (2021). "A Radial Basis Function Finite Difference Scheme for the Benjamin-Ono Equation," *Mathematics*, 9(1), 65.

Wing, A., Liu, T., & Palazotto, A. (2021). "Modeling a high-speed pin-on-disk experiment," *The Journal of Defense Modeling and Simulation*, 15485129211040379.

Liu, T., & Pond, K. (2016). "Modeling and estimating continuous Improvised Explosive Device supply chain behavior," *The Journal of Defense Modeling and Simulation*, 13(1), 67-75.

Selected Honors & Awards

- NSF Research Training Group Fellow, Arizona State University 2016-2019
- AFOSR Visiting Scientist Program Award Winner 2021



Research Interest Areas

- Numerical Analysis
- Computational Methods
- Approximation Theory
- RBF Methods



Dr. Mark E. Oxley

PhD, Mathematics, North Carolina State University

Professor Emeritus of Mathematics

Most Notable Publications

D.W. Ruck, S.K. Rogers, M. Kabrisky, **M.E. Oxley**, "The multilayer perceptron as an approximation to a Bayes optimal discriminant function", *IEEE transactions on Neural Networks* 1 (4), pp 296-298, 1990. Cited 1054 times: Google Scholar 12 Oct 2021.

R.P. Broussard, S.K. Rogers, **M.E. Oxley**, G.L. Tarr, "Physiologically Motivated Image Fusion for Object Detection using a Pulse Coupled Neural Network", *IEEE Transactions on Neural Networks* 10 (3), 554-563. Cited 267 times, Google Scholar 12 Oct 2021.

J.P. Kharoufeh, S.M. Cox, **M.E. Oxley**, "Reliability of manufacturing equipment in complex environments," *Annals of Operations Research* 209 (1), 231-254. Cited 45 times: Google Scholar 12 Oct 2021.

C.M. Schubert Kabban, S. N. Thorsen, **M. E. Oxley**, "The ROC manifold for classification systems", *Pattern Recognition* 44 (2), pp 350-362, 2011. Cited 32 times: Google Scholar 12 Oct 2021.

A.V. Lair, M. E. Oxley, "A Necessary and Sufficient Condition for Global Existence for a degenerate parabolic boundary value problem", *Journal of Mathematical Analysis and Applications* 221 (1), 338-349, 1998. Cited 26 times: Google Scholar 12 Oct 2021.

Selected Honors & Awards

- AFIT-ENC Instructor of the Quarter (Departmental), 1991
- AFIT Gage H. Crocker Outstanding Professor Award, 2003
- AFTAC honor of being selected for Endowed Term Chair AI/ML, October 22, 2019 – current

Significant Accomplishments

- Claudia V. Kropas-Hughes, Steven K. Rogers, Mark E. Oxley, Matthew Kabrisky, Autoassociative-Heteroassociative Neural Network, Patent no. US 6,401,082, 4 Jun 2002.



Research Interest Areas

- Partial differential equations (free and moving boundary value problems, finite-time extinction problems, differential equations in Banach spaces, reaction-diffusion equations)
- Applied analysis (functional analysis, optimization, wavelet analysis, category theory).
- Information fusion (classifier fusion, sensor fusion, evaluation of fusion techniques, receiver operating characteristic curves, manifolds, and analysis).



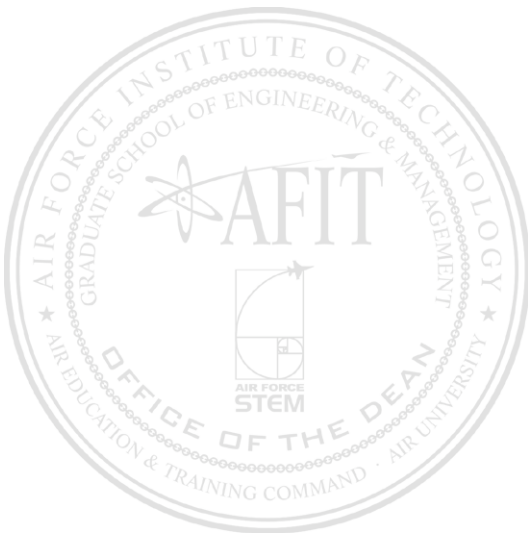
Maj Tyler Pierce

PhD, Applied Mathematics, Air Force Institute of Technology

Assistant Professor of Mathematics

Selected Honors & Awards

- Honor Societies: Tau Beta Pi, Omega Chi Epsilon, Omega Rho
- Distinguished Graduate of Air Force Institute of Technology (MS - Operations Research)



Research Interest Areas

- Numerical Methods
- Partial Differential Equations
- Stability Analysis
- Wave Modeling



Dr. Jonah A. Reeger

PhD, Applied Mathematics, University of Colorado at Boulder

Assistant Professor of Mathematics

Most Notable Publications

J. A. Reeger and B. Fornberg. "Numerical quadrature over the surface of a sphere." *Stud. Appl. Math.*, 137(2): 174-188, 2016.

J. A. Reeger and B. Fornberg. "Painleve IV with both parameters zero: A numerical study." *Stud. Appl. Math.*, 130(2):108-133, 2013.

M. Ghrist, B. Fornberg, and **J. A. Reeger**. "Stability ordinates of Adams predictor-corrector methods." *BIT Numerical Mathematics*, 55(3):733-750, 2015.

J. A. Reeger and B. Fornberg. "Numerical quadrature over smooth surfaces with boundaries." *J. Comput. Phys.*, 355: 176-190, 2018.

J. A. Reeger. "Approximate integrals over the volume of the ball." *J. Sci. Comput.* Vol. 83 (45), 2020.

Selected Honors & Awards

- 2017-2018 Faculty Excellence Award presented by the Southwestern Ohio Council for Higher Education.
- Instructor of the Quarter. Air Force Institute of Technology, Department of Mathematics and Statistics Spring Quarter 2016 and Winter Quarter 2017.
- Fellowship, Charles Stark Draper Laboratories, Houston, Texas, 2007-2009.
- Outstanding Cadet in Mathematics, Sponsored by the National Defense Industrial Association, and Distinguished Graduate, United States Air Force Academy, 2007.



Research Interest Areas

- Numerical Analysis
- Scientific Computing
- Modeling and Simulation of High Energy Lasers
- Radial Basis Functions



Dr. Christine Schubert Kabban

PhD, Applied Mathematics, Air Force Institute of Technology

Professor of Statistics

Most Notable Publications

Schubert Kabban, C.M., Greenwell, B.M., DeSimio, M.P., Derriso, M.M. The Probability of Detection for SHM Systems: Repeated Measures Data. *Structural Health Monitoring* 14(3): 252-264, 2015. DOI: [10.1177/1475921714566530](https://doi.org/10.1177/1475921714566530).

Brandt, Y., Currier, L., Plante, T.W., **Schubert Kabban, C.M.**, Tvaryanas, A.P. "A Randomized Controlled Trial of Core Strengthening Exercises in Helicopter Crewmembers with Low Back Pain". *Aerospace Medicine and Human Performance* 86(10): 889-894, 2015.

Batterton, K.A.* and **Schubert, C.M.** A nonparametric fiducial interval for the Youden Index in multi-state diagnostic settings. *Statistics in Medicine* 35(1): 78-96, 2016. DOI: [10.1002/sim.6613](https://doi.org/10.1002/sim.6613).

Mohd-Zaid, F., **Schubert Kabban, C.M.**, Deckro, R.F. "A Test on the L-moments of the Degree Distribution of a Barabási-Albert Network for Detecting Nodal and Edge Degradation". *Journal of Complex Networks* 6(1): 24-53, Feb 2018. DOI: [10.1093/comnet/cnx020](https://doi.org/10.1093/comnet/cnx020).

Schubert Kabban, C., Uber, R., Lin, K., Lin, B., Bhuiyan, Md.Y., Giurgiutiu, V. "Uncertainty Evaluation in the Design of Structural Health Monitoring Systems for Damage Detection". *Aerospace Journal* 5(2): 45, 2018. DOI: [10.3390/aerospace5020045](https://doi.org/10.3390/aerospace5020045).

Jurado, J., **Schubert Kabban, C.**, Racquet, J. A Regression-Based Methodology to Improve Estimation of Inertial Sensor Errors Using Allan Variance Data. Navigation pp. 1-13, 2019. <https://doi.org/10.1002/navi.278>.

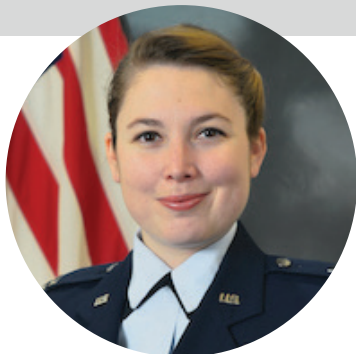
Selected Honors & Awards

- 2022 Gage H. Crocker Outstanding Professor Award, Air Force Institute of Technology
- Instructor of the Quarter, Winter 2021, Department of Mathematics and Statistics, Air Force Institute of Technology
- 2020 Dean's Distinguished Teaching Professor, Air Force Institute of Technology
- Graduate School of Engineering and Management 4th Quarter Team Award: Teaching Evaluation Tool Team, Dec 2020
- AFIT 4th Quarter Civilian Category III Award winner 2018
- 2018 Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence Award
- 2017 Appreciation Award for outstanding contribution to advancing Center Research, awarded from the Center for Human-Animal Interaction, Virginia Commonwealth University, School of Medicine



Research Interest Areas

Classification and Detection System Performance, ROC Curves, Nonparametrics, Regression Modeling, Biostatistics, Statistical Simulation, Structural Health Monitoring, Multivariate Methods, Information Fusion and Big Data, Design of Experiments, Categorical Data Analysis and Statistical Network Analysis.



Maj Victoria R. C. Sieck

PhD, Statistics, University of New Mexico

Deputy Director, STAT Center of Excellence

Assistant Professor of Statistics

Most Notable Publications

Sieck VRC, Christensen FGW. "A framework for improving the efficiency of operational testing through Bayesian adaptive design." *Qual Reliab Eng Int.* 2020; 1-16

Selected Honors & Awards

- Graduated with Distinction, PhD in Statistics, University of New Mexico
- Outstanding Graduate in Research, Department of Mathematics and Statistics, University of New Mexico



Research Interest Areas

- Bayesian Analysis
- Design of Experiments
- Adaptive Testing Methods



Maj Jonathan S. Turner

PhD, Applied Mathematics (Statistics), Air Force Institute of Technology

Assistant Professor of Statistics

Most Notable Publications

Turner, J., Kotsireas, I. , Bulutoglu, D. , & Geyer, A. "A Legendre pair of length 77 using complementary binary matrices with fixed marginals," *Designs, Codes and Cryptography*, 89(6), (2021).1321-1333.

Turner, J., Bulutoglu, D., Baczowski, D., & Geyer, A. "Counting the decimation classes of binary vectors with relatively prime length and density," *Journal of Algebraic Combinatorics* (2020).

Selected Honors & Awards

- Air Force Commendation Medal
- Air Force Achievement Medal
- Global War on Terrorism Medal



Research Interest Areas

- Applied Statistics
- Combinatorics
- Design of Experiments
- Optimization



Lt Col Christopher Weimer

PhD, Operations Research, Air Force Institute of Technology

Assistant Professor of Statistics

Most Notable Publications

Weimer, C. W., Miller, J. O., Hill, R. R., & Hodson, D. D. (2022). An opinion dynamics model of meta-contrast with continuous social influence forces. *Physica A: Statistical Mechanics and its Applications*, 589, 126617.

Weimer, C. W., Miller, J. O., Hill, R. R., & Hodson, D. D. (2019). "Agent scheduling in opinion dynamics: A taxonomy and comparison using generalized models." *Journal of Artificial Societies and Social Simulation*, 22(4), 5.

Weimer, C. W., Miller, J. O., & Hill, R. R. (2016). "Agent-based modeling: An introduction and primer." *In Proceedings of the 2016 Winter Simulation Conference*, (pp. 65-79). IEEE Press.

Weimer, C. W., Miller, J. O., Friend, M., & Miller, J. (2013). "Forecasting effects of MISO actions: an ABM methodology." *In Proceedings of the 2013 Winter Simulation Conference*, (pp. 2762-2771). IEEE Press.

Selected Honors & Awards

- 2020 Field Grade Officer of the Year, Air Force Installation and Mission Support Center
- 2020 Team of the Year, Air Force Installation and Mission Support Center
- 2018 Analytic Team of the Year, Air Force Materiel Command



Research Interest Areas

- Computational sociology
- Opinion dynamics
- Agent-based modeling and simulation
- Computational sociology
- Generative social science
- Machine learning
- Optimization
- Applied statistics



Dr. Edward D. White

PhD, Statistics, Texas A&M University

Professor of Statistics

Most Notable Publications

"Unmasking Cost Growth Behavior: A Longitudinal Study", *Defense Acquisition Research Journal* 25(1), 30-51, Cory D'Amico, **Edward White**, Jonathan Ritschel, and Scott Kozlak, 2018.

"Comparison of Body Composition Metrics for United States Air Force Airmen", *Military Medicine* 183(3-4), e201–e207, J.R. Griffith, **Edward D. White**, R. David Fass, and Brandon M. Lucas, 2018. <https://doi.org/10.1093/milmed/usx053>

"Wavelet ANOVA Bisection Method for Identifying Simulation Model Bias", *Simulation Modelling Practice and Theory* 80, 66-74, Andrew Atkinson, Raymond Hill, Joseph Pignatiello Jr., G. Geoffrey Vining, **Edward White**, Eric Chicken, 2018.

"Model Validation of Functional Responses Across Experimental Regions Using Functional Regression Extensions to the CORA Objective Rating System", *Journal of Verification, Validation and Uncertainty Quantification* 2(4), 041004-041004-9, Scott M. Storm, Raymond R. Hill, Joseph J. Pignatiello, G. Geoffrey Vining and **Edward D. White**, 2017. DOI: [10.1115/1.4039303](https://doi.org/10.1115/1.4039303).

"Forecasting U.S. Army Enlistment Contract Production in Complex Geographical Marketing Areas", *Journal of Defense Analytics and Logistics* 1(1), 69-87, Joshua L. McDonald, **Edward D. White**, Raymond R. Hill, and Christian Pardo, 2017. <https://doi.org/10.1108/JDAL-03-2017-0001>

Selected Honors & Awards

- Dr. Leslie M. Norton Teaching Excellence Award (2016, 2017)
- Southwestern Ohio Council for Higher Education (SOCHE) Faculty Excellence Award winner (2016)



Research Interest Areas

- Design of Experiments
- Biostatistics
- Growth Curves
- Linear and Nonlinear Regression
- Categorical Data Analysis
- Log-Linear Models
- Statistical Simulation
- Response Surface Modeling
- Big Data Analytics



Dr. Aihua Wood

PhD, Mathematics, University of Connecticut

Professor of Mathematics

Most Notable Publications

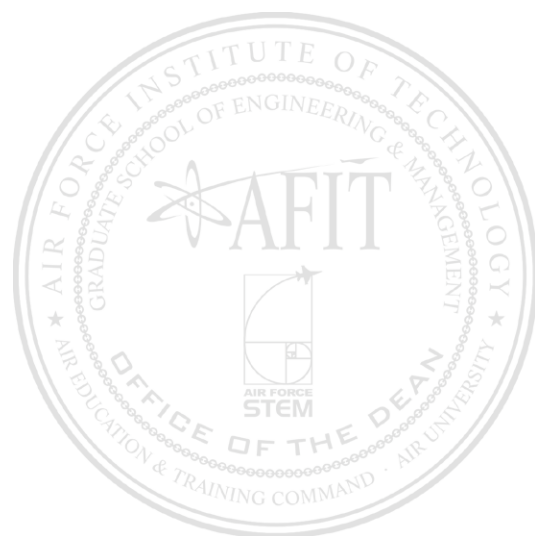
Wood, A., "On symmetry in elliptic systems," *App. Anal.*, Vol. 41 (1991), 1-9.

Wood, A., "On singular semilinear elliptic equations," *J. Math. Anal. App.*, Vol. 173 (1993), 222-228.

Wood, A., Vansudevan, N., "Acoustic emission from a nucleating point fracture in a composite plane. Part I: Theory," *J. Acoustic Soc. Am.*, Vol. 92 No. 5, 2964-2976.

Wood, A., Choi, Y., "On symmetry in semilinear elliptic problems with nonnegative solutions," *App. Anal.*, Vol. 53 (1994), 125-134.

Wood, A., Lair, A., "Entire solution of a singular semilinear elliptic problem," *J. Math. Anal. App.*, Vol. 200 (1996), 498-505.



Research Interest Areas

- Partial differential equations
- Electromagnetic wave propagation
- Rarefied gas dynamics
- Machine learning



Dr. Jeffery D. Weir

**PhD, Industrial Engineering and Operations Research,
Georgia Institute of Technology**

Department Head, Operational Sciences

Professor of Operations Research

Most Notable Publications

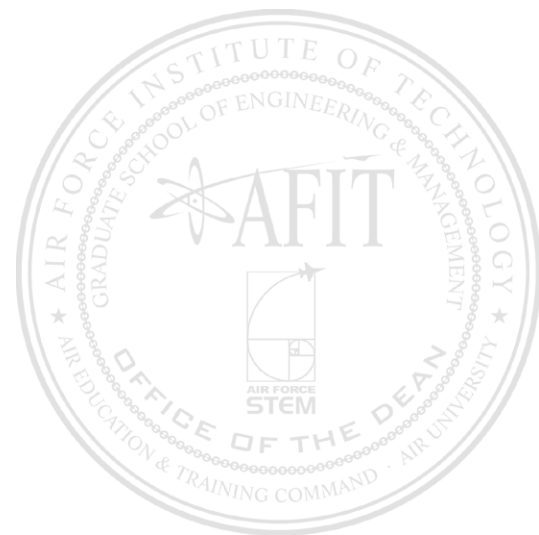
Hanks, R, **Weir, J D**, and Lunday, B, "Robust goal programming using different robustness echelons via norm-based and ellipsoidal uncertainty sets," *European Journal of Operations Research*, Vol 262, no 2, pp 636-646, 2017.

McNabb, M, **Weir, J D**, Hil, R and Hall, S, "Testing local search move operators on the vehicle routing problem with split deliveries and time windows," *Computers & Operations Research*, Vol 56, pp 93-109, 2015.

Cui, C, Wu, T, Hu, M, **Weir, J D**, and Li, X, "Short-term building energy model recommendation system: A meta-learning approach," *Applied Energy*, Vol 172, pp 251-263, 2016.

Hu, M, **Weir, J D**, Wu, T, "Decentralized operation strategies for an integrated building energy system using a memetic algorithm," *European Journal of Operational Research*, Vol 217, no 1, pp 185-197, 2012.

Chambal, S P, **Weir, J D**, Kahraman, Y R, and Gutman, A J "A practical procedure for customizable one-way sensitivity analysis in additive value models," *Decision Analysis*, Vol 8, no 1, pp 251-330, 2011.



Research Interest Areas

- Decision Analysis
- Applied Statistics
- Deterministic Optimization



Dr. Darryl K. Ahner, PE

PhD, Systems Engineering (Operations Research), Boston University

Dean for Research

Professor of Operations Research

Most Notable Publications

Ahner, Darryl K., and Carl R. Parson. "Optimal multi-stage allocation of weapons to targets using adaptive dynamic programming." *Optimization Letters* 9, no. 8 (2015): 1689-1701.

Ahner, D. and McCarthy, A. "Response surface modeling of precision-guided fragmentation munitions," *The Journal of Defense Modeling and Simulation* 17, no. 1 (2020): 83-97.

Keith, Andrew J., and **Darryl K. Ahner**. "A survey of decision making and optimization under uncertainty." *Annals of Operations Research* 300.2 (2021): 319-353.

Kline, Alexander, **Darryl Ahner**, and Raymond Hill. "The weapon-target assignment problem." *Computers & Operations Research* 105 (2019): 226-236.

Kline, Alexander G., **Darryl K. Ahner**, and Brian J. Lunday. "Real-time heuristic algorithms for the static weapon target assignment problem." *Journal of Heuristics* 25, no. 3 (2019): 377-397

Selected Honors & Awards

- The Office of the Secretary of Defense Medal for Exceptional Civilian Service. 2021
- Affiliate Society Council of Dayton Outstanding Engineers & Scientists. 2017
- E. Grosvenor Plowman Award for Best Paper at Council of Supply Chain Management Professionals Global Conference. 2014
- 2012 Colonel Charles A. Stone Award (AFIT mission impact). 2012
- Legion of Merit for Analysis. 2008

Significant Accomplishments

- Founding Director, Office of the Secretary of Defense Scientific Test and Analysis Techniques Center of Excellence (STAT CoE). 2012-2021
- Program and Curriculum Chair, Data Analytics. 2019-2021
- Vice President, Secretary of the Society, Military Operations Research Society. 2016-2017
- Vice President for Professional Development, Military Operations Research Society. 2015-2016



Research Interest Areas

Probabilistic Operations Research Applications to include: Optimization of Stochastic Models, Simulation Modeling, Dynamic Programming – sequential decision making under uncertainty, Test & Evaluation, Software Testing, Information Theory, and Military Operations Research Applications



Col Jason R. Anderson

PhD, Logistics Supply Chain Management, Air Force Institute of Technology

Assistant Professor of Logistics and Supply Chain Management

Most Notable Publications

Anderson, J. R., Ogden, J. D., Cunningham, W. A., & Schubert-Kabban, C. (2017). "An exploratory study of hours of service and its safety impact on motorists." *Transport Policy*, 53, 161-174. <https://www.sciencedirect.com/science/article/abs/pii/S0967070X16306631>

Anderson, Jason, William Cunningham, and Seong-Jong Joo. "Examining the Economic Impacts of the Increased Fuel Efficiency Standards on State Gas-Tax Revenues." *Journal of Accounting & Finance* (2158-3625) 18.6 (2018). http://m.www.na-businesspress.com/JAF/JAF18-6/AndersonJ_18_6.pdf

Yacan Wang, **Jason Anderson**, Seong-Jong Joo and Joseph R. Huscroft. "The Leniency of Return Policy and Consumers' Repurchase Intention in online retailing." *Industrial Management & Data Systems* V. 120 No. 1, pp. 21-39 Oct (2019). <https://www.emerald.com/insight/content/doi/10.1108/IMDS-01-2019-0016/full/html>

Geng, Kexin; Wang, Yacan; Ettema, Dick; Anderson, Jason. Exploring The Effects of Congestion Charge on Relocation Decisions Under Non-Capital Functions Relieving Strategy in Beijing. *Research in Transportation Business and Management*, V 38 pp. 100469, March (2021) <https://www.sciencedirect.com/science/article/abs/pii/S221053952030033X>

Selected Honors & Awards

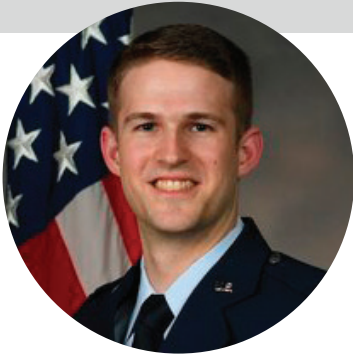
- ASAM Professor of the Year, 2021
- AFIT Centennial Mentor of the Year, 2019
- MOAA (MILITARY OFFICERS ASSOCIATION OF AMERICA) Operational Sciences Faculty Winner, 2019
- AFIT ENS SOCHE Award Winner, 2018
- AFIT ENS Professor of the Year, 2018
- ASAM Professor of the Year, 2017
- The Air Force Historical Foundation Bryce Poe II Award: Anderson, Jason R. (2013), "Drawing the Red Line: The Cost Benefit Analysis on Larger Life Rafts"



Research Interest Areas

Transportation, logistics management, inventory, sourcing, operations management, simulation, regulatory policy, sustainment, aviation management and aviation logistics, queuing,

supply base reduction, cost-benefit analysis, supply chain resilience, supply chain planning and strategy, organizational behavior and leadership.



Capt Nicholas Boardman

PhD, Industrial Engineering, University of Arkansas

Assistant Professor of Operations Research

Most Notable Publications

Boardman, N.T., & Sullivan, K.M. (2021) "Time-Based Node Deployment Policies for Reliable Wireless Sensor Networks." *IEEE Transactions on Reliability*.

Boardman, N.T., Lunday, B.J., & Robbins, M.J. (2017) "Heterogeneous Surface-to-Air Missile Defense Battery Location: A Game Theoretic Approach." *Journal of Heuristics*, 23(6), 417-447.

Selected Honors & Awards

- Distinguished Doctoral Fellowship, University of Arkansas (2018)
- Distinguished Graduate, Air Force Institute of Technology (2016)
- Dean's Award Winner (Best Master's Thesis), Air Force Institute of Technology (2016)
- Distinguished Graduate, United States Air Force Academy (2014)



Research Interest Areas

- Network optimization
- Reliability and maintenance of complex systems
- Game theory and strategic interactions
- Heuristics



Dr. Lance E. Champagne

PhD, Operations Research, Air Force Institute of Technology

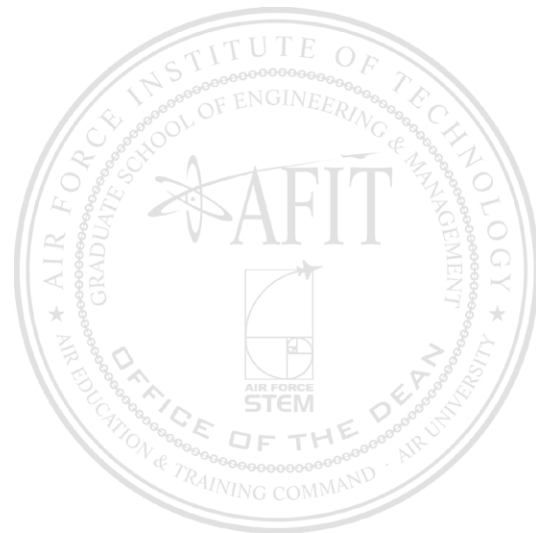
Assistant Professor of Operations Research

Most Notable Publications

Champagne, L. E. and R. R. Hill, October 2009. "A Simulation Validation Method Based on Bootstrapping Applied to an Agent-Based Model of the Bay of Biscay Historical Scenario". *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* Vol. 6, No. 4, 201-212.

Hill, R. R., R. G. Carl, **L. E. Champagne**. 2006. "Using Agent Simulation Methods to Examine and Investigate Search Theory Against a Historical Case Study". *Journal of Simulation*, Vol. 1, No. 1, 29-38.

Hill, R. R., **L. E. Champagne**, and J. C. Price. 2004. "Using Agent-Based Simulation and Game Theory to Examine the WWII Bay of Biscay U-Boat Campaign". *Journal of Defense Modeling and Simulation*, Vol. 1, No. 2, pp. 99-109.



Research Interest Areas

- Agent-based and discrete event simulation
- Applied and multivariate statistics



Dr. Frank W. Ciarallo

PhD, Industrial Administration, Carnegie Mellon University

Associate Professor of Logistics & Supply Chain Management

Most Notable Publications

B. Fouts, J. Serres, R. Hill, **F.W. Ciarallo**, (2018) "Application Development for Optimizing Patient Placement on Aeromedical Evacuation Flights: Proof-of-Concept", *Air Force Research Lab, 711th Human Performance Wing, Technical Report*, Report Number AFRL-SA-WP-SR-2018-001, <https://apps.dtic.mil/docs/citations/AD1045050>

F.W. Ciarallo, K.K. Ward, R.R. Hill, (2017) "Modeling Airline Boarding for Improved Efficiency and Passenger Experience", *Proceedings of the 2017 Industrial and Systems Engineering Conference*, Pittsburgh, PA, 1900-1905, <https://search.proquest.com/docview/1951119310>

A. Lowas, **F.W. Ciarallo**, (2016) "Reliability and operations: Keys to lumpy aircraft spare parts demands", *Journal of Air Transport Management*, 50(1), 30-40, <https://doi.org/10.1016/j.jairtraman.2015.09.004>

F.W. Ciarallo, S. Niranjana, N. Brown, (2016) "A Salt Inventory Management Strategy for Winter Maintenance", *Operations and Supply Chain Management: An International Journal*, 9(1), 31-49, <http://doi.org/10.31387/oscm0230159>

M.J. Bova, **F.W. Ciarallo**, R.R. Hill, (2016) "Development of an Agent-Based Model for the Secondary Threat Resulting from a Ballistic Impact Event", *Journal of Simulation*, 10(1), 24-35, DOI: 10.1057/jos.2015.1

Selected Honors & Awards

- 2013 Faculty Award for Excellence in Service, College of Engineering & Computer Science, Wright State University
- 2012 Moving Spirit Award, Institute for Operations Research and the Management Sciences (INFORMS)

Significant Accomplishments

- Co-Editor, Journal of Defense Analytics & Logistics, 2019



Research Interest Areas

Strategies for Centralization of Stock in Pharmaceutical Distribution Networks, Study of Aircraft Component Failures Leading to Lumpy Spare Part Demands, Two-Echelon Inventory Systems with Transshipment and Quantity Discounts, Warehouse Picking Operations including Picker Congestion, Evaluating Airline Boarding Strategies for Passenger Aircraft, Evaluating Block Chain Capabilities to Fulfill Information Needs of the Healthcare System, Modeling Situation Awareness of Agents Navigating on a Network with Imperfect Information, Helper Objectives in Multiobjectivization for Job Shop Scheduling.



Dr. Bruce A. Cox

PhD, Industrial Engineering, Georgia Institute of Technology

Assistant Professor of Operations Research

Most Notable Publications

Hornberger, Z., **Cox, B.**, and Lunday, B., "Optimal Heterogeneous Search and Rescue Asset Location Modeling for Expected Spatiotemporal Demands using Historic Event Data." *Journal of the Operational Research Society*, 2022.

Zawadzki, M., Montibeller, G., **Cox, B.**, and Belderrain, C., "Deterrence against terrorist attacks in sports-mega events: A method to identify the optimal portfolio of defensive countermeasures." *Risk Analysis*, 2022.

Cox, B., Juditsky, A., Nemirovski, A., "Decomposition Techniques for Bilinear Saddle Point Problems and Variational Inequalities with Affine Monotone Operators," *Journal of Optimization Theory and Applications*, 2015.

Cox, B., Juditsky, A., Nemirovski, A., "Dual subgradient algorithms for large-scale nonsmooth learning problems," *Mathematical Program Series B*, 148:1-2, 2014.

Selected Honors & Awards

- Bronze Star
- Defense Meritorious Service Medal with one oak leaf cluster
- Meritorious Service Medal
- Air Force Commendation Medal with one oak leaf cluster
- Air Force Achievement Medal
- Air Force Recognition Ribbon (AFA's Howard W. Leaf Award)
- National Defense Service Medal
- Global War on Terrorism Expeditionary Medal
- Global War on Terrorism Service Medal
- AF Overseas Ribbon Short
- Air Force Expeditionary Service Ribbon with Gold Border
- AF Longevity Service with two oak leaf clusters
- Small Arms Expert Marksmanship Ribbon with oak leaf cluster
- AF Training Ribbon
- NATO Medal



Research Interest Areas

- Machine Learning
- Computer Vision
- Personnel planning (hiring, retention and manning forecasting)
- Space Domain Awareness
- Resilient and robust resource allocation



Dr. William A. Cunningham III

PhD, Economics, University of Arkansas

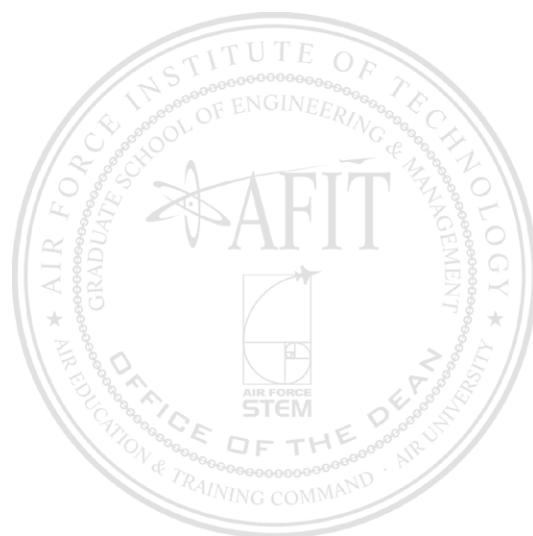
Professor of Logistics and Supply Chain Management

Most Notable Publications

Cunningham, W. A. "Examining the Economic Impacts of the Increased Fuel Efficiency Standards on State Gas-Tax Revenues", (with Jason Anderson, and Seong Joo), accepted in *Journal of Accounting and Finance*, to be published in volume 18(6), 2018.

Cunningham, W. A. "An exploratory study of hours of service and its safety impact on motorists", (with Anderson, J. R*, Ogden, J. D., & Schubert-Kabban, C.) *Transport Policy*, 2017, 53, 161-174.

Cunningham, W. A. "Managing hub and Spoke Networks: A Military Case Comparing Time and Cost", (with Joseph Skipper, Christopher Boone, and Raymond Hill), *Journal of Global Business and Technology*, Vol 12 No. 1, Spring 2016, pp. 33-47.



Research Interest Areas

- Strategic Mobility
- Cost/Benefit Analysis
- Econometric Modelling
- Costing
- Privatization and A-76 Studies
- Modal Choice Network Analysis
- Location Analysis
- Supply Chain Management
- RFID



Dr. Richard F. Deckro

Doctorate of Business Administration, Decision Science, Kent State University

Distinguished Professor of Operations Research

Director, Future Operations Investigation Laboratory (FOIL)

Most Notable Publications

William N. Caballero, Brian J. Lunday & **Richard F. Deckro**
“Leveraging Behavioral Game Theory to Inform Military Operations Planning”, forthcoming in *Military Operations Research*, Vol. 25, No. 1 (2020), pp. 5-22.

Jared K. Nystrom, Matthew J. Robbins, **Richard F. Deckro**, & James F. Morris, “Simulating Attacker and Defender Strategies within a Dynamic Game on Network Topology”, *Journal of Simulation*, Vol. 12, No 4, 2018, pages 307 – 331.

J. Todd Hamill, **Richard F. Deckro**, Robert F. Mills, & James W. Chrissis, “Reach-Based Assessment of Position”, *Military Operations Research*, Vol. 13, No 4, (2008), pp. 59-78.
(2008 INFORMS MAS Koopman Award).

“Evaluating information assurance strategies,” JT Hamill, **RF Deckro**, JM Kloeber Jr, *Decision Support Systems* 39 (3), 463-484, 2005.

Victor D. Wiley, **Richard F. Deckro**, & Jack A. Jackson, “Optimization Analysis for Design and Planning of Multi-Project Programs”, *European Journal of Operational Research*, Vol 107 No.2, 1998, Pages 492-506.

Selected Honors & Awards

- 2017 J. Steinhardt Prize Military Applications Society, INFORMS
- 2016 Fellow, Military Operations Research Society
- Air Force Analyst Lifetime Achievement Award, 2009
- Clayton J. Thomas Award, Military Operations Research Society, 2009

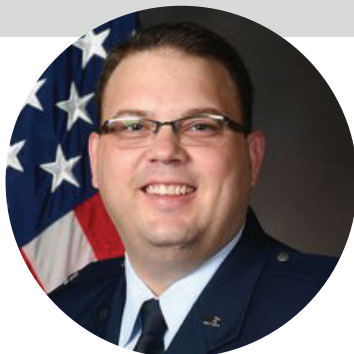
Significant Accomplishments

- Vice Chair-Systems Analysis & Studies Panel, NATO Science & Technology Organization, (Apr 2022-present)
- US Principal Panel Member - Systems Analysis and Studies Panel, NATO Science and Technology Organization, (Feb 2020-Apr 2022)
- US Panel Member - Systems Analysis and Studies Panel, NATO Science and Technology Organization, (Dec 2016-present)
- Editor, *Military Operations Research*, (2001 - 2015)
- President Military Applications Society, INFORMS (2004-2006)



Research Interest Areas

- Information operations
- Irregular warfare
- Counterterrorism
- Social network modeling and analysis
- Applied mathematical programming and optimization
- Project and program management
- Campaign modeling
- Reconciliation, Restoration, and Reconstruction
- Modeling Space
- Scheduling
- Network models



Lt Col John M. Dickens

PhD, Logistics Systems, University of North Texas

Deputy Department Head

Assistant Professor of Logistics and Supply Chain Management

Most Notable Publications

- Glassburner et al., "Theory of Paradox Within Service-Dominant Logic," *Service Science*, June 2018.
- **J. Dickens**, "The Exceptional Release," 24-29, Spring 2013.

Selected Honors & Awards

- ENS 2018 Professor of the Year



Research Interest Areas

- Supply chain resilience
- Logistics service quality
- Value creation
- Value co-production and supply chain analytics



Dr. Mark A. Gallagher

PhD, Operations Research, Air Force Institute of Technology

Professor of Practice in Operations Research

Most Notable Publications

Gallagher, Mark A., Stephen Sturgeon, Benjamin Finch, and Franco L. Villongco, "Probabilistic Analysis of Complex Combat Scenarios," *Military Operations Research*, 27, no. 1 (2022): 87-105. <https://doi.org/10.5711/1082598327187>

Gallagher, Mark A., Kenneth W. Bauer Jr, and Peter S. Maybeck. "Initial data truncation for univariate output of discrete-event simulations using the Kalman filter." *Management Science* 42, no. 4 (1996): 559-575. <https://doi.org/10.1287/mnsc.42.4.559>

Gallagher, Mark A., and David A. Lee. "Final-Cost Estimates for Research & Development Programs Conditioned on Realized Costs." *Military Operations Research* 2, no. 2 (1996): 51-65.

Gallagher, Mark A., and Elizabeth J. Kelly. "A new methodology for military force structure analysis." *Operations research* 39, no. 6 (1991): 877-885. <https://doi.org/10.1287/opre.39.6.877>

Gallagher, Mark A., and Albert H. Moore. "Robust minimum-distance estimation using the 3-parameter Weibull distribution." *Reliability, IEEE Transactions on* 39, no. 5 (1990): 575-580. DOI: [10.1109/24.61314](https://doi.org/10.1109/24.61314)

Selected Honors & Awards

- Meritorious Senior Career Professional – Presidential Rank Award (2018)
- Fellow of Society, Military Operations Research Society, 2014
- Clayton J. Thomas Award, Military Operations Research Society, 2013
- Rist Prize, Military Operations Research Society, 2002 & 2003
- Barchi Prize, Military Operations Research Society, 1990 & 1995

Significant Accomplishments

- Technical Director, Air Force Studies and Analyses (AF/A9), 2009-2019
- Council Member, Military and Security Society, 2019-2022
- Chair of the Board, Snyder-Robinson Foundation, 2019-present
- Council Member, Military and Security Society, 2019-present
- INFORMS Prize Committee Chair, Institute for Operations Research and Management Sciences (INFORMS), 2019-2020



Research Interest Areas

- Defense analysis process
- Campaign analysis
- Cost analysis



Maj Michael J. Garee

PhD, Industrial Engineering, Purdue University

Assistant Professor of Operations Research

Most Notable Publications

Garee, M., Chan, W.K.V., Wan, H., 2018, "Regression-based Social Influence Networks and the Linearity of Aggregated Belief," *Proc. Winter Simulation Conference*. Available online at: <https://doi.org/10.1109/WSC.2018.8632423>.

Garee, M., Hill, R.R., Ahner, D.K., Czarnecki, G., 2017, "Fragment capture simulation for MANPADS test arena optimization," *Journal of Simulation*, Volume 11, Issue 2, pp 75-86. Available online at: <https://doi.org/10.1057/jos.2016.9>.

Selected Honors & Awards

- Inductee in Tau Beta Pi national engineering honor society (2019)
- Inductee in Omega Rho operations research honor society (2014)

Significant Accomplishments

- Program Committee member for Winter Simulation Conference 2020



Research Interest Areas

- Agent-based simulation
- Data visualization
- Computer science
- Engineering education



Dr. Nathan B. Gaw

PhD, Industrial Engineering, Arizona State University

Assistant Professor of Operations Research

Most Notable Publications

Gaw, N., Yousefi, S., & Reisi Gahrooei, M. R. (2022). "Multimodal Data Fusion for Systems Improvement: A review." *IIE Transactions*, 54(11), 1098-1116.

Caballero, W. N., **Gaw, N.,** Jenkins, P. R., & Johnstone, C. (In Press) "Toward Automated Instructor Pilots in Legacy Air Force Systems: Physiology-Based Flight Difficulty Classification Via Machine Learning." *Expert Systems with Applications*.

Gaw, N., Hawkins-Daarud, A., Hu, L. S., Yoon, H., Wang, L., Xu, Y., ... & Li, J. (2019). "Integration of machine learning and mechanistic models accurately predicts variation in cell density of glioblastoma using multiparametric MRI." *Scientific reports*, 9(1), 1-9.

Arun, N., **Gaw, N.,** Singh, P., Chang, K., Aggarwal, M., Chen, B., ... & Kalpathy-Cramer, J. (2021). "Assessing the (un) trustworthiness of saliency maps for localizing abnormalities in medical imaging." *Radiology: Artificial Intelligence*.

Hu, L. S., Ning, S., Eschbacher, J. M., Baxter, L. C., **Gaw, N.,** Ranjbar, S., ... & Mitchell, J. R. (2017). "Radiogenomics to characterize regional genetic heterogeneity in glioblastoma." *Neuro-oncology*, 19(1), 128-137.

Selected Honors & Awards

- IISE QCRC Best Student Paper Finalist, IISE Annual Conf. Expo, 2022
- CogPilot Datathon Challenge (hosted by DAF-MIT AI Accelerator), 2022
- Awards: Flight Difficulty Prediction (Best Model), Pilot Error Regression (Runner-Up), Most Innovative Approach, Most Interpretable Model, Best Pitch
- Best Paper Award (Applied Track), INFORMS Data Mining & Decision Analytics Workshop, 2019
- Harold Wolff-John Graham Award (Best Paper), American Academy of Neurology, 2016
- Harold G. Wolff Lecture Award (Best Paper), American Headache Society, 2015

Significant Accomplishments

- Council Member (2021-2023), Data Mining (DM) Society, Institute for Operations Research and the Management Sciences (INFORMS)
- Director/Board Member (2021-2023), Data Analytics & Information Systems (DAIS) Division, Institute of Industrial and Systems Engineers
- Lead Co-Chair (2021-2023), Data Analytics and Information Systems Track, IISE Annual Conference & Expo
- Vice President (2022-2023), INFORMS Cincinnati-Dayton Region Chapter
- Co-Chair (2021-2022), Workshop on Data Mining & Decision Analytics (DMDA), INFORMS Annual Meeting
- U.S. Patent, Hu, L. S., Li, J., Swanson, K. R., Wu, T., Gaw, N., Yoon, H., & Hawkins-Daarud, A. (2020). Methods for Using Machine Learning and Mechanistic Models for Biological Feature Mapping with Multiparametric MRI. *U.S. Patent Application No. 16/764,837*.

Research Interest Areas



Multimodality Fusion, Interpretability, Trustworthiness, Semi-Supervised Learning, Active Learning, Machine Learning, Data Science, Bioinformatics, Deep Learning, Post Traumatic Headache



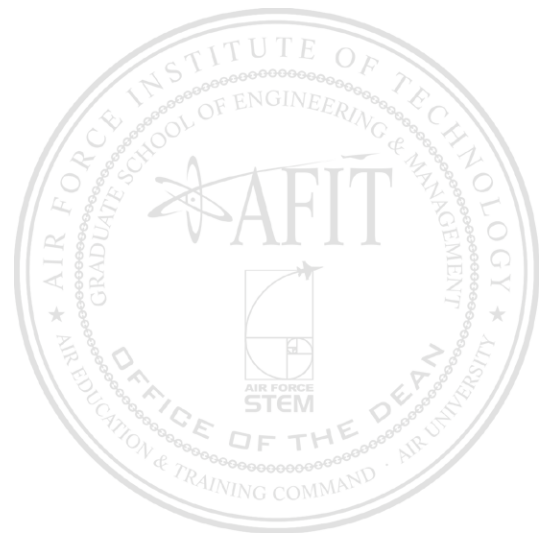
Lt Col Aaron V. Glassburner

PhD, Business-Logistics Systems, University of North Texas

Assistant Professor of Logistics and Supply Chain Management

Most Notable Publications

Glassburner, A. V., Nowicki, D. R., Sauser, B., Randall, W. S., & Dickens, J. M. (2018). "Theory of Paradox Within Service-Dominant Logic." *Service Science*, 10(2), 111-123.



Research Interest Areas

- Inventory Theory
- Operations Management
- Supply Chain Resilience



Lt Col Timothy W. Holzmann

PhD, Industrial Engineering, Clemson University

Assistant Professor of Operations Research

Most Notable Publications

Holzmann, T. and Smith, J.C. "The Shortest Path Interdiction Problem with Randomized Strategies: Complexity and Algorithms." *Operations Research*, 29(1): 82-99, 2021.

Holzmann, T. and Smith, J.C. "Modeling the Shortest Path Interdiction Problem with Randomized Strategies." *Proceedings of the 2019 IIE Annual Conference*, May 2019, Orlando, FL.

Holzmann, T. and Smith, J.C. "The Shortest Path Interdiction Problem with Arc Improvement Recourse: A Multi-objective Approach." *Naval Research Letters*, 66(3): 230-252, 2019.

Holzmann, T. and Smith, J.C. "Solving discrete multi-objective optimization problems using modified augmented weighted Tchebychev scalarizations." *European Journal of Operations Research*, 271(2): 436-449, 2018.

Holzmann, T. and Cochran, J. "A Stochastic Model to Estimate Joint Fire Fratricide." *Military Operations Research Journal*, 17(2), 2012.

Selected Honors & Awards

- Distinguished Graduate, (AFIT) 2009
- Dean's Award (AFIT) 2009

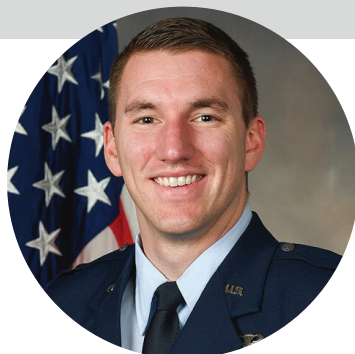
Significant Accomplishments

- Program chair for Operations Research Certificate Program



Research Interest Areas

- Network optimization
- Game theory
- Bi-level optimization
- Algorithm design
- Optimization under uncertainty



Maj Phillip R. Jenkins

PhD, Operations Research, Air Force Institute of Technology

Assistant Professor of Operations Research

Most Notable Publications

Jenkins, P.R., Caballero, W.N., and Hill, R.R. (2021). "Predicting Success in United States Air Force Pilot Training using Machine Learning Techniques." *Socio-Economic Planning Sciences* (forthcoming, accepted 6 July 2021). DOI: <https://doi.org/10.1016/j.seps.2021.101121>.

Rao*, A.P, **Jenkins, P.R.**, Vu, D.M., Auxier II, J.D., and Shattan, M.B. (2021). "Rapid quantitative analysis of trace elements in plutonium alloys using a handheld laser-induced breakdown spectroscopy (LIBS) device coupled with chemometrics and machine learning." *Analytical Methods*, 13 (30), 3368-3378. (2021 HOT Article Award Winner) DOI: <https://doi.org/10.1039/D1AY00826A>.

Caballero, W.N., **Jenkins, P.R.**, and Keith, A.J. (2021). "Poisoning Finite-Horizon Markov Decision Processes at Design Time." *Computers and Operations Research*, 129 (May), 1-17. DOI: <https://doi.org/10.1016/j.cor.2020.105185>.

Jenkins, P.R., Robbins, M.J., and Lunday, B.J. (2021). "Approximate Dynamic Programming for Military Medical Evacuation Dispatching Policies." *INFORMS Journal on Computing*, 33 (1), 2-26. DOI: <https://doi.org/10.1287/ijoc.2019.0930>.

Jenkins, P.R., Lunday, B.J., and Robbins, M.J. (2020). "Robust, Multi-Objective Optimization for the Military Medical Evacuation Location-Allocation Problem." *Omega*, 97 (December), 102088, 1-12. DOI: <https://doi.org/10.1016/j.omega.2019.07.004>.

Selected Honors & Awards

- HOT Article Award, Analytical Methods, 2021
- Innovations in Nuclear Technology Research and Development Award, Department of Energy, 2021
- Outstanding Young Member OR/MS Award, INFORMS Cincinnati-Dayton Chapter, 2020
- General Omar N. Bradley Research Fellowship in Mathematics, United States Military Academy, 2019
- Richard H. Barchi Prize, Military Operations Research Society, 2018

Significant Accomplishments

- Distinguished Graduate, Squadron Officer School 2019
- Distinguished Graduate, M.S. in Operations Research Program (AFIT) 2017



Research Interest Areas

- Dynamic programming
- Approximate dynamic programming
- Markov decision processes
- Stochastic programming
- Machine Learning
- Multi-objective optimization



Dr. Seong-Jong Joo

PhD, Business Administration, Saint Louis University

Professor of Logistics & Supply Chain Management

Most Notable Publications

O'Neal, T., Min, H., Cherobini, D., & Joo, S. (2021). "Benchmarking aircraft maintenance performances using data envelopment analysis," *International Journal of Quality & Reliability Management*, Vol. 38, No. 6, pp. 1328-1341.
<https://doi.org/10.1108/IJQRM-05-2020-0157>

Joo, S., Min, H., & Smith, C. (2017). "Benchmarking freight rates and procuring cost-attractive transportation services", *The International Journal of Logistics Management*, Vol. 28, No. 1, Pgs. 194-205.
 DOI: <https://doi.org/10.1108/IJLM-01-2015-0030>

Min, H. & Joo, S. (2016). "A comparative performance analysis of airline strategic alliances using data envelopment analysis", *Journal of Air Transport Management*, Vol. 52, pgs. 99-110.
 DOI: <https://doi.org/10.1016/j.jairtraman.2015.12.003>

Joo, S. (2009). "Scheduling preventive maintenance for modular designed components: A dynamic approach", *European Journal of Operational Research*, Vol. 192, No. 2, Pgs. 512-520.
 DOI: <https://doi.org/10.1016/j.ejor.2007.09.033>

Selected Honors & Awards

- School of Business Outstanding Professor Award, April 21, 2014



Research Interest Areas

- Supply chain strategies
- Sourcing
- Transportation
- Survival analysis
- Performance measurement



Lt Col Phillip M. LaCasse

PhD, Industrial & Manufacturing Engineering, University of Wisconsin, Milwaukee

Assistant Professor of Operations Research

Most Notable Publications

LaCasse, P., Otieno, W., Maturana, F., "Predicting Contact-Without-Connection Defects on Printed Circuit Boards Employing Ball Grid Array Package Types: A Data Analytics Case Study in the Smart Manufacturing Environment," *SN Appl. Sci.* 2, 156 (2020).
<https://doi.org/10.1007/s42452-019-1924-z>

P. LaCasse, W. Otieno, and F. Maturana, "A Survey of Feature Set Reduction Approaches for Predictive Analytics Models in the Connected Manufacturing Enterprise," *Appl. Sci.*, vol. 9, no. 5, p. 843, 2019.

P. M. LaCasse, W. Otieno, and F. P. Maturana, "A hierarchical, fuzzy inference approach to data filtration and feature prioritization in the connected manufacturing enterprise," *J. Big Data*, vol. 5, no. 1, p. 45, Dec. 2018.

LaCasse, P., Otieno, W., Vance, G., Maturana, F., and Cvijetinovic, M., "A Defect Prediction Case Study for Printed Circuit Board Assemblies Containing Ball Grid Array Package Types," *Surface Mount Technology Association (SMTA) International 2019*, Rosemont, IL, 22-26 Sept. 2019.

LaCasse, P., Otieno, W., Maturana, F., "Operationalization of Defect Prediction Case Study in a Holonic Manufacturing System," *9th International Conference on industrial Applications of Holonic and Multi-Agent Systems (HoloMAS)*, 2019, Linz, Austria, Aug. 2019.

Selected Honors & Awards

- 2019 UW-Milwaukee College of Engineering & Applied Sciences Distinguished Student Award



Research Interest Areas

- Operations research
- Applied statistics
- Smart manufacturing
- Machine learning
- Queueing systems



Dr. Brian J. Lunday

PhD, Industrial & Systems Engineering, Virginia Polytechnic Institute and State University

Associate Department Head

Professor of Operations Research

Most Notable Publications

*Caballero, W. N. & **Lunday, B. J.** (2019) "Influence Modeling: Mathematical Programming Representations of Persuasion under Either Risk or Uncertainty." *European Journal of Operational Research*, 278 (1), 266-282. Available online at: <https://doi.org/10.1016/j.ejor.2019.04.006>.

Lunday, B. J. & Robbins, M. J. (2019) "Collaboratively-developed Vaccine Pricing and Stable Profit Sharing Mechanisms." *Omega*, 84, 102-113. Available online at: <https://doi.org/10.1016/j.omega.2018.04.007>.

Lessin, A. M., **Lunday, B. J.**, & Hill, R. R. (2018) "A Bilevel Exposure-oriented Sensor Location Problem for Border Security." *Computers and Operations Research*, 98, 56-68. Available online at: <https://doi.org/10.1016/j.cor.2018.05.017>.

Paul, N. R., **Lunday, B. J.**, & Nurre, S. G. (2017). "A Multiobjective, Maximal Conditional Covering Location Problem applied to the Relocation of Hierarchical Emergency Response Facilities." *Omega*, 66, 147-158. Available online at: <http://dx.doi.org/10.1016/j.omega.2016.02.006>.

Sherali, H. D., & **Lunday, B. J.** (2013). "On Generating Maximal Nondominated Benders Cuts." *Annals of Operations Research*, 210(1), 57-72. Available online at: <http://dx.doi.org/10.1007/s10479-011-0883-6>.

Selected Honors & Awards

- Gage H. Crocker Outstanding Professor Award, Wright Memorial Chapter, Air Force Association 2020
- Faculty Excellence Award, Southern Ohio Consortium of Higher Education (SOCHE) 2020
- Professor Ezra Kotcher Award, Wright Memorial Chapter, Air Force Association 2019
- Lessons Learned Senior Civilian Professional of the Year, United States Air Force 2018
- Richard H. Barchi Prize, Military Operations Research Society 2018

Significant Accomplishments

- President Military & Security (MAS) Society, Institute for Operations Research and Management Sciences (INFORMS), 2021-present
- Associate Editor, *Military Operations Research*, 2019-present



Research Interest Areas

- Mathematical optimization
- Bilevel programming
- Game theory
- Location theory
- Network interdiction



Maj Jacob D. Maywald

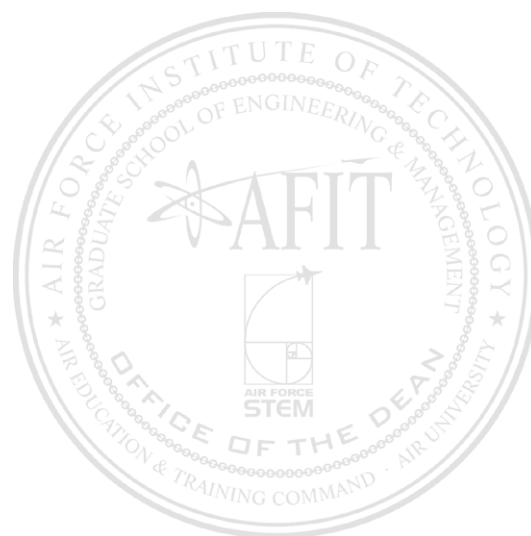
PhD, Business-Logistics Systems, University of North Texas

Assistant Professor of Supply Chain and Logistics

Most Notable Publications

Maywald, J., Reiman, A., Johnson, A., & Overstreet, R. (2017). "The Myth of Strategic and Tactical Airlift." *Air and Space Power Journal*, Spring, 61–71.

Maywald, J., Reiman, A., Overstreet, R., & Johnson, A. (2019). "Aircraft selection modeling: A multi-step heuristic to enumerate airlift alternatives." *Annals of Operations Research*, 274(1), 425–445.



Research Interest Areas

- Supply Chain Technology
- Autonomous Robotics in Intralogistics
- Human-Technology Interaction



Maj Daniel A. Pamplona

**PhD, Aeronautical Infrastructure Engineering,
Aeronautics Institute of Technology (Brazil)**

Assistant Professor of Operations Research

Most Notable Publications

Pamplona, D.A. and Alves, C.J.P., 2020. "An overview of air delay: A case study of the Brazilian scenario." *Transportation Research Interdisciplinary Perspectives*, 7, p.100189.

Pamplona, D.A., Weigang, L., de Barros, A.G., Shiguemori, E.H. and Alves, C.J.P., 2018, July. "Supervised neural network with multilevel input layers for predicting of air traffic delays." *2018 International Joint Conference on Neural Networks (IJCNN)* (pp. 1-6). IEEE.

Ribeiro, V.F., **Pamplona, D.A.**, Fregnani, J.A.T., de Oliveira, Í.R. and Weigang, L., 2016, November. "Modeling the swarm optimization to build effective continuous descent arrival sequences." *2016 IEEE 19th International Conference on Intelligent Transportation Systems (ITSC)* (pp. 760-765). IEEE.

Pamplona, D.A. and Alves, C.J.P., 2020. "Does a fighter pilot live in the danger zone? A risk assessment applied to military aviation." *Transportation research interdisciplinary perspectives*, 5, p.100114.

Selected Honors & Awards

- Best thesis of the Aeronautical Infrastructure Engineering Program – Year 2020
- Michal Gartenkraut Award for Distinction in Transportation Research – Year 2014
- William Grossman Award for Excellence in transportation Research – Year 2014



Research Interest Areas

- Air Transportation
- Flight Safety
- Optimization
- Artificial Intelligence
- Decision Analysis
- Problem Structuring Methods



Dr. Adam D. Reiman

PhD, Logistics, Air Force Institute of Technology

Assistant Professor of Logistics and Supply Chain Management

Most Notable Publications

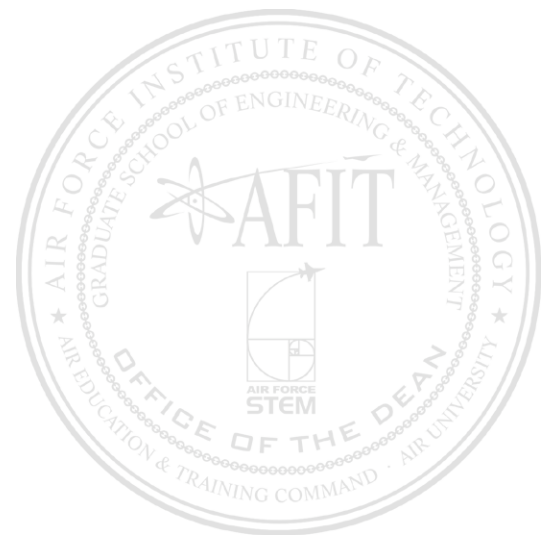
Carlson, N. J., **Reiman, A. D.**, Overstreet, R. E., & Douglas, M. A. (2018). "Load planning processes to enhance cargo compartment utilization." *Journal of Defense Analytics and Logistics*, 1(2), 137-150.

Maywald, J. D., **Reiman, A. D.**, Overstreet, R. E., Johnson, A. W. (2018) "Aircraft selection modeling: a multi-step heuristic to enumerate airlift alternatives." *Annals of Operations Research*, 1-21.

Maywald, J., **Reiman, A.**, Johnson A. & Overstreet, R. (2017). "The myth of strategic and tactical airlift." *Air and Space Power Journal*.

Reiman, A. D. (2014). "Enterprise analysis of strategic airlift to obtain competitive advantage through fuel efficiency." *Air Force Institute of Technology School of Engineering and Management*.

Reiman, A., Main, B. & Anderson, B. (2013). "Enhancing airlift fuel efficiency through increased utilization of cargo capacity." *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, 12(1), 19-29.



Research Interest Areas

- Logistics Management
- Airlift: Metrics, Routing, Scheduling, Fuel Efficiency
- Energy: Efficiency, Supply and Demand
- Value Focused Thinking
- Heuristic Search Algorithms



Dr. Matthew JD Robbins

PhD, Industrial Engineering, University of Illinois

Associate Professor of Operations Research

Most Notable Publications

Rettke, A.J., **Robbins, M.J.**, and Lunday, B.J., 2016. "Approximate Dynamic Programming for the Dispatch of Military Medical Evacuation Assets," *European Journal of Operational Research*, 254 (3), 824-839. DOI: <https://doi.org/10.1016/j.ejor.2016.04.017>.

Robbins, M.J., Jenkins, P.R., Bastian, N.D., and Lunday, B.J., 2018. "Approximate Dynamic Programming for the Aeromedical Dispatching Problem: Value Function Approximation Utilizing Multiple Level Aggregation," *Omega* (forthcoming, accepted 19 Dec 18). (MORS 2018 Barchi Prize Winning Paper.) DOI: <https://doi.org/10.1016/j.omega.2018.12.009>.

Widrick, R.S., Nurre, S.G., and **Robbins, M.J.**, 2018. "Optimal Policies for the Management of an Electric Vehicle Battery Swap Station," *Transportation Science*, 52 (1), 59-79. DOI: <https://doi.org/10.1287/trsc.2016.0676>.

Nystrom, J.K., **Robbins, M.J.**, Deckro, R.F., and Morris, J.F., 2018. "Simulating Attacker and Defender Strategies within a Dynamic Game on Network Topology," *Journal of Simulation*, 12 (4), 307-331. DOI: <https://doi.org/10.1057/s41273-017-0054-0>.

Davis, M.T., **Robbins, M.J.**, and Lunday, B.J., 2017. "Approximate Dynamic Programming for Missile Defense Interceptor Fire Control," *European Journal of Operational Research*, 259 (3), 873-886. DOI: <https://doi.org/10.1016/j.ejor.2016.11.023>.

Selected Honors & Awards

- Best Paper Award (Omega – The International Journal of Management Science) 2019
- Richard H. Barchi Prize (Military Operations Research Society) 2018
- Outstanding Young Member Award (INFORMS, Cincinnati-Dayton Chapter) 2014

Significant Accomplishments

- Associate Editor, Military Operations Research (2019-present)
- Associate Editor, Naval Research Logistics (2019-present)
- Elected Council Member, INFORMS Military and Security Society (2019-present)
- President, INFORMS Cincinnati-Dayton Chapter (2019)



Research Interest Areas

- Stochastic optimization
- Approximate dynamic programming
- Reinforcement learning
- Machine learning



Lt Col Jesse G. Wales

PhD, Operations Research with Engineering, Colorado School of Mines

Assistant Professor of Operations Research

Most Notable Publications

Wales, J., Zolan, A., Hamilton, W., Newman, A., & Wagner, M. (2022). "Combining simulation and optimization to derive operating policies for a concentrating solar power plant." *OR Spectrum*, (just-accepted) 1-32.

Wales, J. G., Zolan, A. J., Newmans, A. M., & Wagner, M. J. (2021). "Optimizing Vehicle Fleet and Assignment for Concentrating Solar Power Plant Heliostat Washing." *IIE Transactions*, 54(6), 550-562.

Anderson, J., Astudillo, J., Butcher, Z., Cornman, M., Correale, A., Crumpacker, J., Dennie, N., Gaines, A., Gallagher, M., Goodwill, J., Graves, E., Hale, D., Holland, E., Huffman, B., McGee, M., Pollack, N., Ramirez, R., Song, C., Swize, E., ..., & Zawadzki, M. (2021). "Stochastic preemptive goal programming of Air Force weapon systems mix." *The Journal of Defense Modeling and Simulation*, 15485129211051751.

Selected Honors & Awards

- Field Grade Officer of the Year, Air Force Inspection Agency, 2014
- Operations Research Honor Graduate, Air Force Institute of Technology, 2014
- Air Force Company Grade Analyst of the Year Honorable Mention, 2011
- Company Grade Officer of the Year, Det. 4, AF Operational Test and Evaluation Center, 2010
- Top Third Graduate, Squadron Officer School, 2008



Research Interest Areas

- Deterministic optimization
- Large-scale systems optimization
- Assignment and scheduling problems
- Renewable energy systems



Dr. Michael R. Grimaila, CISM, CISSP

PhD, Computer Engineering, Texas A&M University

Department Head, Systems Engineering & Management

Professor of Systems Engineering

Most Notable Publications

Okolica, J.S., Peterson, G., Mills, R.F., and **Grimaila, M.R.**, "Sequence Pattern Mining with Variables," *IEEE Transactions on Knowledge and Data Engineering*, pp. 1-20, 19 November 2018, DOI: [10.1109/TKDE.2018.2881675](https://doi.org/10.1109/TKDE.2018.2881675).

Hodson, D.D., **Grimaila, M.R.**, Mailloux, L.O., Grimaila, M.R., McLaughlin, C.V., & Baumgartner, G.B., "Modeling quantum optics for quantum key distribution system simulation," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, January 12, 2017, DOI: [10.1177/1548512916684561](https://doi.org/10.1177/1548512916684561), pp. 1-12.

Mailloux, L.O., **Grimaila, M.R.**, Hodson, D.D., McLaughlin, C., & Baumgartner, G., "Modeling, simulation, and performance analysis of decoy state enabled quantum key distribution systems," *Applied Sciences*, 2017, 7(2), 212.

Johnson, J., **Grimaila, M.R.**, Humphries, J., and Baumgartner, G., "An Analysis of Error Reconciliation Protocols used in Quantum Key Distribution Systems," *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, Sage Press, DOI: [10.1177/1548512913503418](https://doi.org/10.1177/1548512913503418), pp. 1-11, September 2013.

Grimaila, M.R., Myers, J., Mills, R.F., and Peterson, G., "Design and Analysis of a Dynamically Configured Log-based Distributed Security Event Detection Methodology," *The Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, Sage Press, DOI: [10.1177/1548512911399303](https://doi.org/10.1177/1548512911399303), Vol. 9(3), pp. 219-241, 2012.

Selected Honors & Awards

- AFIT Board of Visitors Colonel Charles Stone Award (2012)
- Fellow of the Information System Security Association (2011)
- Senior Member IEEE (2005)

Significant Accomplishments

- Corresponding Editor, *Journal of Defense Modeling and Simulation*, 2018-Present
- Editorial Board of *Information System Security Association (ISSA) Journal*, 2003-Present
- Assistant Editor, *The Defense Cyber Review*, Army Cyber Institute, West Point, 2016-Present



Research Interest Areas

- Civil Defense / CBRNE Response
- Computer and Network Security
- Quantum Networking
- Modeling and Simulation
- Systems Engineering



Lt Col Paul M. Beach

PhD, Systems Engineering, Air Force Institute of Technology

Assistant Professor of Systems Engineering

Most Notable Publications

Beach, P.M., (2020). "A Methodology to Identify Alternative Suitable NoSQL Data Models via Observation of Relational Database Interactions." (*Doctoral dissertation*). Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio.

Beach, P. M., Langhals, B. T., Grimaila, M. R., Hodson, D. D., & Engle, R. D. (2019). "Developing a Methodology for the Identification of Alternative NoSQL Data Models via Observation of Relational Database Usage." In *Proceedings of the International Conference on Information and Knowledge Engineering (IKE)* (pp. 39-44). *The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp)*.

Beach, Paul M., Logan O. Mailloux, Brent T. Langhals, and Robert F. Mills. "Analysis of Systems Security Engineering Design Principles for the Development of Secure and Resilient Systems." *IEEE Access* 7 (2019): 101741-101757.

Beach, P. M., Mills, R. F., Burfeind, B. C., Langhals, B. T., & Mailloux, L. O. (2018). "A STAMP-based approach to developing quantifiable measures of resilience." In *Proceedings of the International Conference on Embedded Systems, Cyber-physical Systems, and Applications (ESCS)* (pp. 103-109). *The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp)*.

Mailloux, L. O., **Beach, P. M.**, & Span, M. T. (2018, April). "Examination of security design principles from NIST SP 800-160." In *2018 Annual IEEE International Systems Conference (SysCon)* (pp. 1-8). IEEE.

Selected Honors & Awards

- Honor Societies: Tau Beta Pi, Eta Kappa Nu
- Meritorious Service Medal
- Joint Service Commendation Medal
- Air Force Commendation Medal with Oak Leaf Cluster
- Air Force Achievement Medal
- Army Achievement Medal
- Distinguished Graduate, Intermediate Network Warfare Training (2012)



Research Interest Areas

- Systems Security Engineering
- Systems Software Engineering
- Cybersecurity
- Data analytics
- Databases



Lt Col Christine L. Bolton

**PhD Candidate, System Dynamics with focus on Strategic Decision Making,
Worcester Polytechnic Institute**

Instructor of Acquisition & Program Management

Selected Honors & Awards

- Logistics Officers' Association Award Winner, AMOC, Apr 2005
- Superior Performer - Logistics Standardization and Evaluation Team (LSET) Inspection, 1FW, Mar 2006 Company Grade Officer of the Quarter, 1st Equipment Maintenance Squadron, Mar 2006
- Program Manager of the Quarter, Electronic Systems Center, Jul 2010
- Company Grade Officer of the Quarter, Aerial Ground Surveillance Systems Division, Jan 2012 Program Manager of the Quarter, Next Generation Systems Branch, Oct 2012
- Company Grade Officer of the Year, Weapons Certification Division, Jan 2015

Significant Accomplishments

- Logistics Officers' Association Award Winner, AMOC, Apr 2005
- Superior Performer - Logistics Standardization and Evaluation Team (LSET) Inspection, 1FW, Mar 2006 Company Grade Officer of the Quarter, 1st Equipment Maintenance Squadron, Mar 2006
- Program Manager of the Quarter, Electronic Systems Center, Jul 2010
- Company Grade Officer of the Quarter, Aerial Ground Surveillance Systems Division, Jan 2012 Program Manager of the Quarter, Next Generation Systems Branch, Oct 2012
- Company Grade Officer of the Year, Weapons Certification Division, Jan 2015



Research Interest Areas

Improve strategic management decisions by using integrated methods—management, leadership, and behavioral economic theories, modeling problems using system dynamics to better understand complex problems, causations, leverage points, then test potential resolutions, and identify unintended consequences prior to organizational decision and implementation. Specific focus of PhD Dissertation is how the Government can improve different aspects of the Defense Acquisition System by applying management, leadership, and behavioral economic theories to better understand existing complex problems while using system dynamics to identify causations, leverage points, test hypothesized improvements, identify unintended consequences, and improve strategic management and decision making.



Maj Michael "Mike" J. Brown

PhD, Economics, The University of Tennessee

Assistant Professor

Most Notable Publications

Brown, M.J., Fass, R.D., and Ritschel, J.D. (2019). "A Case for Open Mission Systems in DOD Aircraft Avionics," *Air and Space Power Journal*, 33(4): 83-93.

Selected Honors & Awards

- ICEAA Outstanding AFIT Thesis Award (#1/11), 2017
- Non-Academic Professional Recognitions
- AFLCMC/HB CGO of the Year, 2018
- Wing CGO of the Quarter, 2014
- Wing Staff CGO of the Quarter, 2014
- ACC/FM CGO of the Quarter, 2014
- Wing Staff CGO of the Quarter, 2013
- ACC/FM CGO of the Quarter, 2013



Research Interest Areas

- Cost Analysis
- Defense Acquisitions
- Applied Econometrics



Dr. Christopher M. Chini

PhD, Civil Engineering, University of Illinois at Urbana-Champaign

Assistant Professor of Engineering Management

Most Notable Publications

Chini, C.M., Djehdian, L.A., Lubega, W.N., and Stillwell, A.S. (2018). "Virtual Water Transfers of the U.S. Electric Grid." *Nature Energy*, 3, 1115-1123.
DOI: [10.1038/s41560-018-0266-1](https://doi.org/10.1038/s41560-018-0266-1).

Delorit, J.D., Schuldt, S.J., and **Chini, C.M.** (2020). "Evaluating an Adaptive Management Strategy for Organizational Energy Use under Climate Uncertainty." *Energy Policy*, 142, 111547.
DOI: [10.1016/j.enpol.2020.111547](https://doi.org/10.1016/j.enpol.2020.111547).

Chini, C.M. and Stillwell, A.S. (2017). "The State of U.S. Urban Water: Data and the Energy-Water Nexus." *Water Resources Research*, 54(3) 1796-1811.
DOI: [10.1002/2017WR022265](https://doi.org/10.1002/2017WR022265).

Siddik, M., **Chini, C.M.**, and Marston, L.M. (2020). "Urban water and carbon footprints of electricity are sensitive to geographical attribution method." *Environmental Science & Technology*, 54(12), 7533-7541.
DOI: [10.1021/acs/est.0c00176](https://doi.org/10.1021/acs.est.0c00176).

Peer, R.A.M. and **Chini, C.M.** (2020). "An Integrated Assessment of the Global Virtual Water Trade Network of Energy." *Environmental Research Letters*.
DOI: [10.1088/1743-9326/abbbb0](https://doi.org/10.1088/1743-9326/abbbb0).

Selected Honors & Awards

- Editor's Choice Award Article for Journal of Sustainable Water and the Built Environment Vol 6, Issue 3, 2020
- Water Resources Research Top Downloaded Paper of 2018-2019 Award, 2020
- UCOWR Ph.D. Dissertation Award in Water Policy and Socio-Economics, 2019
- National Science Foundation Graduate Research Fellowship, 2015
- Department of the Army Achievement Medal for Civilian Service, 2013



Research Interest Areas

- Water resources systems
- Energy-water nexus
- Climate change and infrastructure
- Energy resilience
- Water resilience



Dr. John M. Colombi

PhD, Air Force Institute of Technology

Professor of Systems Engineering

Most Notable Publications

Author or coauthor on over 100 publications

Colombi, J., Buckle, L., Black, J., and S. Nurre (2017). "Optimal Launch Manifesting for Heterogeneous Disaggregated Satellite Constellations," *Journal of Spacecraft and Rockets*, Vol. 54, No. 3 (2017), pp. 582-591. <https://doi.org/10.2514/1.A33796>

Colombi, J., Robbins, M., Burger[#], J. & Weber^E, Y. (2015). "Interface evaluation for open system architectures using multiobjective decision analysis." *Military Operations Research (MOR) Journal* 20(2):55-69.

Hardman, N., Jacques, D. R., **Colombi, J. M.**, Hill^F, R., & Miller^E, J. (2013). "Requirements elicitation through legacy mishap analysis," *American institute of aeronautics and astronautics (AIAA) Journal of Aerospace Information Systems*, 10(3), 105-113.

Ford[#], T. C., **Colombi, J. M.**, Jacques^F, D. R., & Graham^F, S. R. (2009). "A general method of measuring interoperability and describing its impact on operational effectiveness." *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology*, 6(1), 17-32.

Thompson[#], R., **Colombi, J.**, Black^F J. and B. Ayres^F (2015). "Disaggregated Space System Concept Optimization: Model-Based Conceptual Design Methods," *Journal of Systems Engineering* (18) 6, pp 549-675.

Selected Honors & Awards

- 2019: Primary advisor for 173 students on 109 projects; Committee member on 129 more students
- 2019: AFIT Leadership Award – Senior Faculty
- 2018: Senior Member, IEEE
- 2017: ABET Program Evaluator for Systems Engineering
- 2017: Best Paper, IEEE Systems Conference, Montreal, Canada, 24-27 April 2017
- 2015: Southwest Ohio Council for Higher Education (SOCHE) Faculty Excellence Award

Significant Accomplishments

2021-2022: Distinguished Visiting Professor, USAFA. Taught cadets Digital Engineering using Model-based Systems Engineering and SysML

2016-2022: Developed and taught over 35 short-courses, Model-based Systems Engineering: Theory to Practice, supporting acquisition community

Served 21 years active duty in USAF (ret. Lt Col) as a Developmental Engineer. Research, engineering and management assignments:

- Program Manager, Command and Control (C2) Enterprise;
- Chief Engineer, Airborne Warning and Control System (AWACS) Systems;
- Chief, AWACS Command and Control Programs Integrated Product Team;
- Chief, Defensive Information Operations Research Team, National Security Agency; and
- Communication Systems Engineer, Rome Laboratories



Research Interest Areas

Model-based Systems Engineering (MBSE) for conceptual trade space exploration, Autonomous aircraft design and test, Complex adaptive systems, Acquisition research, and Human systems integration.



Lt Col Warren J. Connell

PhD, Information Technology, George Mason University

Deputy Department Head

Assistant Professor of Systems Engineering

Most Notable Publications

Connell, Warren, Albanese, Massimiliano, and Sridhar Venkatesan. "A Framework for Moving Target Defense Quantification." *IFIP International Information Security and Privacy Conference*. Springer International Publishing, 2017.

Connell, Warren, Menascé, Daniel, and Massimiliano Albanese. "Performance Modeling of Moving Target Defenses." *Fourth ACM Workshop on Moving Target Defense (MTD)*. ACM, 2017.

Connell, Warren, Luan Pham, and Sam Philip. "Analysis of Concurrent Moving Target Defenses." *Fifth ACM Workshop on Moving Target Defense (MTD)*. ACM, 2018.

Connell, Warren, Menascé, Daniel, and Massimiliano Albanese. "Performance Modeling of Moving Target Defenses with Reconfiguration Limits." *IEEE Transactions on Dependable and Secure Computing*. IEEE Early Access, 2018.

Selected Honors & Awards

- National System for Geospatial Intelligence Company Grade Officer of the Year, 2010
- 3-time F-35 Test Directorate Senior Officer of the Quarter, between 2019-2020

Significant Accomplishments

- Certified Information System Security Professional, 2013-present
- First-ever Cyber Test Lead for the F-35 Joint Program Office, 2020



Research Interest Areas

- Cyber Moving Target Defenses
- Autonomous Computing
- Aircraft Cyber Testing



Lt Col Amy M. Cox

PhD, Systems Engineering, The George Washington University

Assistant Professor of Systems Engineering

Most Notable Publications

Flenar, Wagner, **Cox** and Jacques, "Determining Detectable and Exploitable Aspects of Rogue Small Unmanned Aircraft Systems". *Journal of DoD Research and Engineering* (accepted in 2019).

Selected Honors & Awards

- 2015: Merrit Williamson Best Conference Paper Award, American Society for Engineering Management
- 2012: Outstanding Air Force Program Manager, ACAT III or Equivalent
- 2011: Joint Service Achievement Medal, Achievement
- 2005: Distinguished Graduate, Defense Language Institute (French)

Significant Accomplishments

- Developed prototype degree program for Acquisitions Managers; first two Systems Management students graduated in March 2019
- Brevet, Flight Test Engineer, École du Personnel Navigant d'Essais et de Réception, Istres, FR, Specialization in Rotary Wing Aircraft, July 2006



Research Interest Areas

- User Innovation
- Innovation Portfolio Performance
- System Design and Architecture
- Social Network Analysis
- UAV Flight Test and Performance



Lt Col Scott T. Drylie

PhD, Economics, George Mason University

Assistant Professor of Acquisitions

Most Notable Publications

Drylie, S. (2020) "Professional Scholarship from 1893 to 2020 on Adam Smith's Views on School Funding: A Heterodox Examination," *Econ Journal Watch*.

Drylie, S. (April, 2021) "Adam Smith on schooling: A classical liberal rereading," *Journal of Economic Behavior and Organization*.

Plack, E.A., Ritschel, J.D., +White, E.D., +Koschnick, C.M., and **+Drylie, S.T.** (2021). "Exploring Performance in Science and Technology Programs," *Defense Acquisition Research Journal*.

Miller, K.M., White, E.F., Ritschel, J.D., Fass, R.D., **Drylie, S.** (2022). Empirical Investigations of Engineering Change Order Percentages in Defense Contracts," *Journal of Cost Analysis and Parametrics*.

Goljan, J. Ritschel, J.D., **+Drylie, S.**, +White, E.D. (2022). "Software Estimating in an Agile Environment," *Journal of Cost Analysis and Parametrics*.

Selected Honors & Awards

- DoD Financial Management Certification, Level 3
- Certified Cost Estimator/analyst, ICEAA (International Cost Estimating & Analysis Association)
- Developed new courses for the Cost Analysis and Acquisitions programs
- Dean's Distinguished Teaching Award, Graduate School of Engineering Management (2021)
- Afghanistan Campaign Medal (2020)

Significant Accomplishments

- Has advised 10 students and served on 14 more committees engaged in relevant defense-sponsored topics.



Research Interest Areas

- Price Theory
- Labor Economics
- Historical Economics
- Institutional Economics
- Smithian Political Economics
- Culture
- Trust and Social Capital
- Inflation Forecasting
- Software Estimating
- Operating and Support Costs
- Organizational Change
- Process Improvements
- Military Retention



Dr. John J. Elshaw

PhD, Management, Purdue University

Associate Professor of Management

Most Notable Publications

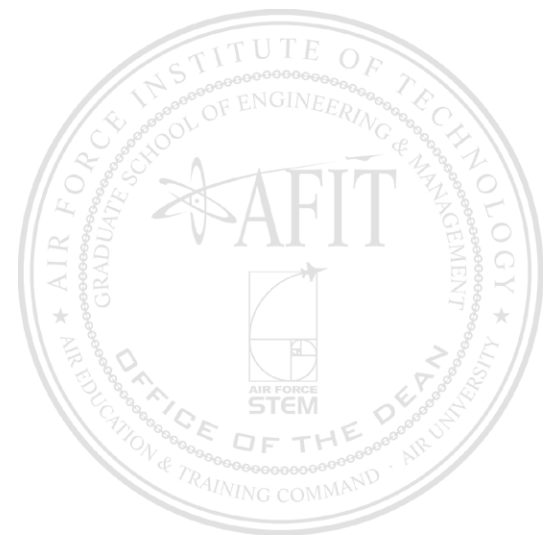
Kim, Sungbin, Miller, Michael E., Rusnock, Christina F., & **Elshaw, John J.** (2018). "Spatialized audio improves call sign recognition during multi-aircraft control". *Applied Ergonomics*, 70, pp. 51-58.

Gay, C., Horowitz, B., **Elshaw, J.**, Bobko, P., & Kim, I. (2017). "Operator suspicion and decision responses to cyber-attacks on unmanned ground vehicle systems". *Proceedings of the Human Factors and Ergonomics Society*, Vol 61, Issue 1, pp. 226-230.

Elshaw, John J., Badiru, Adedeji B., & Harris, Sharif F. (2017). "Learning curve analysis in department of defense acquisition programs". *Acquisition Research Program: Creating Synergy for Informed Change* (online publication), 22 November 2017, Naval Postgraduate School.

Elshaw, John J., Fass, Robert D., & Mauntel, Brian R. (2017). "Cognitive Mentorship: Protégé Behavior as a Mediator to Performance". *Journal of Mentoring and Teaching* (In Print).

Elshaw, J. J. "Social Science Measurement (2016)". *Handbook of Measurements: Benchmarks for Systems Accuracy and Precision*, Badiru editions, Taylor and Francis.



Research Interest Areas

- Leadership, Human-Technology interaction (virtual teams, electronic monitoring, distance leadership)
- Learning curves and the impact on acquisition
- Workgroup and team processes within organizations, social networks, organizational climate and culture
- Cross-cultural leadership and communication
- Cognition and emotions
- Motivation (self-regulation, intrinsic versus extrinsic control)
- Human performance
- Organizational trust, performance, and commitment



Dr. Robert David Fass

PhD, Business Administration, New Mexico State University

Assistant Professor of Systems Integration and Cost Analysis

Most Notable Publications

Erneston, C., **Fass, R.**, Ritschel J., Cox A. (2022). "A preliminary analysis of the costs and benefits of physical therapy and strength training for fighter pilots." *Aerospace Medicine and Human Performance*. 93(8):637–642.

<https://doi.org/10.3357/AMHP.6086.2022>

Miller, K.M., White, E.D., Ritschel, J.D., **Fass, R.D.**, and Drylie S.T. (2022). "Empirical Investigation of Economic Change Order Percentages in Defense Contracts," *Journal of Cost Analysis and Parametrics*, 10(2): 76-90.

Myers, M. A., White, E. D., Ritschel, J. D., & **Fass, R. D.** (2021). "Quantifying the effects of aircraft engine upgrades on operating and support costs." *Defense Acquisition Research Journal*, 28(3), 320–343.

<https://doi.org/10.22594/10.22594/dau.20-862.28.03>

Brown, M. J., **Fass, R.D.**, and Ritschel, J. D. (2019). "A Case for Open Mission Systems in DoD Aircraft Avionics," *Air and Space Power Journal*, Volume 33, Issue 4, pp. 83-93.

<https://www.airuniversity.af.edu>

Rosson, J., Rice, M., Lopez, Jr., J., **Fass, R.** (2019). "Incentivizing Cyber Security Investment in the Power Sector Using an Extended Cyber Insurance Framework", *Homeland Security Affairs*, 15, Article 2 (May 2019). <https://www.hsaj.org/articles/15082>

Selected Honors & Awards

- Educator of the Year Award, 2022, International Cost Estimating & Analysis Association, Dayton Chapter
- Teacher of the Year, 2011, Department of Systems and Engineering Management
- Certified Cost Estimator/Analyst (CCEA) from the International Cost Estimating & Analysis Association (ICEAA). Re-Certified: Feb 10, 2020. Expiration Date: Mar 19, 2025
- Phi Beta Kappa, 1989

Significant Accomplishments

- Delivers graduate education supported by 20-year military career (ret, Lt Col) as a warranted Contracting Officer (64P) in Defense Acquisition
- Thesis chair/committee member on over 50 defense acquisition related research projects since 2008
- Enhanced quantitative rigor of cost program curriculum with existing course enhancements and new courses



Research Interest Areas

Defense Acquisition System, Cost Analysis, Subject Matter Expert Elicitation, Decision Making, Risk Analysis, Technology Transition, Creativity and Innovation, Leadership, Storytelling, Organizational Behavior, Organizational Change and Development, Organizational Culture, Motivation, Performance Measurement, Business Strategy, Strategic Alliances, Psychometric Research Methods, Qualitative Research Methods, Inductive Theory Building, Theory Application & Testing, Structural Equation Modeling, Social Network Analysis, Learning Modalities, Data Science, Data Visualization, and Bayesian Statistics.



Dr. Thomas C. Ford

PhD, Systems Engineering, Air Force Institute of Technology

Assistant Professor of Systems Engineering

Most Notable Publications

Michael F. Schneider, Michael E. Miller, **Thomas C. Ford**, Gilbert Peterson, David Jacques. "Intent Integration for Human-Agent Teaming," *Systems Engineering*. 13 January 2022.

DOI [10.1002/sys.21616](https://doi.org/10.1002/sys.21616)

Sean Kelly, David Jacques, Brad Ayres, Richard Cobb, **Thomas Ford**. "Using a CubeSat Reference Architecture for Accelerated Model Development and Analysis," *Journal of Small Satellites*. Vol 10, No. 3, 29 Oct 2021. pp. 1097-1108.

Torrey Wagner, **Thomas C. Ford**. "DoD Applications of Agile Software Development Methods," *Journal of Defense Research and Engineering*. Vol 1, Issue 3, Special Edition, 2018.

Thomas C. Ford, David W. Meyer, John M. Colombi, Brian K. Scheller, Cody G. Palmer. "A Method for Assessing the Time-Variant Value of Multi-Domain Architectures," *Journal of Defense Modeling and Simulation*. Published on-line June 29, 2016.

Thomas C. Ford, John M. Colombi, David R. Jacques and Scott R. Graham, "A General Method of Measuring Interoperability and Describing Its Impact on Operational Effectiveness," *Journal of Defense Modeling and Simulation*. January 1, 2009, 6:17-32. (Invited Paper)

Selected Honors & Awards

- Certified SAFe Agilist (2018), Object Management Group Certified Systems Modeler – Model User (2017), NRO Silver Medal (2012)

Significant Accomplishments

- Delivers graduate education supported by 22-year military career (ret, Lt Col) as Developmental Engineer (62E) in Defense Acquisition
- Teaches online Systems Engineering Masters courses to military and civilian, current and future, Lead- and Chief-Engineers as well as Operators throughout CONUS and OCONUS
- Served on committee for two PhD students, advised or served on committee for 13 MS students performing Air Force-focused research
- Re-designed and modernized SENG520 Systems Engineering Design



Research Interest Areas

- Model-based Systems Engineering (MBSE)
- Systems Design & Modeling
- System Interoperability
- Modeling and Simulation
- Agile Software Systems Engineering

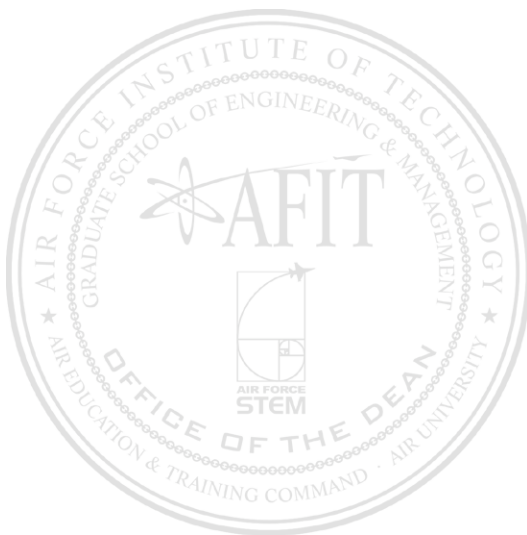


Lt Col Jeremy R. Geiger

PhD, Systems Engineering, Air Force Institute of Technology

Assistant Professor of Systems Engineering

Distance Learning Program Director



Selected Honors & Awards

- 2010: Defense Meritorious Service Medal
- 2017: Meritorious Service Medal
- 2017: Aerial Achievement Medal with 2 Oak Leaf Clusters
- 2017: Field Grade Officer of the Year, 418 FLTS

Significant Accomplishments

- 2010: Deployed to Afghanistan in Operation Enduring Freedom
- 2013: United States Air Force Test Pilot School, Class 13A



Research Interest Areas

- Organizational Behavior
- Measure Development
- Verification & Validation
- Flight Test & Evaluation
- Business Processes & Efficiency
- Innovation



Dr. Mark N. Goltz

PhD, Environmental Engineering and Science, Stanford University

Distinguished Professor Emeritus of Environmental Engineering and Science

Most Notable Publications

Kanel, S. R., H. Misak, D. Nepal, S. Mall, S.W. Brittle, I.E. Sizemore, D. Kempisty, **M.N. Goltz**, "Application of Carbon Nanotube Yarns as a Filter Media to Treat Nitroaromatic-contaminated Water", accepted *New Carbon Materials*, 2015.

Huang, J., J.A. Christ, **M.N. Goltz**, and A.H. Demond, "Modeling NAPL Dissolution from Pendular Rings in Idealized Porous Media", *Water Resources Research*, 51, DOI: [10.1002/2015WR016924](https://doi.org/10.1002/2015WR016924), 2015.

Huang, J. and **M.N. Goltz**, "Semi-Analytical Solutions for Transport in Aquifer and Fractured Clay Matrix System", *Water Resources Research*, 51, 7218-7237, DOI: [10.1002/2014WR 016073](https://doi.org/10.1002/2014WR 016073), 2015.

Kanel, S. R., J. Flory J., A. Meyerhoefer, J.L. Fraley, I.E. Sizemore, and **M.N. Goltz**, "Influence of Natural Organic Matter on Fate and Transport of Silver Nanoparticles in Saturated Porous Media: Laboratory Experiments and Modeling", *Journal of Nanoparticle Research*, 17(3):1-13, 2015.

Powell, C.L., **M.N. Goltz**, and A. Agrawal, "Degradation Kinetics of Chlorinated Aliphatic Hydrocarbons by Methane Oxidizers Naturally-Associated with Wetland Plant Roots", *Journal of Contaminant Hydrology*, 170: 68-75, 2014.

Selected Honors & Awards

- AFIT Distinguished Professor, 2015
- AFIT Graduate School of Engineering and Management Charles P. Brothers Outstanding Volunteer Service Award, 2014
- Fellow, Society of American Military Engineers, 2009



Research Interest Areas

Groundwater contamination remediation technologies, Fate and transport of organic contaminants in the subsurface, Stimulating commercialization of environmental remediation technologies, Mathematical modeling of contaminant transport by groundwater, In situ bioremediation of chlorinated organic compounds in the subsurface, Scaling-up from the laboratory to the field, Physical and chemical water and wastewater treatment technologies, and Environmental modeling.



Dr. Willie F. Harper Jr.

PhD, Civil and Environmental Engineering, University of California, Berkeley

Professor of Environmental Engineering and Science

Most Notable Publications

Brandon M. Stewart, Michael E. Miller, David M. Kempisty, John Stubbs, and **Willie F. Harper, Jr.** (2018). "Oxidation of Tartrazine with ultraviolet light emitting diodes: pH and duty cycles effects", *Water Science and Technology*, Vol 77 (3), 1651-1659.

Willie F. Harper, Jr., William Flemings, Kandace Bailey, Walter Lee, Daniel Felker, Vicente Gallardo, Matthew Magnuson, and Rebecca Phillips (2017). "Adsorption of malathion onto copper and iron surfaces relevant to water infrastructure". *Journal of American Water Works Association*, Vol 109 (11), E494-E502.

Akihiko Terada, Sho Sugawara, Keisuke Hojo, Yuki Takeuchi, Shohei Riya, **Willie F. Harper Jr.**, Tomoko Yamamoto, Megumi Kuroiwa, Kazuo Isobe, Chie Katsuyama, Yuichi Suwa, Keisuke Koba, and Masaaki Hosomi (2017). "Hybrid nitrous oxide production from partial nitrifying bioreactor: hydroxylamine interactions with nitrite". *Environmental Science and Technology*, Vol. 51(5), 2748-2756.

Robert Scott, Patrick Mudimbi, Michael E. Miller, Matthew Magnuson, Stuart Willison, Rebecca Phillips, **Willie F. Harper, Jr.** (2017). "Advanced oxidation of tartrazine and brilliant blue with pulsed ultraviolet light emitting diodes". *Water Environment Research*, Vol. 89, 24-31.

Daniel Baseley, Luke Wunderlich, Grady Phillips, Kevin Gross, Glen Perram, Stuart Willison, Rebecca Phillips, Matthew Magnuson, Sang Don Lee, **Willie F. Harper, Jr.** (2016). "Hyperspectral analysis for standoff detection of dimethyl methylphosphonate on building materials", *Building and Environment*, Vol. 108, 135-142.

Selected Honors & Awards

- Embassy Science Fellow (Togo), 2017-2018
- John L. McLucas Basic Research Award, 2016



Research Interest Areas

- Water quality, including biological and chemical treatment methods



Dr. David R. Jacques

PhD, Aeronautical Engineering, Air Force Institute of Technology

Professor of Systems Engineering

Most Notable Publications

Vandawaker, R.M., **D. Jacques**, E. Ryan, J. Huscroft and J. Freels. "Health Monitoring Impact on Non-Repairable Component Supply Methods", *Journal of Quality in Maintenance Engineering*, 23 (1), 82-94, 2016.

Humphreys, C., R. Cobb, **D. Jacques** and J. Reeger, "A Hybrid Optimization Technique Applied to the Intermediate-Target Optimal Control Problem", *Global Journal of Technology and Optimization*, Vol. 7, Issue 2, August, 2016.

Vandawaker, R.M., **Jacques, D.R.**, Freels, J.K., "Impact of Prognostic Uncertainty in System Health Monitoring", *International Journal of Prognostic Health Management*, ISSN 2153-2648, 2015 011, May 2015.

Ryan, E., **D. Jacques** and J. Colombi, "An Ontological Framework for Clarifying Flexibility-Related Terminology via Literature Survey", *INCOSE Systems Engineering*, 16(1): 99-110, 2013.

Jacques D. and D. Smith, "A Simplified Building Air Flow Model for Agent Concentration Prediction", *Journal of Occupational and Industrial Hygiene*, Volume 7, Issue 11, 2010.

Selected Honors & Awards

- 2016 – General Bernard Schriever Award for CY 2015



Research Interest Areas

Dr. Jacques is leading research in the area of effective multi-vehicle control for flexible reconnaissance and surveillance operations. As part of this work, he has been utilizing a tailored SE process for rapid conceptualization/design/build/test cycles to enable flight test evaluation of new operational concepts within a 9-12 month cycle time, with this work drawing in students and faculty from multiple departments. He especially enjoys research in the area of optimal design, where system effectiveness is used as the design objective as opposed to lower level subsystem performance measures. He is actively interested in using System Architecture as an analytic basis using methods from graph theory and/or discrete-event simulation.



Lt Col Kip Johnson

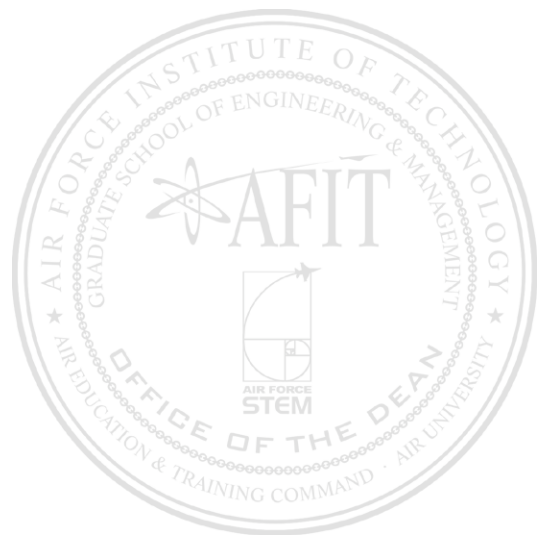
PhD, Aeronautics and Astronautics, Massachusetts Institute of Technology (MIT)

Assistant Professor of Systems Engineering

Most Notable Publications

(2017, PhD Thesis) Systems-Theoretic Safety Analyses Extended for Coordination

(2002, MS Thesis) Experimental Study of Automation to Support Time-Critical Replanning Decisions



Research Interest Areas

- Systems theory applied to safety and other emergent properties
- Integrating Systems-theoretic processes into MBSE methods and tools
- Flight test safety
- Architecting the enterprise



Lt Col Benjamin R. Knost

PhD, Civil Engineering, The Ohio State University

Assistant Professor of Engineering Management

Most Notable Publications

Knost, B.R. (2022). "Incorporating Resilience into Infrastructure Investment Decisions: Developed Framework, Specifications, Estimations, and Evaluation." (Doctoral Dissertation) The Ohio State University, Columbus, Ohio.

Knost, B.R., Mishalani, R.G. (2021). "Modeling the Systematic Error in Pavement Deterioration Forecasts: Empirical Results and Interpretations Using Airfield PCI Data." *Journal of Infrastructure Systems*, 27(4), 04021046.

Knost, B.R. (2016). "Evaluating the Accuracy of Pavement Deterioration Forecasts: Application to United States Air Force Airfields." (M.S. Thesis). The Ohio State University, Columbus, Ohio.

Knost, B.R. (2006). "Formal and informal work group relationships with performance: a moderation model using social." (M.S. Thesis). Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio.

Selected Honors & Awards

- Bronze Star Medal, 2013
- Meritorious Service Medal (x3), 2022
- Joint Service Commendation Medal, 2008
- Air Force Commendation Medal (x3), 2012



Research Interest Areas

- Resilient installations
- Construction management
- Built-infrastructure asset management
- Decision-making under uncertainty



Lt Col Clay M. Koschnick

PhD, Industrial and Systems Engineering, University of Florida

Assistant Professor of Systems Engineering

Most Notable Publications

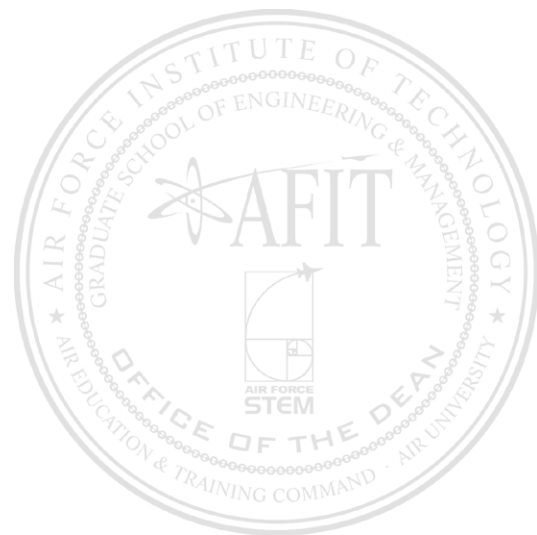
Weaver, B., **Koschnick, C.**, Ritschel, J., and White, E. (2022). "Financial Ratio Relationship to Defense Contractor Cost Overruns," *Journal of Contract Management*, Vol. 17 40-55.

Ryan, K., Cox, A., Blake, E., **Koschnick, C.**, and Thal, A. (2022). "Innovation Transition Success: Practice Doesn't Make Perfect," *Defense Acquisition Research Journal*, 29(4), 336-358.

Hogan D, Elshaw J, **Koschnick C**, Ritschel J, Badiru A, Valentine S. "Cost Estimating Using a New Learning Curve Theory for Non-Constant Production Rates." *Forecasting*. 2020; 2(4):429-451.

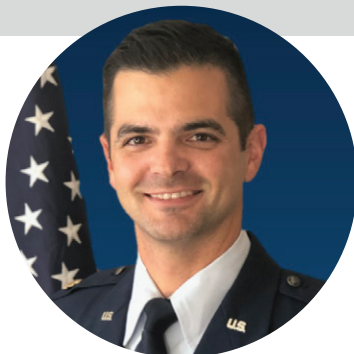
Pasion, C.; Wagner, T.; **Koschnick, C.**; Schuldt, S.; Williams, J.; Hallinan, K. "Machine Learning Modeling of Horizontal Photovoltaics Using Weather and Location Data." *Energies*. 2020, 13, 2570.

Koschnick, Clay and Hartman, Joseph C. (2019). "Using performance-based warranties to influence consumer purchase decisions," *The Engineering Economist*, DOI: [10.1080/0013791X.2019.1642430](https://doi.org/10.1080/0013791X.2019.1642430)



Research Interest Areas

- Economic and Financial Analysis of the Defense Industry
- Risk and Decision Analysis



Maj Joseph P. Kristbaum

PhD, Human Factors Engineering, Wright State University

Assistant Professor of Systems Engineering

Most Notable Publications

Kristbaum, Joseph P., and Frank W. Ciarallo. 2020. "Strategic Decision Facilitation: Supporting Critical Assumptions of the Human in Empirical Modeling of Pairwise Value Comparisons" *Systems* 8, no. 3: 30.

<https://doi.org/10.3390/systems8030030>

Kristbaum, Joseph, and Frank Ciarallo. 2022. "Strengthening Criteria Independence through Optimization of Alternative Value Ratio Comparisons" *Processes* 10, no. 7: 1301.

<https://doi.org/10.3390/pr10071301>

Selected Honors & Awards

- Meritorious Service Medal with oak leaf cluster
- Air and Space Commendation Medal with oak leaf cluster
- Air and Space Achievement Medal
- National Defense Service Medal
- Global War On Terrorism Expeditionary Medal
- Global War on Terrorism Service Medal



Research Interest Areas

- Organizational Behavior
- Judgement and Decision Making
- Optimization
- Human Systems Integration
- Human Systems Modeling
- Model Based Systems Engineering



Dr. Brent T. Langhals

PhD, Management Information Systems, University of Arizona

Associate Professor of Information Resource Management

Most Notable Publications

L. Zoboroski, T. Wagner, B. Langhals, "Classical and Neural Network Machine Learning to Determine the Risk of Marijuana Use." *International Journal of Environmental Research and Public Health*, Vol. 18 (2021).

Engle, R.*, Langhals, B.T., Grimaila, M.R., Hodson, D.D., (2021) "A Methodology for Storing Log Data with Changing Structure in a Relational Database." *Journal of DoD Research and Engineering*, Vol 4, Issue 1, January 2021.

Sigala, A.*, Langhals, B.T. (2020). "Applications of Unmanned Aerial Systems (UAS): A Delphi Study Projecting Future UAS Missions and Relevant Challenges," *DRONES*, Vol 4, Issue 1, March 2020.

Beach, P. M.*, Mailloux, L.O., Langhals, B.T, Mills, R.F. (2019). "Analysis of Systems Security Engineering Design Principles for the Development of Secure and Resilient Systems," *IEEE Access*, Vol 7, Issue 1, July 2019.

Guinn, V. L.*, Langhals, B. T., Elshaw, J. J. (2018). "Evaluating Smartphones for Infrastructure Work Order Management," *International Journal of Interactive Mobile Technologies*, Vol 12, Issue 8, December 2018.

Selected Honors & Awards

- 2018 – AFIT Sigma Iota Epsilon Instructor of the Year
- 2013 – Department of Systems Engineering and Management Educator of the Year

Significant Accomplishments

- Director, AFIT Data Analytics Program
- US Patent No. 9,667,947, Issued 30 May 2017 for "Stereoscopic 3-D Presentation for Air Traffic Control Digital Radar Displays" to SMSgt Jason Russi, Dr. Brent Langhals, Dr. Michael Miller, Mr. Eric Heft.



Research Interest Areas

- Data analytics
- Database
- Human-computer interaction
- Systems engineering
- Psychophysiological cues and vigilance



Dr. David S. Long

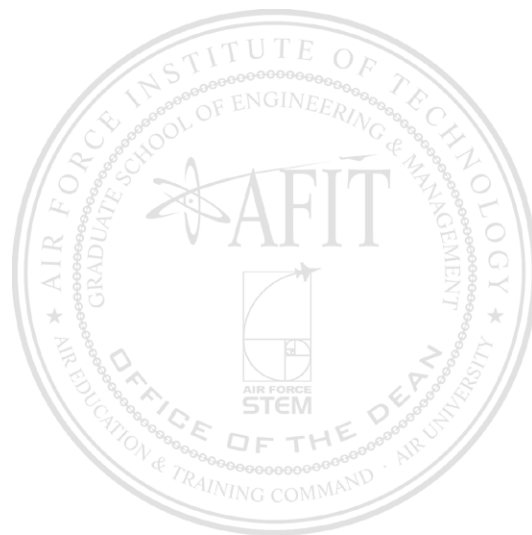
PhD, Engineering Systems with Human Factors, Massachusetts Institute of Technology

Assistant Professor of Systems Engineering



Research Interest Areas

- Systems integration
- System analysis
- Performance analysis
- Human factors application and instruction
- Aircraft maintenance
- Flight test
- System development
- Sub-system development
- System integration
- System maintenance
- Process improvements
- Human factors and integration





Dr. Brandon M. Lucas

PhD, Economics, George Mason University

Assistant Professor of Systems Integration & Cost Analysis

Most Notable Publications

White, Edward & **Lucas, Brandon** & Ritschel, Jonathan & Mrla, Danielle. (2019). "The impact of WSARA on the cost of Air Force weapon systems." *Journal of Public Procurement*, 2019. 2-14. 10.1108/JOPP-03-2019-022.

Griffith, J., White, E., Fass, R., & **Lucas, B.** (2018). "Comparison of Body Composition Metrics for United States Air Force Airmen". *Military Medicine*, 183(3-4), e201-e207.

Trudelle, Ryan C., White, Edward D., Ritschel, Jonathan D., Koschnick, Clay M., **Lucas, Brandon M.** "Modeling Median Will-Cost Estimates for Defense Acquisition Programs". *Journal of Defense Analytics and Logistics*, 2017, Vol. 1, Issue 1, pgs. 19-33.

Trudelle, Ryan C., White, Edward D., Koschnick, Clay M., Ritschel, Jonathan, D., **Lucas, Brandon M.** "Estimating an Acquisition Program's Likelihood of Staying within Cost and Schedule Bounds". *Defense Acquisition Review Journal*, October 2017, Vol. 24, No. 4, pgs. 600-625.

Klein, Daniel B. and **Lucas, Brandon** (2011). "In a Word or two, placed in the middle: The Invisible Hand in Smith's *Tomes*." *Economic Affairs*, Vol. 31. No. 1, pp. 43-52.

Selected Honors & Awards

- DoD Financial Management Certification, Level 3
- Certified Cost Estimator/Analyst, ICEAA (International Cost Estimating & Analysis Association)

Significant Accomplishments

- Delivers graduate education preceded by 21-year military career (ret. Lt Col) as Financial Manager/ Cost Analyst (65F/W) supporting Defense Acquisition & Support.
- Advised 13 students and served on 22 additional committees engaged in relevant defense-sponsored topics.



Research Interest Areas

- | | | |
|-------------------|--------------------------------|---|
| • Economics | • Schedule Analysis | • Organizational Culture |
| • Profit Analysis | • Incentives | • Defense Acquisition System Processes and Policies |
| • Cost Growth | • Forecasting | • Cost-Benefit Analysis |
| • Decision Making | • Qualitative Research Methods | |



Dr. Eric G. Mbonimpa

PhD, Civil and Environmental Engineering, Purdue University

Assistant Professor of Engineering and Environmental Management

Most Notable Publications

Sedej, O., Mbonimpa, E., Sleight, T., & Slagley, J. (2022). Application of Machine Learning to Predict the Performance of an EMIPG Reactor Using Data from Numerical Simulations. *Energies*, 15(7), 2559.

Sedej, Owen, and Eric Mbonimpa. "CFD Modeling of a Lab-Scale Microwave Plasma Reactor for Waste-to-Energy Applications: A Review." *Gases* 1.3 (2021): 133-147.

C. Mukherjee, J. Denney, **E.G. Mbonimpa**, J. Slagley, R. Bhowmik. "A review on municipal solid waste-to-energy trends in the USA." *Renewable and Sustainable Energy Reviews* 119, 2020, 109512.

Emery I., D. Kempisty, B. Fain, **E. Mbonimpa**. "Evaluation of treatment options for potable water impacted with perfluorinated alkyl substances using life cycle assessment." *International Journal of Life Cycle Assessment*, 24(1), 117-128.

Emery I., **E. Mbonimpa**, A. Thal. "Climate-based policies may increase life cycle social costs of vehicle fleet operation." *Energy Policy* 101, 1-9.

Significant Accomplishments

- U.S. Patent No. 9,546,100. Washington, DC: U.S. Patent and Trademark Office. Mbonimpa, E. G., Blatchley III, E. R., Applegate, B., & Vadheim, B. (2017).



Research Interest Areas

- Alternative energy sources
- Artificial Intelligence
- Climate and Environmental change
- Sustainability



Dr. John M. McGuirl

PhD, Cognitive Systems Engineering, The Ohio State University

Assistant Professor, Systems Engineering

Most Notable Publications

Peterson, **J. McGuirl**, J.M., Miller, M.E., Bales, D. Sternitzky, B. (2021). "Viewing Air Battle Management Through the Lens of Interdependence." *Proceedings of the 22nd International Symposium on Aviation Psychology*, Dayton, OH.

Miller, M.E., **McGuirl, J.M.**, Schneider, M.F., Ford, T. C. (2020) "Systems modeling language extension to support modeling of human-agent teams." *Systems Engineering*, 23(5), (519-533).

Schneider, M. F., Miller, M.E., **McGuirl, J. M.** (2020) "Tracking Operator Intent in Tactical Operations." *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, Toronto, Canada. (3214-3220)

McGuirl, J.M., Sarter, N.B., and Woods, D.D. (2011) "Incident command situation assessment utilizing video feeds from UAVs: New risks for decision making breakdowns." In M. Jennex (Ed.) *Crisis Response and Management and Emerging Information Systems: Critical Applications*. IGI Publishing.

McGuirl, J.M. & Sarter, N.B. (2006). "Supporting trust calibration and the effective use of decision aids by presenting dynamic system confidence information." *Human Factors*, 48(4), (656-665).

Selected Honors & Awards

- Recognized as one of the "Top 5 Papers of the Year" in Systems Engineering, 2020
- Best Paper in Conference – 3rd ISCRAM Conference, May 2008
- Best Paper in Session – 20th Digital Avionics Systems Conference, May 2001



Research Interest Areas

- Decision Support Systems
- Human-machine Teaming
- Human Systems Integration
- Interface Design
- System Dynamics Modeling
- Model-based Systems Engineering



Dr. Michael E. Miller

PhD, Industrial and Systems Engineering, Virginia Tech

Professor of Systems Engineering

Most Notable Publications

Schneider, **M.F.**, **Miller**, M.E., Ford, T.C., Peterson, G. and Jacques, D. (2022). "Intent Integration for Human-Agent Teaming," *Systems Engineering*, 25(4), 291-303.

Schneider, M., **Miller**, M., Ford, T. Peterson, G. and Jacques, D. (2021). "Exploring Intent for Improved Human-Agent Team Coordination," *Journal of Cognitive Engineering and Decision Making*, 13(2-3).

Miller, M.E., McGuirl, J.M., Schneider, M.F., and Ford, T.C. (2020). "A Language and Method to Permit Modeling of Human-Agent Teams," *Systems Engineering*, 23(5), 519-533.

Bindewald, J.M., **Miller**, M.E. and Peterson, G.L. (2019). "Creating Effective Automation to Maintain Explicit User Engagement", *International Journal of Human-Computer Interaction*, 36(4), 341-354.

Kim, S., **Miller**, M.E., Rusnock, C.F. and Elshaw, J. (2018). "Spatial Audio Improves Call Sign Recognition during Multi-Aircraft Control", *Applied Ergonomics*, 70, 51-58.

Loschky, L.C., McConkie, G.W., Yang, J. and **Miller**, M.E. (2005). "The limits of visual resolution in natural scene viewing," *Visual Cognition*, 12(6), 1057-1092.

Selected Honors & Awards

- Member Editorial Board, *MDPI Systems Journal*, 2020 through 2022
- Southwestern Ohio Council for Higher Education Faculty Excellence Award, 2017
- Best Paper – Safety, Human Factors and Ergonomics, Industrial and Systems Engineering Research Conference, 2016

Significant Accomplishments

- Sixteen years of industry experience as a systems/human factors engineer in multi-national corporations.
- Contributed to more than 100 issued U.S. Patents and 40 published journal articles.
- Inventor of the RGBW pixel format employed by LG Electronics in OLED television.



Research Interest Areas

- Human-Agent Teaming
- Human-Display Integration
- Human Performance Modeling



Maj Brigham A. Moore

PhD, Systems Engineering, Air Force Institute of Technology

Assistant Professor of Engineering Management

Most Notable Publications

Moore, B., Jacques, D., and Schuldt, S. (2021). "Leveraging Network Interdependencies to Overcome Inaccessible Civil Infrastructure Data." *Proceedings of the 2021 Winter Simulation Conference*, IEEE Press.

Moore, Brigham (2021). "Interdependent Infrastructure Recovery Using Multilayered Networks and Optimization." Ph.D. Dissertation, Air Force Institute of Technology, Wright-Patterson Air Force Base, OH.

Moore, Brigham (2017). "Empowering Airmen Builds a Culture of Innovation." *Air Force Civil Engineer* 25(2):7-8.

Moore, Brigham (2014). "Modeling Chlorine Residual and Disinfection Byproduct Formation in Circulating Distribution Systems." M.S. Thesis, University of Alaska Anchorage, Anchorage, AK.

Selected Honors & Awards

- Tri-service National Junior Science and Humanities Symposium (NJSHS) Judge (2021 & 2020)
- Student Field Grade Officer of the Quarter, Department of Systems Engineering and Management, Air Force Institute of Technology (2021)
- Company Grade Officer of the Year, United States Air Forces Europe, MAJCOM-level award recipient (2017)

Significant Accomplishments

- Member of American Society of Civil Engineers (since 2010)
- Member of Society of American Military Engineers (since 2010)
- Professional Engineer – Environmental (since 2014)
- Project Management Professional (since 2017)



Research Interest Areas

- Resilience Engineering of Critical Infrastructure
- Military Engineering Applications and Operations
- Asset Management of Natural and Built Infrastructure
- Civil and Environmental Engineering in Space Operations
- Civil and Environmental Engineering Implications of Millennial Science



Dr. Jonathan D. Ritschel

PhD, Economics, George Mason University

Program Chair, Cost Analysis

Associate Professor of Cost Analysis

Most Notable Publications

D'Amico, C.N., White, E.D., **Ritschel, J.D.**, and Kozlak, S.J. (2018) "Unmasking Cost Growth Behavior: A Longitudinal Study," *Defense Acquisition Research Journal*, 25(1): 30-51.

Trudelle, R.C., White, E.D., **Ritschel, J.D.**, Koschnick, C.M., and Lucas, B.M. (2017). "Modeling Median Will-Cost Estimates for Defense Acquisition Programs," *Journal of Defense Analytics and Logistics*, 1(1): 19-33.

Trudelle, R.C., White, E.D., Koschnick, C.M., **Ritschel, J.D.**, and Lucas, B.M. (2017). "Estimating the Likelihood of a Defense Acquisition Program Staying within Cost and Schedule Bounds," *Defense Acquisition Research Journal*, 24(4): 600-625.

Ritschel, J.D., and Ritschel, T.L. (2017). "Improving Resource Management in the Afghan Air Force," *Air and Space Power Journal*, 31(2): 4-16.

Gardner, N.R., **Ritschel, J.D.**, White, E.D., and Wallen, A.T. (2017). "Forecasting Foreign Exchange Rates for Department of Defense Budgeting," *Journal of Public Procurement*, 17(3), 315-336.

Selected Honors & Awards

- DoD Financial Management Certification, Level 3 (2017)

Significant Accomplishments

- Delivers graduate education supported by 20-year military career (ret. Lt Col) as Cost Analyst (65W) in Defense Acquisition.
- Advised 12 students and served on 36 more committees engaged in relevant defense-sponsored topics.



Research Interest Areas

- Economics
- Cost and schedule analysis
- Public choice
- Operating and support costs
- Effects of acquisition reforms on cost growth in DoD weapon systems
- Research and development cost estimation
- Economic institutional analysis



Dr. Jeremy M. Slagley, CIH, CSP

PhD, Occupational Safety and Health, West Virginia University

Associate Professor of Industrial Hygiene and Environmental Science

Most Notable Publications

Sedej, O., Mbonimpa, E., Sleight, T., & **Slagley, J.** (2022). "Artificial Neural Networks and Gradient Boosted Machines Used for Regression to Evaluate Gasification Processes: A Review." *Journal of Energy and Power Technology*. 4(3): 027; doi:10.21926/jept.2203027.

*Blair, M., **Slagley, J.**, & Schaal, N.C. (2022). "Pure Tone Audiometry Evaluation Method Effectiveness in Detecting Hearing Changes Due to Workplace Ototoxicant, Continuous Noise, and Impulse Noise Exposures." *Ear and Hearing*.

*Blair, M., **Slagley, J.**, & Schaal, N.C. (2021). "Effect of Noise and Ototoxicants on Developing Standard Threshold Shifts at a U.S. Air Force Depot Level Maintenance Facility." *Journal of Occupational and Environmental Hygiene*, 18(7), pp. 323-333.

Mukherjee, C., Denney, J., Mbonimpa, E. G., **Slagley, J.**, & Bhowmik, R. (2020). "A review on municipal solid waste-to-energy trends in the USA." *Renewable and Sustainable Energy Reviews*, 119, 109512.

Richburg, C., **Slagley, J.** (2019). "Noise Concerns of Residents Living in Close Proximity to Hydraulic Fracturing Sites in Southwestern Pennsylvania." *Public Health Nursing*, 2019.

Selected Honors & Awards

- 2022 Fulbright US Scholar to Poland
- 2020 Third Quarter AFIT Team Award: Countering Weapons of Mass Destruction Graduate Certificate Team
- 2019 AFIT Graduate School Dean's Distinguished Teaching Professor Award
- 2018 Southwest Ohio Council for Higher Education (SOCHE) Faculty Excellence

Significant Accomplishments

- Director: Graduate Industrial Hygiene Master's Program (2016-2023); Countering Weapons of Mass Destruction Certificate Program (2020-present)
- ABET Program Evaluator
- Member, Noise Committee of the American Industrial Hygiene Association (Chair 2015-16; 2018-19)



Research Interest Areas

- Engineering controls of occupational health hazards
- Hazardous noise; ototoxic chemical exposures
- Aerosol sampling and risk characterization
- CBRN detection and decontamination
- Waste-to-energy conversion



Maj Jordan L. Stern

PhD, Systems Engineering, Stevens Institute of Technology

Assistant Professor of Systems Engineering and Management

Program Chair, Applied Systems and Engineering

Most Notable Publications

Stern, J. and Grogan, P., "Federated Space Systems Tradespace Exploration for Strategic Robustness." *Journal of Spacecraft and Rockets*, 2022. <https://doi.org/10.2514/1.A35103>

Stern, J., Valencia-Romero, A., and Grogan, P., "Strategic robustness in bi-level system-of-systems design." *Design Science*, Vol. 8, No. e6. 2022. <https://doi.org/10.1017/dsj.2022.2>

Selected Honors & Awards

- 2022 - Fabrycky-Blanchard Award for Excellence in Research
- 2017 - Best Thesis Award – Department of Systems Engineering and Management
- 2017 - Distinguished Graduate – Air Force Institute of Technology
- 2012 - Distinguished Graduate – Air Force ROTC Detachment 930



Research Interest Areas

- System of systems modeling and design
- Model-based Systems Engineering
- Space systems design
- Robustness



Dr. Alfred E. Thal, Jr.

PhD, Environmental Engineering, University of Oklahoma

Associate Professor of Engineering Management

Most Notable Publications

Clayson, D.S., **A.E. Thal, Jr.**, and E.D. White III, "Cost Performance Index Stability in Environmental Remediation Projects," *Journal of Defense Analytics and Logistics* (accepted 30 April 2018).

Alley, S.L., V.V. Valencia, **A.E. Thal, Jr.**, and E.D. White III, "Probabilistic Assessment of Failure for United States Air Force Building Systems," *Journal of Performance of Constructed Facilities*, 2017.

Emery, I., E. Mbonimpa, and **A.E. Thal, Jr.**, "Climate-based Policies May Increase Life-cycle Social Costs of Vehicle Fleet Operation," *Energy Policy*, 2017.

Valencia, V.V., **A.E. Thal, Jr.**, J.M. Colombi, and W.E. Sitzabee, "Infrastructure Decay Modeling With the Input-Output Inoperability Model," *Journal of Risk and Uncertainty in Engineering Systems*, 2015.

Griffin, J.S., **A.E. Thal, Jr.**, and S.E. Leach, "Enhancing Asset Management Through a Better Understanding of Energy Consumption," *International Journal of Strategic Property Mgmt*, 2014.

Nyikos*, D.M., **A.E. Thal, Jr.**, M.J. Hicks, and S.E. Leach, "To LEED or not to LEED: Analysis of Cost Premiums Associated with Sustainable Facility Design," *Engineering Management Journal*, 2012.

Thal, A.E., Jr., and D.E. Shahady, "Innovation in a Military Research Laboratory: An Initial Exploratory Study," *Technology Analysis and Strategic Management*, 2010.

Selected Honors & Awards

- Sigma Iota Epsilon (SIE) Management Instructor of the Year, 2015
- Best Application Paper Award, Western Decision Sciences Institute (WDSI) Annual Meeting, Maui, Hawaii, 31 Mar-3 Apr, 2015
- Best Paper Award in Engineering Economy Track, Industrial and Systems Engineering Research Conference (ISERC), Orlando, Florida, May 19-23, 2012
- Merritt A. Williamson Best Conference Paper Award, American Society of Engineering Management (ASEM), Rogers, Arkansas, October 13-16, 2010



Research Interest Areas

- Engineering management
- Facility/infrastructure management
- Project management
- Risk management
- Economic analysis
- Innovation
- Sustainability
- Process improvement

GRADUATE SCHOOL RESEARCH



Autonomy and Navigation Technology Center

The Autonomy and Navigation Technology (ANT) Center is a forward-looking research center seeking to identify and solve tomorrow's most challenging navigation and autonomous and cooperative control problems. The ANT Center's goal is to develop navigation technology that ensures we can navigate anywhere, anytime, using anything. The ANT Center focuses on three research thrusts: autonomous and cooperative systems, non-GPS precision navigation, and robust GPS navigation/NAVWAR.

Center for Cyberspace Research

The Center for Cyberspace Research (CCR), established in March 2002, conducts cyber security and cyber operations research at the Master's and PhD levels. CCR affiliated faculty teach and direct graduate research focusing on understanding and developing advanced cyber-related theories and technologies, such as critical infrastructure protection, cyber-physical systems, network intrusion detection and avoidance, insider threat mitigation, cyberspace situational awareness, malicious software detection and analysis, software protection, and anti-tamper technologies.

Center for Directed Energy

The Center for Directed Energy (CDE) supports Air Force and DOD agencies in transitioning Directed Energy weapons, such as high energy lasers (HELs), to the battlefield through vigorous scientific experiments, engineering research and diverse consulting activities, in conjunction with educational programs offered through the Department of Engineering Physics.

Center for Space Research and Assurance

The Center for Space Research and Assurance (CSRA) is focused on delivering highly-valued resilient, responsive, and reliable space capabilities to the DOD and Intelligence Community

through executing cutting-edge space technology development, science, and space experiments in collaboration with government organizations to meet the challenges of tomorrow by developing the technical space cadre through world-class research and immersive hands-on graduate education.

Center for Technical Intelligence Studies and Research

The Center for Technical Intelligence Studies and Research (CTISR) is focused on Air Force, Space Force, DOD and Intelligence Community's scientific, technical and operational activities through graduate research programs. CTISR brings together cleared faculty across academic departments to solve difficult, multi-disciplinary technical intelligence problems.

Nuclear Expertise for Advancing Technologies

The Nuclear Expertise for Advancing Technologies (NEAT) center was established within the AFIT graduate school with three primary functions: research, education, and publications focused on human capital development. The objective of the research is to tie together the disparate technological areas and disciplines to be at the cutting-edge of present and future technologies.

Homeland Security Community of Best Practices

The Homeland Security Community of Best Practices (HS CoBP) is the new strategic arm and tactical day-to-day team of experts at the Air Force Institute of Technology to support the Department of Homeland Security (DHS) in test and evaluation (T&E). The HS CoBP mission is to conduct roundtable events to foster innovative, quality, and agile activities to build an authoritative community of strategic professionals from government, industry, and academia to author critical area T&E best practice guidebooks to ultimately assess and assist acquisition programs.

In addition to the Graduate School's seven dedicated research centers, AFIT has been designated as the Air Force's Cyber Technical Center of Excellence and manages the Scientific Test & Analysis Techniques Center of Excellence. Learn more at www.AFIT.edu/ENR.

FACULTY EXCELLENCE DIRECTORY

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