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research@afit.edu

or visit the AFIT website:  www.afit.edu
The Air Force Institute of Technology (AFIT) actively aligns our faculty and student research activities with national defense priorities to deliver dual purpose results: valuable educational experiences to enhance our graduates’ performance throughout their careers, and innovative solutions of importance to our sponsors. AFIT works closely with research sponsors from many Air Force and DOD organizations to identify high interest problems that match our faculty expertise and educational requirements to maximize value.

AFIT initiated the new Nuclear Events Analysis and Testing Center in 2019 to contribute to nuclear modernization priorities and build upon our 60+ years of nuclear programming. AFIT’s Autonomy and Navigation Technology Center, Center for Cyberspace Research, Center for Directed Energy, Center for Operational Analysis, Center for Technical Intelligence Studies and Research, Center for Space Research and Assurance and other research groups continue to serve as focal points for many of our research initiatives. Emerging research groups are addressing game-changing technologies including hypersonics, human-machine systems, data sciences, and developing defense-related additive manufacturing applications. AFIT advises over 40 major acquisition programs through the Scientific Test & Analysis Techniques Test & Evaluation Center of Excellence to achieve maximum effectiveness of test resources. New consultation efforts include exploration of multi-domain approaches to the Air Force’s core missions.

AFIT has strategic partnerships with the Air Force Research Laboratory, the National Air and Space Intelligence Center, the Air Force Life Cycle Management Center, the United States Transportation Command, and many other organizations and operational communities to maximize the contributions of our research programs to national defense needs. Our faculty and students also engage in collaborations with researchers at universities throughout the nation to advance the state-of-the-art in a variety of disciplines. AFIT cooperates with commercial enterprises to ensure timely transfer of new technology to US industry through Cooperative Research and Development Agreements (CRADAs).

AFIT welcomes new opportunities to engage in research projects that are of mutual interest to our customers, faculty, and students. Additional information is available at http://www.afit.edu/ENR/.

Heidi R. Ries, Ph.D.
Dean for Research
Graduate School of Engineering
and Management
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1. INTRODUCTION

1.1 OVERVIEW

This Research Report presents the FY19 research statistics and contributions of the Graduate School of Engineering and Management (EN) at AFIT. AFIT research interests and faculty expertise cover a broad spectrum of technical areas related to USAF needs, as reflected by the range of topics addressed in the faculty and student publications listed in this report. In most cases, the research work reported herein is directly sponsored by one or more USAF or DOD agencies.

AFIT welcomes the opportunity to conduct research on additional topics of interest to the USAF, DOD, and other federal organizations when adequate manpower and financial resources are available and/or provided by a sponsor. In addition, AFIT provides research collaboration and technology transfer benefits to the public through Cooperative Research and Development Agreements (CRADAs). Interested individuals may discuss ideas for new research collaborations, potential CRADAs, or research proposals with individual faculty using the contact information in this document or via the AFIT Directory at https://www.afit.edu/BIOS/.

Additional information on the research programs at AFIT may also be found on the research web home page at http://www.afit.edu/ENR/. The Office of Research and Sponsored Programs, Graduate School of Engineering and Management can be reached at 937-255-3633, (DSN 785-3633) or by Email: research@afit.edu. The primary points of contact are Ms. Bobbie J. Bowling, the Director of Sponsored Programs, 937-255-3636 x4396, DSN 785-3636 x4396 and Dr. Heidi R. Ries, Dean for Research, 937-255-3636 x4544, DSN 785-3636 x4544.

1.2 THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT RESEARCH COLLABORATION

As detailed in the 2019-2020 catalog at https://www.afit.edu/ENER/doclib.cfm?dl=31, AFIT offers Master’s and Doctoral programs in a variety of disciplines through six departments: Department of Aeronautics and Astronautics (ENY), Department of Electrical and Computer Engineering (ENG), Department of Engineering Physics (ENP), Department of Mathematics and Statistics (ENC), Department of Operational Sciences (ENS), and Department of Systems Engineering and Management (ENV). In all of these disciplines, research is an integral component of graduate education, developing an individual student’s skills and providing new knowledge of interest to many.

A brief listing of each department’s research areas of emphasis appears below. Please contact the faculty or relevant departmental office for further information, or visit the Graduate School of Engineering and Management departmental websites at http://www.afit.edu/en/.

The Department of Aeronautics and Astronautics, as well as its resident Center for Space Research & Assurance, invites research topic proposals and collaborative suggestions for the Aeronautical Engineering, Astronautical Engineering, Materials Science, and Space Systems programs. The following list highlights the Department’s research specialties:

- Aeroelasticity and Design Optimization
- Aerospace Structures and Materials
- Aircraft Survivability
- Autonomous Control of UAVs
- Compact Combustor Development
- Computational Fluid Dynamics
- Control of High Performance Aircraft
- Dynamic Flight Simulation
- Experimental Fluid Dynamics
- High Velocity Impact
- Impact Dynamics
- Inflatable Space Structures
- Materials and Structural Analysis
- Mechanics of Materials and Structures
- Micro Air Vehicles
- Non-Linear Dynamics
- Re-entry Dynamics
- Rocket & Space Propulsion
- Rotocraft Aeromechanics
- Satellite Cluster Dynamics, Navigation, & Control
- Spacecraft Dynamics & Control
- Spacecraft/Sensor Integration and Testing
- Thermal Control of Spacecraft
- Turbine Heat Transfer
- Weapon Aerodynamics
The Department of Electrical and Computer Engineering, as well as its resident Autonomy and Navigation Technology Center and Center for Cyberspace Research, invites research topic proposals and collaborative suggestions for the Electrical Engineering, Computer Engineering, Computer Science, Cyber Operations, and Cyber Warfare programs. The following list highlights the Department’s research specialties:

<table>
<thead>
<tr>
<th>Advanced Security-Focused Computing</th>
<th>Evolutionary Algorithms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectures</td>
<td>Guidance, Navigation, and Control</td>
</tr>
<tr>
<td>Artificial Intelligence</td>
<td>Hardware Assurance</td>
</tr>
<tr>
<td>Automatic Target Recognition</td>
<td>Information Visualization</td>
</tr>
<tr>
<td>Communications/Radar</td>
<td>Micro-and Nano-Systems</td>
</tr>
<tr>
<td>Computer Communication Networks</td>
<td>Navigation Warfare</td>
</tr>
<tr>
<td>Cryptography</td>
<td>Parallel and Distributed Processing</td>
</tr>
<tr>
<td>Cyber Operations and Security</td>
<td>Signal and Image Processing</td>
</tr>
<tr>
<td>Electromagnetics/Low Observables</td>
<td>Software Protection</td>
</tr>
<tr>
<td>Electro-Optics</td>
<td>Wireless Networks</td>
</tr>
<tr>
<td>Electronic Warfare</td>
<td>Wireless Sensor Networks</td>
</tr>
</tbody>
</table>

The Department of Engineering Physics, as well as its resident Center for Directed Energy and Center for Technical Intelligence Studies and Research, invites research topic proposals and collaborative suggestions for the Applied Physics, Nuclear Engineering, Optical Sciences and Engineering, Materials Science (jointly operated with the Department of Aeronautics and Astronautics), and Combating Weapons of Mass Destruction programs. The following list highlights the Department’s research specialties within these programs:

<table>
<thead>
<tr>
<th>Adaptive Optics, Aero-Optics and Beam Control</th>
<th>Nanomechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric Characterization and Compensation</td>
<td>Nuclear Forensics</td>
</tr>
<tr>
<td>Atmospheric Effects on Weapons Systems</td>
<td>Nuclear Survivability</td>
</tr>
<tr>
<td>Computational Physics</td>
<td>Nuclear Weapons Effects</td>
</tr>
<tr>
<td>Defects in Crystalline Solids</td>
<td>Positron Spectrometry</td>
</tr>
<tr>
<td>Directed Energy Weapons Effectiveness</td>
<td>Radiation and Particle Detection</td>
</tr>
<tr>
<td>Imaging Science</td>
<td>Radiation Effects on Materials and Electronics</td>
</tr>
<tr>
<td>Lasers and Electro-Optics</td>
<td>Radiation Transport</td>
</tr>
<tr>
<td>Microscopic Imaging of Surfaces</td>
<td>Remote Sensing and Signature Analysis</td>
</tr>
<tr>
<td>Modeling and Simulation of Atmospheric Effects</td>
<td>Satellite Meteorology</td>
</tr>
<tr>
<td>Molecular Reaction Dynamics</td>
<td>Semiconductors</td>
</tr>
<tr>
<td>Nanomaterials</td>
<td>Space Physics</td>
</tr>
</tbody>
</table>

The Department of Mathematics and Statistics invites research topic proposals and collaborative suggestions for the following research specialties:

<table>
<thead>
<tr>
<th>Acoustic Wave Scattering</th>
<th>Network Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayesian Analysis</td>
<td>Nonlinear Waves</td>
</tr>
<tr>
<td>Biostatistics</td>
<td>Numerical Analysis</td>
</tr>
<tr>
<td>Categorical Data Analysis</td>
<td>Optimization</td>
</tr>
<tr>
<td>Control Theory</td>
<td>Partial Differential Equations</td>
</tr>
<tr>
<td>Data Analytics</td>
<td>Rarefied Gas Dynamics</td>
</tr>
<tr>
<td>Design of Experiments</td>
<td>Regression Modeling</td>
</tr>
<tr>
<td>Electromagnetics</td>
<td>Stochastic Processes</td>
</tr>
<tr>
<td>Fluid Dynamics</td>
<td>Structural Health Monitoring</td>
</tr>
<tr>
<td>Human Performance</td>
<td>Wavelets</td>
</tr>
<tr>
<td>Information Fusion</td>
<td></td>
</tr>
</tbody>
</table>

The Department of Operational Sciences, as well as its resident Center for Operational Analysis, invites research topic proposals and collaborative suggestions within the areas of Operations Research, Logistics, and Supply Chain Management programs. The following list highlights the Department’s research specialties:

<table>
<thead>
<tr>
<th>Agile Combat Support Prioritization</th>
<th>Autonomous System Operations and Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Target Recognition</td>
<td>Big Data and Analytics</td>
</tr>
</tbody>
</table>
Combat Modeling  
Decision Analysis  
Design and Analysis of Experiments  
Enterprise Level Depot Sustainment  
Evaluation of Autonomous Systems  
Facility Location Optimization  
Force Structure Analysis Tool Development  
Information Modeling  
Inventory Analysis  
Irregular Warfare  
Irregular Warfare Model Development  
Lean Operations  
Logistics  
Machine Learning  
Maintenance and Production Management  
Managerial Economics  
Manpower Modeling and Forecasting  
Materials Research Test Planning  
Mathematical Programming  
Modeling and Simulation  
Network Analysis  
Neural Networks  
Operations Management  
Operations Research  
Optimization  
Organization Behavior  
Petroleum Management  
Repair Network Integration  
Robust Decision Making  
Robust Design  
Robust Mobility Modeling  
Scheduling  
Service Operations Management  
Social Network Modeling and Analysis  
Statistical Process Monitoring  
Stochastic Modeling  
Strategic Sourcing  
Supply Chain Management and Resource Optimization  
Test and Evaluation  
Test Science  
Time Series Analysis  
Transportation Policy and Strategic Modeling  

The Department of Systems Engineering and Management is a multidisciplinary department offering graduate degrees in seven different majors and conducting research in collaboration with the wide spectrum of programs throughout AFIT. The mission of the Department is to provide defense-focused graduate education and engage in interdisciplinary research to achieve integrated solutions to current and future Air Force challenges and enhance the interface between technology and human resources by focusing on systems, processes, and management. The following list highlights the Department’s research specialties:

Acquisition Learning Curves  
Applied Environmental Sciences  
Built Environment Microbiome  
Computer and Network Security  
Construction Management  
Cost Analysis  
Cyber Attack on UAS  
Data Analytics  
Design and Analysis of Experiments  
Ecological Engineering  
Emergency Management  
Facility and Infrastructure Management  
Fuels Microbiology  
Geographical Information Science  
Human Systems Integration  
Human-Agent Interaction  
Image and Display Science  
Indoor Air Quality  
Information Assurance and Security  
Infrastructure Asset Management  
Knowledge Management  
Model-Based Systems Engineering  
Modeling and Simulation  
Neck and Injury Biomechanics  
Occupational/Environmental  
Operations Research  
Permafrost  
Photovoltaics  
Physiologically-Based Pharmacokinetic Modeling Analysis  
Product Design and Development  
Project Management  
Project Delivery  
Reliability Engineering  
Strategic Decision Support  
Structural Health Monitoring  
Structural Performance  
Surface Science  
Sustainability and Life Cycle Assessment  
System Architecture  
Systems Engineering  
Unmanned Air System Design and Test  
Vigilance  
Water Quality  
Waste-to-Energy Conversion Modeling
Another avenue for educational and research collaboration with the Graduate School of Engineering and Management is through association with one or more of AFIT’s Research Centers. A brief listing of each Center’s research or educational areas of emphasis appears below. Please contact the Centers directly (see Chapter 6) or visit http://www.afit.edu/ENR/page.cfm for further information.

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 by focusing on three research thrusts: autonomous and cooperative systems, non-GPS precision navigation, and robust GPS navigation/NAVWAR.

The **Center for Cyberspace Research (CCR)** 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. The CCR is forward-looking and responsive to the changing educational and research needs of the Air Force, Department of Defense, and the federal government. CCR faculty's research and teaching establishes AFIT as a national Center of Academic Excellence in Research (CAE-R) and Center of Academic Excellence in Cyber Operations (CAE-CO), designated by the Department of Homeland Security (DHS) and the National Security Agency (NSA).

The **Center for Directed Energy (CDE)** is dedicated to Air Force and DOD research in high energy lasers (HELs), high power microwaves (HPMs), and their enabling technologies. The Center is an advocate for transitioning these systems to the battlefield through vigorous scientific and engineering research, graduate education programs and diverse consulting activities.

The **Center for Operational Analysis (COA)** conducts defense-focused research which directly supports DOD strategic objectives. The COA applies rigorous quantitative and qualitative tools, methodologies and approaches to identify, analyze and solve complex operations and supply chain problems while developing critical and forward-thinking analysts, managers, and leaders.

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.

The **Center for Technical Intelligence Studies and Research (CTISR)** is focused on Air Force, DOD and Intelligence Community’s scientific, technical and operational activities through graduate research programs. Activities are directed on improving technical intelligence gathering via remote sensing. Current research is focused on signature measurement, phenomenological understanding, and algorithm development for target detection and tracking, battle space combustion characterization, event classification, and material identification.

The **Center of Excellence (COE) for Scientific Test and Analysis Techniques (STAT) in Test & Evaluation (T&E)** is a reach-back T&E capability that provides advice and assistance in the application of scientific test and analysis techniques in the development of Test & Evaluation Master Plans (TEMP). The COE provides value to the PEOs/PMs across the DOD through assistance provided to the Chief Developmental Tester (T&E Program Leads) during the T&E planning, execution and assessment. The COE provides an additional resource of subject matter expertise for the program managers and chief developmental testers of Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS) during the T&E planning, execution, and assessment process.

The **Nuclear Expertise for Advancing Technologies (NEAT) Center** is a new AFIT center established on 1 May 2019. The NEAT Center’s mission is to provide the nation with relevant expertise to address emergent and future nuclear warfighting capabilities across all domains. The NEAT Center will be the first place organizations turn to when they require intellectual capital, knowledge, or assistance in solving technical nuclear acquisition and warfighting challenges. The NEAT Center’s vision is to be the recognized center for the development of competent and knowledgeable technical expertise and innovative research in support of present and future strategic operations.
2. SPECIAL RECOGNITIONS

2.1 FACULTY FELLOWS

COLLINS, PETER J., Professor of Electrical Engineering, Department of Electrical and Computer Engineering
Fellow of Antenna Measurement and Techniques Association

DECKRO, RICHARD F., Distinguished Professor of Operations Research, Department of Operational Sciences
Fellow of the Military Operations Research Society

*ELROD, WILLIAM E., Professor Emeritus of Aerospace Engineering, Department of Aeronautics and
Astronautics, Fellow of the American Society of Mechanical Engineers International

*FRANKE, MILTON E., Professor Emeritus of Aerospace Engineering, Department of Aeronautics and
Astronautics, Fellow of the American Society of Mechanical Engineers

*HENGEHOLD, ROBERT L., Professor Emeritus of Physics, Department of Engineering Physics, Fellow of the
American Physical Society

HILL, RAYMOND R., Professor of Operations Research, Department of Operational Sciences; Program Chair,
Operations Research Doctoral Program, Fellow of Eastern Connecticut State University

*HOUPIIS, CONSTANTINE H., Professor Emeritus of Electrical Engineering, Department of Electrical and
Computer Engineering, Professional Engineer (State of Ohio), Fellow of the Institute of Electrical and Electronic
Engineers

*MAYBECK, PETER S., Professor Emeritus of Electrical Engineering, Department of Electrical and Computer
Engineering, Fellow of the Institute of Electrical and Electronic Engineers

PACHTER, MEIR, Professor of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow
of the Institute of Electrical and Electronic Engineers.

PALAZOTTO, ANTHONY N., Distinguished Professor, Aerospace Engineering, Department of Aeronautics and
Astronautics, Fellow of the American Institute of Aeronautics and Astronautics, Fellow of the American Academy of
Mechanics, Fellow of the American Society of Civil Engineers, Fellow of the Engineering Mechanics Institute

PERRAM, GLEN P., Professor of Physics, Department of Engineering Physics, Fellow of the Optical Society
of America, Fellow of the Directed Energy Professional Society

PIGNATIELLO, JOSEPH J., Professor of Operations Research, Head, Department of Operational Sciences, Fellow
of the Institute of Industrial Engineers, Fellow of the American Society for Quality

POLANKA, MARC D., Professor of Aerospace Engineering, Department of Aeronautics and Astronautics
Fellow of the American Society of Mechanical Engineers International

RUGGLES-WRENN, MARINA B., Professor of Aerospace Engineering, Department of Aeronautics and
Astronautics, Fellow of the American Society of Mechanical Engineers International

TERZUOLI, ANDREW J., Associate Professor of Electrical Engineering, Department of Electrical and Computer
Engineering, Fellow of the Electromagnetics Academy

*TORVIK, PETER J., Professor Emeritus of Aerospace Engineering and Engineering Mechanics, Department of
Aeronautics and Astronautics, Fellow of the American Institute of Aeronautics and Astronautics, Life Fellow of the
American Society of Mechanical Engineers International, Fellow of the Ohio Academy of Science

WEIR, JEFFERY W., Professor of Operations Research, Associate Department Head, Department of Operational
Sciences, Fellow of the Southwestern Ohio Council for Higher Education. America, Fellow of the Directed Energy
Professional Society

*Emeritus faculty
2.2 PROFESSIONAL CERTIFICATIONS

AHNER, DARRYL K., Professional Engineer (Commonwealth of Virginia)

ANDERSON, JASON R., MIT Leadership Academy for Engineering and Science Research Certification

BADIRU, ADEDEJI B., Certified Project Management Professional (PMP), Leadership Certificate (University of Tennessee Leadership Institute), Professional Engineer (State of Oklahoma)


BUTLER, SAMUEL D., Lt Col, Systems, Planning, Research, Development and Engineering Systems Engineer–Level 2 Certified

COOPER, CASEY W., Certified Industrial Hygienist

DEJORIT, JUSTIN D., Maj, Professional Engineer (State of Ohio), Registered Environmental Professional

DEXTER, MICHAEL L., Lt Col, (APDP) Engineer–Level 3 Certified; Program Manager–Level 1 Certified, Science and Technology Manager–Level 1 Certified

ENINGER, ROBERT M., Lt Col, Certified Industrial Hygienist

FASS, ROBERT D., Certified Cost Estimator/Analyst (International Cost Estimating and Analysis Association)

FREELS, JASON K., Maj, Systems Planning, Research, Development and Engineering (SPRDE) Certification, Level III

*GOLTZ, MARK N., Board Certified Environmental Engineer (American Academy of Environmental Engineers), Professional Engineer (State of Minnesota)


GREENDYKE, ROBERT B., Professional Engineer (State of Texas)

HARPER WILLIE F., Jr., Professional Engineer (State of Arizona)

*HOUPIS, CONSTANTINE H., Professional Engineer (State of Ohio)

KEMPISTY, DAVID Lt Col, Professional Engineer (State of Michigan)

KUNZ, DONALD L., Professional Engineer (Commonwealth of Virginia)

LOPER, ROBERT D., APDP Level II Certification–SPRDE, APDP Level II Certification–S&T Management, APDP Level I Certification–Program Management

MARCINIAK, MICHAEL A., APDP Level II Certification–SPRDE, APDP Level II Certification–Program Management, APDP Level I Certification–Test and Evaluation, Certified Laser Safety Officer (Board of Laser Safety, Orlando, FL)

MAYBECK, PETER S., Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Institute of Electrical and Electronic Engineers
MAILLOUX, LOGAN O., Maj, Certified Information Systems Security Professional (CISSP), Certified Systems Engineering Professional (CSEP)

MBONIMPA, ERIC G., Professional Engineer (State of Michigan)

MULLINS, BARRY E., Professional Engineer (State of Colorado), Certified SCADA Security Architect (CSSA), National Security Agency INFOSEC Evaluation Methodology (IEM), National Security Agency INFOSEC Assessment Methodology (IAM)

PARR, JEFFREY C., Lt Col, Systems Planning, Research, Development and Engineering (SPRDE) Certification, Level III.

*QUINN, DENNIS W., Professional Engineer, State of Ohio

REEDER, MARK F., Professional Engineer (State of Ohio)

REITH, MARK G., Certified Information Systems Security Professional (CISSP), Certified Ethical Hacker (CEH)

RITSCHEL, JONATHAN, Lt Col, APDP Business-Cost Estimation Certification, Level II.

RUTLEDGE, JAMES L., LT COL, Professional Engineer (State of Texas)

SHATTAN, MICHAEL B., LTC, Professional Engineer (State of Virginia)

SHELLEY, MICHAEL L., Certified Air Force Hearing Conservationist

SLAGLEY, JEREMY M., Board Certified Industrial Hygienist, Board Certified Safety Professional

STEWARD, BRYAN J., Space Professional Development Program–Level 2 Certified

TUTTLE, RONALD F., APDP Level III Certification–Program Management, APDP Level III Certification–SPRDE

VALENCE, VHANCE V., Maj, Professional Engineer (State of North Carolina)


*Emeritus Faculty
2.3 RESEARCH AND TEACHING AWARDS

2.3.1 FACULTY

ANDERSON, JASON R., 2019 Military Officers Association of America Outstanding Military Professor Award

BETTINGER, ROBERT A., Maj, 2019 AU Nominee for Air Force Outstanding Scientist/Engineer – Mid-Career Military Field Grade Officer of the Quarter, Department of Aeronautics & Astronautics, 3rd Quarter, 2019

BEVINS, JAMES E., 2019 Tau Beta Pi Outstanding Thesis Advisor

BOHAN, BRIAN T., AND POLANKA, MARC D., Art in Science Award – 2019 Dayton-Cincinnati Aerospace Symposium (DCASS)

BORGHETTI, BRETT J., Dr., EE/CE Faculty Member of the Year Award

CHANDRAHALIM, HENGY, IEEE NEMS 2019 Best Paper Finalist

COLLINS, PETER J., 2018 Antenna Measurement Techniques Association (AMTA) Distinguished Achievement Award recipient, Awarded at the 40th Annual AMTA Symposium, 4-9 November 2018, Williamsburg, VA: For Outstanding and Pioneering Contributions to the Practice of Antenna Design, Analysis, and Measurements

DICKENS, JOHN M., Lt Col, 2019 ENS Educator of the Year

ELSHAW, JOHN J., 2019 Dean’s Distinguished Professor Award

FICKUS, MATTHEW C., ENC Instructor of the Quarter, 2019 Spring Quarter


HODSON, DOUGLAS D., Outstanding Achievement Award, the 2019 World Congress in Computer, Science Computer Engineering, and Applied Computing (CSCE 19), July 2019

*HOUPIS, CONSTANTINE H., Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, Fellow of the Institute of Electrical and Electronic Engineers

JACKSON, JULIE A., IEEE Aerospace and Electronic Systems Society 2019 Fred Nathanson Memorial Radar Award, Apr 2019

JENKINS, PHILLIP R., Capt, 2019 General Omar N. Bradley Research Fellowship in Mathematics

KOMIVES, JEFFREY, Lt Col, MOAA Outstanding Military Professor Award

LANGHALS, BRENT T., 2018-2019 Sigma Iota Epsilon Outstanding Instructor Award

LOPER, ROBERT D., SOCHE Faculty Excellence Award, Nov 2018

LUNDAY, BRIAN J., 2019 Faculty Excellence Award, Southern Ohio Council of Higher Education, 2019 Professor Ezra Kotcher Award, Wright Memorial Chapter, Air Force Association, 2019 Lessons Learned Senior Civilian Professional of the Year, United States Air Force, 2018 Best Reviewer Recognition, Omega: The International Journal of Management Science

MULLINS, BARRY E., Research Advisor for CCR-United States Cyber Command Cyberspace Research Excellence Award (Best Cyber Thesis), L. Stafira, Mar 2019
NAVA, OMAR A., Maj, Col Charles A. Stone Award, Apr 2019; AETC Weather Field Grade Officer of the Year, Nov 2018

NUNNALLY, BEAU A., ENC Instructor of the Quarter, 2019 Winter Quarter

POLANKA, MARC, M.D., AIAA Outstanding Section Award, Very Large Category, 1st Place, 2018
AETC AF Outstanding Scientist/Engineer Educator, 2019, AFIT Innovation Award, Senior Faculty, 2019
SAE Manly Award Winner: Best Paper, 2019, Appointed Chair of the AIAA Associate Fellows Committee
Elected Vice-Chair of the ASME IGTI Heat Transfer Committee

RUTLEDGE, JAMES L., Lt Col, 2019 Air University Outstanding Scientist/Engineer–Senior Military

SCHULDT, STEVEN J., Maj, 2019 AFIT Leslie M. Norton Teaching Excellence Award

SLAGLEY, JEREMY M., 2019 Dean’s Distinguished Professor Awards, ENC Instructor of the Quarter, 2019 Spring Quarter

WHITE, EDWARD D., III, ENC Instructor of the Quarter, 2018 Fall Quarter, ENC Instructor of the Year, 2018-2019

WEIR, JEFFERY D., 2019 Instructor of the Year, Advance Studies in Air Mobility

WRUGGLES-WRENN, M.B.
Art in Science 1st Place Competition Winner, the 44th AIAA Dayton Cincinnati Aerospace Science Symposium, February 2019


*Emeritus Faculty
2.3.2 STUDENTS

ANGELL, EMILY E., Capt, Distinguished Graduate, Department of Systems Engineering and Management

BEEMER, CODY J., Capt, 2019 Dean’s Award for the most exceptional master’s thesis by a graduating student in the Department of Systems Engineering and Management. Thesis title: An Analysis of Built Environment Factors in Residences and the Associated Effects on Mental Health Symptoms of United States Veterans; Distinguished Graduate, Department of Systems Engineering and Management

BERNER, WILLIAM C., Capt, Ivan B. Thompson Award

BEVERIDGE, NATHANAEL R., 2nd Lt, Distinguished Graduate, Department of Operational Sciences

BOLLER, SCOTT A., Best Presentation Award – 2019 Dayton-Cincinnati Aerospace Sciences Symposium (DCASS); Distinguished Graduate, Department of Aeronautics and Astronautics

BRAMBLETT, LAUREN M., 2nd Lt, Dr. James T. Moore Graduate Research Prize (MORS)

CHESTER, DAVID, Capt, Distinguished Graduate Award, Department of Systems Engineering and Management

CHIARATTI, NICOLAS S., Capt, Kittyhawk AOC Academic Research Excellence Award in Electronic Defense

CINTRON, LEWIS A., Capt, 2019 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Electrical and Computer Engineering, Thesis title: Modeling a Consortium-Based Distributed Ledger Network with Applications for Intelligent Transportation Infrastructure; Distinguished Graduate Award, Department of Electrical and Computer Engineering

CONZONETTA, DAVID, 1st Lt, Distinguished Graduate Award, Department of Systems Engineering and Management

CROUCH, TARA E., Capt, Best Thesis in Fluid Mechanics, Title: Direct Numerical Simulation of Roughness Induced Hypersonic Boundary Layer Transition on a Seven Degree Half-Angle Cone, Department of Aeronautics and Astronautics

DALLMAN, WILLIAM, Capt, Louis F. Polk Award; Distinguished Graduate Award, Department of Electrical and Computer Engineering

DAVIS, RANDALL, Capt, Distinguished Graduate, Department of Operational Sciences


EGNER, BRYAN V., 2nd Lt, Advanced Technical Intelligence Association (ATIA) Student Award; American Nuclear Society Thesis Award

ELLIS, ASHLEE N., Capt, Lt Edwin E. Aldrin Sr. Award

ENOS, TREVOR A., 1st Lt, Project Management Institute Thesis Award

EVERETT, NICHOLAS, D., Capt, Kittyhawk AOC Academic Research Excellence Award in Information Superiority

GAHAN, KENNETH C., Capt, 2019 Dean’s Award for the most exceptional master’s thesis by a graduating student in the Dept of Aeronautics and Astronautics, Thesis title: Multi-Path Automatic Ground Collision Avoidance System for Performance Limited Aircraft with Flight Tests: Project Have MEDUSA; Distinguished Graduate, Department of Aeronautics and Astronautics

GANITANO, CRAIG S., Capt, Distinguished Graduate Award, Department of Electrical and Computer Engineering

GEORGE, BRANDON, Capt, Distinguished Graduate, Department of Aeronautics and Astronautics

HARKINS, MEGAN L., Maj, Art in Science: 1st Place Competition Winner: 44th AIAA Dayton-Cincinnati Aerospace Science Symposium, February 2019

HARRELL, WILLIAM L., Maj, Field Grade Officer of the Year

HARRIS, KAREN Y., MSgt, Non-Commissioned Officer of the Year; Secretary James G. Roche Award

HINES, PARKER A., 2nd Lt, Dr. Anthony D’Angelo Student Leadership Award

HORNBERGER, ZACHARY T., 2019 Dean’s Award for the most exceptional master’s thesis by a graduating student in the Department of Operational Sciences, Thesis title: Search and Rescue Operations Forecasting and Optimization

JACKSON, SUNDERLIN, 2nd Lt, Distinguished Graduate, Department of Aeronautics and Astronautics

JENKINS, PHILLIP R., Capt, Company Grade Officer of the Year (PhD)

JORDAN, RAMOANE E., Capt, George K. Dimitroff Award

KEANE, MICHAEL, Capt, 2019 Best Technical Presentation in Materials Science – 44th Dayton-Cincinnati Aerospace Sciences Symposium (DCASS), March 2019

LABEDZ, THEODORE J., Capt, EN Student Company Grade Officer of the Year (Master’s); Society of American Military Engineers (SAME) Award

LANGHALS, BRENT T., Dr., SIE Instructor of the Year

LEDWITH, MATTHEW C., Distinguished Graduate, Department of Operational Sciences

LEE, TAYLOR, 1st Lt, Navigation Research Excellence Award

MARKMAN, MATTHEW R., Capt, International Cost Estimating and Analysis Association Thesis Award

McREYNOLDS, BRIAN J., Maj, Best Light-Based Thesis

MONTEIRO, LUCIANA M., Capt, International Student of the Year; Jerome G. Peppers Jr. Outstanding Student Award; Air University International Student Badge (Brazil)

NUNDU, AILEEN, Capt, Air University International Student Badge (Australia)

PETER, TROY, 2nd Lt, Distinguished Graduate, Department of Operational Sciences

QUARTERMONT, NICOLAS J., Capt, Tau Beta Pi Thesis Award; Mervin E. Gross Award (AFIT Student of the Year); Distinguished Graduate, Department of Engineering Physics

RATHSACK, TYLOR C., Art in Science Award – 2019 Dayton-Cincinnati Aerospace Sciences Symposium, (DCASS)

SANDERSON, DAWN L., 2019 Dean's Award for the most exceptional master's thesis by a graduating student in the Department of Mathematics and Statistics. Thesis title: Modeling the Distribution of Lightning Strike Distances outside a Preexisting Lightning Area., 2019 Chancellor's Award for the most exceptional master’s thesis by a graduating student. Thesis title: “Modeling the Distribution of Lightning Strike Distances outside a Preexisting Lightning Area.

SAUNDERS, RYAN, 2nd Lt, AIAA Graduate Student Award for Service Excellence
SCHMITT, COURTNEY A., 2nd Lt, Distinguished Graduate, Department of Mathematics and Statistics

SCHULDT, STEVEN J., Maj, Dr. Leslie M. Norton Teaching Excellence Award

STAFIRA, LUKAS A., 2nd Lt, Cyberspace Research Excellence Award; Distinguished Graduate Award, Department of Electrical and Computer Engineering

STEELE, MEGAN L., 2019 American Industrial Hygiene Foundation Scholarship

SITLER, JEFFREY L., Lt Col Charles P. Brothers Jr. Outstanding Volunteer Service Award

TAYLOR, FORREST D., Maj, Center for Technical Intelligence Studies and Research Outstanding Thesis Award


VERGARA, CHRISTOPHER M., Capt, Air University International Student Badge (Australia)

VILLARREAL, MICAH, Capt, Distinguished Graduate, Department of Electrical and Computer Engineering

WEBB, JEREMIAH M., 1st Lt, 2019 Air Force Historical Foundation Award (General Bryce Poe II Award); General Bryce Poe II Award

ZOELLICK, CASEY L., Capt, 2019 Dean’s Award for the most exceptional master’s thesis for a student graduating in the Department of Engineering Physics, These Title: Source Term Estimation of Atmospheric Pollutants Using an Ensemble of HYSPLIT Concentration Simulations; Distinguished Graduate, Department of Engineering Physics
3. RESEARCH STATISTICS

3.1 RESEARCH AND CONSULTING MEASURES
There are measurable indicators of AFIT’s contribution to the engineering and scientific community and AFIT’s success in staying well informed of technical possibilities and scientific opportunities. These indicators include the number and quality of technical publications accepted by the editors of journals; the number of presentations accepted for regional, national and international conferences; the number of sponsor funded research projects conducted; and finally, the number of student Graduate Research Papers, MS theses, and PhD dissertations completed and submitted to the Defense Technical Information Center. For FY19, these output measures are shown in Tables 3.1a and 3.1b for the Departments and Centers, respectively.

Table 3.1a Faculty Research and Sponsored Programs Output by Department

<table>
<thead>
<tr>
<th>Graduate School, by Department</th>
<th>Graduate School (EN) Total</th>
<th>Math &amp; Stats (ENC)</th>
<th>Electrical &amp; Comp Eng (ENG)</th>
<th>Engineering Physics (ENP)</th>
<th>Operational Sciences (ENS)</th>
<th>Sys Eng &amp; Management (ENV)</th>
<th>Aeronautics &amp; Astro (ENY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Faculty (FTE)*</td>
<td>137</td>
<td>18</td>
<td>31</td>
<td>22</td>
<td>20</td>
<td>23</td>
<td>23</td>
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<tr>
<td>Number of Research Faculty (FTE)</td>
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<td>1</td>
<td>2</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Refereed Publication Authorships**</td>
<td>284</td>
<td>23</td>
<td>48</td>
<td>51</td>
<td>44</td>
<td>62</td>
<td>56</td>
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<tr>
<td>Refereed Conferences on the Basis of Full Paper Review**</td>
<td>138</td>
<td>3</td>
<td>55</td>
<td>37</td>
<td>7</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Refereed Conferences on the Basis of Abstract Review**</td>
<td>227</td>
<td>10</td>
<td>20</td>
<td>78</td>
<td>47</td>
<td>19</td>
<td>53</td>
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<tr>
<td>Sponsor Funded Projects***</td>
<td>247</td>
<td>12</td>
<td>52</td>
<td>75</td>
<td>27</td>
<td>20</td>
<td>61</td>
</tr>
<tr>
<td>Books &amp; Chapters in Books**</td>
<td>17</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>1</td>
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<tr>
<td>Patents****</td>
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<td>11</td>
<td>11</td>
<td>0</td>
<td>1</td>
<td>13</td>
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<tr>
<td>Doctoral Dissertations Advised</td>
<td>30</td>
<td>4</td>
<td>6</td>
<td>11</td>
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<td>0</td>
<td>4</td>
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<tr>
<td>Master's Theses Advised</td>
<td>217</td>
<td>4</td>
<td>59</td>
<td>20</td>
<td>44</td>
<td>42</td>
<td>48</td>
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<tr>
<td>Graduate Research Papers Advised</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*FTE: Full-time equivalent military and permanent civilian faculty
**Publications/Presentations are counted by faculty authorships.
***One project associated with the Office of Research and Sponsored Programs (ENR) is reflected in Graduate School (EN) Total.
****Includes: Patents awarded, patent applications, and invention disclosures counted by faculty authorships.
Table 3.1b Faculty Research and Sponsored Programs Output, by Center

<table>
<thead>
<tr>
<th></th>
<th>Total All Centers</th>
<th>ANT</th>
<th>CCR</th>
<th>CDE</th>
<th>COA</th>
<th>CSRA</th>
<th>CTISR</th>
<th>NEAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Affiliated Faculty*</td>
<td>128</td>
<td>26</td>
<td>18</td>
<td>18</td>
<td>21</td>
<td>40</td>
<td>16</td>
<td>8</td>
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<tr>
<td>Refereed Publication Authorships**</td>
<td>170</td>
<td>23</td>
<td>32</td>
<td>23</td>
<td>6</td>
<td>50</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>Refereed Conferences on the Basis of Full Paper Review**</td>
<td>97</td>
<td>16</td>
<td>33</td>
<td>22</td>
<td>5</td>
<td>9</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Refereed Conferences on the Basis of Abstract Review**</td>
<td>151</td>
<td>10</td>
<td>2</td>
<td>41</td>
<td>44</td>
<td>33</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Sponsor Funded Projects</td>
<td>117</td>
<td>27</td>
<td>10</td>
<td>23</td>
<td>10</td>
<td>30</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Books &amp; Chapters in Books**</td>
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<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Patents***</td>
<td>16</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Doctoral Dissertations Advised</td>
<td>16</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Master's Theses Advised</td>
<td>99</td>
<td>20</td>
<td>20</td>
<td>3</td>
<td>22</td>
<td>29</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Graduate Research Papers Advised</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Some faculty are affiliated with multiple centers.

**Publications/Presentations are counted by faculty authorships.

****Includes: Patents awarded, patent applications, and invention disclosures counted by faculty authorships.
3.2 RESEARCH AND CONSULTING SPONSORSHIP
As part of an Air Force institution, the faculty members of the Air Force Institute of Technology focus their research on current problems as well as future systems of the Air Force and other DOD organizations. Evidence of this focus is that 98% of all theses, dissertations, and graduate research papers listed in Table 3.1a are externally sponsored by Air Force, DOD and government agencies. In addition, most of the research projects and consultations are carried out for Air Force and DOD units. The data are summarized in Figure 3.1 and Table 3.2.

Figure 3.1 Sponsors of AFIT Theses, Dissertations, and Graduate Research Papers

*Pie Chart on the right shows breakdown by AFRL Technology Directorates*
<table>
<thead>
<tr>
<th>SPONSOR ORGANIZATION</th>
<th>PhD Dissertations</th>
<th>Master’s Theses</th>
<th>Graduate Research Papers</th>
<th>Funded Projects</th>
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</thead>
<tbody>
<tr>
<td>OFFICE OF THE SECRETARY OF THE AIR FORCE</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>United States Air Force Academy</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>HQ UNITED STATES AIR FORCE</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>AIR COMBAT COMMAND</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AIR EDUCATION AND TRAINING COMMAND</td>
<td></td>
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<td></td>
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<tr>
<td>Air Force Institute of Technology</td>
<td>11</td>
<td>72</td>
<td>1</td>
<td></td>
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<tr>
<td>AIR FORCE MATERIAL COMMAND</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
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<tr>
<td>746th Test Squadron</td>
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<tr>
<td>Air Force Arnold Engineering Center</td>
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<td>Air Force Civil Engineering Center</td>
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<tr>
<td>Air Force Life Cycle Management Center</td>
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<td>Air Force SEEK EAGLE Office</td>
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<tr>
<td>Air Force Security Assessment Center</td>
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<tr>
<td>Air Force Research Laboratory (AFRL)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>711 Human Performance Wing (RH)</td>
<td>2</td>
<td>4</td>
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<tr>
<td>Air Force School of Aerospace Medicine</td>
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<tr>
<td>Air Force Office of Scientific Research (AFOSR)</td>
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<tr>
<td>Aerospace Systems Directorate (RQ)</td>
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<tr>
<td>Directed Energy Directorate (RD)</td>
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<tr>
<td>Information Directorate (RI)</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
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<td>Materials &amp; Manufacturing Directorate (RX)</td>
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<td>Munitions Directorate (RW)</td>
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<td>Sensors Directorate (RY)</td>
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<td>14</td>
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<td>Small Business Office (SB)</td>
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<td>Space Vehicles Directorate (RV)</td>
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<td>Air Force Installation and Mission Support Center</td>
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<td>Air Force Sustainment Center</td>
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<td>Strategic Development Planning and Experimentation</td>
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<td>Space and Missile Systems Center</td>
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<td>AIR FORCE SPECIAL OPERATIONS COMMAND</td>
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<td>USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS</td>
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<td>Air Force Communications Command</td>
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<td>Air Force Cost Analysis Agency</td>
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<td>Air Force Technical Applications Center</td>
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<td>High Performance Computing Modernization Program</td>
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<td>Joint Aircraft Survivability Program Office</td>
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<td>Count 2</td>
<td>Count 3</td>
<td>Count 4</td>
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<td>Joint Chiefs of Staff</td>
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<td>Joint Warfare Analysis Center</td>
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<td>Missile Defense Agency</td>
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<td>National Geospatial-Intelligence Agency</td>
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<tr>
<td>National Guard Bureau</td>
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<td>Naval Postgraduate School</td>
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<td></td>
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<tr>
<td>Navy Sea Systems Command</td>
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<tr>
<td>Office of the Secretary of Defense</td>
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<tr>
<td>Office of Naval Research</td>
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<tr>
<td>United States Army</td>
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<td>3</td>
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<tr>
<td>US Army Combat Capabilities Development Command C5ISR</td>
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<tr>
<td>US Army Engineer Research and Development Center</td>
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</tr>
<tr>
<td>US Army Tactical Protection System</td>
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<td>United States Navy</td>
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<tr>
<td>US Africa Command</td>
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<td>3</td>
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<td>US Pacific Command</td>
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<tr>
<td>US Strategic Command</td>
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<td></td>
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<tr>
<td>US Transportation Command</td>
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<td>2</td>
<td></td>
<td>1</td>
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<tr>
<td><strong>OTHER FEDERAL AGENCIES</strong></td>
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<td>Department of Energy</td>
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<td>National Nuclear Security Administration</td>
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<td>Department of Homeland Security</td>
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<tr>
<td>Department of Veterans Affairs</td>
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</tr>
<tr>
<td>Environmental Protection Agency</td>
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<td></td>
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<td>3</td>
</tr>
<tr>
<td>Federal Emergency Management Agency</td>
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<td></td>
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<td></td>
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<tr>
<td>National Aeronautics and Space Administration</td>
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<td><strong>INTERNATIONAL ORGANIZATIONS</strong></td>
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<td>Brazilian Air Force Institute of Logistics</td>
<td></td>
<td></td>
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<tr>
<td><strong>NON-FEDERAL ORGANIZATIONS</strong></td>
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<tr>
<td>Achilles Technologies Solutions – Materials and Electro-chemical Research (NAVY)</td>
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</tr>
<tr>
<td>Creare</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Draper Laboratory</td>
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<td></td>
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<tr>
<td>Lidomika, LLC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lockheed Martin</td>
<td></td>
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</tr>
<tr>
<td>Lockheed Martin Missiles and Fire Control</td>
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<tr>
<td>Raytheon Space and Airborne Systems</td>
<td></td>
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<tr>
<td>Spectral Sciences</td>
<td></td>
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</tr>
<tr>
<td>The Boeing Company</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The Ohio State University Dept of Mechanical and Aerospace Engineering</td>
<td></td>
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<tr>
<td><strong>TOTALS</strong></td>
<td>30</td>
<td>217</td>
<td>18</td>
<td>190</td>
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</tbody>
</table>
3.3 EXTERNAL SPONSOR FUNDING FOR THE GRADUATE SCHOOL OF ENGINEERING AND MANAGEMENT

Many of the Graduate School of Engineering and Management’s theses and research projects, completed under faculty supervision, are funded in part by other Air Force, DOD and government units and agencies. Often, this funding results from collaboration between faculty and thesis sponsors and occurs when the research project can be leveraged by the purchase of equipment or services not otherwise available. Figure 3.2 summarizes the past ten fiscal years of sponsored funding. Tables 3.3 and 3.4, and Figure 3.3, summarize external funding for FY19.

![Figure 3.2 New Award History FY10-FY19](image)

**Table 3.3 FY19 External Funding & Research Expenditures for Academic Departments & Research Centers ($1,000’s)**

<table>
<thead>
<tr>
<th>Department</th>
<th>#</th>
<th>$k</th>
<th>#</th>
<th>$k</th>
<th>#</th>
<th>$k</th>
<th>#</th>
<th>$k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics &amp; Statistics (ENC)</td>
<td>11</td>
<td>827</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>827</td>
<td>1,308</td>
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</tr>
<tr>
<td>Electrical &amp; Computer Eng (ENG)</td>
<td>43</td>
<td>5,946</td>
<td>3</td>
<td>347</td>
<td>46</td>
<td>6,293</td>
<td>8,915</td>
<td></td>
</tr>
<tr>
<td>Engineering Physics (ENP)</td>
<td>45</td>
<td>5,625</td>
<td>0</td>
<td>0</td>
<td>45</td>
<td>5,625</td>
<td>6,995</td>
<td></td>
</tr>
<tr>
<td>Research &amp; Sponsored Programs (ENR)</td>
<td>1</td>
<td>75</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>75</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Operational Sciences (ENS)</td>
<td>21</td>
<td>6,105</td>
<td>7</td>
<td>300</td>
<td>28</td>
<td>6,405</td>
<td>6,928</td>
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<tr>
<td>Systems Eng &amp; Management (ENV)</td>
<td>15</td>
<td>975</td>
<td>2</td>
<td>243</td>
<td>17</td>
<td>1,218</td>
<td>1,445</td>
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<tr>
<td>Aeronautical &amp; Astronautical Eng (ENY)</td>
<td>58</td>
<td>3,874</td>
<td>2</td>
<td>49</td>
<td>60</td>
<td>3,923</td>
<td>8,845</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>194</td>
<td>23,427</td>
<td>14</td>
<td>939</td>
<td>208</td>
<td>24,366</td>
<td>34,436</td>
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**Center**

<table>
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<th>#</th>
<th>$k</th>
<th>#</th>
<th>$k</th>
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</thead>
<tbody>
<tr>
<td>Autonomy and Navigation Technology (ANT)</td>
<td>24</td>
<td>3,969</td>
<td>3</td>
<td>347</td>
<td>27</td>
<td>4,316</td>
<td>5,048</td>
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<tr>
<td>Center for Cyberspace Research (CCR)</td>
<td>10</td>
<td>746</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>746</td>
<td>1,823</td>
<td></td>
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<tr>
<td>Center for Directed Energy (CDE)</td>
<td>23</td>
<td>2,615</td>
<td>0</td>
<td>0</td>
<td>23</td>
<td>2,615</td>
<td>3,107</td>
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<tr>
<td>Center for Operational Analysis (COA)</td>
<td>8</td>
<td>1,465</td>
<td>2</td>
<td>96</td>
<td>10</td>
<td>1,561</td>
<td>3,175</td>
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<tr>
<td>Center for Space Research and Assurance (CSRA)</td>
<td>29</td>
<td>2,589</td>
<td>1</td>
<td>15</td>
<td>30</td>
<td>2,604</td>
<td>3,195</td>
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<tr>
<td>Center for Tech Intel Studies &amp; Research (CTISR)</td>
<td>12</td>
<td>2,027</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>2,027</td>
<td>2,181</td>
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<tr>
<td>Nuclear Expertise for Advancing Technologies (NEAT)</td>
<td>5</td>
<td>635</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>635</td>
<td>407</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>111</td>
<td>14,046</td>
<td>6</td>
<td>458</td>
<td>117</td>
<td>14,504</td>
<td>18,936</td>
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</tr>
</tbody>
</table>

Notes: Total research expenditures reported include institutional cost sharing, which is not included in newly awarded projects. Numbers reported to the NSF research expenditure surveys vary somewhat due to differences in definitions. All Center funds are also included in departmental funding.
Figure 3.3 New FY19 Awards by Sponsor

Table 3.4 New FY19 Awards to Academic Departments & Research Centers by Sponsor

<table>
<thead>
<tr>
<th>Dept.</th>
<th>AFRL $k</th>
<th>AFMC (Non-AFRL) $k</th>
<th>Other USAF $k</th>
<th>Other DOD $k</th>
<th>Other Federal $k</th>
<th>Non-Federal $k</th>
<th>Total $k</th>
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<tbody>
<tr>
<td>ENC</td>
<td>578</td>
<td>-</td>
<td>249</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>ENG</td>
<td>4,346</td>
<td>100</td>
<td>591</td>
<td>1,236</td>
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<td>20</td>
<td>6,293</td>
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<tr>
<td>ENP</td>
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<td>-</td>
<td>1,486</td>
<td>2,766</td>
<td>491</td>
<td>-</td>
<td>5,625</td>
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<tr>
<td>ENR</td>
<td>75</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>75</td>
</tr>
<tr>
<td>ENS</td>
<td>990</td>
<td>1,994</td>
<td>112</td>
<td>2,319</td>
<td>940</td>
<td>50</td>
<td>6,405</td>
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<tr>
<td>ENV</td>
<td>469</td>
<td>243</td>
<td>237</td>
<td>199</td>
<td>70</td>
<td>-</td>
<td>1,218</td>
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<tr>
<td>ENY</td>
<td>1,281</td>
<td>70</td>
<td>404</td>
<td>2,058</td>
<td>70</td>
<td>40</td>
<td>3,923</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>8,521</strong></td>
<td><strong>2,507</strong></td>
<td><strong>3,079</strong></td>
<td><strong>8,578</strong></td>
<td><strong>1,571</strong></td>
<td><strong>110</strong></td>
<td><strong>24,366</strong></td>
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</tbody>
</table>

Note: “Other DOD” in this table includes the DEJTO, OSD, NGA, NSA, US Army, and US Navy pie slices from Figure 3.3, plus funding from other DOD organizations.

Center

<table>
<thead>
<tr>
<th>Center</th>
<th>AFRL $k</th>
<th>AFMC (Non-AFRL) $k</th>
<th>Other USAF $k</th>
<th>Other DOD $k</th>
<th>Other Federal $k</th>
<th>Non-Federal $k</th>
<th>Total $k</th>
</tr>
</thead>
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<tr>
<td>ANT</td>
<td>2,696</td>
<td>-</td>
<td>380</td>
<td>1,220</td>
<td>-</td>
<td>20</td>
<td>4,316</td>
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<tr>
<td>CCR</td>
<td>520</td>
<td>-</td>
<td>211</td>
<td>15</td>
<td>-</td>
<td>-</td>
<td>746</td>
</tr>
<tr>
<td>CDE</td>
<td>378</td>
<td>100</td>
<td>45</td>
<td>2,066</td>
<td>26</td>
<td>-</td>
<td>2,615</td>
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<tr>
<td>COA</td>
<td>285</td>
<td>696</td>
<td>2</td>
<td>528</td>
<td>-</td>
<td>50</td>
<td>1,561</td>
</tr>
<tr>
<td>CSRA</td>
<td>456</td>
<td>7</td>
<td>315</td>
<td>1,826</td>
<td>-</td>
<td>-</td>
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<tr>
<td>CTISR</td>
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<td>1,415</td>
<td>431</td>
<td>-</td>
<td>-</td>
<td>2,027</td>
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<tr>
<td>NEAT</td>
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<td>-</td>
<td>100</td>
<td>110</td>
<td>425</td>
<td>-</td>
<td>635</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4,516</strong></td>
<td><strong>803</strong></td>
<td><strong>2,468</strong></td>
<td><strong>6,196</strong></td>
<td><strong>451</strong></td>
<td><strong>70</strong></td>
<td><strong>14,504</strong></td>
</tr>
</tbody>
</table>

Note: All Center funds are also included in departmental funding.
4. SPONSORSHIP OF STUDENT RESEARCH

4.1 OFFICE OF THE SECRETARY OF THE AIR FORCE

Master’s Theses

ADDERLEY, NIKOLAI A., Graph-Based Temporal Analysis in Digital Forensics. AFIT-ENG-MS-19-M-005. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: DC3/DC. [CCR]

Graduate Papers


4.2 HEADQUARTERS OF THE UNITED STATES AIR FORCE

Master’s Theses


CARBONI, JOHN, The Effect of Modeling Simultaneous Events on Simulation Results. AFIT-ENG-MS-19-M-014. Faculty Advisor: Dr. Douglas D. Hodson. Sponsor: HQ USAF.

4.3 AIR COMBAT COMMAND

49th OPERATIONS GROUP

Master’s Theses


4.4 AIR EDUCATION AND TRAINING COMMAND

Master’s Theses


AIR FORCE INSTITUTE OF TECHNOLOGY

Doctoral Dissertations

DODSON, TABITHA, Investigations of Point Defects in KH2PO4 Crystals Using Ab Initio Quantum Methods. AFIT-ENP-DS-19-S-021. Faculty Advisor: Dr. Nancy C. Giles. Sponsor: N/A.


LENYK, CHRISTOPHER, Point Defects in Lithium Gallate and Gallium Oxide. AFIT-ENP-DS-19-S-023. Faculty Advisor: Dr. Nancy C. Giles. Sponsor: AFIT/EN.

LLOYD, ROBERT L., Numerical Simulation of Unstable Laser Resonators with a High-Gain Medium. AFIT-ENP-DS-19-S-024. Faculty Advisor: Dr. David E. Weeks. Sponsor: N/A. [CDE]


STONE, BRENT J., Enabling Auditing and Intrusion Detection for Proprietary Controller Area Networks. AFIT-ENG-DS-18-D-003. Faculty Advisor: Dr. Scott R. Graham. Sponsor: N/A. [CCR]

TURNER, JONATHAN, An Efficient Search-Based Algorithm. AFIT-ENC-DS-19-J-074. Faculty Advisor: Lt Col Andrew J. Geyer. Sponsor: N/A.

Master’s Theses

ALAJMI, ABDULAZIZ, RSAF C-130 Part Cancellation Process Analysis. AFIT-ENS-MS-19-S-032. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.


ALQAHTANI, AHMED, Saudi Arabia Progression Toward Renewable Energy According to its Vision 2030. AFIT-ENV-MS-19-S-050. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.


ARNOLD, CHRISTIAN, High Resolution, Low-Bandwidth, Real-Time Reconnaissance Using Structure from Motion with Planar Homography Estimation. AFIT-ENG-MS-18-M-007. Faculty Advisor: Dr. Scott L. Nykl. Sponsor: N/A.


BROWN, DOUGLAS, Applying Survival Analysis with Frailty to Aircraft Reliability. AFIT-ENS-MS-19-M-103. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: N/A.

COLE, TIFFANY D., Satellite On-Orbit Characterization Based on Inspection Relative Orbit Parameters. AFIT-ENY-MS-18-D-033. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A. [CSRA]

DELA CRUZ, MICHAEL, Designing Liquid Crystal For Optoacoustic Detection. AFIT-ENG-MS-19-M-023. Faculty Advisor: Dr. Hengky Chandrahali. Sponsor: N/A.

DELONG, BRANDEN, Quantifying Resiliency Risk Metrics through Facility Dispersion. AFIT-ENV-MS-19-M-170 Faculty Advisor: Maj Steven J. Schultd. Sponsor: N/A.


FLORES, ENOC, Improved Fabrication For Micromirror Arrays. AFIT-ENG-MS-19-M-027. Faculty Advisor: Maj Tod Laurvick. Sponsor: N/A.


GILLILAND, SHARON, The First Step Towards an Interchangeable Aircraft Management Construct. AFIT-ENS-MS-19-J-030. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.


HANSON, WILLIAM, Analysis of the Gálvez-Davison Index for Convective Forecasting over Africa Using the GALWEM. AFIT-ENP-MS-19-M-081. Faculty Advisor: Lt Col Hsien-Liang Tseng. Sponsor: N/A.


HEMKEN, KATHERINE B., Forecasting Sustainment Cargo Requirements. AFIT-ENS-MS-19-J-035. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: N/A. [COA]

HERTWIG, FRED D., Search-Based vs. Task-Based Space Surveillance for Ground-Based Telescopes. AFIT-ENV-MS-19-M-178. Faculty Advisor: Dr. John Colombi. Sponsor: N/A. [CSRA ANT]


JAMES, KENNETH, Testing the Fault Tolerance of a Wide Area Backup Protection System using SPIN. AFIT-ENG-MS-19-M-034. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.


LABEDZ, THEODORE, Quantifying Permafrost Extent, Condition, and Degradation at Eielson Air Force Base. AFIT-ENV-MS-19-M-184. Faculty Advisor: Maj Steven J. Schuldt. Sponsor: N/A.


MAIKELL, MEGAN, Characterization and Anomalous Diffusion Analysis of a 100W Low Power Annular Hall Effect Thruster. AFIT-ENY-MS-19-M-231. Faculty Advisor: Dr. Carl R. Hartsfield. Sponsor: N/A.

MANGEN, MATTHEW, An Analysis of Changing the Federal Age Requirement for a Commercial Driver's License. AFIT-ENS-MS-19-J-038. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.


MAUS, JOCELIN, Applying the Multiple Multidimensional Knapsack Assignment Problem to a Cargo Allocation and Transportation Problem with Stochastic Demand. AFIT-ENS-MS-19-M-137. Faculty Advisor: Maj Thomas P. Talafuse. Sponsor: N/A.


MICHAUD, PAUL, Micro-Contacts With 3-D Surfaces Made With Grayscale Lithography. AFIT-ENG-MS-19-M-043. Faculty Advisor: Tod Laurvick. Sponsor: N/A.


NUNDU, AILEEN, Direct Path Interference Suppression and Received Signal Processing For OFDM Passive Radar. AFIT-ENG-MS-19-M-049. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFIT/ENG.


PAMILAGAS, KEVIN, Analyzing a Method to Determine the Utility of Adding a Classification System to a Sequence for Improved Accuracy. AFIT-ENC-MS-19-M-002. Faculty Advisor: Dr. Christine Schubert Kabban. Sponsor: N/A.


PRUDHOMME, DANIEL, Project HAVE BASS. AFIT-ENY-MS-19-M-237. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: N/A.


REYNOLDS, THOMAS, From the APOD to the Point of Need. AFIT-ENS-MS-19-J-045. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: N/A.

ROBINSON, TORY, Characterization of Metal Contacts on Hydrothermally Synthesized Uranium Dioxide For Novel Semiconductor Applications. AFIT-ENG-MS-19-M-052. Faculty Advisor: Tod Laurvick. Sponsor: N/A.


SANDS, BRENDON, Time Series Analysis of Stochastic Networks with Correlated Random Arcs. AFIT-ENS-MS-19-M-147. Faculty Advisor: Lt Col Andrew J. Geyer. Sponsor: N/A.

SCHMITT, COURTNEY, Harmonic Equiangular Tight Frames Comprised of Regular Simplices. AFIT-ENC-MS-19-M-004. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.

SINN, YONG U., Unresolved Object Detection Using Synthetic Data Generation and Artificial Neural Networks. AFIT-ENG-MS-19-M-055. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A. [CSRA CTISR]


TYHURST, JAMES, Non-Intrusive Occupancy Detection Methods and Models. AFIT-ENV-MS-19-M-200. Faculty Advisor: Lt Col Andrew J. Hoisington. Sponsor: N/A.


Graduate Research Papers


4.5 AIR FORCE MATERIEL COMMAND

Doctoral Dissertations


Master’s Theses


AIR FORCE ARNOLD ENGINEERING DEVELOPMENT CENTER

Master’s Theses


AIR FORCE CIVIL ENGINEERING CENTER

Master’s Theses


HAYES, AUSTIN, The Evaluation of High-Molecular-Weight Methacrylate as a Treatment Option for Shrinkage Cracks in Airfield Pavement. AFIT-ENV-MS-19-M-177. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AFCEC.

JORDAN, RAMOANE, Fate and Transport Modeling of Perfluoroalkyl Substances (PFAS) in Groundwater from Aqueous Film Forming Foam (AFFF) Impacted Sites. AFIT-ENV-MS-19-M-181. Faculty Advisor: Dr. Willie F. Harper. Sponsor: AFCEC/CZOM.

SPRANGER, ZACHARY, Analysis and Design of Modular Overhead Protection System Utilizing Readily Available Materials. AFIT-ENV-MS-19-M-198. Faculty Advisor: Dr. Alfred Thal. Sponsor: AFCEC.

AIR FORCE SEEK EAGLE OFFICE

Master’s Theses

PUNG, JUSTIN, Tracking Shock Movement on the Surface of an Oscillating, Straked Semispan Delta Wing. AFIT-ENY-MS-19-M-238. Faculty Advisor: Lt Col Darrell S. Crowe. Sponsor: 46 SK/SKC.

AIR FORCE SECURITY ASSISTANCE CENTER

Master’s Theses


AIR FORCE LIFE CYCLE MANAGEMENT CENTER

Master’s Theses


ENOS, TREVOR, A Case Study of EPA Clauses as they Apply to Fixed Price Contracts. AFIT-ENV-MS-19-M-173. Faculty Advisor: Dr. Jonathan Ritschel. Sponsor: AFLCMC/FZ.

GILL, ANDREW, Examining the Drivers of C-130J Maintenance Requirements. AFIT-ENS-MS-19-M-115. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFLCMC/LZ.


KOLANO, BRYAN, Multivariate Analysis of Diversity and Inclusion Data. AFIT-ENS-MS-19-M-132. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 88th ABW.


**AIR FORCE RESEARCH LABORATORY**

**Master’s Theses**


KEESLING, RICHARD B., Exploratory Analysis of the Potential Use of Augmented Reality in Aircraft Maintenance. AFIT-ENS-MS-19-M-129. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: AFRL. [COA]


PLOURDE, TIMOTHY, Analysis of the Effect of Corrosion on the Surface Chemistry of Mild Steel Exposed to Biofuel. AFIT-ENV-MS-19-M-193. Faculty Advisor: Dr. Jeremy Slagley. Sponsor: AFRL.

**AFRL: 711th HUMAN PERFORMANCE WING**

**Doctoral Dissertations**

ANDERSON, TIMOTHY, Statistical L-Moment and L-Moment Ratio Estimation and Their Applicability in Network Analysis. AFIT-ENC-DS-19-S-001. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: 711 HPW/RHCML.

LOPEZ, JENNIFER, Sample Size Requirements and Considerations for Models to Assess Human-Machine System Performance. AFIT-ENC-DS-19-S-003. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: 711 HPW/RH.

**Master’s Theses**

BUCK, JENNIFER, Pay-Setting Analysis of Laboratory Demonstration Workforce. AFIT-ENS-MS-19-M-104. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 711th HPW.

CHAVEZ, SENOBIO, Serious Game Design Using MDA and Bloom's Taxonomy. AFIT-ENG-MS-19-M-017. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: 711th HPW/RH.


AFRL: AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

Master’s Theses

CANZONETTA, DAVID, Assessing Artificial-Agent Response Time Effects on Human-Agent Teams in Variable Inter-Arrival Time Environments. AFIT-ENV-MS-19-M-166. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AFOSR.


ETHRIDGE, JAMES A., Computational and Experimental Development of 2D Anisotropic Photonic Crystal Metamaterials. AFIT-ENP-MS-19-M-077. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR/RT.


JOHNSON, BROOKE, Machine Translation with Image Context from Mandarin Chinese to English. AFIT-ENG-MS-19-M-035. Faculty Advisor: Dr. Brett J. Borghetti. Sponsor: AFOSR.


SAUNDERS, RYAN, Influence of Leading Edge Oscillatory Blowing on Time-Accurate Dynamic Store Separation. AFIT-ENY-MS-19-M-244. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFOSR/RT.

SIGALA, ALBERTO, A Delphi Study to Examine Current and Future UAS Autonomous Mission Capabilities. AFIT-ENV-MS-19-M-197. Faculty Advisor: Dr. Brent T. Langhals. Sponsor: AFOSR.

STANKOWSKI, KYLE, Target Detection in Heterogeneous Clutter with Low Resolution Radar. AFIT-ENG-MS-19-S-011. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFOSR/RT.

VILLARREAL, MICAH, Confirmation Bias Estimation from Electroencephalography with Machine Learning. AFIT-ENG-MS-19-M-065. Faculty Advisor: Dr. Brett J. Borghetti. Sponsor: AFOSR/RT.

AFRL: AEROSPACE SYSTEMS DIRECTORATE

Master’s Theses

BABCOCK, HORATIO, Investigation of Endwall Vortex Manipulation in High Lift Turbines Caused by Active Endwall Forcing. AFIT-ENY-MS-19-M-202. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.


CALLAGHAN, PATRICK, Evaluation of Unmanned Aircraft Flying Qualities Using a Stitched Learjet Model. AFIT-ENY-MS-19-M-206. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFRL/RQ.


HARRIS, KAREN, A Comparative Analysis on UAS Operating Procedures within Military Airspace. AFIT-ENS-MS-19-M-120. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: AFRL/RQ.

JACKSON, SUnderlin D., Control Strategies for Multi-Evaporator Vapor Compression Cycles. AFIT-ENY-MS-19-M-221. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RQ. [CSRA]

JOHNSON, GRANT, Flow Control and Slender Body Dynamics for Store Separation into Subsonic and Supersonic Freestreams. AFIT-ENY-MS-19-M-222. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.

LABUDA, DAVID, Schlieren Imaging and Flow Analysis on a Cone/Flare Model in the AFRL Mach 6 Ludwieg Tube Facility. AFIT-ENY-MS-19-M-226. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.


MONTGOMERY, MADISON J., Active Control of a Morphing Wing Aircraft and Failure Analysis For System Reliability. AFIT-ENG-MS-19-M-045. Faculty Advisor: Dr. Robert C. Leishman. Sponsor: AFRL/RQ. [ANT]


AFRL: DIRECTED ENERGY DIRECTORATE

Doctoral Dissertations


Master’s Theses


AFRL: MATERIALS AND MANUFACTURING DIRECTORATE

Master’s Theses

GOROSPE, ANDREW, Non-Contact Height Estimation for Material Extrusion Additive Systems via Monocular Imagery. AFIT-ENG-MS-19-M-029. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RX.

**AFRL: MUNITIONS DIRECTORATE**

**Doctoral Dissertations**


**Master’s Theses**


**AFRL: SENSORS DIRECTORATE**

**Doctoral Dissertations**


**Master’s Theses**


CINTRON, LUIS A., Modeling a Consortium-Based Distributed Ledger Network with Applications for Intelligent Transportation Infrastructure. AFIT-ENG-MS-18-M-019. Faculty Advisor: Dr. Scott R. Graham. Sponsor: AFRL/RY. [CCR]


UNDERWOOD, BLAINE, Plasma Treatment Method for Ohmic Contacts on Zinc Oxide Thin Film Transistors. AFIT-ENG-MS-19-M-062. Faculty Advisor: Maj Tod Laurvick. Sponsor: AFRL/RY.

WALLACE, SCOUT T., Extended Kalman Filtering for Missile Live-Fire Data Analysis. AFIT-ENG-MS-18-D-004. Faculty Advisor: Lt Col Scott J. Pierce. Sponsor: AFRL/RY. [ANT]

AFRL: SMALL BUSINESS OFFICE

Master’s Theses


AFRL: SPACE VEHICLES DIRECTORATE

Master’s Theses


ROUND, JOSEPH F., Variations of Heavy Ion Abundances Relative to Proton Abundances in Large Solar Energetic Particle Events. AFIT-ENP-MS-19-M-090. Faculty Advisor: Dr. Robert D. Loper. Sponsor: AFRL/RV. [CSRA]


AIR FORCE INSTALLATION AND MISSION SUPPORT CENTER

Master’s Theses

AIR FORCE SUSTAINMENT CENTER

Graduate Research Papers

STEWART, JESSICA, Lessons Learned from Operation Inherent Resolve. AFIT-ENS-MS-19-J-051. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: 448 SCMW/DV.

4.6 AIR MOBILITY COMMAND

Master’s Theses


Graduate Research Papers

COBURN, ZACHARY, A Qualitative Study of Air Mobility Command's Phoenix Horizon-Reach Program. AFIT-ENS-MS-19-J-024. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: USAF EC/EC.


4.7 AIR FORCE SPACE COMMAND

Master’s Theses


45th WEATHER SQUADRON


KATUZIENSKI, DANIEL, Comparing Dual-Polarization Radar Lightning Forecast Methods across Southwest Utah. AFIT-ENP-MS-19-M-083. Faculty Advisor: Maj Omar A. Nava. Sponsor: 45 WS.

SANDERSON, DAWN, Modeling the Distribution of Lightning Strike Distances outside a Preexisting Lightning Area. AFIT-ENC-MS-19-M-003. Faculty Advisor: Dr. Edward D. White. Sponsor: 45 WS.


SPACE AND MISSILE SYSTEMS CENTER

Master’s Theses


ELWORTH, CHRISTOPHER, Comparing Estimated-to-Actual Development Budgets for Air Force Space Programs. AFIT-ENV-MS-19-M-172. Faculty Advisor: Dr. Edward D. White. Sponsor: SMC/RFM.


4.8 AIR FORCE SPECIAL OPERATIONS COMMAND

Master’s Theses


4.9 USAF FIELD OPERATING AGENCIES/DIRECT REPORTING UNITS

AIR FORCE COST ANALYSIS AGENCY

Master’s Theses

ANGELL, EMILY, Analysis of Military Construction Cost Growth in Major Defense Acquisition Programs. AFIT-ENV-MS-19-M-159. Faculty Advisor: Dr. Edward D. White. Sponsor: AFCAA.

KLINE, SETH, Text Analysis of Air Force References in Twitter. AFIT-ENV-MS-19-M-183. Faculty Advisor: Dr. Jonathan Ritschel. Sponsor: AFCAA.

AIR FORCE TECHNICAL APPLICATIONS CENTER

Master’s Theses


HALL, AMY, Development of a Model for C-11 Production Via the N-14 (p,alpha) Reaction Using a GE PETtrace Cyclotron. AFIT-ENP-MS-19-M-080. Faculty Advisor: Maj James E. Bevins. Sponsor: AFTAC.
QUARTEMONT, NICHOLAS, Nuclear Data Covariance Analysis of an Energy Tuning Assembly for Simulating Nuclear Weapon Environments. AFIT-ENP-MS-19-M-089. Faculty Advisor: Maj James E. Bevins. Sponsor: AFTAC.


NATIONAL AIR AND SPACE INTELLIGENCE CENTER

Doctoral Dissertations


Master’s Theses


BRAMBLETT, LAUREN M., Turbojet Range, Loiter, and Altitude Tradeoff Estimations in Efficient Modeling and Optimization Formulations. AFIT-ENS-MS-19-M-102. Faculty Advisor: Dr. Lance E. Champagne. Sponsor: NASIC. [COA]

LIBRANDI, ROCCO, Variable Type Inference Based On Statistical and Architectural Indications. AFIT-ENG-MS-19-M-040. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: NASIC/AC.

4.10 DEPARTMENT OF DEFENSE

Doctoral Dissertations


Master’s Theses

LARKIN, MICHAEL T., A Stochastic Game Theoretical Model for Cyber Security. AFIT-ENS-MS-19-M-133. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: USD (R&E) DTEP. [COA]

Graduate Research Papers


AIR FORCE SPECIALTY CODE

Master’s Theses

ST PETER, TROY, Implementing an Autoregressive Distributed Lag Approach with Air Force Maintenance Data. AFIT-ENS-MS-19-M-151. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFSC/LG.

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Master’s Theses


DEFENSE INTELLIGENCE AGENCY

Master’s Theses


DEFENSE THREAT REDUCTION AGENCY

Doctoral Dissertations


Master’s Theses

EGNER, BRYAN, Development of a Mixed-Radiation Directional Rotating Scatter Mask Detection System. AFIT-ENP-MS-19-M-075. Faculty Advisor: Dr. Larry W. Burggraf. Sponsor: DTRA.


DIRECTED ENERGY JOINT TECHNOLOGY OFFICE

Doctoral Dissertations


Master’s Theses

WOLFMeyer, SCOTT S., Coupled Atmospheric Surface Observations with Surface Aerosol Particle Counts for Daytime Sky Radiance Quantification. AFIT-ENP-MS-19-M-095. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: DEJTO. [CDE]

JOINT CHIEFS OF STAFF

Master’s Theses

JOINT WARFARE ANALYSIS CENTER

Master’s Theses


NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Doctoral Dissertations

YOUNG, SHANNON, Optimization of a Moment-Based Detection Algorithm. AFIT-ENP-DS-18-D-010. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NGA.

OFFICE OF THE SECRETARY OF DEFENSE

Master’s Theses


UNITED STATES AFRICA COMMAND

Master’s Theses

BAKER, JADE, West Africa Logistics Networks. AFIT-ENS-MS-19-M-100. Faculty Advisor: Dr. Bruce A. Cox Sponsor: US AFRICOM.


PENDERGRASS, MICHAELA A., A Topological View of the Relationship between Women and Armed Conflict in West Africa. AFIT-ENS-MS-19-M-143. Faculty Advisor: LTC Christopher M. Smith. Sponsor: USAFRICOM. [COA]

UNITED STATES ARMY

Doctoral Dissertations

JENKINS, PHILLIP, Strategic Location and Dispatch Management of Assets in a Military Medical Evacuation Enterprise. AFIT-ENS-DS-19-J-037. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: MEPD.

Master’s Theses


UNITED STATES NAVY

Master’s Theses

HORNBERGER, ZACHARY, Search and Rescue Operations Forecasting and Optimization. AFIT-ENS-MS-19-M-123. Faculty Advisor: Lt Col Bruce A. Cox. Sponsor: CG RDC.


UNITED STATES STRATEGIC COMMAND

Doctoral Dissertations

CABALLERO, WILLIAM, Behavioral and Behaviorally Robust Models. AFIT-ENS-DS-19-J-022. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: USSTRATCOM.

KEITH, ANDREW J., Inferential, Sequential, and Adversarial Approaches. AFIT-ENS-DS-19-S-041. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: STRATCOM. [COA]


UNITED STATES TRANSPORTATION COMMAND

Master’s Theses

HUGHES, MICHAEL S., A Port-Based Analysis of USTRANSCOM Shipping Network Vulnerability. AFIT-ENS-MS-19-M-124. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: USTRANSCOM/JDPAC. [COA]


Graduation Research Projects


4.11 OTHER FEDERAL AGENCIES

DEPARTMENT OF ENERGY

Doctoral Dissertations

DEPARTMENT OF HOMELAND SECURITY

Doctoral Dissertations

DUGAN, CHRISTINA, Electrical Characterization of Crystalline UO2, ThO2, and U00.71Th0.29O2. AFIT-ENP-DS-18-D-007. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DHS/DNDO.

Master’s Theses


MOSBY, JOSHUA K., A Blockchain-Based Anomalous Detection System For Internet Of Things' Devices. AFIT-ENG-MS-19-M-047. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS. [CCR]

STAFIRA, LUKAS A., Examining Effectiveness of Web-Based Internet of Things' Honeypots. AFIT-ENG-MS-19-M-057. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS. [CCR]

DEPARTMENT OF VETERANS AFFAIRS

Master’s Theses

BEEMER, CODY, An Analysis of Built Environment Factors in Residences and the Associated Effects on Mental Health Symptoms of United States Veterans. AFIT-ENV-MS-19-M-161. Faculty Advisor: Lt Col Andrew J. Hoisington. Sponsor: MIRECC.

ENVIRONMENTAL PROTECTION AGENCY

Master’s Theses


FEDERAL EMERGENCY MANAGEMENT AGENCY

Master’s Theses

GREEN, NICHOLAS, Shipping Designs for the Post-Disaster Cargo Surge. AFIT-ENS-MS-19-M-118. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: FEMA.

4.12 INTERNATIONAL ORGANIZATIONS

BRAZILIAN AIR FORCE INSTITUTE OF LOGISTICS

Master’s Theses

MONTEIRO, LUCIANA M., Predicting Failures of the Brazilian Air Force Tucano Fleet Using Survival Analysis. AFIT-ENS-MS-19-M-139. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: ILA. [COA]
4.13 NON-FEDERAL SPONSORS

LOCKHEED MARTIN MISSILES AND FIRE CONTROL

Master’s Theses


RAYTHEON SPACE AND AIRBORNE SYSTEMS

Master’s Theses

BROWNLEE, LAUREN E., Battle Damage Assessment with Optical Cross Section Measurements. AFIT-ENP-MS-19-S-018. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: Raytheon SAS. [CDE]

THE BOEING COMPANY

Master’s Theses


THE OHIO STATE UNIVERSITY

Master’s Theses

5. ACADEMIC DEPARTMENT PUBLICATIONS AND FUNDING INFORMATION
5.1 DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS

Access Phone: 937-255-3069, DSN 785-3069
Fax: 937-656-7053, DSN 986-7053
Homepage: http://www.afit.edu/ENY/

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5.1.1 DOCTORAL DISSERTATIONS


5.1.2 MASTER’S THESES

BABCOCK, HORATIO, Investigation of Endwall Vortex Manipulation in High Lift Turbines Caused by Active Endwall Forcing. AFIT-ENY-MS-19-M-202. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.


CALLAGHAN, PATRICK, Evaluation of Unmanned Aircraft Flying Qualities Using a Stitched Learjet Model. AFIT-ENY-MS-19-M-206. Faculty Advisor: Dr. Donald L. Kunz. Sponsor: AFRL/RQ.


COLE, TIFFANY D., Satellite On-Orbit Characterization Based on Inspection Relative Orbit Parameters. AFIT-ENY-MS-18-D-033. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A. [CSRA]


GAHAN, KENNETH, Project Have Medusa. AFIT-ENY-MS-19-M-213. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: AFOSR.


JACKSON, SUNDERLIN D., Control Strategies for Multi-Evaporator Vapor Compression Cycles. AFIT-ENY-MS-19-M-221. Faculty Advisor: Dr. Anthony N. Palazotto. Sponsor: AFRL/RQ. [CSRA]

JOHNSON, GRANT, Flow Control and Slender Body Dynamics for Store Separation into Subsonic and Supersonic Freestreams. AFIT-ENY-MS-19-M-222. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.


LABUDA, DAVID, Schlieren Imaging and Flow Analysis on a Cone/Flare Model in the AFRL Mach 6 Ludwieg Tube Facility. AFIT-ENY-MS-19-M-226. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFRL/RQ.


MAIKELL, MEGAN, Characterization and Anomalous Diffusion Analysis of a 100W Low Power Annular Hall Effect Thruster. AFIT-ENY-MS-19-M-231. Faculty Advisor: Dr. Carl R. Hartsfield. Sponsor: N/A. [CSRA]


PRUDHOMME, DANIEL, Project HAVE BASS AFIT-ENY-MS-19-M-237. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: N/A.

PUNG, JUSTIN, Tracking Shock Movement on the Surface of an Oscillating, Straked Semispan Delta Wing. AFIT-ENY-MS-19-M-238. Faculty Advisor: Lt Col Darrell S. Crowe. Sponsor: 46 SK/SKC.


SAUNDERS, RYAN, Influence of Leading Edge Oscillatory Blowing on Time-Accurate Dynamic Store Separation. AFIT-ENY-MS-19-M-244. Faculty Advisor: Dr. Mark F. Reeder. Sponsor: AFOSR/RT.

SCHMIDT, KYRA L., Analytical Models and Control Design Approaches for a 6 DOF Motion Test Apparatus. AFIT-ENY-MS-19-M-245. Faculty Advisor: Dr. Richard Cobb. Sponsor: AFRL/RW. [CSRA]


5.1.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable.

BETTINGER, ROBERT A., Maj
Assistant Professor of Astronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2017 (AFIT/ENY); BS, Astronautical Engineering, United States Air Force Academy, 2007; MA, History, American Public University, 2010; MS, Astronautical Engineering, Air Force Institute of Technology, 2011; PhD, Astronautical Engineering, Air Force Institute of Technology, 2014. Maj Bettinger's research interests include reentry dynamics, spacecraft safety and survivability, as well as optimization and control for aerospace applications. Recent research includes developing uncontrolled reentry prediction algorithms and skip reentry maneuver optimization. Maj Bettinger is a member of Tau Beta Pi and Sigma Gamma Tau. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4578, Email: Robert.Bettinger@afit.edu

Sponsor Funded Research Projects

“Launch Site Optimization Study for Launch-On-Demand System.” Sponsor: SDPE. Funding: $20,002. [CSRA]

“Spacecraft Survivability, Reliability, and Rendezvous (S2R2) Short Course.” Sponsor: NASIC. Funding: $7,500 - Bettinger 50%, Hess 50%. [CSRA]

“Policy and Geopolitical Implications of Launch-on-Demand Capabilities.” Sponsor: Air University. Funding: $2,453.

“Attitude Determination using Terrestrial Illumination Matching.” Sponsor: AFRL/RV. Funding: $40,000. [CSRA]


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


Other Significant Research Productivity


BOHAN, BRIAN T., Maj
Assistant Professor of Aeronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2018 (AFIT/ENY); BS, Aeronautical Engineering, Clarkson University - Potsdam, NY, 2005; MS, Aeronautical Engineering, Air Force Institute of Technology, 2011; PhD, Aeronautical Engineering, Air Force Institute of Technology, 2018. Major Bohan's research interests include turbomachinery, combustion, heat transfer, applied fluid dynamics, and computational fluid dynamics. Major Bohan teaches courses on turbomachinery, computational fluid dynamics, and aircraft design. He has experience in Air Force test and evaluation, propulsion integration, aerodynamic configuration, and as a propulsion subject matter expert for weapon system development. Maj Bohan is a member of Tau Beta Pi, Sigma Gamma Tau, AIAA, and ASME. Tel. 937-255-3636 x4773, Email: Brian.Bohan@afit.edu

Sponsor Funded Research Projects

“Development of a New UCC Powered Engine Configuration (Revised).” Sponsor: AFLCMC. Funding: $49,938 - Bohan 80%, Polanka 20%.

“Development of an Integrated UCC into a Cruise Missile.” Sponsor: AFRL/RQ. Funding: $5,000 - Bohan.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications

Other Significant Research Productivity


COBB, RICHARD G.
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2001 (AFIT/ENY); BS, Pennsylvania State University, 1988; MS, Air Force Institute of Technology, 1992; PhD, Air Force Institute of Technology, 1996. While at AFIT, Dr. Cobb has taught graduate level courses in satellite design, optimal control, trajectory optimization, system identification, and spacecraft control systems. His research focuses on 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, and architectures for enhancing Space Situational Awareness. While on active duty, Dr. Cobb served as the technical advisor for AFRL’s Space Vehicles’ Technology Branch, and led several space flight experimental programs, including the Vibration Isolation and Suppression System, sponsored by BMDO, and the Satellite Ultra-quiet Isolation Technology Experiment. Dr. Cobb also served as a launch operations officer at Cape Canaveral AFS on the Global Positioning System program, responsible for the integration and launch of the GPS Block II satellite constellation. He is an Associate Fellow of AIAA. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4559, Email: Richard.Cobb@afit.edu

Sponsor Funded Research Projects

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $140,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%. [CSRA]


“Multi-slew Constrained Dynamic Optimization.” Sponsor: Undisclosed. Funding: $40,000. [CSRA]

“Satellite Attitude Control Testbed Upgrades.” Sponsor: Undisclosed. Funding: $38,000 - Cobb 34%, Johnson 33%, Zagaris 33%. [CSRA]


“Timely Path Optimization for Enhanced Autonomy.” Sponsor: AFRL/RQ. Funding: $25,000. [ANT]

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**GRANDHI, RAMANA V.**
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2018 (AFIT/ENY); Previously Dr. Grandhi was a Distinguished Professor at Wright State University, and also served as its Director of Engineering PhD program for 15 years, as well as Executive Director of International Collaborations and Graduate Programs for 4 years. His research interests focus in multidisciplinary analysis and optimization, aircraft structures, risk-based design, and advanced manufacturing processes. Dr. Grandhi is a Fellow of the American Society of Mechanical Engineering, and a Fellow of the American Institute of Aeronautics and Astronautics. Tel. 937-255-3636 x4723, Email: Ramana.gGrandhi@afit.edu

**Sponsor Funded Research Projects**


**Refereed Journal Publications**

Editorships in Professional Journals


Editorial Board, *Journal of Manufacturing Review*.


Associate Editor, *Journal of Structural and Multidisciplinary Optimization*.


GREENDYKE, ROBERT B.

Associate Professor of Aeronautics and Astronautics and Director, AFIT Scientist and Engineer Education Programs at Kirtland AFB, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2005 (AFIT/ENY); BBA, Economics, Baylor University, 1979; BS, Aerospace Engineering, Texas A&M University, 1986; MS, Aerospace Engineering, Texas A&M University, 1988; PhD, Interdisciplinary Engineering, Texas A&M University, 1998. Dr. Greendyke's research interests include computational fluid dynamics, Direct Simulation Monte Carlo methods, hypersonic and reacting flows, radiation simulation, thermophysics, and plasma simulation. He was a research scientist at NASA-Langley Research Center studying re-entry and aerobraking flows, as well as an Associate Professor at the University of Texas at Tyler where he established a start-up Mechanical Engineering Program from concept through accreditation. Dr. Greendyke has published more than 30 journal articles, technical reports, and conference publications in multiple fields. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics. Tel. 937-255-3636 x4567, Email: Robert.Greendyke@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HARTSFIELD, CARL R.

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2015 (AFIT/ENY); B, Aerospace Engineering, Georgia Institute of Technology, 1991; MS, Aeronautical Engineering, Air Force Institute of Technology, 2001; PhD, Astronautical Engineering, Naval Postgraduate School, 2006. Dr. Hartsfield is a former faculty member of The Ohio State University, a former space sensor payload program manager, and retired USAF Lt Col. His research interests include space and rocket propulsion and optimal design of spacecraft, including integration and testing of spacecraft. Dr. Hartsfield’s research focuses on experimental evaluation and diagnostics for space propulsion, analytic evaluation of spacecraft design, and applications of additive manufacturing for optimal spacecraft structures. He served as an invited space propulsion session co-chair at the 2011 NASA GRC HBCUOMI Outreach Symposium, as a session chair at the 2011 and 2012 Dayton/Cincinnati Aerospace Sciences Symposium, as chair for the technical program and session chair at the 2017 Dayton/Cincinnati Aerospace Sciences Symposium, and as Executive Chair for the 2018 Dayton/Cincinnati Aerospace Sciences Symposium. Dr. Hartsfield is a member of AIAA, Sigma Gamma Tau, and the American Society for Engineering Education. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4667, Email: Carl.Hartsfield@afit.edu
Sponsor Funded Research Projects


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


HESS, JOSHUAH, A., Maj
Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2016 (AFIT/ENY); BS, Aerospace Engineering, Virginia Polytechnic and State University, 2009; MS, Astronautical Engineering, Air Force Institute of Technology, 2011; PhD, Aeronautical Engineering, Air Force Institute of Technology, 2016. Major Hess’s research interests include relative satellite motion and spacecraft proximity operations, spacecraft attitude determination, optimal control, differential pursuit/evasion games, and estimation theory. He has investigated adaptive estimation of nonlinear spacecraft attitude dynamics, as well as the relative navigation between satellites conducting proximity operations. Previously, Major Hess worked as a space system engineer at the National Air and Space Intelligence Center (NASIC) and has deployed to Southwest Asia in support of Operation Enduring Freedom. He is a member of Tau Beta Pi, Sigma Gamma Tau, and AIAA. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4713, Email: Joshuah.Hess@afit.edu

Sponsor Funded Research Projects

“Satellite Pursuit-Evasion Differential Games.” Sponsor: AFRL/RV. Funding: $20,000. [CSRA]

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


**JOHNSON, KIRK W., Lt Col**

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2016 (AFIT/ENY); BS, Mechanical Engineering, Worcester Polytechnic Institute, 2000; MS, Astronautical Engineering, Air Force Institute of Technology, 2010; PhD, Aerospace Engineering, Texas A&M University, 2016. Lt Johnson's research interests include orbital mechanics and astrodynamics, focusing on satellite relative motion, formation flying, general perturbation methods, and space navigation. He has led engineering teams performing analysis and modeling, and simulation for the National Air and Space Intelligence Center and for the Missile Defense Agency. He is a member of Tau Beta Pi, Sigma Gamma Tau, and the American Astronautical Society. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4285, Email: Kirk.Johnson@afit.edu

**Sponsor Funded Research Projects**

“Image Processing and OD for SSA.” Sponsor: AFRL/RV. Funding: $16,000. [CSRA]

“Localization of Gnd/Space RF trans.” Sponsor: AFRL/RV. Funding: $16,000. [CSRA]


“Orbit-Dynamics Visual Servoing.” Sponsor: AFRL/RV. Funding: $16,000. [CSRA]

“Rapid CubeSat Build and Test.” Sponsor: AFRL/RV. Funding: $50,000. [CSRA]

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $140,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%. [CSRA]


“Satellite Attitude Control Testbed Upgrades.” Sponsor: Undisclosed. Funding: $38,000 - Cobb 34%, Johnson 33%, Zagaris 33%. [CSRA]

Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


KEMNITZ, RYAN A., Maj
Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: September 2018 (AFIT/ENVY); BS, Mechanical Engineering, United States Air Force Academy, 2008; MS, Mechanical Engineering, University of Utah, 2012; PhD, Materials Science, Air Force Institute of Technology, 2018. Major Kemnitz’s research interests include process parameter and laser scanning strategy development for additive manufacturing of metal alloys, mechanical and microstructural characterization of additively manufactured materials, and the use of finite element analysis to predict the impact of defects on the mechanical behavior of additively manufactured materials. He is a member of Tau Beta Pi and AIAA. Tel. 937-255-3636 x4775, Email: Ryan.Kemnitz@afit.edu

Sponsor Funded Research Projects

“Novel Hypersonic Structural Design Using AM.” Sponsor: AFRL/RQ. Funding: $33,000 - Kemnitz 50%, Hartsfield 50%.

“Novel Hypersonic Structural Design Using AM.” Sponsor: AFRL/RQ. Funding: $75,000 - Kemnitz 50%, Hartsfield 50%.


Refereed Journal Publications


**KEYS, ANDREW S.**
Associate Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2019 (AFIT/ENY); Dr. Keys earned his bachelor's and master's degrees in electrical engineering from Auburn University in 1988 and 1990, respectively, and earned his doctorate of philosophy in electrical engineering from the University of Alabama in Huntsville in 2002. Prior to joining the AFIT faculty in February of 2019, Dr. Keys was employed for more than 27 years with the National Aeronautics and Space Administration's (NASA's) Marshall Space Flight Center (MSFC), where he served in multiple leadership and technology management positions. His research interests include the development of sensors and detectors for the purpose of space-based remote sensing, electro-optics and photonic technologies, optical and laser systems, radiation hardening of avionics and electronics, and the advancement of related space technologies. Tel. 937-255-3636 x4747, Email: Andrew.Keys@afit.edu

**KOMIVES, JEFFREY R., Lt Col**
Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2016 (AFIT/ENY); BS, Aeronautical & Astronautical Engineering, Purdue University, 2003; MS, Aeronautical Engineering, Air Force Institute of Technology, 2009; PhD, Aerospace Engineering & Mechanics, University of Minnesota, 2016. Lt Col Komives' research interests include aerodynamics, hypersonics, and computational fluid dynamics. He is a developmental engineer with experience in simulation, test and evaluation, and electronic warfare. During his deployment to Operation Enduring Freedom he was responsible for Counter Remote Controlled-IED Electronic Warfare training across most of Afghanistan. Lt Col Komives is a member of Sigma Gamma Tau, AIAA, and the Association of Old Crows. AFIT research center affiliation(s): CSRA and CTISR. Tel. 937-255-3636 x4744, Email: Jeffrey.Komives@afit.edu

**Sponsor Funded Research Projects**


“Signature Codes for Hypersonic Modeling.” Sponsor: AFRL/RV. Funding: $46,000 - Komives 60%, Emmons 40%. [CSRA]

“Turbulence Modeling in Hypersonic Flows.” Sponsor: USAFA. Funding: $73,925 - Komives 34%, Reeder 33%, Gross 33%.


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


KUNZ, DONALD L.
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2003
(AFIT/ENY); BS, Syracuse University, 1971; MS, Georgia Institute of Technology, 1972; PhD, Georgia Institute of
Technology, 1976; Dr. Kunz’s research interests include rotorcraft dynamics, vibrations and loads, structural
dynamics, aeroelasticity, flying qualities of UAVs, multibody dynamics, and computational structural mechanics. He
has published more than 100 journal articles, conference papers, and technical reports. Prior to coming to AFIT, Dr.
Kunz worked at the US Army Aeroflightdynamics Directorate, McDonnell Douglas Helicopter Company, Old
Dominion University, and the US Army Aviation and Missile Command. He is an Associate Fellow of AIAA, a
member of AHS, and a licensed professional engineer in the Commonwealth of Virginia. Tel. 937-255-3636 x4548,
Email: Donald.Kunz@afit.edu

Sponsor Funded Research Projects

“Basic Research with Integrated Flight Test.” Sponsor: AFOSR. Funding: $94,377 - Kunz 60%, Reeder 20%, Cobb
20%.


Refereed Journal Publications

http://doi.org/10.1142/S2301385019500079


Refereed Conference Papers Accepted on the Basis of Full Paper Review

Target by Agents with Turn Radius Constraints,” International Conference on Unmanned Aircraft Systems, Atlanta,
GA, June 2019. DOI: 10.1109/ICUAS.2019.8798373

Refereed Conference Papers Accepted on the Basis of Abstract Review

AIAA Aviation and Aeronautics Forum and Exposition, Dallas, TX, June 2019. DOI: 10.2514/6.2019-3547

Model,” AIAA Aviation and Aeronautics Forum and Exposition, Dallas, TX, June 2019. DOI: 10.2514/6.2019-3548

Books and Chapters in Books

1687350664, September 2019.

Other Significant Research Productivity

Aerospace Flutter and Dynamics Council, Blacksburg, Virginia, April 2019.


**LIEBST, BRADLEY S.**
Professor of Aerospace Engineering and Head, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1989 (AFIT/ENY); BS, Wichita State University, 1978; MS, Massachusetts Institute of Technology, 1979; PhD, Massachusetts Institute of Technology, 1981. Dr. Liebst's research interests include Eigen structure assignment and control, stability and control of aerospace vehicles, passive and active control of large flexible structures, and aircraft handling qualities. He has published more than 30 articles and reports and chaired more than 40 theses and dissertations. Prior to teaching at AFIT, Dr. Liebst was Assistant Professor of Aerospace Engineering for six years at the University of Minnesota where he was voted the 1987 Best Institute of Technology (U of M) Professor. Tel. 937-255-3636 x4636, Email: Bradley.Liebst@afit.edu

**LINGENFELTER, ANDREW J., Maj**
Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2016 (AFIT/ENY); BS, Mechanical Engineering, University of Nebraska – Lincoln, 2008; MEng, Industrial and Systems Engineering, University of Florida, 2011; PhD, Aeronautical Engineering, Air Force Institute of Technology, 2016. Maj Lingenfelter’s research interests include aircraft survivability, weapons, weapons testing, and additive manufacturing. His previous research has focused on flow visualization and ballistically induced failure of aircraft fuel tanks. Maj Lingenfelter is a member of AIAA, Tau Beta Pi, and Sigma Gamma Tau. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4348, Email: Andrew.Lingenfelter@afit.edu

**Sponsor Funded Research Projects**

“Ballistic Properties of Additively Manufactured Structures.” Sponsor: JASPO. Funding: $74,000 - Lingenfelter 70%, O'Hara 30%.

“Combat Aircraft Survivability Education.” Sponsor: JASPO. Funding: $34,000.

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**LITTLE, BRYAN D., Lt Col**
Assistant Professor of Astronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2019 (AFIT/ENY); BS, Aerospace Engineering, University of Washington, 2004; MS, Astronautical Engineering, Air Force Institute of Technology, 2009; PhD, Astronautic Engineering, Purdue University, 2019. Lt Col Little’s research interests include space situational awareness, astrodynamics, cis-lunar orbits, and satellite systems. Lt Col Little is a member of the American Astronautical Society and AIAA. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4901, Email: Bryan.Little@afit.edu

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**MEYER, DAVID W.**
Adjunct Instructor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date Sep 2019 (AFIT/ENY); BS, Mechanical Engineering, the Ohio State University, 1987; MS, Mechanical Engineering, Naval Postgraduate School, 1994; MS Operations Research, Naval Postgraduate School, 2007. Mr. Meyer’s research interests include space domain awareness, space warfighting and strategy, modeling and simulation, combat modeling and high performance computing. Tel. 937-255-3636 x4512, Email: David.Meyer@afit.edu

**Sponsor Funded Research Projects**

“Space Modeling and Simulation.” Sponsor: JWAC. Funding: $60,000.

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $140,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%. [CSRA]


**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**PALAZOTTO, ANTHONY N.**
Distinguished Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1975 (AFIT/ENY); BS, New York University, 1955; MS, Brooklyn Polytechnic Institute, 1961; PhD, New York University, 1968. Dr. Palazotto’s interests include nonlinear mechanics, shell analysis, finite elements, composite materials, viscoplasticity, and nonlinear dynamics. Dr. Palazotto is the co-author of a textbook, “The Nonlinear Analysis of Shell Structures,” published in 1992 by the AIAA. In addition, he has authored 248 archival technical publications and more than 600 technical presentations and manuscripts. Dr. Palazotto received the Hetanyi Award in 1982 from the Society of Experimental Mechanics, the Cleary Award in 1981 from the Air Force Materials Lab, the Structures and Materials Award from the ASCE in 1986, and the AIAA Sustained Service Award in 2004. Dr. Palazotto is a Fellow of the ASCE, a Fellow of the AIAA, a Fellow of the American Academy of Mechanics, and a Fellow of the Engineering Mechanics Institute. He has advised more than 180 MS theses, 35 Doctoral dissertations and 15 Post Docs. He is a registered Professional Engineer in the State of Ohio. Tel. 937-255-3636 x4599, Email: Anthony.Palazotto@afit.edu

**Sponsor Funded Research Projects**


“High Strain Rate Wear Model.” Sponsor: AFRL/RQ. Funding: $25,000.


“Predictive Model for Behavior of Bolted Composite/Metallic Laminate Joint.” Sponsor: AFRL/RQ. Funding: $21,714.
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


POLANKA, MARC D.
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2009 (AFIT/ENY); BS, Mechanical Engineering, University of Dayton, 1992; MS, Mechanical Engineering, Stanford University, 1993; PhD, Mechanical Engineering, University of Texas, 1999. Prior to accepting a position with AFIT, Dr. Polanka served 17 years in the Turbine Engine Division of the Air Force Research Laboratory’s Propulsion Directorate. His research interests include aspects of heat transfer, combustion, and fluid mechanics including experimental applications involving turbine and combustor aerodynamics, and cooling techniques. He has been published in a variety of journals including the AIAA Journal of Propulsion and Power, the ASME Journal of Turbomachinery, and the Journal of Engineering for Gas Turbines and Power. Dr. Polanka has two patents to his credit. He is an Associate Fellow of the AIAA, the past Section Chair of the Dayton-Cincinnati Section of the AIAA, and the Honors and Awards Chair for the same section. Dr. Polanka serves as the Chair of the AIAA Associate Fellows Selection Committee and is the Faculty Representative for the AFIT Student Section branch of AIAA. Additionally, he is a Fellow of the ASME and serves as the Vice Chair of the K-14 Heat Transfer Committee of the International Gas Turbine Institute where he is also a past Point Contact for the annual Turbo Expo conference. He is currently serving as an Associate Editor of the ASME Journal of Engineering for Gas Turbines and Power.
Tel. 937-255-3636 x4714, Email: Marc.Polanka@afit.edu

Sponsor Funded Research Projects

“Combustion Physics under High Centripetal Acceleration.” Sponsor: AFOSR. Funding: $55,983 - Polanka 85%, Rutledge 15%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Editorships in Professional Journals

Associate Editor: *ASME Journal of Engineering for Gas Turbines and Power*

Associate Editor: *The JANNAF Journal*

Patent Applications


60
Other Significant Research Productivity


REEDER, MARK F.
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2002 (AFIT/ENY); BS, Mechanical Engineering, West Virginia University, 1989; MS, Mechanical Engineering, The Ohio State University, 1991; PhD, Mechanical Engineering, The Ohio State University, 1994. Prior to accepting a position with AFIT, Dr. Reeder served as an NRC Research Associate at NASA Glenn and subsequently as the manager of Research and Development for a manufacturer of industrial mixing equipment. His research interests include all aspects of fluid mechanics with an emphasis on experimental applications involving external aerodynamics, mixing enhancement, and propulsion. His publications include characterizations of store separation from a cavity utilizing pressure sensitive paint and measurements relating to several types of aircraft using 6-DOF balances, particle image velocimetry, filtered Rayleigh scattering, and other diagnostic tools. Dr. Reeder has also recently published in the area of low temperature ablation in a supersonic flow as applied to thermal management systems for space access vehicles. He has been published in a variety of journals including Experiments in Fluids, Journal of Fluid Mechanics, AIAA Journal, AIAA Journal of Propulsion and Power, AIAA Journal of Aircraft, AIAA Journal of Spacecraft and Rockets, Physics of Fluids, NASA Tech Briefs, AIChE Journal, and Chemical Engineering Progress. Dr. Reeder also has four patents to his credit, is a licensed Professional Engineer in the State of Ohio and is an elected member of the Academy of Distinguished Alumni, Department of Mechanical and Aerospace Engineering, West Virginia University. He currently serves on the editorial board of the International Journal of Micro Air Vehicles. Dr. Reeder is an Associate Fellow of the AIAA and a member of ASME. Tel. 937-255-3636 x4530, Email: Mark.Reeder@afit.edu

Sponsor Funded Research Projects

“Drop Testing in the AFIT Small Supersonic Tunnel with Ejection Mechanism.” Sponsor: AFRL/RQ. Funding: $28,277 - Reeder 40%, Freeman 30%, Walker 30%.

“Force and Moment Coefficients for Miniature Self-Defense Munition (MSDM) Geometry.” Sponsor: Lockheed Martin. Funding: $40,000 - Reeder 50%, Crowe 50%.

“Hypersonic Aerodynamic Studies using AFRL Facilities.” Sponsor: AFRL/RQ. Funding: $15,000 - Reeder 50%, Komives 50%.

“Measurements and Analysis of Wall Effects on Rotating Engine Components.” Sponsor: AFRL/RQ. Funding: $20,000.

Refereed Journal Publications


RUGGLES WRENN, MARINA B.
Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2003 (AFIT/ENY); BS, Polytechnic Institute of New York, 1981; MS, Rensselaer Polytechnic Institute, 1983; PhD, Rensselaer Polytechnic Institute, 1987. Dr. Ruggles-Wrenn’s interests center on mechanics of materials and structures, including experimental investigation of material behavior in extreme environments, advanced structural materials, high-temperature structural design methods, and viscoplasticity. She has published more than 150 peer reviewed scientific publications. Dr. Ruggles-Wrenn received several research and best paper awards, including Stinson Trophy of the National Aeronautic Association, Col Gage H. Crocker Outstanding Professor Award, and the AFIT Instructor of the Quarter Award. Prior to joining AFIT, she was a research scientist at the Oak Ridge National Laboratory (1987-2003). Dr. Ruggles-Wrenn is a member of the Editorial Board of *Applied Composite Materials* and an Associate Technical Editor of the *ASME Journal of Pressure Vessel Technology*. She is a Fellow of the American Society of Mechanical Engineers (ASME), and a member of the American Ceramic Society. Tel. 937-255-3636 x4641, Email: Marina.Ruggles-Wrenn@afit.edu

Sponsor Funded Research Projects

“Characterization of Creep Behavior of an EBC Coated SiC/SiC CMC in Air and in Steam Environment.” Sponsor: AFRL/RX. Funding: $20,000.

“Durability of Bonded CMC Joints under Sustained Loading at Elevated Temperature in Air and in Steam Environment.” Sponsor: AFRL/RX. Funding: $20,000.

“Static Fatigue of SiC Fiber in Air and Si(OH)4 Saturated Steam.” Sponsor: AFRL/RX. Funding: $10,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Editorships in Professional Journals


Member of the Editorial Board: Applied Composite Materials – International Journal for the Science and Application of Composite Materials

Associate Technical Editor: ASME Journal of Pressure Vessel Technology

RUTLEDGE, JAMES L., Lt Col
Associate Professor of Aerospace Engineering; Department of Aeronautics and Astronautics, AFIT Appointment Date: 2011 (AFIT/ENY); BS, Mechanical Engineering, University of Texas at Austin, 2002; MS, Mechanical Engineering, University of Texas at Austin, 2004; PhD, Aeronautical Engineering, Air Force Institute of Technology, 2009. Lt Col Rutledge’s research interests include experimental and computational investigations of gas turbine heat transfer, unsteady fluid mechanics, inverse heat transfer, and aerothermodynamics. He holds a patent, has published 28 archival journal articles and was awarded the Rohsenow Prize in 2008 by ASME, as well as an ASME Best Paper award in 2017. Lt Col Rutledge is a member of the ASME K-14 Gas Turbine Heat Transfer Committee, ASME, AIAA, and Tau Beta Pi. He is an associate editor for the ASME Journal of Turbomachinery, a registered professional engineer in the State of Texas, and has deployed to Afghanistan in support of Operation Enduring Freedom. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4734, Email: James.Rutledge@afit.edu

Sponsor Funded Research Projects

“Advanced Film Cooling Technique Development.” Sponsor: AFRL/RQ. Funding: $36,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Editorships in Professional Journals

Associate Editor: ASME Journal of Turbomachinery.

Patent Applications


SCHAUER, FRED R.

Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: Jan 2019 (AFIT/ENY); BS, Mechanical Engineering, University of Dayton, 1993; PhD, Mechanical Engineering, University of Illinois at Urbana-Champaign, 1998; Air War College, 2008. Dr Schauer’s research interests include energy, propulsion, and power. In particular, he is active in developing novel cycles. From 1997 – 2019, he served as the principal investigator for AFRL’s in-house detonation propulsion research program. Starting from AF sponsored dissertation research on laser diagnostics and modeling flame/turbulence interactions, he eventually led the Propulsion and Power Advanced Concepts Group, which includes the Detonation Engine Research Facility and the Small Engine Research Laboratory. Prior to joining AFIT fulltime, Dr. Schauer served as a research advisor for numerous MS and PhD students, and he maintains collaborations with other research institutions including AFRL, NASA, DOE, and other academic institutions. His research group has published extensively and been recognized by AIAA, ASME, AFOSR, and AFRL, including the AFRL Commander’s Cup and Innovation Award, the AFRL Science & Technology Achievement Award (two times), the ASME Airbreathing Propulsion Award, and as finalists for both the Collier Trophy and Aviation Laureate. Dr. Schauer is an AFRL Fellow and was named both the Air Force Scientist of the Year and AIAA Engineer of the Year. Tel. 937-255-3636 x4204, Email: Fred.Schauer@afit.edu

Sponsor Funded Research Projects

“Novel Cycle Research.” Sponsor: AFRL/RQ. Funding: $20,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


THOMAS, LEVI M., Maj
Associate Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2017 (AFIT/ENY); BS, Aeronautical Engineering, United States Air Force Academy, 2006; MS, Aeronautical Engineering, Air Force Institute of Technology, 2009; AA, Foreign Language, Defense Language Institute, 2011; PhD, Mechanical Engineering, Purdue University, 2017. Maj Thomas’ research interests include optical diagnostics, high-speed measurement techniques, and combustion. Maj Thomas has experience as an intelligence analyst (air-to-air weapons), as a combustion research engineer (detonation combustion), and as an exchange officer working with the German Aerospace Center (combustion physics). His previous research includes detonation measurements, as well as laser-based velocity and temperature measurements. Maj Thomas’ professional memberships include AIAA, ASME, and the Combustion Institute. He is also a registered professional engineer in the state of Colorado. Maj Thomas deployed to Iraq in 2018 in support of Operation Inherent Resolve. Tel. 937-255-3636 x4500, Email: Levi.Thomas@afit.edu

**Sponsor Funded Research Projects**


**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**

WALKER, MICHAEL M., Lt Col
Assistant Professor of Aerospace Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2018 (AFIT/ENY); BS, Aeronautical Engineering, United States Air Force Academy, 2003; MS, Aeronautical Engineering, Air Force Institute of Technology, 2007; MBA, Amberton University, 2008; PhD, Aerospace Engineering, The Ohio State University, 2018. Lt Col Walker’s research interests include low-speed aerodynamics, swept-wing performance, active flow control, experimental fluid mechanics, combat aircraft survivability, and composite armor testing. He is a developmental engineer with experience at the Air Force Research Laboratory (AFRL), Hanscom AFB, the National Air and Space Intelligence Center (NASIC), Wright-Patterson AFB, and the Launch and Range Systems Directorate (LRS), Los Angeles AFB. Lt Col Walker deployed to Kandahar Airfield, Afghanistan in support of Operation Enduring Freedom, and is a member of Sigma Gamma Tau and AIAA. Tel. 937-255-3636 x4745, Email: Michael.Walker@afit.edu

WIESEL, WILLIAM E., Jr.
Professor of Astronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 1977 (AFIT/ENY); BS, University of Massachusetts, 1970; MS, Harvard University, 1972; PhD, Harvard University, 1974. Dr. Wiesel's research interests include applications of dynamical systems theory to orbital mechanics and astrodynamics, especially KAM theory, estimation and control, planetary astronomy, stability theory, and optimal control. He is the author of Spaceflight Dynamics, a leading introductory text on astronautical engineering. Dr. Wiesel has authored more than 50 technical papers and has been a member of the Department of Aeronautics and Astronautics for 40 years. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4312, Email: William.Wiesel@afit.edu

Sponsor Funded Research Projects

“Onboard SmallSat Navigation and Mission Planning.” Sponsor: AFRL/RV. Funding: $40,000. [CSRA]

Refereed Journal Publications


ZAGARIS, COSTANTINOS, Maj
Assistant Professor of Astronautical Engineering, Department of Aeronautics and Astronautics, AFIT Appointment Date: 2018 (AFIT/ENY); B.S. Aerospace Engineering, Virginia Tech, 2007; MS, Astronautical Engineering, Air Force Institute of Technology, 2012; PhD, Astronautical Engineering, Naval Postgraduate School, 2018. Maj Zagaris’ research interests include autonomous spacecraft guidance, spacecraft relative motion dynamics, optimal control, and reachability. Tel. 937-255-3636 x4774, Email: Costantinos.Zagaris@afit.edu

Sponsor Funded Research Projects

“Multiagent Robotics for On-orbit Servicing.” Sponsor: AFRL/RV. Funding: $50,008 - Zagaris 50%, Leishman 50%. [CSRA/ANT]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review

### 5.2 DEPARTMENT OF ENGINEERING PHYSICS

Access Phone 937-255-2012, DSN 785-2012  
Fax: 937-656-6000, DSN 786-6000  
Homepage: [http://www.afit.edu/ENP/](http://www.afit.edu/ENP/)

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5.2.1 DOCTORAL DISSERTATIONS

DODSON, TABITHA, Investigations of Point Defects in KH2PO4 Crystals Using Ab Initio Quantum Methods. AFIT-ENP-DS-19-S-021. Faculty Advisor: Dr. Nancy C. Giles. Sponsor: N/A.

DUGAN, CHRISTINA, Electrical Characterization of Crystalline UO2, ThO2, and U0.71Th0.29O2. AFIT-ENP-DS-18-D-007. Faculty Advisor: Dr. James C. Petrosky. Sponsor: DHS/DNDO.

LENYK, CHRISTOPHER, Point Defects in Lithium Gallate and Gallium Oxide. AFIT-ENP-DS-19-S-023. Faculty Advisor: Dr. Nancy C. Giles. Sponsor: AFIT/EN.

LLOYD, ROBERT L., Numerical Simulation of Unstable Laser Resonators with a High-Gain Medium. AFIT-ENP-DS-19-S-024. Faculty Advisor: Dr. David E. Weeks. Sponsor: N/A. [CDE]


YOUNG, SHANNON, Optimization of a Moment-Based Detection Algorithm. AFIT-ENP-DS-18-D-010. Faculty Advisor: Dr. Kevin C. Gross. Sponsor: NGA.
5.2.2 MASTER'S THESES


BROWNLEE, LAUREN E., Battle Damage Assessment with Optical Cross Section Measurements. AFIT-ENP-MS-19-S-018. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: Raytheon SAS. [CDE]


EGNER, BRYAN, Development of a Mixed-Radiation Directional Rotating Scatter Mask Detection System. AFIT-ENP-MS-19-M-075. Faculty Advisor: Dr. Larry W. Burggraf Sponsor: DTRA.

ETHRIDGE, JAMES A., Computational and Experimental Development of 2D Anisotropic Photonic Crystal Metamaterials. AFIT-ENP-MS-19-M-077. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR/RT. [CDE CTISR]


HALL, AMY, Development of a Model for C-11 Production Via the N-14(p,alpha) Reaction Using a GE PETtrace Cyclotron. AFIT-ENP-MS-19-M-080. Faculty Advisor: Maj James E. Bevins. Sponsor: AFTAC.

HANSON, WILLIAM, Analysis of the Gálvez-Davison Index for Convective Forecasting over Africa Using the GALWEM. AFIT-ENP-MS-19-M-081. Faculty Advisor: Lt Col Hsien-Liang Tseng. Sponsor: N/A.


KATUZIENSKI, DANIEL, Comparing Dual-Polarization Radar Lightning Forecast Methods Across Southwest Utah. AFIT-ENP-MS-19-M-083. Faculty Advisor: Maj Omar A. Nava. Sponsor: 45 WS.


QUARTEMONT, NICHOLAS, Nuclear Data Covariance Analysis of an Energy Tuning Assembly for Simulating Nuclear Weapon Environments. AFIT-ENP-MS-19-M-089. Faculty Advisor: Maj James E. Bevins. Sponsor: AFTAC.

ROUND, JOSEPH F., Variations of Heavy Ion Abundances Relative to Proton Abundances In Large Solar Energetic Particle Events. AFIT-ENP-MS-19-M-090. Faculty Advisor: Dr. Robert D. Loper. Sponsor: AFRL/RV. [CSRA]


WOLFMeyer, Scott S., Coupled Atmospheric Surface Observations with Surface Aerosol Particle Counts for Daytime Sky Radiance Quantification. AFIT-ENP-MS-19-M-095. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: DEJTO. [CDE]

5.2.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT
Notes: Research Center affiliations are listed in [ ] if applicable.

BAILEY, WILLIAM F.
Associate Professor Emeritus of Physics, Department of Engineering Physics, AFIT Appointment Date: 1978 (AFIT/ENP); BS, United States Military Academy, 1964; MS, The Ohio State University, 1966; PhD, Air Force Institute of Technology, 1978. Dr. Bailey’s research interests center on weakly ionized gases and reactive kinetics with special applications to semiconductor processing in gas discharges, shock characterization in ionized flows, and solutions of the inhomogeneous electron kinetic equation. Dr. Bailey has published more than 20 papers in refereed conference proceedings and international journals, and has chaired more than 25 theses and dissertations. He is a member of Tau Beta Pi, Sigma Pi Sigma, and Sigma Xi. Tel. 937-255-3636 x4501, Email: William.Bailey@afit.edu

BEVINS, JAMES E., Maj
Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2017 (AFIT/ENP); BS, Nuclear Engineering, University of Tennessee, 2009; MS, Nuclear Engineering, Air Force Institute of Technology, 2011; PhD, Nuclear Engineering, University of California – Berkeley, 2017. Maj Bevins’ research interests include experimental and modeling research in the areas of nuclear forensics, nuclear detection, nuclear data, radiation transport, and applied optimization design of nuclear systems. Maj Bevins has authored 12 refereed archival journal publications and 22 refereed conference proceedings. He holds two notices of invention and two provisional patents. He has successfully advised five MS students and is currently advising two MS students and four PhD students. AFIT Research affiliation(s): NEAT. Tel. 937-255-3636 x4767, Email: James.Bevins@afit.edu

Sponsor Funded Research Projects

“Endowed Term Chair.” Sponsor: AFTAC/AFTAC. Funding: $33,333.

“Nuclear Survivability Experimentation, Modeling, and Data Verification.” Sponsor: NNSA. Fund: $200,000 - Bevins 55%, Hobbs 20%, Dexter 15%, McClory 10%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Patent Applications**


**BICKLEY, ABIGAIL A.**

Research Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2017 (AFIT/ENP); BA, Dartmouth College, 2000; PhD, University of Maryland, 2004. Dr. Bickley’s expertise is in nuclear forensics and radiation transport. Her current research focuses on the characterization of radiological and nuclear samples for nuclear forensics signature identification and software development of statistical analysis tools for nuclear forensics applications. In addition, Dr. Bickley is examining neutral particle transport in the space environment. Before joining AFIT, she was on the faculty of Michigan State University and worked in nuclear treaty monitoring. Dr. Bickley is a member of the American Physical Society (APS) and American Chemical Society (ACS). Tel. 937-255-3636 x4555, Email: Abigail.Bickley@afit.edu

**Sponsor Funded Research Projects**

“Support for the US Nuclear Detonation Detection System.” Sponsor: DOE/NNSA. Funding: $50,000. Bickley 50%, McClory 50%. [NEAT]

**Other Significant Research Productivity**


BOSE-PILLAI, SANTASRI R.
Research Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2011 (AFIT/ENP); BE, Electrical Engineering, Jadavpur University (India), 2000; MS, Electrical Engineering, New Mexico State University, 2005; PhD, Electrical Engineering (with emphasis on Optics), New Mexico State University, 2008.
Dr. Bose-Pillai’s research interests are in propagation and imaging through the atmosphere, generation of partially coherent sources, telescope pointing and tracking, and laser communications through free space. At AFIT, she has been working on remote characterization of atmospheric turbulence using imaging and other optical techniques. She has also been investigating methods for generation of different types of partially coherent sources. Dr. Bose-Pillai has more than fifty journal and conference publications to her credit. Prior to joining AFIT, she was a Visiting Assistant Professor in the Physics and Optical Engineering Department at Rose-Hulman Institute of Technology, Terre Haute, IN. She is a Senior Member of SPIE, and a regular member of OSA and DEPS. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4903, Email: Santasri.Bosepillai.ctr@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


Invention Disclosures


BURGGRAF, LARRY W.
Professor of Engineering Physics and Chemical Physics, Department of Engineering Physics, AFIT Appointment Date: 1994 (AFIT/ENP); BA, Chemistry, Olivet Nazarene University, 1968; MS, Chemistry, The Ohio State University, 1971; MA, Applied Mathematics, University of West Florida, 1977; PhD, Chemistry, University of Denver, 1981; Post-doctoral Associate, Computational Chemistry, Iowa State University, 1993. Dr. Burggraf conducts experimental and theoretical research in physical chemistry and materials chemistry including radiation biophysics, exotic atom chemistry, positron spectroscopy, surface and cluster spectroscopy, excitonic nanomaterials, atomic force microscopy, gamma spectroscopy, and gamma imaging to solve DOD, DHS, and DOE problems in WMD non-proliferation. Theoretical research to model surfaces, clusters, nanomaterials and exotic-atom molecules applies quantum mechanics modeling to interpret experimental results. Dr. Burggraf has authored more than 55 refereed archival publications. He holds one patent. He has successfully advised 43 Master’s students, eight PhD students, and is currently advising one MS and one PhD student. Tel. 937-255-3636 x4507, Email: Larry.Burggraf@afit.edu

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


Other Significant Research Productivity


BURGI, KENNETH W., Lt Col
Assistant Professor of Optical Engineering, Department of Engineering Physics, AFIT Appointment Date: 2016 (AFIT/ENP); BS, Michigan Technological University, 2002; MS, Michigan Technological University, 2010; PhD, Air Force Institute of Technology, 2016. Lt Col Burgi’s research focus is primarily the development of methods to control reflectively scattered light from rough surfaces. These methods could be used to reconstruct images of objects without direct line-of-sight using scattered light. As a former instructor pilot, Lt Col Burgi has deployed three times in support of Operation Enduring Freedom and Operation Iraqi Freedom. He has flown 1,295 combat flight hours in 363 combat sorties in the C-17 and MC-12 aircraft. He has published two referred journal articles and three conference publications. Lt Col Burgi is a member of SPIE and the current Engineering Physics Interim Department Head. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4696, Email: Kenneth.Burgi@afit.edu

Sponsor Funded Research Projects

“Dynamic Data Driven Phase Optimization for Controlling Light Scattered by a Rough Surface.” Sponsor: AFOSR. Funding: $37,290 - Burgi 75%, Marciniak 15%, Oxley 10%. [CDE/CTISR]

Refereed Conference Papers Accepted on the Basis of Abstract Review


BUTLER, SAMUEL D., Lt Col
Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Applied Physics (Computer Science Emphasis), Brigham Young University, 2004; MS, Physics, Air Force Institute of Technology, 2010; PhD, Physics, Air Force Institute of Technology, 2015. Lt Col Butler’s research is primarily focused on development of optical scatter models for use in remote sensing applications, particularly in the IR. He has also previously been involved in munitions development, quantum mechanical scattering, cryptography, and quantum information. Lt Col Butler has published two refereed journal articles and eight conference presentations. He has also deployed to Afghanistan as a deputy IG in support of Operation Enduring Freedom in 2011, and to Southwest Asia in 2016. Lt Col Butler is a member of SPIE, and is the AFIT chapter co-advisor of SPIE. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4385, Email: Samuel.Butler@afit.edu

Sponsor Funded Research Projects

“Analysis of Modified Microfacet BRDF Models for Polarimetric Optical Scatter.” Sponsor: AFOSR. Funding: $45,200 - Butler 75%, Marciniak 25%. [CDE/CTISR]

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


CAYLOR, MICHAEL J.
Associate Director, Center for Technical Intelligence Studies and Research, and Research Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2017 (AFIT/ENP); BS, Aerospace Engineering, University of Notre Dame, 1981; MS, Aerospace Engineering, University of Notre Dame, 1983; MS, Engineering Management, Florida Institute of Technology, 1985; PhD, Aerospace Engineering, University of Notre Dame, 1993. AFIT research center affiliation(s): CTISR. Tel. 937-255-3636 x4565, Email: Michael.Caylor@afit.edu

CLINTON, JUSTIN A.
Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2013 (AFIT/ENP); BS, Nuclear Engineering, Rensselaer Polytechnic Institute, 2004; PhD, Nuclear Engineering, Rensselaer Polytechnic Institute, 2011. Dr. Clinton’s research interests are in the areas of computational methods for radiation transport, mixed radiation production using pulsed power sources, and developing a strategic-level nuclear wargaming framework. Research conducted in these areas has resulted in verification of an updated industry standard transport code, providing confidence in ongoing radiation protection characterization of military vehicles. Collaborators include government laboratories such as the Army and Air Force Research Laboratories, Air Force Office of Scientific Research, the Defense Threat Reduction Agency, The Ohio University, University of Michigan, and DOE Laboratories. Dr. Clinton is a member of the American Nuclear Society, as well as the Institute of Electrical and Electronics Engineers. AFIT research center affiliation(s): ANT, NEAT. Tel. 937-255-6565 x4586, Email: Justin.Clinton@afit.edu

Sponsor Funded Research Projects


Refereed Journal Publications


DEXTER, MICHAEL L., Lt Col
Deputy Department Head, Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT
Appointment Date: 2017 (AFIT/ENP); BS, Applied Physics, University of Nebraska at Omaha, 2004; MS, Applied
Physics, Air Force Institute of Technology, 2009; PhD, Nuclear Physics, Air Force Institute of Technology, 2015. Lt
Col Dexter’s research interests include the physics of high density plasmas, intense light physics, nuclear forensics,
nuclear effects modelling and simulation, laser effects on materials, digital image processing, and advanced
technology development. Tel. 937-255-3636 x4742, Email: Michael.Dexter@afit.edu

Sponsor Funded Research Projects

“Nuclear Survivability Experimentation, Modeling, and Data Verification.” Sponsor: NNSA. Fund: $200,000 - Bevins
55%, Hobbs 20%, Dexter 15%, McClory 10%.

Refereed Journal Publications

Will D. Johnston, Michael L. Dexter, John W. McClory, and James E. Bevins, “Validation of the Impact of Reflected
Shock on Surface Interacting Nuclear Detonations,” Hardened Electronics and Radiation Technology Conference,
JRERE, San Diego, CA, April 2019. [NEAT]

Testing of a Simulated NUDET Optical Detection Model Using Realistic Weather Conditions,” Hardened

EMMONS, DANIEL J., Maj
Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2017 (AFIT/ENP); BS,
Physics, San Diego State University, 2007; MS, Applied Physics, Air Force Institute of Technology, 2012; PhD,
Applied Physics, Air Force Institute of Technology, 2017. Maj Emmons’ research interests center on computational
gas discharge modeling, plasma kinetics, and the effects of ionospheric disturbances on high frequency radio wave
propagation. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4571, Email: Daniel.Emmons@afit.edu

Sponsor Funded Research Projects

“GPS Radio Occultation Data.” Sponsor: AFRL/RV. Funding: $16,100. [CSRA]

“Modeling and Characterization of the Hypersonic Vehicle Operations Environment.” Sponsor: DARPA. FundoFg:
$158,947 - Tseng 31%, Loper 23%, Emmons 23%, Tournay 23%.

Refereed Conference Papers Accepted on the Basis of Abstract Review

over North America,” Abstract EGU2019-6057, Presentation: EGU General Assembly, Vienna, Austria, 7-11 Apr,
2019.

“Environmental Characterization of the Atmosphere Using WACCM-X,” Abstract EGU2019-18650, Presentation:
EGU General Assembly, Vienna, Austria, 7-11 Apr 2019.

Other Significant Research Productivity

Presented research at classified Technical Exchange Meeting held at AFRL with 50+ participants from MIT/LL, SMC,
Naval Research Laboratory, IARPA, and several universities.

Nava, O.A., Emmons, D.J., and Loper, R., “Modulation of Lightning Occurrence by the Solar Wind,” Japan
Geoscience Union Meeting, Tokyo, Japan, May 2019. [CSRA]

North America,” European Geosciences Union General Assembly, Vienna, Austria, Apr 2019.
FEE, JAMES R., Jr., Col
Section Commander, AU Det 1; Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Purdue University, 1997; MS, Air Force Institute of Technology, 2002; PhD, Air Force Institute of Technology, 2015. Col Fee’s research is primarily focused on computational simulation of nuclear weapon effects with a focus in electromagnetic pulse. He has also previously managed radiation hardened microelectronics programs for satellite and missile systems. Col Fee has published two refereed journal articles in open literature, one refereed journal article in classified literature, and one conference presentation. He also deployed to Iraq as an Intelligence Advisor in support of Operation New Dawn. Col Fee holds a Master of Military Operational Art and Science from Air University (2012). Tel. 937-255-3636 x4438, Email: James.Fee@afit.edu

FERDINANDUS, MANUEL R.
Research Assistant Professor of Optical Sciences, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); BS, Seattle University, 1999; MS, Rochester Institute of Technology, 2007; PhD, University of Central Florida, 2014. Dr. Ferdinandus performs research on nonlinear optics, optical limiting, infrared laser sources, and hyperspectral target detection. Previously, he worked in space operations and satellite system acquisition. Dr. Ferdinandus is a member of the Optical Society of America. AFIT research center affiliation(s): CDE. Tel. 937-255-6565 x4339, Email: Manuel.Ferdinandus@afit.edu

Sponsor Funded Research Projects

“Airy and Non-Gaussian Beam Testbed.” Sponsor: AFRL/RY. Funding: $63,024 - Ferdinandus 90%, Perram 10%. [CDE]


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


FIO RINO, STEVEN T.
Director, Center for Directed Energy, and Professor of Atmospheric Physics, Department of Engineering Physics, AFIT Appointment Date: 2003 (AFIT/ENP); BS, Geography (Climatology), The Ohio State University, 1987; BS, Meteorology, Florida State University, 1989; MS, Atmospheric Dynamics, The Ohio State University, 1993; PhD, Physical Meteorology, Florida State University, 2002. Dr. Fiorino’s research interests include retrieving environmental parameters via microwave remote sensing, developing signal processing algorithms to fuse meteorological data collection with non-weather ISR platforms, evaluating uncertainty in high-energy laser engagement due to atmospheric effects, and improving microphysical characterizations for nuclear fallout, transport, and dispersion. He has published broadly in meteorological, directed energy, and military journals. Dr. Fiorino is a member of the American Meteorological Society (AMS), American Institute of Aeronautics and Astronautics (AIAA), the Directed Energy Professional Society (DEPS), Society of Photo-Instrumentation Engineers SPIE), and the Optical Society (OSA). He also holds a Master of Military Operational Art and Science from Air University (2003). AFIT research center affiliation(s): CDE and CSRA. Tel. 937-255-3636 x4506, Email: Steven.Fiorino@afit.edu

Sponsor Funded Research Projects

“2019 AFIT Center for Directed Energy Summer Intern (DESI) Program.” Sponsor: DEJTO. Funding: $125,000. [CDE]

“2019 AFIT Center for Directed Energy DoD HPCMP HPC Internship Program (HIP).” Sponsor: HPCMP. Funding: $25,000. [CDE]


“Airborne Aero-Optics Laboratory-Beam Control.” Sponsor: DEJTO. Funding: $120,000. [CDE]

“Atmospheric Effects Inputs for HEL JWS and JLaSE.” Sponsor: OSD. Funding: $110,000. [CDE]

“CY2019 DE JTO AP TAWG Research and Analysis.” Sponsor: DEJTO. Funding: $400,000. [CDE]

“CY2019 DE JTO M&S TAWG Research and Analysis.” Sponsor: DEJTO. Funding: $400,000. [CDE]

“Extended-Range Comprehensive Atmospheric Optics Sensing (ERCAOS) Experimental Campaign.” Sponsor: DARPA. Funding: $150,000. [CDE]

“Probabilistic and Predictive HEL Performance Analyses for SDPE.” Sponsor: AFLCMC. Funding: $100,000. [CDE]

“Sensor Weather Effects Modeling.” Sponsor: AFRL/RY. Funding: $125,000. [CDE]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


**Editorships in Professional Journals**


**Patent Applications**


**FRANZ, ANTHONY L., Lt Col**

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, United States Air Force Academy, 1992; MS, Air Force Institute of Technology, 1997; PhD, University of Maryland, 2007. Lt Col Franz’s research focuses on lasers and optics. His recent work has focused on developing light weight diffractive optics for use on satellites and novel approaches for imaging and hyperspectral imaging systems. Before joining AFIT, he was a physics faculty member at the Air Force Academy for eight years, and deployed to Iraq and Afghanistan. He has also worked in nuclear treaty monitoring, and infrared missile engagement modeling and simulation. Lt Col Franz is a member of the American Association of Physics Teachers (AAPT), the American Physical Society (APS), the International Society for Optics and Photonics (SPIE), and the Optical Society of America (OSA). AFIT research center affiliation(s): CTISR. Tel. 937-255-3636 x4429, Email: Anthony.Franz@afit.edu

**Sponsor Funded Research Projects**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**GILES, NANCY C.**

Executive Associate Dean for Strategies, Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2009 (AFIT/ENP); and 2019 (AFIT/EN); BS, University of North Carolina at Chapel Hill, 1981; PhD, North Carolina State University, 1987. Dr. Giles’ research focuses on solid-state physics: photoluminescence (PL), absorption, Raman, and magnetic resonance (EPR) spectroscopy leading to identification of point defects in semiconducting and optical materials, PL excitation and time-resolved PL spectroscopies, nonlinear optical materials, laser-host materials, and scintillators. She is the author of 198 archival publications in refereed journals and two book chapters. Before joining AFIT, she was a physics faculty member at West Virginia University for 19 years. She has over 5,000 citations of her papers; her h-index is 37. Current work includes wide bandgap materials for power electronics, scintillator and radiation detection materials, photorefractives, and nonlinear optical materials of interest to AFRL/RX for infrared countermeasures. Dr. Giles is a member of the Optical Society of America, American Physical Society, and Materials Research Society. Tel. 937-255-3636 x4601, Email: Nancy.Giles@afit.edu
Sponsor Funded Research Projects

“Optical and EPR Characterization of CdSiP2 Crystals.” Sponsor: AFRL/RX. Funding: $30,000.

Refereed Journal Publications


Other Significant Research Productivity


GROSS, KEVIN C.
Director, Center for Technical Intelligence Studies and Research, and Associate Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Wright State University, 1998; MS, Wright State University, 2001; PhD, Air Force Institute of Technology, 2007. Dr. Gross’ main interests are remote sensing, spectroscopy, radiative transfer, and developing physics-based algorithms to exploit electro-optical data. He has chaired eleven MS thesis efforts and six PhD dissertations, co-authored 94 papers (32 archival publications), and served as co-PI on externally-funded research projects exceeding $9M. He has taught graduate courses in electrodynamics, quantum mechanics, atomic and molecular spectroscopy, radiative transfer, radiometry and detection, and hyperspectral imaging. His diverse research background includes: (1) field measurements of transient battlespace combustion events (munition and IED detonations, afterburning aircraft, rocket motors); (2) development of hyperspectral combustion diagnostics (lab flames; scramjets); (3) environmental remote sensing (smokestack effluents); (4) algorithm development for persistent infrared target tracking and detection; (5) polarimetric hyperspectral imaging for material discrimination and identification; (6) field measurements of disturbed earth (buried IED’s); (7) atmospheric compensation of hyperspectral imagery; (8) non-destructive evaluation of materials; (9) architecting, training, and hardening AI/ML algorithms for sensor data exploitation via physics-based machine learning. AFIT research center affiliation(s): CTISR. Tel 937-255-3636 x4558, Email: Kevin.Gross@afit.edu

Sponsor Funded Research Projects

“Algorithm Development for WFOV Mission Data Processing (Phase 2 SBIR).” Sponsor: AFRL/RV. Funding: $140,000 - Gross 20%, Steward 40%, Hawks 40%. [CTISR]

“Open Skies IR Target Study.” Sponsor: NASIC. Funding: $250,000 - Gross 5%, Hawks 75%, Marciniak 10%, Franz 10%. [CTISR]

“Spectro-polarimetric Imaging of Disturbed Earth - Phase III.” Sponsor: USA ERDC. Funding: $176,250 - Gross 50%, Hawks 50%. [CTISR]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HAWKS, MICHAEL R.
Research Assistant Professor of Optical Engineering (through Perduco), Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Astrophysics, Michigan State University, 1991; MS, Engineering Physics, AFIT, 1993; PhD, Optical Sciences, AFIT, 2006. Dr. Hawks’ main research interests include electro-optic and infrared (EO/IR) remote sensing. Specific application areas include monocular passive ranging, hyperspectral and polarimetric imaging, and computational imaging. He previously taught at the United States Air Force Academy, and has conducted research in chemical lasers, space object identification, chem/bio agent detection, infrared countermeasures, nuclear detonation detection, and other remote sensing applications at the Air Force Research Laboratory and other assignments. He has received 12 research grants, chaired nine MS committees, and published 38 technical papers and reports. He is a member of the Optical Society of America and SPIE, and is a retired USAF Lt Col. AFIT research center affiliation(s): CTISR. Tel. 937-255-3636 x4828, Email: Michael.Hawks.ctr@afit.edu

Sponsor Funding Projects

“Algorithm Development for WFOV Mission Data Processing (Phase 2 SBIR).” Sponsor: AFRL/RV. Funding: $140,000 – Hawks 40%, Gross 20%, Steward 40%. [CTISR]

“Open Skies IR Target Study.” Sponsor: NASIC. Funding: $250,000 – Hawks 75%, Gross 5%, Marciniak 10%, Franz 10%. [CTISR]


“Spectro-polarimetric Imaging of Disturbed Earth - Phase III.” Sponsor: USA ERDC. Funding: $176,250 – Hawks 50%, Gross 50%. [CTISR]


HENGEHOLD, ROBERT L.
Professor Emeritus of Physics, Department of Engineering Physics, AFIT Appointment Date: 1961 (AFIT/ENP); AB, Thomas More College, 1956; MS, University of Cincinnati, 1961; PhD, University of Cincinnati, 1965. Dr. Hengehold’s research areas center on experimental solid state physics, semiconductor physics, optical diagnostics, and electron and laser spectroscopy. He is the author of more than 100 archival publications and more than 215 presentations at technical meetings. He has served as an advisor on more than 17 doctoral dissertations and 80 master’s theses. He is currently carrying out studies of (1) depth resolved cathodoluminescent spectroscopy of materials suitable for neutron absorbing semiconductor solid state detectors, and (2) optical characterization of compound semiconductor materials and super lattice structures for mid-infrared diode lasers and detectors. This work involves collaborative efforts with the Directed Energy and Sensors Directorates at AFRL, and the DTRA. Dr. Hengehold received the Air University Commander’s Award for Faculty Achievement in 1982, the Gage H. Crocker Outstanding Professor Award in 1996, the Outstanding Professional Achievement Award from the Affiliate Society Council of the Engineering and Science Foundation of Dayton in 1997, and the General Bernard A. Schriever Award in 1999. He was elected a Fellow of the American Physical Society in 2008. Tel. 937-255-3636 x4502, Email: Robert.Hengehold@afit.edu

HERR, NICHOLAS C., Maj
Assistant Professor of Materials Science, Department of Engineering Physics, AFIT Appointment Date: 2016 (AFIT/ENP); BS, United States Air Force Academy, 2008; MS, Air Force Institute of Technology, 2010; PhD, Air Force, 2016. Maj Herr’s research focuses on high-power laser damage of carbon composites, remote sensing, and atomic force microscopy. Tel. 937-255-3636 x4524, Email: Nicholas.Herr@afit.edu

HOBBS, EDWARD L., Lt Col
Deputy Director of the Nuclear Event Analysis and Testing Center for Specialized Research, established 1 May 2019, and Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2018 (AFIT/ENP); Lt Col Hobbs’ research interests are primarily focused on deterministic neutron transport. Most recently, he developed methods to address the difficulties of the non-linear characteristics associated with the time-eigenvalue diffusion and even-parity transport equations. His calculations currently provide the time-eigenvalue used to model the burst characteristics associated with a Fast Burst Reactor (FBR). Additional research interests include non-proliferation, counter-proliferation, and consequence management, specifically as they relate to the military and Nuclear and Counter-Proliferation Officer (NCP/52) missions. Lt Col Hobbs is also interested in improved methods to determine accurate nuclear data (material), stochastic transport methods, and health physics (radiation safety). Tel. 937-255-3636 x4609, Email: Edward.Hobbs@afit.edu

Sponsor Funded Research Projects

“Nuclear Survivability Experimentation, Modeling, and Data Verification.” Sponsor: NNSA. Fund: $200,000 - Bevins 55%, Hobbs 20%, Dexter 15%, McClory 10%.
HOGSED, MICHAEL R., Lt Col
Assistant Professor of Engineering Physics, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Baylor University, 1997; MS, Oklahoma State University, 1999; PhD, Air Force Institute of Technology, 2005. Lt Col Hogsed’s research focuses on semiconductor device characterization and radiation effects on advanced microelectronic materials and devices. He has published six refereed journal articles. Currently under investigation are materials in the germanium-silicon-tin system ($\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$) for photonic applications. Other research includes radiation hardness assurance testing of novel electronic components and COTS microprocessors. Lt Col Hogsed also has 10 years’ experience in the Air Force nuclear enterprise as an analyst and S and T manager for a variety of nuclear matters, to include treaty monitoring, weapon employment planning factors, and counter proliferation intelligence. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4547, Email: Michael.Hogsed@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HOLLAND, DARREN E.,
Research Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2018 (AFIT/ENP); BA, Cedarville University, 2006; MS, University of Michigan, 2008; PhD, University of Michigan, 2012. Dr. Holland’s expertise focuses on optimization and radiation transport. His current research focuses on optimizing a gamma and neutron rotating scatter mask for source location identification and imaging. Before joining AFIT, he was on the faculty of Cedarville University. Dr. Holland is a member of the American Society of Mechanical Engineers (ASME). AFIT Research center affiliations(s): NEAT.Tel. 937-255-3636 x4697, Email: Darren.Holland.ctr@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


JAMES, ROYCE W., CDR
Visiting Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2019, (AFIT/ENP); CG Academy Appointment Date: 2004, (CGA/dsp); BS, New Mexico State University, 1999; MS, Columbia University, 2003; PhD, Stephens Institute of Technology, 2009. CDR James’ research focus is primarily focused on laboratory and space based magnetized plasmas, plasma interactions with electromagnetic radiation (with emphasis on high energy lasers), fusion energy, and plasma water treatment. CDR James recently served as the Head of Physics at the Coast Guard Academy, is a co-founder of the New London Freedom School, a Science Technology and Mathematics Magnet School Board Member, and Member of the Nuclear Energy Advisory Council for the state of CT. CDR James has published three refereed journal articles and twenty conference publications. CDR James is a member of APS-DPP, and the current Engineering Physics Interim Department Head. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4339, Email: Royce.James@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review


LENYK, CHRISTOPHER A., Lt Col
Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); BS, Nuclear Engineering, Rensselaer Polytechnic Institute, 2002; MS Nuclear Engineering, Air Force Institute of Technology, 2014; PhD Nuclear Engineering, Air Force Institute of Technology, 2019. Lt Col Lenyk’s research focuses on solid-state physics, radiation effects, and nuclear weapon effects using a variety of experimental techniques, including photoluminescence (PL), absorption and electron paramagnetic resonance (EPR), thermoluminescence (TL), and wavelength-dependent TL leading to identification of point defects in ultra-wide bandgap and optical materials, laser-host materials, and scintillators for radiation detection. He is the author of four archival publications in refereed journals. Before joining AFIT, he held a variety of assignments and leadership positions in the areas of directed energy weapons, nuclear treaty monitoring, space intelligence, and countering weapons of mass destruction. Current research includes wide bandgap materials for power electronics, scintillator and radiation detection materials, photorefractives, and nonlinear optical materials. Lt Col Lenyk is a member of SPIE. Tel. 937-255-3636 x4558, Email: Christopher.lenyk@afit.edu

Refereed Journal Publications


**Other Significant Research Productivity**


**LOPER, ROBERT D.**

Assistant Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2014 (AFIT/ENP); BS, University of Dayton, 1994; MS, University of Texas at Dallas, 1998; MTS, United Theological Seminary, 2011; PhD, Air Force Institute of Technology, 2013. Dr. Loper’s research interests are focused on space physics, centering on solar astrophysics, magnetospheric physics, and the near-Earth space environment. Dr. Loper is a member of Tau Beta Pi and Sigma Pi Sigma. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4333, Email: Robert.Loper@afit.edu

**Sponsor Funded Research Projects**


**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review:**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


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Lutz, Jesse J.
Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Chemistry, Grand Valley State University, 2006; PhD, Physical Chemistry, Michigan State University, 2011. Dr. Lutz is a member of the Quantum Computer Science group within SNL’s Center for Computing Research. His current research interests include fundamental quantum algorithm development, and the investigation of solid-state spin-qubit decoherence by modeling the dynamics of its nuclear spin-bath environment. His previous research focused on characterization of the structure and spectral signatures of silicon carbide clusters, modeling relativistic and finite-nucleus effects in molecules containing lanthanides, and development of ab initio many-body electronic structure methods for the accurate prediction of energies and properties of atomic and molecular systems.

Refereed Journal Publications


Other Significant Research Productivity


MARCINIAK, MICHAEL A.
Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1999 (AFIT/ENP); BS, St. Joseph’s College, 1981; BSEE, University of Missouri, 1983; MSEE, Air Force Institute of Technology, 1987; PhD, Air Force Institute of Technology, 1995. Dr. Marciniak’s research interests include various aspects of light-matter interaction, including (1) polarimetric scatterometry of nanostructured materials, such as photonic crystals and infrared meta-surfaces; (2) bidirectional reflectance distributions for optical signatures; and (3) high-energy laser damage assessment. He has published 30 refereed and 75 other publications, and chaired 11 PhD and more than 50 MS thesis committees. He holds one patent. He is a retired Lt Col, USAF with 22 years of service. AFIT research center affiliation(s): CDE and CTISR. Tel. 937-255-3636 x4529, Email: Michael.Marciniak@afit.edu

Sponsor Funded Research Projects

“2D Photonic Crystals from Birefringent Nanorod Thin-Films for Nanophotonic Component Applications.” Sponsor: AFOSR. Funding: $39,142. [CDE]


"Open Skies IR Target Study." Sponsor: NASIC. Funding: $250,000 - Gross 5%, Hawks 75%, Marciniak 10%, Franz 10%. [CTISR]

“Analysis of Modified Microfacet BRDF Models for Polarimetric Optical Scatter.” Sponsor: AFOSR. Funding: $45,200 - Butler 75%, Marciniak 25%. [CDE/CTISR]

“Dynamic Data Driven Phase Optimization for Controlling Light Scattered by a Rough Surface.” Sponsor: AFOSR. Funding: $37,290 - Burgi 75%, Marciniak 15%, Oxley 10%. [CDE/CTISR]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


MATHEWS, KIRK A.
Professor Emeritus of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 1987 (AFIT/ENP); BS, California Institute of Technology, 1971; MS, Air Force Institute of Technology, 1982; PhD, Air Force Institute of Technology, 1983. Dr. Mathews’ research interests center on computational methods for neutral particle radiation transport and modeling and analysis of nuclear phenomena and measurements, including enrichment cascade modeling, high altitude radiation transport, blast and shock, nuclear thermal radiation, deconvolution of radiation spectra, and statistical analysis of nuclear measurements. Dr. Mathews has published 20 papers in refereed journals and 21 conference proceedings, and has chaired 35 theses and 13 dissertations. He is a member of the American Nuclear Society and Tau Beta Pi.

MCCLORY, JOHN W.
Associate Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2008 (AFIT/ENP); BS, Physics, Rensselaer Polytechnic Institute, 1984; MS, Physics, Texas A&M University, 1993; PhD, Nuclear Engineering, Air Force Institute of Technology, 2008. Dr. McClory’s expertise is in radiation effects, radiation detector development, and nuclear weapon effects. His research includes determining the effect of space and nuclear weapon radiation on electronic and structural materials, the interaction of radiation with matter, and the use of nuclear reactions to inform nuclear forensics techniques. He has advised 16 PhD students (five current) and 33 MS students (two current), received 17 research grants, and published 90 journal articles during his time on the AFIT faculty. He is a member of the IEEE Nuclear and Plasma Sciences Society, American Nuclear Society, and Materials Research Society. AFIT research center affiliation(s): CSRA, CTISR, and NEAT. Tel. 937-255-3636 x7308, Email: John.McClory@afit.edu

Sponsor Funded Research Projects

“Endowed Term Chair.” Sponsor: AFTAC/AFTAC. Funding: $16,667.

“Support for the US Nuclear Detonation Detection System.” Sponsor: DOE/NNSA. Funding: $50,000. McClory 50%, Bickley 50%. [NEAT]

“Nuclear Survivability Experimentation, Modeling, and Data Verification.” Sponsor: NNSA. Fund: $200,000 - Bevins 55%, Hobbs 20%, Dexter 15%, McClory 10%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


M.C. Recker, and J.W. McClory, “Comparison of Clustering Algorithms for Analysis of Pulse Shape Data from Cs2LiYCl6:Ce3+ (CLYC),” Presentation: Hardened Electronics and Radiation Technology Conference, April 2019. [NEAT]


MCCRAE, JACK E., Jr.
Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2013 (AFIT/ENP); BS, Physics, Massachusetts Institute of Technology, 1984; MS, Physics (Optics), Air Force Institute of Technology, 1993; PhD, Physics, Air Force Institute of Technology, 1997. Dr. McCrae’s research interests include optics, lasers, quantum and non-linear optics, quantum computing, laser radar, atmospheric propagation, and imaging. He is a retired USAF Col with 27 years of service. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4739, Email: Jack.Mccrae@afit.edu

Sponsor Funded Research Projects

“Novel Characterization Measurements and Meteorological-Driven Modeling of Turbulence and Refraction in the Lower Atmosphere for Directed Energy Applications.” Sponsor: DEJTO. Funding: $280,000 - McCrae 80%, Fiorino 20%. [CDE] [Refereed Conference Papers Accepted on the Basis of Full Paper Review]


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Patent Applications**


**NAVA, OMAR A., Maj**

Assistant Professor of Atmospheric Science, Department of Engineering Physics, AFIT Appointment Date: 2016 (AFIT/ENP); BS, United States Air Force Academy, 2005; BS, Naval Postgraduate School, 2006; MS, Southern Methodist University, 2010; MS, Air Force Institute of Technology, 2011; PhD, University of California Los Angeles, 2016. Maj Nava’s research interests cover a variety of topics in atmospheric science to include problems in numerical weather prediction, tropical meteorology, mesoscale processes, and space physics. He has advised three MS students during his time on the AFIT faculty. Before joining AFIT, he was the Chief of Weather Operations at the Joint Space Operations Center at Vandenberg AFB, CA. He has seven archival publications and presentations, and is a member of the American Meteorological Society and American Geophysical Union. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4518, Email: Omar.Nava@afit.edu

**Sponsor Funded Research Projects**

“Correlating Lightning Obs w/ HF Noise.” Sponsor: AFRL/RV. Funding: $16,100. [CSRA]


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


**PAK, MICHAEL V.**
Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); MS, Quantum Chemistry, St. Petersburg State University, 1992; PhD, Theoretical Physics, St. Petersburg State University, 1996; PhD, Quantum Chemistry, Iowa State University, 2002. Dr. Pak’s research interests include the theory of quantization, topological quantum computing and quantum theory of multi-component systems. Of particular interest is the development of new methods to accurately describe matter-antimatter interactions, and specifically positron annihilation in complex multi-electron environment. New research interests include modeling of Majorana states for topological quantum computation and development of theoretical methods to accurately predict temperature dependent short lifetime beta decay and electron capture decay at temperatures attained during nuclear explosions. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4501, Email: Michael.Pak@afit.edu

**PATNAIK, ANIL K.** Associate Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); BS, Physics, Utkal University (India), 1993; MS, Utkal University (India), 1995; PhD, Physics, Physical Research Laboratory (India), 2001; Post-doc, University of Electro-Communications (Japan), 2003. Dr. Patnaik specializes in the theory and experimentation of fundamental laser-matter interactions, both in the realm of classical and quantum regime, and their applications. He has worked on a wide range of topics in quantum optics, nonlinear optics, laser-based diagnostics, and state-of-art AF applications, leading to about 190 publications and presentations, including highly-cited peer-reviewed journal publications, book chapters, plenary and invited talks, and seminars and conference presentations. He has authored two authoritative review articles on the optical diagnostics techniques for reacting flows and plasmas, one of which has been in the top 1% cited engineering journal paper status in web of science for the last few years. His theoretical work on fiber-based slow light has been in international news. Dr. Patnaik has successfully led many AFRL- and AFOSR-funded projects as PI or co-PI. He has held several academic and visiting positions at prestigious institutions such as Princeton University, Texas A&M, Purdue, and Max-Planck Institute for Quantum Optics, Garching (Germany). He worked with Professor Glauber (Nobel Laureate in Quantum Optics) on fundamental laser-matter interactions. He has been actively involved with professional societies such as APS, OSA and AIAA. Tel. 937-255-3636 x4532, Email: Anil.Patnaik@afit.edu

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**PERRAM, GLEN P.**

Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1989 (AFIT/ENP); BS, Cornell University, 1980; MS, Air Force Institute of Technology, 1981; PhD, Air Force Institute of Technology, 1986. Dr. Perram’s research interests include high power chemical lasers, optically pumped gas phase lasers, laser-material interactions, hyperspectral imaging, reaction kinetics, atomic and molecular spectroscopy, environmental science, and remote sensing. He has advised 36 PhD and 51 MS students, received 50 research grants, and published more than 100 journal articles during his 30 years on the AFIT faculty. Dr. Perram is a fellow of the Optical Society of America and the Directed Energy Professional Society, and is a Registered Professional Engineer in the State of Ohio. AFIT research center affiliation(s): CDE and CTISR. Tel. 937-255-3636 x4504, Email: Glen.Perram@afit.edu

**Sponsor Funded Research Projects**

“Digital Holography: Coherence Effects.” Sponsor: Undisclosed. Funding: $72,811 - Perram 50%, Rice 50%. [CTISR]

“Digital Holography: Recording Geometry.” Sponsor: Undisclosed. Funding: $37,914 - Perram 50%, Rice 50%. [CTISR]

“Diode Pumped Alkali Laser Kinetics: Rb-He System.” Sponsor: MDA. Funding: $250,000 - Perram 50%, Rice 50%. [CDE]


“Hollow Core Raman Fiber Laser for Mid-IR Applications.” Sponsor: Lidomika, LLC. Funding: $45,015 - Perram 50%, Rice 50%. [CDE]

“In-Process Monitoring of Additive Manufacturing: Phase IIX, Inconel Spectra and Imagery.” Sponsor: NASA/UTC. Funding: $25,600. [CDE]

“Melt Pool Monitoring for Metal Additive Manufacturing.” Sponsor: ATS LLC. Funding: $5,000. [CDE]

“Wave Front Sensing for Laser Weapon Applications.” Sponsor: AFRL/RD. Funding: $75,181 - Perram 80%, Rice 20%. [CDE]

“Airy and Non-Gaussian Beam Testbed.” Sponsor: AFRL/RY. Funding: $63,024 - Ferdinandus 90%, Perram 10%. [CDE]

**Refereed Journal Publications**


Christopher A Rice, Kevin Lapp, Anthony Rapp, Woody Miller, and Glen P. Perram, “Rubidium D1 and D2 Far Wing Line Shapes Induced by Rare Gases,” *Journal of Quantitative Spectroscopy and Radiative Transfer*, 224, 550-555, Feb 2019. [CDE]


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**PETROSKY, JAMES C.**
Director, Nuclear Event Analysis and Testing Center for Specialized Research, Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2000 (AFIT/ENP); BA, Engineering Physics/Computer Science, Millersville University of Pennsylvania, 1984; MS, Engineering Physics, Rensselaer Polytechnic Institute, 1992; PhD, Engineering Physics, Rensselaer Polytechnic Institute, 1995. Dr. Petrosky has expertise in radiation effects on electronic devices, EMP, experimental design, radiation detection, and nuclear weapon effects. His research spans 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. Experimental techniques include I-V(T), C-V(T), photoluminescence spectroscopy, Hall Effect, x-ray and UV photo spectroscopy, applications of measurement techniques in harsh environments/in-situ measurements, and obtaining real-time data. Applications include electronic switches and actuators, RF/IR sensors, force transducers, and electronics controls for use in the space and nuclear weapons environment. Dr. Petrosky has successfully chaired 11 PhD students, 45 Master’s students, and mentored and supported six post-doctoral researchers. AFIT research center affiliation(s): CSRA and NEAT. Tel. 937-255-3636 x4562, Email: James.Petrosky@afit.edu

**Sponsor Funded Research Projects**

“Support Activities to Homeland Security.” Sponsor: DHS. Funding: $200,000. [NEAT]

“Support to NNSA for QASPR Independent Review.” Sponsor: DOE/NNSA. Funding: $15,000.
Refereed Journal Publications


PHILLIPS, GRADY T.
Research Assistant Professor of Engineering Physics (through ORISE), Department of Engineering Physics, AFIT Appointment Date: 2014 (AFIT/ENP); BS, Physics, Wofford College, 1990; BA, Mathematics, Wofford College, 1990; MS, Physics, Clemson University, 1993; PhD, Applied Physics, Air Force Institute of Technology, 2006. Dr. Phillips’ research interests include remote sensing encompassing spectral signatures from laser/material interactions, hyperspectral imagery, and environmental monitoring; experimental research utilizing laser physics, spectroscopy, chemical kinetics, and flow dynamics to advance technologies in high power chemical lasers, gas phase lasers, and optical diagnostics. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4743, Email: Grady.Phillips.ctr@afit.edu

RICE, CHRISTOPHER A.
Research Assistant Professor, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, Electrical Engineering, Cedarville University, 2004; MS, Electrical Engineering, Air Force Institute of Technology, 2006; PhD, Applied Physics, Air Force Institute of Technology, 2012. Dr. Rice is interested in topic areas related to high energy lasers, remote sensing, and optical diagnostics. His work on specific research topics currently includes atmospheric propagation of diode pumped alkali lasers, diode pumped alkali and rare gas laser gain construction, aerosol measurement and validation, modeling, simulation and validation of directed energy simulations, and remote sensing. AFIT research center affiliation(s): CDE and CTISR. Tel. 937-255-6565 x4375, Email: Christopher.Rice@afit.edu

Sponsor Funded Research Projects


“Digital Holography: Coherence Effects.” Sponsor: Undisclosed. Funding: $72,811 - Perram 50%, Rice 50%. [CTISR]

“Digital Holography: Recording Geometry.” Sponsor: Undisclosed. Funding: $37,914 - Perram 50%, Rice 50%. [CTISR]

“Diode Pumped Alkali Laser Kinetics: Rb-He System.” Sponsor: MDA. Funding: $250,000 - Perram 50%, Rice 50%. [CDE]

“Hollow Core Raman Fiber Laser for Mid-IR Applications.” Sponsor: Lidomika, LLC. Funding: $45,015 - Perram 50%, Rice 50%. [CDE]
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Tim True, Christopher A. Rice, and Glen P. Perram, “Excited State Cesium Line Shapes with High Pressure Rare Gases,” *21st Annual DEPS S+T Symposium*, Destin, FL, 8–12 Apr, 2019. [CDE]

Patent Applications


RIES, HEIDI R.
Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1999 (AFIT/ENP); Interim Chief Academic Officer, AFIT; Dean for Research, Graduate School of Engineering and Management (AFIT/ENR); Interim Dean, Graduate School of Engineering and Management (2013); BS, Physics, The Ohio State University, 1982; MS, Physics, The Ohio State University, 1984; PhD, Applied Physics, Old Dominion University, 1987. Dr. Ries serves as AFIT’s interim chief academic officer, chief research officer, primary liaison to the Air Force Research Laboratory, and served as Interim Dean during FY13. Dr. Ries’ research interests include radiation effects, nonlinear optical materials, electron paramagnetic resonance spectroscopy, and laser processing of materials. Prior to joining the AFIT faculty, Dr. Ries served as Director of the Center for Materials Research at Norfolk State University in Norfolk, Virginia, and as Associate Director of the Applied Research Center at the Jefferson Center for Research and Technology Research Park in Newport News, Virginia. Dr. Ries was elected to the ASEE Engineering Research Council Board of Directors in 2008 and served a two-year term as Secretary/Treasurer (2011-2013). She has served on the Engineering and Science Foundation of Dayton Board since 2005, and as its Chair since 2015. Dr. Ries serves as a peer evaluator and team chair for Higher Learning Commission accreditation processes. She was recognized by the Dayton Daily News as one of the region’s 2009 Ten Top Women, and was the Air Force’s civilian winner of the 2011 Department of Defense Women’s History Month Foreign Language and Science, Technology, Engineering and Math (STEM) Role Model Award. Tel. 937-255-3636 x4544, Email: Heidi.Ries@afit.edu

Sponsor Funded Research Projects

“AFRL-AFIT MOA Partnership Agreement.” Sponsor: AFOSR. Funding: $74,699

SAMIN, ADIB J.
Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); BS, Chemistry (math minor), Wayne State University, 2008; MS, Chemical Physics, The Ohio State University, 2012; PhD, Mechanical Engineering, The Ohio State University, 2017. Dr. Samin was awarded a graduate student fellowship in 2010, and was the recipient of The Director’s Postdoctoral Fellowship at Los Alamos National Laboratory (LANL) in 2018. He spent three years as a postdoctoral researcher at The Ohio State University working on modeling materials for next generation nuclear reactor concepts and corrosion. He also spent a year at LANL examining structural materials for nuclear reactors. Dr. Samin’s research interests include multi-scale modeling of materials in extremes, and electrochemistry with applications focused on corrosion and nuclear energy. Dr. Samin has authored more than thirty refereed archival journal publications. Tel. 937-255-4535 x4767, Email: Adib.Samin@afit.edu

Refereed Journal Publications

SHATTAN, MICHAEL B., Lt Col
Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2018 (AFIT/ENP); BS, United States Military Academy, 1999; MS, Massachusetts Institute of Technology, 2008; PhD, University of Tennessee, 2018. Lt Col Shattan’s research interests focus on the use of Laser-Induced Breakdown Spectroscopy (LIBS) for nuclear forensics purposes, as well as studying the physics and chemistry of simulated nuclear fireball environments via laser spectroscopy techniques. Additionally, Lt Col Shattan is interested in Resonance Enhanced Multiphoton Ionization (REMPI) techniques for trace gas and particulate detection. Before joining AFIT, he was a PhD candidate at the University of Tennessee. He also holds a Professional Engineer license in the commonwealth of Virginia. Tel. 937-255-3636 x4587, Email Michael.Shattan@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


STEWARD, BRYAN J.
Research Assistant Professor of Optical Engineering, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Optical Sciences and Engineering, University of Arizona, 2004; MS, Applied Physics, Air Force Institute of Technology, 2006; PhD, Optical Sciences and Engineering, Air Force Institute of Technology, 2011. Dr. Steward’s current research interests include infrared and electro-optical remote sensing, physics-based sensor and scene modeling, and algorithm development primarily for application to technical intelligence problems. Additional interests include characterization of battlespace combustion (e.g. muzzle flash, detonations, and rocket plumes), methods for assessing on-orbit sensor performance, and machine learning. He has 16 archival publications and presentations. Before joining AFIT, he spent more than nine years at the National Air and Space Intelligence Center (NASIC) where he most recently led R and D activities as a Principal Intelligence Analyst in the Persistent Infrared Squadron. AFIT research center affiliation(s): CTISR. Tel. 937-255-3636 x4639, Email: Bryan.Steward@afit.edu

Sponsor Funded Research Projects

“Persistent Infrared Scientific and Analytical Support.” Sponsor: NASIC. Funding: $180,000 - Steward 60%, Gross 10%, Hawks 30%. [CTISR]

“Support to TAP Lab Effort (STAPLES).” Sponsor: SMC. Funding: $248,255 - Steward 95%, Hodson 5%. [CTISR]

“Support to TAP Lab Effort (STAPLES).” Sponsor: SMC. Funding: $663,000 - Steward 90%, Gross 10%. [CTISR]
Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


TOURNAY, ROBERT C., Lt Col
Assistant Professor of Atmospheric Science, Department of Engineering Physics, AFIT Appointment Date: 2018 (AFIT/ENP); BS, University of Maryland, College Park, 2000; MS, Naval Postgraduate School, 2008; PhD, Colorado State University, 2016. Lt Col Tournay’s research interests include land surface-atmosphere interaction, numerical weather modeling, hydrology and flooding, as well as applying artificial intelligence and machine learning to weather forecasting. Prior to his PhD studies, Lt Col Tournay served as Commander, Sixteenth Weather Squadron, Offutt AFB, Nebraska as well as Commander, Forty-sixth Weather Squadron, Eglin AFB, Florida. Lt Col Tournay deployed to Iraq in support of Operation IRAQI FREEDOM, as well as to Qatar in support of AF Central Command operations. He is a member of the American Meteorological Society. Tel. 937-255-3636 x4743, Email: Robert.Tournay@afit.edu

Sponsor Funded Research Projects

“Endowed Term Chair.” Sponsor: AFTAC/AFTAC. Funding: $33,333.


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


TSENG, ROSE H., Lt Col
Assistant Professor of Atmospheric Science, Department of Engineering Physics, AFIT Appointment Date: 2016 (AFIT/ENP); BS, University of California at Los Angeles (UCLA), 2004; MS, Naval Postgraduate School, 2010; PhD, UCLA, 2016. Lt Col Tseng’s research interests include future climatological changes, the influence of aerosols on precipitation and tropical cyclones, and the Arctic sea ice decline, as these topics pertain to future political, societal and environmental impacts. Prior to her PhD studies, Lt Col Tseng served as Commander, Detachment 1, 607th Weather Squadron at Camp Red Cloud, Republic of Korea. Lt Col Tseng has given a number of talks regarding her research on the effects of black carbon on precipitation, including the University of California (Carbon Neutrality Initiative), and the Pardee RAND Graduate School (LA Policy Symposium). Lt Col Tseng also serves as Board Advisor for Women Veteran Issues for The BREATH Center in San Clemente, CA. Lt Col Tseng served a deployment tour as USAF Joint Meteorological and Oceanographic Officer- Afghanistan and NATO Headquarters Resolute Support Chief Meteorological Officer from April - October 2017 in Kabul, Afghanistan. Tel. 937-255-3636 x4520, Email: hsteng@afit.edu

Sponsor Funded Research Projects


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity

TUTTLE, RONALD F.
Associate Professor of Nuclear Engineering, Department of Engineering Physics, AFIT Appointment Date: 2001 (AFIT/ENP); BS, Chemical Engineering, University of Missouri (Columbia), 1968; MS, Nuclear Engineering, University of Missouri (Columbia), 1970; PhD, Nuclear Engineering, University of Missouri (Columbia), 1980. Dr. Tuttle’s research areas include applications of active and passive remote sensing, spectroscopy, diagnostics, and signals processing to problems in intelligence collection and exploitation. Other areas of interest include nuclear weapon effects and space nuclear power systems modeling, and mechanics of aerosols. He has published in both unclassified and classified refereed archival journals and conference proceedings. Dr. Tuttle served as Director, Center for Technical Intelligence Studies and Research, AFIT, until Aug 2012. Tel. 937-255-3636 x4536, Email: Ronald.Tuttle@afit.edu

VARSHNEY, GAIVEN
Research Assistant Professor of Nuclear Engineering, Department of Engineering Physics, AFIT; Appointment Date: 2019 (AFIT/ENP); Post-Doctoral Research Associate, 2016 (AFIT/ENP); BS (Honors), Chemistry, Aligarh Muslim University, India, 2001; MS, Analytical Chemistry, Aligarh Muslim University, India, 2003; M. Phil., Applied Chemistry, Z.H. College of Engineering and Technology, A.M.U, India, 2004; PhD, Applied Chemistry, Z.H. College of Engineering and Technology, A.M.U., India, 2008. Dr. Varshney’s current research interests involve several nuclear forensic areas, including but not limited to: detection of radioactive elements, experimental separation and analysis of nuclear debris from different nuclear accidents and tests, radiation detection, and materials characterization. AFIT research center affiliation(s): NEAT. Tel. 937-255-3636 x4574, Email: gaiven.varshney@afit.edu

Refereed Journal Publications

Other Significant Research Productivity


WEEKS, DAVID E.
Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1993 (AFIT/ENP); BA, Physics, Colgate University, 1983; MS, Physics, Georgia Institute of Technology, 1985; PhD, Physics, University of Arkansas, 1989. Dr. Weeks’ research interests include the development of time dependent wave packet methods to model the quantum mechanics of simple chemical reactions and compute associated state to state reactive scattering matrix elements. Of particular interest are new methods that incorporate non-adiabatic coupling between electronic and nuclear degrees of freedom. His new research interests include fiber laser modeling and the development of plasma models to improve the operation of noble gas laser systems. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4561, Email: David.Weeks@afit.edu
WOLF, PAUL J.
Professor of Physics, Department of Engineering Physics, AFIT Appointment Date: 1994 (AFIT/ENP); Associate Dean for Academic Affairs, Graduate School of Engineering and Management (AFIT/EN); BS, Regis College, 1978; MS, Air Force Institute of Technology, 1979; PhD, Air Force Institute of Technology, 1985. Dr. Wolf serves as the Associate Dean for Academic Affairs responsible for administrative leadership for all academic matters in the Graduate School and serves as AFIT’s accreditation liaison to the Higher Learning Commission and ABET. Dr. Wolf’s current scholarly interests include emergent behaviors of complex systems, foundations of quantum mechanics, and existential threat analyses. Dr. Wolf has made experimental contributions to atomic/molecular spectroscopy, reactive and non-reactive collision kinetics, laser-based thin film deposition processes, ionospheric and atmospheric chemistry, and environmental monitoring. Prior to joining the AFIT faculty in 1994, Dr. Wolf served as Chief for the Visible Chemical Laser Section at the Air Force Weapons Laboratory, Kirtland AFB, NM, Director/Principal Investigator of the Materials Physics Division at the F.J. Seiler Research Laboratory, USAFA, CO, Assistant Professor of Physics in the Physics Department at the U.S. Air Force Academy, and Research Director for Impulse Laser Effects at the Defense Nuclear Agency. He has over 20 publications in refereed archival journals. Tel. 937-255-3636 x4560, Email: Paul.Wolf@afit.edu
5.3 DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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5.3.1 DOCTORAL DISSERTATIONS 105
5.3.2 MASTER'S THESES 106
5.3.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT 110
5.3.1 DOCTORAL DISSERTATIONS


STONE, BRENT J., Enabling Auditing and Intrusion Detection for Proprietary Controller Area Networks. AFIT-ENG-DS-18-D-003. Faculty Advisor: Dr. Scott R. Graham. Sponsor: N/A. [CCR]
5.3.2 MASTER'S THESES

ADDERLEY, NIKOLAI A., Graph-Based Temporal Analysis in Digital Forensics. AFIT-ENG-MS-19-M-005. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: DC3/DC. [CCR]


ARNOLD, CHRISTIAN, High Resolution, Low-Bandwidth, Real-Time Reconnaissance Using Structure from Motion with Planar Homography Estimation. AFIT-ENG-MS-18-M-007. Faculty Advisor: Dr. Scott L. Nykl. Sponsor: N/A.


CARBONI, JOHN, The Effect of Modeling Simultaneous Events on Simulation Results. AFIT-ENG-MS-19-M-014. Faculty Advisor: Dr. Douglas D. Hodson. Sponsor: HQ USAF.


CHAVEZ, SENOBIO, Serious Game Design Using MDA and Bloom's Taxonomy. AFIT-ENG-MS-19-M-017. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: 711th HPW/RH.


CINTRON, LUIS A., Modeling a Consortium-Based Distributed Ledger Network with Applications for Intelligent Transportation Infrastructure. AFIT-ENG-MS-18-M-019. Faculty Advisor: Dr. Scott R. Graham. Sponsor: AFRL/RW. [CCR]


DELA CRUZ, MICHAEL, Designing Liquid Crystal For Optoacoustic Detection. AFIT-ENG-MS-19-M-023. Faculty Advisor: Dr. Hengky Chandrahalim. Sponsor: N/A.


FLORES, ENOC, Improved Fabrication For Micromirror Arrays. AFIT-ENG-MS-19-M-027. Faculty Advisor: Maj Tod Laurvick. Sponsor: N/A.


GOROSPE, ANDREW, Non-Contact Height Estimation for Material Extrusion Additive Systems via Monocular Imagery. AFIT-ENG-MS-19-M-029. Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AFRL/RX.


JOHNSON, BROOKE, Machine Translation with Image Context from Mandarin Chinese to English. AFIT-ENG-MS-19-M-035. Faculty Advisor: Dr. Brett J. Borghetti. Sponsor: AFOSR.


LIBRANDI, ROCCO, Variable Type Inference Based On Statistical and Architectural Indications. AFIT-ENG-MS-19-M-040. Faculty Advisor: Dr. Andrew J. Terzuoli. Sponsor: NASIC/AC.


MICHAUD, PAUL, Micro-Contacts With 3-D Surfaces Made With Grayscale Lithography. AFIT-ENG-MS-19-M-043. Faculty Advisor: Tod Laurvick. Sponsor: N/A.


MONTGOMERY, MADISON J., Active Control Of a Morphing Wing Aircraft and Failure Analysis For System Reliability. AFIT-ENG-MS-19-M-045. Faculty Advisor: Dr. Robert C. Leishman. Sponsor: AFRL/RQ. [ANT]


MOSBY, JOSHUA K., A Blockchain-Based Anomalous Detection System For Internet Of Things' Devices. AFIT-ENG-MS-19-M-047. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS. [CCR]


NUNDU, AILEEN, Direct Path Interference Suppression and Received Signal Processing For OFDM Passive Radar. AFIT-ENG-MS-19-M-049. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFIT/ENG.

RAMOS, JENNIFER N., Uranium Dioxide Actinide Detection Device Support Design For Space Applications. AFIT-ENG-MS-19-M-050. Faculty Advisor: Dr. Tod Laurvick. Sponsor: N/A. [CSRA]


ROBINSON, TORY, Characterization of Metal Contacts on Hydrothermally Synthesized Uranium Dioxide For Novel Semiconductor Applications. AFIT-ENG-MS-19-M-052. Faculty Advisor: Tod Laurvick. Sponsor: N/A.


SINN, YONG U., Unresolved Object Detection Using Synthetic Data Generation and Artificial Neural Networks. AFIT-ENG-MS-19-M-055. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A. [CSRA CTISR]


STAFIRA, LUKAS A., Examining Effectiveness of Web-Based Internet of Things' Honeypots. AFIT-ENG-MS-19-M-057. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS. [CCR]

STANKOWSKI, KYLE, Target Detection in Heterogeneous Clutter with Low Resolution Radar. AFIT-ENG-MS-19-M-011. Faculty Advisor: Dr. Julie A. Jackson. Sponsor: AFOSR/RT.


UNDERWOOD, BLAINE, Plasma Treatment Method for Ohmic Contacts on Zinc Oxide Thin Film Transistors. AFIT-ENG-MS-19-M-062. Faculty Advisor: Maj Tod Laurvick. Sponsor: AFRL/RY.


VILLARREAL, MICAH, Confirmation Bias Estimation from Electroencephalography with Machine Learning. AFIT-ENG-MS-19-M-065. Faculty Advisor: Dr. Brett J. Borghetti. Sponsor: AFOSR/RT.

WALLACE, SCOUT T., Extended Kalman Filtering for Missile Live-Fire Data Analysis. AFIT-ENG-MS-18-D-004. Faculty Advisor: Lt Col Scott J. Pierce. Sponsor: AFRL/RY. [ANT]

5.3.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable.

BECKER, DAVID J., Maj
Assistant Professor of Electric Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2018 (AFIT/ENG); BSEE, University of Maine, Orono, 2006; MS, Air Force Institute of Technology, 2013; PhD, Electrical Engineering, Air Force Institute of Technology, 2018. Maj Becker’s research interests include space object detection from electro-optical sensors, and image processing. Tel. 937-255-3636 x4371, Email: David.Becker@afit.edu

Refereed Journal Publications


BETANCES, JOAN A., Maj
Electrical Engineering Division Chief, Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2016 (AFIT/ENG); BSEE, Walla Walla University, 2003; MS, Air Force Institute of Technology, 2012; PhD, Electrical Engineering, Air Force Institute of Technology, 2016. Maj Betances’s research interests include software-defined radios, cognitive radios, and wireless security. He is a member of Eta Kappa Nu and Tau Beta Pi honor societies. AFIT research center affiliation(s): ANT, CCR, CSRA, and CCR. Tel. 937-255-3636 x3305, Email: Joan.Betancesjorge@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


BORGHETTI, BRETT J.

Associate Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2008 (AFIT/ENG); BSEE, Worcester Polytechnic Institute, 1992; MSCS, Air Force Institute of Technology, 1996; PhD, Computer Science, University of Minnesota, 2006. Dr. Borghetti’s research interests include machine learning, autonomous agents, and multi-agent systems. AFIT research center affiliation(s): ANT, CCR, and CTISR. Tel. 937-255-3636 x4612, Email: Brett.Borghini@afit.edu

Sponsor Funded Research Projects

“Information Acquisition Deficit Detection and Mitigation through Neurophysiological-sensed Operator Patterns.” Sponsor: AFOSR. Funding: $80,340 - Borghetti 50%, Oxley 50%.

“Modeling Decision Confidence to Improve Cyber Mission Effectiveness.” Sponsor: 711 HPW. Funding: $12,375. [CCR]
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


BROWN, FRANK M.
Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1961 (AFIT/ENG); BS, MS, PhD, The Ohio State University. Dr. Brown’s research interests are discrete mathematics, and operations research.

CAIN, STEPHEN C.
Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2003 (AFIT/ENG); BSEE, University of Notre Dame, 1992; MSEE, Michigan Technological University, 1994; PhD, University of Dayton, 2001. Dr. Cain’s research interests include electro-optics, remote sensing, and signal processing. Tel. 937-255-3636 x4716, Email: Stephen.Cain@afit.edu
Sponsor Funded Research Projects

“Non-Linear Photo-Detector Calibration without Calibrated Sources.” Sponsor: AFOSR. Funding: $18,424.


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


CANCIANI, AARON J., Maj
Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2015 (AFIT/ENG); BSEE, Air Force Academy, 2010; MSEEE, Air Force Institute of Technology, 2012; PhD, Electrical Engineering, Air Force Institute of Technology, 2016. Maj Canciani’s research interests include GPS-alternative navigation systems using environmental signals, SLAM, deep learning, and vision navigation. He is a member of The Institute of Navigation (ION). AFIT research center affiliation(s): ANT. Tel. 937-255-3636 x4618, Email: Aaron.Canciani@afit.edu

Sponsor Funded Research Projects

“High Resolution Magnetic Mapping over Naval Test Range.” Sponsor: NGA. Funding: $250,000. [ANT]


Other Significant Research Productivity

Spent summer FY19 onsite collaborating with Lincoln Lab establishing research relationships and initiating AFIT-MIT-Lincoln Lab partnerships.

CASEY, DANIEL J., Maj
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2016 (AFIT/ENG); BS, Computer Science, United States Air Force Academy, 2006; MS, Computer Science, Southern Methodist University, 2009. Maj Casey’s research interests include software defined networking, and reverse engineering. He is a member of Tau Beta Pi Engineering Honor Society.

CHANDRAHALIM, HENGY
Director of AFIT Nanofabrication and Characterization Facility, Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2017 (AFIT/ENG); BSc, The Ohio State University, 2000; MEng, Cornell University, 2004; MSc, Cornell University, 2008; PhD, Electrical and Computer Engineering, Cornell University, 2009. Dr. Chandrahalim’s research interests include: symbiotically enhancing electronic, phononic, magnonic, and photonic microsystems, fabrication techniques for novel integrated nanosystems, optofluidics, photoacoustics, biophotonics, nonlinear optics, and optomechanics, mutually assisting micro and nanosystems, and molecular scale sensing. He is a lifetime member of the APS and SPIE, a member of the OSA, and senior member of the IEEE. Tel. 937-255-3636 x4483, Email: Hengky.Chandrahalim@afit.edu

Sponsor Funded Research Projects

“3-D Nanomachining of Remote Sensors on Optical Fibers.” Sponsor: AFOSR. Funding: $50,140
“Reconfigurable Nonlinear Optical Media in Metastructural Photonics.” Sponsor: AFRL/RX. Funding: $20,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


Other Significant Research Productivity

Talk: “Chip-Scale Reconfigurable Whispering-Gallery Lasers,” Department of Physics, Indiana University-Purdue University, Indianapolis, Indiana, 12 Sep, 2019.

General chair for the Foundation of Nonlinear Optics 2019 (FoNLO’19) conference.

Technical program committee member for the IEEE Transducers/Eurosensors 2019 conference.

COLLINS, PETER J.
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2006 (AFIT/ENG); BA, Bethel College, MN, 1985; BSEE, University of Minnesota, 1985; MSEE, Air Force Institute of Technology, 1990; PhD, Air Force Institute of Technology, 1996. Dr. Collins’ research interests include low observables, computational electromagnetics, radar cross section metrology, remote sensing, and electromagnetic material design and analysis. He is a senior member of the IEEE. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x7256, Email: Peter.Collins@afit.edu

Sponsor Funded Research Projects


“Enabling Technologies for Advanced Munitions.” Sponsor: AFLCMC. Funding: $100,000 - Collins 50%, Hartsfield 25%, Lingenfelter 25%.

“Enabling Technologies for Advanced Munitions.” Sponsor: AFLCMC. Funding: $100,000 - Collins 50%, Hartsfield 25%, Lingenfelter 25%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity

2018 Antenna Measurement Techniques Association (AMTA) Distinguished Achievement Award recipient. Awarded at the 40th Annual AMTA Symposium, 4-9 November 2018, Williamsburg, VA, “For Outstanding and Pioneering Contributions to the Practice of Antenna Design, Analysis, and Measurements.”


CORBELL, PHILLIP M., Lt Col
Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering. AFIT Appointment Date: 2014 (AFIT/ENG); BSEE, Southern Illinois University, 1998; MSEE, Air Force Institute of Technology, 2000; PhD, Air Force Institute of Technology, 2006. Lt Col Corbell’s research interests include electronic warfare, navigation warfare, waveform diversity, phased array, adaptive, cognitive, MIMO, multi-static MTI radar architectures, software defined radios, and other disruptive technologies. He is a member of Tau Beta Pi, Eta Kappa Nu, Alpha Lambda Delta, and IEEE. AFIT research center affiliation(s): ANT and CSRA.

CURRO, JOSEPH A., Capt
Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2018 (AFIT/ENG); BSEE, Clarkson University, 2010; MSEE, Air Force Institute of Technology, 2012; PhD, Electrical Engineering, Air Force Institute of Technology, 2018. Capt Curro’s research interests include GPS-alternative navigation systems using environmental signals. His interests also include using machine learning and neural networks for alternative navigation. He is a member of The Institute of Navigation (ION). AFIT research center affiliation(s): ANT. Tel. 937-255-3636 x4620, Email: Joseph.Curro@afit.edu

Sponsor Funded Research Projects

“Advanced Tactics Development through Deep Reinforcement Learning.” Sponsor: NASIC. Funding: $300,000. [ANT]

“Android Sensor Framework for ATAK.” Sponsor: AFRL/RI. Funding: $130,000. [ANT]

“Deep Reinforcement Learning for Air Combat.” Sponsor: AFRL/RQ. Funding: $30,000 [ANT]

Other Significant Research Productivity

Established new Artificial Intelligence special study class based on emerging urgent needs by multiple sponsors.
DAVIS, NATHANIEL J., IV
Professor Emeritus, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2005 (AFIT/ENG); BSEE, Virginia Polytechnic Institute and State University, 1976; MSEE, Virginia Polytechnic Institute and State University, 1977; PhD, Purdue University, 1985. Dr. Davis’ research interests include computer communications networks, cyber operations, and large scale computer architectures. He is a Senior Member of the IEEE, and a member of the Sigma Xi, Eta Kappa Nu, and Tau Beta Pi honorary societies.

DEYOUNG, MARK E., Lt Col
Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2018 (AFIT/ENG); BS, Columbia College, 2003; MS, Air Force Institute of Technology, 2008; PhD, Computer Engineering, Virginia Tech, 2018. Lt Col DeYoung's research interests include hardware/software co-design, embedded systems, cyber situational awareness, computational statistics, software engineering, and reverse engineering. He is a member of Eta Kappa Nu and Upsilon Pi Epsilon honor societies. AFIT research center Affiliation: CCR. Tel. 937-255-3636 x3368, Email: Mark.DeYoung@afit.edu

GRAHAM, SCOTT R.
Associate Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2015 (AFIT/ENG); BS, Electrical Engineering, Brigham Young University, 1993; MS, Electrical Engineering, Air Force Institute of Technology, 1999; PhD, Electrical Engineering, University of Illinois at Urbana-Champaign, 2004. Dr. Graham’s research interests include the intersection between real physical systems and the computers that control them. Specific areas of interest include trusted avionics and vehicular computer systems. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4581, Email: Scott.Graham@afit.edu

Sponsor Funded Research Projects

“Reconnaissance Improvement via Change Detection, Data Compression, & Comm Resilience Using Jetson TX1s & TX2s.” Sponsor: Undisclosed. Funding: $30,780 - Graham 50%, Nykl 50%. [ANT/CCR “Cyber Resiliency at the Component Level.” Sponsor: AFRL/RY. Funding: $130,000 – Graham 50%, Betances 50% [CCR]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Books and Chapters in Books**


**Editorships in Professional Journals**


**Patent Applications**


**GUNAWARDENA, SANJEEV**
Research Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2014 (AFIT/ENG); BSEE & BS, Engineering Physics, Ohio University, 1997; MSEE, Ohio University, 2000; PhD, Ohio University, 2007. Dr. Gunawardena’s research interests include satellite navigation and timing (SatNav), navigation warfare, software defined radio, reconfigurable computing, and domain-specific programmable ASICs. He is a member of the US Institute of Navigation. AFIT research center affiliation(s): ANT. Tel. 937-255-3636 x4659, Email: Sanjeev.Gunawardena@afit.edu

**Sponsor Funded Research Projects**

“SatNav Signal Monitoring and Analysis Technology Development.” Sponsor: AFRL/RY. Funding: $759,917. [ANT]
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HAMILTON, NICOLAS S., Maj
Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2019 (AFIT/ENG); BSEE, Rose-Hulman Institute of Technology, 2009; MSEE, Air Force Institute of Technology, 2011; PhD, Electrical Engineering, Air Force Institute of Technology, 2019. Maj Hamilton’s research interests include radiation hardening space electronics through hardware and software redundancy, Field Programmable Gate Arrays (FPGA), and Very Large Scale Integrated (VLSI) Circuit design. He is a member of the Eta Kappa Nu, Tau Beta Pi, and IEEE. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4220 Email: Nicolas.Hamilton@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity


HARTRUM, THOMAS C.
Associate Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 1977 (AFIT/ENG); BEE, The Ohio State University, 1969; MS, The Ohio State University, 1969;
PhD, The Ohio State University, 1973; MBA, Wright State University, 1979. Dr. Hartrum’s field of expertise is
software.

HAVRILLA, MICHAEL J.
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date:
2002 (AFIT/ENG); BS, Michigan State University, 1987; MSEE, Michigan State University, 1989; PhD, Michigan
State University, 2001. Dr. Havrilla’s research interests include electromagnetic theory, guided wave theory and
applications, electromagnetics of complex media, material characterization, low observables, electromagnetic
scattering, and antenna theory. He is a member of HKN and Sigma Xi, a Senior Member of the IEEE, and a Full
Member of the International Union of Radio Science-Commission B. Tel. 937-255-3636 x4582,
Email: Michael.Havrilla@afit.edu

Sponsor Funded Research Projects

“Material Measurement Laboratory Research.” Sponsor: AFRL/RY. Funding: $225,000.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review

M. Havrilla, “Accommodating Plane Wave Reflections in the kDB System,” International Symposium on

M. Havrilla, “Scalar Potential Depolarizing Dyad Artifact in Bi-isotropic Media,” International Symposium on

Other Significant Research Productivity

M. Havrilla, “Accommodating Plane Wave Reflections in the kDB System,” International Symposium on

M. Havrilla, “Scalar Potential Depolarizing Dyad Artifact in Bi-Isotropic Media,” International Symposium on

M. Havrilla, “Field and Potential Based Methods in Anisotropic and Biaxial Media,” International

HODSON, DOUGLAS D.
Associate Professor of Software Engineering, Department of Electrical and Computer Engineering, AFIT Appointment
Date: 2011 (AFIT/ENG); BS, Physics, Wright State University, 1985; MS, Electro-Optics, University of Dayton,
1987; MBA, University of Dayton, 1999; PhD, Computer Engineering, Air Force Institute of Technology, 2009. Dr.
Hudson’s research interests include real-time distributed simulation architectures for training, test and analysis,
networks, design patterns for modeling radar, and infrared effects. His research interests also include the modeling and
simulation of Quantum Key Distribution protocols. Tel. 937-255-3636 x4719, Email: Douglas.Hodson@afit.edu

Sponsor Funded Research Projects

“AFSIM Maturation and Capability Improvements.” Sponsor: AFRL/RQ. Funding: $35,948 - Hodson 50%, Peterson
50%. [ANT/CCR]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity


Associate Editor, Journal of Defense Modeling and Simulation.


HOPKINS, KENNETH F.

Adjunct Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2018 (AFIT/ENG); BS, Northern Kentucky University, 1975; MS (EE), University of Cincinnati, 1979; MS (Physics), University of Cincinnati, 1980; PhD, Electrical Engineering, University of Cincinnati, 1983; Completed Air War College, Air University, 2008. Dr. Hopkins’ research interests include photonic devices, infrared detectors, and infrared laser sources.

Sponsor Funded Research Projects

“Silicon Photonics for Fiber Lasers.” Sponsor: AFRL/RX. Funding: $20,000.

HOPKINSON, KENNETH M.

Interim Department Head and Professor, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2004 (AFIT/ENG); BSCS, Rensselaer Polytechnic Institute, 1997; MSCS, Cornell University, 2002; PhD, Cornell University, 2004. Dr. Hopkinson’s research interests include wired and wireless networking, fault tolerant and reliable distributed systems, middleware, operating systems, net-centric warfare, network security, cloud computing, machine learning applied to remote sensing, and the use of networks to enhance critical infrastructures. Dr. Hopkinson is a Senior Member of the IEEE, a Senior Member of the ACM, and a member of the Upsilon Pi Epsilon and the Eta Kappa Nu honorary societies. AFIT research center affiliation(s): ANT, CCR, CSRA, and CTISR. Tel. 937-255-3636 x4579, Email: Kenneth.Hopkinson@afit.edu
Sponsor Funded Research Projects

“AI-based Strategy for Space Ops.” Sponsor: AFRL/RV. Funding: $40,000 - Hopkinson 50%, Betances 50%. [CSRA]

“Autonomous Systems Software.” Sponsor: AFRL/RV. Funding: $40,000 - Hopkinson 50%, Betances 50%. [CSRA]

“Multi-objective Evolutionary Algorithm for Space Surveillance Satellite Allocation.” Sponsor: AFRL/RV. Funding: $100,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity


HOUPIST, CONSTANTINE H.
Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1952 (AFIT/ENG); BS, University of Illinois, 1947; MS, University of Illinois, 1948; PhD, University of Wyoming, 1971. Dr. Houpius’ research interests include guidance and control of aerospace vehicles, application of optimal control theory to engineering systems, flight control systems, digital control systems, computational and numerical methods for control systems design, linear and nonlinear control theory, multivariable theory, and quantitative feedback theory. Dr. Houpius has published numerous technical articles and textbooks. He is a registered professional engineer and a Fellow of the IEEE.

JACKSON, JULIE A.
Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2009 (AFIT/ENG); BS, Electrical Engineering, Wright State University, 2002; MS, Electrical Engineering, The Ohio State University, 2004; PhD, Electrical Engineering, The Ohio State University 2009. Dr. Jackson’s research interests include electromagnetic and statistical modeling, radar imaging algorithms, and radar signal exploitation. She is a member of IEEE, Εta Kappa Nu, and Tau Beta Pi. AFIT research center affiliation(s): CTISR. Tel. 937-255-3636 x4678, Email: Julie.Jackson@afit.edu

Sponsor Funded Research Projects

“Multistatic Receiver Optimization and Target Detection.” Sponsor: AFRL/RY. Funding: $58,000.

“Signal Detection in Linearly Mixed Observations with Background Replacement.” Sponsor: AFOSR. Funding: $30,537.
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


KING, DAVID W., Lt Col
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2019 (AFIT/ENG); BSCS, University of Maryland, 2005; MSCO, Air Force Institute of Technology, 2012; PhD, Computer Science, Air Force Institute of Technology, 2019. Maj King’s research interests include artificial intelligence, bio-inspired algorithms, emergence, and multi-agent systems. He is a member of Tau Beta Pi. AFIT research center affiliation(s): ANT. David.King@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


LAMONT, GARY B.
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1970 (AFIT/ENG); Bachelor of Physics, University of Minnesota, 1961; MSEE, University of Minnesota, 1967; PhD, University of Minnesota, 1970. Dr. Lamont teaches courses in computer science and computer engineering. His research interests include: evolutionary computation, artificial immune systems, intrusion and anomaly detection, information security, parallel and distributed computing, combinatorial optimization problems (single objective and multi-objective), software engineering, digital signal processing, and intelligent and distributed control. He has advised many MS and PhD students in these disciplines. Dr. Lamont has authored several textbooks (Multi-Objective EAs, Computer Control), various book chapters, as well as numerous papers. Dr. Lamont was also an engineering systems analyst for the Honeywell Aerospace Division for six years. He is a Senior Member of IEEE, and a member of ACM, ASEE, SIAM, Tau Beta Pi, and Eta Kappa Nu. Tel. 937-255-3636 x4718, Email: Gary.Lamont@afit.edu

LAURVICK, TOD V., Maj
Electrical Engineering Deputy Department Head, Assistant Professor of Electric Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2016 (AFIT/ENG); BSEE, Michigan Technological University, 1995; MS, Air Force Institute of Technology, 2009; PhD, Electrical Engineering, Air Force Institute of Technology, 2016. Maj Laurvick’s research interests include advancement of micro/nanoscale fabrication techniques and material impacts to nano scale devices. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4382, Email: Tod.Laurvick@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review

E. Flores and T. Laurvick, “MEMS Mirror Alternatives Using Polymer/Metal Composite Structures,” NAECON, October 2018.


LEISHMAN, ROBERT C.
ANT Center Director and Research Assistant Professor of Autonomy, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2016 (AFIT/ENG); BS, Utah State University, 2006; MS, Brigham Young University, 2009; PhD, Mechanical Engineering, Brigham Young University, 2013. Dr. Leishman’s research interests include: guidance, navigation and control of small unmanned aerial vehicles, GPS-denied navigation using vision systems, and autonomous systems and robotics. He is a member of The Institute of Navigation (ION) and The Institute of Electrical and Electronics Engineers (IEEE), including the IEEE Controls Systems Society (CSS) and IEEE Robotics and Automation Society (RAS). AFIT research center affiliation(s): ANT. Tel. 937-255-3636 x4755, Email: Robert.Leishman@afit.edu

Sponsor Funded Research Projects

“ENG18-001 PNT Focused Distance Learning Electrical Engineering Master’s Degree.” Sponsor: 746 TS. Funding: $80,000 - Leishman 34%, Canciani 33%, Gunawardena 33%. [ANT]

“ENG18-004 PNT Focused Distance Learning Electrical Engineering Master’s Degree.” Sponsor: USA CERDEC. Funding: $80,000 - Leishman 34%, Canciani 33%, Gunawardena 33%. [ANT]
“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $24,940 - Leishman 80%, Jacques 20%. [ANT]

“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $39,127 - Leishman 80%, Jacques 20%. [ANT]

“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $85,933 - Leishman 80%, Jacques 20%. [ANT]

“Real-Time Path Planning in Constrained, Uncertain Environments.” Sponsor: AFRL/RY. Funding: $150,000. [ANT]

“Scorpion Suite Development and Support.” Sponsor: USA/ISR. Funding: $225,000 - Leishman 50%, Taylor 50%. [ANT]

“Scorpion Support for AgilePod Flight Test.” Sponsor: AFRL/RY. Funding: $200,000. [ANT]

Other Significant Research Productivity

Led the development of several new sponsored research endeavors as the new ANT Center Director.

Assumed primary faculty responsibility for GNC-focused DL degree program.

Assumed PI responsibility on 10 sponsored research projects.

Assumed Advisor responsibility for one additional MS thesis research student in addition to three previously assigned students.

LIEVSAY, JAMES R., Maj
Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2017 (AFIT/ENG); BSEE, United States Air Force Academy, 2006; MSEE, Air Force Institute of Technology, 2011; PhD, Electrical Engineering, University of Oklahoma, 2017. Maj Lievsay’s research interests include radar and array signal processing. AFIT research center affiliation(s): ANT and CTISR. Tel. 937-255-3636 x3369, Email: James.Lievsay@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


LIN, ALAN C., Maj
Adjunct Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2015 (AFIT/ENG); BSCE, Rutgers University, 2004; MSCS, Air Force Institute of Technology, 2008; PhD, Computer Science, Air Force Institute of Technology, 2015. Maj Lin’s research interests include cyber security and education, serious gaming and gamification, data mining, space systems, and software engineering. He is a member of Tau Beta Pi. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4757, Email: Alan.Lin@afit.edu
MARTIN, RICHARD K.
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2004 (AFIT/ENG); BS, Electrical Engineering and Physics, University of Maryland, 1999; MS, Electrical Engineering, Cornell University, 2001; PhD, Electrical Engineering, Cornell University, 2004. Dr. Martin’s research interests include source localization, radio tomographic imaging, 3D laser radar imaging, and engineering education. AFIT research center affiliation(s): ANT and CCR. Tel. 937-255-3636 x4625, Email: Richard.Martin@afit.edu

Sponsor Funded Research Projects
“Classification Methods and Passive Augmentation of Spectropolarimetric LADAR.” Sponsor: AFRL/RW. Funding: $67,543.

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Full Paper Review

Patents Awarded

MAYBECK, PETER S.
Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1973 (AFIT/ENG); BS, Massachusetts Institute of Technology, 1968; PhD, Massachusetts Institute of Technology, 1972. Dr. Maybeck’s research interests include optimal estimation and stochastic control Kalman filtering, adaptive estimation, pointing and tracking, optimally aided inertial navigation systems, and multiple model adaptive filtering. He is the author of the widely recognized three volume reference text, “Stochastic Models, Estimation and Control,” and over 100 technical articles. Dr. Maybeck has received numerous national and local awards including the C. Holmes MacDonald Distinguished Young Electrical Engineering Teach and the ASEE Frederick Emmons Terman Award as the outstanding Electrical Engineering Professor in the US in 1985. He is a fellow of the IEEE. AFIT research center affiliation(s): CCR.

MERKLE, LAURENCE D.
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2015 (AFIT/ENG); BS, Computer and Systems Engineering, Rensselaer Polytechnic Institute, 1987; MSCE, Air Force Institute of Technology, 1992; PhD, Computer Engineering, Air Force Institute of Technology, 1996. Dr. Merkle’s research interests include quantum computing, space situational awareness, computing education, computational science and engineering, evolutionary computation, serious games, and secure computing. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4526, Email: Laurence.Merkle@afit.edu

Refereed Journal Publications
Refereed Conference Papers Accepted on the Basis of Abstract Review


MILLAR, JEREMY R., Maj
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2017 (AFIT/ENG); BS, University of Tennessee, 2000; MS, Air Force Institute of Technology, 2009; PhD, Computer Science, Air Force Institute of Technology, 2017. Maj Millar’s research interests include parallel and distributed systems, modeling and simulation, and software engineering. AFIT research center affiliation(s): CCR.

MILLS, ROBERT F.
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2003 (AFIT/ENG); BS, Electrical Engineering, Montana State University, 1983; MS, Electrical Engineering, AFIT, 1987; PhD, Electrical Engineering, University of Kansas, 1994. Dr. Mills’ research interests include electronic warfare, network security, and cyber resilience in weapon systems. He is a Senior Member of the IEEE, and is a member of the Eta Kappa Nu and Tau Beta Pi honor societies. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4527, Email: Robert.Mills@afit.edu

Sponsor Funded Research Projects

“RF-EW Systems Support.” Sponsor: AFRL/RY. Funding: $40,000. [CCR]

Refereed Journal Publications


Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books

MULLINS, BARRY E.
Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2004 (AFIT/ENG); BS, Computer Engineering, University of Evansville, 1983; MS, Computer Engineering, Air Force Institute of Technology, 1987; PhD, Electrical Engineering, Virginia Polytechnic Institute and State University, 1997.
Dr. Mullins’ research interests include cyber-physical systems security, cyber operations, critical infrastructure protection, computer/network/embedded systems security, and reverse code engineering. Dr. Mullins is a member of Tau Beta Pi, Eta Kappa Nu, American Society for Engineering Education, and a Senior Member of IEEE. He is the recipient of the 2010 IEEE Eta Kappa Nu C. Holmes MacDonald Outstanding Teaching Award. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x7979, Email: Barry.Mullins@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books


Patents Awarded


Other Significant Research Productivity

NOEL, GEORGE E.
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2019 (AFIT/ENG); BS, Computer Science, U.S. Air Force Academy, Colorado Springs, CO, 1998; MS, Information Resource Management, Air Force Institute of Technology, 2002; PhD, Computer Science, Air Force Institute of Technology, 2013. Dr. Noel’s research interests include natural language processing, topic models, ontology learning, neural networks, machine learning, and big data. Tel. 937-255-3636 x4613, Email: George.Noel@afit.edu

NYKL, SCOTT L.
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2015 (AFIT/ENG); BS, Software Engineering, University of Wisconsin-Platteville, 2006; MS, Computer Science, Ohio University, 2012; PhD, Computer Science, Ohio University, 2013. Dr. Nykl’s research interests include computer graphics, interactive 3D graphics, level of detail, image-based rendering, GPGPU programming/parallel computation, distributed real time visualizations, computer vision, computational geometry, sensor fusion, linear algebra, numerical analysis, Synthetic Vision (SVS), Augmented Reality (AR) Parallel/Concurrent Programming, Multi-Core/Multi-Threading, algorithms, big data, and networking, and data structures. AFIT research center affiliation(s): ANT and CCR. Tel. 937-255-3636 x4395, Email: Scott.Nykl@afit.edu

Sponsor Funded Research Projects


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Refereed Conference Papers Accepted on the Basis of Abstract Review


Books and Chapters in Books


Patent Applications


PACHTER, MEIR
Professor, Department of Electrical and Computer Engineering. AFIT Appointment Date: 1993 (AFIT/ENG); BS, Israel Institute of Technology, 1967; MS, Israel Institute of Technology, 1969; PhD, Israel Institute of Technology, 1975. Dr. Pachter's fields of expertise include automatic control of aircraft and missiles, adaptive control and system identification, inertial and GPS navigation, autonomous control/neural networks/fuzzy logic control, nonlinear control, and applied mathematics. Dr. Pachter has published papers in these areas and in differential games, robotics, and theory of computational geometry. Dr. Pachter is interested in the application of mathematics to the solution of engineering and scientific problems. His current areas of interest include military operations optimization, cooperative control, estimation and optimization, statistical signal processing, adaptive optics, inertial navigation, and GPS navigation. AFIT research center affiliation(s): ANT and CCR. Tel. 937-255-3636 x7247, Email: Meir.Pachter@afit.edu

Sponsor Funded Research Projects

“Cooperative Control.” Sponsor: AFRL/RQ. Funding: $40,000. [ANT]


Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


R. Anderson, M. Pachter, and R. Murphey, “Defender Assisted Evasion Maneuvers,” *Proceedings of the 59th Israel Annual Conference on Aerospace Sciences*, Tel Aviv and Haifa, 6-7 March 2019. [ANT] [CCR]


**PETERTON, GILBERT L.**
Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2002 (AFIT/ENG); BS, Architecture University of Texas at Arlington, 1995; MS, Computer Science, University of Texas at Arlington, 1998; PhD, University of Texas at Arlington, 2001. Dr. Peterson’s research interests include uncertainty in artificial intelligence, robotics, machine learning, and digital forensics. AFIT research center affiliation(s): ANT and CCR. Tel. 937-255-6565 x4281, Email: Gilbert.Peterson@afit.edu

**Sponsor Funded Research Projects**

“Autonomy Capability Design and Development.” Sponsor: 711 HPW. Funding: $250,000. [CCR]

“SensorRE - Analytic Provenance System for Software Reverse Engineering.” Sponsor: AFRL/RI. Funding: $25,000. [CCR]

**Refereed Journal Publications**

Okolica, J.S., Peterson, G.L., Mills, R.F., and Grimaila, M.R., “Sequence Pattern Mining with Variables,” *IEEE Transactions on Knowledge and Data Engineering*, DOI: 10.1109/TKDE.2018.2881675
Refereed Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books


Editorships in Professional Journals

Associate Editor, *International Journal of Critical Infrastructure Protection*. [CCR]

Invention Disclosures

Vambrace, Software License for Digital Forensics Abstraction Interface, October 2019. [CCR]

Other Significant Research Productivity


PIERCE, SCOTT J., Lt Col
Deputy Head, Department of Electrical and Computer Engineering, Assistant Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2014 (AFIT/ENG); BS, Electrical Engineering, Brigham Young University, 2002; MSEE, Air Force Institute of Technology, 2008; PhD, Air Force Institute of Technology, 2015. Maj Pierce’s research interests include image-aided navigation, autonomous control, cooperative navigation, sensor fusion, and flight path optimization. He is a member of ION and IEEE.

PYATI, VITTAL P.
Professor Emeritus of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1983 (AFIT/ENG); BE, University of Madras, India, 1953; MSE, Marquette University, 1962; PhD, Electrical Engineering, University of Michigan, 1966. Dr. Pyati’s fields of expertise include electromagnetics, radar, low observables, and electronic ware. Dr. Pyati has authored more than 40 publications in journals and DOD conferences. He has been a consultant to various US Air Force organizations.

RAQUET, JOHN F.
Adjunct Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1998 (AFIT/ENG); BS, US Air Force Academy, 1989; MS, Massachusetts Institute of Technology, 1991; PhD, University of Calgary, Canada, 1998. Dr. Raquet's areas of interest include Global Positioning System (GPS) precise positioning, non-GPS precision navigation, optically-aided navigation, navigation101 using signals of opportunity, integration of MEMS-based inertial measurement units with other sensors, autonomous vehicle navigation and control, and electromagnetic interference and mitigation techniques affecting GPS performance.

Sponsor Funded Research Projects

“Alternative Sensors for Non-GPS Navigation.” Sponsor: Draper Laboratory. Funding: $20,000. [ANT]
“ANT Center and Laboratory Support per MOA between AFIT and AFRL.” Sponsor: AFRL/RY. Funding: $200,000 - Raquet 50%, Pierce 50%. [ANT]

“Multi-Sensor Navigation Demonstration.” Sponsor: USA CERDEC. Funding: $300,000. [ANT]

“PNT-Focused Distance Learning Electrical Engineering Master's Degree.” Sponsor: AFRL/RY. Funding: $100,000 - Raquet 25%, Canciani 25%, Leishman 25%, Gunawardena 25%. [ANT]


“Scorpion Suite Development and Support.” Sponsor: USA CERDEC. Funding: $225,000 - Leishman 50%, Taylor 50%. [ANT]

“Support for PNT Modeling and Simulation.” Sponsor: USA CERDEC. Funding: $100,000. [ANT]

REITH, MARK G.
Assistant Professor of Computer Science, Department of Electrical and Computer Engineering, AFIT Appointment Date: 2016 (AFIT/ENG); BS, Computer Science, University of Portland, 1999, MSCS, Air Force Institute of Technology, 2003; PhD, Computer Science, University of Texas at San Antonio, 2009. Lt Col Reith’s research interests include cyber warfare theory and operation, software engineering, and software security and exploitation. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4603, Email: Mark.Reith@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Martin, S. and Reith, M. “Rethinking USAF Cyber Education and Training,” 14th International Conference on Cyber Warfare & Security ICCWS, 28 February-1 March 2019, Stellenbosch University, Stellenbosch, South Africa. [CCR]

Pendleton, A. and Reith, M. “Quantifying Cyber Vulnerability Risk in Acquisitions,” 14th International Conference on Cyber Warfare & Security ICCWS, 28 February-1 March 2019, Stellenbosch University, Stellenbosch, South Africa. [CCR]
Dillon, P. and Reith M. “Building Irrefutable Trust throughout Computer Networks using Blockchains,” *14th International Conference on Cyber Warfare & Security ICCWS*, 28 February-1 March 2019, Stellenbosch University, Stellenbosch, South Africa. [CCR]

**SWEENEY, PATRICK J., Lt Col**
Assistant Professor of Computer Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 2018 (AFIT/ENG); BScpE, Clarkson University, 1999; MS, Air Force Institute of Technology, 2005; PhD, Computer Engineering, Thayer School of Engineering at Dartmouth College, 2014. Lt Col Sweeney’s research interests include cybersecurity of commercial and military embedded systems, next-generation avionics, and reverse engineering. He is a member of Eta Kappa Nu honor society. AFIT research center affiliation(s): CCR. Tel. 937-255-3636 x4757, Email: Patrick.Sweeney@afit.edu

**Sponsor Funded Research Projects**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Patent Applications**


**TEMPLE, MICHAEL A.**
Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT Appointment Date: 1996 (AFIT/ENG); BSE, Southern Illinois University, 1985; MSE, Southern Illinois University, 1986; PhD, Air Force Institute of Technology, 1993. Dr. Temple’s research interests include the exploitation of signal (wired, wireless, intentional, unintentional, etc.) Distinct Native Attribute (DNA) features to improve device hardware and/or operation discrimination. This includes application to Radio Frequency (RF-DNA), Wired Signal (WS-DNA), and Correlation Based (CB-DNA) Fingerprinting methods that exploit inherent physical features to enhance authentication of hardware bit-level identities and the operational state of selected devices. Sponsored research activity, as adopted by and/or transitioned to Air Force, Department of Defense, and national agencies as provided approximately $1M annually in R&D Technology benefit. Senior member of IEEE since Jan 2002. AFIT research center affiliation(s): ANT, CSRA and CCR. Tel. 937-255-3636 x4279, Email: Michael.Temple@afit.edu

**Sponsor Funded Research Projects**

“RF-EW Systems Support.” Sponsor: AFRL/Ry. Funding: $35,000 [CCR]

**Refereed Journal Publications**


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


TERZUOLI, ANDREW J., Jr.
Associate Professor of Electrical Engineering, Department of Electrical and Computer Engineering, AFIT
Appointment Date: 1982 (AFIT/ENG); BS, Electrical Engineering, Polytechnic Institute of Brooklyn, 1969; MS, Electrical Engineering, Massachusetts Institute of Technology, 1970; PhD, Electrical Engineering, The Ohio State University, 1982. Dr. Terzuoli’s research areas have included Antennas and Electromagnetics; Computer Model Based Studies; Application of Parallel Computation, VLSI Technology, and RISC Architecture to Numerical and Transform Methods; Remote Sensing and Communication; Passive RF Sensing; Wave Scattering, Radar Cross Section, and Stealth (LO/CLO) Technology; Machine Vision and Image Processing; and Automated Object Recognition. He has published numerous reports and articles in journals and conference proceedings in these and related areas. His research is funded by various agencies including AFRL and NASIC. Prior to joining AFIT in 1982, Dr. Terzuoli was a research associate at the ElectroScience laboratory at The Ohio State University and was a member of the technical staff at the Bell Telephone Laboratories in New Jersey. He is an active officer of IEEE and a fellow of the Electromagnetics Academy. AFIT research center affiliation(s): CDE and CSRA. Tel. 937-255-3636 x4717, Email: Andrew.Terzuoli@afit.edu

Sponsor Funded Research Projects

“Nuclear Command, Control and Communications.” Sponsor: AFRL/RI. Funding: $400,000.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


5.4 DEPARTMENT OF MATHEMATICS AND STATISTICS

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5.4.1 DOCTORAL DISSERTATIONS

5.4.2 MASTER’S THESES

5.4.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT
### 5.4.1 DOCTORAL DISSERTATIONS

ANDERSON, TIMOTHY, Statistical L-Moment and L-Moment Ratio Estimation and Their Applicability in Network Analysis. AFIT-ENC-DS-19-S-001. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: 711 HPW/RHCML.

LOPEZ, JENNIFER, Sample Size Requirements and Considerations for Models to Assess Human-Machine System Performance. AFIT-ENC-DS-19-S-003. Faculty Advisor: Dr. Christine M. Schubert Kabban. Sponsor: 711HPW/RH.


TURNER, JONATHAN, An Efficient Search-Based Algorithm. AFIT-ENC-DS-19-J-074. Faculty Advisor: Lt Col Andrew J. Geyer. Sponsor: N/A.
5.4.2 MASTER’S THESES


PAMILAGAS, KEVIN, Analyzing a Method to Determine the Utility of Adding a Classification System to a Sequence for Improved Accuracy. AFIT-ENC-MS-19-M-002. Faculty Advisor: Dr. Christine Schubert Kabban. Sponsor: N/A.

SANDERSON, DAWN, Modeling the Distribution of Lightning Strike Distances Outside a Preexisting Lightning Area. AFIT-ENC-MS-19-M-003. Faculty Advisor: Dr. Edward D. White. Sponsor: 45 WS.

SCHMITT, COURTNEY, Harmonic Equiangular Tight Frames Comprised of Regular Simplices. AFIT-ENC-MS-19-M-004. Faculty Advisor: Dr. Matthew C. Fickus. Sponsor: N/A.
5.4.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable.

AKERS, BENJAMIN F.
Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2011(AFIT/ENC); BS, Pennsylvania State University, 2003; MA, University of Wisconsin - Madison, 2005; PhD, University of Wisconsin-Madison, 2008. Dr. Akers’ research interests include nonlinear waves, applied mathematics, fluid mechanics, and numerical analysis. Dr. Akers’ current research considers the stability and existence of traveling water waves, as well as the fluid flows induced by high energy lasers. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4522, Email: Benjamin.Akers@afit.edu

Sponsor Funded Research Projects

“Applications of Radial Basis Functions.” Sponsor: AFOSR. Funding: $34,763 - Akers 50%, Reeger 50%. [CDE]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


ANDERSON, TIMOTHY S., Maj
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2019 (AFIT/ENC); BS, Midwestern State University, 2006; MA, University of Washington, 2011; PhD, Air Force Institute of Technology, 2019. Maj Andersons' research interests include L-moments, uncertainty estimation, and computational statistics. Maj Andersons' current research looks to maintain custody of satellite objects while decreasing required observations by implementing a sparse graphical representation of the multivariate volatility structure of correlated space objects. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4450, Email: Timothy.Anderson@afit.edu
ARMSTRONG, ANDREW M., Maj
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2016 (AFIT/ENC); BS, Michigan Technological University, 2008; MS, Air Force Institute of Technology, 2010; MS, University of Texas at San Antonio, 2011; PhD, Air Force Institute of Technology, 2016. Maj Armstrong’s research interests include wavelet analysis, astrostatistics, machine learning, big data, and computational statistics.

BAKER, WILLIAM P.
Associate Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1986 (AFIT/ENC); BA, University of California at Irvine, 1969; MA, University of California at Irvine, 1970; PhD, Northwestern University, 1987. Dr. Baker's research interests include asymptotic and perturbation methods, wave propagation and scattering theory, applied mathematics, functional analysis, low observables, and numerical analysis. Dr. Baker's current research focuses on thermal dynamics of high speed wear, vibrational dynamics of thermally loaded materials, and dynamics and control of satellite structures. Dr. Baker is a Master Navigator with prior military assignments in flight test, satellite communications, cruise missile, and radar analysis. Tel. 937-255-3636 x4517, Email: William.Baker@afit.edu

Refereed Journal Publications


BEMROSE, TRAVIS J., Maj
Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2016 (AFIT/ENC); BS, University of Idaho, 2003; MS, University of Texas at San Antonio, 2012; PhD, University of Missouri–Columbia, 2016. Maj Bemrose’s research interests include Hilbert space frame theory, compressive sensing, numerical methods, and modeling and simulation. His current research focuses on the Paulsen problem, adaptive-dictionary image reconstruction, and equiangular frames. Tel. 937-255-3636 x4619, Email: Travis.Bemrose@afit.edu

BROOKS, ERIC L., Lt Col
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2018 (AFIT/ENC); BS, University of South Carolina-Aiken, 2001; MS, Rochester Institute of Technology, 2012; PhD, Air Force Institute of Technology, 2018. Lt Col Brooks’ research interests include big data, machine learning statistical genetics, compressive sampling. In his current research, he addresses the high-dimensionality challenge associated with DNA data by leveraging concepts of compressive sampling for feature selection and dimensionality reduction. Tel. 937-255-3636 x4398, Email: Eric.Brooks@afit.edu

BULUTOGLU, DURSUN A.
Associate Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2004 (AFIT/ENC); BS, University of Maryland at College Park, 1996; PhD, University of California, Berkeley, 2001. Dr. Bulutoglu’s research interests include design of experiments and combinatorial problems in statistics. His papers focus on finding generalized minimum aberration (GMA) factorial designs by enumerating all non-isomorphic orthogonal arrays. The tools he uses for enumerating orthogonal arrays are integer programming, constraint programming, and isomorphism rejection. Tel. 937-255-3636 x4704, Email: Dursun.Bulutoglu@afit.edu

Sponsor Funded Research Projects

**Refereed Journal Publications**


**FICKUS, MATTHEW C.**
Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2004 (AFIT/ENC); BS, University of Maryland, Baltimore County, 1995; MS, University of Maryland, Baltimore County, 1997; PhD, University of Maryland, College Park, 2001. Dr. Fickus' research interests include applied harmonic analysis, frame theory, and compressed sensing. Tel. 937-255-3636 x4513, Email: Matthew.Fickus@afit.edu

**Refereed Journal Publications**


**Other Significant Research Productivity**


**GEYER, ANDREW J., Lt Col**
Assistant Professor of Statistics and Deputy Head, Department of Mathematics and Statistics, AFIT Appointment Date: 2014 (AFIT/ENC); BS, North Dakota State University, 2000; MS, Air Force Institute of Technology, 2009; PhD, Air Force Institute of Technology, 2014. Lt Col Geyer’s research interests include design of experiments, combinatorial optimization problems in statistics, statistical performance metrics, and statistical classification techniques. The tools he uses are integer programming, constraint programming, graph isomorphism rejection, and multivariate statistical analysis. Lt Col Geyer has served as a weather officer in F-16, AH-64, OH-58D, and CH-47 flying units, as well as in units supporting United States Army and Special Operations ground forces. Tel. 937-255-3636 x4584, Email: Andrew.Geyer@afit.edu

**Sponsor Funded Research Projects**

“Environmental Modeling for Space Launch Support at Patrick AFB, FL.” Sponsor: 45 WS. Funding: $78,650 - Geyer 50%, White 40%, Nava 10%.
**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**HARTLAGE, ROBERT B., Lt Col**  
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2019 (AFIT/ENC); BS, University of Louisville, 2002; MS Eng, Wright State University, 2004; MS, Air Force Institute of Technology, 2007; PhD, Air Force Institute of Technology, 2012. Lt Col Hartlage’s research interests include mathematical modeling of transportation systems, metaheuristics for quickly designing dynamic communication networks, and for solving network-type communication and transportation problems. Lt Col Hartlage’s current research uses biologically inspired metaheuristics to solve resource constrained, multi-modal transportation problems. Tel. 937-255-3636 x4630, Email: Robert.Hartlage@afit.edu

**JORDAN, JEREMY D., Lt Col**  
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2016 (AFIT/ENC); BA, Aurora University, 2001; MS, Air Force Institute of Technology, 2007; PhD, Air Force Institute of Technology, 2012. Lt Col Jordan’s research interests include combinatorial optimization, decision analysis, network theory, and big data analysis. Lt Col Jordan has served as an operations research analyst for operational testing and human research, as well as an international program manager for the Air Force Office of Scientific Research (AFOSR). AFIT research center affiliation(s): COA. Tel. 937-255-3636 x4669, Email: Jeremy.Jordan@us.af.mil

**Sponsor Funded Research Projects**

“Design of Networks in Uncertain Environment with Buffered Probability of Exceedance (bPOE) and Cardinality of Upper Average (CUA) Characteristics.” Sponsor: AFOSR. Funding: $37,223.

“Latency Reduction for Autonomous Waveform Design in Congested Environments.” Sponsor: AFRL/RY. Funding: $30,000 - Jordan 50%, Uber 50%.

**Refereed Journal Publications**


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Other Significant Research Productivity


LAIR, ALAN V.
Professor of Mathematics and Head, Department of Mathematics and Statistics, AFIT Appointment Date: 1982 (AFIT/ENC); BA, North Texas State University, 1970; MS, Texas Tech University, 1972; PhD, Texas Tech University, 1976. Dr. Lair's research interests include parabolic and elliptic partial differential equations, functional analysis, applied mathematics, and nonlinear diffusion. He has published several papers on the properties of solutions of various nonlinear partial differential equations. Tel. 937-255-3636 x4519, Email: Alan.Lair@afit.edu

Refereed Journal Publications


LIU, TONY, Capt
Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2019 (AFIT/ENC); BA, Rutgers University, 2012; MS, Air Force Institute of Technology, 2014; PhD, Arizona State University, 2019. Capt Liu's research interests include applied mathematics, approximation theory, and numerical analysis. Capt Liu's current research includes finding the optimal placement of sampling nodes for approximation methods. Tel. 937-255-3636 x4722, Email: Tony.Liu@afit.edu

MAGNUS, AMY L.
Research Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2017 (AFIT/ENC); BSEE, Rochester Institute of Technology, 1990; MSEE, Air Force Institute of Technology, 1995; PhD, Air Force Institute of Technology, 2003. Dr. Magnus conducts research in distributed intelligence, i.e., the mature work that emerges from human computers teams. Her research combines multiple disciplines including information fusion, near and remote sensing, data analytics, constraint programming, and narrative analysis. Within these disciplines, Dr. Magnus works the seam between sensory organization and natural language processing translating signals to symbols and symbols into stories. Her contributions to artificial intelligence define the computational differences between training and learning; she designs and demonstrates studies where autonomy can be examined as an oscillating signal. AFIT research center affiliation(s): CCR and CSRA. Tel. 937-255-3636 x4454, Email: Amy.Magnus@afit.edu

Sponsor Funded Research Projects

“Distributed Intelligence and the Nature of Mature Work.” Sponsor: AFOSR. Funding: $149,917 - Magnus 90%, Oxley 10%. [CCR]

Other Significant Research Productivity


**MORRILL, DANA F., Maj**
Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2018 (AFIT/ENC); BS, Weber State University, 2005; MS, Air Force Institute of Technology, 2013; PhD, Air Force Institute of Technology, 2018. Maj Morrill’s research interests include optical waves, applied mathematics, fluid mechanics, and numerical analysis. Maj Morrill’s current research considers fluid flows induced by high energy lasers. AFIT research center affiliation(s): CDE. Tel. 937-255-3636 x4729, Email: Dana.Morrill@afit.edu

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**NUNNALLY, BEAU A., Lt Col**
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2018 (AFIT/ENC); BS, Virginia Polytechnic Institute and State University, 2004; MS, Air Force Institute of Technology, 2012; PhD, Air Force Institute of Technology, 2018. Lt Col Nunnally’s research interests include classification, diagnostic testing, modeling and prediction, network analysis, regression, MANOVA, decision analysis, and decision support with multiple objectives. Lt Col Nunnally’s current research is on inference in classification systems, sequential systems, and multiple-objective response surface methodology. Tel. 937-255-3636 x4394, Email: Beau.Nunnally@afit.edu

**OXLEY, MARK E.**
Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1987 (AFIT/ENC); BS, University of the Cumberland, 1978; MS, Purdue University, 1980; PhD, North Carolina State University, 1987. Dr. Oxley's research interests include partial differential equations, free and moving boundary value problems, finite-time extinction problems, functional analysis, optimization, artificial neural networks, wavelet analysis, classifier fusion, information fusion and evaluation of fusion techniques, receiver operating characteristic (ROC) curves, and ROC manifolds. AFIT research center affiliation(s): ANT and CTISR. Tel. 937-255-3636 x4515, Email: Mark.Oxley@afit.edu

**Sponsor Funded Research Projects**

“Fusion in Exploitation of Sensing Technology.” Sponsor: AFOSR. Funding: $58,740 - Oxley 50%, Schubert Kabban 50%.

“The Mathematical Theory of Individual Exposure Health Risk Profile (IEHRP).” Sponsor: USAFSAM. Funding: $115,104 - Oxley 50%, Schubert Kabban 50%.


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**

Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


QUINN, DENNIS W.
Professor Emeritus of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1974 (AFIT/ENC); BA, Mathematics, University of Delaware, 1969; MS, Applied Mathematics, University of Delaware, 1971; PhD, Applied Mathematics, University of Delaware, 1973. Dr. Quinn's fields of expertise include numerical methods, finite elements, finite differences, integral equation methods, numerical analysis, functional analysis, system identification, and applied mathematics. Dr. Quinn has advised several MS students in modeling toxic chemical exposure. He has also published papers dealing with integral and finite element solutions of acoustic problems, using the telegrapher's equation to model lightning; using the method of characteristics in cancer risk assessment; using the diffusion equation to model diffusion through the skin in pharmacokinetic modeling; and using the boundary element method for moving boundary problems.

REYNOLDS, DANIEL E.
Assistant Professor Emeritus of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 1974 (AFIT/ENC); BA, University of Rochester, 1965; MS, Air Force Institute of Technology, 1971; MS, Wright State University, 1983. Mr. Reynolds’ research interests include management cybernetics, learning theory, and exploring ways computer graphics can support statistical and mathematical education. In 1989, Mr. Reynolds received Tau Beta Phi's Outstanding Professor Award.

SCHUBERT KABBAN, CHRISTINE M.
Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2010 (AFIT/ENC); BA, University of Dayton, 1992; MBA, Wright State University, 1994; MS, Wright State University, 1995; PhD, Air Force Institute of Technology, 2005. Dr. Schubert Kabban's research interests include classification techniques, diagnostic testing, ROC curve theory and extensions, human performance, information fusion, modeling and prediction, NDE methods, network analysis, regression and regression extensions, survey design and analysis, and general biostatistics. Dr. Schubert Kabban’s current research is in evaluating the performance of classification systems and information-fused systems via ROC methodology, sequential strategies for classification, structural health monitoring of airframes, as well as epidemiological applications to disease prediction and medical diagnostics. Tel. 937-255-3636 x4549, Email: Christine.SchubertKabban@afit.edu

Sponsor Funded Research Projects

“Automated Statistical Exploitation for Artificial Intelligence.” Sponsor: 711 HPW. Funding: $100,000.

“Sequencing Information for Efficient, Accurate Classification.” Sponsor: AFOSR. Funding: $33,136.
Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Books and Chapters in Books


Other Significant Research Productivity


SRITHARAN, SIVAGURU S.
Provost and Vice Chancellor, AFIT Appointment Date: 2015 (AFIT/CL); BSc (Hons.) University of Sri Lanka, 1977; MS, University of Washington, 1979; PhD, University of Arizona, 1982. Dr. Sritharan’s research interests include control theory, stochastic analysis, functional analysis, and numerical analysis of aerodynamics at all range of Mach numbers and electromagnetics. Dr. Sritharan’s current research focuses on mathematical and computational issues relevant to hypersonics, directed energy weapons, and autonomy. AFIT research center affiliation(s): CDE.

TURNER, JONATHAN S., Capt
Assistant Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 2019 (AFIT/ENC); BS, Texas State University, 2011; MS, Texas State University, 2012; MS, Air Force Institute of Technology, 2014; PhD, Air Force Institute of Technology, 2019. Capt Turner’s research interests include combinatorial problems in statistics and discrete optimization with application towards data compression. The tools he uses for exploring combinatoric equivalence relations are discrete Fourier transform, integer programming, and heuristics. Tel. 937-255-3636 x7403, Email: Jonathan.Turner@afit.edu

UBER, RICHARD P., Capt
Assistant Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 2016 (AFIT/ENC); BGS, University of Nebraska Omaha, 2006; MS, Texas A&M University, 2010; PhD, Air Force Institute of Technology, 2016. Capt Uber’s current research interests are electromagnetic wave scattering, partial differential equations, computational modeling, structural health monitoring, and machine translation. He has served as an Operations Research Analyst for Headquarters Air Education and Training Command, and as a Mandarin Language Instructor at the Defense Language Institute Foreign Language Center.

**Other Significant Research Productivity**


WHITE, EDWARD D., III
Professor of Statistics, Department of Mathematics and Statistics, AFIT Appointment Date: 1998 (AFIT/ENC); BS, University of Tampa, 1990; MAS, The Ohio State University, 1991; PhD, Texas A&M University, 1998. Dr. White’s research interests include design of experiments, categorical data analysis, biostatistics, and model building. Tel. 937-255-3636 x4540, Email: Edward.White@afit.edu

**Refereed Journal Publications**


**Other Significant Research Productivity**


**WOOD, AI HUA W.**
Professor of Mathematics, Department of Mathematics and Statistics, AFIT Appointment Date: 1994 (AFIT/ENC); BS, Peking University, 1984; MS, University of Connecticut, 1988; PhD, University of Connecticut, 1990. Dr. Wood’s research interests include partial differential equations, electromagnetic wave propagation, and Boltzmann equations.
Tel. 937-255-3636 x4272, Email: Aihua.Wood@afit.edu

**Sponsor Funded Research Projects**


**Other Significant Research Productivity**


5.5 DEPARTMENT OF OPERATIONAL SCIENCES

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5.5.1 DOCTORAL DISSERTATIONS


CABALLERO, WILLIAM, Behavioral and Behaviorally Robust Models. AFIT-ENS-DS-19-J-022. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: USSTRATCOM.

JENKINS, PHILLIP, Strategic Location and Dispatch Management of Assets in a Military Medical Evacuation Enterprise. AFIT-ENS-DS-19-J-037. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: MEPD.

KEITH, ANDREW J., Inferential, Sequential, and Adversarial Approaches. AFIT-ENS-DS-19-S-041. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: STRATCOM. [COA]

5.5.2 MASTER’S THESES

ALAJMI, ABDULAZIZ, RSAF C-130 Part Cancellation Process Analysis. AFIT-ENS-MS-19-S-032. Faculty Advisor: Dr. William A. Cunningham. Sponsor: NA.


BAKER, JADE, West Africa Logistics Networks. AFIT-ENS-MS-19-M-100. Faculty Advisor: Dr. Bruce A. Cox Sponsor: US AFRICOM.


BRAMBLETT, LAUREN M., Turbojet Range, Loiter, and Altitude Tradeoff Estimations in Efficient Modeling and Optimization Formulations. AFIT-ENS-MS-19-M-102. Faculty Advisor: Dr. Lance E. Champagne. Sponsor: NASIC. [COA]

BROWN, DOUGLAS, Applying Survival Analysis with Frailty to Aircraft Reliability. AFIT-ENS-MS-19-M-103. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: N/A.

BUCK, JENNIFER, Pay-Setting Analysis of Laboratory Demonstration Workforce. AFIT-ENS-MS-19-M-104. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 711th HPW.


GILL, ANDREW, Examining the Drivers of C-130J Maintenance Requirements. AFIT-ENS-MS-19-M-115. Faculty Advisor: Dr. William A. Cunningham. Sponsor: AFLCMC/LZ.


GREEN, NICHOLAS, Shipping Designs for the Post-Disaster Cargo Surge. AFIT-ENS-MS-19-M-118. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: FEMA.

HARRIS, KAREN, A Comparative Analysis on UAS Operating Procedures within Military Airspace. AFIT-ENS-MS-19-M-120. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: AFRL/RQ.

HORNERGER, ZACHARY, Search and Rescue Operations Forecasting and Optimization. AFIT-ENS-MS-19-M-123. Faculty Advisor: Lt Col Bruce A. Cox. Sponsor: CG RDC.

HUGHES, MICHAEL S., A Port-Based Analysis of USTRANSCOM Shipping Network Vulnerability. AFIT-ENS-MS-19-M-124. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: USTRANSCOM/JDPAC. [COA]


KEESLING, RICHARD B., Exploratory Analysis of the Potential Use of Augmented Reality in Aircraft Maintenance. AFIT-ENS-MS-19-M-129. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: AFRL. [COA]


KOLANO, BRYAN, Multivariate Analysis of Diversity and Inclusion Data. AFIT-ENS-MS-19-M-132. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: 88th ABW.

LARKIN, MICHAEL T., A Stochastic Game Theoretical Model for Cyber Security. AFIT-ENS-MS-19-M-133. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: USD (R&E) DTEP. [COA]


MANGEN, MATTHEW, An Analysis of Changing the Federal Age Requirement for a Commercial Driver's License. AFIT-ENS-MS-19-J-038. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.

MAUS, JOCELIN, Applying the Multiple Multidimensional Knapsack Assignment Problem to a Cargo Allocation and Transportation Problem with Stochastic Demand. AFIT-ENS-MS-19-M-137. Faculty Advisor: Maj Thomas P. Talafuse. Sponsor: N/A.


MONTEIRO, LUCIANA M., Predicting Failures of the Brazilian Air Force Tucano Fleet Using Survival Analysis. AFIT-ENS-MS-19-M-139. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: ILA. [COA]


PENDERGRASS, MICHAELA A., A Topological View of the Relationship between Women and Armed Conflict in West Africa. AFIT-ENS-MS-19-M-143. Faculty Advisor: LTC Christopher M. Smith. Sponsor: USAFRICOM. [COA]


SANDS, BRENDON, Time Series Analysis of Stochastic Networks with Correlated Random Arcs. AFIT-ENS-MS-19-M-147. Faculty Advisor: Lt Col Andrew J. Geyer. Sponsor: N/A.


ST PETER, TROY, Implementing an Autoregressive Distributed Lag Approach with Air Force Maintenance Data. AFIT-ENS-MS-19-M-151. Faculty Advisor: Dr. Raymond R. Hill. Sponsor: AFSC/LG.


5.5.3 GRADUATE RESEARCH PAPERS

COBURN, ZACHARY, A Qualitative Study of Air Mobility Command's Phoenix Horizon-Reach Program. AFIT-ENS-MS-19-J-024. Faculty Advisor: Dr. Seong-Jong Joo. Sponsor: USAF EC/EC.


GILLILAND, SHARON, The First Step Towards an Interchangeable Aircraft Management Construct. AFIT-ENS-MS-19-J-030. Faculty Advisor: Dr. William A. Cunningham. Sponsor: N/A.


HEMKEN, KATHERINE B., Forecasting Sustainment Cargo Requirements. AFIT-ENS-MS-19-J-035. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: N/A. [COA]


REYNOLDS, THOMAS, From the APOD to the Point of Need. AFIT-ENS-MS-19-J-045. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: N/A.

5.5.4 FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliations are listed in [ ] if applicable.

AHNER, DARRYL K.
Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2010 (AFIT/ENS); Director, Scientific Test and Analysis Techniques (STAT) for Test and Evaluation (T&E) Center of Excellence, Appointment Date: 2012; Director, Center for Operational Analysis, Appointment Date: 2018; BS, Mechanical Engineering, United States Military Academy, 1990; MS, Applied Mathematics, Rensselaer Polytechnic Institute, 1999; MS, Operations Research and Statistics, Rensselaer Polytechnic Institute, 1999; PhD, Systems Engineering, Boston University, 2005. Dr. Ahner's research interests include dynamic programming, optimization of stochastic models, test and evaluation, software testing, information theory, and military operations research applications. Dr. Ahner is a licensed Professional Engineer in the Commonwealth of Virginia. Dr. Ahner is a member of the Military Operations Research Society, Institute of Electrical and Electronics Engineers, and the Institute for Operations Research and the Management Sciences. Tel. 937-255-3636 x4708, Email: Darryl.Ahner@afit.edu

Sponsor Funded Research Projects


“AFSIM Modular Development to Support the Solar Space Power Initiative (SSPI).” Sponsor: AFRL/RV. Funding: $950,000. [COA]

“AFSIM Training Support.” Sponsor: SDPE. Funding: $75,000.

“Analysis and Test Planning for Female Accommodation.” Sponsor: AFLCMC. Funding: $65,000.

“COE-S 210/COE-R 210 Short courses.” Sponsor: NAVSEASYSCMD. Funding: $36,000.


“Joint Live Fire T&E Analysis of Methodologies.” Sponsor: OSD. Funding: $191,000.


“T-6 Subject Matter Expertise Engineering Support.” Sponsor: AFLCMC. Funding: $325,000.

“Test & Evaluation Strategy Development for T-X Advanced Pilot Trainer.” Sponsor: AFLCMC. Funding: $550,000 - Ahner 50%, Thorsen 50%.

“Test and Evaluation Center of Excellence.” Sponsor: OSD. Funding: $360,520.

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Editorships in Professional Journals**

Editorial Board, *Military Operations Research Society*

**Other Significant Research Productivity**

**ANDERSON, JASON R., Lt Col**  
Assistant Professor of Logistics and Supply Chain Management and Deputy Department Head, Chair, Department of Operational Sciences, AFIT Appointment Date: 2016 (AFIT/ENS); Program Manager of Advanced Study of Air Mobility (ASAM), 2016; BS, Operations Research, United States Air Force Academy, 2000; Masters of Science and Administration, Central Michigan University, 2007; Masters of Logistics and Supply Chain Management, Air Force Institute of Technology, 2013; PhD, Logistics and Supply Chain Management, Air Force Institute of Technology, 2016. Lt Col Anderson’s research interests include transportation, logistics management, inventory, operations management, simulation, and sourcing. Lt Col Anderson is a member of the Airlift/Tanker Association, American Society of Transportation & Logistics, and the Council of Supply Chain Management Professionals.  
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**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**BREITBACH, TIMOTHY W., Maj**  
Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2016 (AFIT/ENS); BA, University of Notre Dame, 2005; MS, Air Force Institute of Technology, 2012; PhD, Massachusetts Institute of Technology, 2017. Dr. Breitbach’s research interests include supply chain finance and data analysis, humanitarian logistics and the role of supply chains in international development, supply chain resilience, and block chain. Maj Breitbach is a member of the Logistics Officer Association, Production and Operations Management Society, and the Council of Supply Chain Management Professionals.  
Tel. 937-255-3636 x4458, Email: Timothy.Breitbach@afit.edu

**Sponsor Funded Research Projects**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


**CHAMPAGNE, LANCE E.**
Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2018 (AFIT/ENS); BS, Biomedical Engineering and Mathematics, Tulane University, 1991; MS, Operations Research, Air Force Institute of Technology, 1999; PhD, Operations Research, Air Force Institute of Technology, 2004. Dr. Champagne’s research interests include agent-based and discrete-event simulation, and applied and multivariate statistics. Dr. Champagne is a member of the Military Operations Research Society. Tel. 937-255-6565 x4646, Email: Lance.Champagne@afit.edu

**Sponsor Funded Research Projects**

“Education and Research Support for Modeling, Simulation, & Analysis.” Sponsor: SDPE. Funding: $250,000 - Champagne 40%, Miller 30%, Lunday 30%. [COA]

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**CIARALLO, FRANK W.**
Associate Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2019 (AFIT/ENS); BS, Electrical Engineering, Engineering & Public Policy, Carnegie Mellon University, 1986; MS, Manufacturing and Operations Systems, Carnegie Mellon University, 1988; PhD, Industrial Administration, Carnegie Mellon University, 1993. Dr. Ciarallo’s research interests include 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, and helper objectives in multiobjective for job shop scheduling. Tel. 937-255-3636 x4702, Email: Frank.Ciarallo@afit.edu

**COX, BRUCE A., Lt Col**
Assistant Professor and Division Chief of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2018 (AFIT/ENS); BS, Worcester Polytechnic Institute, 1999; MS, Virginia Commonwealth University, 2006; PhD, Georgia Institute of Technology, 2011. Dr. Cox’s research interests include large scale linear and convex optimization, robust optimization, heuristics, and optimal control. Lt Col Cox is the Vice President of the Cincinnati-Dayton Chapter of the Institute of Operations Research and Management Sciences, and is a member of the Military Operations Research Society. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x4510, Email: Bruce.Cox@afit.edu

**Sponsor Funded Research Projects**

“F-15 Modernization Schedule Optimization.” Sponsor: AFLCMC. Funding: $250,000 - Cox 80%, Lunday 20%.

“West Africa Logistics Network (WALN).” Sponsor: USAFRICOM. Funding: $43,600 - Cox 50%, Breitbach 50%.
Cunningham, William A.
Professor of Logistics and Supply Chain Management, Department of Operational Sciences; Program Director, MS in Logistics & Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 1994 (AFIT/ENS); BS, Business Administration, Economics, Missouri Southern State College, 1976; MS, Economics, Oklahoma State University, 1979; PhD, Economics, University of Arkansas, 1986. Dr. Cunningham’s research interests include strategic mobility, cost/benefit analysis, econometric modeling, costing, privatization and A-76 studies, modal choice, network analysis, location analysis, supply chain management, and RFID. Dr. Cunningham is a member of the Heavy Duty Trucking Advisory Board. AFIT research center affiliation(s): COA.
Tel. 937-255-3636 x4283, Email: William.Cunningham@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review


Editorships in Professional Journals

Editorial Review Board, *Journal of Transportation Management* [COA]

Deckro, Richard F.
Distinguished Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 1994 (AFIT/ENS); Joint Warfare Analysis Center (JWAC) Chair of Applied Operations Research, and Director, Future Operations Investigation Laboratory (FOIL); BS, Industrial Engineering, State University of New York at Buffalo, 1972; MBA & DBA, Decision Sciences, Kent State University, 1973/1976. Dr. Deckro’s research, teaching, and consultation interests include the areas of information operations and information assurance, behavioral modeling including social network analysis, counter insurgency and irregular warfare, applied mathematical programming and optimization, scheduling, network models, project and program management, modeling and analysis, space applications, campaign modeling, reconstruction and stabilization, measures of effectiveness and assessment, technology selection and management, advanced manufacturing methods, multi-criteria decision making, and decision analysis. Dr. Deckro is a Fellow of the Military Operations Research Society and a USA Panel Member, NATO Science and Technology Organization System Analysis and Studies Panel. AFIT research center affiliation(s): CSRA.
Tel. 937-255-3636 x4325, Email: Richard.Deckro@afit.edu

Sponsor Funded Research Projects

“JWAC AFIT Interaction.” Sponsor: JWAC. Funding: $78,180 - Deckro 40%, Lunday 6%, Ahner 6%, Meyer 43%, Cobb 5%. [COA]

Refereed Journal Publications


Other Significant Research Productivity


DICKENS, JOHN M., Lt Col
Assistant Professor and Division Chief of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2018 (AFIT/ENS); BS, U.S. Military History, Air Force Academy, 2002; MS, Logistics and Supply Chain Management, Air Force Institute of Technology, 2011; Master of Military Operational Art & Science, Air University, 2014; PhD, Logistics Systems, University of North Texas, 2018. Lt Col Dicken’s research interests include service-dominant logic, value and value creation, supply chain resilience, transaction cost economics, self-determination theory, resource-based view, experiments, survey, and simulation methodologies. Tel. 937-255-6565 x4319, Email: John.Dickens@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review

GALLAGHER, MARK A.
Professor of Practice of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2019; BS, Operations Research and Computer Science, United States Air Force Academy, 1983; MS, Operations Research, Air Force Institute of Technology, 1986; PhD, Operations Research, Air Force Institute of Technology, 1992. Dr. Gallagher’s research interests include applied statistics, forecasting, decision analysis, and linear programming. Dr. Gallagher is a Fellow of the Military Operations Research Society, and a member of the Institute for Operations Research and Management Sciences, Military and Security Society, and the Air Force Association. Tel. 937-255-3636 x4703, Email: Mark.Gallagher@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review


Editorships in Professional Journals
Associate Editor, Military Operations Research
Editorial Board, Modeling and Simulation Journal
HILL, RAYMOND R.
Professor of Operations Research, Department of Operational Sciences; Program Chair, Operations Research Doctoral Program; Program Director, Graduate Test and Evaluation Certificate and Data Science Certificate; Director, Science of Test Research Laboratory, Department of Operational Sciences, AFIT Appointment Date:1997 (AFIT/ENS); BS, Mathematics, Eastern Connecticut State University, 1983; MS, Operations Research, Air Force Institute of Technology, 1988; PhD, Industrial and Systems Engineering, The Ohio State University, 1996. Dr. Hill’s research interests include applied statistics and data analytics, in particular the application of design of experiments methodologies to test and evaluation, mathematical optimization, in particular the use of heuristic search methods for addressing particularly hard problems, and applied simulation modeling and analysis with particular interests in the areas of agent-based modeling and the validation of such models. Dr. Hill is a member of the Military Operations Research Society. Tel. 937-255-3636 x7469, Email: Raymond.Hill@afit.edu

Sponsor Funded Research Projects

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Editorships in Professional Journals**

Editor, *Journal of Defense Analytics and Logistics*

Editor, *Military Operations Research*

Associate Editor, *Journal of Defense Modeling and Simulation*

Associate Editor, *Journal of Simulation*

Associate Editor, *International Journal of Mathematics in Operational Research*

Associate Editor, *Naval Research Logistics*

Associate Editor, *Quality Engineering*

**HOLZMANN, TIMOTHY W., Lt Col**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2019; BA, Mathematics, Cedarville University, 2004; MS, Operations Research, Air Force Institute of Technology, 2009; PhD, Industrial Engineering, Clemson University, 2019. Maj Holzmann’s research interests include combinatorial optimization, optimization under uncertainty, multiobjective optimization, decision support, and stochastic modeling. Maj Holzmann is a member of the Institute for Operations Research and the Management Sciences, and the Military Operations Research Society. Tel. 937-255-3636 x4337, Email: Timothy.Holzmann@afit.edu

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


JENKINS, PHILLIP R., Capt
Tel. 937-255-3636 x6100, Email: Phillip.Jenkins@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review

Jenkins, P.R., “Utilizing Operations Research Techniques to Solve Military Medical Evacuation Problems,” INFORMS Annual Meeting, Phoenix, AZ, 4-7 Nov 2018.


Robbins, M.J., Jenkins, P.R., Bastian, N.D., and Lunday, B.J., “Approximate Dynamic Programming for the Aeromedical Evacuation Dispatching Problem: Value Function Approximation Utilizing Multiple Level Aggregation,” INFORMS Annual Meeting, Phoenix, AZ, 4-7 Nov 2018.


JOO, SEONG-JONG
Professor of Logistics & Supply Chain Management, Department of Operational Sciences; Co-Director, Distance Learning Program; MS, Logistics & Supply Chain Management; Program Chair, Logistics Doctoral Program, Department of Operational Sciences, AFIT Appointment Date: 2016 (AFIT/ENS); BS, Korea Air Force Academy (Seoul, Korea), 1982; MBA, Saint Louis University, 1992; PhD, Saint Louis University, 1995. Dr. Joo’s research interests include sourcing, inventory management, transportation, and performance measurement and benchmarking. Dr. Joo is a member of the Academy of Management, American Production and Inventory Control Society, Decision Sciences Institute, Institute for Supply Management, and Production and Operations Management Society. AFIT research center affiliation(s): COA.
Tel. 937-255-3636 x4761, Email: Seong-Jong.Joo@afit.edu

Sponsor Funded Research Projects


“Research, Analysis and Transition Support to the Directorate of Logistics and Sustainment/AFMC.” Sponsor: AFMC/A4. Funding: $90,000 - Joo 40%, Steeneck 25%, Boehmke 20%, Breitbach 5%. [COA]

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


LACASSE, PHILLIP M., Lt Col
Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2019 (AFIT/ENS); BS, Mathematics, United States Military Academy, 2000; MS, Industrial Engineering, University of Wisconsin, 2010; PhD, Industrial Engineering, University of Wisconsin, 2019. Lt Col LaCassee’s research interests include data science, probability and statistics, operations research, and sports analytics.
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Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


LUNDAY, BRIAN J.
Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2016 (AFIT/ENS); BS, Mechanical Engineering, United States Military Academy, West Point, 1992; MS, Industrial Engineering, University of Arizona, 2001; PhD, Industrial and Systems Engineering, Virginia Polytechnic Institute and State University, 2010. Dr. Lunday’s theoretical research interests include math programming, game theoretic models, and algorithmic design for global optimization, whereas his application research interests include network design, network interdiction, network restoration, facility location, and resource allocation/assignment. Dr. Lunday is a member of the Institute for Operations Research and Management Sciences, Military Operations Research Society, and the Air Force Association. Tel. 937-255-3636 x4624, Email: Brian.Lunday@afit.edu

Sponsor Funded Research Projects

“Personnel Recovery Asset Basing in the USAFRICOM AOR.” Sponsor: USAFRICOM. Funding: $8,820.

“Transportation and Distribution Research.” Sponsor: USTRANSCOM. Funding: $125,000.

Refereed Journal Publications

Jenkins, P.R., Lunday, B.J., and Robbins, M.J., “Robust, Multi-Objective Optimization for the Military Medical Evacuation Location-Allocation Problem,” Omega, Jul 2019. DOI: 10.1016/j.omega.2019.07.004


Refereed Conference Papers Accepted on the Basis of Abstract Review


**Editorships in Professional Journals**

Associate Editor, *Military Operations Research* [COA]

**MILLER, JOHN O.**

Associate Professor of Operations Research, Department of Operational Sciences; Program Chair, Operations Research Division, AFIT Appointment Date: 2002 (AFIT/ENS); Director, Combat Modeling Laboratory; BS, Biology, United States Air Force Academy, 1980; MBA, University of Missouri at Columbia, 1983; MS, Operations Research, Air Force Institute of Technology, 1987; PhD, Industrial Engineering, The Ohio State University, 1997. Dr. Miller’s research interests include computer simulation, ranking and selection, agent based modeling, combat modeling, network centric warfare, high performance computing, applied statistics, and nonparametric statistics. AFIT research center affiliation(s): COA. Tel. 937-255-3636 x4326, Email: John.Miller@afit.edu

**Sponsor Funded Research Projects**

“Operational Analysis of Blue Weapons with Focus on Autonomy.” Sponsor: Lockheed Martin. Funding: $50,000 - Miller 75%, Champagne 25%. [COA]

“SIMIO Simulation Training for AFLCMC.” Sponsor: AFLCMC. Funding: $6,000 - Miller 50%, Hodson 50%. [COA]

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Editorships in Professional Journals**

Associate Editor, *International Journal of Operations Research* [COA]
PIGNATIELLO, JOSEPH J., Jr.
Professor of Operations Research and Head, Department of Operational Sciences; AFIT Appointment Date: 2010 (AFIT/ENV); 2011 (AFIT/ENS); BS, Mathematics, University of Massachusetts, 1976; MS, Industrial and Systems Engineering, The Ohio State University, 1979; PhD, Industrial and Systems Engineering, The Ohio State University, 1982. Dr. Pignatiello’s research interests include statistical process monitoring, change-point models, design and analysis of experiments, reliability, statistical data analysis, robust design, and Six Sigma methods. Dr. Pignatiello is a Fellow of both the American Society for Quality, and the Institute of Industrial and Systems Engineers.
Tel. 937-255-3636 x4311, Email: Joseph.Pignatiello@afit.edu

Refereed Journal Publications

Editorships in Professional Journals
Editorial Board, Quality Engineering
Editorial Board, IIE Transactions
Editorial Advisory Board, International Journal of Lean Six Sigma

REIMAN, ADAM D., Col
Associate Dean of the Graduate School of Engineering and Management, and Assistant Professor of Logistics and Supply Chain Management, Department of Operational Sciences, AFIT Appointment Date: 2014 (AFIT/ENS); BS, Astronautical Engineering, United States Air Force Academy, 1995; MBA, Military Management, Touro University International, 2006; MS, Logistics Management, Air Force Institute of Technology, 2009; PhD, Logistics, Air Force Institute of Technology, 2014. Col Reiman’s research interests include airlift metrics, routing, scheduling, fuel efficiency, energy efficiency, supply and demand, value-focused thinking, and heuristic search algorithms.
Tel. 937-255-3636 x4689, Email: Adam.Reiman@afit.edu

ROBBINS, MATTHEW J.
Associate Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2019; BS, Computer Systems Engineering, University of Arkansas, 1999; MS, Operations Research, Air Force Institute of Technology, 2005; PhD, Industrial Engineering, University of Illinois, 2010. Dr. Robbins’ research interests include applied statistics, approximate dynamic programming, stochastic processes, game theory, Markov decision processes, machine learning, and simulation. Dr. Robbins is a member of the Institute for Operations Research and the Management Sciences, Military and Security Society, Optimization Society (Optimization under Uncertainty), and Military Operations Research Society.
Tel. 937-255-3636 x4606, Email: Matthew.Robbins@adit.edu

Refereed Journal Publications
Jenkins, P.R., Lunday, B.J., and Robbins, M.J., “Robust, Multi-Objective Optimization for the Military Medical Evacuation Location-Allocation Problem,” Omega, Jul 2019. DOI: 10.1016/j.omega.2019.07.004


**Editorships in Professional Journals**

Associate Editor, *Military Operations Research*

**Other Significant Research Productivity**


**TALAFUSE, THOMAS P., Maj**

Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2017 (AFIT/ENS); BS, Operations Research and Mathematics, United States Air Force Academy, 2007; MS, Operations Research, Air Force Institute of Technology, 2011; PhD, Industrial Engineering, University of Arkansas, 2016. Maj Talafuse’s research interests include reliability, reliability growth, optimization, stochastic processes, design of experiments, applied statistics, and risk analysis. He is a member of the Institute for Operations Research and the Management Sciences, and the Institute for Industrial and Systems Engineers. Tel. 937-255-3636 x4740, Email: Thomas.Talafuse@afit.edu

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**

WEIR, JEFFERY D.
Professor of Operations Research and Associate Department Head, Department of Operational Sciences; AFIT Appointment Date: 2002 (AFIT/ENS); BS, Electrical Engineering, Georgia Institute of Technology, 1988; MBA, Embry Riddle-Aeronautical University, 1992; MS, Operations Research, Air Force Institute of Technology, 1995; PhD, Industrial & Systems Engineering, Georgia Institute of Technology, 2002. Dr. Weir’s research interests include decision analysis, deterministic optimization, and applied statistics. Dr. Weir is a member of the Institute of Industrial Engineers, and the Decision Sciences Institute. AFIT research center affiliation(s): COA.
Tel. 937-255-3636 x4523, Email: Jeffery.Weir@afit.edu

Sponsor Funded Research Projects

“Cost Capability Analysis AFIT Support to Acquisition Intelligence Requirements Task Force (AIR-TF) and Headquarters Air Force A2 (HAF/A2).” Sponsor: OSD. Funding: $450,000. [COA]

Refereed Journal Publications


Editorships in Professional Journals

Associate Editor, Military Operations Research Journal [COA]

Associate Editor, IIE Transactions on Healthcare Systems Engineering [COA]

ZAWADZKI, MARCELO, Lt Col
Assistant Professor of Operations Research, Department of Operational Sciences, AFIT Appointment Date: 2018 (AFIT/ENS); BS, Aeronautical Sciences, Brazilian Air Force Academy, 1999; MS, Operations Research, Technological Institute of Aeronautics, 2009; MBA, Public Management, Universidade Federal Fluminense, 2011; PhD, Operations Research, Technological Institute of Aeronautics/London School of Economics and Political Science, 2014. Lt Col Zawadzki’s research interests include resource allocations against emerging threats, and multiobjective analysis. Tel. 937-255-3636 x4521, Email: Marcelo.Zawadzki.BR@afit.edu
5.6 DEPARTMENT OF SYSTEMS ENGINEERING AND MANAGEMENT

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Fax: 937-656-4699, DSN 986-4699
Homepage: http://www.afit.edu/ENV/

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5.6.1 DOCTORAL DISSERTATIONS

NA.

5.6.2 MASTER’S THESES


ANGELL, EMILY, Analysis of Military Construction Cost Growth in Major Defense Acquisition Programs. AFIT-ENV-MS-19-M-159. Faculty Advisor: Dr. Edward D. White. Sponsor: AFCAA.


BEEMER, CODY, An Analysis of Built Environment Factors in Residences and the Associated Effects on Mental Health Symptoms of United States Veterans. AFIT-ENV-MS-19-M-161. Faculty Advisor: Lt Col Andrew J. Hoisington. Sponsor: MIRECC.


CANZONETTA, DAVID, Assessing Artificial-Agent Response Time Effects on Human-Agent Teams in Variable Inter-Arrival Time Environments. AFIT-ENV-MS-19-M-166. Faculty Advisor: Dr. Michael E. Miller. Sponsor: AFOSR.


DELONG, BRANDEN, Quantifying Resiliency Risk Metrics through Facility Dispersion. AFIT-ENV-MS-19-M-170 Faculty Advisor: Maj Steven J. Schuldt. Sponsor: N/A.


ELWORTH, CHRISTOPHER, Comparing Estimated-to-Actual Development Budgets for Air Force Space Programs. AFIT-ENV-MS-19-M-172. Faculty Advisor: Dr. Edward D. White. Sponsor: SMC/RFM.
ENOS, TREvor, A Case Study of EPA Clauses as they Apply to Fixed Price Contracts. AFIT-ENV-MS-19-M-173. Faculty Advisor: Dr. Jonathan Ritschel. Sponsor: AFLCMC/FZ.


HAYES, AUSTIN, The Evaluation of High-Molecular-Weight Methacrylate as a Treatment Option for Shrinkage Cracks in Airfield Pavement. AFIT-ENV-MS-19-M-177. Faculty Advisor: Dr. Alfred E. Thal. Sponsor: AFCEC.

HERTWIG, FRED D., Search-Based vs Task-Based Space Surveillance for Ground-Based Telescopes. AFIT-ENV-MS-19-M-178. Faculty Advisor: Dr. John Colombi. Sponsor: N/A. [CSRA ANT]


JORDAN, RAMOANE, Fate and Transport Modeling of Perfluoroalkyl Substances (PFAS) in Groundwater from Aqueous Film Forming Foam (AFFF) Impacted Sites. AFIT-ENV-MS-19-M-181. Faculty Advisor: Dr. Eric Mbonimpa. Sponsor: AFCEC/CZOM.


KLINE, SETH, Text Analysis of Air Force References in Twitter. AFIT-ENV-MS-19-M-183. Faculty Advisor: Dr. Jonathan Ritschel. Sponsor: AFCAA.

LABEDZ, THEODORE, Quantifying Permafrost Extent, Condition, and Degradation at Eielson Air Force Base. AFIT-ENV-MS-19-M-184. Faculty Advisor: Maj Steven J. Schuldt. Sponsor: N/A.


PLOURDE, TIMOTHY, Analysis of the Effect of Corrosion on the Surface Chemistry of Mild Steel Exposed to Biofuel. AFIT-ENV-MS-19-M-193. Faculty Advisor: Dr. Jeremy Slagley. Sponsor: AFRL/RX.


SIGALA, ALBERTO, A Delphi Study to Examine Current and Future UAS Autonomous Mission Capabilities. AFIT-ENV-MS-19-M-197. Faculty Advisor: Dr. Brent T. Langhals. Sponsor: AFOSR.

SPRANGER, ZACHARY, Analysis and Design of Modular Overhead Protection System Utilizing Readily Available Materials. AFIT-ENV-MS-19-M-198. Faculty Advisor: Dr. Alfred Thal. Sponsor: AFCEC.

TYHURST, JAMES, Non-Intrusive Occupancy Detection Methods and Models. AFIT-ENV-MS-19-M-200. Faculty Advisor: Lt Col Andrew J. Hoisington. Sponsor: N/A.

5.6.3 FACULTY BIOGRAPHIES & RESEARCH OUTPUT

Notes: Research Center affiliation is listed in [ ] if applicable.

BADIRU, ADEDEJI B.
Dean, Graduate School of Engineering and Management, AFIT Appointment Date: 2013 (AFIT/EN); BS, Tennessee Technological University, 1979; MS, Tennessee Technological University, 1981; PhD, Industrial Engineering, University of Central Florida, 1984. Dr. Badiru’s research interests include Project Modeling, Analysis, Management and Control, Mathematical Modeling, Computer Simulation, Information Systems, and Economic Analysis. He is the author of several books and technical journals. Tel. 937-255-3636 x4799, Email: Adedeji.Badiru@afit.edu

Refereed Journal Publications


Books and Chapters in Books


CHINI, CHRISTOPHER M.
Assistant Professor of Engineering Management, Department of Systems Engineering and Management; AFIT Appointment Date: 2019 (AFIT/ENV); BS, Civil Engineering, Texas A&M University, 2011; MS, Civil Engineering, University of Illinois at Urbana-Champaign, 2015; PhD, Civil Engineering, University of Illinois at Urbana-Champaign, 2018. Dr. Chini’s research interests include resource management, installation resilience, life cycle analysis, energy-water nexus, asset management, and water resources planning and management. Dr. Chini is also interested in data management and visualization, as well as geospatial information systems and scientific communication. Tel. 937-255-3636 x4568, Email: Christopher.Chini@afit.edu

Refereed Journal Publications

COLOMBI, JOHN M.
Associate Professor and Program Chair of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2008 (AFIT/ENV); AFIT Military Appointment Date: 2003 (AFIT/ENG); BSEE, University of Lowell, 1982; MSEE, Air Force Institute of Technology, 1992; PhD, Electrical Engineering, Air Force Institute of Technology, 1996. Dr. Colombi’s research interests, within the broad discipline of Systems Engineering, include systems architecture and model-based systems engineering techniques, multi-vehicle unmanned/autonomous design, acquisition process modeling, optimal space constellation design, systems of systems analysis, complex adaptive systems and human systems integration. AFIT research center affiliation(s): CSRA. Tel. 937-255-3636 x3347, Email: John.Colombi@afit.edu

Sponsor Funded Research Projects

“Development of AFLCMC MBSE Models, Training and Competency.” Sponsor: AFLCMC. Funding: $150,000.


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


COOPER, CASEY W., Maj
Assistant Professor of Industrial Hygiene, Department of Systems Engineering and Management; AFIT Appointment Date: 2019 (AFIT/ENV); BS, Environmental Engineering, United States Air Force Academy, 2004; MBA, Tennessee Technological University, 2010; MS Environmental Engineering and Science, Air Force Institute of Technology, 2010; PhD, Occupational and Environmental Health, University of Oklahoma Health Science Center, 2019. Dr. Cooper’s research interests include bioterrorism, bioaerosols, aerosol science, industrial hygiene, CBRN countermeasures, health physics, radiation, and healthcare acquired infections. Tel. 937-255-3636 x4511, Email: casey.cooper@afit.edu

Refereed Journal Publications


COX, AMY M., Lt Col
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2016 (AFIT/ENV); BS, Mechanical Engineering, University of Cincinnati, 1997; MS, Space Operations, Air Force Institute of Technology, 1999; AA French, Presidio of Monterey, 2005; Brevet, Flight Test Engineering, Ecole du Personnel Navigant d’Essais et de Reception, 2006; PhD, Systems Engineering, George Washington University, 2017. Lt Col Cox’s research interests include flexible design, system architecture, user innovation, and open innovation. Tel. 937-255-3636 x4352, Email: Amy.Cox@afit.edu
Sponsor Funded Research Projects

“F-15 Modernization Schedule Optimization.” Sponsor: AFLCMC. Funding: $250,000 - Cox 80%, Lunday 20%.

“West Africa Logistics Network (WALN).” Sponsor: USAFRICOM. Funding: $43,600 - Cox 50%, Breitbach 50%.

DELORIT, JUSTIN D., Maj
Assistant Professor of Engineering Management, Department of Systems Engineering and Management; AFIT Appointment Date: 2019 (AFIT/ENV); BS, Civil Engineering, Michigan Technological University, 2005; MS, Air Force Institute of Technology, 2012; PhD, Civil and Environmental Engineering, University of Wisconsin-Madison, 2018. Maj Delorit’s research interests include installation resilience, decision-making under risk and uncertainty, applied forecasting, engineering economics, and water resources planning and management.
Tel. 937-255-3636 x4648, Email: Justin.Delorit@afit.edu

ELSHAW, JOHN J.
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management; AFIT Appointment Date: 2013 (AFIT/ENV); BS, Accounting, University of Akron, 1991; MBA, Regis University, 1996; PhD, Krannert School of Management, Purdue University, 2010. Dr. Elshaw’s research interests include organizational behavior, trust, leadership, human resource management, organizational causes of high-consequence errors, technology impact on individual and group behavior, social network analysis, cognition and emotions, organizational climate and culture, psychological influences on foreign audiences, cross-cultural leadership and communication, and hierarchical linear modeling.
Tel. 937-255-3636 x4650, Email: John.Elshaw@afit.edu

Sponsor Funded Research Projects

“A New Learning Curve For DoD Acquisition Programs: How To Account For The “Flattening Effect.” Sponsor: NPS. Funding: $57,780 - Elshaw 60%, Koschnick 30%, Ritschel 10%.

“Measuring Human-Machine Trust Relationships.” Sponsor: AFOSR. Funding: $24,975. [ANT]

Refereed Journal Publications


Other Significant Research Productivity


ENINGER, ROBERT M., Col
Assistant Professor of Industrial Hygiene, AFIT Appointment Date: 2015 (AFIT/ENV); BS, Civil and Environmental Engineering, United States Air Force Academy, 1995; MS, Civil Engineering, University of Texas-San Antonio, 2000; MS, Health Science, Purdue University, 2002; PhD, Environmental Health, University of Cincinnati, 2008. Lt Col Eninger’s research interests include aerosol science, exposure assessment, and respiratory protective devices.
Email: Robert.Eninger@us.af.mil
Sponsor Funded Research Projects

"CBRN Decon Effectiveness for EMEDS (Decon Capabilities for Far Forward Med Team)." Sponsor: 711 HPW.
Funding: $276,600 - Slagley 50%, Eninger 50%.

Refereed Journal Publications


FASS, ROBERT D.
Assistant Professor of Systems Integration and Cost Analysis, Department of Systems Engineering and Management, AFIT Appointment Date: 2015 (AFIT/ENV); BA Economics, University of New Mexico, 1989; MBA, University of New Mexico, 1993; PhD, Business Administration and Management, New Mexico State University, 2008. Dr. Fass’ research interests include cost analysis, decision analysis, risk analysis, operations research, behavioral economics, organizational behavior, organizational change, and government acquisition policy.
Tel. 937-255-3636 x4388, Email: Robert.Fass@afit.edu

Other Significant Research


https://www.hsaj.org/articles/15082

https://doi.org/10.22594/dau.18-802.25.03
FORD, THOMAS C.
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management (through Integrity Applications, Inc.), AFIT Appointment Date: 2014 (AFIT/ENV); BS, Electrical Engineering, Brigham Young University, 1994; BA, Chinese, Brigham Young University, 1994; MS, Engineering, Wright State University, 1998; PhD, Systems Engineering, Air Force Institute of Technology, 2008. Dr. Ford’s research interests include interoperability, resiliency, and system architecting.
Tel. 937-255-3636 x4747, Email: Thomas.Ford@afit.edu

FREELS, JASON K., Maj
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2013 (AFIT/ENV); BS, Auburn University, 2000; MS, Air Force Institute of Technology, 2006; PhD, Systems Engineering, Air Force Institute of Technology, 2013. Maj Freels’ research interests include reliability growth testing, accelerated life testing, accelerated degradation testing, and competing risk analysis.
Tel. 937-255-3636 x4676, Email: Jason.Freels@afit.edu

GRIMAILA, MICHAEL R.
Professor and Head, Department of Systems Engineering and Management, AFIT Appointment Date: 2004 (AFIT/ENV); BS, Texas A&M University, 1993; MS, Texas A&M University, 1995; PhD, Computer Engineering, Texas A&M University, 1999. Dr. Grimaila’s research interests include modeling and simulation, network management and security, quantum cryptography, quantum networking, and systems engineering. He is a member of the ACM, a Senior Member of the IEEE, and a Fellow of the ISSA. AFIT research center affiliation(s): CCR.
Tel. 937-255-3636 x4800, Email: Michael.Grimaila@afit.edu

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Full Paper Review

Refereed Conference Papers Accepted on the Basis of Abstract Review

Editorships in Professional Journals
Editorial Board of Information System Security Association (ISSA) Journal. [CCR]
Assistant Editor, The Defense Cyber Review, Army Cyber Institute, West Point. [CCR]

HARPER, WILLIE F.
Professor of Engineering and Environmental Management, Department of Systems Engineering and Management, AFIT Appointment Date: 2012 (AFIT/ENV); BS, Civil Engineering, University of California, Los Angeles, 1992; MENG, Civil and Environmental Engineering, Cornell University, 1993; PhD, Civil and Environmental Engineering, University of California, Berkeley, 2002. Dr. Harper's research interests include water quality with a focus on environmental biotechnology, advanced oxidation, and sensing. Tel. 937-255-3636 x4528, Email: Willie.Harper@afit.edu
Sponsor Funded Research Projects

“Sequencing Batch Reactors (SBR) for Fate of Bacillus Spores in Wastewater: An Addendum Describing Follow-on Investigations.” Sponsor: EPA. Funding: $70,000.

Refereed Journal Publications


**HOISINGTON, ANDREW J., Lt Col**
Assistant Professor and Curriculum Chair of Engineering Management, Department of Systems Engineering and Management, AFIT Appointment Date: 2017 (AFIT/ENV); BS, Civil Engineering, University of Michigan, 2001; MS, Environmental Engineering, University of Texas, Austin, 2007; PhD, Environmental Engineering, University of Texas, Austin, 2013. Lt Col Hoisington’s research interests include air quality in the built environment, microbiome of the built environment, and air quality or microbiome factors that influence mental health.
Tel. 937-255-3636 x4826, Email: Andrew.Hoisington@afit.edu

Sponsor Funded Research Projects


“Preventative vs. Breakpoint Maintenance for Facility Sustainment Modeling.” Sponsor: AFIMSC. Funding: $12,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


Hoisington, A.J., “Understanding Microbiome Papers Through Data Analysis and Figure Interpretation,” Presentation: St. Elizabeth Hospital and University of Maryland Baltimore, Washington DC, 22 Jan 2019.

Hoisington, A.J., “Altering the Microbiome for Improved Mental Health Outcomes–Exploring the Premise, the Progress, and the Problems,” Presentation: The Ohio State University Graduate School of Public Health, Columbus, OH, 22 Oct 2018.

JACQUES, DAVID R.
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT
Appointment Date: 2017 (AFIT/ENV); BS, Mechanical Engineering, Lehigh University, 1983; MS, Aeronautical Engineering, AFIT, 1989; PhD, Aeronautical Engineering, AFIT, 1995. Dr. Jacques’ research interests include development planning, architecture-based evaluation, multi-objective or constrained optimal design, and cooperative behavior and control of autonomous vehicles. AFIT research center affiliation(s): ANT and CSRA.
Tel. 937-255-3636 x3329, Email: David.Jacques@afit.edu

Sponsor Funded Research Projects

“Cooperative Search and Surveillance with Unmanned Agents.” Sponsor: AFRL/RY. Funding: $30,000 - Jacques 80%, Colombi 80%. [ANT]


KOSCHNICK, CLAY M., Lt Col
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT
Appointment Date: 2015 (AFIT/ENV); BS, United States Air Force Academy, 1998; MS, Georgia Institute of Technology, 2007; PhD, University of Florida, 2012. Lt Col Koschnick’s research interests include engineering economy, decision analysis, and econometrics.
Tel 937-255-3636 x4638, Email: Clay.Koschnick@afit.edu

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


**KRISTBAUM, JOSEPH P., Maj**

Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2019 (AFIT/ENV); BS, Marquette University, 2007; MS, Oklahoma State University, 2013; PhD, Wright State University, 2019. Maj Kristbaum’s research interests include organizational behavior, optimization, and judgement and decision making.

Tel 937-255-3636 x4588, Email: Joseph.Kristbaum@afit.edu

**LANGHALS, BRENT T.**

Assistant Professor of Information Resource Management, Department of Systems Engineering and Management, AFIT Appointment Date: 2016 (AFIT/ENV); BS, United States Air Force Academy, 1995; MS, Air Force Institute of Technology, 2001; PhD, University of Arizona, 2011. Dr. Langhals’ research interests include data analytics, big data, human-computer interfaces, systems engineering, vigilance, and psychophysiological cue detection.

Tel 937-255-3636 x7402, Email: Brent.Langhals@afit.edu

**Sponsor Funded Research Projects**


**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**

Other Significant Research Productivity


LONG, DAVID S.
Assistant Professor of Systems Engineering (through SRISY), Department of Systems Engineering and Management, AFIT Appointment Date: 2016 (AFIT/ENV); BS, Industrial Engineering and Management, North Dakota State University, 1988; MS, Engineering, California State University Northridge, 1997; PhD, Engineering Systems, Massachusetts Institute of Technology, 2012. Dr. Long’s research interests include systems of systems, open systems architecture, model-based systems engineering, wicked problems, human machine interfaces, automation, and autonomy.
Tel. 937-255-3636 x4390, Email: David.Long.ctr@afit.edu

LUCAS, BRANDON M., Lt Col
Assistant Professor of Cost Analysis, Department of Systems Engineering and Management, AFIT Appointment Date: 2015 (AFIT/ENV); BA, University of Texas at Austin, 1998; ME and MA, University of Oklahoma, 2002; MS, Air Force Institute of Technology, 2004; PhD, Economics, George Mason University, 2011. Lt Col Lucas’ research interests include incentive structures, profit motives, coordination issues, and the economics of public choice and the law.
Email: Brandon.Lucas@afit.edu

MAILLOUX, LOGAN O., Lt Col
Associate Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2015 (AFIT/ENV); BS, Computer Engineering, Lawrence Technological University, 2002; MS, Systems Engineering, Air Force Institute of Technology, 2008; PhD, Systems Engineering, Air Force Institute of Technology, 2015. Lt Col Mailloux serves as a computer developmental engineer and is a Certified Information System Security Professional (CISSP), Certified Systems Engineering Professional (CSEP). Lt Col Mailloux holds DOD certifications in cyberspace operations, systems engineering science and technology management, test and evaluation, and program management. He is a member of IEEE, ACM, INCOSE, and ITEA professional societies, as well as HKN and TBP honor societies. Lt Col Mailloux has served the USAF as a cyberspace operations expert responsible for planning and executing network defense exercises, documenting and training computer security best practices, performing test and evaluation of enterprise resource planning solutions, and maintaining distributed simulation infrastructure. His research interests include system security engineering, complex information systems, and quantum key distribution. AFIT research center affiliation(s): CCR.
Tel. 937-255-3636 x3348, Email: Logan.Mailloux@afit.edu

MBONIMPA, ERIC G.
Assistant Professor of Engineering and Environmental Management, Department of Systems Engineering and Management, AFIT Appointment Date: 2014 (AFIT/ENV); BS, Civil Engineering, Kigali Institute of Science and Technology, 2004; MS, Environmental Engineering, University of Missouri-Columbia, 2007; PhD, Environmental Engineering, Purdue University, 2010. Dr. Mbonimpa's research interests include environmental sustainability, life cycle assessment, and fate and transport of contaminants and water quality.
Tel. 937-255-3636 x7405, Email: Eric.Mbonimpa@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


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MCGUIRL, JOHN M.
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT
Appointment Date: 2018 (AFIT/ENV); B.S. Electrical Engineering, University of Massachusetts, 1990; M.S., Industrial and Systems Engineering, The Ohio State University, 2002; PhD, Industrial and Systems Engineering, The Ohio State University, 2008. Dr. McGuirl’s research interests include human-machine interaction, complex cognitive systems, decision-support systems, and team decision-making under stress.
Email: John.McGuirl.ctr@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review


MILLER, MICHAEL E.
Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT
Appointment Date: 2010 (AFIT/ENV); BS, Ohio University, 1987; MS, Ohio University, 1989; PhD, Industrial and Systems Engineering, Virginia Tech., 1993. Dr. Miller’s research interests include Human Systems Integration, Human-Automated Agent Interaction, and Application of Human Vision to Display, and Lighting Design. AFIT research center affiliation(s): ANT. Tel. 937-255-3636 x4651, Email: Michael.Miller@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Books and Chapters in Books


Patent Applications


Other Significant Research Productivity


REITH, MARK G.
Assistant Professor of Cyber Systems, Department of Systems Engineering and Management, AFIT Appointment Date: 2019 (AFIT/ENV); BS, Computer Science, University of Portland, 1999; MS, Computer Science, Air Force Institute of Technology, 2003; PhD, Computer Science, University of Texas at San Antonio, 2009. Research interests include cyber education, multi-domain operations, dynamic mission mapping, Agile software engineering and model-based systems engineering. Tel: 937-255-3636 x4603, Email: Mark.Reith@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


RITSCHEL, JONATHAN D.
Assistant Professor of Cost Analysis, Department of Systems Engineering and Management, AFIT Appointment Date: 2011 (AFIT/ENV); BBA, Accountancy, University of Notre Dame, 1997; MS, Cost Analysis, Air Force Institute of Technology, Wright-Patterson AFB, OH, 2003; PhD, Economics, George Mason University, VA, 2011. Dr. Ritschel’s research interests include public choice, the effects of acquisition reforms on cost growth in DOD weapon systems, research and development cost estimation, and economic institutional analysis.
Tel. 937-255-3636 x4484, Email: Jonathan.Ritschel@afit.edu

Sponsor Funded Research Projects

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


SCHULDT, STEVEN J., Maj
Assistant Professor of Engineering Management and Director, Graduate Engineering Management Program, Department of Systems Engineering and Management, AFIT. Appointment Date: 2018 (AFIT/ENV); BS, Civil Engineering, University of Illinois at Urbana-Champaign, 2006; MS, Environmental Engineering and Science, Air Force Institute of Technology, 2012; PhD, Civil Engineering, University of Illinois at Urbana-Champaign, 2017. Maj Schuldt’s research interests include installation resilience, project/construction management, optimal resource/asset utilization, and sustainability. Tel. 937-255-3636 x4645, Email: Steven.Schuldt@afit.edu

Sponsor Funded Research Projects

“20M AFIT GEM Civil Engineer Research.” Sponsor: AFCEC. Funding: $198,247 - Schuldt 50%, Hoisington 50%.

“20M AFIT GEM Civil Engineer Research.” Sponsor: AFCEC. Funding: $26,753 - Schuldt 50%, Hoisington 50%.

“Air National Guard Civil Engineer Research.” Sponsor: NGB. Funding: $100,200.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


SITU, JOHN X., Maj
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2018 (AFIT/ENV); MS, Operations Research, Air Force Institute of Technology, 2012; PhD, Systems Engineering and Operations Research, George Mason University, 2018. Maj Situ received his commission from the University of Texas at Austin in 2006, and began his operations research analyst career at Edwards Air Force Base, California, where he served as an operational flight test analyst and electronic warfare analyst. Maj Situ also served as personnel analyst, Chief of Force Development Analysis and Chief, Analysis Branch at the Air Force Personnel Center, Randolph Air Force Base, Texas. In 2015, he was selected for the Air Force Institute of Technology Faculty Training Program. Maj Situ’s research interests include stochastic optimization, meta-heuristics, modeling and simulation, and dynamic programming. John.Situ@afit.edu

SLAGLEY, JEREMY M.
Assistant Professor of Industrial Hygiene and Environmental Science, Department of Systems Engineering and Management, AFIT Appointment Date: 2016 (AFIT/ENV); BS, United States Military Academy, 1993; MS, University of Iowa, 2000; PhD, West Virginia University, 2006. Dr. Slagley’s research interests include occupational stressor assessment and control, specifically for hazardous noise, aerosols, and exposure assessment. He also models deployed waste-to-energy systems for sustainability. Tel. 937-255-3636 x4632, Email: Jeremy.Slagley@afit.edu

Sponsor Funded Research Projects
“CBRN Decon Effectiveness for EMEDS (Decon Capabilities for Far Forward Med Team).” Sponsor: 711 HPW.
Funding: $276,600 - Slagley 50%, Eninger 50%.

Refereed Journal Publications


Books and Chapters in Books
STUBBS, JOHN E., Lt Col
Deputy Department Head and Assistant Professor of Environmental Engineering and Science, Department of Systems Engineering and Management, AFIT Appointment Date: 2017 (AFIT/ENV); BS, North Carolina State University, 1998; MS, Air Force Institute of Technology, 2010; PhD, Air Force Institute of Technology, 2017. Lt Col Stubbs’ research interests include physical and chemical water treatment processes and environmental sustainability. Tel. 937-255-3636 x4329, Email: john.stubbs@afit.edu

Refereed Conference Papers Accepted on the Basis of Abstract Review

Other Significant Research Productivity

THAL, ALFRED E., Jr.
Assistant Professor of Engineering Management, Department of Systems Engineering and Management, AFIT Appointment Date: 1998 (AFIT/ENV); BS, Civil Engineering, Texas Tech University, 1981; MS, Engineering Management, AFIT, 1985; PhD, Environmental Engineering, University of Oklahoma, 1999. Dr. Thal’s research interests include engineering and environmental management, groundwater flow and remediation technologies, facility and infrastructure management, product development, sustainability, and project management. Tel. 937-255-3636 x7401, Email: Al.Thal@afit.edu

Refereed Journal Publications

WAGNER, TORREY J., Lt Col
Assistant Professor of Systems Engineering, Department of Systems Engineering and Management, AFIT Appointment Date: 2017 (AFIT/ENV); BS, Electrical Engineering, University of Minnesota, 2000; MS, Aerospace Systems Engineering, Loughborough University, 2004; PhD, Electro-Optics, Air Force Institute of Technology, 2010. Lt Col Wagner’s primary interest is DOD-focused energy systems engineering, including the research topics of air vehicle, ground vehicle, fixed installation and contingency base energy systems. Tel. 937-255-3636 x4611, Email: Torrey.Wagner@afit.edu

Sponsor Funded Research Projects
“Identification & Mitigation of Biodiesel Microbial Biodeterioration.” Sponsor: AFRL/RQ. Funding: $20,000.


Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**

Created New Course: *SENG 582A Aviation Energy Systems Engineering* with co-instructors from the Air Force Research Laboratory Aerospace Systems Directorate.

J. Williams and T. Wagner, “Northern Hemisphere Horizontal Photovoltaic Power Output Data for 12 Sites,” Mendeley Data, July 2019. [http://dx.doi.org/10.17632/hfhwnn8w24.5](http://dx.doi.org/10.17632/hfhwnn8w24.5)


6. RESEARCH CENTER PUBLICATIONS AND FUNDING INFORMATION

The contents of this section are duplicated data, grouped by center. The information is previously listed within each project’s specific academic department.
6.1 AUTONOMY AND NAVIGATION TECHNOLOGY CENTER

Autonomy and Navigation Technology (ANT) Center
Director                           (937) 255-3636 x4755
Executive Administrator             (937) 255-3636 x4583
Laboratory Manager              (937) 255-3636 x4911
Homepage:  http://www.afit.edu/ANT

6.1.1 DOCTORAL DISSERTATIONS


6.1.2 MASTER’S THESES


BERHOLD, JEDEDEIAH M., Convolutional Neural Network Architecture Study for Aerial Visual Localization. AFIT-ENG-MS-19-M-010. Faculty Advisor: Dr. Robert C. Leishman. Sponsor: AFRL/RY.


HERTWIG, FRED D., Search-Based vs Task-Based Space Surveillance for Ground-Based Telescopes. AFIT-ENV-MS-19-M-178. Faculty Advisor: Dr. John Colombi. Sponsor: N/A.


MONTGOMERY, MADISON J., Active Control Of a Morphing Wing Aircraft and Failure Analysis For System Reliability. AFIT-ENG-MS-19-M-045. Faculty Advisor: Dr. Robert C. Leishman. Sponsor: AFRL/RQ.


WALLACE, SCOUT T., Extended Kalman Filtering for Missile Live-Fire Data Analysis. AFIT-ENG-MS-18-D-004. Faculty Advisor: Lt Col Scott J. Pierce. Sponsor: AFRL/RY.


6.1.3 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

BETANCES, JOAN A., Maj, Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review


BORGHETTI, BRETT J., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review

CANCIANI, AARON J., Maj, Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“High Resolution Magnetic Mapping over Naval Test Range.” Sponsor: NGA. Funding: $250,000.


CASEY, DANIEL J., Maj, Department of Electrical and Computer Engineering

COBB, RICHARD G., Department of Aeronautics and Astronautics

Sponsor Funded Research Projects


COLLINS, PETER J., Department of Electrical and Computer Engineering

COLOMBI, JOHN M., Department of Systems Engineering and Management

CORBELL, PHILLIP M., Lt Col, Department of Electrical and Computer Engineering

COX, AMY M., Lt Col, Department of Systems Engineering and Management

GUNAWARDENA, SANJEEV, Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HODSON, DOUGLAS D., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“AFSIM Maturation and Capability Improvements.” Sponsor: AFRL/RQ. Funding: $35,948 - Hodson 50%, Peterson 50%.

HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

Refereed Journal Publications


JACQUES, DAVID R., Department of Systems Engineering and Management

Sponsor Funded Research Projects

“Cooperative Search and Surveillance with Unmanned Agents.” Sponsor: AFRL/RY. Funding: $30,000 - Jacques 80%, Colombi 80%.

LEISHMAN, ROBERT C., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“ENG18-001 PNT Focused Distance Learning Electrical Engineering Master’s Degree.” Sponsor: 746 TS. Funding: $80,000 - Leishman 34%, Canciani 33%, Gunawardena 33%.

“ENG18-004 PNT Focused Distance Learning Electrical Engineering Master’s Degree.” Sponsor: USA CERDEC. Funding: $80,000 - Leishman 34%, Canciani 33%, Gunawardena 33%.

“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $24,940 - Leishman 80%, Jacques 20%.

“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $39,127 - Leishman 80%, Jacques 20%.

“Morphing and Shape Adaptable Aircraft Control, Integration, and Flight Test.” Sponsor: AFRL/RQ. Funding: $85,933 - Leishman 80%, Jacques 20%.


“Scorpion Suite Development and Support.” Sponsor: USA/ISR. Funding: $225,000 - Leishman 50%, Taylor 50%.

“Scorpion Support for AgilePod Flight Test.” Sponsor: AFRL/RY. Funding: $200,000.

LIEVSAY, JAMES R., Maj, Department of Electrical and Computer Engineering

MARTIN, RICHARD K., Department of Electrical and Computer Engineering

MERKLE, LAURENCE D., Department of Electrical and Computer Engineering
MILLER, MICHAEL E., Department of Systems Engineering and Management

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


NYKL, SCOTT L., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


OXLEY, MARK E., Department of Mathematics and Statistics

Refereed Conference Papers Accepted on the Basis of Full Paper Review


PACHTER, MEIR, Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“Cooperative Control.” Sponsor: AFRL/RQ. Funding: $40,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review

Patrick Wasz, Meir Pachter, and Khanh Pham, “Two-On-One Pursuit with a Non-Zero Capture Radius,” 


PETERSON, GILBERT L., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review

DOI: 10.1109/SASO.2018.00017

King, D.W., L. Esterle, and Peterson, G.L., “Entropy-Based Team Self-Organization with Signal Suppression,” 
Proceedings of the Artificial Life Conference 2019. 2019, DOI: 10.1162/isal_a_00154

Other Significant Research Productivity


PIERCE, SCOTT J., Lt Col, Department of Electrical and Computer Engineering

RAQUET, JOHN F., Department of Electrical and Computer Engineering

Sponsor Funded Research Project


“ANT Center and Laboratory Support per MOA between AFIT and AFRL.” Sponsor: AFRL/RY. Funding: $200,000 - Raquet 50%, Pierce 50%.

“Multi-Sensor Navigation Demonstration.” Sponsor: USA CERDEC. Funding: $300,000.

“PNT-Focused Distance Learning Electrical Engineering Master's Degree.” Sponsor: AFRL/RY. Funding: $100,000 - Raquet 25%, Canciani 25%, Leishman 25%, Gunawardena 25%.

“Scorpion Suite Development and Support.” Sponsor: USA CERDEC. Funding: $225,000 - Leishman 50%, Taylor 50%.

“Support for PNT Modeling and Simulation.” Sponsor: USA CERDEC. Funding: $100,000.

TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering
6.2 CENTER FOR CYBERSPACE RESEARCH

Center for Cyberspace Research (CCR)
Director                (937) 255-6565 x4690
Executive Program Coordinator  (937) 255-3636 x4602
Homepage:  http://www.afit.edu/CCR

6.2.1 DOCTORAL DISSERTATIONS

   Faculty Advisor: Dr. Scott R. Graham. Sponsor: N/A.

   Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: AF Pentagon, Studies, Analyses and Assessments.

STONE, BRENT J., Enabling Auditing and Intrusion Detection for Proprietary Controller Area Networks. AFIT-
   ENG-DS-18-D-003. Faculty Advisor: Dr. Scott R. Graham. Sponsor: N/A.

6.2.2 MASTER’S THESES

ADDERLEY, NIKOLAI A., Graph-Based Temporal Analysis in Digital Forensics. AFIT-ENG-MS-19-M-005.
   Faculty Advisor: Dr. Gilbert L. Peterson. Sponsor: DC3/DC.

ALSHAMMARI, DHAHER M., Trust and Suspicion as a Function of Cyber Security in Human Machine Team
   (HMT) of Unmanned Systems. AFIT-ENV-MS-19-S-051. Faculty Advisor: Dr. John J. Elshaw. Sponsor: N/A.

ARAGON, ANGELITO E., Evaluating Machine Learning Techniques for Smart Home Device Classification. AFIT-
   ENG-MS-19-M-006. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS.

BOGGS, BRANDON N., RF-DNA Fingerprinting Ping 2020i ADS-B UAT Devices Using a Low-Cost SDR. AFIT-
   ENG-MS-19-M-011. Faculty Advisor: Dr. Michael A.Temple. Sponsor: AFRL/RY.

BRAMLETTE, CLINT M., Cyber-Attack Drone Payload Development and Geolocation Via Directional Antennae.
   AFIT-ENG-MS-19-M-012. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: N/A.

BRAUN, ANDREW D., High Fidelity Satellite Navigation Receiver Front-End for Advanced Signal Quality
   Monitoring and Authentication. AFIT-ENG-MS-19-M-013. Faculty Advisor: Dr. Sanjeev Gunawardena. Sponsor:
   N/A.

CHIARATTI, NICHOLAS S., Software Defined Radio (SDR) Device Discrimination Using Chip Shape-Distinct
   Native Attribute (CS-DNA) Features. AFIT-ENG-MS-19-M-018. Faculty Advisor: Dr. Michael A.Temple. Sponsor: 
   AFRL AFMC.

CINTRON, LUIS A., Modeling a Consortium-Based Distributed Ledger Network with Applications for Intelligent
   Transportation Infrastructure. AFIT-ENG-MS-18-M-019. Faculty Advisor: Dr. Scott R. Graham. Sponsor:
   AFRL/RY.

   AFIT-ENG-MS-19-M-021. Faculty Advisor: Maj Joan A. Betances Jorge. Sponsor: AFRL/RY.

DONTIGNGY, TROY B., Space Surveillance Network Design. AFIT-ENG-MS-19-J-003. Faculty Advisor: Dr.
   Laurence D. Merkle. Sponsor: AFRL/RY.


HACKER, KENNETH L., Preserving Privacy In Automotive Tire Pressure Monitoring Systems. AFIT-ENG-MS-19-M-031. Faculty Advisor: Dr. Scott R. Graham. Sponsor: N/A.

JAMES, KENNETH, Testing the Fault Tolerance of a Wide Area Backup Protection System using SPIN. AFIT-ENG-MS-19-M-034. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.


MARTIN, SETH A., Unguided Cyber Education Techniques Of the Non-Expert. AFIT-ENG-MS-19-M-041. Faculty Advisor: Mark A.Reith. Sponsor: N/A.

MOSBY, JOSHUA K., A Blockchain-Based Anomalous Detection System For Internet Of Things' Devices. AFIT-ENG-MS-19-M-047. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS.


STAFIRA, LUKAS A., Examining Effectiveness of Web-Based Internet of Things' Honeypots. AFIT-ENG-MS-19-M-057. Faculty Advisor: Dr. Barry E. Mullins. Sponsor: DHS.


6.2.3 FACULTY RESEARCH OUTPUT
Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

BETANCES, JOAN A., Maj, Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications

BORGHETTI, BRETT J., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


Refereed Conference Papers Accepted on the Basis of Full Paper Review


C COLLINS, PETER J., Department of Electrical and Computer Engineering

GRAHAM, SCOTT R., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“Reconnaissance Improvement via Change Detection, Data Compression, & Comm Resilience Using Jetson TX1s & TX2s.” Sponsor: Undisclosed. Funding: $30,780 - Graham 50%, Nykl 50%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Books and Chapters in Books


Editorships in Professional Journals


Patent Applications


GRIMAILA, MICHAEL R., Department of Systems Engineering and Management

Editorials in Professional Journals


Assistant Editor, The Defense Cyber Review, Army Cyber Institute, West Point.

GUNAWARDENA, SANJEEV, Department of Electrical and Computer Engineering

HODSON, DOUGLAS D., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


“AFSIM Maturation and Capability Improvements.” Sponsor: AFRL/RQ. Funding: $35,948 - Hodson 50%, Peterson 50%.

HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review

Other Significant Research Productivity
https://www.clark.center/details/shamman/Adversarial%20Thinking

MAGNUS, AMY L., Department of Mathematics and Statistics

Sponsor Funded Research Projects
“Distributed Intelligence and the Nature of Mature Work.” Sponsor: AFOSR. Funding: $149,917 - Magnus 90%, Oxley 10%.

MARTIN, RICHARD K., Department of Electrical and Computer Engineering

MERKLE, LAURENCE D., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Abstract Review

MILLS, ROBERT F., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects
“RF-EW Systems Support.” Sponsor: AFRL/RY. Funding: $40,000.

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Full Paper Review

Books and Chapters in Books

MULLINS, BARRY E., Department of Electrical and Computer Engineering

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books


Patents Awarded


Other Significant Research Productivity


NYKL, SCOTT L., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books


PACHTER, MEIR, Department of Electrical and Computer Engineering

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


PETE RSON, GILBERT L., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Books and Chapters in Books


Editorships in Professional Journals

Associate Editor, International Journal of Critical Infrastructure Protection.

Invention Disclosures

Vambrace, Software License for Digital Forensics Abstraction Interface, October 2019.

REITH, MARK G., Department of Systems Engineering and Management

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Martin, S. and Reith, M. “Rethinking USAF Cyber Education and Training”, 14th International Conference on Cyber Warfare & Security ICCWS, 28 February-1 March 2019, Stellenbosch University, Stellenbosch, South Africa.


Dillon, P. and Reith M. “Building Irrefutable Trust throughout Computer Networks using Blockchains”, 14th International Conference on Cyber Warfare & Security ICCWS, 28 February-1 March 2019, Stellenbosch University, Stellenbosch, South Africa.

SWEENEY, PATRICK J., Lt Col, Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“Research Supporting Weapon System Cyber Resiliency.” Sponsor: AFRL/RY. Funding: $24,975 - Sweeney 50%, Graham 50%.
Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications


TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Patent Applications

6.3 CENTER FOR DIRECTED ENERGY

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Executive Administrator (937) 255-3636 x4551
Homepage:  http://www.afit.edu/CDE

6.3.1 DOCTORAL DISSERTATIONS

LLOYD, ROBERT L., Numerical Simulation of Unstable Laser Resonators with a High-Gain Medium. AFIT-ENP-DS-19-S-024. Faculty Advisor: Dr. David E. Weeks. Sponsor: N/A.


VAN WOERKOM, TODD A., On the Pulsed Ablation of Metals and Semiconductors. AFIT-ENP-DS-19-S-030. Faculty Advisor: Dr. Glen P.Perram. Sponsor: AFRL/RY.


6.3.2 MASTERS THESES

BROWNLEE, LAUREN E., Battle Damage Assessment with Optical Cross Section Measurements. AFIT-ENP-MS-19-S-018. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: Raytheon SAS.

ETHRIDGE, JAMES A., Computational and Experimental Development of 2D Anisotropic Photonic Crystal Metamaterials. AFIT-ENP-MS-19-M-077. Faculty Advisor: Dr. Michael A. Marciniak. Sponsor: AFOSR/RT.


WOLFMEYER, SCOTT S., Coupled Atmospheric Surface Observations with Surface Aerosol Particle Counts for Daytime Sky Radiance Quantification. AFIT-ENP-MS-19-M-095. Faculty Advisor: Dr. Steven T. Fiorino. Sponsor: DEJTO.

6.3.3 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

AKERS, BENJAMIN F., Department of Mathematics and Statistics

Sponsor Funded Research Projects

“Applications of Radial Basis Functions.” Sponsor: AFOSR. Funding: $34,763 - Akers 50%, Reeger 50%.

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Other Significant Research Productivity**


BOSE-PILLAI, SANTASRI R., Department of Engineering Physics

**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


Patent Applications

Invention Disclosures

BURGI, KENNETH W., Lt Col, Department of Engineering Physics

Sponsor Funded Research Projects
“Dynamic Data Driven Phase Optimization for Controlling Light Scattered by a Rough Surface.” Sponsor: AFOSR. FundPhaseg: $37,290 - Burgi 75%, Marciniak 15%, Oxley 10%.

Refereed Conference Papers Accepted on the Basis of Abstract Review

BUTLER, SAMUEL D., Lt Col, Department of Engineering Physics

Refereed Journal Publications

Refereed Conference Papers Accepted on the Basis of Abstract Review

COBB, RICHARD G., Department of Aeronautics and Astronautics

Refereed Conference Papers Accepted on the Basis of Abstract Review


FERDINANDUS, MANUEL R., Department of Engineering Physics

**Sponsor Funded Research Projects**

"Airy and Non-Gaussian Beam Testbed." Sponsor: AFRL/RY. Funding: $63,024 - Ferdinandus 90%, Perram 10%.

FIORINO, STEVEN T., Department of Engineering Physics

**Sponsor Funded Research Projects**


“2019 AFIT Center for Directed Energy DoD HPCMP HPC Internship Program (HIP).” Sponsor: HPCMP. Funding: $25,000.


“Airborne Aero-Optics Laboratory-Beam Control.” Sponsor: DEJTO. Funding: $120,000.

“ Atmospheric Effects Inputs for HEL JWS and JLaSE.” Sponsor: OSD. Funding: $110,000.

“CY2019 DE JTO AP TAWG Research and Analysis.” Sponsor: DEJTO. Funding: $400,000.

“CY2019 DE JTO M&S TAWG Research and Analysis.” Sponsor: DEJTO. Funding: $400,000.

“Extended-Range Comprehensive Atmospheric Optics Sensing (ERCAOS) Experimental Campaign.” Sponsor: DARPA. Funding: $150,000.

“Probabilistic and Predictive HEL Performance Analyses for SDPE.” Sponsor: AFLCMC. Funding: $100,000.


**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


Editorships in Professional Journals

Guest Editor, Atmospheric Propagation Special Section of Optical Engineering, Vol. 59, Issue 8.

Patent Applications


GROSS, KEVIN C., Department of Engineering Physics

HAWKS, MICHAEL R., Department of Engineering Physics

MARCINIAK, MICHAEL A., Department of Engineering Physics

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


MCCRAE, JACK E., Jr., Department of Engineering Physics

Sponsor Funded Research Projects

“Novel Characterization Measurements and Meteorological-Driven Modeling of Turbulence and Refraction in the Lower Atmosphere for Directed Energy Applications.” Sponsor: DEJTO. Funding: $280,000 - McCrae 80%, Fiorino 20%.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


MORRILL, DANA F., Maj, Department of Mathematics and Statistics

Refereed Conference Papers Accepted on the Basis of Abstract Review


PERRAM, GLEN P., Department of Engineering Physics

Sponsor Funded Research Projects

“Diode Pumped Alkali Laser Kinetics: Rb-He System.” Sponsor: MDA. Funding: $250,000 - Perram 50%, Rice 50%.

“Hollow Core Raman Fiber Laser for Mid-IR Applications.” Sponsor: Lidomika, LLC. Funding: $45,015 - Perram 50%, Rice 50%.


“Melt Pool Monitoring for Metal Additive Manufacturing.” Sponsor: ATS LLC. Funding: $5,000.

“Wave Front Sensing for Laser Weapon Applications.” Sponsor: AFRL/RD. Funding: $75,181 - Perram 80%, Rice 20%.

**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**PHILLIPS, GRADY T., Department of Engineering Physics**

**RICE, CHRISTOPHER A., Department of Engineering Physics**

**Sponsor Funded Research Projects**


**Refereed Journal Publications**


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications


SRITHARAN, SIVAGURU S., Department of Mathematics and Statistics
TERZUOLI, ANDREW J., Jr., Department of Electrical and Computer Engineering
WEEKS, DAVID E., Department of Engineering Physics
6.4 CENTER FOR OPERATIONAL ANALYSIS

Center for Operational Analysis (COA)
Director (937) 255-3636 x4251
Deputy Director (937) 255-3636 x4523
Homepage: http://www.afit.edu/COA

6.4.1 DOCTORAL DISSERTATIONS


KEITH, ANDREW J., Inferential, Sequential, and Adversarial Approaches. AFIT-ENS-DS-19-S-041. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: STRATCOM.

KLINE, ALEXANDER G., Real-Time Heuristics and Metaheuristics for Static and Dynamic Weapon Target Assignments. AFIT-ENS-DS-18-D-016. Faculty Advisor: Dr. Darryl K. Ahner. Sponsor: STRATCOM/JWAC.

6.4.2 MASTER’S THESES


BRAMBLETT, LAUREN M., Turbojet Range, Loiter, and Altitude Tradeoff Estimations in Efficient Modeling and Optimization Formulations. AFIT-ENS-MS-19-M-102. Faculty Advisor: Dr. Lance E. Champagne. Sponsor: NASIC.


HUGHES, MICHAEL S., A Port-Based Analysis of USTRANSCOM Shipping Network Vulnerability. AFIT-ENS-MS-19-M-124. Faculty Advisor: Dr. Brian J. Lunday. Sponsor: USTRANSCOM/JDPAC.


KEESLING, RICHARD B., Exploratory Analysis of the Potential Use of Augmented Reality in Aircraft Maintenance. AFIT-ENS-MS-19-M-129. Faculty Advisor: Maj Timothy W. Breitbach. Sponsor: AFRL.


MONTEIRO, LUCIANA M., Predicting Failures of the Brazilian Air Force Tucano Fleet Using Survival Analysis. AFIT-ENS-MS-19-M-139. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: ILA.


PENDERGRASS, MICHAELA A., A Topological View of the Relationship between Women and Armed Conflict in West Africa. AFIT-ENS-MS-19-M-143. Faculty Advisor: LTC Christopher M. Smith. Sponsor: USAFRICOM.


WESTMAN, MARYDELL V., Using Simulation to Model Reserve Officer Training Corps Cadet Flow. AFIT-ENS-MS-19-M-155. Faculty Advisor: Dr. John O. Miller. Sponsor: USACC.

6.4.3 GRADUATE RESEARCH PAPERS


HEMKEN, KATHERINE B., Forecasting Sustainment Cargo Requirements. AFIT-ENS-MS-19-J-035. Faculty Advisor: Dr. Daniel W. Steeneck. Sponsor: N/A.


WALKUSKY, MARK M., Optimizing the Forward Presence of PACAF's Expeditionary Communications. AFIT-ENS-MS-19-J-054. Faculty Advisor: Maj Benjamin T. Hazen. Sponsor: N/A.

6.4.4 FACULTY RESEARCH OUTPUT
Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

AHNER, DARRYL K., Department of Operational Sciences
Sponsor Funded Research Projects

“AFSIM Modular Development to Support the Solar Space Power Initiative (SSPI).” Sponsor: AFRL/RV. Funding: $950,000.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Editorships in Professional Journals

Editorial Board, Military Operations Research Society

Other Significant Research Productivity


ANDERSON, JASON R., Lt Col, Department of Operational Sciences

Refereed Conference Papers Accepted on the Basis of Abstract Review


BORGHETTI, BRETT J., Department of Electrical and Computer Engineering

Refereed Journal Publications


BREITBACH, TIMOTHY W., Maj, Department of Operational Sciences

Sponsor Funded Research Projects


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


CHAMPAGNE, LANCE E. Department of Operational Sciences

Sponsor Funded Research Projects

“Education and Research Support for Modeling, Simulation, & Analysis.” Sponsor: SDPE. Funding: $250,000 - Champagne 40%, Miller 30%, Lunday 30%.

Refereed Conference Papers Accepted on the Basis of Abstract Review


CIARALLO, FRANK W., Department of Operational Sciences
COX, BRUCE A., Lt Col, Department of Operational Sciences

Sponsor Funded Research Projects

“F-15 Modernization Schedule Optimization.” Sponsor: AFLCMC. Funding: $250,000 - Cox 80%, Lunday 20%.

“West Africa Logistics Network (WALN).” Sponsor: USAFRICOM. Funding: $43,600 - Cox 50%, Breitbach 50%

DECKRO, RICHARD F., Department of Operational Sciences

Sponsor Funded Research Projects

“JWAC AFIT Interaction.” Sponsor: JWAC. Funding: $78,180 - Deckro 40%, Lunday 6%, Ahner 6%, Meyer 43%, Cobb 5%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


Dickens, John M., Lt Col, Department of Operational Sciences

Refereed Conference Papers Accepted on the Basis of Abstract Review


GALLAGHER, MARK A., Department of Operational Sciences

Refereed Conference Papers Accepted on the Basis of Abstract Review


**Editorships in Professional Journals**

Associate Editor, *Military Operations Research*

Editorial Board, *Modeling and Simulation Journal*

**HOLZMANN, TIMOTHY W., Lt Col, Department of Operational Sciences**

**Referred Journal Publications**


**Referred Conference Papers Accepted on the Basis of Full Paper Review**


**Referred Conference Papers Accepted on the Basis of Abstract Review**


**JENKINS, PHILLIP R., Capt, Department of Operational Sciences**

**Referred Journal Publications**


Refereed Conference Papers Accepted on the Basis of Abstract Review


LACASSE, PHILLIP M., Lt Col, Department of Operational Sciences

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


LUNDAY, BRIAN J., Department of Operational Sciences

Sponsor Funded Research Projects

“Personnel Recovery Asset Basing in the USAFRICOM AOR.” Sponsor: USAFRICOM. Funding: $8,820.

“Transportation and Distribution Research.” Sponsor: USTRANSCOM. Funding: $125,000.

Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**

Robbins, M.J., Jenkins, P.R., Bastian, N.D., and Lunday, B.J., “Approximate Dynamic Programming for the Aeromedical Evacuation Dispatching Problem: Value Function Approximation Utilizing Multiple Level Aggregation,” INFORMS Annual Meeting, Phoenix, AZ, 4-7 Nov 2018.

Jenkins, P.R., Robbins, M.J., and Lunday, B.J., “Approximate Dynamic Programming for Military Medical Evacuation Dispatching Policies,” INFORMS Cincinnati-Dayton Chapter Fall Technical Symposium, Dayton, OH, 19 Oct 2018


Editorships in Professional Journals

Associate Editor, Military Operations Research

MILLER, JOHN O., Department of Operational Sciences

Sponsor Funded Research Projects

“Operational Analysis of Blue Weapons with Focus on Autonomy.” Sponsor: Lockheed Martin. Funding: $50,000 - Miller 75%, Champagne 25%.

“SIMIO Simulation Training for AFLCMC.” Sponsor: AFLCMC. Funding: $6,000 - Miller 50%, Hodson 50%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Editorships in Professional Journals

Associate Editor, International Journal of Operations Research

PIGNATIELLO, JOSEPH J., Jr., Department of Operational Sciences

Refereed Journal Publications


**Editorships in Professional Journals**

Editorial Board, *Quality Engineering*

Editorial Board, *IIE Transactions*

Editorial Advisory Board, *International Journal of Lean Six Sigma*

**REIMAN, ADAM D., Col, Department of Operational Sciences**

**ROBBINS, MATTHEW J., Department of Operational Sciences**

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**

Robbins, M.J., Jenkins, P.R., Bastian, N.D., and Lunday, B.J., “Approximate Dynamic Programming for the Aeromedical Evacuation Dispatching Problem: Value Function Approximation Utilizing Multiple Level Aggregation,” INFORMS Annual Meeting, Phoenix, AZ, 4-7 Nov 2018.

Jenkins, P.R., Robbins, M.J., and Lunday, B.J., “Approximate Dynamic Programming for Military Medical Evacuation Dispatching Policies,” INFORMS Cincinnati-Dayton Chapter Fall Technical Symposium, Dayton, OH, 19 Oct 2018

**Editorships in Professional Journals**

Associate Editor, *Military Operations Research*
**Other Significant Research Productivity**


**STEENECK, DANIEL W., Department of Operational Sciences**

**Other Significant Research Productivity**


**SMITH, CHRISTOPHER M., Lt Col, Department of Operational Sciences**

**TALAFUSE, THOMAS P., Maj, Department of Operational Sciences**

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**WEIR, JEFFERY D., Department of Operational Sciences**

**Sponsor Funded Research Projects**

"Cost Capability Analysis AFIT Support to Acquisition Intelligence Requirements Task Force (AIR-TF) and Headquarters Air Force A2 (HAF/A2).” Sponsor: OSD. Funding: $450,000.

**Refereed Journal Publications**


**Editorships in Professional Journals**

Associate Editor, *Military Operations Research Journal*

Associate Editor, *IIE Transactions on Healthcare Systems Engineering*

**ZAWADZKI, MARCELO, Lt Col, Department of Operational Sciences**
6.5 CENTER FOR SPACE RESEARCH AND ASSURANCE

Center for Space Research and Assurance (CSRA)
Director                  (937) 255-3636 x4679
Deputy Director           (937) 255-3636 x4285
Associate Director        (937) 255-3636 x4559
Homepage:  http://www.afit.edu/CSRA

6.5.1 DOCTORAL DISSERTATIONS


6.5.2 MASTER THESES


COLE, TIFFANY D., Satellite On-Orbit Characterization Based on Inspection Relative Orbit Parameters. AFIT-ENY-MS-18-D-033. Faculty Advisor: Dr. Richard G. Cobb. Sponsor: N/A.

CROUCH, SAMUEL T., Modeling Electrical Conductivity of Chemical Rocket Exhaust Plumes. AFIT-ENY-MS-19-M-210. Faculty Advisor: Dr. Carl R. Hartsfield. Sponsor: 45 WS.


HERTWIG, FRED D., Search-Based vs Task-Based Space Surveillance for Ground-Based Telescopes. AFIT-ENV-MS-19-M-178. Faculty Advisor: Dr. John Colombi. Sponsor: N/A.


MAIKELL, MEGAN, Characterization and Anomalous Diffusion Analysis of a 100W Low Power Annular Hall Effect Thruster. AFIT-ENY-MS-19-M-231. Faculty Advisor: Dr. Carl R. Hartsfield. Sponsor: N/A.

MERCIER, MARK R., Optimal Inspection of a Satellite with Dynamic Zone Constraints. AFIT-ENY-MS-19-M-234. Faculty Advisor: Lt Col Kirk W. AFSPC

O'KEEFE, JAMES C., Mechanical and Vibration Damping Characterization of Hybrid Carbon Nanotube Laminates. AFIT-ENY-MS-19-M-235. Faculty Advisor: Maj Ryan P. O'Hara. Sponsor: N/A.


ROUND, JOSEPH F., Variations of Heavy Ion Abundances Relative to Proton Abundances In Large Solar Energetic Particle Events. AFIT-ENP-MS-19-M-090. Faculty Advisor: Dr. Robert D. Loper. Sponsor: AFRL/RV.


SCHMIDT, KYRA L., Analytical Models and Control Design Approaches for a 6 DOF Motion Test Apparatus. AFIT-ENY-MS-19-M-245. Faculty Advisor: Dr. Richard Cobb. Sponsor: AFRL/RW.

SINN, YONG U., Unresolved Object Detection Using Synthetic Data Generation and Artificial Neural Networks. AFIT-ENG-MS-19-M-055. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.


6.5.3 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

ALBRECHT, TIMOTHY W., Col, Department of Operational Sciences

Sponsor Funded Research Projects


AYRES, BRADLEY J., Department of Aeronautics and Astronautics

BETANCES, JOAN A., Maj, Department of Electrical and Computer Engineering

BETTINGER, ROBERT A., Maj, Department of Aeronautics and Astronautics

Sponsor Funded Research Projects


“Launch Site Optimization Study for Launch-On-Demand System.” Sponsor: SDPE. Funding: $20,002.

“Spacecraft Survivability, Reliability, and Rendezvous (S2R2) Short Course.” Sponsor: NASIC. Funding: $7,500 - Bettinger 50%, Hess 50%.

“Jetson TX2 PC104 Board.” Sponsor: Undisclosed. Funding: $90,556 - Bettinger 40%, Hartsfield 30%, Cobb 30%.

“Policy and Geopolitical Implications of Launch-on-Demand Capabilities.” Sponsor: Air University. Funding: $2,453.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Patent Applications

Other Significant Research Productivity


COBB, RICHARD G., Department of Aeronautics and Astronautics

Sponsor Funded Research Projects

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $140,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%.

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $160,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%.


“Satellite Attitude Control Testbed Upgrades.” Sponsor: Undisclosed. Funding: $38,000 - Cobb 34%, Johnson 33%, Zagaris 33%.


Refereed Journal Publications


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**COLLINS, PETER J., Department of Electrical and Computer Engineering**

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**


**COLOMBI, JOHN M., Department of Systems Engineering and Management**

**Refereed Journal Publications**


**Refereed Conference Papers Accepted on the Basis of Full Paper Review**

CORBELL, PHILLIP M., Lt Col, Department of Electrical and Computer Engineering

COX, BRUCE A., Lt Col, Department of Operational Sciences

DECKRO, RICHARD F., Department of Operational Sciences

EMMONS, DANIEL J., Maj, Department of Engineering Physics

Sponsor Funded Research Projects


Other Significant Research Productivity


FERDINANDUS, MANUEL R., Department of Engineering Physics

REFERRED JOURNAL PUBLICATIONS


Refereed Conference Papers Accepted on the Basis of Full Paper Review


GRIMAILA, MICHAEL R., Department of Systems Engineering and Management

GROSS, KEVIN C., Department of Engineering Physics

GUNAWARDENA, SANJEEV, Department of Electrical and Computer Engineering

HARTSFIELD, CARL R., Department of Aeronautics and Astronautics

Sponsor Funded Research Projects

Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


HAWKS, MICHAEL R., Department of Engineering Physics

Refereed Conference Papers Accepted on the Basis of Full Paper Review


HESS, JOSHUAH, A., Maj, Department of Aeronautics and Astronautics

Sponsor Funded Research Projects


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


HODSON, DOUGLAS D., Department of Electrical and Computer Engineering

HOGSED, MICHAEL R., Lt Col, Department of Engineering Physics

HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

Sponsor Funded Research Projects

“AI-based Strategy for Space Ops.” Sponsor: AFRL/RV. Funding: $40,000 - Hopkinson 50%, Betances 50%.

“Autonomous Systems Software.” Sponsor: AFRL/RV. Funding: $40,000 - Hopkinson 50%, Betances 50%.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


JACQUES, DAVID R., Department of Systems Engineering and Management

JOHNSON, KIRK W., Lt Col, Department of Aeronautics and Astronautics

Sponsor Funded Research Projects

“Image Processing and OD for SSA.” Sponsor: AFRL/RV. Funding: $16,000.

“Localization of Gnd/Space RF Trans.” Sponsor: AFRL/RV. Funding: $16,000.


“Rapid CubeSat Build and Test.” Sponsor: AFRL/RV. Funding: $50,000.


“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $140,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%.

“AFIT Support for Operations in Contested Space.” Sponsor: SSDP. Funding: $160,000 - Cobb 20%, Hess 20%, Zagaris 20%, Meyer 20%, Johnson 20%.

“Developing Artificial Intelligence Opponents for Contested Space Simulations.” Sponsor: AFRL/RV. Funding: $100,00 - Cobb 25%, Hess 25%, Johnson 25%, Curro 25%.

“Satellite Attitude Control Testbed Upgrades.” Sponsor: Undisclosed. Funding: $38,000 - Cobb 34%, Johnson 33%, Zagaris 33%.

Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity


KOMIVES, JEFFREY R., Lt Col, Department of Aeronautics and Astronautics

Sponsor Funded Research Projects

"Signature Codes for Hypersonic Modeling." Sponsor: AFRL/RV. Funding: $46,000 - Komives 60%, Emmons 40%.

LAURVICK, TOD V., Maj, Department of Electrical and Computer Engineering

LINGENFELTER, ANDREW J., Maj, Department of Aeronautics and Astronautics

Refereed Conference Papers Accepted on the Basis of Abstract Review


LOPER, ROBERT D., Department of Engineering Physics

Refereed Journal Publications:


Refereed Conference Papers Accepted on the Basis of Full Paper Review:


Refereed Conference Papers Accepted on the Basis of Abstract Review:


Other Significant Research Productivity


MAGNUS, AMY L., Department of Mathematics and Statistics

MAILLOUX, LOGAN O., Lt Col, Department of Systems Engineering and Management

MARCINIAK, MICHAEL A., Department of Engineering Physics

Refereed Conference Papers Accepted on the Basis of Abstract Review


MCCLORY, JOHN W., Department of Engineering Physics
MERKLE, LAURENCE D., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Abstract Review


NAVA, OMAR A., Maj, Department of Engineering Physics

Sponsor Funded Research Projects

“Correlating Lightning Obs w/ HF Noise.” Sponsor: AFRL/RV. Funding: $16,100.

Other Significant Research Productivity


PETROSKY, JAMES C., Department of Engineering Physics

RUTLEDGE, JAMES L., Lt Col, Department of Aeronautics and Astronautics

STEWARD, BRYAN J., Department of Engineering Physics

Refereed Conference Papers Accepted on the Basis of Full Paper Review


TEMPLE, MICHAEL A., Department of Electrical and Computer Engineering

TERZUOLI, ANDREW J., Jr., Department of Electrical and Computer Engineering

WIESEL, WILLIAM E., Jr., Department of Aeronautics and Astronautics

Sponsor Funded Research Projects


Refereed Journal Publications

6.6 CENTER FOR TECHNICAL INTELLIGENCE STUDIES AND RESEARCH

Center for Technical Intelligence Studies and Research (CTISR)
Director (937) 255-3636 x4742
Associate Director (937) 255-3636 x4565
Homepage: http://www.afit.edu/CTISR

6.6.1 DOCTORAL DISSERTATIONS

Faculty Advisor: Dr. Richard G. Cobb.


6.6.2 MASTER’S T HESES

ETHRIDGE, JAMES A., Computational and Experimental Development of 2D Anisotropic Photonic Crystal Metamaterials. AFIT-ENP-MS-19-M-077. Faculty Advisor: Dr. Michael A. Marcinjak. Sponsor: AFOSR/RT.


SINN, YONG U., Unresolved Object Detection Using Synthetic Data Generation and Artificial Neural Networks. AFIT-ENG-MS-19-M-055. Faculty Advisor: Dr. Kenneth M. Hopkinson. Sponsor: N/A.

6.6.3 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

BORGHETTI, BRETT J., Department of Electrical and Computer Engineering

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review

Refereed Conference Papers Accepted on the Basis of Abstract Review


BUTLER, SAMUEL D., Lt Col, Department of Engineering Physics
CAYLOR, MICHAEL J., Department of Engineering Physics
COBB, RICHARD G., Department of Aeronautics and Astronautics
DEXTER, MICHAEL L., Lt Col, Department of Engineering Physics
FRANZ, ANTHONY L., Lt Col, Department of Engineering Physics

Refereed Conference Papers Accepted on the Basis of Abstract Review


GROSS, KEVIN C., Department of Engineering Physics

Sponsor Funded Research Project

“Algorithm Development for WFOV Mission Data Processing (Phase 2 SBIR).” Sponsor: AFRL/RV. Funding: $140,000 - Gross 20%, Steward 40%, Hawks 40%.

“Performance Analysis and Sensor Toolkit for ASSET (PASTA).” Sponsor: Undisclosed. Funding: $79,000 - Gross 10%, Steward 10%, Hawks 50%, Oxley 30%.

“Spectro-polarimetric Imaging of Disturbed Earth - Phase III.” Sponsor: USA ERDC. Funding: $176,250 - Gross 50%, Hawks 50%.

“Open Skies IR Target Study.” Sponsor: NASIC. Funding: $250,000 - Gross 5%, Hawks 75%, Marciniak 10%, Franz 10%.

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


HAWKS, MICHAEL R., Department of Engineering Physics

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


HOPKINSON, KENNETH M., Department of Electrical and Computer Engineering

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity


JACKSON, JULIE A., Department of Electrical and Computer Engineering

KOMIVES, JEFFREY R., Lt Col, Department of Aeronautics and Astronautics

Sponsor Funded Research Projects

“Turbulence Modeling in Hypersonic Flows.” Sponsor: USAFA. Funding: $73,925 - Komives 34%, Reeder 33%, Gross 33%.

LIEVSAY, JAMES R., Maj, Department of Electrical and Computer Engineering

MARCINIAK, MICHAEL A., Department of Engineering Physics

Sponsor Funded Research Projects

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Other Significant Research Productivity


PERRAM, GLEN P., Department of Engineering Physics

Sponsor Funded Research Projects

“Digital Holography: Coherence Effects.” Sponsor: Undisclosed. Funding: $72,811 - Perram 50%, Rice 50%.

“Digital Holography: Recording Geometry.” Sponsor: Undisclosed. Funding: $37,914 - Perram 50%, Rice 50%.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


RICE, CHRISTOPHER A., Department of Engineering Physics

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Abstract Review


STEWARD, BRYAN J., Department of Engineering Physics

Sponsor Funded Research Projects

“Persistent Infrared Scientific and Analytical Support.” Sponsor: NASIC. Funding: $180,000 - Steward 60%, Gross 10%, Hawks 30%.

“Support to TAP Lab Effort (STAPLES).” Sponsor: SMC. Funding: $248,255 - Steward 95%, Hodson 5%.

“Support to TAP Lab Effort (STAPLES).” Sponsor: SMC. Funding: $663,000 - Steward 90%, Gross 10%.

Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


Other Significant Research Productivity

6.7 NUCLEAR EXPERTISE FOR ADVANCING TECHNOLOGIES (NEAT)

Nuclear Expertise for Advancing Technologies (NEAT)
Director                           255-3636 x4562
Deputy Director/Publications Chair  255-3636 x4609
Administrator/Education Chair       255-3636 x4735
Research Chair                     255-3636 x4767
Homepage: https://www.afit.edu/NEATCSR/

6.7.1 DOCTORAL DISSERTATIONS

N/A.

6.7.2 MASTER’S THESES

N/A.

6.7.3 FACULTY RESEARCH OUTPUT

Notes: Faculty Bios can be found under their respective department listings. Shared credit for funding awards is indicated by the percentages shown for each faculty member associated with the project.

BEVINS, JAMES E., Department of Engineering Physics

Sponsor Funded Research Projects

“Nuclear Survivability Experimentation, Modeling, and Data Verification.” Sponsor: NNSA. Funding: $175,000 - Bevins 55%, Hobbs 20%, Dexter 15%, McClory 10%.


Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Review


**Patents**


**BICKLEY, ABIGAIL A., Department of Engineering Physics**

**DEXTER, MICHAEL L., Department of Engineering Physics**

**Refereed Conference Papers Accepted on the Basis of Full Review**


**HOBBS, EDWARD L., Department of Engineering Physics**

**HOLLAND, DARREN E., Department of Engineering Physics**

**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**Patents**


**MCCLORY, JOHN W., Department of Engineering Physics**

**Sponsor Funded Research Projects**

“AFIT/ENP Research Support of Defense Threat Reduction Agency Nuclear Technologies.” Sponsor: DTRA. Funding: $110,000 – McClory 30%, Bevins 40%, Clinton 30%.

“Support for the US Nuclear Detonation Detection System.” Sponsor: NNSA. Funding: $50,000 – McClory 50%, Bickley 50%.
Refereed Journal Publications


MCGIFFIN, CURTIS D., Associate Dean, AFIT School of Strategic Force Studies

NARASAKI, CRAIG T. Dean, AFIT School of Strategic Force Studies

PETE RSON, G., Department of Engineering Physics

PETOSKY JAMES, C., Department of Engineering Physics

Sponsor Funded Research Projects

Refereed Journal Publications


Other Significant Research Productivity

Established the NEAT on 1 May 2019.

VARSHNEY, GAIVEN, Department of Engineering Physics

Refereed Journal Publications


Other Significant Research Productivity


WANG, BUGUO, Department of Engineering Physics
7. TECHNOLOGY TRANSFER
7.1 COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS

“Alternative Sensors for Non-GPS Navigation,” USAF CRADA No. 18-AFIT-08, Collaborator: Charles Stark Draper Laboratory, Inc., Faculty Investigator: Dr. John Raquet. Effective Date: 4 October 2018, Term: 33 months.


“Hollow Core Raman Fiber Laser for Mid-IR Applications,” USAF CRADA No. 19-AFIT-02, Collaborator: Lidomika LLC, Faculty Investigator: Dr. Glen Perram. Effective Date: 11 December 2018, Term: 12 months.


“IEC Electric Propulsion Research,” USAF CRADA No. 19-AFIT-04, Collaborator: University of Kentucky, Faculty Investigator: Dr. Carl Hartsfield. Effective Date: 7 June 2019, Term: 24 months.

“NDA - Data Analytic Collaborative Research Project,” USAF CRADA No. 19-AFIT-05, Collaborator: Walt Disney Parks and Resorts U.S., Inc. (Disney), Faculty Investigator: Dr. Ray Hill. Effective Date: 26 June 2019, Term: 12 months.


7.2 PATENTS

Invention Disclosures

Steven Fiorino, James Campbell (not AFIT), David Flagg (not AFIT), Paul Frederickson (not AFIT), Neil Gordon (not AFIT), Tracy Haack (not AFIT), Eric Hallenborg (not AFIT), Stephen Hammel (not AFIT), Teddy Holt (not AFIT), Katherine Horgan (not AFIT), Kevin McBryde (not AFIT), Lee Rogers (not AFIT), Shouping Wang (not AFIT), and Victor Wiss (not AFIT), “Method for Characterizing Atmospheric Full-Electromagnetic Spectrum Propagation,” October 2018.


Michael Dela Cruz, and Hengky, “Statistically-Designed Liquid Crystal Materials,” AFD-1924, filed 6 Feb 2019

Patent Applications

Hyde, Milo, and Bose-Pillai, Santasri. (2018). Generation of Vector Partially Coherent Optical Sources Using Phase Only Spatial Light Modulators
AFD-1689; Application No. 16/156,656

Spring-Loaded Rub Sealing for Wave Disk Engine
AFD-1878P; Application No. 62/820,994
C.J. Tait, P.J. Akbari, M.D. Polanka, and B.C. Sell
Linear Model for Reentry Time Prediction of Spacecraft in Low-Eccentricity, Low-Earth Orbits  
AFD-1925; Application No. 16,352,936  
Maj Robert Bettinger

Vacuum Lift Apparatus  
AFD-2003P; Application No. 62/883,595  
Ruben Adorno-Rodriquez

Diode Pumped Alkali Laser Extended to Novel Wavelengths via Two-Photon Pumping  
AFD-1768; Application No. 16/189,258  
Nathan Haluska, Christopher Rice, and Glen Perram

Energy Separation Turbine Cooling Method  
AFD-1952P; 62/867,277  
Carol Bryant, James Rutledge, and Matthew Fuqua

Temperature-Immune Self-Referencing Fabry-Pérot Cavity Sensors  
AFD-1926P; Application No. 62/804,996  
J. L. Rutledge, M.N. Fuqua, and C. E. Bryant

Noncontact Liquid Crystalline Broadband Optoacoustic Sensors  
AFD-1894; Application No. 62/803,630  
Hengky Chandrahalim and Michael T. Dela Cruz

Statistically-Designed Liquid Crystalline Molecular Cell Sensors  
AFD-1984P; Application No. 62/803,630  
Hengky Chandrahalim and Michael T. Dela Cruz

Passive Physical Layer Distinct Native Attribute Cyber Security Monitor  
AFD-1967P; Application No. 62/856,784  
Christopher Rondeau, Michael Temple, Juan Lopez, Maj Joan Betances

Active Attestation of Embedded Systems Using Field Programmable Logic Arrays  
AFD-1725; Application No. 62/635,204  

Method for Recovering Full Polarization Radar Data from a Subset of Polarization Channel Measurement  
AFD-1804; Application No. 62/633,928  
J.A. Jackson and F. Lee-Elkin

Stereo Vision Relative Navigation of Airborne Vehicles  
AFD-1963; Application No. 62/886,550  
S.L. Nykl, B. Woolley, and J. Pecarina

Rotating Scatter Mask Design Classes for Directional Radiation Detection and Imaging  
AFD-1942P; Application No. 62/816,435  
D.E. Holland, R.J. Olesen, L.W. Burggraf, B.E. O'Day, and J.E. Bevins

An Efficient Dual-Particle Directional Detection System Using a Rotating Scatter Mask  
AFD-1940P; Patent Application No. 62/816,451  
R. J. Olesen, B.V. Egner, V.M. Martin, and J.E.

Generation of Vector Partially Coherent Optical Sources Using Phase-Only Spatial Light Modulators  
AFD-1689; Application No. 62/753,875  
Milo W. Hyde, and Santasri R. Bose-Pillai
Interactive Artificial Intelligence System with Adaptive Timing
AFD-1945; Application No.
D.J. Canzonetta, M.F. Schneider, and M.E. Miller

Early Warning Reentry System Comprising High Efficiency Module for Determining Spacecraft Reentry Time
AFD-2040; Application No. 16/352,936
Maj Robert Bettinger

Disk Engine with Circumferential Swirl Radial Combustor
AFD-1976P; Application No. 62/856,801
Maj Brian Bohan, M.D. Polanka, and B.M. Staton


Estimation of Atmospheric Turbulence Parameters Using Differential Motion of Extended Features in Time-Lapse Imagery
AFD-1990P; Application No. 62/924,745
Santasri R. Bose-Pillai, Jack E. McCrae, Christopher A. Rice, and Steven T. Fiorino

**Patents Awarded**


Barry Mullins, and Benjamin Ramsey (Oct 2018). Wireless Intrusion Detection and Device Fingerprinting through Preamble Manipulation
United States Patent 10,111,094
APPENDICES

APPENDIX A: POST-DOCTORAL AND OTHER RESEARCH ASSOCIATES’ CREDENTIALS

ARCHIBALD, AARON J.
Research Engineer, Department of Engineering Physics, AFIT Center for Directed Energy. AFIT Appointment Date: 2016 (AFIT/ENP); BS, Engineering Physics, Wright State University, 2010; MS, Nanotechnology, Chung Yuen Christian University, 2012. Mr. Archibald’s research supports the efforts of the Airborne Aero-Optics Laboratory through design, fabrication, and operation of the experimental laser tracking system. Tel. 937-255-3636 x4758, Email: Aaron.Archibald@afit.edu

BURDSALL, ADAM C., Oak Ridge Institute for Science and Education Post-Doctoral Fellow, AFIT Appointment Date: 2018 (AFIT/ENV); BS, Geology, Wittenberg University (Springfield, Ohio), 2011; MS, Earth and Environmental Sciences, Wright State University (Dayton, Ohio), 2013; PhD, Environmental Science, Wright State University (Dayton, Ohio), 2018. Dr. Burdsall’s work has focused on the fate of chlorinated and nitroaromatic groundwater pollutants and the use of nanoparticle minerals in their remediation, sedimentology, and surface and subsurface hydrology. Current work is focused on using advanced oxidation methods to degrade nitroaromatic groundwater pollutants and bioaerosol release mechanisms and monitoring.

CHANDRANI, MUKHERJEE, PhD is a post-doctoral research assistant in the Environmental Thrust area. She is an ORISE contractor studying waste-to-energy processes, and recently published an article in Renewable and Sustainable Energy Reviews titled, “A review on municipal solid waste-to-energy trends in the USA.”

ELMORE, BRANNON J.

Referred Journal Publications


Referred Conference Papers Accepted on the Basis of Full Paper Review


Referred Conference Papers Accepted on the Basis of Abstract Review


EVERT, DAVID N.
Software Engineer, Department of Engineering Physics, and AFIT Center for Directed Energy. Appointment Date: 2019 (AFIT/ENP); BS, Aerospace Engineering, The Ohio State University, 2019. Mr. Evert’s research includes development and validation of C++ LEEDER software to measure atmospheric effects on directed energy applications. Email: david.evert.ctr@afit.edu

HONG, JINSUNG
Senior Researcher under ESEP (Engineer and Scientist Exchange Program), working in the Department of Systems Engineering at AFIT. Mr. Hong received a B.S. degree in aerospace engineering in 2005 from Inha University, South Korea. He also received both a M.S. and a Ph.D. degree in aerospace engineering in 2007 and 2018 from KAIST, Korea Advanced Institute of Technology, South Korea. He has been a senior researcher since 2008 at ADD, Agency for Defense Development, South Korea. His current research effort is aimed at designing UAV control laws based on the Vector Field and Cuker-Smale model, and expanding it for multiple UAV cooperation. Email: Jinsung.Song@afit.edu

KEEFER, KEVIN J.
Research Physicist, Department of Engineering Physics, AFIT Appointment Date: 2012 (AFIT/ENP); BS, Atmospheric Physics, United States Air Force Academy, 1981; MS, Systems Management, University of Southern California, 1983; MS Engineering Physics, Air Force Institute of Technology, 1985; PhD, Solid State Physics, Air Force Institute of Technology, 1990; Measurement and Signature Intelligence Certificate, Air Force Institute of Technology, 2004. Dr. Keefer’s research interests include: atmospheric sciences with special emphasis on microphysical processes and radiative transfer effects associated with atmospheric molecular and aerosol constituents, as well as solar radiative flux, micrometeorological, molecular, aerosol, and optical turbulence instrumentation for remote sensing and directed energy research and experimentation, and military/geo-political history and its implications for development of current and future national security strategy. Tel. 937-3636 x4344 Email: Kevin.Keefer@afit.edu

Refereed Conference Papers Accepted on the Basis of Full Paper Review


**Refereed Conference Papers Accepted on the Basis of Abstract Review**


**LEMMER, GEORGE P.**

Education: BS Biological Sciences Wright State University, 2010; currently pursuing MS of Industrial Hygiene from AFIT. Mr. Lemmer’s Research efforts include literature review of CBRN decontamination on patients, titled, “A Review of CBRN Topics Related to Military and Civilian Patient Exposure and Decontamination,” published in the *American Journal of Disaster Medicine*. Mr. Lemmer also presented current and future research at the AIHCE2019 conference. His current research includes efforts to characterize and model aerosol exposure chamber with computational fluid dynamics (CFD). Future research will include characterizing the airflow around a patient on a litter using particle shadow image velocimetry and CFD as it relates to the environment within a C-130H Hercules during aeromedical evacuation transport. Email: George.Lemmer@afit.edu

**MUKHERJEE, CHANDANI**

Post-Doctoral Research Assistant in the area of Environmental Thrust. Ms. Mukherjee is an ORISE contractor studying waste-to-energy processes. She recently published a review on municipal solid waste-to-energy trends in *USA in Renewable and Sustainable Energy Reviews*.

**PETERSON, GEORGE G.**

ORISE Participant, AFIT Appointment Date: 2018 (AFIT/ENP); PhD, Materials Engineering, University of Nebraska–Lincoln, 2017; BSME, Mechanical Engineering, University of Nebraska Lincoln, 2012; BA, Political Science, Augustana University, 1998. Dr. Peterson’s work is focused on the correlation of material properties and changes to electrical response of semiconductors with an emphasis on radiation interaction. The related mission spaces are electronics survivability, stockpile to target delivery, nuclear forensics, and radiation detection, comprised of both modeling and experimental testing. AFIT research center affiliation(s): NEAT. Tel. 937-255 3636 x4688, Email: George.Peterson@afit.edu

**Refereed Journal Publications**


RAUT, YOGENDRA Y.
Research Scientist; Department of Engineering Physics, AFIT Appointment Date: 2019 (AFIT/ENP); PhD, Environmental Science, The Ohio State University, 2017; MS, Ecological Modeling, The University of New England, New South Wales Australia, 1997; BS (Hons) from Tribhuvan University (Nepal), 1984. Dr. Raut’s work is focused on soil, water, and air quality. The fate of stormwater management, carbon fractionation, nanoparticles, and laboratory equipment are some of the other areas of his expertise. Dr. Raut has authored/co-authored four books, including one textbook. Tel. 937-255-3636 x4241; Email: Yogendra.Raut.ctr@afit.edu

SCHMIDT, JACLYN E.
Research Meteorologist, LEEDR POC, Department of Engineering Physics, AFIT Appointment Date: 2015 (AFIT/ENP); BS, Meteorology, University of South Alabama, 2010. Ms. Schmidt’s research involves atmospheric characterization and radiative transfer modeling and simulation, and the enhancement of 4D Weather Cubes and its applications to high energy laser system performance binning and forecasting. Email: Jaclyn.Schmidt@afit.edu

Refereed Journal Publications


Refereed Conference Papers Accepted on the Basis of Full Paper Review


Refereed Conference Papers Accepted on the Basis of Abstract Review


https://ams.confex.com/ams/2019Annual/meetingapp.cgi/Paper/356249
TITUS, EMILY
Research Associate and graduate student working on a Masters of Industrial Hygiene at AFIT. Ms. Titus’ current research efforts support a project aimed at understanding the gaps in CBRN (Chemical, Biological, Radiological, and Nuclear) decontamination. Her past work includes a literature review and gap analysis of this topic, which was published recently in the American Journal of Disaster Medicine. Preliminary results were presented in poster sessions at the EPA International Decontamination Conference and the Chemical and Biological Defense Science and Technology Conference. Ms. Titus’ current research is aimed at developing a full-body method for quantifying the extent of contamination using a UV fluorescent tracer and image analysis. This will be used to quantify the extent of contamination both before and after decontamination efforts. Specifically she is interested in backing the statistic that any decontamination method results in a 90% reduction in contamination with data. Email: Emily.Titus@afit.edu

WANG, BUGUO
Part-time Research Scientist (research faculty), Department of Engineering Physics, AFIT Appointment Date: 2014 (AFIT/ENP); BSc, MSc, Physical Chemistry, Soochow University (Suzhou, China), 1990; PhD, Materials Science and Engineering, Chinese Academy of Sciences (Shanghai, China), 1997. Dr. Wang’s work is focused on the structural, optical, and electrical properties of novel semiconductor materials and devices, in correlation with their growth conditions as well as radiation effects. AFIT research center affiliation(s): NEAT Email: buguo.wang.ctr@afit.edu

Refereed Journal Publications


VIKUTYTE, JURATE, DR.

XING, YUN
Education: PhD in Bioengineering, Georgia Institute of Technology, 2005, currently an AFIT onsite contactor affiliated with KBR. Dr Xing's past research efforts include cancer nanotechnology, biomedical imaging, and biodefense. She has published 21 peer-reviewed journal articles with more than 3,000 citations, six invited book chapters and a book (editor). Her current research efforts include studying the behavior of biocontaminants and their surrogates in wastewater and other types of water matrices. Email: Yun.Xing@afit.edu
# APPENDIX B: SELECTED ACRONYM LIST

There are a number of abbreviations for organizations that are used in this report. This alphabetical listing includes only selected organizations.

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>711 HPW/RH</td>
<td>711 Human Performance Wing Human Effectiveness Directorate</td>
</tr>
<tr>
<td>ACC</td>
<td>Air Combat Command</td>
</tr>
<tr>
<td>AETC</td>
<td>Air Education and Training Command</td>
</tr>
<tr>
<td>AFCAA</td>
<td>Air Force Cost Analysis Agency</td>
</tr>
<tr>
<td>AFCEC</td>
<td>Air Force Civil Engineering Center</td>
</tr>
<tr>
<td>AFGSC</td>
<td>Air Force Global Strike Command</td>
</tr>
<tr>
<td>AFIA</td>
<td>Air Force Inspection Agency</td>
</tr>
<tr>
<td>AFIMSC</td>
<td>Air Force Installation and Mission Support Center</td>
</tr>
<tr>
<td>AFIT</td>
<td>Air Force Institute of Technology</td>
</tr>
<tr>
<td>AFIT ANT</td>
<td>AFIT Center for Autonomy and Navigation Technology</td>
</tr>
<tr>
<td>AFIT CCR</td>
<td>AFIT Center for Cyberspace Research</td>
</tr>
<tr>
<td>AFIT CDE</td>
<td>AFIT Center for Directed Energy</td>
</tr>
<tr>
<td>AFIT COA</td>
<td>AFIT Center for Operational Analysis</td>
</tr>
<tr>
<td>AFIT CSRA</td>
<td>AFIT Center for Space Research and Assurance</td>
</tr>
<tr>
<td>AFIT CTISR</td>
<td>AFIT Center for Technical Intelligence Studies and Research</td>
</tr>
<tr>
<td>AFIT/ENC</td>
<td>AFIT Department of Mathematics &amp; Statistics</td>
</tr>
<tr>
<td>AFIT/ENG</td>
<td>AFIT Department of Electrical &amp; Computer Engineering</td>
</tr>
<tr>
<td>AFIT/ENS</td>
<td>AFIT Department of Engineering Physics</td>
</tr>
<tr>
<td>AFIT/ENV</td>
<td>AFIT Department of Operational Sciences</td>
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<tr>
<td>AFIT/ENV</td>
<td>AFIT Department of Systems Engineering &amp; Management</td>
</tr>
<tr>
<td>AFIT/ENV</td>
<td>AFIT Department of Aeronautics and Astronautics</td>
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<tr>
<td>AFIT STAT COE</td>
<td>AFIT Center of Excellence for Scientific Test &amp; Analysis Techniques</td>
</tr>
<tr>
<td>AFTAC</td>
<td>Air Force Technical Applications Center</td>
</tr>
<tr>
<td>AFTAC</td>
<td>Air Force Technical Applications Center</td>
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<td>AFTAC</td>
<td>Air Force Test Pilot School</td>
</tr>
<tr>
<td>AIAA</td>
<td>American Institute of Aeronautics and Astronautics</td>
</tr>
<tr>
<td>AMC</td>
<td>Air Mobility Command</td>
</tr>
<tr>
<td>ASEE</td>
<td>American Society for Engineering Education</td>
</tr>
<tr>
<td>DAGSI</td>
<td>Dayton Area Graduate Studies Institute</td>
</tr>
<tr>
<td>DARPA</td>
<td>Defense Advanced Research Projects Agency</td>
</tr>
<tr>
<td>DE JTO</td>
<td>Directed Energy Joint Technology Office</td>
</tr>
<tr>
<td>DHS</td>
<td>Department of Homeland Security</td>
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<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DOE</td>
<td>Department of Energy</td>
</tr>
<tr>
<td>DTRA</td>
<td>Defense Threat Reduction Agency</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Agency</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
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<tr>
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</tr>
<tr>
<td>ERDC</td>
<td>Engineer Research and Development Center</td>
</tr>
<tr>
<td>EUCOM</td>
<td>United States European Command</td>
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<tr>
<td>IEEΕ</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>INCOSE</td>
<td>International Council on Systems Engineering</td>
</tr>
<tr>
<td>JASPO</td>
<td>Joint Aircraft Survivability Program Office</td>
</tr>
<tr>
<td>JTWC</td>
<td>Joint Typhoon Warning Center</td>
</tr>
<tr>
<td>JWAC</td>
<td>Joint Warfare Analysis Center</td>
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<tr>
<td>MIT</td>
<td>Los Alamos National Laboratory</td>
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<tr>
<td>LTS</td>
<td>Laboratory for Telecommunications Sciences</td>
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<td>MDA</td>
<td>Missile Defense Agency</td>
</tr>
<tr>
<td>MIT</td>
<td>Massachusetts Institute of Technology</td>
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<td>MORs</td>
<td>Military Operations Research Society</td>
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<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
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<tr>
<td>NASIC</td>
<td>National Air and Space Intelligence Center</td>
</tr>
<tr>
<td>NAVAIR</td>
<td>Naval Air Systems Command</td>
</tr>
<tr>
<td>NGA</td>
<td>National Geospatial-Intelligence Agency</td>
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<tr>
<td>NNSA</td>
<td>National Nuclear Security Administration</td>
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<tr>
<td>NPS</td>
<td>Naval Postgraduate School</td>
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<tr>
<td>NSA</td>
<td>National Security Agency</td>
</tr>
<tr>
<td>NSF</td>
<td>National Science Foundation</td>
</tr>
<tr>
<td>OSD</td>
<td>Office of the Secretary of Defense</td>
</tr>
<tr>
<td>SAF</td>
<td>Office of the Secretary of the Air Force</td>
</tr>
<tr>
<td>SCOW</td>
<td>635 Supply Chain Operations Wing</td>
</tr>
<tr>
<td>SMC</td>
<td>Space and Missile Systems Center</td>
</tr>
<tr>
<td>SOCHE</td>
<td>Southwestern Ohio Council for Higher Education</td>
</tr>
<tr>
<td>SPIE</td>
<td>The International Society for Optical Engineering</td>
</tr>
<tr>
<td>TuAF</td>
<td>Turkish Air Force</td>
</tr>
<tr>
<td>USAF</td>
<td>United States Air Force</td>
</tr>
<tr>
<td>USAFA</td>
<td>United States Air Force Academy</td>
</tr>
<tr>
<td>USSOCOM</td>
<td>United States Special Operations Command</td>
</tr>
<tr>
<td>USTRANSCOM</td>
<td>United States Transportation Command</td>
</tr>
<tr>
<td>WPAFB</td>
<td>Wright-Patterson Air Force Base</td>
</tr>
</tbody>
</table>
APPENDIX C: INFORMATION FOR OBTAINING A COPY OF A THESIS

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For users with a smartcard (i.e., CAC, PIV or ECA):
https://www.dtic.mil/

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NATIONAL TECHNICAL INFORMATION SERVICE
U.S. Department of Commerce
Website: https://ntrl.ntis.gov/NTRL/

Click on the ‘keyword’ dropdown menu on the left side of the page. Click on thesis (for dissertations also). In addition to the title and author, ‘Air Force’ should be entered as ‘source.’

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Air Force Institute of Technology
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Wright-Patterson AFB, OH 45433-7765
Phone: 937-255-3633 (DSN 785-3633)
Website: http://www.afit.edu
Email: research@afit.edu
This report summarizes the research activities of the Air Force Institute of Technology’s Graduate School of Engineering and Management. It describes research interests and faculty expertise; lists student theses/dissertations; identifies research sponsors and contributions; and outlines the procedures for contacting the school. Included in the report are: faculty publications, conference presentations, consultations, and funded research projects. Research was conducted in the areas of Aeronautical and Astronautical Engineering, Electrical Engineering and Electro-Optics, Computer Engineering and Computer Science, Systems Engineering and Management, Operational Sciences, Mathematics, Statistics and Engineering Physics.